

## Diatom zones (NPD)

*Bauer*

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E-2R-CC

## TOTAL PRESERVATION

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

*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 oligocentra*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia spp.*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira spp.*  
*Cavatulus exiguis*  
*Cavatulus jouseaeus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus micocenicus*  
*Cavatulus rectus*  
*Cavatulus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
*Cosmoldiscus Insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*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 simonensis*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis spp.*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolloides*  
*Fragilariopsis fossils*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis spp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium spp.*  
*Grammatophora spp.*  
*Halampheira costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus spp.*  
*Ikebea tenulis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Liszmania ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatka**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia spp.*  
*Podosira stelligera*  
*Porusira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimorpha elegans*  
*Pseudonitzschia seriata*  
*Pseudopixilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 2013/June/17

OBSERVER's NAME AKEMI

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebengoni*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupili*  
*Shionodiscus praeoestrupili*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*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 praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
**Thalassiosira singularis**  
**Thalassiosira temperel**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabel**  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidaia divergens*  
*Yoshidaia spp.*

## Cheiroleceros Resting Spores

TOTAL OF VEGETATIVE CELLS

11137 22031 1055K

## Diatom zones (NPD)

*Binner*

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

## Core, section, interval (cm)

1417E - 3R - CC

## TOTAL PRESERVATION

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

*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 levisianus*  
*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.*  
*Cavatulus exiguis*  
*Cavatulus jouseanus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cavatulus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorum*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
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*Denticulopsis katayamae*  
*Denticulopsis laeta*  
*Denticulopsis praedimorpha* var. minor  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praefluita*  
*Denticulopsis simonsenii*  
*Denticulopsis tanikumarae*  
*Denticulopsis vulgaris*  
*Denticulopsis spp.*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
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*Distephanosira sp.*  
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*Hyalodiscus spp.*  
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*Nitzschia rolandii*  
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*Paralia spp.*  
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*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopixilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pydilicula zabelnae*  
*Rhaphoneis amphiceros*

DATE: 2018 June 17OBSERVER's NAME AKEMI

## RELATIVE ABUNDANCE OF EACH TAXON

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*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
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*Thalassiosira jouseae*  
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*Thalassiosira lusca*  
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*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeybæli*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidalia divergens*  
*Yoshidalia 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)

WY178 - FR-3W, 53cm

## TOTAL PRESERVATION

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

DATE: 2013 / June / 18

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)

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*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 velutissima*  
*Azpeitia spp.*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira spp.*  
*Cavatulus exiguis*  
*Cavatulus jouseanus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus mioceneus*  
*Cavatulus rectus*  
*Cavatulus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophus*  
*Cosmoldiscus Insignis*  
*Crudidenticula ikebei*  
*Crudidenticula kanayae*  
*Crudidenticula nicobarica*  
*Crudidenticula paranicobarica*  
*Crudidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis slmonsenii*  
*Delphineis surirella*  
*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 tanikumurae*  
*Denticulopsis vulgaris*  
*Denticulopsis spp.*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanoisira architecturalis*  
*Distephanoisira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dololus*  
*Fragilariopsis fossilli*  
*Fragilariopsis oceanica*  
*Fragilariopsis plicena*  
*Fragilariopsis spp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium spp.*  
*Grammatophora spp.*  
*Halamphepha costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus spp.*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tasunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medlaria magna*  
*Medlaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatka*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia roelandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia spp.*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopixilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Roccella gelida*  
*Roccella praenitida*  
*Roccella semigelida*  
*Roccella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupili*  
*Shionodiscus praeoestrupili*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides var. incurvatum*  
*Thalassionema nitzschiooides var. inflatum*  
*Thalassionema nitzschiooides var. parvum*  
*Thalassionema pseudonitzschiooides*  
*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 manujamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
*Thalassiosira singularis*  
*Thalassiosira temperale*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Thalassiothrix spp.*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidaiia divergens*  
*Yoshidaiia 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)

U417E-4R-4W, 76 cm

## TOTAL PRESERVATION

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

*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.*  
*Actinopithicus senarius*  
*Actinopithicus vulgaris*  
*Actinopithicus spp.*  
*Araniscus lewisiatus*  
*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 exiguius*  
*Cavitatus jouseanus*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus micogenicus*  
*Cavitatus rectus*  
*Caviflatus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crucidenticula Ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*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*  
*Diploaneis spp.*  
*Diploaneis bombus*  
*Diploaneis puella*  
*Diploaneis smithii*  
*Diploaneis suborbicularis*  
*Diploaneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis var. minor*  
*Eunotia praerupta var. praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolloplus*  
*Fragilariopsis fossile*  
*Fragilariopsis oceanica*  
*Fragilariopsis plicena*  
*Fragilariopsis spp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium spp.*  
*Grammatophora spp.*  
*Halamphora costata*  
*Hydrodiscus obsoletus*  
*Hydrodiscus spp.*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraeoides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatkica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*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*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013/June/18

OBSERVER's NAME ITSUKI

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergoni*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupili*  
*Shionodiscus praeoestrupili*  
*Shionodiscus trifilatus*  
*Stephanopyxis dimorpha*  
*Stephanopyds horridus*  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides var. incurvatum*  
*Thalassionema nitzschiooides var. inflatum*  
*Thalassionema nitzschiooides var. parvum*  
*Thalassionema pseudonitzschiooides*  
*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 marumajica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeabyssi*  
*Thalassiosira robusta*  
*Thalassiosira sanctissima*  
*Thalassiosira singularis*  
*Thalassiosira temperale*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira spp.*  
*Thalassiotrix longissima*  
*Thalassiotrix spp.*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidai divergens*  
*Yoshidai spp.*

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Daren*

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E - 4R - CC

## TOTAL PRESERVATION

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

DATE: 2013 / June / 17

OBSERVER's NAME AKEMI

## 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 velutissima*  
*Azpeitia spp.*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira spp.*  
*Cavatulus exiguis*  
*Cavatulus jouseanus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus micronicus*  
*Cavatulus rectus*  
*Cavatulus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*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*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolollus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis spp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium spp.*  
*Grammatophora spp.*  
*Halampheira costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus spp.*  
*Ikebeia tenulis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kozumiella tatsuokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medularia magna*  
*Medularia splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatka*  
*Neodenticula kozumili*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia roelandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Paralia spp.*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelnae*  
*Rhaphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
*Rouvia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *infatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*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 praenudulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoensis*  
*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)

Brown

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E-5R-CC

## TOTAL PRESERVATION

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

*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 biradaria*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocerica*  
*Azpeitia praeodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia spp.*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira spp.*  
*Cavilatus exiguus*  
*Cavilatus jouseaeus*  
*Cavilatus lanceolatus*  
*Cavilatus linearis*  
*Cavilatus micogenicus*  
*Cavilatus rectus*  
*Cavilatus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorhus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simsonenii*  
*Delphineis surirella*  
*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 simsonenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis spp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunota pectinalis var. minor*  
*Eunota praerupta var. praerupta*  
*Eunota sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilaropsis cylindrus*  
*Fragilaropsis dolloides*  
*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 lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatkatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*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*  
*Pseudodimorpha elegans*  
*Pseudonitzschia seriata*  
*Pseudopixilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*  
*Raphoneis amphiceros*

DATE: 2013 / June / 17  
OBSERVER's NAME: ABEMI

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupilis*  
*Shionodiscus praeoestrupilis*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides var. incurvatum*  
*Thalassionema nitzschiooides var. inflatum*  
*Thalassionema nitzschiooides var. parvum*  
*Thalassionema pseudonitzschiooides*  
*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 mediaconvervexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaciensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidai divergens*  
*Yoshidai spp.*

## Chaeoceros Resting Spores

## TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

DATE:

1417.F 6R washout

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 vlvls/FOV)  
F (>1 vlv/10FOVs & <1 vlv/10FOVs)  
R (<3 vlv/travers & <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.*  
*Actinophtychus senarius*  
*Actinophtychus vulgaris*  
*Actinophtychus 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.*  
*Cavitalus exiguis*  
*Cavitalus jouseanus*  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus rectus*  
*Cavitalus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*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 paeophylina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis spp.*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolllus*  
*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 tatsunokuhensis*  
*Kozloviella minor*  
*Lisztinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraides*  
*Navicula menisculus*  
*Navicula safinarum*  
*Neodenticula kamtschatkatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*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*  
*Pseudodimorogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus ostruppii*  
*Shionodiscus praeoestruppii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *infatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*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 marjamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira spp.*  
*Thalassiotrichix longissima*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidai divergens*  
*Yoshidai spp.*

Chaetoceros Resting Spores

TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

un determined

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

U1417 E. 7R - 1W, 52 cm

## TOTAL PRESERVATION

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

*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 velutissima*  
*Azpeitia spp.*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira spp.*  
*Cavifatus exiguum*  
**Cavifatus jouseanus**  
*Cavifatus lanceolatus*  
*Cavifatus linearis*  
*Cavifatus miocenicus*  
*Cavifatus rectus*  
*Cavifatus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmoldiscus Insignis**  
*Crudidenticula ikebei*  
*Crudidenticula kanayae*  
*Crudidenticula nicobarica*  
*Crudidenticula paranicobarica*  
*Crudidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphinis simonsenii*  
*Delphineis surirella*  
*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 praelata*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis spp.*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolloides*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis spp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium spp.*  
*Grammatophora spp.*  
*Halaphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus spp.*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozuma tatsuokuchensis**  
*Kozloviella minor*  
*Liszkinia ornata*  
**Medularia magna**  
**Medularia splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroidea*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkae**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**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 praearbaroi*  
*Pseudodimorpha elegans*  
*Pseudonitzschia seriata*  
*Pseudopixilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelnae*  
*Rhaphoneis amphiceros*

DATE: 2013 / June / 18

OBSERVER's NAME 17SVIC1

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebengonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouda californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupili**  
**Shionodiscus praeoestrupili**  
*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 irregularis*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marjamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitidus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
**Thalassiosira singularis**  
**Thalassiosira temperalis**  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabel**  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Thalassiothrix spp.*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidaiia divergens*  
*Yoshidaiia spp.*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

100

10.0 11.0 12.0

## Diatom zones (NPD)

unterminated

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417, E 7R3W 42

12

## TOTAL PRESERVATION

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

P

*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.**Cavatulus exiguus**Cavatulus jouseanus**Cavatulus lanceolatus**Cavatulus linearis**Cavatulus miocenicus**Cavatulus rectus**Cavatulus spp.**Cestodiscus kugleri**Cestodiscus trochus**Cestodiscus spp.**Coccoeis californica**Coccoeis costata**Coccoeis scutellum**Coscinodiscus asteromphalus**Coscinodiscus marginatus* ~~EE~~*Coscinodiscus oculus-iridis**Coscinodiscus radiatus**Coscinodiscus rhombicus**Coscinodiscus symbolorophus**Cosmiodiscus insignis**Crucidenticula ikebei**Crucidenticula kanayae**Crucidenticula ricobarica**Crucidenticula paranicobarica**Crucidenticula sawamuriae**Cyclotella striata**Cyclotella meneghiniana**Cymbella cistula**Cymbella minuta**Cymbella subaequalis**Delphineis angustata**Delphineis ischaboensis**Delphineis kippae**Delphineis sachalinensis**Delphineis simonsenii**Delphineis surirella**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 praefluita**Denticulopsis simonsenii**Denticulopsis tanimurae**Denticulopsis vulgaris**Diploneis bombus**Diploneis puella**Diploneis smithii**Diploneis suborbicularis**Diploneis sp.**Distephanosira architecturalis**Distephanosira sp.**Ellerbeckia sol**Ellerbeckia sp.**Eunotia pectinalis* var. *minor**Eunotia praerupta* var. *praerupta**Eunotia sp.**Fragilaria construens**Fragilaria sp.**Fragilariopsis cylindrus**Fragilariopsis dolichus**Fragilariopsis fossils**Fragilariopsis oceanica**Fragilariopsis pilocena**Fragilariopsis sp.**Goniothecium decoratum**Goniothecium rogersii**Goniothecium spp.**Grammatophora spp.**Halampheora costata**Hyalodiscus obsoletus**Hyalodiscus spp.**Ikebea tenulis**Kisseleviella carina**Kisseleviella ezoensis**Kolzumia tatsunokuchiensis**Kozloviella minor**Lisitzinia ornata**Medilaria magna**Medilaria splendida**Melosira albicans**Navicula elginensis**Navicula lyraides**Navicula menisculus**Navicula salinarum**Neodenticula kartschatica**Neodenticula kolzumii**Neodenticula seminae**Nitzschia challengerii**Nitzschia cylindrica**Nitzschia jouseae**Nitzschia palea**Nitzschia reinholdii**Nitzschia rolandii**Odontella aurita**Paralia sulcata**Paralia spp.**Podosira stelligera**Porosira glacialis**Proboscia barbol**Proboscia curvirostris**Proboscia interposta**Proboscia praearbaroi**Pseudodimmerogramma elegans**Pseudonitzschia seriata**Pseudopixilla americana**Pseudotriceratium radiosoreticulatum**Pyxidicula zabeliae**Raphoneis amphiceros*

DATE: 18. 6. 2013

OBSERVER's NAME konno

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis**Rhizosolenia hebetata* f. *semispina**Rhizosolenia norwegica**Rhizosolenia praebengonii**Rhizosolenia setigera**Roperia tesselata**Rocella gelida**Rocella praenitida**Rocella semigelida**Rocella vigilans**Rouda californica**Rouxia granda**Rouxia isopolica**Rouxia naviculoides**Rouxia obesa**Shionodiscus oestrupii**Shionodiscus praeoestrupii**Shionodiscus trifultus**Stephanopyxis dimorpha**Stephanopyxis horridus**Stephanopyxis turris**Stephanopyxis spp.**Thalassionema bacillaris**Thalassionema nitzschiooides**Thalassionema nitzschiooides* var. *incurvatum**Thalassionema nitzschiooides* var. *inflatum**Thalassionema nitzschiooides* var. *parvum**Thalassionema pseudonitzschiooides**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 praenudulus**Thalassiosira praeybabei**Thalassiosira robusta**Thalassiosira sanctaeiae**Thalassiosira singularis**Thalassiosira temperat**Thalassiosira umaiensis**Thalassiosira undulosa**Thalassiosira yabel**Thalassiosira spp.**Thalassiothrix longissima**Trachyneis aspera**Trachyneis spp.**Yoshidaia divergens**Yoshidaia spp.*

## Cheiroleceros Resting Spores

## TOTAL OF VEGETATIVE CELLS

3 → 20

Sp. nge, F

Cycl. sp. - 12

## 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)

U1117E - 7R-CC

## TOTAL PRESERVATION

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

*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 velutissima**Azpeitia spp.**Bacterosira bathyomphala**Bacterosira fragilis**Bacterosira spp.**Cavatulus exiguis**Cavatulus jouseanus**Cavatulus lanceolatus**Cavatulus linearis**Cavatulus miocenicus**Cavatulus rectus**Cavatulus spp.**Cestodiscus kugleri**Cestodiscus trochus**Cestodiscus spp.**Cocconeis californica**Cocconeis costata**Cocconeis scutellum**Coscinodiscus asteromphalus**Coscinodiscus marginatus**Coscinodiscus oculus-iridis**Coscinodiscus radiatus**Coscinodiscus rhombicus**Coscinodiscus symbolophorus**Cosmoldiscus Insignis**Crucidenticula ikebei**Crucidenticula kanayae**Crucidenticula nicobarica**Crucidenticula paranicobarica**Crucidenticula sawamurae**Cyclotella striata**Cyclotella meneghiniana**Cymbella cistula**Cymbella minutula**Cymbella subaequalis**Delphineis angustata**Delphineis ischaboensis**Delphineis kippae**Delphineis sachalinensis**Delphineis simsonenii**Delphineis surirella**Denticulopsis crassa**Denticulopsis dimorpha var. dimorpha**Denticulopsis dimorpha var. areolata**Denticulopsis hustedtii**Denticulopsis hyalina**Denticulopsis katayamae**Denticulopsis laeta**Denticulopsis praedimorpha var. minor**Denticulopsis praedimorpha var. praedimorpha**Denticulopsis paeahyalina**Denticulopsis paeakatayamae**Denticulopsis paealauta**Denticulopsis simonsenii**Denticulopsis tanimurae**Denticulopsis vulgaris**Diploneis bombus**Diploneis puella**Diploneis smithii**Diploneis suborbicularis**Diploneis sp.**Distephanosira architecturalis**Distephanosira sp.**Ellerbeckia sol**Ellerbeckia sp.**Eunotia pectinalis var. minor**Eunotia praerupta var. praerupta**Eunotia sp.**Fragilaria construens**Fragilaria sp.**Fragilariopsis cylindrus**Fragilariopsis dolloides**Fragilariopsis fossils**Fragilariopsis oceanica**Fragilariopsis pilocena**Fragilariopsis spp.**Goniothecium decoratum**Goniothecium rogersii**Goniothecium spp.**Grammatophora spp.**Halampheira costata**Hyalodiscus obsoletus**Hyalodiscus spp.**Ikebea tenuis**Kisseleviella carina**Kisseleviella ezoensis**Kozumia tatsunokuchensis**Kozlovella minor**Lisitzinia ornata**Medilaria magna**Medilaria splendida**Melosira albicans**Navicula elginensis**Navicula lyroides**Navicula menisculus**Navicula salinarum**Neodenticula kamtschatka**Neodenticula kolzumii**Neodenticula seminae**Nitzschia challengerii**Nitzschia cylindrica**Nitzschia jouseae**Nitzschia palea**Nitzschia rehboldii**Nitzschia rolandii**Odontella aurita**Paralia sulcata**Paralia spp.**Podosira stelligera**Porosira glacialis**Proboscia barbol**Proboscia curvirostris**Proboscia interposta**Proboscia praebarbol**Pseudodimmerogramma elegans**Pseudonitzschia seriata**Pseudopyxis americana**Pseudotriceratium radiosoreticulatum**Pyxidicula zabelnae**Raphoneis amphiceros*DATE: 2013 / June 18  
OBSERVER's NAME ITSVKI

