

## Diatom zones (NPD)

undet

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

1418. F, 9R1w100

DATE: 2. 7. 2013

OBSERVER's NAME KUMU

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus Ingens***  
***Actinocyclus Ingens f. nodus***  
***Actinocyclus Ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
***Denticulopsis katayamae***  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis prae-hyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliois***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbot***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboti*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperel***  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Sponge -



Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

1410 F. 4R 2W/00

DATE: 2.7.2003

OBSERVER'S NAME ROWN

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatulus IF
- Actinocyclus ellipticus
- Actinocyclus Ingens
- Actinocyclus Ingens f. nodus
- Actinocyclus Ingens f. planus
- Actinocyclus oculatus
- Actinocyclus ochotensis
- Actinocyclus octonarius
- Actinocyclus robustus
- Actinocyclus tsugaruensis
- Actinocyclus spp.
- Actinoptychus senarius
- Actinoptychus vulgaris
- Actinoptychus spp.
- Araniscus lewisianus
- Araniscus spp.
- Asteromphalus darwinii
- Asteromphalus oligogenicus
- Asteromphalus parvulus
- Asteromphalus robustus
- Asteromphalus spp.
- Azpeitia biradiata
- Azpeitia komurae
- Azpeitia nodulifera
- Azpeitia oligogenica
- Azpeitia praenodulifera
- Azpeitia salisburyana
- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis T
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus IF
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus
- Coscinodiscus rhombicus
- Coscinodiscus symbolophorus
- Cosmidiscus insignis
- Crucidenticula ikebei
- Crucidenticula kanayae
- Crucidenticula nicobarica
- Crucidenticula paranicobarica
- Crucidenticula sawamurae
- Cyclotella striata
- Cyclotella meneghiniana
- Cyclotella spp.
- Cymbella cistula
- Cymbella minuta
- Cymbella subaequalis
- Cymbella spp.
- Delphineis angustata
- Delphineis ischaboensis
- Delphineis kippae
- Delphineis sachalinensis
- Delphineis simonsenii
- Delphineis surirella
- Delphineis spp.

- Denticulopsis crassa
- Denticulopsis dimorpha var. dimorpha
- Denticulopsis dimorpha var. areolata
- Denticulopsis hustedii
- Denticulopsis hyalina
- Denticulopsis katayamae
- Denticulopsis lauta
- Denticulopsis praedimorpha var. minor
- Denticulopsis praedimorpha var. praedimorpha
- Denticulopsis praeahyalina
- Denticulopsis praekatayamae
- Denticulopsis praelaeta
- Denticulopsis simonsenii
- Denticulopsis tanimurae
- Denticulopsis vulgaris
- Denticulopsis spp.
- Diploneis bombus
- Diploneis puella
- Diploneis smithii
- Diploneis suborbicularis
- Diploneis spp.
- Distephanosira architecturalis
- Distephanosira spp.
- Ellerbeckia sol
- Ellerbeckia spp.
- Eunotia pectinalis var. minor
- Eunotia praerupta var. praerupta
- Eunotia spp.
- Fragilaria construens
- Fragilaria spp.
- Fragilariopsis cylindrus
- Fragilariopsis dollofus
- Fragilariopsis fossilis
- Fragilariopsis oceanica
- Fragilariopsis pilocena
- Fragilariopsis spp.
- Goniothecium decoratum
- Goniothecium rogersii
- Goniothecium spp.
- Grammatophora spp.
- Halamphora costata
- Hyalodiscus obsoletus
- Hyalodiscus spp.
- Ikebea tenuis
- Kisseleviella carina
- Kisseleviella ezoensis
- Kozumia tatsunokuchensis
- Kozloviella minor
- Lisitzinia ornata
- Medlaria magna
- Medlaria splendida
- Melosira albicans
- Navicula elginensis
- Navicula lyroides
- Navicula menisculus
- Navicula salinarum
- Neodenticula kamschatka
- Neodenticula kozumii
- Neodenticula seminiae IF
- Nitzschia challengerii
- Nitzschia jouseae R
- Nitzschia palea
- Nitzschia reinholdii
- Nitzschia rolandii
- Odontella aurita T
- Odontella spp.
- Paralia sulcata T
- Paralia spp.
- Podosira stelligera
- Porosira glacialis
- Proboscia barboi
- Proboscia curvirostris
- Proboscia interposita
- Proboscia praebarboi
- Pseudodimmerograma elegans
- Pseudonitzschia seriata
- Pseudopyxilla americana
- Pseudotriceratium radiosoreticulatum
- Pyxidicula zabelinae

- Rhaphoneis amphiceros
- Rhaphoneis spp.
- Rhizosolenia hebetata f. hiemalis IF
- Rhizosolenia hebetata f. semispina
- Rhizosolenia norwegica
- Rhizosolenia praebergonii
- Rhizosolenia setigera
- Rhizosolenia spp.
- Roperia tessellata
- Rocella gelida
- Rocella praenitida
- Rocella semigelida
- Rocella vigilans
- Rouxia californica
- Rouxia granda
- Rouxia isopolica
- Rouxia naviculoides
- Rouxia obesa
- Shionodiscus oestrupii
- Shionodiscus praecoestrupii
- Shionodiscus trifultus
- Stephanopyxis dimorpha
- Stephanopyxis horridus
- Stephanopyxis turris
- Stephanopyxis spp. IF
- Surirella spp.
- Thalassionema bacillaris
- Thalassionema nitzschioides T
- Thalassionema nitzschioides var. incurvatum
- Thalassionema nitzschioides var. inflatum T
- Thalassionema nitzschioides var. parvum
- Thalassionema pseudonitzschioides
- Thalassionema schraderi
- Thalassionema spp.
- Thalassiosira antiqua
- Thalassiosira bioculata
- Thalassiosira castanea
- Thalassiosira convexa
- Thalassiosira decipiens
- Thalassiosira dubiosa
- Thalassiosira eccentrica
- Thalassiosira fasciculata
- Thalassiosira fraga
- Thalassiosira gravida
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregulara
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus F
- Thalassiosira lineata T
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marujamica
- Thalassiosira mediaconvexa
- Thalassiosira minutissima
- Thalassiosira miocenicus
- Thalassiosira nordenskioldii
- Thalassiosira orientalis
- Thalassiosira praefraga
- Thalassiosira praenidulus
- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperel
- Thalassiosira umaensis
- Thalassiosira undulosa
- Thalassiosira yabei
- Thalassiosira spp. IF
- Thalassiothrix longissima IF
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

Chaetoceros Resting Spores IF  
TOTAL OF VEGETATIVE CELLS

Sponge IF  
Silico -  
faban -  
closed copula +  
Ebt: -

## Diatom zones (NPD)

Barnech

## Core, section, interval (cm)

1410 F. 4R 4w/100

DATE: 2.7.2013

OBSERVER's NAME E. ONNO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus Ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatica***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperel***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418.F, SRW26

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2.7.2013

OBSERVER's NAME Kourno

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 vlv/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komuræ***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula parnicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelaeta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchlensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula koizumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediiconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Bc  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

148, F, SR 2w/00

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2, 7 2013

OBSERVER's NAME KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus otonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
*Cavitatus jouseanus*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmidiscus insignis*  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
*Fragilariopsis doliois*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis plocana*  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Koizumia tatsunokuchensis*  
*Kozloviella minor*  
*Lisitinia ornata*  
*Medlaria magna*  
*Medlaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamschatka*  
*Neodenticula koizumii*  
*Neodenticula seminiae*  
*Nitzschia challengerii*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barboi*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus triflutus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*Thalassionema* spp.  
*Thalassiosira antiqua*  
*Thalassiosira bioculata*  
*Thalassiosira castanea*  
*Thalassiosira convexa*  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
*Thalassiosira grunowii*  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
*Thalassiosira jacksonii*  
*Thalassiosira jouseae*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira marujamca*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenic*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
*Thalassiosira singularis*  
*Thalassiosira temperlei*  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

148.5-150.5 SR3w79

DATE: 2.7.2013

OBSERVER'S NAME KOONO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens f. nodus***  
***Actinocyclus ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha var. dimorpha***  
***Denticulopsis dimorpha var. areolata***  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
***Denticulopsis katayamae***  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha var. minor*  
*Denticulopsis praedimorpha var. praedimorpha*  
*Denticulopsis praeahyalina*  
*Denticulopsis praekatayamae*  
***Denticulopsis praelaeta***  
*Denticulopsis simonsenii*  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliois***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kotzumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatka***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides var. incurvatum*  
*Thalassionema nitzschioides var. inflatum*  
*Thalassionema nitzschioides var. parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamika***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

1418F SR4W/00

## DATE:

2.7.2013

## OBSERVER'S NAME

KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliois***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plicata***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikabea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatica***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

undet

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418. F, SRCc

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praeiialina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plicocera***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatkica***  
***Neodenticula kolzumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis homidus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenic*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperi***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros Resting Spores***  
**TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

## Core, section, interval (cm)

DATE: 2.7.2013

OBSERVER'S NAME KONNO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 vlv/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus Ingens***  
*Actinocyclus Ingens* f. *nodus*  
*Actinocyclus Ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praeahalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisztinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula tyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rotandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis hortulus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schradleri***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros* Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1410.F. 6R4w42

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## DATE:

2.7.2013

## OBSERVER'S NAME

KONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 vlv/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
*Cavitatus jouseanus*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmidiscus insignis*  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praeurupta* var. *praeurupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolioilus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis plocena*  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kotzumia tatsunokuchensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medlaria magna*  
*Medlaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamschatka*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barboi*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
*Pyxidicula zabellinae*

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
*Rhizosolenia praebergerii*  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*Thalassionema* spp.  
*Thalassiosira antiqua*  
*Thalassiosira bioculata*  
*Thalassiosira castanea*  
*Thalassiosira convexa*  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
*Thalassiosira grunowii*  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
*Thalassiosira jacksonii*  
*Thalassiosira jouseae*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira marujamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenic*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
*Thalassiosira singularis*  
*Thalassiosira temperel*  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

14/2. F. 6R4w/00

DATE: 2.7.2013

OBSERVER's NAME KONNO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliofus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plococena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikabea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenic*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaciensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Bergen*  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

*1418.F. BRCC*

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: *2.7.2013*OBSERVER'S NAME *KONOVO*

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
***Actinocyclus ingens* f. *planus***  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula parnicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedii*  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolifolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plicata***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatica***  
***Neodenticula koizumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Sunirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenic*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umacensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Boreas*

## Core, section, interval (cm)

1718F-DR-1W, 38cm

DATE: 2013/July/12

OBSERVER's NAME

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
***Actinocyclus ocellatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praeodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis prae-hyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikabea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediana magna***  
***Mediana splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula tyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros* Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Bunnar*

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418E - DR - 2W, 100cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/2

OBSERVER'S NAME

ALGEM2

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula parnicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonseni***  
*Delphineis sunirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonseni*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolioilus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikabea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitizina ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula kozumil***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbot***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboti*  
*Pseudodimmergrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperel***  
*Thalassiosira umaoniensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

1418F-9R-3W, 103cm

DATE: 2013/July 12

OBSERVER'S NAME

AFCO 2

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), G (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
***Actinocyclus ingens* f. *planus***  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedii*  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis prae-hyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliois***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatica***  
***Neodenticula koizumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbot***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboti*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia senata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperel***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

198F-9R-9W, 100cm

DATE: 2013/ July 12

OBSERVER's NAME

AKEMZ

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia prae-nodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis prae-hyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikabea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozioviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radioreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeinitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunovii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamka***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

148.47R. CC

DATE: 2.7.2013

OBSERVER'S NAME KONNO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolifolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

1410 F. BRCE

DATE:

27 2013

OBSERVER's NAME

KONDO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens f. nodus***  
***Actinocyclus ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Dislephanosira architecturalis*  
*Dislephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotracerium radioreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouda californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperel***  
*Thalassiosira yamoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

undet

## Core, section, interval (cm)

148F-9R - (14, 46 cm)

## DATE:

2013/July/12

## OBSERVER's NAME

AFEMZ

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedii*  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula tyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kotzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radioreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenicica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaotensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabel***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

fragments

poor

## Diatom zones (NPD)

Undet.

## Core, section, interval (cm)

148F-GR-20, 00cm

DATE: 2013/July/2

OBSERVER's NAME AKEMZ

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 viv/10FOVs & <1 viv/10FOVs)  
R (>3 viv/traverse & <1 viv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula parnicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliofus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plococena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia senata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros* Resting Spores**  
TOTAL of VEGETATIVE CELLS

fragments

sponge T



Diatom zones (NPD)

NPD 1

Core, section, interval (cm)

1918F-GR-fu, San

DATE: 2013/July/12

OBSERVER's NAME AKEMZ

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*

*Achnanthes inflata*

*Achnanthes lanceolata*

*Achnanthes lineariformis*

*Achnanthes* spp.

*Actinocyclus curvatus* T 2

*Actinocyclus ellipticus*

*Actinocyclus ingens*

*Actinocyclus ingens* f. *nodus*

*Actinocyclus ingens* f. *planus*

*Actinocyclus oculatus*

*Actinocyclus ochotensis*

*Actinocyclus octonarius* 1

*Actinocyclus robustus*

*Actinocyclus tsugaruensis*

*Actinocyclus* spp.

*Actinocyclus senarius*

*Actinocyclus vulgaris*

*Actinocyclus* spp.

*Araniscus lewisianus*

*Araniscus* spp.

*Asteromphalus darwinii*

*Asteromphalus oligocenicus*

*Asteromphalus parvulus*

*Asteromphalus robustus*

*Asteromphalus* spp.

*Azpeitia biradiata*

*Azpeitia komurae*

*Azpeitia nodulifera*

*Azpeitia oligocenica*

*Azpeitia praeodulifera*

*Azpeitia salisburyana*

*Azpeitia tabularis*

*Azpeitia vetustissima*

*Azpeitia* spp.

*Bacterosira bathyomphala*

*Bacterosira fragilis* 1

*Bacterosira* spp.

*Cavitatus exiguus*

*Cavitatus jouseanus*

*Cavitatus lanceolatus*

*Cavitatus linearis*

*Cavitatus miocenicus*

*Cavitatus rectus*

*Cavitatus* spp.

*Cestodiscus kugleri*

*Cestodiscus* spp.

*Cocconeis californica*

*Cocconeis costata*

*Cocconeis scutellum*

*Cocconeis* spp. 1

*Coscinodiscus asteromphalus*

*Coscinodiscus marginatus*

*Coscinodiscus oculus-iridis*

*Coscinodiscus radiatus*

*Coscinodiscus rhombicus*

*Coscinodiscus symbolophorus*

*Cosmidiscus insignis*

*Crucidenticula ikebei*

*Crucidenticula kanayae*

*Crucidenticula nicobarica*

*Crucidenticula paranicobarica*

*Crucidenticula sawamurae*

*Cyclotella striata*

*Cyclotella meneghiniana*

*Cyclotella* spp.