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata f. hiemalis**Rhizosolenia hebetata f. semispina**Rhizosolenia norwegica**Rhizosolenia praesbergonii**Rhizosolenia setigera**Ropertia tesselata**Rocella gelida**Rocella praenitida**Rocella semigelida**Rocella vigilans**Roudia californica**Rouxia granda**Rouxia isopolica**Rouxia naviculoides**Rouxia obesa**Shlondiscus oestrupili**Shlondiscus praeoestrupili**Shionodiscus trifultus**Stephanopyxis dimorpha**Stephanopyxis horridus**Stephanopyxis turris**Stephanopyxis spp.**Thalassionema bacillaris**Thalassionema nitzschiooides**Thalassionema nitzschiooides var. incurvatum**Thalassionema nitzschiooides var. inflatum**Thalassionema nitzschiooides var. parvum**Thalassionema pseudonitzschiooides**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 nordenskioldii**Thalassiosira orientalis**Thalassiosira praefragia**Thalassiosira praenudulus**Thalassiosira praeybabei**Thalassiosira robusta**Thalassiosira sanctae**Thalassiosira singularis**Thalassiosira temperata**Thalassiosira umaoensis**Thalassiosira undulosa**Thalassiosira yabeli**Thalassiosira spp.**Thalassiothrix longissima**Trachyneis aspera**Trachyneis spp.**Yoshidaia divergens**Yoshidaia spp.*

## Chaetoceros Resting Spores

## TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

NPDBb

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira bathyomphala*  
*Bacteriosira fragilis*  
*Cavitalus exiguus*  
**Cavitalus jouseaeus**  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Coccoeis californica*  
*Coccoeis costata*  
*Coccoeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symboloruphus*  
**Cosmidiscus insignis**  
*Crucidicula ikebei*  
*Crucidicula kanayae*  
*Crucidicula nicobarica*  
*Crucidicula paranicobarica*  
*Crucidicula sawamurensis*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

≤ 0.0  
 → 1.0  
 ≤ 2.0  
 → 3.0  
 ≤ 4.0  
 → 5.0  
 ≤ 6.0

## Core, section, interval (cm)

140 E-8P-3W, 96 cm

## TOTAL PRESERVATION

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

*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 praeatalina*  
*Denticulopsis praeatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Disstephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Fragilariopsis dolollus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilcena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Liszitinia ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkae** ET D P  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
*Nitzschia rotundil*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscidea barbol**  
**Proboscidea curvirostris**  
*Proboscidea interposita*  
*Proboscidea praearbaroi*  
*Pseudodimeroigrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

open copula

Rad sf

DATE: 2013 June 18

OBSERVER'S NAME AKEMI

## 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)

*Rhizosolenia hebetata* f. *hiemalis* — / (R)  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebargentii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oastrupii** — / (R)  
**Shionodiscus praecestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 marjamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenstkioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temperata**  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiotrich longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

## Cheiosteros Resting Spores

## TOTAL of VEGETATIVE CELLS

000

## Diatom zones (NPD)

## Core, section, interval (cm)

1917 E - 8R - 3W, 98 cm

## TOTAL ABUNDANCE:

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

Un determined

## TOTAL PRESERVATION

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

*Achnanthes groenlandica**Achnanthes inflata**Achnanthes lanceolata**Achnanthes lineariformis**Actinocyclus curvatus**Actinocyclus ellipticus**Actinocyclus ingens**Actinocyclus ingens f. nodus**Actinocyclus ingens f. planus**Actinocyclus oculatus**Actinocyclus ochotensis**Actinocyclus octonarius**Actinocyclus robustus**Actinocyclus tsugaruensis**Actinoplychus senarius**Actinoplychus vulgaris**Araniscus lewisianus**Asteromphalus darwinii**Asteromphalus oligocenicus**Asteromphalus parvulus**Asteromphalus robustus**Azpeitia biradiata**Azpeitia komurae**Azpeitia nodulifera**Azpeitia oligocenica**Azpeitia praenodulifera**Azpeitia salisburyana**Azpeitia tabularis**Azpeitia vetustissima**Bacterosira bathyomphala**Bacterosira fragilis**Cavatatus exiguis**Cavatatus jouseanus**Cavatatus lanceolatus**Cavatatus linearis**Cavatatus miocenicus**Cavatatus rectus**Cestodiscus kugleri**Cestodiscus trochus**Coccineis californica**Coccineis costata**Coccineis scutellum**Coscinodiscus asteromphalus**Coscinodiscus marginatus**Coscinodiscus oculus-iridis**Coscinodiscus radiatus**Coscinodiscus rhombicus**Coscinodiscus symbolophorus**Cosmiodiscus insignis**Crucidenticula ikebei**Crucidenticula kanayae**Crucidenticula nicobarica**Crucidenticula paranicobarica**Crucidenticula sawamurae**Cyclotella striata**Cyclotella meneghiniana**Cymbella cistula**Cymbella minuta**Cymbella subaequalis**Delphineis angustata**Delphineis ischabensis**Delphineis kippae**Delphineis sachalinensis**Delphineis simonsenii**Delphineis surrella**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 praealta**Denticulopsis simonsenii**Denticulopsis tamimurensis**Denticulopsis vulgaris**Diploneis bombus**Diploneis puella**Diploneis smithii**Diploneis suborbicularis**Distephanosira architecturalis**Ellerbeckia sol**Eunotia pectinata var. minor**Eunotia praerupta var. praerupta**Fragilaria construens* (Ehrenberg) Grunow*Flagilariopsis cylindrus**Fragilariopsis dolobius**Fragilariopsis fossils**Fragilariopsis oceanica**Fragilariopsis pilicena**Goniothecium decoratum**Goniothecium rogersii**Halamphora costata**Hyalodiscus obsoletus**Ikebaea tenuis**Kisseleviella carina**Kisseleviella ezoensis**Kolzumia tatsunokuchiensis**Kozloviella minor**Lisitzinia ornata**Mediaria magna**Mediaria splendida**Melosira albicans**Navicula elginiensis**Navicula menisculus**Navicula salinarum**Neodenticula kamtschatkae**Neodenticula kolzumii**Neodenticula seminae**Nitzschia challengeri**Nitzschia cylindrica**Nitzschia jouseana**Nitzschia palea**Nitzschia reinholdii**Nitzschia rolandii**Odontella aurita**Paralia sulcata**Podosira stelligera**Porosira glacialis**Proboscia barbol**Proboscia curvirostris**Proboscia interposta**Proboscia praearbori**Pseudodimerogetes elegans**Pseudonitzschia seriata**Pseudopyxis americana**Pseudotriceratium radiosoreticulatum**Pyxidicula zabeliae**Raphoneis amphiceros**Rhabdonema hebetata f. hiemalis**Rhabdonema hebetata f. semispina**Rhabdonema norwegica**Rhabdonema praebergonii**Roperia tesselata**Roccella gelida**Roccella praenitida**Roccella semigelida**Roccella vigilans**Rouxia californica**Rouxia granda**Rouxia isoplica**Rouxia naviculoides**Rouxia obesa**Shionodiscus oestrupii**Shionodiscus praeoestrupii**Shionodiscus trifultus**Stephanopyxis dimorpha**Stephanopyxis horridus**Stephanopyxis turris**Thalassionema bacillaris**Thalassionema nitzschioideum**Thalassionema nitzschioideum var. incurvatum**Thalassionema nitzschioideum var. inflatum**Thalassionema nitzschioideum var. parvum**Thalassionema pseudonitzschioideum**Thalassionema schraderi**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 jouseana**Thalassiosira leptopus**Thalassiosira lineata**Thalassiosira lusca**Thalassiosira manifesta**Thalassiosira maryamica**Thalassiosira mediaconvexa**Thalassiosira minutissima**Thalassiosira miocenica**Thalassiosira nordenskioldii**Thalassiosira orientalis**Thalassiosira praefraga**Thalassiosira praenidulus**Thalassiosira praeybægi**Thalassiosira robusta**Thalassiosira sanctaeae**Thalassiosira singularis**Thalassiosira temporalis**Thalassiosira umaoiensis**Thalassiosira undulosa**Thalassiosira yabel**Thalassiothrix longissima**Trachyneis aspera**Yoshidaiya divergens*

DATE: 28/12/June/18

OBSERVER's NAME AKEMI

## 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)

Th - sp. F (P)

3

REKA HK C. angulatus

F3

## Diatom zones (NPD)

NPD 7Bb?

**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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisiensis*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira bathyomphala*  
*Bacteriosira fragilis*  
*Cavatitus exiguus*  
**Cavatitus jouseanus**  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trachus*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmoldiscus insignis**  
*Crucidinicula ikabei*  
*Crucidinicula kanayae*  
*Crucidinicula nicoberica*  
*Crucidinicula paranicoberica*  
*Crucidinicula sawamurensis*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

← 0.0 → 7.0  
 → 1.0 ← 8.0  
 ← 2.0 → 9.0  
 → 3.0 ← 10.0  
 ← 4.0 → 11.0  
 → 5.0 ← 12.0  
 ← 6.0 → 13.0

## Core, section, interval (cm)

147E-8R-4W, 46cm

## TOTAL PRESERVATION

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

*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*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pecinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dolilolus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Fragilariopsis pilosana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Listizinia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkae**  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposta*  
*Proboscia praearbaroi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013/June/18

OBSERVER's NAME AKEMI

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praeburgonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
*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 marjamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitudulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temperata**  
*Thalassiosira umaloensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

NPPDBb?

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E-8R-5W, 90 cm

## TOTAL PRESERVATION

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

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus Ingens*  
*Actinocyclus Ingens f. nodus*  
*Actinocyclus Ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisiensis*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurensis*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavitalus exiguus*  
*Cavitalus jousseanus*  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Coccoeis californica*  
*Coccoeis costata*  
*Coccoeis scutellum*  
*Coscindiscus asteromphalus*  
*Coscindiscus marginatus*  
*Coscindiscus oculus-iridis*  
*Coscindiscus radiatus*  
*Coscindiscus rhombicus*  
*Coscindiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikabei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonisenii*  
*Delphineis surirella*

*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 paelauta*  
*Denticulopsis simonisenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisztszina ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatkae*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*Nitzschia joussea*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposta*  
*Proboscia praebarboi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013/June/18

OBSERVER's NAME AKEMI

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 joussea*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira marjancica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umtaliensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiotrich longissima*  
*Trachyneis aspera*  
*Yoshidaiia divergens*

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

O  
100

## Diatom zones (NPD)

NPD 7Bb

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417.E. 8RCC

## TOTAL PRESERVATION

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

*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.

R 2 *Actinoptychus senarius* T*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 velutissima**Azpeitia* spp.*Bacterosira bathyomphala**Bacterosira fragilis**Bacterosira* spp.*Cavitalus exiguis**Cavitalus jouseanus**Cavitalus lanceolatus**Cavitalus linearis**Cavitalus miocenicus**Cavitalus rectus**Cavitalus* spp.*Cestodiscus kugleri**Cestodiscus trochus**Cestodiscus* spp.*Coccineis californica**Coccineis costata* —*Coccineis scutellum**Coscinodiscus asteromphalus*R 29 *Coscinodiscus marginatus* 正正正正*Coscinodiscus oculus-iridis**Coscinodiscus radiatus**Coscinodiscus rhombicus**Coscinodiscus symbolorophus**Cosmoldiscus Insignis**Crucidenticula ikebei**Crucidenticula kanayae**Crucidenticula nicobarica**Crucidenticula paranicobarica**Crucidenticula sawamurae**Cyclotella striata*R 22 *Cyclotella meneghiniana* 正正正*Cymbella cistula**Cymbella minuta**Cymbella subaequalis**Delphineis angustata**Delphineis ischaboensis**Delphineis kippae**Delphineis sachalinensis**Delphineis simonsenii**Delphineis surirella**Denticulopsis crassa**Denticulopsis dimorpha* var. *dimorpha**Denticulopsis dimorpha* var. *areolata*

*Denticulopsis hustedti*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis laeta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelutea*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dollosus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis plicena*  
*Fragilariopsis sp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halampheira costata*  
*Hyalodiscus obsoletus* —  
*Hyalodiscus* spp.  
*Ikebea tenulis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kozumiella tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatka* FFFF  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*Nitzschia joussea*  
*Nitzschia palea*  
*Nitzschia reithrodillii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata* +  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glaciales*  
*Proboscia barbol* +  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelnae*  
*Raphoneis amphiceros*

silico T

cyclo. sp. -

\* -

DATE: 18.6.2013

OBSERVER's NAME KO NNO

## 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)

R / *Rhizosolenia hebetata* f. *hiemalis* ~*Rhizosolenia hebetata* f. *semispina**Rhizosolenia norwegica**Rhizosolenia praebengonii**Rhizosolenia setigera**Ropera tesselata**Rocella gelida**Rocella praelitida**Rocella semigelida**Rocella vigilans**Rouxia californica**Rouxia granda**Rouxia isopolica**Rouxia naviculoides**Rouxia obesa*R / *Shionodiscus oestrupii* TEE*Shionodiscus praeoestrupii**Shionodiscus trifultus**Stephanopyxis dimorpha**Stephanopyxis horridus**Stephanopyxis turris**Stephanopyxis* spp.*Thalassionema bacillaris**Thalassionema nitzschiooides**Thalassionema nitzschiooides* var. *incurvatum**Thalassionema nitzschiooides* var. *inflatum*/ *Thalassionema nitzschiooides* var. *parvum* —*Thalassionema pseudonitzschiooides**Thalassionema schraderi**Thalassionema* spp.*Thalassiosira antiqua**Thalassiosira bioculata**Thalassiosira castanea**Thalassiosira convexa**Thalassiosira decipiens**Thalassiosira dubiosa**Thalassiosira eccentrica**Thalassiosira fasciculata**Thalassiosira fraga**Thalassiosira gradata**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 praenudulus**Thalassiosira praeyabei**Thalassiosira robusta**Thalassiosira sanctaeae**Thalassiosira singularis**Thalassiosira temperata**Thalassiosira umaoiensis**Thalassiosira undulosa**Thalassiosira yabeli*R / *Thalassiothrix longissima* E*Thalassiothrix* spp. T*Trachyneis aspera**Trachyneis* spp.*Yoshidaia divergens**Yoshidaia* spp.

Chaetoceros Resting Spores T

TOTAL of VEGETATIVE CELLS

3

7

## 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)

U1X178-9R-CC

## TOTAL PRESERVATION

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

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes spp.*  
*Actinocyclus curvulus*  
*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 lewisiatus*  
*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.*  
*Cavatulus exiguis*  
*Cavatulus jouseaeus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cavatulus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*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 praelata*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis spp.*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunota pectinalis var. minor*  
*Eunota praerupta var. praerupta*  
*Eunota sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilaropsis cylindrus*  
*Fragilaropsis dolilolus*  
*Fragilaropsis fossilis*  
*Fragilaropsis oceanica*  
*Fragilaropsis pilocena*  
*Fragilaropsis spp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium spp.*  
*Grammatophora spp.*  
*Halampheora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus spp.*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medleria magna*  
*Medleria splendida*  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kartschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challenger*  
*Nitzschia cylindrica*  
*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*  
*Pseudodimorpha elegans*  
*Pseudonitzschia seriata*  
*Pseudotaxylla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013/June/18

OBSERVER's NAME: 175UKI

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia paebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
*Rouda californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus paeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides var. incurvatum*  
*Thalassionema nitzschiooides var. inflatum*  
*Thalassionema nitzschiooides var. parvum*  
*Thalassionema pseudonitzschiooides*  
*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 marjamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidaea divergens*  
*Yoshidaea spp.*

## Chaetoceros Resting Spores

## TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

Uncalibrated

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus Ingens*  
*Actinocyclus Ingens f. nodus*  
*Actinocyclus Ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisiensis*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira balthymophala*  
*Bacterosira fragilis*  
*Caviflatus exiguum*  
*Caviflatus jouseanus*  
*Caviflatus lanceolatus*  
*Caviflatus linearis*  
*Caviflatus miocenicus*  
*Caviflatus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus* F R  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

## Core, section, interval (cm)

1417E-10R-1W, 99

## TOTAL PRESERVATION

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis kafayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis prakatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamimurae*  
*Denticulopsis vulgaris*  
*Diplotheis bombus*  
*Diplotheis puella*  
*Diplotheis smithii*  
*Diplotheis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossalis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisztnia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamschatcata*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratum radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013 June 18OBSERVER's NAME ALLENZ

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*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*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*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 praenitulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*Chaetoceros Resting Spores*

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Undetermined

## TOTAL ABUNDANCE:

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

Very Barren

## Core, section, interval (cm)

1417E - 10R - 2W, 20 cm

## TOTAL PRESERVATION

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

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

*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 praeplaty whole*  
*Denticulopsis simonisenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis doliolus*  
*Flagilariopsis fossils*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilocana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisselevilla carina*  
*Kisselevilla ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listzinia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013 / June / 18

OBSERVER'S NAME ALCEM2

## 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)

*Rhizosolenia hebetata* f. *hiemata*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia preebergoni*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus paoeostrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *Incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 lucas*  
*Thalassiosira manifesta*  
*Thalassiosira marjoramica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*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)

1417E-10R-3W, 67 cm

## TOTAL PRESERVATION

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

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

*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 praeplatyamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Disstephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunolia pectinalis* var. *minor*  
*Eunolia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatka**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 2013 June 13

OBSERVER'S NAME *Algerne*

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praeburgonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*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*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
**Thalassiosira singularis**  
**Thalassiosira temporei**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

**Diatom zones (NPD)***Banner***TOTAL ABUNDANCE:**

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

**Core, section, interval (cm)**

1417E-10R-4W, 10cm

**TOTAL PRESERVATION**

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

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

**Denticulopsis crassa**  
**Denticulopsis dimorpha** var. *dimorpha*  
**Denticulopsis dimorpha** var. *areolata*  
**Denticulopsis hustedtii**  
**Denticulopsis hyalina**  
**Denticulopsis katoryamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha** var. *minor*  
**Denticulopsis praedimorpha** var. *praedimorpha*  
**Denticulopsis praehyalina**  
**Denticulopsis praekatayamae**  
**Denticulopsis praelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tamurae**  
**Denticulopsis vulgaris**  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunoia pectinalis* var. *minor*  
*Eunoia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dololus**  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
**Flagilariopsis pilosana**  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kantschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 2013/June/18

OBSERVER'S NAME AKEMI

**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)

*Rhizosolenia hebetata* f. *hiemata*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia preebergoni**  
*Rhizosolenia setigera*  
*Ropertia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
**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 miccenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitudus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temperata**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

**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)

U4417E - 10R - CC

## TOTAL PRESERVATION

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

DATE: 2013/June/18

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 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 lewisiatus*  
*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 exiguis*  
*Cavitatus jouseae*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus spp.*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
*Cosmoldiscus Insigne*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis slmonsenii*  
*Delphineis surirella*  
*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 praelaeta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis spp.*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilarlopsis dolollus*  
*Fragilarlopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilarlopsis pilocena*  
*Fragilariopsis spp.*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium spp.*  
*Grammatophora spp.*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus spp.*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kozloviella tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula algénensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatka*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*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 praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopixilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelnae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupli*  
*Shionodiscus preeoestrupli*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis spp.*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *infatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*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 praenudulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Thalassiothrix spp.*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidaia divergens*  
*Yoshidaia spp.*

## Cheiloceros 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)

V1478 - #R-cc

## TOTAL PRESERVATION

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

*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 velutissima*  
*Azpeitia spp.*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira spp.*  
*Caviflatus exiguis*  
*Caviflatus jouseanus*  
*Caviflatus lanceolatus*  
*Caviflatus linearis*  
*Caviflatus miocenicus*  
*Caviflatus rectus*  
*Caviflatus spp.*  
*Cestodiscus kugleri*  
*Cestodiscus trachus*  
*Cestodiscus spp.*  
*Coccneis californica*  
*Coccneis costata*  
*Coccneis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crucidiscula ikebei*  
*Crucidiscula kanayae*  
*Crucidiscula nicobarica*  
*Crucidiscula paranicobarica*  
*Crucidiscula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis slmonsenii*  
*Delphineis surirella*  
*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 praelata*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis sp.*  
*Distephanosira architecturalis*  
*Distephanosira sp.*  
*Ellerbeckia sol*  
*Ellerbeckia sp.*  
*Eunota pectinalis* var. *minor*  
*Eunota praerupta* var. *praerupta*  
*Eunota sp.*  
*Fragilaria construens*  
*Fragilaria sp.*  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolilus*  
*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*  
*Lisztrinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraeides*  
*Navicula menisculus*  
*Navicula sinularum*  
*Neodenticula kamtschatkata*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*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*  
*Pseudodimorogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopixilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*  
*Raphoneis amphiceros*

DATE: 2013 / June 18

OBSERVER's NAME TSU

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia spp.*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Roudia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifillus*  
*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 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 praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temperel*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira spp.*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Trachyneis spp.*  
*Yoshidaiia divergens*  
*Yoshidaiia spp.*

## Chaeloceros Resting Spores

## TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

*Burnon*

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

## Core, section, interval (cm)

1417E-12R-1c

## TOTAL PRESERVATION

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

DATE: 2013 June 15

OBSERVER's NAME AFEMZ

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisiianus*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira bathyomphala*  
*Bacteriosira fragilis*  
*Cavatitus exiguus*  
**Cavatitus jouseae**  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trachus*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symboloruphus*  
**Cosmoldiscus insignis**  
*Crucidencula ikebei*  
*Crucidencula kanayae*  
*Crucidencula micobarica*  
*Crucidencula paranicobarica*  
*Crucidencula sawamurensis*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

*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 preakatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonserii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Fragilaria cylindrus*  
**Fragilaropsis dolikos**  
*Fragilaropsis fossilis*  
*Fragilaropsis oceanica*  
*Fragilaropsis pilosena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisztszina ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkae**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porusira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyrdicula zabeliae**  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebargentii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 marjanica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenstkioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
**Thalassiosira singularis**  
**Thalassiosira temperata**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidai divergens*

*Chaetoceros* Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417E - BR - CC

## TOTAL ABUNDANCE:

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

Underdetermined

*Achnanthes groenlandica**Achnanthes inflata**Achnanthes lanceolata**Achnanthes lineariformis**Actinocyclus curvatus**Actinocyclus ellipticus**Actinocyclus ingens**Actinocyclus ingens f. nodus**Actinocyclus ingens f. planus**Actinocyclus oculatus**Actinocyclus ochotensis**Actinocyclus octonarius**Actinocyclus robustus**Actinocyclus tsugaruensis**Actinoplychus senarius**Actinoplychus vulgaris**Araniscus lewisianus**Asteromphalus darwini**Asteromphalus oligocenicus**Asteromphalus parvulus**Asteromphalus robustus**Azepeia biradiata**Azepeia komurae**Azepeia nodulifera**Azepeia oligocenica**Azepeia praenolifera**Azepeia salisburyana**Azepeia tabularis**Azepeia vetustissima**Bacterosira bathyomphala**Bacterosira fragilis**Cavatitus exiguus**Cavatitus jouseanus**Cavatitus lanceolatus**Cavatitus linearis**Cavatitus miocenicus**Cavatitus rectus**Cestodiscus kugleri**Cestodiscus trochus**Cocconeis californica**Cocconeis costata**Cocconeis scutellum**Coscinodiscus asteromphalus**Coscinodiscus marginatus* F (R)*Coscinodiscus oculus-iris**Coscinodiscus radiatus**Coscinodiscus rhombicus**Coscinodiscus symbolorophorus**Cosmidiscus insignis**Crudenticula ikebei**Crudenticula kanayae**Crudenticula nicobarica**Crudenticula paranicobarica**Crudenticula sawamurae**Cyclorella striata**Cyclorella meneghiniana**Cymbella cistula**Cymbella minuta**Cymbella subaequalis**Delphineis angustata**Delphineis ischaboensis**Delphineis kippae**Delphineis sachalinensis**Delphineis simonsenii**Delphineis surirella*

≤ 0.0

→ 1.0

(20)

## TOTAL PRESERVATION

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

Underdetermined

*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 simonensis**Denticulopsis tamurae**Denticulopsis vulgaris**Diploneis bombus**Diploneis puella**Diploneis smithii**Diploneis suborbicularis**Distephanosira architecturalis**Ellerbeckia sol**Eunotia pectinalis* var. *minor**Eunotia praerupta* var. *praerupta**Fragilaria construens* (Ehrenberg) Grunow*Fragilariaopsis cylindrus**Fragilariaopsis dolloides**Fragilariaopsis fossilis**Fragilariaopsis oceanica**Fragilariaopsis pilocena**Goniothecium decoratum**Goniothecium rogersii**Halamphora costata**Hyalodiscus obsoletus**Ikebea tenuis**Kisseleviella carina**Kisseleviella ezoensis**Kolzumia tatsunokuchiensis**Kozloviella minor**Lisitzinia ornata**Mediaria magna**Mediaria splendida**Melosira albicans**Navicula elginiensis**Navicula lyraoides**Navicula menisculus**Navicula salinarum**Neodenticula kamtchatkae**Neodenticula kolzumii**Neodenticula seminae**Nitzschia challengeri**Nitzschia cylindrica**Nitzschia jouseae**Nitzschia palea**Nitzschia reinholdii**Nitzschia rolandii**Odontella aurita**Paralia sulcata**Podosira stelligera**Porosira glacialis**Proboscia barbol**Proboscia curvirostris**Proboscia interposta**Proboscia praearbaroi**Pseudodimerogetrum elegans**Pseudonitzschia seriata**Pseudopyxis americana**Pseudotriceratium radiosoreticulatum**Pyxidicula zabelinea**Raphoneis amphiceros*

DATE: 20/3/June/18

OBSERVER'S NAME AKEMI

## RELATIVE ABUNDANCE of EACH TAXON

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

—(R)

*Rhizosolenia hebetata* f. *hiemalis**Rhizosolenia hebetata* f. *semispina**Rhizosolenia norwegica**Rhizosolenia praebargentii**Rhoperia tessellata**Roccella gelida**Roccella praenitida**Roccella semigelida**Roccella vigilans**Rouxia californica**Rouxia granda**Rouxia isoplica**Rouxia naviculoides**Rouxia obesa**Shionodiscus oestrupii**Shionodiscus praeoestrupii**Shionodiscus trifultus**Stephanopyxis dimorpha**Stephanopyxs horridus**Stephanopyxis turris**Thalassionema bacillaris**Thalassionema nitzschiooides**Thalassionema nitzschiooides* var. *incurvatum**Thalassionema nitzschiooides* var. *inflatum**Thalassionema nitzschiooides* var. *parvum**Thalassionema pseudonitzschiooides**Thalassionema schraderi**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 marjamica**Thalassiosira mediaconvexa**Thalassiosira minutissima**Thalassiosira miocenica**Thalassiosira nordenskioldii**Thalassiosira orientalis**Thalassiosira praefraga**Thalassiosira praenidulus**Thalassiosira praeybabei**Thalassiosira robusta**Thalassiosira sanctaeiae**Thalassiosira singularis**Thalassiosira temporalis**Thalassiosira umaoiensis**Thalassiosira undulosa**Thalassiosira yabeli**Thalassiothrix longissima**Trachyneis aspera**Yoshidaiia divergens**Chectoceros Resting Spores*

TOTAL of VEGETATIVE CELLS

4

Diatom zones (NPD)	Core, section, interval (cm)	DATE: 2013/June/6
Baren	1417F - 14R - CC	OBSERVER'S NAME AKENZ
TOTAL ABUNDANCE:	TOTAL PRESERVATION	RELATIVE ABUNDANCE of EACH TAXON
M (>60%), A (20-60%), C (5-20%) F (2-5%), R (<2%), B (no diatoms)	G (good), M (moderate), P (poor)	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)
<i>Achnanthes groenlandica</i>	<i>Denticulopsis crassa</i>	<i>Rhizosolenia hebetata f. hiemalis</i>
<i>Achnanthes inflata</i>	<i>Denticulopsis dimorpha</i> var. <i>dimorpha</i>	<i>Rhizosolenia hebetata f. semispina</i>
<i>Achnanthes lanceolata</i>	<i>Denticulopsis dimorpha</i> var. <i>areolata</i>	<i>Rhizosolenia norwegica</i>
<i>Achnanthes lineariformis</i>	<i>Denticulopsis hustedtii</i>	<i>Rhizosolenia praesbergonii</i>
<i>Actinocyclus curvatus</i>	<i>Denticulopsis hyalina</i>	<i>Rhizosolenia setigera</i>
<i>Actinocyclus ellipticus</i>	<i>Denticulopsis kawaiyamae</i>	<i>Roperia tesselata</i>
<i>Actinocyclus ingens</i>	<i>Denticulopsis lauta</i>	<i>Rocella gelida</i>
<i>Actinocyclus ingens</i> f. <i>nodus</i>	<i>Denticulopsis praedimorpha</i> var. <i>minor</i>	<i>Rocella praenitida</i>
<i>Actinocyclus ingens</i> f. <i>planus</i>	<i>Denticulopsis praedimorpha</i> var. <i>praedimorpha</i>	<i>Rocella semigelida</i>
<i>Actinocyclus oculatus</i>	<i>Denticulopsis praehyalina</i>	<i>Rocella vigilans</i>
<i>Actinocyclus ochotensis</i>	<i>Denticulopsis praekatayamae</i>	<i>Rouxia californica</i>
<i>Actinocyclus octonarius</i>	<i>Denticulopsis praealta</i>	<i>Rouxia granda</i>
<i>Actinocyclus robustus</i>	<i>Denticulopsis simonsenii</i>	<i>Rouxia isoploica</i>
<i>Actinocyclus tsugaruensis</i>	<i>Denticulopsis tanimurae</i>	<i>Rouxia naviculoides</i>
<i>Actinopychus senarius</i>	<i>Denticulopsis vulgaris</i>	<i>Rouxia obesa</i>
<i>Actinopychus vulgaris</i>	<i>Diploneis bombus</i>	<i>Shionodiscus cestrupii</i>
<i>Araniscus lewisianus</i>	<i>Diploneis puella</i>	<i>Shionodiscus praecestrupii</i>
<i>Asteromphalus darwini</i>	<i>Diploneis smithii</i>	<i>Shionodiscus trifultus</i>
<i>Asteromphalus oligocenicus</i>	<i>Diploneis suborbicularis</i>	<i>Stephanopyxis dimorpha</i>
<i>Asteromphalus parvulus</i>	<i>Distephanosira architecturalis</i>	<i>Stephanopyxis horridus</i>
<i>Asteromphalus robustus</i>	<i>Ellerbeckia sol</i>	<i>Stephanopyxis turris</i>
<i>Azpeitia biradiata</i>	<i>Eunotia pectinalis</i> var. <i>minor</i>	<i>Thalassionema bacillaris</i>
<i>Azpeitia komurae</i>	<i>Eunotia praerupta</i> var. <i>praerupta</i>	<i>Thalassionema nitzschiooides</i>
<i>Azpeitia nodulifera</i>	<i>Fragilaria construens</i> (Ehrenberg) Grunow	<i>Thalassionema nitzschiooides</i> var. <i>incurvatum</i>
<i>Azpeitia oligocenica</i>	<i>Flagilaria cylindrus</i>	<i>Thalassionema nitzschiooides</i> var. <i>inflatum</i>
<i>Azpeitia praenodulifera</i>	<i>Fragilariopsis doliolus</i>	<i>Thalassionema nitzschiooides</i> var. <i>parvum</i>
<i>Azpeitia salisburyana</i>	<i>Fragilariopsis fossilis</i>	<i>Thalassionema pseudonitzschiooides</i>
<i>Azpeitia tabularis</i>	<i>Fragilariopsis oceanica</i>	<i>Thalassionema schraderi</i>
<i>Azpeitia vetustissima</i>	<i>Fragilariopsis piloselloides</i>	<i>Thalassiosira antiqua</i>
<i>Bacterosira bathyomphala</i>	<i>Goniothecium decoratum</i>	<i>Thalassiosira bioculata</i>
<i>Bacterosira fragilis</i>	<i>Goniothecium rogersii</i>	<i>Thalassiosira castanea</i>
<i>Cavitalus exiguus</i>	<i>Halamphora costata</i>	<i>Thalassiosira convexa</i>
<i>Cavitalus jouseaeus</i>	<i>Hyalodiscus oboletus</i>	<i>Thalassiosira decipiens</i>
<i>Cavitalus lanceolatus</i>	<i>Ikebea tenuis</i>	<i>Thalassiosira dubiosa</i>
<i>Cavitalus linearis</i>	<i>Kisseleviella carina</i>	<i>Thalassiosira eccentrica</i>
<i>Cavitalus miocenicus</i>	<i>Kisseleviella ezoensis</i>	<i>Thalassiosira fasciculata</i>
<i>Cavitalus rectus</i>	<i>Kolzumia tatsunokuchiensis</i>	<i>Thalassiosira fraga</i>
<i>Ceslodiscus kugleri</i>	<i>Kozloviella minor</i>	<i>Thalassiosira gravida</i>
<i>Ceslodiscus trochus</i>	<i>Lisitzinia ornata</i>	<i>Thalassiosira grunowii</i>
<i>Cocconeis californica</i>	<i>Mediaria magna</i>	<i>Thalassiosira hyalina</i>
<i>Cocconeis costata</i>	<i>Mediaria splendida</i>	<i>Thalassiosira irregulata</i>
<i>Cocconeis scutellum</i>	<i>Melosira albicans</i>	<i>Thalassiosira jacksonii</i>
<i>Coscinodiscus asteromphalus</i>	<i>Navicula elginensis</i>	<i>Thalassiosira jouseae</i>
<i>Coscinodiscus marginatus</i>	<i>Navicula liroides</i>	<i>Thalassiosira leptopus</i>
<i>Coscinodiscus oculus-iris</i>	<i>Navicula menisculus</i>	<i>Thalassiosira linea</i>
<i>Coscinodiscus radiatus</i>	<i>Navicula salinarum</i>	<i>Thalassiosira lusca</i>
<i>Coscinodiscus rhombicus</i>	<i>Neodenticula kantschatica</i>	<i>Thalassiosira manifesta</i>
<i>Coscinodiscus symbolorophorus</i>	<i>Neodenticula kolzumii</i>	<i>Thalassiosira marjamicana</i>
<i>Cosmoldiscus insignis</i>	<i>Neodenticula seminae</i>	<i>Thalassiosira mediaconvexa</i>
<i>Crudenticula ikebei</i>	<i>Nitzschia challengeri</i>	<i>Thalassiosira minutissima</i>
<i>Crudenticula kanayae</i>	<i>Nitzschia cylindrica</i>	<i>Thalassiosira miocenica</i>
<i>Crudenticula nicobarica</i>	<i>Nitzschia jouseae</i>	<i>Thalassiosira nordenskioldii</i>
<i>Crudenticula paranicobarica</i>	<i>Nitzschia palea</i>	<i>Thalassiosira orientalis</i>
<i>Crudenticula sawamurae</i>	<i>Nitzschia reinholdii</i>	<i>Thalassiosira praefraga</i>
<i>Cyclotella striata</i>	<i>Nitzschia rolandii</i>	<i>Thalassiosira praenidulus</i>
<i>Cyclotella meneghiniana</i>	<i>Odontella aurita</i>	<i>Thalassiosira praeybabei</i>
<i>Cymbella cistula</i>	<i>Paralia sulcata</i>	<i>Thalassiosira robusta</i>
<i>Cymbella minuta</i>	<i>Podosira stelligera</i>	<i>Thalassiosira sanctaeae</i>
<i>Cymbella subaequalis</i>	<i>Porosira glacialis</i>	<i>Thalassiosira singularis</i>
<i>Delphineis angustata</i>	<i>Proboscia barbol</i>	<i>Thalassiosira temperata</i>
<i>Delphineis ischaboensis</i>	<i>Proboscia curvirostris</i>	<i>Thalassiosira umaoensis</i>
<i>Delphineis kippae</i>	<i>Proboscia interposita</i>	<i>Thalassiosira undulosa</i>
<i>Delphineis sachalinensis</i>	<i>Proboscia praearbarbi</i>	<i>Thalassiosira yabel</i>
<i>Delphineis simonsenii</i>	<i>Pseudodimmericramma elegans</i>	<i>Thalassiothrix longissima</i>
<i>Delphineis surirella</i>	<i>Pseudonitzschia seriata</i>	<i>Trachyneis aspera</i>
	<i>Pseudopyxilla americana</i>	<i>Yoshidaea divergens</i>
	<i>Pseudotriceratium radiosoreticulatum</i>	
	<i>Pyxidicula zabeliae</i>	
	<i>Raphoneis amphiceros</i>	