*Cymbella cistula*

*Cymbella minuta*

*Cymbella subaequalis*

*Cymbella* spp.

*Delphineis angustata*

*Delphineis ischaboensis*

*Delphineis kippae*

*Delphineis sachalinensis*

*Delphineis simonsenii*

*Delphineis surirella*

*Delphineis* spp.

← 1.0

→ 2.0

← 3.0

*Denticulopsis crassa*

*Denticulopsis dimorpha* var. *dimorpha*

*Denticulopsis dimorpha* var. *areolata*

*Denticulopsis hustedii*

*Denticulopsis hyalina*

*Denticulopsis katayamae*

*Denticulopsis lauta*

*Denticulopsis praedimorpha* var. *minor*

*Denticulopsis praedimorpha* var. *praedimorpha*

*Denticulopsis praehyalina*

*Denticulopsis praekatayamae*

*Denticulopsis praelauta*

*Denticulopsis simonsenii*

*Denticulopsis tanimurae*

*Denticulopsis vulgaris*

*Denticulopsis* spp.

*Diploneis bombus*

*Diploneis puella*

*Diploneis smithii*

*Diploneis suborbicularis*

*Diploneis* spp.

*Distephanosira architecturalis*

*Distephanosira* spp.

*Ellerbeckia sol*

*Ellerbeckia* spp.

*Eunotia pectinalis* var. *minor*

*Eunotia praerupta* var. *praerupta*

*Eunotia* spp.

*Fragilaria construens*

*Fragilaria* spp.

*Fragilariopsis cylindrus*

*Fragilariopsis dololus*

*Fragilariopsis fossilis*

*Fragilariopsis oceanica*

*Fragilariopsis pilocena*

*Fragilariopsis* spp.

*Goniothecium decoratum*

*Goniothecium rogersii*

*Goniothecium* spp.

*Grammatophora* spp.

*Halamphora costata*

*Hyalodiscus obsoletus* 1

*Hyalodiscus* spp. 1

*Ikebea tenuis*

*Kisseleviella carina*

*Kisseleviella ezoensis*

*Kozumia tatsunokuchensis*

*Kozloviella minor*

*Lisitzinia ornata*

*Medlaria magna*

*Medlaria splendida*

*Melosira albicans*

*Navicula elginensis*

*Navicula lyroides*

*Navicula menisculus*

*Navicula salinarum*

*Neodenticula kamschatica*

*Neodenticula kozumii*

*Neodenticula seminae* T F 4

*Nitzschia challengerii*

*Nitzschia jouseae*

*Nitzschia palea*

*Nitzschia reinholdii*

*Nitzschia rolandii*

*Odontella aurita*

*Odontella* spp.

*Paralia sulcata*

*Paralia* spp.

*Podosira stelligera*

*Porosira glacialis*

*Proboscia barboi*

*Proboscia curvirostris* T (IEIF) 2

*Proboscia interposita*

*Proboscia praebarboi*

*Pseudodimmergrana elegans*

*Pseudonitzschia seriata*

*Pseudopyxilla americana*

*Pseudotriceratium radiosreticulatum*

*Pyxidicula zabelinae*

closed spore  
Rest spore IE

*Rhaphoneis amphicros*

*Rhaphoneis* spp.

*Rhizosolenia hebetata* f. *hiemalis* IET ?

*Rhizosolenia hebetata* f. *semispina* T 2

*Rhizosolenia norvegica*

*Rhizosolenia praerbergonii*

*Rhizosolenia setigera*

*Rhizosolenia* spp.

*Roperia tessellata*

*Rocella gelida*

*Rocella praenitida*

*Rocella semigelida*

*Rocella vigilans*

*Rouxia californica*

*Rouxia granda*

*Rouxia isopolica*

*Rouxia naviculoides*

*Rouxia obesa*

*Shionodiscus ostrupii* IET 28

*Shionodiscus praestrupii*

*Shionodiscus trifultus* T 2

*Stephanopyxis dimorpha*

*Stephanopyxis horridus*

*Stephanopyxis turris*

*Stephanopyxis* spp.

*Surirella* spp.

*Thalassionema bacillaris*

*Thalassionema nitzschoides*

*Thalassionema nitzschoides* var. *incurvatum*

*Thalassionema nitzschoides* var. *inflatum*

*Thalassionema nitzschoides* var. *parvum*

*Thalassionema pseudonitzschoides*

*Thalassionema schraderei*

*Thalassionema* spp.

*Thalassiosira antiqua*

*Thalassiosira bioculata*

*Thalassiosira castanea*

*Thalassiosira convexa*

*Thalassiosira decipiens*

*Thalassiosira dubiosa*

*Thalassiosira eccentrica* IET F 18

*Thalassiosira fasciculata*

*Thalassiosira fraga*

*Thalassiosira gravida* IET F 8

*Thalassiosira grunowii*

*Thalassiosira hyalina*

*Thalassiosira irregulara*

*Thalassiosira jacksonii*

*Thalassiosira jouseae*

*Thalassiosira leptopus*

*Thalassiosira lineata* T 2

*Thalassiosira lusca*

*Thalassiosira manifesta*

*Thalassiosira marujamca*

*Thalassiosira mediaconvexa*

*Thalassiosira minutissima*

*Thalassiosira miocenica*

*Thalassiosira nordenskioldii*

*Thalassiosira orientalis*

*Thalassiosira praefraga*

*Thalassiosira praenidulus*

*Thalassiosira praeyabei*

*Thalassiosira robusta*

*Thalassiosira sancettae*

*Thalassiosira singularis*

*Thalassiosira temperei*

*Thalassiosira umaoensis*

*Thalassiosira undulosa*

*Thalassiosira yabei* IET IET 20

*Thalassiosira* spp.

*Thalassiothrix longissima*

*Thalassiothrix* spp.

*Trachyneis aspera*

*Trachyneis* spp.

*Yoshidaia divergens*

*Yoshidaia* spp.

*Chaetoceros* Resting Spores 6 R

TOTAL of VEGETATIVE CELLS 100

## Diatom zones (NPD)

*Barren*  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

1410.F. 9240/100

DATE: 3.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus Ingens*  
*Actinocyclus Ingens f. nodus*  
*Actinocyclus Ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
*Cavitatus jouseanus*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmodiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolotus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Koizumia tatsunokuchensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medlaria magna*  
*Medlaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamschatka*  
*Neodenticula kozumii*  
*Neodenticula seminiae*  
*Nitzschia challengerii*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarbol*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
*Rhizosolenia praeborgonii*  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praecoestrupii*  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*Thalassionema* spp.  
*Thalassiosira antiqua*  
*Thalassiosira bioculata*  
*Thalassiosira castanea*  
*Thalassiosira convexa*  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
*Thalassiosira grunowii*  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
*Thalassiosira jacksonii*  
*Thalassiosira jouseae*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira marujamica*  
*Thalassiosira mediiconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
*Thalassiosira singularis*  
*Thalassiosira temperlei*  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

141P.F. 9Rcc

DATE: 2.7.2013

OBSERVER'S NAME KOLMUO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlw/10FOVs & <1 vlw/10FOVs)  
R (>3 vlw/traverse & <1 vlw/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopterychus senarius*  
*Actinopterychus vulgaris*  
*Actinopterychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praeodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kolzumia tatsunokuchensis***  
*Kozioviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmergrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radioreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praesoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamka***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

Sponge +

## Diatom zones (NPD)

Bartley

## Core, section, interval (cm)

1418 F 10R cc

DATE: 2.7.2013

OBSERVER'S NAME KONO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocentrica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedii*  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis prae-hyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelaeta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchlensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeiliida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS



Diatom zones (NPD)

NPD 11

Core, section, interval (cm)

U1418F 11R-2W 100cm

DATE: 2013/July 13

OBSERVER'S NAME

ITSUKI

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatulus
- Actinocyclus ellipticus
- Actinocyclus ingens
- Actinocyclus ingens 1. nodus
- Actinocyclus ingens 1. planus
- Actinocyclus oculatus
- Actinocyclus ochotensis
- Actinocyclus octonarius
- Actinocyclus robustus
- Actinocyclus tsugaruensis
- Actinocyclus spp.
- Actinoplychus senarius
- Actinoplychus vulgaris
- Actinoplychus spp.
- Araniscus lewisianus
- Araniscus spp.
- Asteromphalus darwinii
- Asteromphalus oligocenicus
- Asteromphalus parvulus
- Asteromphalus robustus
- Asteromphalus spp.
- Azpeitia biradiata
- Azpeitia komurae
- Azpeitia nodulifera
- Azpeitia oligocenica
- Azpeitia praenodulifera
- Azpeitia salisburyana
- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus
- Coscinodiscus rhombicus
- Coscinodiscus symbolophorus
- Cosmidiscus insignis
- Crucidenticula ikebei
- Crucidenticula kanayae
- Crucidenticula nicobarica
- Crucidenticula paranicobarica
- Crucidenticula sawamurae
- Cyclotella striata
- Cyclotella meneghiniana
- Cyclotella spp.
- Cymbella cistula
- Cymbella minuta
- Cymbella subaequalis
- Cymbella spp.
- Delphineis angustata
- Delphineis ischaboensis
- Delphineis kippae
- Delphineis sachalinensis
- Delphineis simonsenii
- Delphineis surella
- Delphineis spp.

- Denticulopsis crassa
- Denticulopsis dimorpha var. dimorpha
- Denticulopsis dimorpha var. areolata
- Denticulopsis hustedii
- Denticulopsis hyalina
- Denticulopsis katayamae
- Denticulopsis lauta
- Denticulopsis praedimorpha var. minor
- Denticulopsis praedimorpha var. praedimorpha
- Denticulopsis praehyalina
- Denticulopsis praekatayamae
- Denticulopsis praelauta
- Denticulopsis simonsenii
- Denticulopsis tanimurae
- Denticulopsis vulgaris
- Denticulopsis spp.
- Diploneis bombus
- Diploneis puella
- Diploneis smithii
- Diploneis suborbicularis
- Diploneis spp.
- Distephanosira architecturalis
- Distephanosira spp.
- Ellerbeckia sol
- Ellerbeckia spp.
- Eunotia pectinalis var. minor
- Eunotia praeprupta var. praeprupta
- Eunotia spp.
- Fragilaria construens
- Fragilaria spp.
- Fragilariopsis cylindrus
- Fragilariopsis dolius
- Fragilariopsis fossilis
- Fragilariopsis oceanica
- Fragilariopsis plocana
- Fragilariopsis spp.
- Goniothecium decoratum
- Goniothecium rogersii
- Goniothecium spp.
- Grammatophora spp.
- Halamphora costata
- Hyalodiscus obsoletus
- Hyalodiscus spp.
- Ikebea tenuis
- Kisseleviella carina
- Kisseleviella ezoensis
- Koizumia tatsunokuchiensis
- Kozloviella minor
- Lisitzinia ornata
- Mediaria magna
- Mediaria splendida
- Melosira albicans
- Navicula elginensis
- Navicula lyroides
- Navicula menisculus
- Navicula salinarum
- Neodenticula kamschatka
- Neodenticula koizumii
- Neodenticula seminae
- Nitzschia challengeri
- Nitzschia jouseae
- Nitzschia palea
- Nitzschia reinholdii
- Nitzschia rolandii
- Odontella aurita
- Paralia sulcata
- Paralia spp.
- Podosira stelligera
- Porosira glacialis
- Proboscia barboi
- Proboscia curvirostris
- Proboscia interposita
- Proboscia praebarboi
- Pseudodimmerogramma elegans
- Pseudonitzschia seriata
- Pseudopyxilla americana
- Pseudotriceratium radiosoreticulatum
- Pyxidicula zabelinae

- Rhaphoneis amphicerus
- Rhaphoneis spp.
- Rhizosolenia hebetata 1. hiemalis
- Rhizosolenia hebetata 1. semipinna
- Rhizosolenia norvegica
- Rhizosolenia praeborgonii
- Rhizosolenia setigera
- Rhizosolenia spp.
- Roperia tessellata
- Rocella gelida
- Rocella praenitida
- Rocella semigelida
- Rocella vigilans
- Rouxia californica
- Rouxia granda
- Rouxia isopolica
- Rouxia naviculoides
- Rouxia obesa
- Rouxia spp.
- Shionodiscus ostrupii
- Shionodiscus praeostrupii
- Shionodiscus trifidulus
- Stephanopyxis dimorpha
- Stephanopyxis horridus
- Stephanopyxis turris
- Stephanopyxis spp.
- Thalassionema bacillaris
- Thalassionema nitzschioides
- Thalassionema nitzschioides var. incurvatum
- Thalassionema nitzschioides var. inflatum
- Thalassionema nitzschioides var. parvum
- Thalassionema pseudonitzschioides
- Thalassionema schraderi
- Thalassionema spp.
- Thalassiosira antiqua
- Thalassiosira bioculata
- Thalassiosira castanea
- Thalassiosira convexa
- Thalassiosira decipiens
- Thalassiosira dubiosa
- Thalassiosira eccentrica
- Thalassiosira fasciculata
- Thalassiosira fraga
- Thalassiosira gravida
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregulata
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus
- Thalassiosira lineata
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marujamica
- Thalassiosira mediaconvexa
- Thalassiosira minutissima
- Thalassiosira miocenica
- Thalassiosira nordenskioldii
- Thalassiosira orientalis
- Thalassiosira praefraga
- Thalassiosira praenidulus
- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperlei
- Thalassiosira umaoniensis
- Thalassiosira undulosa
- Thalassiosira yabei
- Thalassiosira spp.
- Thalassiothrix longissima
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

85

R6  
R2  
R4  
R1  
R2

R12

R6

R51

R1

R1

R9

R5 Chaetoceros Resting Spores

Silica

100%

100

->

Diatom zones (NPD)

NPD 11

Core, section, interval (cm)

W448F - 14R - 100cm

DATE: 2013 / July / 13

OBSERVER's NAME ITSUKI

TOTAL ABUNDANCE:

M (>10%), A (20-60%), C (5-20%), F (2-5%), R (<2%), B (no diatoms)

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)
F (>1 vlv/10FOVs & <1 vlv/10FOVs)
R (>3 vlv/traverse & <1 vlv/10FOVs)
X (present), B (barren)

- Achnanthes groenlandica
Achnanthes inflata
Achnanthes lanceolata
Achnanthes lineariformis
Achnanthes spp.
Actinocyclus curvatus
Actinocyclus ellipticus
Actinocyclus ingens
Actinocyclus ingens f. nodus
Actinocyclus ingens f. planus
Actinocyclus oculatus
Actinocyclus ochotensis
Actinocyclus octonarius
Actinocyclus robustus
Actinocyclus tsugaruensis
Actinocyclus spp.
Actinocyclus senarius
Actinocyclus vulgaris
Actinocyclus spp.
Araniscus lewisianus
Araniscus spp.
Asteromphalus darwinii
Asteromphalus oligogenicus
Asteromphalus parvulus
Asteromphalus robustus
Asteromphalus spp.
Azpeitia biradiata
Azpeitia komurae
Azpeitia nodulifera
Azpeitia oligogenica
Azpeitia praenodulifera
Azpeitia salisburyana
Azpeitia tabularis
Azpeitia vetustissima
Azpeitia spp.
Bacterosira bathyomphala
Bacterosira fragilis
Bacterosira spp.
Cavitatus exiguus
Cavitatus jouseanus
Cavitatus lanceolatus
Cavitatus linearis
Cavitatus miocenicus
Cavitatus rectus
Cavitatus spp.
Cestodiscus kugleri
Cestodiscus trochus
Cestodiscus spp.
Cocconeis californica
Cocconeis costata
Cocconeis scutellum
Cocconeis spp.
Coscinodiscus asteromphalus
Coscinodiscus marginatus
Coscinodiscus oculus-iridis
Coscinodiscus radiatus
Coscinodiscus rhombicus
Coscinodiscus symbolophorus
Cosmodiscus insignis
Crucidenticula ikebei
Crucidenticula kanayae
Crucidenticula nicobarica
Crucidenticula paranicobarica
Crucidenticula sawamurae
Cyclotella striata
Cyclotella meneghiniana
Cyclotella spp.
Cymbella cistula
Cymbella minuta
Cymbella subaequalis
Cymbella spp.
Delphineis angustata
Delphineis ischaboensis
Delphineis kippae
Delphineis sachalinensis
Delphineis simonsenii
Delphineis surirella
Delphineis spp.

- Denticulopsis crassa
Denticulopsis dimorpha var. dimorpha
Denticulopsis dimorpha var. areolata
Denticulopsis hustedii
Denticulopsis hyalina
Denticulopsis katayamae
Denticulopsis lauta
Denticulopsis praedimorpha var. minor
Denticulopsis praedimorpha var. praedimorpha
Denticulopsis praehyalina
Denticulopsis praekatayamae
Denticulopsis praelauta
Denticulopsis simonsenii
Denticulopsis tanimurae
Denticulopsis vulgaris
Denticulopsis spp.
Diploneis bombus
Diploneis puella
Diploneis smithii
Diploneis suborbicularis
Diploneis spp.
Distephanosira architecturalis
Distephanosira spp.
Ellerbeckia sol
Ellerbeckia spp.
Eunotia pectinalis var. minor
Eunotia praeurupta var. praeurupta
Eunotia spp.
Fragilaria construens
Fragilaria spp.
Fragilariopsis cylindrus
Fragilariopsis dollolus
Fragilariopsis fossilis
Fragilariopsis oceanica
Fragilariopsis plicocera
Fragilariopsis spp.
Goniothecium decoratum
Goniothecium rogersii
Goniothecium spp.
Grammatophora spp.
Halamphora costata
Hyalodiscus obsoletus
Hyalodiscus spp.
Ikebea tenuis
Kisseleviella carina
Kisseleviella ezoensis
Kozumia tatsunokuchensis
Kozloviella minor
Lisitzinia ornata
Mediaria magna
Mediaria splendida
Melosira albicans
Navicula eiginensis
Navicula lyroides
Navicula menisculus
Navicula salinarum
Neodenticula kamschatica
Neodenticula kozumii
Neodenticula seminiae
Nitzschia challengerii
Nitzschia jouseae
Nitzschia palea
Nitzschia reinholdii
Nitzschia rolandii
Odontella aurita
Odontella spp.
Paralia sulcata
Paralia spp.
Podosira stelligera
Porosira glacialis
Proboscia barboi
Proboscia curvirostris
Proboscia interposita
Proboscia praebarboi
Pseudodimmerograma elegans
Pseudonitzschia seriata
Pseudopyxilla americana
Pseudotriceratium radioreticulatum
Pyxidicula zabelinae

- Rhaphoneis amphiceros
Rhaphoneis spp.
Rhizosolenia hebetata f. hiemalis
Rhizosolenia hebetata f. semispina
Rhizosolenia norvegica
Rhizosolenia praebergonii
Rhizosolenia setigera
Rhizosolenia spp.
Roperia tessellata
Rocella gelida
Rocella praenitida
Rocella semigelida
Rocella vigilans
Rouxia californica
Rouxia granda
Rouxia isopallca
Rouxia naviculoides
Rouxia obesa
Shionodiscus oestrupii
Shionodiscus praecoestrupii
Shionodiscus trifidus
Stephanopyxis dimorpha
Stephanopyxis horridus
Stephanopyxis turris
Stephanopyxis spp.
Surirella spp.
Thalassionema bacillariss
Thalassionema nitzschoides
Thalassionema nitzschoides var. incurvatum
Thalassionema nitzschoides var. inflatum
Thalassionema nitzschoides var. parvum
Thalassionema pseudonitzschoides
Thalassionema schraderi
Thalassionema spp.
Thalassiosira antiqua
Thalassiosira bioculata
Thalassiosira castanea
Thalassiosira convexa
Thalassiosira decipiens
Thalassiosira dubiosa
Thalassiosira eccentrica
Thalassiosira fasciculata
Thalassiosira fraga
Thalassiosira gravida
Thalassiosira grunowii
Thalassiosira hyalina
Thalassiosira irregularis
Thalassiosira jacksonii
Thalassiosira jouseae
Thalassiosira leptopus
Thalassiosira lineata
Thalassiosira lusca
Thalassiosira manifesta
Thalassiosira marujamica
Thalassiosira mediaconvexa
Thalassiosira minutissima
Thalassiosira miocenica
Thalassiosira nordenskioldii
Thalassiosira orientalis
Thalassiosira praefraga
Thalassiosira praenidulus
Thalassiosira praeyabei
Thalassiosira robusta
Thalassiosira sancettae
Thalassiosira singularis
Thalassiosira temperlei
Thalassiosira umaensis
Thalassiosira undulosa
Thalassiosira yabei
Thalassiosira spp.
Thalassiothrix longissima
Thalassiothrix spp.
Trachyneis aspera
Trachyneis spp.
Yoshidaia divergens
Yoshidaia spp.
Chaetoceros Resting Spores
TOTAL OF VEGETATIVE CELLS

R 1

R 2 Aulacoseira

R 3

F 7

R 5

R 2

F 12

F 9

C 4

F 8

R 1

R 1

R 5

F 9

closed Dinos
sponge

70
4.5 5.5

100

## Diatom zones (NPD)

NPD 12

## Core, section, interval (cm)

1418.F. 11R5W76

DATE: 3.7.2013

OBSERVER'S NAME KO NUNO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedii*  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarbol*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schradleri***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Bomen

## Core, section, interval (cm)

1418F-11R-CC

DATE: 2013/July/12

OBSERVER's NAME AFEMZ

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens f. nodus***  
***Actinocyclus ingens f. planus***  
***Actinocyclus ocellatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praeodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha var. dimorpha***  
***Denticulopsis dimorpha var. areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha var. minor***  
***Denticulopsis praedimorpha var. praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelaeta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plicocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula tyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyddicula zabelinae***

*Rhaphoneis amphicros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides var. incurvatum*  
*Thalassionema nitzschioides var. inflatum*  
*Thalassionema nitzschioides var. parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabel***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1410 F, 13R 2w24

TOTAL PRESERVATION  
 G (good), M (moderate), P (poor)

DATE: 3.7.2013  
 OBSERVER'S NAME KORUNA

RELATIVE ABUNDANCE of EACH TAXON  
 A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenic*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula parnicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisztinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula kolzumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros Resting Spores***  
 TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

Bayerlein

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
*Cavitatus jouseanus*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmidiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Delphineis* spp.

## Core, section, interval (cm)

1418 F. 13R 2W 8?

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
*Fragilariopsis dololus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Koizumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medlaria magna*  
*Medlaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatica*  
*Neodenticula koizumii*  
*Neodenticula seminiae*  
*Nitzschia challengerii*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barboi*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praerbarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyddicula zabellinae*

DATE: 3.7.2013

OBSERVER'S NAME

KOMP

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
*Rhizosolenia praeborgonii*  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeeostrupii*  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*Thalassionema* spp.  
*Thalassiosira antiqua*  
*Thalassiosira bioculata*  
*Thalassiosira castanea*  
*Thalassiosira convexa*  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
*Thalassiosira grunowii*  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
*Thalassiosira jacksonii*  
*Thalassiosira jouseae*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira marujamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
*Thalassiosira singularis*  
*Thalassiosira temperlei*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

1412 F. 13R2w100

DATE: 3.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens f. nodus***  
***Actinocyclus ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenicus*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praeahalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praeurupta* var. *praeurupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolifolus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsolitus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatica***  
***Neodenticula koizumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmergramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus triflutus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenicus*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros* Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus Ingens***  
***Actinocyclus Ingens f. nodus***  
***Actinocyclus Ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula parnicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

## Core, section, interval (cm)

1418.F, 13R3w7

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula koizumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbot***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praerbarbot*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

DATE: 3.7.2013

OBSERVER'S NAME Komuro

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

Sponge +

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

1418.F, 1324W7DATE: 3.7.2013OBSERVER'S NAME KGJWU

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolioilus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula koizumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenic*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira ymaoensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros* Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barnor

## Core, section, interval (cm)

1418 F-13R-CC

DATE: 29/13/July/2

OBSERVER's NAME AFEM2

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praeahalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliofus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plococna***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatica***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis homidus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Sponge

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

U1X18F-142-149 91cm

DATE: 2013/ July 13

OBSERVER'S NAME ITSUKI

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia prae-nodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis prae-hyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia prae-rupta* var. *prae-rupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dololus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikabea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediana magna***  
***Mediana splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula tyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praeborboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radioreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborboi***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschoides*  
*Thalassionema nitzschoides* var. *incurvatum*  
*Thalassionema nitzschoides* var. *inflatum*  
*Thalassionema nitzschoides* var. *parvum*  
*Thalassionema pseudonitzschoides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamka***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

U1418F, 14R-2W 100cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/03

OBSERVER'S NAME

ITSUKI

## RELATIVE ABUNDANCE of EACH TAXON

A (&gt;10 valves/FOV), C (1-10 vlv/FOV)

F (&gt;1 vlv/10FOVs &amp; &lt;1 vlv/10FOVs)

R (&gt;3 vlv/traverse &amp; &lt;1 vlv/10FOVs)

X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus Ingens**  
*Actinocyclus Ingens* f. *nodus*  
*Actinocyclus Ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmiolodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedtii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kozumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudoniceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeeostrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarlis*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenic*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Parrey*  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418 F, KR 100  
 4W

TOTAL PRESERVATION  
 G (good), M (moderate), P (poor)

DATE: 3.7.2013  
 OBSERVER'S NAME KONNO

RELATIVE ABUNDANCE of EACH TAXON  
 A (>10 valves/FOV), C (1-10 vlvs/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Disstephanosira architecturalis*  
*Disstephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollolus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikabea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatkica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praerbergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouda californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praesostrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediacconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperei**  
*Thalassiosira yamaiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

**Chaetoceros Resting Spores**  
 TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1010.F. SW53

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

14R

DATE: 3.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopterychus senarius*  
*Actinopterychus vulgaris*  
*Actinopterychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praeodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praeupta* var. *praeupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolioilus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatka***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia senata*  
*Pseudopyxilla americana*  
*Pseudotraceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifidulus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperoi***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418, F, 15R20100

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME K. G. N. N. O.

## RELATIVE ABUNDANCE of EACH TAXON

A (&gt;10 valves/FOV), C (1-10 vlv/FOV)

F (&gt;1 vlv/10FOVs &amp; &lt;1 vlv/10FOVs)

R (&gt;3 vlv/traverse &amp; &lt;1 vlv/10FOVs)

X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus Ingens**  
*Actinocyclus Ingens* f. *nodus*  
*Actinocyclus Ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmolodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozlovella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebregonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeeustrupii**  
*Shionodiscus trifidulus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarlis*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperoi**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

1418.F.15R4w13

## DATE:

3.7.2013

## OBSERVER'S NAME KONDO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollois***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Koizumiella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudoniceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praesoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

148. F. 15R 2/100

DATE: 3.7.2013

OBSERVER'S NAME /CO MNU

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens 1. nodus**  
**Actinocyclus ingens 1. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus otonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia prae-nodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis suretella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plicocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumiella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kotzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebregonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeinitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praesoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *infatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praeinitidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctetae*  
**Thalassiosira singularis**  
**Thalassiosira temperei**  
*Thalassiosira umaoniensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Barren*  
**TOTAL ABUNDANCE:**  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418.F.15R5W134

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME KOMNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula parnicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis suretella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumiella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schradleri**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctetae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetocercs Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

barren

## Core, section, interval (cm)

148F-15R-CC

DATE: 2013/July/12

OBSERVER'S NAME AKEMZ

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens f. nodus***  
***Actinocyclus ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha var. dimorpha***  
***Denticulopsis dimorpha var. areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha var. minor***  
***Denticulopsis praedimorpha var. praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolioles***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plicata***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotricerarium radioreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides var. incurvatum*  
*Thalassionema nitzschioides var. inflatum*  
*Thalassionema nitzschioides var. parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenic*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaicensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Barren*  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418.F.16Rzw21

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)

F (>1 vlv/10FOVs & <1 vlv/10FOVs)

R (>3 vlv/traverse & <1 vlv/10FOVs)

X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus ocellatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenic*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischabensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis suirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praethyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plococna**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozumia tatsunokuchiensis**  
*Kozioviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatca**  
**Neodenticula kozumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praerbarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaolensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Barney*  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418. F 16R 2W/00

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3, 7, 2013

OBSERVER'S NAME *Koizumi*

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolioles**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatka**  
**Neodenticula kotzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia senata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

*Barrén*  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418, F, 16R4w/100

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## DATE:

3.7.2013

## OBSERVER'S NAME

KO NNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus Ingens**  
**Actinocyclus Ingens f. nodus**  
**Actinocyclus Ingens f. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmioliscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboenis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis sunirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kozumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudoniceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebraegonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Ropenia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarlis*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperoi**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

**TOTAL ABUNDANCE:**  
M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

**TOTAL PRESERVATION**  
G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME KANUO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlw/10FOVs & <1 vlw/10FOVs)  
R (>3 vlw/traverse & <1 vlw/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptylchus senarius*  
*Actinoptylchus vulgaris*  
*Actinoptylchus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenic*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischabensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surella*  
*Delphineis* spp.