*Cheatoceros* Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

NPD 7B 22

## TOTAL ABUNDANCE:

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

Henry Bowen

## Core, section, interval (cm)

1417E-15R - cc

## TOTAL PRESERVATION

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

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisiensis*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatulus exiguus*  
**Cavatulus jouseae**  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscindiscus asteromphalus*  
*Coscindiscus marginatus* T(B)  
*Coscindiscus oculus-iridis*  
*Coscindiscus radiatus*  
*Coscindiscus rhombicus*  
*Coscindiscus symbolorhus*  
**Cosmoldiscus insignis**  
*Crucidencula ikebei*  
*Crucidencula kanayae*  
*Crucidencula nicobarica*  
*Crucidencula paranicobarica*  
*Crucidencula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphinella angustata*  
*Delphinella ischaboensis*  
*Delphinella kippae*  
*Delphinella sachalinensis*  
**Delphinella simonsenii**  
*Delphinella surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedi*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis preakatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanoisira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolloklus**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hydrodiscus obsoletus*  
*Ikeba tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisztsinia ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elgivensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkae**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porusira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 2013 / June / 18

OBSERVER's NAME AFEMUZ

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praobergonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia iscoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii** (R)  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 manjimica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitidus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
**Thalassiosira singularis**  
**Thalassiosira temperata**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiotrich longissima*  
*Trachyneis aspera*  
*Yoshidala divergens*

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

3

## Diatom zones (NPD)

## Core, section, interval (cm)

DATE: 19.6.2013

## 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)

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

*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 tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia peckinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
***Fragilariopsis dolilosis***  
*Fragilariopsis fossalis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kolzumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medilaria magna***  
***Medilaria splendida***  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatka***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposta*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabeliae***  
*Raphoneis amphiceros*

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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
***Rhizosolenia praeburgonii***  
*Rhizosolenia setigera*  
*Ropera tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifilatus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
***Thalassionema schraderi***  
***Thalassiosira antiqua***  
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***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
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*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 marjamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
***Thalassiosira singularis***  
***Thalassiosira temperae***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

*Cheatoceros* Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417, E. 16R zw 129

## 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)

DATE: 19.6.2013

OBSERVER's NAME KOMUO

## 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)

<i>Achnanthes groenlandica</i>	<i>Denticulopsis crassa</i>
<i>Achnanthes inflata</i>	<i>Denticulopsis dimorpha</i> var. <i>dimorpha</i>
<i>Achnanthes lanceolata</i>	<i>Denticulopsis dimorpha</i> var. <i>areolata</i>
<i>Achnanthes lineariformis</i>	<i>Denticulopsis hustedii</i>
<i>Actinocyclus curvatus</i>	<i>Denticulopsis hyalina</i>
<i>Actinocyclus ellipticus</i>	<i>Denticulopsis katsuyamae</i>
<i>Actinocyclus ingens</i>	<i>Denticulopsis lauta</i>
<i>Actinocyclus ingens</i> f. <i>nodus</i>	<i>Denticulopsis praedimorpha</i> var. <i>minor</i>
<i>Actinocyclus ingens</i> f. <i>planus</i>	<i>Denticulopsis praedimorpha</i> var. <i>praedimorpha</i>
<i>Actinocyclus oculatus</i>	<i>Denticulopsis praehyalina</i>
<i>Actinocyclus ochotensis</i>	<i>Denticulopsis preakatayamae</i>
<i>Actinocyclus octonarius</i>	<i>Denticulopsis praelauta</i>
<i>Actinocyclus robustus</i>	<i>Denticulopsis simonsenii</i>
<i>Actinocyclus tsugaruensis</i>	<i>Denticulopsis tanimurae</i>
<i>Actinoptychus senarius</i>	<i>Denticulopsis vulgaris</i>
<i>Actinoptychus vulgaris</i>	<i>Diploneis bombus</i>
<i>Araniscus lewisiensis</i>	<i>Diploneis puella</i>
<i>Asteromphalus darwinii</i>	<i>Diploneis smithii</i>
<i>Asteromphalus oligocenicus</i>	<i>Diploneis suborbicularis</i>
<i>Asteromphalus parvulus</i>	<i>Distephanoisira architecturalis</i>
<i>Asteromphalus robustus</i>	<i>Ellerbeckia sol</i>
<i>Azpeitia biradiata</i>	<i>Eunotia pectinalis</i> var. <i>minor</i>
<i>Azpeitia komurae</i>	<i>Eunotia praerupta</i> var. <i>praerupta</i>
<i>Azpeitia nodulifera</i>	<i>Fragilaria construens</i> (Ehrenberg) Grunow
<i>Azpeitia oligocenica</i>	<i>Fragilariaopsis cylindrus</i>
<i>Azpeitia praenobilis</i>	<i>Fragilariopsis dolloides</i>
<i>Azpeitia salisburyana</i>	<i>Fragilariopsis fossilis</i>
<i>Azpeitia tabularis</i>	<i>Fragilariopsis oceanica</i>
<i>Azpeitia vetustissima</i>	<i>Fragilariopsis pilosana</i>
<i>Bacterosira bathyomphala</i>	<i>Goniothecium decoratum</i>
<i>Bacterosira fragilis</i>	<i>Goniothecium rogersii</i>
<i>Cavitalus exiguus</i>	<i>Halamphora costata</i>
<i>Cavitalus jouseae</i>	<i>Hyalodiscus obsoletus</i>
<i>Cavitalus lanceolatus</i>	<i>Ikebea tenuis</i>
<i>Cavitalus linearis</i>	<i>Kisseleviella carina</i>
<i>Cavitalus miocenicus</i>	<i>Kisseleviella ezoensis</i>
<i>Cavitalus rectus</i>	<i>Kolzumia tatsunokuchiensis</i>
<i>Cestodiscus kugleri</i>	<i>Kozloviella minor</i>
<i>Cestodiscus trachus</i>	<i>Lisztiinia ornata</i>
<i>Coccoeis californica</i>	<i>Medilaria magna</i>
<i>Coccoeis costata</i>	<i>Medilaria splendida</i>
<i>Coccoeis scutellum</i>	<i>Melosira albicans</i>
<i>Coscinodiscus asteromphalus</i>	<i>Navicula elginensis</i>
<i>Coscinodiscus marginatus</i>	<i>Navicula lyraoides</i>
<i>Coscinodiscus oculus-iridis</i>	<i>Navicula menisculus</i>
<i>Coscinodiscus radiatus</i>	<i>Navicula salinarum</i>
<i>Coscinodiscus rhombicus</i>	<i>Neodenticula kamtschatkae</i>
<i>Coscinodiscus symbolorophorus</i>	<i>Neodenticula kolzumii</i>
<i>Cosmidiscus insignis</i>	<i>Neodenticula seminae</i>
<i>Crucidencula ikebei</i>	<i>Nitzschia challengeri</i>
<i>Crucidencula kanayae</i>	<i>Nitzschia cylindrica</i>
<i>Crucidencula nicoberica</i>	<i>Nitzschia jouseae</i>
<i>Crucidencula paranicoberica</i>	<i>Nitzschia palea</i>
<i>Crucidencula sawamurensis</i>	<i>Nitzschia reinholdii</i>
<i>Cyclotella striata</i>	<i>Nitzschia rolandii</i>
<i>Cyclotella meneghiniana</i>	<i>Odontella aurita</i>
<i>Cymbella cistula</i>	<i>Paralia sulcata</i>
<i>Cymbella minuta</i>	<i>Podosira stelligera</i>
<i>Cymbella subaequalis</i>	<i>Porosira glacialis</i>
<i>Delphinella angustata</i>	<i>Proboscia barbol</i>
<i>Delphinella ischaboensis</i>	<i>Proboscia curvirostris</i>
<i>Delphinella kippae</i>	<i>Proboscia interposita</i>
<i>Delphinella sachalinensis</i>	<i>Proboscia praearborai</i>
<i>Delphinella simonsenii</i>	<i>Pseudodimmericularum elegans</i>
<i>Delphinella surirella</i>	<i>Pseudonitzschia seriata</i>
	<i>Pseudopyxilla americana</i>
	<i>Pseudotriceratium radiosoreticulatum</i>
	<i>Pyxidicula zabeliae</i>
	<i>Raphoneis amphiceros</i>

*Chaetoceros* Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417.E.16R3W38

## 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)

DATE: 19.6.2013

OBSERVER's NAME Konoko

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvls/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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
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*Actinoptychus senarius*  
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*Araniscus lewisianus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
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*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavitalus exiguus*  
*Cavitalus jouseae*  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Coccoeis californica*  
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*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebeli*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
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*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katalayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis preekayayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamimurae*  
*Denticulopsis vulgaris*  
*Diplotheis bombus*  
*Diplotheis puelia*  
*Diplotheis smithii*  
*Diplotheis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Fragilariopsis dololus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilcena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listziniaria ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula safinarum*  
*Neodenticula kamtschatkae*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmericraterium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
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*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*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 marjamicana*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

*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)

1917E-16R-CC

## TOTAL PRESERVATION

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

DATE: 2013 / Jan / 18

OBSERVER's NAME AKEMUZ

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisianus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azepeia biradiata*  
*Azepeia komurae*  
*Azepeia nodulifera*  
*Azepeia oligocenica*  
*Azepeia praenodulifera*  
*Azepeia salisburyana*  
*Azepeia tabularis*  
*Azepeia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatulus exiguus*  
*Cavatulus jouseanus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crudenticula ikebeli*  
*Crudenticula kanayae*  
*Crudenticula nicobarica*  
*Crudenticula paranicobarica*  
*Crudenticula sawamurae*  
*Cyclorella striata*  
*Cyclorella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surrella*  
  
*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 pækatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilaropsis cylindrus*  
*Fragilaropsis dololus*  
*Fragilaropsis fossils*  
*Fragilaropsis oceanica*  
*Fragilaropsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hydrodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medaria magna*  
*Medaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraoides*  
*Navicula meniscularis*  
*Navicula salinarum*  
*Neodenticula kamtchatkae*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praesbergonii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roccella gelida*  
*Roccella praenitida*  
*Roccella semigelida*  
*Roccella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 lucas*  
*Thalassiosira manifesta*  
*Thalassiosira marjamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidai divergens*

*Chectoceros 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)

417E17R-CC

## TOTAL PRESERVATION

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

DATE: 20/3/2018OBSERVER's NAME AICEMZ

## 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)

<i>Achnanthes groenlandica</i>	<i>Denticulopsis crassa</i>
<i>Achnanthes inflata</i>	<i>Denticulopsis dimorpha</i> var. <i>dimorpha</i>
<i>Achnanthes lanceolata</i>	<i>Denticulopsis dimorpha</i> var. <i>areolata</i>
<i>Achnanthes lineariformis</i>	<i>Denticulopsis hustedtii</i>
<i>Actinocyclus curvatus</i>	<i>Denticulopsis hyalina</i>
<i>Actinocyclus ellipticus</i>	<i>Denticulopsis katalayamae</i>
<i>Actinocyclus ingens</i>	<i>Denticulopsis lauta</i>
<i>Actinocyclus ingens</i> f. <i>nodus</i>	<i>Denticulopsis praedimorpha</i> var. <i>minor</i>
<i>Actinocyclus ingens</i> f. <i>planus</i>	<i>Denticulopsis praedimorpha</i> var. <i>praedimorpha</i>
<i>Actinocyclus oculatus</i>	<i>Denticulopsis praehyalina</i>
<i>Actinocyclus ochotensis</i>	<i>Denticulopsis paeckelmae</i>
<i>Actinocyclus octonarius</i>	<i>Denticulopsis paeckelmae</i>
<i>Actinocyclus robustus</i>	<i>Denticulopsis simonsenii</i>
<i>Actinocyclus tsugaruensis</i>	<i>Denticulopsis tamurae</i>
<i>Actinopithicus senarius</i>	<i>Denticulopsis vulgaris</i>
<i>Actinopithicus vulgaris</i>	<i>Diploneis bombus</i>
<i>Araniscus lewisianus</i>	<i>Diploneis puelia</i>
<i>Asteromphalus darwini</i>	<i>Diploneis smithii</i>
<i>Asteromphalus oligocenicus</i>	<i>Diploneis suborbicularis</i>
<i>Asteromphalus parvulus</i>	<i>Distephanosira architecturalis</i>
<i>Asteromphalus robustus</i>	<i>Ellerbeckia sol</i>
<i>Azpeitia biradiata</i>	<i>Eunotia pectinalis</i> var. <i>minor</i>
<i>Azpeitia komurae</i>	<i>Eunotia praerupta</i> var. <i>praerupta</i>
<i>Azpeitia nodulifera</i>	<i>Fragilaria construens</i> (Ehrenberg) Grunow
<i>Azpeitia oligocenica</i>	<i>Fragilariopsis cylindrus</i>
<i>Azpeitia praenodulifera</i>	<i>Fragilariopsis dolobolus</i>
<i>Azpeitia salisburyana</i>	<i>Fragilariopsis fossilis</i>
<i>Azpeitia tabularis</i>	<i>Fragilariopsis oceanica</i>
<i>Azpeitia vetustissima</i>	<i>Fragilariopsis pilicena</i>
<i>Bacterosira bathyomphala</i>	<i>Goniothecium decoratum</i>
<i>Bacterosira fragilis</i>	<i>Goniothecium rogersii</i>
<i>Cavatitus exiguus</i>	<i>Halamphora costata</i>
<i>Cavatitus jouseanus</i>	<i>Hyalodiscus obsoletus</i>
<i>Cavatitus lanceolatus</i>	<i>Ikebea tenuis</i>
<i>Cavatitus linearis</i>	<i>Kisseleviella carina</i>
<i>Cavatitus miocenicus</i>	<i>Kisseleviella ezoensis</i>
<i>Cavatitus rectus</i>	<i>Kolzumia tatsunokuchiensis</i>
<i>Ceslodiscus kugleri</i>	<i>Kozloviella minor</i>
<i>Ceslodiscus trochus</i>	<i>Listziniaria ornata</i>
<i>Cocconeis californica</i>	<i>Medilaria magna</i>
<i>Cocconeis costata</i>	<i>Medilaria splendida</i>
<i>Cocconeis scutellum</i>	<i>Melosira albicans</i>
<i>Coscinodiscus asteromphalus</i>	<i>Navicula elginensis</i>
<i>Coscinodiscus marginatus</i>	<i>Navicula lyraoides</i>
<i>Coscinodiscus oculus-iridis</i>	<i>Navicula menisculus</i>
<i>Coscinodiscus radiatus</i>	<i>Navicula salinarum</i>
<i>Coscinodiscus rhombicus</i>	<i>Neodenticula kantschatica</i>
<i>Coscinodiscus symbolophorus</i>	<i>Neodenticula kolzumii</i>
<i>Cosmidiscus insignis</i>	<i>Neodenticula seminae</i>
<i>Crudenticula ikebei</i>	<i>Nitzschia challengeri</i>
<i>Crudenticula kanayae</i>	<i>Nitzschia cylindrica</i>
<i>Crudenticula nicobarica</i>	<i>Nitzschia jouseae</i>
<i>Crudenticula paranicobarica</i>	<i>Nitzschia palea</i>
<i>Crudenticula sawamurae</i>	<i>Nitzschia reinholdii</i>
<i>Cyclotella striata</i>	<i>Nitzschia rolandii</i>
<i>Cyclotella meneghiniana</i>	<i>Odontella aurita</i>
<i>Cymbella cistula</i>	<i>Paralia sulcata</i>
<i>Cymbella minuta</i>	<i>Podosira stelligera</i>
<i>Cymbella subaequalis</i>	<i>Porosira glacialis</i>
<i>Delphineis angustata</i>	<i>Proboscia barbol</i>
<i>Delphineis ischaboensis</i>	<i>Proboscia curvirostris</i>
<i>Delphineis kippae</i>	<i>Proboscia interposita</i>
<i>Delphineis sachalinensis</i>	<i>Proboscia praearbaroi</i>
<i>Delphineis simonsenii</i>	<i>Pseudodimmerogramma elegans</i>
<i>Delphineis surirella</i>	<i>Pseudonitzschia seriata</i>
	<i>Pseudopyxis americana</i>
	<i>Pseudotriceratium radiosoreticulatum</i>
	<i>Pyxidicula zabeliae</i>
	<i>Raphoneis amphiceros</i>