**Denticulopsis crassa**  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praeahyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumia minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kozumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonitcreratum radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus tritulum*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schradertii**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenic*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

**Chaetoceros Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1410. F. 1626-79

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis sunrella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolotus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatka***  
***Neodenticula kotzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudoniceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarlis*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderei***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularia*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marjamicca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenicca*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

148.5, 17R, 26100

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3. 7. 2013

OBSERVER'S NAME KO UNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlw/10FOVs & <1 vlw/10FOVs)  
R (>3 vlw/traverse & <1 vlw/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus ocellatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentula ikebei*  
*Crucidentula kanayae*  
*Crucidentula nicobarica*  
*Crucidentula paranicobarica*  
*Crucidentula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis sirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella exoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumia minor*  
*Lisitizinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatka**  
**Neodenticula kozumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoidea*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus tritullus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamca**  
*Thalassiosira mediiconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418 F, 1473W71

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlw/10FOVs & <1 vlw/10FOVs)  
R (>3 vlw/traverse & <1 vlw/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmioliscus insignis**  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
**Denticulopsis katayamae**  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
**Denticulopsis praekatayamae**  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plicata**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia rolnhoklii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarbolii*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediacconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praeifraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umalensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARRÉN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

u1K18F-17R-4W, 700

## DATE:

2013/July/3

## OBSERVER'S NAME

ITSUKI

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlw/10FOVs & <1 vlw/10FOVs)  
R (>3 vlw/traverse & <1 vlw/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus otonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustodtii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis prae-hyalina***  
***Denticulopsis prae-katayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollois***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kolzumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoidea*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Cheetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418, F, 17R5W31

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2018

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Aspeitia biradiata*  
**Aspeitia komurae**  
*Aspeitia nodulifera*  
*Aspeitia oligocenica*  
*Aspeitia praenodulifera*  
*Aspeitia salisburyana*  
*Aspeitia tabularis*  
*Aspeitia vetustissima*  
*Aspeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseaui**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculis-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilaropsis cylindrus*  
**Fragilariopsis dollotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatcica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praerbarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudoniteratum radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marjamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

U1X18F-17R-SW, 122 cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013 July 103

OBSERVER'S NAME

ITSUKI

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lautus*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praealyalina*  
*Denticulopsis praeatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollicus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plococna**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella exoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitizina ornata*  
**Medlaria magna**  
**Medlaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminiae**  
*Nitzschia challengeri*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbot**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarbot*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperel**  
*Thalassiosira umaomensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

1418 F, 17800

DATE:

3.7.2013

OBSERVER's NAME

KOMNO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolifolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plicata***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikabea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatkica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia senata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifuitus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schradleri***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularita*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediacconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenic*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros Resting Spores*****TOTAL of VEGETATIVE CELLS**

Diatom zones (NPD)

NPD 11

TOTAL ABUNDANCE: M (>60%), A (20-60%), C (5-20%) F (2-5%), R (<2%), B (no diatoms)

Core, section, interval (cm)

148F - 18R - 2W, 96cm

TOTAL PRESERVATION G (good), M (moderate), P (poor)

DATE: 2013/July/13

OBSERVER'S NAME AKEM12

RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 valves/FOV) F (>1 vlv/10FOVs & <1 vlv/10FOVs) R (>3 vlv/traverse & <1 vlv/10FOVs) X (present), B (barren)

Achnanthes groenlandica

Achnanthes inflata

Achnanthes lanceolata

Achnanthes lineariformis

Achnanthes spp.

R Actinocyclus curvatulus F 3

Actinocyclus ellipticus

Actinocyclus ingens

Actinocyclus ingens f. nodus

Actinocyclus ingens f. planus

Actinocyclus oculatus

R Actinocyclus ochotensis F 10

Actinocyclus octonarius

Actinocyclus robustus

R Actinocyclus tsugaruensis F 11

Actinocyclus spp.

Actinopychus senarius

Actinopychus vulgaris

Actinopychus spp.

Araniscus lewisianus

Araniscus spp.

Asteromphalus darwini

Asteromphalus oligocenicus

Asteromphalus parvulus

Asteromphalus robustus

Asteromphalus spp.

Azpeitia biradiata

Azpeitia komurae

Azpeitia nodulifera

Azpeitia oligocenica

Azpeitia praenodulifera

Azpeitia salisburyana

Azpeitia tabularis

Azpeitia vetustissima

Azpeitia spp.

Bacterosira bathyomphala

Bacterosira fragilis

Bacterosira spp.

Cavitatus exiguus

Cavitatus jouseanus

Cavitatus lanceolatus

Cavitatus linearis

Cavitatus miocenicus

Cavitatus rectus

Cavitatus spp.

Cestodiscus kugleri

Cestodiscus trochus

Cestodiscus spp.

Cocconeis californica

Cocconeis costata

Cocconeis scutellum

Cocconeis spp.

Coscinodiscus asteromphalus

Coscinodiscus marginatus

Coscinodiscus oculus-iridis

Coscinodiscus radiatus

Coscinodiscus rhombicus

Coscinodiscus symbolophorus

Cosmidiscus insignis

Crucidentacula ikebei

Crucidentacula kanayae

Crucidentacula nicobarica

Crucidentacula paranicobarica

Crucidentacula sawamurae

Cyclotella striata

Cyclotella meneghiniana

Cyclotella spp.

Cymbella cistula

Cymbella minuta

Cymbella subaequalis

Cymbella spp.

Delphineis angustata

Delphineis ischabensis

Delphineis kippae

Delphineis sachalinensis

Delphineis simonsenii

Delphineis surirella

Delphineis spp.

Denticulopsis crassa

Denticulopsis dimorpha var. dimorpha

Denticulopsis dimorpha var. areolata

Denticulopsis hustedtii

Denticulopsis hyalina

Denticulopsis katayamae

Denticulopsis lauta

Denticulopsis praedimorpha var. minor

Denticulopsis praedimorpha var. praedimorpha

Denticulopsis praehyalina

Denticulopsis praekatayamae

Denticulopsis praelauta

Denticulopsis simonsenii

Denticulopsis tanimurae

Denticulopsis vulgaris

Denticulopsis spp.

Diploneis bombus

Diploneis puella

Diploneis smithii

Diploneis suborbicularis

Diploneis spp.

Distephanosira architecturalis

Distephanosira spp.

Ellerbeckia sol

Ellerbeckia spp.

Eunotia pectinalis var. minor

Eunotia praerupta var. praerupta

Eunotia spp.

Fragilaria construens

Fragilaria spp.

Fragilariopsis cylindrus

Fragilariopsis dolotulus

Fragilariopsis fossilis

Fragilariopsis oceanica

Fragilariopsis plocena

Fragilariopsis spp.

Goniothecium decoratum

Goniothecium rogersii

Goniothecium spp.

Grammatophora spp.

Halamphora costata

R Hyalodiscus obsoletus F 4

Hyalodiscus spp.

Ikebea tenuis

Kisseleviella carina

Kisseleviella ezoensis

Kolzumia tatsunokuchiensis

Kozlovella minor

Lisitzinia ornata

Mediaria magna

Mediaria splendida

Melosira albicans

Navicula elginensis

Navicula lyroides

Navicula menisculus

Navicula salinarum

Neodenticula kamtschatica

Neodenticula kolzumii

R Neodenticula seminae F 1

Nitzschia challengeri

Nitzschia jouseae

Nitzschia palea

Nitzschia reinholdii

Nitzschia rolandii

Odontella aurita

Paralia sulcata

Paralia spp.

Podosira stelligera

Porosira glacialis

R Proboscia barboi F 5

Proboscia curvirostris

Proboscia interposita

Proboscia praeraboi

Pseudodimmerograma elegans

Pseudonitzschia seriata

Pseudopyxilla americana

Pseudotriceratium radiosoreticulatum

Pyxidicula zabelinae

Rhaphoneis amphicerus

Rhaphoneis spp.

Rhizosolenia hebetata f. hiemalis F 25

Rhizosolenia hebetata f. semispina F 3

Rhizosolenia norvegica

Rhizosolenia praeborgii

Rhizosolenia setigera

Rhizosolenia spp. F 1

Roperia tessellata

Rocella gelida

Rocella praenitida

Rocella semigelida

Rocella vigilans

Rouxia californica

Rouxia granda

Rouxia isopolica

Rouxia naviculoides

Rouxia obesa

R Shionodiscus oestrupii F 3

R Shionodiscus praecoestrupii

Shionodiscus trifolius

Stephanopyxis dimorpha

Stephanopyxis horridus

Stephanopyxis turris

Stephanopyxis spp.

Thalassionema bacillariss

Thalassionema nitzschioides

Thalassionema nitzschioides var. incurvatum

Thalassionema nitzschioides var. inflatum

Thalassionema nitzschioides var. parvum

Thalassionema pseudonitzschioides

Thalassionema schraderi

Thalassionema spp.

Thalassiosira antiqua

Thalassiosira bioculata

Thalassiosira castanea

Thalassiosira convexa

Thalassiosira decipiens

Thalassiosira dubiosa

Thalassiosira eccentrica F 1

Thalassiosira fasciculata

Thalassiosira fraga

Thalassiosira gravida

Thalassiosira grunowii

Thalassiosira hyalina

Thalassiosira irregulata

Thalassiosira jacksonii

Thalassiosira jouseae

Thalassiosira leptopus

Thalassiosira lineata

Thalassiosira lusca

Thalassiosira manifesta

Thalassiosira marujamica

Thalassiosira mediaconvexa

Thalassiosira minutissima

Thalassiosira miocenicica

Thalassiosira nordenskioldii

Thalassiosira orientalis

Thalassiosira praefraga

Thalassiosira praenidulus

Thalassiosira praeyabei

Thalassiosira robusta

Thalassiosira sancettae

Thalassiosira singularis

Thalassiosira temperei

Thalassiosira umaolensis

Thalassiosira undulosa

Thalassiosira yabei

Thalassiosira spp. F 4

Thalassiothrix longissima F 2

Thalassiothrix spp.

Trachyneis aspera

Trachyneis spp.

Yoshidaia divergens

Yoshidaia spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

7 R 70

Handwritten abundance data: <math>\leftarrow 0.0 \leftarrow 6.0 \leftarrow 12.0 \rightarrow 19.0 \rightarrow 26.0 \rightarrow 32.0 \rightarrow 38.0 \rightarrow 44.0 \rightarrow 50.0 \rightarrow 56.0 \rightarrow 62.0 \rightarrow 68.0 \rightarrow 74.0 \rightarrow 80.0 \rightarrow 86.0 \rightarrow 92.0 \rightarrow 98.0 \rightarrow 100.0</math>

Handwritten notes: closed copula, sponge I E I E I E F, Rest spore I E F, silico -

Diatom zones (NPD)

NPD 11

TOTAL ABUNDANCE: M (>60%), A (20-60%), C (3-20%), F (2-5%), R (<2%), B (no diatoms)

Core, section, interval (cm)

1418 F-DR-2W, 100 cm

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE:

2013/July/3

OBSERVER'S NAME

AKEM2

RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV), F (>1 vlv/10FOVs & <1 vlv/10FOVs), R (>3 vlv/traverse & <1 vlv/10FOVs), X (present), B (barren)

- Achnanthes groenlandica
Achnanthes inflata
Achnanthes lanceolata
Achnanthes lineariformis
Achnanthes spp.
Actinocyclus curvatulus
Actinocyclus ellipticus
Actinocyclus ingens
Actinocyclus ingens f. nodus
Actinocyclus ingens f. planus
Actinocyclus oculatus
Actinocyclus ochotensis
Actinocyclus octonarius
Actinocyclus robustus
Actinocyclus tsugaruensis
Actinocyclus spp.
Actinoplychus senarius
Actinoplychus vulgaris
Actinoplychus spp.
Araniscus lewisianus
Araniscus spp.
Asteromphalus darwinii
Asteromphalus oligocenicus
Asteromphalus parvulus
Asteromphalus robustus
Asteromphalus spp.
Azpeitia biradiata
Azpeitia komurae
Azpeitia nodulifera
Azpeitia oligocenica
Azpeitia praenodulifera
Azpeitia salisburyana
Azpeitia tabularis
Azpeitia vetustissima
Azpeitia spp.
Bacterosira bathyomphala
Bacterosira fragilis
Bacterosira spp.
Cavitatus exiguus
Cavitatus jouseanus
Cavitatus lanceolatus
Cavitatus linearis
Cavitatus miocenicus
Cavitatus rectus
Cavitatus spp.
Cestodiscus kugleri
Cestodiscus trochus
Cestodiscus spp.
Cocconeis californica
Cocconeis costata
Cocconeis scutellum
Cocconeis spp.
Coscinodiscus asteromphalus
Coscinodiscus marginatus
Coscinodiscus oculus-iridis
Coscinodiscus radiatus
Coscinodiscus rhombicus
Coscinodiscus symbolophorus
Cosmodiscus insignis
Crucidenticula ikebei
Crucidenticula kanayae
Crucidenticula nicobarica
Crucidenticula paranicobarica
Crucidenticula sawamurae
Cyclotella striata
Cyclotella meneghiniana
Cyclotella spp.
Cymbella cistula
Cymbella minuta
Cymbella subaequalis
Cymbella spp.
Delphineis angustata
Delphineis ischaboensis
Delphineis kippae
Delphineis sachalinensis
Delphineis simonsenii
Delphineis surirella
Delphineis spp.

- Denticulopsis crassa
Denticulopsis dimorpha var. dimorpha
Denticulopsis dimorpha var. areolata
Denticulopsis hustedii
Denticulopsis hyalina
Denticulopsis katayamae
Denticulopsis lauta
Denticulopsis praedimorpha var. minor
Denticulopsis praedimorpha var. praedimorpha
Denticulopsis praehyalina
Denticulopsis praekatayamae
Denticulopsis praelauta
Denticulopsis simonsenii
Denticulopsis tanimurae
Denticulopsis vulgaris
Denticulopsis spp.
Diplooneis bombus
Diplooneis puella
Diplooneis smithii
Diplooneis suborbicularis
Diplooneis spp.
Distephanosira architecturalis
Distephanosira spp.
Ellerbeckia sol
Ellerbeckia spp.
Eunotia pectinalis var. minor
Eunotia praerupta var. praerupta
Eunotia spp.
Fragilaria construens
Fragilaria spp.
Fragilariopsis cylindrus
Fragilariopsis dollolus
Fragilariopsis fossilis
Fragilariopsis oceanica
Fragilariopsis pilocena
Fragilariopsis spp.
Goniothecium decoratum
Goniothecium rogersii
Goniothecium spp.
Grammatophora spp.
Halamphora costata
Hyalodiscus obsoletus
Hyalodiscus spp.
Ikebea tenuis
Kisseleviella carina
Kisseleviella ezoensis
Kozumia tatsunokuchiensis
Kozloviella minor
Lisitzinia ornata
Mediaria magna
Mediaria splendida
Melosira albicans
Navicula elginensis
Navicula lyroides
Navicula menisculus
Navicula salinarum
Neodenticula kamtschatica
Neodenticula kozumii
Neodenticula seminae
Nitzschia challengerii
Nitzschia jouseae
Nitzschia palea
Nitzschia reinholdii
Nitzschia rolandii
Odontella aurita
Paralia sulcata
Paralia spp.
Podosira stelligera
Porosira glacialis
Proboscia barboi
Proboscia curvirostris
Proboscia interposita
Proboscia praebarboi
Pseudodimmerogramma elegans
Pseudonitzschia seriata
Pseudopyxilla americana
Pseudotrisceralium radiosoreticulatum
Pyxidicula zobelinae

- Rhaphoneis amphicerus
Rhaphoneis spp.
Rhizosolenia hebetata f. hiemalis
Rhizosolenia hebetata f. semispina
Rhizosolenia norvegica
Rhizosolenia praebergonii
Rhizosolenia setigera
Rhizosolenia spp.
Roperia tessellata
Rocella gelida
Rocella praenitida
Rocella semigelida
Rocella vigilans
Rouxia californica
Rouxia granda
Rouxia isopolica
Rouxia naviculoides
Rouxia obesa
Shionodiscus ostrupii
Shionodiscus praecoestrupii
Shionodiscus trifultus
Stephanopyxis dimorpha
Stephanopyxis horridus
Stephanopyxis turis
Stephanopyxis spp.
Thalassionema bacillaris
Thalassionema nitzschioides
Thalassionema nitzschioides var. incurvatum
Thalassionema nitzschioides var. inflatum
Thalassionema nitzschioides var. parvum
Thalassionema pseudonitzschioides
Thalassionema schraderi
Thalassionema spp.
Thalassiosira antiqua
Thalassiosira bioculata
Thalassiosira castanea
Thalassiosira convexa
Thalassiosira decipiens
Thalassiosira dubiosa
Thalassiosira eccentrica
Thalassiosira fasciculata
Thalassiosira fraga
Thalassiosira gravida
Thalassiosira grunowii
Thalassiosira hyalina
Thalassiosira irregularata
Thalassiosira jacksonii
Thalassiosira jouseae
Thalassiosira leptopus
Thalassiosira lineata
Thalassiosira lusca
Thalassiosira manifesta
Thalassiosira marujamica
Thalassiosira mediaconvexa
Thalassiosira minutissima
Thalassiosira miocenica
Thalassiosira nordenfioeldii
Thalassiosira orientalis
Thalassiosira praefraga
Thalassiosira praenitidulus
Thalassiosira praeyabei
Thalassiosira robusta
Thalassiosira sancettae
Thalassiosira singularis
Thalassiosira temperoi
Thalassiosira umaiensis
Thalassiosira undulosa
Thalassiosira yabei
Thalassiosira spp.
Thalassiothrix longissima
Thalassiothrix spp.
Trachyneis aspera
Trachyneis spp.
Yoshidaia divergens
Yoshidaia spp.

F ~~IEIT~~ 2F

R ~~IEIT~~ 9

R ~~IE~~ 5

R ~~T~~ 2

R ~~T~~ 2

R ~~F~~ 3

R ~~IE~~ 4

R ~~T~~ 2

R ~~T~~ 2

< 0.0 -> 2.0
< 1.0 -> 2.0
< 2.0
< 3.0
< 4.0
-> 5.0
< 6.0

sponge IE T
feco. spo. IE T
Sitra -
dino

Chaetoceros Resting Spores
TOTAL of VEGETATIVE CELLS 100

## Diatom zones (NPD)

Baren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

1418F-18R-3w, 22 cm

DATE:

2013/July/13

OBSERVER'S NAME

AKEM2

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis sunirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedtii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Koizumiella minor*  
*Lisitizina ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebargonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeinitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

B

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1918 F&amp;R - 96m, 100cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## DATE:

20/3/2013 July 13

## OBSERVER'S NAME

A REM

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens 1. nodus**  
**Actinocyclus ingens 1. planus**  
**Actinocyclus ocellatus**  
*Actinocyclus ochotensis*  
*Actinocyclus otonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis sirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollicus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumiella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatka**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabalinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* 1. *hiemalis*  
*Rhizosolenia hebetata* 1. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia lesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praesoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamca**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

under

TOTAL ABUNDANCE:  
M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

Core, section, interval (cm)

148F-18R-6W-66a

TOTAL PRESERVATION  
G (good), M (moderate), P (poor)

DATE: 2013/July/13

OBSERVER'S NAME: APEM2

RELATIVE ABUNDANCE of EACH TAXON  
A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatus
- Actinocyclus ellipticus
- Actinocyclus ingens
- Actinocyclus ingens f. nodus
- Actinocyclus ingens f. planus
- Actinocyclus oculus
- Actinocyclus ochotensis
- Actinocyclus otonarius
- Actinocyclus robustus
- Actinocyclus tsugaruensis
- Actinocyclus spp.
- Actinoplychus senarius
- Actinoplychus vulgaris
- Actinoplychus spp.
- Araniscus lewisianus
- Araniscus spp.
- Asteromphalus darwinii
- Asteromphalus oligocenicus
- Asteromphalus parvulus
- Asteromphalus robustus
- Asteromphalus spp.
- Azpeitia biradiata
- Azpeitia komurae
- Azpeitia nodulifera
- Azpeitia oligocena
- Azpeitia praenodulifera
- Azpeitia salisburyana
- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus
- Coscinodiscus rhombicus
- Coscinodiscus symbolophorus
- Cosmodiscus insignis
- Crucidentula ikebei
- Crucidentula kanayae
- Crucidentula nicobarica
- Crucidentula paranicobarica
- Crucidentula sawamurae
- Cyclotella striata
- Cyclotella meneghiniana
- Cyclotella spp.
- Cymbella cistula
- Cymbella minuta
- Cymbella subaequalis
- Cymbella spp.
- Delphineis angustata
- Delphineis ischaboensis
- Delphineis kippae
- Delphineis sachalinensis
- Delphineis simonsenii
- Delphineis surirella
- Delphineis spp.

- Denticulopsis crassa
- Denticulopsis dimorpha var. dimorpha
- Denticulopsis dimorpha var. areolata
- Denticulopsis hustedii
- Denticulopsis hyalina
- Denticulopsis katayamae
- Denticulopsis lauta
- Denticulopsis praedimorpha var. minor
- Denticulopsis praedimorpha var. praedimorpha
- Denticulopsis praehyalina
- Denticulopsis praekatayamae
- Denticulopsis praelauta
- Denticulopsis simonsenii
- Denticulopsis tanimurae
- Denticulopsis vulgaris
- Denticulopsis spp.
- Diploneis bombus
- Diploneis puella
- Diploneis smithii
- Diploneis suborbicularis
- Diploneis spp.
- Distephanosira architecturalis
- Distephanosira spp.
- Ellerbeckia sol
- Ellerbeckia spp.
- Eunotia pectinalis var. minor
- Eunotia praerupta var. praerupta
- Eunotia spp.
- Fragilaria construens
- Fragilaria spp.
- Fragilariopsis cylindrus
- Fragilariopsis dolius
- Fragilariopsis fossilis
- Fragilariopsis oceanica
- Fragilariopsis plocena
- Fragilariopsis spp.
- Goniothecium decoratum
- Goniothecium rogersii
- Goniothecium spp.
- Grammatophora spp.
- Halamphora costata
- Hyalodiscus obsoletus
- Hyalodiscus spp.
- Ikebea tenuis
- Kisseleviella carina
- Kisseleviella ezoensis
- Koizumia tatsunokuchiensis
- Kozloviella minor
- Lisitzinia ornata
- Mediaria magna
- Mediaria splendida
- Melosira albicans
- Navicula elginensis
- Navicula lyroides
- Navicula menisculus
- Navicula salinarum
- Neodenticula kamtschatica
- Neodenticula koizumii
- Neodenticula seminae
- Nitzschia challengeri
- Nitzschia jouseae
- Nitzschia palea
- Nitzschia reinholdii
- Nitzschia rolandii
- Odontella aurita
- Paralia sulcata
- Paralia spp.
- Podosira stelligera
- Porosira glacialis
- Proboscia barbol
- Proboscia curvirostris
- Proboscia interposita
- Proboscia praeborboi
- Pseudodimmerogramma elegans
- Pseudonitzschia seriata
- Pseudopyxilla americana
- Pseudotriceratium radiosoreticulatum
- Pyxidicula zabelinae

- Rhaphoneis ampiceros
- Rhaphoneis spp.
- Rhizosolenia hebetata f. hiemalis
- Rhizosolenia hebetata f. semipinna
- Rhizosolenia norvegica
- Rhizosolenia praebergonii
- Rhizosolenia setigera
- Rhizosolenia spp.
- Roperia tessellata
- Rocella gelida
- Rocella praenitida
- Rocella semigelida
- Rocella vigilans
- Rouxia californica
- Rouxia granda
- Rouxia isopolica
- Rouxia naviculoides
- Rouxia obesa
- Shionodiscus oestrupii
- Shionodiscus praeoestrupii
- Shionodiscus trifolius
- Stephanopyxis dimorpha
- Stephanopyxis horridus
- Stephanopyxis turris
- Stephanopyxis spp.
- Thalassionema bacillarum
- Thalassionema nitzschioides
- Thalassionema nitzschioides var. incurvatum
- Thalassionema nitzschioides var. inflatum
- Thalassionema nitzschioides var. parvum
- Thalassionema pseudonitzschioides
- Thalassionema schraderi
- Thalassionema spp.
- Thalassiosira antiqua
- Thalassiosira bioculata
- Thalassiosira castanea
- Thalassiosira convexa
- Thalassiosira decipiens
- Thalassiosira dubiosa
- Thalassiosira eccentrica
- Thalassiosira fasciculata
- Thalassiosira fraga
- Thalassiosira gravida
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregulara
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus
- Thalassiosira lineata
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marujamica
- Thalassiosira mediaconvexa
- Thalassiosira minutissima
- Thalassiosira miocena
- Thalassiosira nordenskioeldii
- Thalassiosira orientalis
- Thalassiosira praefraga
- Thalassiosira praenidulus
- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperlei
- Thalassiosira umaolensis
- Thalassiosira undulosa
- Thalassiosira yabei
- Thalassiosira spp.
- Thalassiothrix longissima
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

fraguere

sponge T

Cheetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS



Diatom zones (NPD)

under

Core, section, interval (cm)

1918F-19R-1w, 23m

DATE:

2013/July/13

OBSERVER'S NAME

AKEN 2

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

abundance B

RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha*** var. *dimorpha*  
***Denticulopsis dimorpha*** var. *areolata*  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha*** var. *minor*  
***Denticulopsis praedimorpha*** var. *praedimorpha*  
***Denticulopsis praeohyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolotus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plicata***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudoniceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schradertii***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

sponge T  
fragments



## Diatom zones (NPD)

B

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%) (B (np diatoms))

## Core, section, interval (cm)

198F-19R-2W, 100cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/13

OBSERVER'S NAME AJEMZ

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischabensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis sunirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katsayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plococana**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozlovella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kolzumii**  
**Neodenticula saminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praeraboi*  
*Pseudodimmergrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonoceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis hornidus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillariss*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira mluttsisima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaolensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

**Chaetoceros Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

418F-19R-94, 100cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/13

OBSERVER'S NAME AKEMZ

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octenarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eumotia pectinalis* var. *minor*  
*Eumotia praerupta* var. *praerupta*  
*Eumotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilaropsis cylindrus*  
**Fragilaropsis dolotus**  
*Fragilaropsis fossilis*  
*Fragilaropsis oceanica*  
**Fragilaropsis pilocena**  
*Fragilaropsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praerbarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudolriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeburtonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Ropenia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marjamic**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperi**  
*Thalassiosira umaolensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

**Chaetoceros Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%) / B (no diatoms)

## Core, section, interval (cm)

1418 FIPR - SW, 110cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/13

OBSERVER'S NAME: A/EM 2

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlw/10FOVs & <1 vlw/10FOVs)  
R (>3 vlw/traverse & <1 vlw/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseaui**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dololus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatka**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudolriceratum radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamka**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

1418 F - 19 R - 74 cm

DATE:

2013/July/13

OBSERVER'S NAME

AFEM2

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseaui**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symblophorus*  
**Cosmodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustodii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kotzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatka**  
**Neodenticula kotzumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonitriceratum radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispha*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marjamicca**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418, F, 19Rcc

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komuræ**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis suirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praekauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marjamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Toga

Mona

Diatom zones (NPD)

*Barren*

Core, section, interval (cm)

1418 F. 20Rce

DATE: 3.7.2013

OBSERVER'S NAME KONNO

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* 1. nodus**  
***Actinocyclus ingens* 1. planus**  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseaui***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustadtil***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Koizumiella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kantschatica***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriala*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabellinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* 1. *hiemalis*  
*Rhizosolenia hebetata* 1. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschoides*  
*Thalassionema nitzschoides* var. *incurvatum*  
*Thalassionema nitzschoides* var. *inflatum*  
*Thalassionema nitzschoides* var. *parvum*  
*Thalassionema pseudonitzschoides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamika***  
*Thalassiosira medioconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperai***  
*Thalassiosira umaolensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Bgnken  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418. F. 21RCC

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 3.7.2013

OBSERVER'S NAME K. MNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
**Actinocyclus ingens** f. *planus*  
**Actinocyclus ocellatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopterychus senarius*  
*Actinopterychus vulgaris*  
*Actinopterychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praeahalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
**Denticulopsis simonsenii**  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumia* minor  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kotzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarbol*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarlis*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%),  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

U-148F 22R-CC

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/3

OBSERVER'S NAME: TSUKI

## RELATIVE ABUNDANCE of EACH TAXON

A (&gt;10 valves/FOV), C (1-10 vlv/FOV)

F (&gt;1 vlv/10FOVs &amp; &lt;1 vlv/10FOVs)

R (&gt;3 vlv/traverse &amp; &lt;1 vlv/10FOVs)

X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboenensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praealyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolotus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengeri*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonitceratium radiosreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderei***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), G (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

148F-23R-1W/20cm

DATE: 2013/July/13

OBSERVER'S NAME AKEM2

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus oclonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha var. dimorpha**  
**Denticulopsis dimorpha var. areolata**  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha var. minor**  
**Denticulopsis praedimorpha var. praedimorpha**  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelaeta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatka**  
**Neodenticula kozumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides var. incurvatum*  
*Thalassionema nitzschioides var. inflatum*  
*Thalassionema nitzschioides var. parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaolensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

141AF-23R-2W, 100cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/3

OBSERVER'S NAME: AICEM2

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens f. nodus***  
***Actinocyclus ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptylchus senarius*  
*Actinoptylchus vulgaris*  
*Actinoptylchus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsanii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsanii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolotus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Kozlovella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatica***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabolinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isoplicata*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperoi***  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418 F, 23R 3w/19

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 4.7.2013

OBSERVER'S NAME KONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseae**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculis-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
**Denticulopsis dimorpha var. dimorpha**  
**Denticulopsis dimorpha var. areolata**  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha var. minor**  
**Denticulopsis praedimorpha var. praedimorpha**  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia* spp.  
*Fragilita construens*  
*Fragilita* spp.  
*Fragiliopsis cylindrus*  
**Fragiliopsis dollotus**  
**Fragiliopsis fossilis**  
*Fragiliopsis oceanica*  
**Fragiliopsis pilocena**  
*Fragiliopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumia minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praerubra*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonitceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus castrupii**  
**Shionodiscus praecastrupii**  
*Shionodiscus trifidulus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides var. incurvatum*  
*Thalassionema nitzschioides var. inflatum*  
*Thalassionema nitzschioides var. parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperi**  
*Thalassiosira umaolensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418.F 23RSW51

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 4.7.2013

OBSERVER'S NAME KOLUNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jousseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonseni**  
*Delphineis surella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praeahyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonseni*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dololus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plicocana**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikabea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeinitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praepraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

U1418F-23R-CC

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## DATE:

2013/July/3

## OBSERVER'S NAME

ITSUKI

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus reclus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbiophorus*  
**Cosmidiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula parnicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dofolius**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozumia lataunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kozumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semisipha*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus ostrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschoides*  
*Thalassionema nitzschoides* var. *incurvatum*  
*Thalassionema nitzschoides* var. *inflatum*  
*Thalassionema nitzschoides* var. *parvum*  
*Thalassionema pseudonitzschoides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

Bellevue

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus ocellatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseaui**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmirodiscus insignis**  
*Crucidentula ikebei*  
*Crucidentula kanayae*  
*Crucidentula nicobarica*  
*Crucidentula paranicobarica*  
*Crucidentula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surella*  
*Delphineis* spp.