*Cheetoceros* Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

DATE: 19. 6. 2013

## TOTAL ABUNDANCE:

M (>80%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

## TOTAL PRESERVATION

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

147. E. 18R zw 67

OBSERVER's NAME KOVÁČ

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens t. nodus*  
*Actinocyclus ingens t. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus isugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisiatus*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatulus exiguis*  
*Cavatulus jouseanus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmiodiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minutula*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboenensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonisenii*  
*Delphineis surirella*

*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 tammariae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Fragilaropsis cylindrus*  
*Fragilaropsis dolollus*  
*Fragilaropsis fossilis*  
*Fragilaropsis oceanica*  
*Fragilaropsis pilocana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebaea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula eliginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamschatkae*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposta*  
*Proboscia praearbaroi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praesbergonii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roccella gelida*  
*Roccella praenitida*  
*Roccella semigelida*  
*Roccella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupili*  
*Shionodiscus paeoestrupili*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 maryamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
*Thalassiosira singularis*  
*Thalassiosira temperae*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

Spong ež-ž

20 -&gt; 3

## Diatom zones (NPD)

**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  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus ingens***  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavitalus exiguus*  
***Cavitalus jouseae***  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trachus*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmoldiscus insignis***  
*Crucidicula kebel*  
*Crucidicula kanayae*  
*Crucidicula nicobarica*  
*Crucidicula paranicobarica*  
*Crucidicula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*

## Core, section, interval (cm)

14/7.E. 18R3W31

## TOTAL PRESERVATION

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

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedtii***  
***Denticulopsis hyalina***  
***Denticulopsis katsuyamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis prakatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonisenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Diplotheis bombus*  
*Diplotheis puella*  
*Diplotheis smithii*  
*Diplotheis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunoia pectinalis* var. *minor*  
*Eunoia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
***Flagilariopsis dololus***  
***Flagilariopsis fossili***  
*Flagilariopsis oceanica*  
***Flagilariopsis pilcena***  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kolzumia tatsunokuchiensis***  
*Kozloviella minor*  
*Listizinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatkae***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarbolii*  
*Pseudodimorpha elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyrdicula zabeliae***  
*Raphoneis amphiceros*

DATE: 19.6.2013

OBSERVER's NAME KOMMO

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemata*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
***Rhizosolenia praebergonii***  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
***Thalassionema schraderi***  
***Thalassiosira antique***  
*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 marjancica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitudulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
***Thalassiosira singularis***  
***Thalassiosira temperata***  
*Thalassiosira uraoensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

3 - 2 - 2 - 0

## Diatom zones (NPD)

Banban

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E-18R-CC

## TOTAL PRESERVATION

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

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

*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 praealta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Fragilariopsis cylindrus*  
*Fragilariopsis doliolus*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilcana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*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 kamtschatkae*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glaciialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013 June 18OBSERVER'S NAME ACEMZ

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praesbergonii*  
*Rhizosolenia setigera*  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus ostrupii*  
*Shionodiscus praeostrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*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 marumajica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

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

**Core, section, interval (cm)**

U-4417 E 19R-2W, 37cm

**TOTAL PRESERVATION**

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

*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 tamnuriae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Fragilariopsis dolloides*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilcana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listiznia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

**DATE: 2013/June/19****OBSERVER's NAME 175VK****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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praesbergeri*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoploca*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 lucsa*  
*Thalassiosira manifesta*  
*Thalassiosira marjamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

**Cheatoceros Resting Spores****TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

## Core, section, interval (cm)

1417.E.19RCC

## 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)

DATE: 19. 6. 2013

OBSERVER's NAME KOONNO

## RELATIVE ABUNDANCE of EACH TAXON

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katsuyamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praealta*  
*Denticulopsis simonisenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinata* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Fragilariopsis cylindrus*  
**Fragilariopsis doliolus**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Listziniaria ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kantschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebargentii**  
*Rhizosolenia setigera*  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
**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 marjoramica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temporal**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*Chaetoceros* Resting Spores

## TOTAL of VEGETATIVE CELLS

Bands

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoprychus senarius*  
*Actinoprychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira balthyomphala*  
*Bacterosira fragilis*  
*Cavitalus exiguus*  
**Cavitalus jouseae**  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Coccoeis californica*  
*Coccoeis costata*  
*Coccoeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
**Cosmoldiscus insignis**  
*Crucidicula ikebeli*  
*Crucidicula kanayae*  
*Crucidicula nicobarica*  
*Crucidicula paranicobarica*  
*Crucidicula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

## Core, section, interval (cm)

U1417E 20R-1W. 49cm

## TOTAL PRESERVATION

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katoryamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praeplatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dolilosis**  
*Flagilariopsis fossils*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisselevilla carina*  
*Kisselevilla ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Mediaria magna**  
**Mediaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraeoides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkae**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glaciensis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimorpha elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 2013 / June 14

OBSERVER's NAME ITSVK

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebargentii**  
*Rhizosolenia setigera*  
*Roperia tessellata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *infatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 fusca*  
*Thalassiosira manifesta*  
**Thalassiosira marumajica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
**Thalassiosira singularis**  
**Thalassiosira temperata**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417 E. 20 Rcc

## 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)

DATE: 19.6.2013

OBSERVER's NAME KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

A (>10 valves/FOV), C (1-10 vlvls/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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisianus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komureae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira balthymophala*  
*Bacterosira fragilis*  
*Caviflatus exiguum*  
*Caviflatus joussanii*  
*Caviflatus lanceolatus*  
*Caviflatus linearis*  
*Caviflatus miocenicus*  
*Caviflatus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmidiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedti*  
*Denticulopsis hyalina*  
*Denticulopsis katalayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatalayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Dislephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunoia pectinalis* var. *minor*  
*Eunoia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilaropsis cylindrus*  
*Flagilaropsis dolloides*  
*Flagilaropsis fossili*  
*Flagilaropsis oceanica*  
*Fragilariopsis plicena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listiznia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatkae*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia joussae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praeburgonii*  
*Rhizosolenia setigera*  
*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*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 joussae*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira marujamica*  
*Thalassiosira medaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417. E, 21 RCC

## 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)

DATE: 19. 6. 2013

OBSERVER's NAME Konnö

## 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)

<i>Achnanthes groenlandica</i>	<i>Denticulopsis crassa</i>
<i>Achnanthes inflata</i>	<i>Denticulopsis dimorpha</i> var. <i>dimorpha</i>
<i>Achnanthes lanceolata</i>	<i>Denticulopsis dimorpha</i> var. <i>areolata</i>
<i>Achnanthes lineariformis</i>	<i>Denticulopsis hustedtii</i>
<i>Actinocyclus curvatus</i>	<i>Denticulopsis hyalina</i>
<i>Actinocyclus ellipticus</i>	<i>Denticulopsis kafayamae</i>
<i>Actinocyclus ingens</i>	<i>Denticulopsis lauta</i>
<i>Actinocyclus ingens</i> f. <i>nodus</i>	<i>Denticulopsis praedimorpha</i> var. <i>minor</i>
<i>Actinocyclus ingens</i> f. <i>planus</i>	<i>Denticulopsis praedimorpha</i> var. <i>praedimorpha</i>
<i>Actinocyclus oculatus</i>	<i>Denticulopsis praehyalina</i>
<i>Actinocyclus ochotensis</i>	<i>Denticulopsis praekatayamae</i>
<i>Actinocyclus octonarius</i>	<i>Denticulopsis praelauta</i>
<i>Actinocyclus robustus</i>	<i>Denticulopsis simonsenii</i>
<i>Actinocyclus tsugaruensis</i>	<i>Denticulopsis tamurae</i>
<i>Actinoplychus senarius</i>	<i>Denticulopsis vulgaris</i>
<i>Actinoplychus vulgaris</i>	<i>Diploneis bombus</i>
<i>Araniscus lewisiatus</i>	<i>Diploneis puella</i>
<i>Asteromphalus darwinii</i>	<i>Diploneis smithii</i>
<i>Asteromphalus oligocenicus</i>	<i>Diploneis suborbicularis</i>
<i>Asteromphalus parvulus</i>	<i>Distephanosira architecturalis</i>
<i>Asteromphalus robustus</i>	<i>Ellerbeckia sol</i>
<i>Azpeitia biradiata</i>	<i>Eunotia pectinalis</i> var. <i>minor</i>
<i>Azpeitia komurae</i>	<i>Eunotia praerupta</i> var. <i>praerupta</i>
<i>Azpeitia nodulifera</i>	<i>Fragilaria construens</i> (Ehrenberg) Grunow
<i>Azpeitia oligocenica</i>	<i>Flagilariopsis cylindrus</i>
<i>Azpeitia praenodulifera</i>	<i>Flagilariopsis dolios</i>
<i>Azpeitia salisburyana</i>	<i>Flagilariopsis fissils</i>
<i>Azpeitia tabularis</i>	<i>Flagilariopsis oceanica</i>
<i>Azpeitia vetustissima</i>	<i>Flagilariopsis pilosana</i>
<i>Bacterioria bathymophala</i>	<i>Goniothecium decoratum</i>
<i>Bacterioria fragilis</i>	<i>Goniothecium rogersii</i>
<i>Cavitalus exiguus</i>	<i>Halamphora costata</i>
<i>Cavitalus jouseanus</i>	<i>Hyalodiscus obsoletus</i>
<i>Cavitalus lanceolatus</i>	<i>Ikebaea tenuis</i>
<i>Cavitalus linearis</i>	<i>Kisseleviella carina</i>
<i>Cavitalus miocenicus</i>	<i>Kisseleviella ezoensis</i>
<i>Cavitalus rectus</i>	<i>Kolzumia tatsunokuchiensis</i>
<i>Cestodiscus kugleri</i>	<i>Kozloviella minor</i>
<i>Cestodiscus trochus</i>	<i>Listrzinia ornata</i>
<i>Coccineis californica</i>	<i>Medilaria magna</i>
<i>Coccineis costata</i>	<i>Medilaria splendida</i>
<i>Coccineis scutellum</i>	<i>Melosira albicans</i>
<i>Coscinodiscus asteromphalus</i>	<i>Navicula elginiensis</i>
<i>Coscinodiscus marginatus</i>	<i>Navicula lyroides</i>
<i>Coscinodiscus oculus-tridius</i>	<i>Navicula menisculus</i>
<i>Coscinodiscus radiatus</i>	<i>Navicula salinarum</i>
<i>Coscinodiscus rhombicus</i>	<i>Neodenticula kantschatica</i>
<i>Coscinodiscus symbolophorus</i>	<i>Neodenticula kolzumii</i>
<i>Cosmodiscus insignis</i>	<i>Neodenticula seminae</i>
<i>Crudenticula ikebeli</i>	<i>Nitzschia challengeri</i>
<i>Crudenticula kanayae</i>	<i>Nitzschia cylindrica</i>
<i>Crudenticula nicobarica</i>	<i>Nitzschia jouseae</i>
<i>Crudenticula paranicobarica</i>	<i>Nitzschia palea</i>
<i>Crudenticula sawamuriae</i>	<i>Nitzschia reinholdii</i>
<i>Cyclotella striata</i>	<i>Nitzschia rolandii</i>
<i>Cyclotella meneghiniana</i>	<i>Odontella aurita</i>
<i>Cymbella cistula</i>	<i>Paralia sulcata</i>
<i>Cymbella minutula</i>	<i>Podosira stelligera</i>
<i>Cymbella subaequalis</i>	<i>Porosira glacialis</i>
<i>Delphineis angustata</i>	<i>Proboscia barbol</i>
<i>Delphineis ischaboensis</i>	<i>Proboscia curvirostris</i>
<i>Delphineis kippae</i>	<i>Proboscia interposita</i>
<i>Delphineis sachalinensis</i>	<i>Proboscia praebarboi</i>
<i>Delphineis simonsenii</i>	<i>Pseudodimeroigrana elegans</i>
<i>Delphineis surirella</i>	<i>Pseudonitzschia seriata</i>
	<i>Pseudopyxis americana</i>
	<i>Pseudotriceratium radiosoreticulatum</i>
	<i>Pyxidicula zabelinea</i>
	<i>Raphoneis amphiceros</i>

<i>Rhizosolenia hebetata</i> f. <i>hiemalis</i>
<i>Rhizosolenia hebetata</i> f. <i>semispina</i>
<i>Rhizosolenia norwegica</i>
<i>Rhizosolenia praebergonii</i>
<i>Rhizosolenia setigera</i>
<i>Roperia tessellata</i>
<i>Rocella gelida</i>
<i>Rocella praenitida</i>
<i>Rocella semigelida</i>
<i>Rocella vigilans</i>
<i>Rouvia californica</i>
<i>Rouxia granda</i>
<i>Rouxia isopolica</i>
<i>Rouxia naviculoides</i>
<i>Rouxia obesa</i>
<i>Shionodiscus oestrupii</i>
<i>Shionodiscus praeoestrupii</i>
<i>Shionodiscus trifultus</i>
<i>Stephanopyxis dimorpha</i>
<i>Stephanopyxis horridus</i>
<i>Stephanopyxis turris</i>
<i>Thalassionema bacillaris</i>
<i>Thalassionema nitzschiooides</i>
<i>Thalassionema nitzschiooides</i> var. <i>incurvatum</i>
<i>Thalassionema nitzschiooides</i> var. <i>inflatum</i>
<i>Thalassionema nitzschiooides</i> var. <i>parvum</i>
<i>Thalassionema pseudonitzschiooides</i>
<i>Thalassiosira schraderi</i>
<i>Thalassiosira antiqua</i>
<i>Thalassiosira bioculata</i>
<i>Thalassiosira castanea</i>
<i>Thalassiosira convexa</i>
<i>Thalassiosira decipiens</i>
<i>Thalassiosira dubiosa</i>
<i>Thalassiosira eccentrica</i>
<i>Thalassiosira fasciculata</i>
<i>Thalassiosira fraga</i>
<i>Thalassiosira gravida</i>
<i>Thalassiosira grunowii</i>
<i>Thalassiosira hyalina</i>
<i>Thalassiosira irregularis</i>
<i>Thalassiosira jacksonii</i>
<i>Thalassiosira jouseae</i>
<i>Thalassiosira leptopus</i>
<i>Thalassiosira lineata</i>
<i>Thalassiosira lusca</i>
<i>Thalassiosira manifesta</i>
<i>Thalassiosira marujamica</i>
<i>Thalassiosira mediaconvexa</i>
<i>Thalassiosira minutissima</i>
<i>Thalassiosira miocenica</i>
<i>Thalassiosira nordenskioeldii</i>
<i>Thalassiosira orientalis</i>
<i>Thalassiosira praefraga</i>
<i>Thalassiosira praenitulus</i>
<i>Thalassiosira praeyabei</i>
<i>Thalassiosira robusta</i>
<i>Thalassiosira sanctaeiae</i>
<i>Thalassiosira singularis</i>
<i>Thalassiosira temporalis</i>
<i>Thalassiosira umaoiensis</i>
<i>Thalassiosira undulosa</i>
<i>Thalassiosira yabeli</i>
<i>Thalassiotrichia longissima</i>
<i>Trachyneis aspera</i>
<i>Yoshidaia divergens</i>

*Chaetoceros* Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417.E, 22RCC surface