## Core, section, interval (cm)

1418 F, 252 1677

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilaropsis cylindrus*  
**Fragilaropsis dolloii**  
**Fragilaropsis fossilis**  
*Fragilaropsis oceanica*  
**Fragilaropsis plocena**  
*Fragilaropsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumia minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatkica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabalinae**

DATE: 4.7.2015

OBSERVER'S NAME KOMURO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeinilida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediacoconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

**Cheetoceros Resting Spores**  
TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

U1410 F-25R-2W 100cm

DATE: 2013/July/14

OBSERVER'S NAME T. S. U. K. I.

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus Ingens**  
*Actinocyclus Ingens* f. *nodus*  
**Actinocyclus Ingens** f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia Komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus Jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus Insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolius**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumia* minor  
*Lisizinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatka**  
**Neodenticula koizumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia Jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbot**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarbot*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifidulus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira Jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperaei**  
*Thalassiosira umaeniensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

TOTAL OF VEGETATING CELLS

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

C1418F-25R-400. 43 cm

DATE: 2013/ July / X

OBSERVER'S NAME

I TSUKI

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens 1. nodus**  
**Actinocyclus ingens 1. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis sunirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
**Denticulopsis dimorpha var. dimorpha**  
**Denticulopsis dimorpha var. areolata**  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katsuyamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha var. minor**  
**Denticulopsis praedimorpha var. praedimorpha**  
**Denticulopsis praehyalina**  
**Denticulopsis praekatsuyamae**  
**Denticulopsis praelata**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plicata**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriala*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia lesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeeustrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschoides*  
*Thalassionema nitzschoides* var. *incurvatum*  
*Thalassionema nitzschoides* var. *inflatum*  
*Thalassionema nitzschoides* var. *parvum*  
*Thalassionema pseudonitzschoides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenicus*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperai**  
*Thalassiosira umaioensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

UTK-18F-23R-YW 100cm

DATE:

2013 July 14

OBSERVER'S NAME

ITSUKI

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligogenica*  
*Azpeitia praenodulifera*  
*Azpeitia saisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis sunirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumiella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kozumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Ropenia lesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus tritulus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *infatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenic*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctetae*  
**Thalassiosira singularis**  
**Thalassiosira temperei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)  
**BARREN**

TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

Core, section, interval (cm)

U4X18F-25R-SW, 62cm

TOTAL PRESERVATION  
 G (good), M (moderate), P (poor)

DATE: 2013/July 14

OBSERVER's NAME I TSUKI

RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. **nodus**  
*Actinocyclus ingens* f. **planus**  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praekauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilaropsis cylindrus*  
**Fragilaropsis dolotus**  
**Fragilaropsis fossilis**  
*Fragilaropsis oceanica*  
**Fragilaropsis plocena**  
*Fragilaropsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabellinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setifera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus ostrupii**  
**Shionodiscus praecostrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperei**  
*Thalassiosira umoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

**Chaetoceros Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418F-25P-CC

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE:

2013/July/13

OBSERVER'S NAME

AKEMO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia saisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praeahyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinatis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolioles***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiansis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kolzumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmergrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonitcratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeinitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *infatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaotensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros* Resting Spores**

TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418, E, 26R1W28

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 4.7.2013

OBSERVER'S NAME KONLD

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseaui**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus reclus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbiophorus*  
**Cosmodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surella*  
*Delphineis* spp.

*Denticulopsis crassa*  
**Denticulopsis dimorpha var. dimorpha**  
**Denticulopsis dimorpha var. areolata**  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha var. minor**  
**Denticulopsis praedimorpha var. praedimorpha**  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatka**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonitriceratium radiosreticulatum*  
**Pyxidicula zabolinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides var. incurvatum*  
*Thalassionema nitzschioides var. inflatum*  
*Thalassionema nitzschioides var. parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularia*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1418, F, 26P2W43

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 4.7.2013

OBSERVER'S NAME KOJUNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praeodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praealyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bambus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilaropsis cylindrus*  
***Fragilaropsis dolloii***  
***Fragilaropsis fossilis***  
*Fragilaropsis oceanica*  
***Fragilaropsis pilocena***  
*Fragilaropsis* spp.  
*Gonothecium decoratum*  
*Gonothecium rogersii*  
*Gonothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praeinlida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoidea*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioidea*  
*Thalassionema nitzschioidea* var. *incurvatum*  
*Thalassionema nitzschioidea* var. *inflatum*  
*Thalassionema nitzschioidea* var. *parvum*  
*Thalassionema pseudonitzschioidea*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamca***  
*Thalassiosira mediacconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praeinludis*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaicensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barken

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1410, F, 26R 2w/6w

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 8.7.2013

OBSERVER'S NAME: CONNO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolifilis**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
**Fragilariopsis plocenae**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozumia tatsunokuchiensis**  
*Kozioviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praeborboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudonitceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediiconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoniensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BAREN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

U1x18F-27R-2W, 100 cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/04

OBSERVER'S NAME

ITSUKI

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvs/FOV)  
F (>1 vlw/10FOVs & <1 vlw/10FOVs)  
R (>3 vlw/traverse & <1 vlw/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseaui***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginalis*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentula ikebei*  
*Crucidentula kanayae*  
*Crucidentula nicobarica*  
*Crucidentula paranicobarica*  
*Crucidentula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis sirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollosi***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Koizumia tatsunokuchiensis***  
*Koizumia minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatkica***  
***Neodenticula koizumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyridicula zabelleae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praesoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira limeata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

U418F-27R-KW.100cm

## DATE:

2013/ July 104

## OBSERVER'S NAME

TSUKI

## RELATIVE ABUNDANCE of EACH TAXON

A (&gt;10 valves/FOV), C (1-10 vlv/FOV)

F (&gt;1 vlv/10FOVs &amp; &lt;1 vlv/10FOVs)

R (&gt;3 vlv/traverse &amp; &lt;1 vlv/10FOVs)

X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens 1. nodus**  
**Actinocyclus ingens 1. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentula ikebei*  
*Crucidentula kanayae*  
*Crucidentula nicobarica*  
*Crucidentula paranicobarica*  
*Crucidentula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surella*  
*Delphineis* spp.

*Denticulopsis crassa*  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumiella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatka**  
**Neodenticula koizumii**  
**Neodenticula seminiae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriala*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaioensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

BARREN

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

U1V18F-27R-5W, 18 cm

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/10

OBSERVER'S NAME

TSUKI

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octenarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus reclus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboenis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehtyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eumotia pectinalis* var. *minor*  
*Eumotia praerupta* var. *praerupta*  
*Eumotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolioles**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis pilocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praerbarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebregonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderei**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamka**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaeniensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

NPD11

Core, section, interval (cm)

WIK18 F-27R-SW 115cm

DATE: 2013 / July / 14

OBSERVER'S NAME: I T S W I C I

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%), F (2-5%), R (<2%), B (no diatoms)

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV), F (>1 vlv/10FOVs & <1 vlv/10FOVs), R (>3 vlv/traverse & <1 vlv/10FOVs), X (present), B (barren)

- Achnanthes groenlandica
Achnanthes inflata
Achnanthes lanceolata
Achnanthes lineariformis
Achnanthes spp.
Actinocyclus curvatus
Actinocyclus ellipticus
Actinocyclus ingens
Actinocyclus ingens f. nodus
Actinocyclus ingens f. planus
Actinocyclus oculatus
Actinocyclus ochotensis
Actinocyclus octonarius
Actinocyclus robustus
Actinocyclus tsugaruensis
Actinocyclus spp.
Actinopychus senarius
Actinopychus vulgaris
Actinopychus spp.
Araniscus lewisianus
Araniscus spp.
Asteromphalus darwinii
Asteromphalus oligocenicus
Asteromphalus parvulus
Asteromphalus robustus
Asteromphalus spp.
Azpeitia biradiata
Azpeitia komurae
Azpeitia nodulifera
Azpeitia oligocenica
Azpeitia praenodulifera
Azpeitia salisburyana
Azpeitia tabularis
Azpeitia vetustissima
Azpeitia spp.
Bacterosira bathyomphala
Bacterosira fragilis
Bacterosira spp.
Cavitatus exiguus
Cavitatus jouseaui
Cavitatus lanceolatus
Cavitatus linearis
Cavitatus miocenicus
Cavitatus rectus
Cavitatus spp.
Cestodiscus kugleri
Cestodiscus trochus
Cestodiscus spp.
Cocconeis californica
Cocconeis costata
Cocconeis scutellum
Cocconeis spp.
Coscinodiscus asteromphalus
Coscinodiscus marginatus
Coscinodiscus oculus-iridis
Coscinodiscus radiatus
Coscinodiscus rhombicus
Coscinodiscus symbiophorus
Cosmodiscus insignis
Crucidentacula ikebei
Crucidentacula kanayae
Crucidentacula nicobarica
Crucidentacula paranicobarica
Crucidentacula sawamurae
Cyclotella striata
Cyclotella meneghiniana
Cyclotella spp.
Cymbella cistula
Cymbella minuta
Cymbella subaequalis
Cymbella spp.
Delphineis angustata
Delphineis ischaboensis
Delphineis kippae
Delphineis sachalinensis
Delphineis simonsenii
Delphineis surella
Delphineis spp.

- Denticulopsis crassa
Denticulopsis dimorpha var. dimorpha
Denticulopsis dimorpha var. areolata
Denticulopsis hustedii
Denticulopsis hyalina
Denticulopsis katayamae
Denticulopsis lauta
Denticulopsis praedimorpha var. minor
Denticulopsis praedimorpha var. praedimorpha
Denticulopsis praehyalina
Denticulopsis praekatayamae
Denticulopsis praelauta
Denticulopsis simonsenii
Denticulopsis tanimurae
Denticulopsis vulgaris
Denticulopsis spp.
Diploneis bombus
Diploneis puella
Diploneis smithii
Diploneis suborbicularis
Diploneis spp.
Distephanosira architecturalis
Distephanosira spp.
Ellerbeckia sol
Ellerbeckia spp.
Eunotia pectinalis var. minor
Eunotia praerupta var. praerupta
Eunotia spp.
Fragilaria construens
Fragilaria spp.
Fragilariopsis cylindrus
Fragilariopsis dolotus
Fragilariopsis fossilis
Fragilariopsis oceanica
Fragilariopsis plocena
Fragilariopsis spp.
Goniothecium decoratum
Goniothecium rogersii
Goniothecium spp.
Grammatophora spp.
Halamphora costata
Hyalodiscus obsoletus
Hyalodiscus spp.
Ikebea tenuis
Kisseleviella carina
Kisseleviella ezoensis
Kolzumia tatsunokuchiensis
Kozlovella minor
Lisitzinia ornata
Mediaria magna
Mediaria splendida
Melosira albicans
Navicula elginensis
Navicula lyroides
Navicula menisculus
Navicula salinarum
Neodenticula kamtschatica
Neodenticula kolzumii
Neodenticula seminiae
Nitzschia challengerii
Nitzschia jouseae
Nitzschia palea
Nitzschia reinholdii
Nitzschia rolandii
Odontella aurita
Paralia sulcata
Paralia spp.
Podosira stelligera
Porosira glacialis
Proboscia barbol
Proboscia curvirostris
Proboscia interposita
Proboscia praebarbol
Pseudodimmerogramma elegans
Pseudonitzschia seriata
Pseudopyxilla americana
Pseudotriceratium radiosreticulatum
Pyxidicula zabelinae

- Rhaphoneis amphicerus
Rhaphoneis spp.
Rhizosolenia hebetata f. hiemalis
Rhizosolenia hebetata f. semispina
Rhizosolenia norvegica
Rhizosolenia praeborgonii
Rhizosolenia setigera
Rhizosolenia spp.
Roperia tessellata
Rocella gelida
Rocella praenitida
Rocella semigelida
Rocella vigilans
Rouxia californica
Rouxia granda
Rouxia isopolica
Rouxia naviculoides
Rouxia obesa
Shionodiscus oestrupii
Shionodiscus praecoestrupii
Shionodiscus trifolius
Stephanopyxis dimorpha
Stephanopyxis horridus
Stephanopyxis turris
Stephanopyxis spp.
Thalassionema bacillarid
Thalassionema nitzschioides
Thalassionema nitzschioides var. incurvatum
Thalassionema nitzschioides var. inflatum
Thalassionema nitzschioides var. parvum
Thalassionema pseudonitzschioides
Thalassionema schraderei
Thalassionema spp.
Thalassiosira antiqua
Thalassiosira bioculata
Thalassiosira castanea
Thalassiosira convexa
Thalassiosira decipiens
Thalassiosira dubiosa
Thalassiosira eccentrica
Thalassiosira fasciculata
Thalassiosira fraga
Thalassiosira gravida
Thalassiosira grunowii
Thalassiosira hyalina
Thalassiosira irregularata
Thalassiosira jacksonii
Thalassiosira jouseae
Thalassiosira leptopus
Thalassiosira lineata
Thalassiosira lusca
Thalassiosira manifesta
Thalassiosira marujamica
Thalassiosira mediaconvexa
Thalassiosira minutissima
Thalassiosira miocenica
Thalassiosira nordenskioldii
Thalassiosira orientalis
Thalassiosira praefraga
Thalassiosira praenitulus
Thalassiosira praeyabei
Thalassiosira robusta
Thalassiosira sancettae
Thalassiosira singularis
Thalassiosira temperlei
Thalassiosira umaolensis
Thalassiosira undulosa
Thalassiosira yabei
Thalassiosira spp.
Thalassiothrix longissima
Thalassiothrix spp.
Trachyneis aspera
Trachyneis spp.
Yoshidaia divergens
Yoshidaia spp.

R29

R1

R1

R1

R2

X1
R4

R3

R1

R9

R9

R1

R4
R3

closed sponge Dingo
Silicis
全角貝上

Chaetoceros Resting Spores
TOTAL OF VEGETATIVE CELLS

59

## Diatom zones (NPD)

B

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no) diatoms

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## Core, section, interval (cm)

148 F-27R-CC

DATE:

2013/July/13

OBSERVER'S NAME

AKEM2

## RELATIVE ABUNDANCE of EACH TAXON

A (&gt;10 valves/FOV), C (1-10 vlv/FOV)

F (&gt;1 vlv/10FOVs &amp; &lt;1 vlv/10FOVs)

R (&gt;3 vlv/traverse &amp; &lt;1 vlv/10FOVs)

X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
*Actinocyclus ingens* f. *nodus*  
*Actinocyclus ingens* f. *planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboenis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehtayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolotus**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kotzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Ropenia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifidulus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillarlis*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaoniensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barren  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

140, F, 28R/102

DATE: 4.7.2013

OBSERVER'S NAME KONNO

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens 1. nodus**  
**Actinocyclus ingens 1. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilaropsis cylindrus*  
**Fragilaropsis dollotus**  
**Fragilaropsis fossilis**  
*Fragilaropsis oceanica*  
**Fragilaropsis pilocena**  
*Fragilaropsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Koizumiella minor*  
*Lisitzinia ornata*  
**Medaria magna**  
**Medaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula koizumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

sponget

Diatom zones (NPD)

Barren

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

Trace

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens f. nodus***  
***Actinocyclus ingens f. planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentricula ikebei*  
*Crucidentricula kanayae*  
*Crucidentricula nicobarica*  
*Crucidentricula paranicobarica*  
*Crucidentricula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surella*  
*Delphineis* spp.

Core, section, interval (cm)

1418, F, 20R2W100

TOTAL PRESERVATION

G (good), M (moderate), P (poor)

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dollicus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aunta*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

DATE: 4. 7. 2013

OBSERVER'S NAME KANNO

RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifuitus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperi***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

sponge\*

Diatom zones (NPD)

NPB 11  
TOTAL ABUNDANCE:  
M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

Core, section, interval (cm)

1412. F. 20R 4W49

TOTAL PRESERVATION  
G (good), M (moderate), P (poor)

DATE:

4.7.2013

OBSERVER'S NAME

KONNO  
RELATIVE ABUNDANCE of EACH TAXON  
A (>10 valves/FOV), C (1-10 vls/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

- Achnanthes groenlandica*
- Achnanthes inflata*
- Achnanthes lanceolata*
- Achnanthes lineariformis*
- Achnanthes* spp.
- Actinocyclus curvatus*
- Actinocyclus ellipticus*
- Actinocyclus Ingens**
- Actinocyclus Ingens* f. *nodus*
- Actinocyclus Ingens** f. *planus*
- Actinocyclus oculatus*
- Actinocyclus ochotensis*
- Actinocyclus octonarius*
- Actinocyclus robustus*
- Actinocyclus tsugaruensis*
- Actinocyclus* spp.
- Actinoplychus senarius*
- Actinoplychus vulgaris*
- Actinoplychus* spp.
- Araniscus lewisianus*
- Araniscus* spp.
- Asteromphalus darwinii*
- Asteromphalus oligogenicus*
- Asteromphalus parvulus*
- Asteromphalus robustus*
- Asteromphalus* spp.
- Azpeitia biradiata*
- Azpeitia komurae**
- Azpeitia nodulifera*
- Azpeitia oligocenica*
- Azpeitia praenodulifera*
- Azpeitia salisburyana*
- Azpeitia tabularis*
- Azpeitia vetustissima*
- Azpeitia* spp.
- Bacterosira bathyomphala*
- Bacterosira fragilis*
- Bacterosira* spp.
- Cavitatus exiguus*
- Cavitatus jouseanus**
- Cavitatus lanceolatus*
- Cavitatus linearis*
- Cavitatus miocenicus*
- Cavitatus rectus*
- Cavitatus* spp.
- Cestodiscus kugleri*
- Cestodiscus trochus*
- Cestodiscus* spp.
- Cocconeis californica*
- Cocconeis costata*
- Cocconeis scutellum*
- Cocconeis* spp.
- Coscinodiscus asteromphalus*
- Coscinodiscus marginatus*
- Coscinodiscus oculus-iridis*
- Coscinodiscus radiatus*
- Coscinodiscus rhombicus*
- Coscinodiscus symbolophorus*
- Cosmodiscus insignis**
- Crucidenticula ikebei*
- Crucidenticula kanayae*
- Crucidenticula nicobarica*
- Crucidenticula paranicobarica*
- Crucidenticula sawamurae*
- Cyclotella striata*
- Cyclotella meneghiniana*
- Cyclotella* spp.
- Cymbella cistula*
- Cymbella minuta*
- Cymbella subaequalis*
- Cymbella* spp.
- Delphineis angustata*
- Delphineis ischaboensis*
- Delphineis kippae*
- Delphineis sachalinensis*
- Delphineis simonsenii**
- Delphineis surella*
- Delphineis* spp.

- Denticulopsis crassa*
- Denticulopsis dimorpha* var. *dimorpha*
- Denticulopsis dimorpha* var. *areolata*
- Denticulopsis hustedii*
- Denticulopsis hyalina*
- Denticulopsis katayamae*
- Denticulopsis lauta*
- Denticulopsis praedimorpha* var. *minor*
- Denticulopsis praedimorpha* var. *praedimorpha*
- Denticulopsis praeahyalina*
- Denticulopsis praeakatayamae*
- Denticulopsis praelata*
- Denticulopsis simonsenii*
- Denticulopsis tanimurae*
- Denticulopsis vulgaris**
- Denticulopsis* spp.
- Diploneis bombus*
- Diploneis puella*
- Diploneis smithii*
- Diploneis suborbicularis*
- Diploneis* spp.
- Distephanosira architecturalis*
- Distephanosira* spp.
- Ellerbeckia sol*
- Ellerbeckia* spp.
- Eunotia pectinalis* var. *minor*
- Eunotia praerupta* var. *praerupta*
- Eunotia* spp.
- Fragilaria construens*
- Fragilaria* spp.
- Fragilariopsis cylindrus*
- Fragilariopsis dolotus**
- Fragilariopsis fossilis**
- Fragilariopsis oceanica*
- Fragilariopsis pilocena**
- Fragilariopsis* spp.
- Goniothecium decoratum*
- Goniothecium rogersii*
- Goniothecium* spp.
- Grammatophora* spp.
- Halamphora costata*
- Hyalodiscus obsoletus*
- Hyalodiscus* spp.
- Ikebea tenuis**
- Kisseleviella carina*
- Kisseleviella ezoensis*
- Koizumia tatsunokuchiensis**
- Kozloviella minor*
- Lisitzinia ornata*
- Mediaria magna**
- Mediaria splendida**
- Melosira albicans*
- Navicula elginensis*
- Navicula lyroides*
- Navicula menisculus*
- Navicula salinarum*
- Neodenticula kamtschatica**
- Neodenticula koizumii**
- Neodenticula seminae**
- Nitzschia challengerii*
- Nitzschia jouseae**
- Nitzschia palea*
- Nitzschia reinholdii**
- Nitzschia rolandii**
- Odontella aurita*
- Paralia sulcata*
- Paralia* spp.
- Podosira stelligera*
- Porosira glacialis*
- Proboscia barboi**
- Proboscia curvirostris**
- Proboscia interposita*
- Proboscia praebarboi*
- Pseudodimmerogramma elegans*
- Pseudonitzschia seriata*
- Pseudopyxilla americana*
- Pseudotracerium radiosoreticulatum*
- Pyxidicula zabelinae**

- Rhaphoneis amphiceros*
- Rhaphoneis* spp.
- Rhizosolenia hebetata* f. *hiemalis*
- Rhizosolenia hebetata* f. *semispina*
- Rhizosolenia norvegica*
- Rhizosolenia praeborgonii**
- Rhizosolenia setigera*
- Rhizosolenia* spp.
- Roperia tessellata*
- Rocella gelida*
- Rocella praelinitida*
- Rocella semigelida*
- Rocella vigilans*
- Rouxia californica**
- Rouxia granda*
- Rouxia isopolica*
- Rouxia naviculoides*
- Rouxia obesa*
- Shionodiscus oestrupii**
- Shionodiscus praecoestrupii**
- Shionodiscus trifultus*
- Stephanopyxis dimorpha*
- Stephanopyxis horridus**
- Stephanopyxis turris*
- Stephanopyxis* spp.
- Thalassionema bacillaris*
- Thalassionema nitzschoides*
- Thalassionema nitzschoides* var. *incurvatum*
- Thalassionema nitzschoides* var. *inflatum*
- Thalassionema nitzschoides* var. *parvum*
- Thalassionema pseudonitzschoides*
- Thalassionema schraderei**
- Thalassionema* spp.
- Thalassiosira antiqua**
- Thalassiosira bioculata*
- Thalassiosira castanea**
- Thalassiosira convexa**
- Thalassiosira decipiens*
- Thalassiosira dubiosa*
- Thalassiosira eccentrica*
- Thalassiosira fasciculata*
- Thalassiosira fraga*
- Thalassiosira gravida*
- Thalassiosira grunowii**
- Thalassiosira hyalina*
- Thalassiosira irregulara*
- Thalassiosira jacksonii**
- Thalassiosira jouseae**
- Thalassiosira leptopus*
- Thalassiosira lineata*
- Thalassiosira lusca*
- Thalassiosira manifesta*
- Thalassiosira marjamicca**
- Thalassiosira mediaconvexa*
- Thalassiosira minutissima**
- Thalassiosira miocenicca*
- Thalassiosira nordenskioldii*
- Thalassiosira orientalis*
- Thalassiosira praefraga*
- Thalassiosira praenidulus*
- Thalassiosira praeyabei*
- Thalassiosira robusta*
- Thalassiosira sanceltiae*
- Thalassiosira singularis**
- Thalassiosira temperi**
- Thalassiosira umaensis*
- Thalassiosira undulosa*
- Thalassiosira yabei**
- Thalassiosira* spp.
- Thalassiothrix longissima*
- Thalassiothrix* spp.
- Trachyneis aspera*
- Trachyneis* spp.
- Yoshidaia divergens*
- Yoshidaia* spp.

TOTAL of VEGETATIVE CELLS

Sponge IF IF IF IF IF IF IF IF Pads T  
Silico -







Diatom zones (NPD)

NPD 10

TOTAL ABUNDANCE: M (>60%), A (20-60%), C (5-20%), F (2-5%), R (<2%), B (no diatoms)

Core, section, interval (cm)

148 F - 29 R - 3 W, 125 cm

TOTAL PRESERVATION: G (good), M (moderate), P (poor)

DATE: 2013/July/14

OBSERVER'S NAME: A. KEMZ

RELATIVE ABUNDANCE of EACH TAXON: A (>10 valves/FOV), C (1-10 vlv/FOV), F (>1 vlv/10FOVs & <1 vlv/10FOVs), R (>3 vlv/traverse & <1 vlv/10FOVs), X (present), B (barren)

- Achnanthes groenlandica
Achnanthes inflata
Achnanthes lanceolata
Achnanthes lineariformis
Achnanthes spp.
Actinocyclus curvatulus
Actinocyclus ellipticus
Actinocyclus ingens
Actinocyclus ingens f. nodus
Actinocyclus ingens f. planus
Actinocyclus oculatus
Actinocyclus ochotensis
Actinocyclus octonarius
Actinocyclus robustus
Actinocyclus tsugaruensis
Actinocyclus spp.
Actinoplychus senarius
Actinoplychus vulgaris
Actinoplychus spp.
Araniscus lewisianus
Araniscus spp.
Asteromphalus darwini
Asteromphalus oligocenicus
Asteromphalus parvulus
Asteromphalus robustus
Asteromphalus spp.
Azpeitia biradiata
Azpeitia komurae
Azpeitia nodulifera
Azpeitia oligocenica
Azpeitia praenodulifera
Azpeitia salisburyana
Azpeitia tabularis
Azpeitia vetustissima
Azpeitia spp.
Bacterosira bathyomphala
Bacterosira fragilis
Bacterosira spp.
Cavitatus exiguus
Cavitatus jouseanus
Cavitatus lanceolatus
Cavitatus linearis
Cavitatus miocenicus
Cavitatus reclus
Cavitatus spp.
Cestodiscus kugleri
Cestodiscus trochus
Cestodiscus spp.
Cocconeis californica
Cocconeis costata
Cocconeis scutellum
Cocconeis spp.
Coccinodiscus asteromphalus
Coccinodiscus marginatus
Coccinodiscus oculus-iridis
Coccinodiscus radiatus
Coccinodiscus rhombicus
Coccinodiscus symbolophorus
Cosmidiscus insignis
Crucidenticula ikebei
Crucidenticula kanayae
Crucidenticula nicobarica
Crucidenticula paranicobarica
Crucidenticula sawamurae
Cyclotella striata
Cyclotella meneghiniana
Cyclotella spp.
Cymbella cistula
Cymbella minuta
Cymbella subaequalis
Cymbella spp.
Delphineis angustata
Delphineis ischaboensis
Delphineis kippae
Delphineis sachalinensis
Delphineis simonsenii
Delphineis surirella
Delphineis spp.