DATE: 19. 6. 2013

OBSERVER's NAME ICONVOS

## 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)

<i>Achnanthes groenlandica</i>	<i>Denticulopsis crassa</i>	<i>Rhizosolenia hebetata f. hiemalis</i>
<i>Achnanthes inflata</i>	<i>Denticulopsis dimorpha</i> var. <i>dimorpha</i>	<i>Rhizosolenia hebetata f. semispina</i>
<i>Achnanthes lanceolata</i>	<i>Denticulopsis dimorpha</i> var. <i>areolata</i>	<i>Rhizosolenia norwegica</i>
<i>Achnanthes lineariformis</i>	<i>Denticulopsis hustedtii</i>	<i>Rhizosolenia praebargentii</i>
<i>Actinocyclus curvatus</i>	<i>Denticulopsis hyalina</i>	<i>Rhizosolenia setigera</i>
<i>Actinocyclus ellipticus</i>	<i>Denticulopsis katayamae</i>	<i>Roperia tesselata</i>
<i>Actinocyclus ingens</i>	<i>Denticulopsis lauta</i>	<i>Rockella gelida</i>
<i>Actinocyclus ingens</i> f. <i>nodus</i>	<i>Denticulopsis praedimorpha</i> var. <i>minor</i>	<i>Rockella praenitida</i>
<i>Actinocyclus ingens</i> f. <i>planus</i>	<i>Denticulopsis praedimorpha</i> var. <i>praedimorpha</i>	<i>Rockella semigelida</i>
<i>Actinocyclus oculatus</i>	<i>Denticulopsis praehyalina</i>	<i>Rockella vigilans</i>
<i>Actinocyclus ochotensis</i>	<i>Denticulopsis praekatayamae</i>	<i>Rouxia californica</i>
<i>Actinocyclus octonarius</i>	<i>Denticulopsis praelauta</i>	<i>Rouxia granda</i>
<i>Actinocyclus robustus</i>	<i>Denticulopsis simonsenii</i>	<i>Rouxia isoploca</i>
<i>Actinocyclus tsugaruensis</i>	<i>Denticulopsis tammariae</i>	<i>Rouxia naviculoides</i>
<i>Actinoptychus senarius</i>	<i>Denticulopsis vulgaris</i>	<i>Rouxia obesa</i>
<i>Actinoptychus vulgaris</i>	<i>Diploneis bombus</i>	<i>Shionodiscus oestrupii</i>
<i>Araniscus lewisianus</i>	<i>Diploneis puella</i>	<i>Shionodiscus praeoestrupii</i>
<i>Asteromphalus darwini</i>	<i>Diploneis smithii</i>	<i>Shionodiscus trifultus</i>
<i>Asteromphalus oligocenicus</i>	<i>Diploneis suborbicularis</i>	<i>Stephanopyxis dimorpha</i>
<i>Asteromphalus parvulus</i>	<i>Distephanosira architecturalis</i>	<i>Stephanopyxis horridus</i>
<i>Asteromphalus robustus</i>	<i>Ellerbeckia sol</i>	<i>Stephanopyxis turris</i>
<i>Azpeitia biradiata</i>	<i>Eunotia pectinalis</i> var. <i>minor</i>	<i>Thalassionema bacillaris</i>
<i>Azpeitia komurae</i>	<i>Eunotia praerupta</i> var. <i>praerupta</i>	<i>Thalassionema nitzschiooides</i>
<i>Azpeitia nodulifera</i>	<i>Fragilaria construens</i> (Ehrenberg) Grunow	<i>Thalassionema nitzschiooides</i> var. <i>incurvatum</i>
<i>Azpeitia oligocenica</i>	<i>Flagilariopsis cylindrus</i>	<i>Thalassionema nitzschiooides</i> var. <i>inflatum</i>
<i>Azpeitia praenodulifera</i>	<i>Fragilariopsis dololus</i>	<i>Thalassionema nitzschiooides</i> var. <i>parvum</i>
<i>Azpeitia salisburyana</i>	<i>Fragilariopsis fossilis</i>	<i>Thalassionema pseudonitzschiooides</i>
<i>Azpeitia tabularis</i>	<i>Fragilariopsis oceanica</i>	<i>Thalassionema schradieri</i>
<i>Azpeitia vetustissima</i>	<i>Fragilariopsis pilosa</i>	<i>Thalassiosira antiqua</i>
<i>Bacterosira bathyomphala</i>	<i>Goniothecium decoratum</i>	<i>Thalassiosira bioculata</i>
<i>Bacterosira fragilis</i>	<i>Goniothecium rogersii</i>	<i>Thalassiosira castanea</i>
<i>Cavitalus exiguus</i>	<i>Halamphora costata</i>	<i>Thalassiosira convexa</i>
<i>Cavitalus jouseanus</i>	<i>Hyalodiscus obsoletus</i>	<i>Thalassiosira decipiens</i>
<i>Cavitalus lanceolatus</i>	<i>Ikebea tenuis</i>	<i>Thalassiosira dubiosa</i>
<i>Cavitalus linearis</i>	<i>Kisseleviella carina</i>	<i>Thalassiosira eccentrica</i>
<i>Cavitalus miocenicus</i>	<i>Kisseleviella ezoensis</i>	<i>Thalassiosira fasciculata</i>
<i>Cavitalus rectus</i>	<i>Kolzumia tatsunokuchiensis</i>	<i>Thalassiosira fraga</i>
<i>Cestodiscus kugleri</i>	<i>Kozloviella minor</i>	<i>Thalassiosira gravida</i>
<i>Cestodiscus trochus</i>	<i>Lisitzinia ornata</i>	<i>Thalassiosira grunowii</i>
<i>Cocconeis californica</i>	<i>Medilaria magna</i>	<i>Thalassiosira hyalina</i>
<i>Cocconeis costata</i>	<i>Medilaria splendida</i>	<i>Thalassiosira irregularis</i>
<i>Cocconeis scutellum</i>	<i>Melosira albicans</i>	<i>Thalassiosira jacksonii</i>
<i>Coscinodiscus asteromphalus</i>	<i>Navicula elginiensis</i>	<i>Thalassiosira jouseae</i>
<i>Coscinodiscus marginatus</i>	<i>Navicula lyraoides</i>	<i>Thalassiosira leptopus</i>
<i>Coscinodiscus oculus-iris</i>	<i>Navicula menisculus</i>	<i>Thalassiosira lineata</i>
<i>Coscinodiscus radiatus</i>	<i>Navicula salinarum</i>	<i>Thalassiosira lucsa</i>
<i>Coscinodiscus rhombicus</i>	<i>Neodenticula kantschatica</i>	<i>Thalassiosira manifesta</i>
<i>Coscinodiscus symbolophorus</i>	<i>Neodenticula kolzumii</i>	<i>Thalassiosira marjamica</i>
<i>Cosmidiscus insignis</i>	<i>Neodenticula seminae</i>	<i>Thalassiosira mediaconvexa</i>
<i>Crudenticula ikebei</i>	<i>Nitzschia challengerii</i>	<i>Thalassiosira minutissima</i>
<i>Crudenticula kanayae</i>	<i>Nitzschia cylindrica</i>	<i>Thalassiosira miocenica</i>
<i>Crudenticula nicobarica</i>	<i>Nitzschia jouseae</i>	<i>Thalassiosira nordenskioldii</i>
<i>Crudenticula paranicobarica</i>	<i>Nitzschia palea</i>	<i>Thalassiosira orientalis</i>
<i>Crudenticula sawamurae</i>	<i>Nitzschia reinholdii</i>	<i>Thalassiosira praefraga</i>
<i>Cyclotella striata</i>	<i>Nitzschia rolandii</i>	<i>Thalassiosira praenudulus</i>
<i>Cyclotella meneghiniana</i>	<i>Odontella aurita</i>	<i>Thalassiosira praeyabei</i>
<i>Cymbella cistula</i>	<i>Paralia sulcata</i>	<i>Thalassiosira robusta</i>
<i>Cymbella minula</i>	<i>Podosira stelligera</i>	<i>Thalassiosira sanctaeae</i>
<i>Cymbella subaequalis</i>	<i>Porosira glacialis</i>	<i>Thalassiosira singularis</i>
<i>Delphineis angustata</i>	<i>Proboscia barbol</i>	<i>Thalassiosira temporalis</i>
<i>Delphineis ischaboensis</i>	<i>Proboscia curvirostris</i>	<i>Thalassiosira umaoensis</i>
<i>Delphineis kippae</i>	<i>Proboscia interposta</i>	<i>Thalassiosira undulosa</i>
<i>Delphineis sachalinensis</i>	<i>Proboscia praearbaroi</i>	<i>Thalassiosira yabel</i>
<i>Delphineis simonsenii</i>	<i>Pseudodimmerogramma elegans</i>	<i>Thalassiothrix longissima</i>
<i>Delphineis surirella</i>	<i>Pseudonitzschia seriata</i>	<i>Trachyneis aspera</i>
	<i>Pseudoxiphidium americana</i>	<i>Yoshidaea divergens</i>
	<i>Pseudotriceratium radiosoreticulatum</i>	
	<i>Pyxidicula zabeliae</i>	
	<i>Raphoneis amphiceros</i>	

*Cheatoceros Resting Spores*

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417. E 22R cc

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisiatus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira balthymophala*  
*Bacteriosira fragilis*  
*Cavatitus exiguus*  
*Cavatitus jouseanus*  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-tridius*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmodiscus Insights*  
*Crucidenticula ikebeli*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamuriae*  
*Cyclorella striata*  
*Cyclorella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

## TOTAL PRESERVATION

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedti*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diplogeis bombus*  
*Diplogeis puella*  
*Diplogeis smithii*  
*Diplogeis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosa*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebaea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medaria magna*  
*Medaria splendida*  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimeroigrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 19. 6. 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*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*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schradieri*  
*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 praenitulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Core, section, interval (cm)  
187. E. 23R CC upper 1cm sand

DATE: 19.6.2013

OBSERVER's NAME konvoo

## 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 vlvls/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*  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisanus*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira bathyomphala*  
*Bacteriosira fragilis*  
*Cavatitus exiguus*  
**Cavatitus jouseanus**  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trachus*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmoldiscus insignis**  
*Crucidenticula ikabei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurensis*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *strobilata*  
*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*  
*Diplotheis bombus*  
*Diplotheis puelia*  
*Diplotheis smithii*  
*Diplotheis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dolollus**  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
**Flagilariopsis pilocena**  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Liszitinia ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkae**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimeroigruma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praeburgonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 praenitudus*  
*Thalassiosira preyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temporalis**  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidai divergens*

*Chaetoceros Resting Spores*

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Core, section, interval (cm) *lower*  
*147. E. 23RCC 4cm mud*DATE: *19.6.2013*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 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisiensis*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira balthymophala*  
*Bacterosira fragilis*  
*Cavatulus exiguus*  
*Cavatulus jouseanus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmidiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurai*  
*Cyclorella striata*  
*Cyclorella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedi*  
*Denticulopsis hyalina*  
*Denticulopsis katoryamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praeakatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilaropsis cylindrus*  
*Flagilaropsis doloflus*  
*Flagilaropsis fossillis*  
*Flagilaropsis oceanica*  
*Flagilaropsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listeria ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatkae*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rotundii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarbol*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudoxiphidium americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebertoni*  
*Rhizosolenia setigera*  
*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*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*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 nordenskioeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiotrichia longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

*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)

**UX17E 24R-CC**

## TOTAL PRESERVATION

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

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
***Actinocyclus Ingens***  
*Actinocyclus Ingens f. nodus*  
*Actinocyclus Ingens f. planus*  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Aranicus lewisi*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira balthymophala*  
*Bacterosira fragilis*  
*Cavitalus exiguus*  
***Cavitalus jouseae***  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus reclus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmoldiscus insignis***  
*Crudenticula ikebei*  
*Crudenticula kanayae*  
*Crudenticula nicobarica*  
*Crudenticula paranicobarica*  
*Crudenticula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*

***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 praeplatyamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis tamimurae***  
***Denticulopsis vulgaris***  
*Diplotheis bombus*  
*Diplotheis puella*  
*Diplotheis smithii*  
*Diplotheis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
***Flagilariopsis dololus***  
***Flagilariopsis fossalis***  
*Flagilariopsis oceanica*  
***Flagilariopsis pilcana***  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kolzumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisztnia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatkica***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudoxylia americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabeliae***  
*Raphoneis amphiceros*

DATE: 2013/June/19

OBSERVER's NAME **TSVK**

## 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)

*Rhizosolenia hebetata* f. *hiemata*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
***Rhizosolenia praebargentii***  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*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*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
***Thalassionema schraderi***  
***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 praenitudus*  
*Thalassiosira praeabyei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
***Thalassiosira singularis***  
***Thalassiosira temporei***  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

## 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)

UX17E - 25R - C

## TOTAL PRESERVATION

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

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

*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 pækatalayamae*  
*Denticulopsis paealta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medaria magna*  
*Medaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013 / June 19  
 OBSERVER's NAME ITSVID

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 lucsa*  
*Thalassiosira manifesta*  
*Thalassiosira marjamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temporei*  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

*Cheilocerco* Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Brown*

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

*1417 E - 26R - CC*

## TOTAL PRESERVATION

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

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis leuia*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonisenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunoia pectinalis* var. *minor*  
*Eunoia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dolulus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listizinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia joussea*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: *2013/Jan/18*OBSERVER'S NAME *AKEMI*

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praeburgonii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*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*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*Thalassiosira antiqua*  
*Thalassiosira biculata*  
*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 joussea*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira manujamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaiia divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Burner*

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E-29R-CC

## TOTAL PRESERVATION

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

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

**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 paelauta**  
**Denticulopsis simonsenii**  
**Denticulopsis tamimurae**  
**Denticulopsis vulgaris**  
*Diplotheis bombus*  
*Diplotheis puella*  
*Diplotheis smithii*  
*Diplotheis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dololus**  
**Flagilariopsis fossillis**  
*Flagilariopsis oceanica*  
**Flagilariopsis pilocena**  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikeba tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Listonema ornata*  
**Medaria magna**  
**Medaria splendida**  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kantschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 2013/June/18

OBSERVER's NAME AKEMI

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebargentii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
**Thalassionema schraderi**  
**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 sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temporalis**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

## Cercozoans Resting Spores

## TOTAL OF VEGETATIVE CELLS

## Diatom zones (NPD)

NPDA (50?)

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus* T  
*Actinocyclus engens* T  
*Actinocyclus engens f. nodus*  
*Actinocyclus engens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatitus exiguus*  
**Cavatitus jouseanus**  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus* T  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
*Cosmidiscus insignis*  
*Crudenticula ikebei*  
*Crudenticula kanayaiae*  
*Crudenticula nicobarica*  
*Crudenticula paranicobarica*  
*Crudenticula sawamurae*  
*Cyclorella striata*  
*Cyclorella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

## Core, section, interval (cm)

1417E - DR-C

## TOTAL PRESERVATION

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina* (B)  
*Denticulopsis katalayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis pækatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dololus**  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Listziniaria ornata*  
**Medaria magna**  
**Medaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kantschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia rehnholzii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*  
*Rhytidia sp.* - (B)

DATE: 20/3/June/18

OBSERVER's NAME: AKENZ

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebargentii**  
*Rhizosolenia setigera*  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 marjoramica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temporalis**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*Chectoceros Resting Spores*

TOTAL of VEGETATIVE CELLS

X: 98.1 Y: 14.5

**Diatom zones (NPD)**undetermined**TOTAL ABUNDANCE:**M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)**Core, section, interval (cm)**1417, E, 29R 2W 10**TOTAL PRESERVATION**G (good), M (moderate), P (poor)  
O**DATE:** 20.6.2017**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*  
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*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisanus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia bradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira bathyomphala*  
*Bacteriosira fragilis*  
*Cavatulus exiguus*  
**Cavatulus jouseanus**  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbophorus*  
*Cosmidiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamuriae*  
*Cyclorella striata*  
*Cyclorella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
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*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis laeta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dololus**  
*Flagilariopsis fossils*  
*Flagilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikebaea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyraeoides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kantschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roccella gelida*  
*Roccella praenitida*  
*Roccella semigelida*  
*Roccella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 lucsa*  
*Thalassiosira manifesta*  
**Thalassiosira marjamicola**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temporalis**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabel**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

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

**Diatom zones (NPD)***undetermined***TOTAL ABUNDANCE:**M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (<2%), B (no diatoms)**Core, section, interval (cm)**

14/17.E.29R3W40

**TOTAL PRESERVATION**

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

DATE: 20.6.2013

OBSERVER's NAME *Koono***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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira balthymophala*  
*Bacteriosira fragilis*  
*Cavatula exiguus*  
*Cavatula jouseaeus*  
*Cavatula lanceolatus*  
*Cavatula linearis*  
*Cavatula miocenicus*  
*Cavatula rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katsuyamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunoila pectinalis* var. *minor*  
*Eunoila praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilcena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*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 kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia lesselata*  
*Roella gelida*  
*Roella praeinitida*  
*Roella semigelida*  
*Roella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioidea*  
*Thalassionema nitzschioidea* var. *incurvatum*  
*Thalassionema nitzschioidea* var. *inflatum*  
*Thalassionema nitzschioidea* var. *parvum*  
*Thalassionema pseudonitzschioidea*  
*Thalassionema schraderi*  
*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 lucas*  
*Thalassiosira manifesta*  
*Thalassiosira marujamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

**Chectoceros Resting Spores****TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

*Unbekannt*

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1 X/7. E 29R 4W 50

## TOTAL PRESERVATION

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

DATE: 20. 6. 2013

OBSERVER's NAME Komuo

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira balthyomphala*  
*Bacterosira fragilis*  
*Cavatitus exiguus*  
*Cavatitus jouseanus*  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*

*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophus*  
*Cosmidiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

*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 pækatalayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Fragilariopsis dolloides*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilcana*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyaldiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medaria magna*  
*Medaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 lucsa*  
*Thalassiosira manifesta*  
*Thalassiosira marjamicana*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidai divergens*

## Cheirotoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*NPD 6B*

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

## Core, section, interval (cm)

1417.E, 29R5W 43

## TOTAL PRESERVATION

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

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katoryamae*  
*Denticulopsis laeta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonensei*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunolia pectinalis* var. *minor*  
*Eunolia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dololos**  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraeides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamschatcica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praearboei*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 20.6.2013

OBSERVER's NAME KOVUNO

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praeburgonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roella gelida*  
*Roella praenitida*  
*Roella semigelida*  
*Roella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecostrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi** *正山正*  
**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 nordenskiöeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
**Thalassiosira singularis**  
**Thalassiosira temperata**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Banner*