- Denticulopsis crassa
Denticulopsis dimorpha var. dimorpha
Denticulopsis dimorpha var. areolata
Denticulopsis hustedii
Denticulopsis hyalina
Denticulopsis katayamae
Denticulopsis lauta
Denticulopsis praedimorpha var. minor
Denticulopsis praedimorpha var. praedimorpha
Denticulopsis praeahyalina
Denticulopsis praekatayamae
Denticulopsis praelauta
Denticulopsis simonsenii
Denticulopsis tanimurae
Denticulopsis vulgaris
Denticulopsis spp.
Diploneis bombus
Diploneis puella
Diploneis smithii
Diploneis suborbicularis
Diploneis spp.
Distephanosira architecturalis
Distephanosira spp.
Ellerbeckia sol
Ellerbeckia spp.
Eunotia pectinalis var. minor
Eunotia praerupta var. praerupta
Eunotia spp.
Fragilaria construens
Fragilaria spp.
Fragilariopsis cylindrus
Fragilariopsis dolotus
Fragilariopsis fossilis
Fragilariopsis oceanica
Fragilariopsis plocena
Fragilariopsis spp.
Goniothecium decoratum
Goniothecium rogersii
Goniothecium spp.
Grammatophora spp.
Halamphora costata
Hyalodiscus obsoletus
Hyalodiscus spp.
Ikebea tenuis
Kisseleviella carina
Kisseleviella ezoensis
Kolzumia tatsunokuchiensis
Kozloviella minor
Lisitzinia ornata
Mediaria magna
Mediaria splendida
Melosira albicans
Navicula elginensis
Navicula lyroides
Navicula menisculus
Navicula salinarum
Neodenticula kamschatkica
Neodenticula kolzumii
Neodenticula seminiae
Nitzschia challengerii
Nitzschia jouseae
Nitzschia palea
Nitzschia reinholdii
Nitzschia rolandii
Odontella aurita
Paralia sulcata
Paralia spp.
Podosira stelligera
Porosira glacialis
Proboscia barboi
Proboscia curvirostris
Proboscia interposita
Proboscia praebarboi
Pseudodimmerogramma elegans
Pseudonitzschia seriata
Pseudopyxilla americana
Pseudotriceratium radiosoreticulatum
Pyxidicula zabelinae

- Rhaphoneis amphicerus
Rhaphoneis spp.
Rhizosolenia hebetata f. hiemalis
Rhizosolenia hebetata f. semispina
Rhizosolenia norvegica
Rhizosolenia praebergonii
Rhizosolenia setigera
Rhizosolenia spp.
Roperia tessellata
Rocella gelida
Rocella praenitida
Rocella semigelida
Rocella vigilans
Rouxia californica
Rouxia granda
Rouxia isopolica
Rouxia naviculoides
Rouxia obesa
Shionodiscus oestrupii
Shionodiscus praecoestrupii
Shionodiscus trifultus
Stephanopyxis dimorpha
Stephanopyxis horridus
Stephanopyxis turris
Stephanopyxis spp.
Thalassionema bacillaris
Thalassionema nitzschioides
Thalassionema nitzschioides var. incurvatum
Thalassionema nitzschioides var. inflatum
Thalassionema nitzschioides var. parvum
Thalassionema pseudonitzschioides
Thalassionema schraderi
Thalassionema spp.
Thalassiosira antiqua
Thalassiosira bioculata
Thalassiosira castanea
Thalassiosira convexa
Thalassiosira decipiens
Thalassiosira dubiosa
Thalassiosira eccentrica
Thalassiosira fasciculata
Thalassiosira fraga
Thalassiosira gravida
Thalassiosira grunowii
Thalassiosira hyalina
Thalassiosira irregularata
Thalassiosira jacksonii
Thalassiosira jouseae
Thalassiosira leptopus
Thalassiosira lineata
Thalassiosira lusca
Thalassiosira manifesta
Thalassiosira marujamica
Thalassiosira mediaconvexa
Thalassiosira minutissima
Thalassiosira miocenica
Thalassiosira nordenskioldii
Thalassiosira orientalis
Thalassiosira praefraga
Thalassiosira praenidulus
Thalassiosira praeyabei
Thalassiosira robusta
Thalassiosira sancettae
Thalassiosira singularis
Thalassiosira temperoi
Thalassiosira umaoiensis
Thalassiosira undulosa
Thalassiosira yabei
Thalassiosira spp.
Thalassiothrix longissima
Thalassiothrix spp.
Trachyneis aspera
Trachyneis spp.
Yoshidaia divergens
Yoshidaia spp.

Handwritten notes: ≥ 1.0, → 2.0, ← 3.0 → 8.0, ← 2.0 ← 9.0, ← 5.0, → 6.0, ← 7.0

Handwritten notes: A. oculatus f. e? (SPA), IET, 7

Handwritten notes: Rose spore IET IET IET IET IET, closed spore, sponge IET

Handwritten notes: 38 F, 100, Chaetoceros Resting Spores, TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

undert

TOTAL ABUNDANCE:  
M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

Core, section, interval (cm)

1418F, 29R5W139

TOTAL PRESERVATION  
G (good), M (moderate), P (poor)

DATE: 4. 7. 2013

OBSERVER'S NAME KOVNO

RELATIVE ABUNDANCE of EACH TAXON  
A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barren)

- Achnanthes groenlandica*
- Achnanthes inflata*
- Achnanthes lanceolata*
- Achnanthes lineariformis*
- Achnanthes* spp.
- Actinocyclus curvatus*
- Actinocyclus ellipticus*
- Actinocyclus ingens**
- Actinocyclus ingens f. nodus**
- Actinocyclus ingens f. planus**
- Actinocyclus oculatus**
- Actinocyclus ochotensis* T 2
- Actinocyclus octonarius*
- Actinocyclus robustus*
- Actinocyclus tsugaruensis*
- Actinocyclus* spp.
- Actinoplychus senarius*
- Actinoplychus vulgaris*
- Actinoplychus* spp.
- Araniscus lewisianus*
- Araniscus* spp.
- Asteromphalus darwinii*
- Asteromphalus oligocenicus*
- Asteromphalus parvulus*
- Asteromphalus robustus*
- Asteromphalus* spp.
- Azpeitia biradiata*
- Azpeitia komurae**
- Azpeitia nodulifera*
- Azpeitia oligocenica*
- Azpeitia praenodulifera*
- Azpeitia salisburyana*
- Azpeitia tabularis*
- Azpeitia vetustissima*
- Azpeitia* spp.
- Bacterosira bathyomphala*
- Bacterosira fragilis*
- Bacterosira* spp.
- Cavitatus exiguus*
- Cavitatus jouseanus**
- Cavitatus lanceolatus*
- Cavitatus linearis*
- Cavitatus miocenicus*
- Cavitatus rectus*
- Cavitatus* spp.
- Cestodiscus kugleri*
- Cestodiscus trochus*
- Cestodiscus* spp.
- Cocconeis californica*
- Cocconeis costata*
- Cocconeis scutellum*
- Cocconeis* spp.
- Coscinodiscus asteromphalus*
- Coscinodiscus marginatus*
- Coscinodiscus oculus-iridis*
- Coscinodiscus radiatus*
- Coscinodiscus rhombicus*
- Coscinodiscus symbolophorus*
- Cosmodiscus insignis**
- Crucidenticula ikebei*
- Crucidenticula kanayae*
- Crucidenticula nicobarica*
- Crucidenticula paranicobarica*
- Crucidenticula sawamurae*
- Cyclotella striata*
- Cyclotella meneghiniana*
- Cyclotella* spp.
- Cymbella cistula*
- Cymbella minuta*
- Cymbella subaequalis*
- Cymbella* spp.
- Delphineis angustata*
- Delphineis ischaboensis*
- Delphineis kippae*
- Delphineis sachalinensis*
- Delphineis simonsenii**
- Delphineis surirella*
- Delphineis* spp.

- Denticulopsis crassa**
- Denticulopsis dimorpha var. dimorpha**
- Denticulopsis dimorpha var. areolata**
- Denticulopsis hustedii**
- Denticulopsis hyalina**
- Denticulopsis katayamae**
- Denticulopsis lauta**
- Denticulopsis praedimorpha var. minor**
- Denticulopsis praedimorpha var. praedimorpha**
- Denticulopsis praehyalina**
- Denticulopsis praekatayamae**
- Denticulopsis praelauta**
- Denticulopsis simonsenii**
- Denticulopsis tanimurae**
- Denticulopsis vulgaris**
- Denticulopsis* spp.
- Diploneis bombus*
- Diploneis puella*
- Diploneis smithii*
- Diploneis suborbicularis*
- Diploneis* spp.
- Distephanosira architecturalis*
- Distephanosira* spp.
- Ellerbeckia sol*
- Ellerbeckia* spp.
- Eunotia pectinalis var. minor*
- Eunotia praerupta var. praerupta*
- Eunotia* spp.
- Fragilaria construens*
- Fragilaria* spp.
- Fragilariopsis cylindrus*
- Fragilariopsis dollotus**
- Fragilariopsis fossilis**
- Fragilariopsis oceanica*
- Fragilariopsis pilocena**
- Fragilariopsis* spp.
- Goniothecium decoratum*
- Goniothecium rogersii*
- Goniothecium* spp.
- Grammatophora* spp.
- Halamphora costata*
- Hyalodiscus obsoletus*
- Hyalodiscus* spp.
- Ikebea tenuis**
- Kisseleviella carina*
- Kisseleviella ezoensis*
- Kozumia tatsunokuchiensis**
- Kozloviella minor*
- Lisitzinia ornata*
- Mediaria magna**
- Mediaria splendida**
- Melosira albicans*
- Navicula elginensis*
- Navicula lyroides*
- Navicula menisculus*
- Navicula salinarum*
- Neodenticula kamtschatica**
- Neodenticula kolzumii**
- Neodenticula seminae**
- Nitzschia challengerii*
- Nitzschia jouseae**
- Nitzschia palea*
- Nitzschia reinholdii**
- Nitzschia rolandii**
- Odontella aurita*
- Paralia sulcata*
- Paralia* spp.
- Podosira stelligera*
- Porosira glacialis*
- Proboscia barbol**
- Proboscia curvirostris**
- Proboscia interposita*
- Proboscia praeraboi*
- Pseudodimmerograma elegans*
- Pseudonitzschia seriata*
- Pseudopyxilla americana*
- Pseudotriceratium radiosoreticulatum*
- Pyxidicula zabelinae**

- Rhaphoneis amphicerus*
- Rhaphoneis* spp.
- Rhizosolenia hebetata f. hiemalis* T 2
- Rhizosolenia hebetata f. semispina*
- Rhizosolenia norvegica*
- Rhizosolenia praeborgonii**
- Rhizosolenia setigera*
- Rhizosolenia* spp.
- Roperia tessellata*
- Rocella gelida*
- Rocella praenitida*
- Rocella semigelida*
- Rocella vigilans*
- Rouxia californica**
- Rouxia granda*
- Rouxia isopolica*
- Rouxia naviculoides*
- Rouxia obesa*
- Shionodiscus oestrupii**
- Shionodiscus praeoestrupii**
- Shionodiscus trifidulus*
- Stephanopyxis dimorpha*
- Stephanopyxis horridus**
- Stephanopyxis turris*
- Stephanopyxis* spp.
- Thalassionema bacillarum*
- Thalassionema nitzschioides*
- Thalassionema nitzschioides var. incurvatum*
- Thalassionema nitzschioides var. inflatum*
- Thalassionema nitzschioides var. parvum*
- Thalassionema pseudonitzschioides*
- Thalassionema schraderi**
- Thalassionema* spp.
- Thalassiosira antiqua**
- Thalassiosira bioculata*
- Thalassiosira castanea**
- Thalassiosira convexa**
- Thalassiosira decipiens*
- Thalassiosira dubiosa*
- Thalassiosira eccentrica*
- Thalassiosira fasciculata*
- Thalassiosira fraga*
- Thalassiosira grandidia*
- Thalassiosira grunowii**
- Thalassiosira hyalina*
- Thalassiosira irregularata*
- Thalassiosira jacksonii**
- Thalassiosira jouseae**
- Thalassiosira leptopus*
- Thalassiosira lineata*
- Thalassiosira lusca*
- Thalassiosira manifesta*
- Thalassiosira marujamca**
- Thalassiosira mediaconvexa*
- Thalassiosira minutissima**
- Thalassiosira miocenica*
- Thalassiosira nordenskioldii*
- Thalassiosira orientalis*
- Thalassiosira praefraga*
- Thalassiosira praenidulus*
- Thalassiosira praeayabei*
- Thalassiosira robusta*
- Thalassiosira sancettae*
- Thalassiosira singularis**
- Thalassiosira temperei**
- Thalassiosira umaoniensis*
- Thalassiosira undulosa*
- Thalassiosira yabei**
- Thalassiosira* spp.
- Thalassiothrix longissima*
- Thalassiothrix* spp.
- Trachyneis aspera*
- Trachyneis* spp.
- Yoshidaia divergens*
- Yoshidaia* spp.

Sponge IF foram IF  
1103thc?

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

B

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## Core, section, interval (cm)

1718F-29R-CC

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

DATE: 2013/July/13

OBSERVER'S NAME: A. FERUZ

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
 F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
 R (>3 vlv/traverse & <1 vlv/10FOVs)  
 X (present), B (barren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
**Actinocyclus ingens**  
**Actinocyclus ingens 1. nodus**  
**Actinocyclus ingens 1. planus**  
**Actinocyclus oculatus**  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopychus senarius*  
*Actinopychus vulgaris*  
*Actinopychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseaui**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-indis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmidiscus insignis**  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dollotus**  
**Fragilariopsis fossilis**  
*Fragilariopsis oceanica*  
**Fragilariopsis plocena**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Koizumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Medlaria magna**  
**Medlaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barboi**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinae**

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
*Thalassionema* spp.  
**Thalassiosira antiqua**  
*Thalassiosira bioculata*  
**Thalassiosira castanea**  
**Thalassiosira convexa**  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperlei**  
*Thalassiosira umoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARRON

## Core, section, interval (cm)

U1418F-30R-2W, 100cm

DATE: 2013/July/07

OBSERVER'S NAME TSUKI

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (barron)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus oclonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboenis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelata***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praeupta* var. *praeupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kotzumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtchatica***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarbolii*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeeostrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillarum*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregulara*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctetae*  
***Thalassiosira singularis***  
***Thalassiosira temperii***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

**Chaetoceros Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BAREN

## Core, section, interval (cm)

U1418 F-30R-4W-100 cm

DATE:

2013/July/07

OBSERVER'S NAME

ITSUKI

## TOTAL PRESERVATION

G (good), M (moderate), P (poor)

## TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlv/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (>3 vlv/traverse & <1 vlv/10FOVs)  
X (present), B (baren)

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
***Actinocyclus ingens* f. *nodus***  
***Actinocyclus ingens* f. *planus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Actinoplychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praetauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis doliolus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kolzumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarbolii*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira grvida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularis*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctetae*  
***Thalassiosira singularis***  
***Thalassiosira temperi***  
*Thalassiosira umaoniensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chaetoceros* Resting Spores**

TOTAL of VEGETATIVE CELLS