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E - 29R-CC

## TOTAL PRESERVATION

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

DATE: 20/3/June/18

OBSERVER's NAME *AKEMZ*

## RELATIVE ABUNDANCE of EACH TAXON

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

<i>Achnanthes groenlandica</i>	<i>Denticulopsis crassa</i>	<i>Rhizosolenia hebetata f. hiemalis</i>
<i>Achnanthes inflata</i>	<i>Denticulopsis dimorpha</i> var. <i>dimorpha</i>	<i>Rhizosolenia hebetata f. semispina</i>
<i>Achnanthes lanceolata</i>	<i>Denticulopsis dimorpha</i> var. <i>areolata</i>	<i>Rhizosolenia norwegica</i>
<i>Achnanthes lineariformis</i>	<i>Denticulopsis hustedtii</i>	<i>Rhizosolenia praebargentii</i>
<i>Actinocyclus curvatus</i>	<i>Denticulopsis hyalina</i>	<i>Rhizosolenia setigera</i>
<i>Actinocyclus ellipticus</i>	<i>Denticulopsis katoryamae</i>	<i>Roperia tesselata</i>
<i>Actinocyclus ingens</i>	<i>Denticulopsis lauta</i>	<i>Rocella gelida</i>
<i>Actinocyclus ingens</i> f. <i>nodus</i>	<i>Denticulopsis praedimorpha</i> var. <i>minor</i>	<i>Rocella praenitida</i>
<i>Actinocyclus ingens</i> f. <i>planus</i>	<i>Denticulopsis praedimorpha</i> var. <i>praedimorpha</i>	<i>Rocella semigelida</i>
<i>Actinocyclus oculatus</i>	<i>Denticulopsis praehyalina</i>	<i>Rocella vigilans</i>
<i>Actinocyclus ochotensis</i>	<i>Denticulopsis praekatayamae</i>	<i>Rouxia californica</i>
<i>Actinocyclus octonarius</i>	<i>Denticulopsis praelauta</i>	<i>Rouxia granda</i>
<i>Actinocyclus robustus</i>	<i>Denticulopsis simonsenii</i>	<i>Rouxia isoplica</i>
<i>Actinocyclus tsugaruensis</i>	<i>Denticulopsis tanimurae</i>	<i>Rouxia naviculoides</i>
<i>Actinoplychus senarius</i>	<i>Denticulopsis vulgaris</i>	<i>Rouxia obesa</i>
<i>Actinoplychus vulgaris</i>	<i>Diplothele bombus</i>	<i>Shionodiscus oestrupii</i>
<i>Araniscus lewisi</i>	<i>Diplothele puelha</i>	<i>Shionodiscus praecestrupii</i>
<i>Asteromphalus darwinii</i>	<i>Diplothele smithii</i>	<i>Shionodiscus trifultus</i>
<i>Asteromphalus oligocenicus</i>	<i>Diplothele suborbicularis</i>	<i>Stephanopyxis dimorpha</i>
<i>Asteromphalus parvulus</i>	<i>Disstephanosira architecturalis</i>	<i>Stephanopyxis horridus</i>
<i>Asteromphalus robustus</i>	<i>Ellerbeckia sol</i>	<i>Stephanopyxis turris</i>
<i>Azpeitia biradiata</i>	<i>Eunotia pectinalis</i> var. <i>minor</i>	<i>Thalassionema bacillaris</i>
<i>Azpeitia komurae</i>	<i>Eunotia praerupta</i> var. <i>praerupta</i>	<i>Thalassionema nitzschiooides</i>
<i>Azpeitia nodulifera</i>	<i>Fragilaria construens</i> (Ehrenberg) Grunow	<i>Thalassionema nitzschiooides</i> var. <i>incavatum</i>
<i>Azpeitia oligocenica</i>	<i>Flagilariopsis cylindrus</i>	<i>Thalassionema nitzschiooides</i> var. <i>inflatum</i>
<i>Azpeitia praenodulifera</i>	<i>Fragilariopsis dolollus</i>	<i>Thalassionema nitzschiooides</i> var. <i>parvum</i>
<i>Azpeitia salisburyana</i>	<i>Fragilariopsis fossilis</i>	<i>Thalassionema pseudonitzschiooides</i>
<i>Azpeitia tabularis</i>	<i>Fragilariopsis oceanica</i>	<i>Thalassionema schraderi</i>
<i>Azpeitia vetustissima</i>	<i>Fragilariopsis pilicena</i>	<i>Thalassiosira antiqua</i>
<i>Bacterosira bathyomphala</i>	<i>Goniothecium decoratum</i>	<i>Thalassiosira bioculata</i>
<i>Bacterosira fragilis</i>	<i>Goniothecium rogersii</i>	<i>Thalassiosira castanea</i>
<i>Cavitalus exiguus</i>	<i>Halamphora costata</i>	<i>Thalassiosira convexa</i>
<i>Cavitalus jouseaeus</i>	<i>Hyalodiscus obsoletus</i>	<i>Thalassiosira decipiens</i>
<i>Cavitalus lanceolatus</i>	<i>Ikebea tenuis</i>	<i>Thalassiosira dubiosa</i>
<i>Cavitalus linearis</i>	<i>Kisseleviella carina</i>	<i>Thalassiosira eccentrica</i>
<i>Cavitalus miocenicus</i>	<i>Kisseleviella ezoensis</i>	<i>Thalassiosira fasciculata</i>
<i>Cavitalus rectus</i>	<i>Kolzumia tatsunokuchiensis</i>	<i>Thalassiosira fraga</i>
<i>Cestodiscus kugleri</i>	<i>Kozloviella minor</i>	<i>Thalassiosira gravida</i>
<i>Cestodiscus trochus</i>	<i>Lisitzinia ornata</i>	<i>Thalassiosira grunowii</i>
<i>Coccoeis californica</i>	<i>Medilaria magna</i>	<i>Thalassiosira hyalina</i>
<i>Coccoeis costata</i>	<i>Medilaria splendida</i>	<i>Thalassiosira irregularis</i>
<i>Coccoeis scutellum</i>	<i>Melosira albicans</i>	<i>Thalassiosira jacksonii</i>
<i>Coscinodiscus asteromphalus</i>	<i>Navicula elginensis</i>	<i>Thalassiosira jouseae</i>
<i>Coscinodiscus marginatus</i>	<i>Navicula lyraeides</i>	<i>Thalassiosira leptopus</i>
<i>Coscinodiscus oculus-iridis</i>	<i>Navicula menisculus</i>	<i>Thalassiosira lineata</i>
<i>Coscinodiscus radiatus</i>	<i>Navicula safinarum</i>	<i>Thalassiosira lusca</i>
<i>Coscinodiscus rhombicus</i>	<i>Neodenticula kamtschatkae</i>	<i>Thalassiosira manifesta</i>
<i>Coscinodiscus symbolorophorus</i>	<i>Neodenticula kolzumii</i>	<i>Thalassiosira marjancica</i>
<i>Cosmidiscus insignis</i>	<i>Neodenticula seminae</i>	<i>Thalassiosira mediaconvexa</i>
<i>Crudenticula ikebei</i>	<i>Nitzschia challengeri</i>	<i>Thalassiosira minutissima</i>
<i>Crudenticula kanayae</i>	<i>Nitzschia cylindrica</i>	<i>Thalassiosira miocenica</i>
<i>Crudenticula nicobarica</i>	<i>Nitzschia jouseae</i>	<i>Thalassiosira nordenskioldii</i>
<i>Crudenticula paranicobarica</i>	<i>Nitzschia palea</i>	<i>Thalassiosira orientalis</i>
<i>Crudenticula sawamuriae</i>	<i>Nitzschia reinholdii</i>	<i>Thalassiosira praefraga</i>
<i>Cyclotella striata</i>	<i>Nitzschia rolandii</i>	<i>Thalassiosira praenidulus</i>
<i>Cyclotella meneghiniana</i>	<i>Odontella aurita</i>	<i>Thalassiosira praeyabei</i>
<i>Cymbella cistula</i>	<i>Paralia sulcata</i>	<i>Thalassiosira robusta</i>
<i>Cymbella minuta</i>	<i>Podosira stelligera</i>	<i>Thalassiosira sanctaeae</i>
<i>Cymbella subaequalis</i>	<i>Porosira glacialis</i>	<i>Thalassiosira singularis</i>
<i>Delphineis angustata</i>	<i>Proboscia barbol</i>	<i>Thalassiosira temperata</i>
<i>Delphineis ischaboensis</i>	<i>Proboscia curvirostris</i>	<i>Thalassiosira umaoiensis</i>
<i>Delphineis kippae</i>	<i>Proboscia interposita</i>	<i>Thalassiosira undulosa</i>
<i>Delphineis sachalinensis</i>	<i>Proboscia praabarboi</i>	<i>Thalassiosira yabel</i>
<i>Delphineis simonsenii</i>	<i>Pseudodimmerogramma elegans</i>	<i>Thalassiotrich longissima</i>
<i>Delphineis surirella</i>	<i>Pseudonitzschia seriata</i>	<i>Trachyneis aspera</i>
	<i>Pseudoxiphidium americana</i>	<i>Yoshidaea divergens</i>
	<i>Pseudotriceratium radiosoreticulatum</i>	
	<i>Pyxidicula zabeliae</i>	
	<i>Raphoneis amphiceros</i>	

## 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)

1417.E.30R 1w 55

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus Ingens*  
*Actinocyclus Ingens f. nodus*  
*Actinocyclus Ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisiatus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira balthymophala*  
*Bacteriosira fragilis*  
*Cavatulus exiguis*  
*Cavatulus jouseanus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
*Cosmoldiscus insignis*  
*Crudenticula ikebei*  
*Crudenticula kanayae*  
*Crudenticula nicobarica*  
*Crudenticula paranicobarica*  
*Crudenticula sawamurae*  
*Cyclorella striata*  
*Cyclorella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

## TOTAL PRESERVATION

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

*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 paelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Fragilariopsis dolloides*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listziniaria ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 20.6.2013

OBSERVER'S NAME Kombo

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praeburgonii*  
*Rhizosolenia setigera*  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 lucas*  
*Thalassiosira manifesta*  
*Thalassiosira marjamicola*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*Chaetoceros* Resting Spores

## TOTAL of VEGETATIVE CELLS

**Diatom zones (NPD)***Burnen***TOTAL ABUNDANCE:**

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

**Core, section, interval (cm)**

1417 E - 30P - CC

**TOTAL PRESERVATION**

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

DATE: 2013/June/18

OBSERVER's NAME AKEMI

**RELATIVE ABUNDANCE OF EACH TAXON**

A (>10 valves/FOV), C (1-10 vlvls/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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus levisianus*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatitus exiguus*  
**Cavatitus jouseaeus**  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus reclus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmoldiscus insignis**  
*Crucidencula ikebei*  
*Crucidencula kanayae*  
*Crucidencula nicobarica*  
*Crucidencula paranicobarica*  
*Crucidencula sawamurensis*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

*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 pækatahayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimuræ*  
*Denticulopsis vulgaris*  
*Diplolepis bombus*  
*Diplolepis puella*  
*Diplolepis smithii*  
*Diplolepis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Fragilariaopsis cylindrus*  
*Fragilariaopsis dolilobus*  
*Fragilariaopsis fossilis*  
*Fragilariaopsis oceanica*  
*Fragilariaopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listitzinia ornata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatcica**  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratum radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schraderi**  
**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 praenitudus*  
*Thalassiosira preyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
**Thalassiosira singularis**  
**Thalassiosira temporalis**  
*Thalassiosira umaloensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabeli**  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaea divergens*

**Chaetoceros Resting Spores****TOTAL OF VEGETATIVE CELLS**

## Diatom zones (NPD)

## Core, section, interval (cm)

1417.E.3R1W26

## 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)

DATE: 20.6.2013

OBSERVER's NAME KOVADO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvls/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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatulus exiguum*  
*Cavatulus jouseaeus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crucidinicula ikabei*  
*Crucidinicula kanayae*  
*Crucidinicula nicobarica*  
*Crucidinicula paranicobarica*  
*Crucidinicula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

*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 simonsonii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diplonea bombus*  
*Diplonea puelia*  
*Diplonea smithii*  
*Diplonea suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dolollus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listizinia ornata*  
*Medaria magna*  
*Medaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatka*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbori*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zebelineae*  
*Rhaphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoploica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 nordenstkioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidala divergens*

*Chaetoceros* Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

*Bamboo*

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417E - 7R - CC

## TOTAL PRESERVATION

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

DATE: 2013/June/18

OBSERVER's NAME ALBUM

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus Ingens*  
*Actinocyclus Ingens f. nodus*  
*Actinocyclus Ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisianus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komureae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira balthymophala*  
*Bacteriosira fragilis*  
*Cavilatus exiguum*  
*Cavilitus jouseanus*  
*Cavilitus lanceolatus*  
*Cavilitus linearis*  
*Cavilitus miocenicus*  
*Cavilitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmidiscus insignis*  
*Crucidenticula ikabei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonisenii*  
*Delphineis surirella*

*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 praeplatyamiae*  
*Denticulopsis praelauta*  
*Denticulopsis simonisenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturals*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis doloflus*  
*Flagilariopsis fossili*  
*Flagilariopsis oceanica*  
*Fragilariopsis pilicena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listzinia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamschatcica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia stictata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposta*  
*Proboscia praebarboi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rockella gelida*  
*Rockella praenitida*  
*Rockella semigelida*  
*Rockella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi*  
*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 praenitudus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabeli*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

NPD 4Bb ?

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417.E 32R ZW 40

## TOTAL PRESERVATION

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

DATE: 20.6.2013

OBSERVER's NAME KONDO

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens* T  
*Actinocyclus ingens f. nodus* T  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisiatus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azepebia bradiata*  
*Azepebia komurae*  
*Azepebia nodulifera*  
*Azepebia oligocenica*  
*Azepebia praenodulifera*  
*Azepebia salisburyana*  
*Azepebia tabularis*  
*Azepebia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatula exiguum*  
*Cavatatus jouseanus*  
*Cavatatus lanceolatus*  
*Cavatatus linearis*  
*Cavatatus miocenicus*  
*Cavatatus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus* 正正  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorphus*  
*Cosmidiscus insignis*  
*Crudenticula ikebei*  
*Crudenticula kanayae*  
*Crudenticula nicobarica*  
*Crudenticula paranicobarica*  
*Crudenticula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Dentibacter sp.*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. minor  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praelata*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diplothele bombus*  
*Diplothele puella*  
*Diplothele smithii*  
*Diplothele suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. minor  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossils*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosa*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebaea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kantschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glaciales*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roccella gelida*  
*Roccella praenitida*  
*Roccella semigelida*  
*Roccella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schradieri*  
*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 lucas*  
*Thalassiosira manifesta*  
*Thalassiosira marjamica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*Chaetoceros* Resting Spores

## TOTAL of VEGETATIVE CELLS

A in f nodus (141, 145, 182, 107)

Sponge ~

Rads -

28 - 2

Diatom zones (NPD)  
undetermined

**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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugariensis*  
*Actinoplychus senarius*  
*Actinoplychus vulgaris*  
*Araniscus lewisianus*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia bradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatella exigua*  
**Cavatatus jouseanus**  
*Cavatatus lanceolatus*  
*Cavatatus linearis*  
*Cavatatus miocenicus*  
*Cavatatus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus* ~~TF~~  
*Coscinodiscus oculus-iris*  
*Coscinodiscus radialis*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmoldiscus insignis**  
*Crudenticula ikebei*  
*Crudenticula kanayae*  
*Crudenticula nicobarica*  
*Crudenticula paranicobarica*  
*Crudenticula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*

sponge -

Core, section, interval (cm)  
18/7.E.32R 3W33

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

*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 tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
**Flagilariopsis dololus**  
*Flagilariopsis fossils*  
*Flagilariopsis oceanica*  
**Flagilariopsis pilocena**  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kolzumia tatsunokuchiensis**  
*Kozloviella minor*  
*Lisitzinia ornata*  
**Medaria magna**  
**Medaria splendida**  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kantschatica**  
**Neodenticula kolzumii**  
**Neodenticula seminae**  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
**Nitzschia jouseae**  
*Nitzschia palea*  
**Nitzschia rehnholdii**  
**Nitzschia rolandii**  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
**Proboscia barbol**  
**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimeroigrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabeliae**  
*Raphoneis amphiceros*

DATE: 20. 6. 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roccella gelida*  
*Roccella praenitida*  
*Roccella semigelida*  
*Roccella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praeoestrupii**  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
**Thalassionema schradieri**  
**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 marjoramica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeae*  
**Thalassiosira singularis**  
**Thalassiosira temporal**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabel**  
*Thalassiotrix longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*Chaetoceros* Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Undetermined

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417.E.32 RCC

## TOTAL PRESERVATION

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

DATE: 20. 6. 2013

OBSERVER's NAME KONDO

## RELATIVE ABUNDANCE of EACH TAXON

A (>10 valves/FOV), C (1-10 vlvls/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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisi*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira bathyomphala*  
*Bacteriosira fragilis*  
*Cavitalus exiguus*  
*Cavitalus jouseae*  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus miocenicus*  
*Cavitalus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus* 53  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolorophorus*  
*Cosmoldiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurensis*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katsayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis praeplatyamiae*  
*Denticulopsis praelauta* D-sp?  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Disiphonosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Fragilariopsis dolloides*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilcena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hydrodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Liszitina ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyrodes*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatkae*  
*Neodenticula koizumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rotundil*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol* 3  
*Proboscia curvirostris*  
*Proboscia interposta*  
*Proboscia praebarboi*  
*Pseudodimerogetrum elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabelinae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebergonii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praesoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schraderi*  
*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 nordenstkioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitidus*  
*Thalassiosira praeybabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidai divergens*

## Cercozoa Resting Spores

## TOTAL of VEGETATIVE CELLS

Rad T

Spong. sp.

20 → 1

## Diatom zones (NPD)

**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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens* ?+  
*Actinocyclus ingens f. nodus*  
*Actinocyclus ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscus lewisianus*  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Cavatulus exiguus*  
*Cavatulus jouseaeus*  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trachus*  
*Coccineis californica*  
*Coccineis costata*  
*Coccineis scutellum*  
*Coscindiscus asteromphalus*  
*Coscindiscus marginatus*  
*Coscindiscus oculus-iridis*  
*Coscindiscus radiatus*  
*Coscindiscus rhombicus*  
*Coscindiscus symbolophorus*  
*Cosmoldiscus insignis*  
*Crucidenicula ikabei*  
*Crucidenicula kanayae*  
*Crucidenicula nicobarica*  
*Crucidenicula paranicobarica*  
*Crucidenicula sawamuriae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

## Core, section, interval (cm)

1417.E.35R1W26

## TOTAL PRESERVATION

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

Q

DATE: 20.6.2013

OBSERVER's NAME Konno

## RELATIVE ABUNDANCE of EACH TAXON

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katoryamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis prakatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonensei*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Dislephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossilis*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilosena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carna*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Listizinia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatka*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengeri*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rotundil*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glaciales*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbarbol*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxis americana*  
*Pseudotriceratum radiosoreticulatum*  
*Pyxidicula zabelinae*  
*Raphoneis amphiceros*  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia praebargentii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praecoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *infatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
*Thalassionema schraderi* +  
*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 marjancica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskiöeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitudulus*  
*Thalassiosira preyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctae*  
*Thalassiosira singularis*  
*Thalassiosira temperata*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Yoshidai divergens*

*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)  
1417.E.35RCC

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

*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 lewisanus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia bidafida*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia velutissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavatulus exiguus*  
**Cavatulus jouseanus**  
*Cavatulus lanceolatus*  
*Cavatulus linearis*  
*Cavatulus miocenicus*  
*Cavatulus rectus*  
*Cavatulus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Coccineis californica*  
*Coccineis costata*  
*Coccoineis scutellum*  
*Coscindiscus asteromphalus*  
*Coscindiscus marginatus*  
*Coscindiscus oculus-iridis*  
*Coscindiscus radiatus*  
*Coscindiscus rhombicus*  
*Coscindiscus symbolophorus*  
**Cosmolodiscus Insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobaria*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphinella angustata*  
*Delphinella ischaboensis*  
*Delphinella kippae*  
*Delphinella sachalinensis*  
**Delphinella simonsenii**  
*Delphinella surirella*  
**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 praelata*  
*Denticulopsis simonsenii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puelia*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
**Fragilariopsis dolichus**  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
**Fragilariopsis placentae**  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
**Ikebea tenuis**  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
**Kozuma tatsunokuchiensis**  
*Kozlovella minor*  
*Lisitzinia ornata*  
**Medilaria magna**  
**Medilaria splendida**  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
**Neodenticula kamtschatkatica**  
**Neodenticula kozumi**  
**Neodenticula seminaea**  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
**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 praearbarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudotaxylla americana*  
*Pseudotriceratium radiosoreticulatum*  
**Pyxidicula zabelinas**  
*Raphoneis amphericus*

DATE: 21.6.2013  
OBSERVER's NAME KONNO

## RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhizosolenia hebetata* 1. *hiemalis*  
*Rhizosolenia hebetata* 1. *semispina*  
*Rhizosolenia norwegica*  
**Rhizosolenia praesbergonii**  
*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.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
**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 lucsa*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediacconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
**Thalassiosira temperata**  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabel**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidala divergens*  
*Yoshidala* spp.

*Chaetoceros* Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## Core, section, interval (cm)

1417, F 367 CC

## 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*  
*Actinocyclus curvatus*  
*Actinocyclus ellipticus*  
*Actinocyclus Ingens*  
*Actinocyclus Ingens f. nodus*  
*Actinocyclus Ingens f. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Araniscis lewisi*  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Bacteriosira bathyomphala*  
*Baclerosira fragilis*  
*Cavatitus exiguus*  
*Cavatitus jouseanus*  
*Cavatitus lanceolatus*  
*Cavatitus linearis*  
*Cavatitus miocenicus*  
*Cavatitus rectus*  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-tridius*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmiodiscus insignis*  
*Crudenticula ikebei*  
*Crudenticula kanayae*  
*Crudenticula nicobarica*  
*Crudenticula paranicobarica*  
*Crudenticula sawamuriae*  
*Cyclorella striata*  
*Cyclorella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*

DATE: 20.6.2013

OBSERVER's NAME KUNDO

## TOTAL PRESERVATION

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

*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 pækatalayamae*  
*Denticulopsis pælauta*  
*Denticulopsis simonsenii*  
*Denticulopsis tamurae*  
*Denticulopsis vulgaris*  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Distephanosira architecturalis*  
*Ellerbeckia sol*  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Fragilaria construens* (Ehrenberg) Grunow  
*Flagilariopsis cylindrus*  
*Flagilariopsis dololus*  
*Flagilariopsis fossils*  
*Flagilariopsis oceanica*  
*Flagilariopsis pilocena*  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia ornata*  
*Medaria magna*  
*Medaria splendida*  
*Melosira albicans*  
*Navicula elginiensis*  
*Navicula lyraoides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtschatka*  
*Neodenticula kolzumii*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Paralia sulcata*  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praearbaroi*  
*Pseudodimeroograma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia preebergonii*  
*Rhizosolenia setigera*  
*Roperia tesselata*  
*Roccella gelida*  
*Roccella praenitida*  
*Roccella semigelida*  
*Roccella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *inflatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*Thalassionema schradieri*  
*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 marjamicola*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenudulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sanctaeiae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoiensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiotrichia longissima*  
*Trachyneis aspera*  
*Yoshidaia divergens*

*Chaetoceros* Resting Spores

## TOTAL of VEGETATIVE CELLS

Sponge +

Diatom zones (NPD)	Core, section, interval (cm)	DATE: 20.6.2013
TOTAL ABUNDANCE:	TOTAL PRESERVATION	OBSERVER's NAME: konko
M (>60%), A (20-60%), C (5-20%) F (2-5%), R (<2%), B (no diatoms)	G (good), M (moderate), P (poor)	
<i>Achnanthes groenlandica</i> <i>Achnanthes inflata</i> <i>Achnanthes lanceolata</i> <i>Achnanthes lineariformis</i> <i>Actinocyclus curvatus</i> <i>Actinocyclus ellipticus</i> <i>Actinocyclus ingens</i> <i>Actinocyclus ingens f. nodus</i> <i>Actinocyclus ingens f. planus</i> <i>Actinocyclus oculatus</i> <i>Actinocyclus ochotensis</i> <i>Actinocyclus octonarius</i> <i>Actinocyclus robustus</i> <i>Actinocyclus tsugaruensis</i> <i>Actinopychus senarius</i> <i>Actinopychus vulgaris</i> <i>Araniscus lewisianus</i> <i>Asteromphalus darwinii</i> <i>Asteromphalus oligocenicus</i> <i>Asteromphalus parvulus</i> <i>Asteromphalus robustus</i> <i>Azpeitia biradiata</i> <i>Azpeitia komurae</i> <i>Azpeitia nodulifera</i> <i>Azpeitia oligocenica</i> <i>Azpeitia praenodulifera</i> <i>Azpeitia salisburyana</i> <i>Azpeitia tabularis</i> <i>Azpeitia vetustissima</i> <i>Bacterosira bathyomphala</i> <i>Bacterosira fragilis</i> <i>Cavatulus exiguum</i> <i>Cavatulus jouseanus</i> <i>Cavatulus lanceolatus</i> <i>Cavatulus linearis</i> <i>Cavatulus miocenicus</i> <i>Cavatulus rectus</i> <i>Cestodiscus kugleri</i> <i>Cestodiscus trochus</i> <i>Cocconeis californica</i> <i>Cocconeis costata</i> <i>Cocconeis scutellum</i> <i>Coscinodiscus asteromphalus</i> <i>Coscinodiscus marginatus</i> <i>Coscinodiscus oculus-iridis</i> <i>Coscinodiscus radiatus</i> <i>Coscinodiscus rhombicus</i> <i>Coscinodiscus symbolophorus</i> <i>Cosmoldiscus insignis</i> <i>Crucidenticula ikebeli</i> <i>Crucidenticula kanayae</i> <i>Crucidenticula nicobarica</i> <i>Crucidenticula paranicobarica</i> <i>Crucidenticula sawamurae</i> <i>Cyclotella striata</i> <i>Cyclotella meneghiniana</i> <i>Cymbella cistula</i> <i>Cymbella minuta</i> <i>Cymbella subaequalis</i> <i>Delphineis angustata</i> <i>Delphineis ischaboensis</i> <i>Delphineis kippae</i> <i>Delphineis sachalinensis</i> <i>Delphineis simonsenii</i> <i>Delphineis surirella</i>	<i>Denticulopsis crassa</i> <i>Denticulopsis dimorpha</i> var. <i>dimorpha</i> <i>Denticulopsis dimorpha</i> var. <i>areolata</i> <i>Denticulopsis hustedtii</i> <i>Denticulopsis hyalina</i> <i>Denticulopsis katayamae</i> <i>Denticulopsis leuia</i> <i>Denticulopsis praedimorpha</i> var. <i>minor</i> <i>Denticulopsis praedimorpha</i> var. <i>praedimorpha</i> <i>Denticulopsis praehyalina</i> <i>Denticulopsis praekatayamae</i> <i>Denticulopsis praelauta</i> <i>Denticulopsis simonsenii</i> <i>Denticulopsis tanimurae</i> <i>Denticulopsis vulgaris</i> <i>Diplotheis bombus</i> <i>Diplotheis puella</i> <i>Diplotheis smithii</i> <i>Diplotheis suborbicularis</i> <i>Disstephanosira architecturalis</i> <i>Ellerbeckia sol</i> <i>Eurotia pectinalis</i> var. <i>minor</i> <i>Eurotia praerupta</i> var. <i>praerupta</i> <i>Fragilaria construens</i> (Ehrenberg) Grunow <i>Flagilaropsis cylindrus</i> <i>Flagilaropsis dolofus</i> <i>Flagilaropsis fossili</i> <i>Flagilaropsis oceanica</i> <i>Flagilarlopsis pilocena</i> <i>Goniothecium decoratum</i> <i>Goniothecium rogersii</i> <i>Halamphora costata</i> <i>Hyalodiscus obsoletus</i> <i>Ikebea tenuis</i> <i>Kisseleviella carina</i> <i>Kisseleviella ezoensis</i> <i>Kolzumia tatsunokuchiensis</i> <i>Kozloviella minor</i> <i>Lisztnia ornata</i> <i>Mediaria magna</i> <i>Mediaria splendida</i> <i>Melosira albicans</i> <i>Navicula elginensis</i> <i>Navicula lyroides</i> <i>Navicula menisculus</i> <i>Navicula salinarum</i> <i>Neodenticula kamtschatkae</i> <i>Neodenticula kolzumii</i> <i>Neodenticula seminae</i> <i>Nitzschia challengeri</i> <i>Nitzschia cylindrica</i> <i>Nitzschia jouseae</i> <i>Nitzschia palea</i> <i>Nitzschia reinholdii</i> <i>Nitzschia rolandii</i> <i>Odontella aurita</i> <i>Paralia sulcata</i> <i>Podosira stelligera</i> <i>Porosira glacialis</i> <i>Proboscia barbol</i> <i>Proboscia curvirostris</i> <i>Proboscia interposita</i> <i>Proboscia praebarboi</i> <i>Pseudodimerogetrum elegans</i> <i>Pseudonitzschia seriata</i> <i>Pseudoxypixia americana</i> <i>Pseudotriceratium radiosoreticulatum</i> <i>Pyxidicula zabeliae</i> <i>Raphoneis amphiceros</i>	<i>Rhizosolenia hebetata</i> f. <i>hiemalis</i> <i>Rhizosolenia hebetata</i> f. <i>semispina</i> <i>Rhizosolenia norwegica</i> <i>Rhizosolenia paebergonii</i> <i>Rhizosolenia setigera</i> <i>Roperia tesselata</i> <i>Rocella gelida</i> <i>Rocella praenitida</i> <i>Rocella semigelida</i> <i>Rocella vigilans</i> <i>Rouxia californica</i> <i>Rouxia granda</i> <i>Rouxia isopolica</i> <i>Rouxia naviculoides</i> <i>Rouxia obesa</i> <i>Shionodiscus oestrupii</i> <i>Shionodiscus praeoestrupii</i> <i>Shionodiscus trifultus</i> <i>Stephanopyxis dimorpha</i> <i>Stephanopyxis horridus</i> <i>Stephanopyxis turris</i> <i>Thalassionema bacillaris</i> <i>Thalassionema nitzschiooides</i> <i>Thalassionema nitzschiooides</i> var. <i>incurvatum</i> <i>Thalassionema nitzschiooides</i> var. <i>infatum</i> <i>Thalassionema nitzschiooides</i> var. <i>parvum</i> <i>Thalassionema pseudonitzschiooides</i> <i>Thalassionema schraderi</i> <i>Thalassiosira antiqua</i> <i>Thalassiosira bioculata</i> <i>Thalassiosira castanea</i> <i>Thalassiosira convexa</i> <i>Thalassiosira decipiens</i> <i>Thalassiosira dubiosa</i> <i>Thalassiosira eccentrica</i> <i>Thalassiosira fasciculata</i> <i>Thalassiosira fraga</i> <i>Thalassiosira gravida</i> <i>Thalassiosira grunowii</i> <i>Thalassiosira hyalina</i> <i>Thalassiosira irregularis</i> <i>Thalassiosira jacksonii</i> <i>Thalassiosira jouseae</i> <i>Thalassiosira leptopus</i> <i>Thalassiosira lineata</i> <i>Thalassiosira lusca</i> <i>Thalassiosira manifesta</i> <i>Thalassiosira marujamica</i> <i>Thalassiosira mediaconvexa</i> <i>Thalassiosira minutissima</i> <i>Thalassiosira miocenica</i> <i>Thalassiosira nordenskiöeldii</i> <i>Thalassiosira orientalis</i> <i>Thalassiosira praefraga</i> <i>Thalassiosira praenidulus</i> <i>Thalassiosira praeabyei</i> <i>Thalassiosira robusta</i> <i>Thalassiosira sanctaeiae</i> <i>Thalassiosira singularis</i> <i>Thalassiosira temperata</i> <i>Thalassiosira umaoiensis</i> <i>Thalassiosira undulosa</i> <i>Thalassiosira yabeli</i> <i>Thalassiothrix longissima</i> <i>Trachyneis aspera</i> <i>Yoshidiala divergens</i>

*Cheiatoxeres 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)

*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.  
*Actinopithicus senarius*  
*Actinopithicus vulgaris*  
*Actinopithicus* spp.  
*Araniscus lewisanus*  
*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.  
*Cavitalus exiguus*  
*Cavitalus jouseanus*  
*Cavitalus lanceolatus*  
*Cavitalus linearis*  
*Cavitalus mioceneus*  
*Cavitalus rectus*  
*Cavitalus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmofeliscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crudenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*

## Core, section, interval (cm)

1417E-38R-CC

## TOTAL PRESERVATION

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

*Denticulopsis hustedtii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamiae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praehyalina*  
*Denticulopsis pækatayamae*  
*Denticulopsis paelauta*  
*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 dolloides*  
*Fragilariopsis fossile*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halimphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
*Ikebea tenuis*  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchiensis*  
*Kozloviella minor*  
*Lisitzinia omata*  
*Medilaria magna*  
*Medilaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyrodes*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamtchatka*  
*Neodenticula kolzumi*  
*Neodenticula seminae*  
*Nitzschia challengerii*  
*Nitzschia cylindrica*  
*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 praearbaroi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopixylla americana*  
*Pseudotriceratium radiosoreticulatum*  
*Pyxidicula zabeliae*  
*Raphoneis amphiceros*

DATE: 2013/June/10

OBSERVER's NAME AKEMI

## 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)

*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
*Rhizosolenia paebergonii*  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouada californica*  
*Rouxia granda*  
*Rouxia isoplica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus oestrupii*  
*Shionodiscus praeoestrupii*  
*Shionodiscus trifultus*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschiooides*  
*Thalassionema nitzschiooides* var. *incurvatum*  
*Thalassionema nitzschiooides* var. *infatum*  
*Thalassionema nitzschiooides* var. *parvum*  
*Thalassionema pseudonitzschiooides*  
*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 marjanica*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocenea*  
*Thalassiosira nordenskiöeldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabeli*  
*Thalassiosira robusta*  
*Thalassiosira sanctetiae*  
*Thalassiosira singularis*  
*Thalassiosira temporalis*  
*Thalassiosira umaoensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabel*  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidai divergens*  
*Yoshidai* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

NPD 6B?

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

1417 E-39R-CC

## TOTAL PRESERVATION

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

*Achnanthes groenlandica**Achnanthes inflata**Achnanthes lanceolata**Achnanthes lineariformis**Achnanthes spp.**Actinocyclus curvatus**Actinocyclus ellipticus**Actinocyclus Ingens* ~~KE~~ 10*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 lewisiensis**Araniscus spp.**Asteromphalus darwinii**Asteromphalus oligocenicus**Asteromphalus parvulus**Asteromphalus robustus**Asteromphalus spp.**Azpeitia biradita**Azpeitia komurae**Azpeitia nodulifera**Azpeitia oligocenica**Azpeitia praenodulifera**Azpeitia salisburyana**Azpeitia tabularis**Azpeitia velutissima**Azpeitia spp.**Bacterosira bathyomphala**Bacterosira fragilis**Bacterosira spp.**Cavifatus exiguis**Cavifatus jouseanus**Cavifatus lanceolatus**Cavifatus linearis**Cavifatus miccenicus**Cavifatus rectus**Cavifatus spp.**Cestodiscus kugleri**Cestodiscus trochus**Cestodiscus spp.**Cocconeis californica**Cocconeis costata**Cocconeis scutellum**Coscinodiscus asteromphalus**Coscinodiscus marginatus**Coscinodiscus oculus-iridis**Coscinodiscus radiatus**Coscinodiscus rhombicus**Coscinodiscus symbolophorus**Cosmoldiscus insignis**Crucidenticula ikebei**Crucidenticula kanayae**Crucidenticula nicobarica**Crucidenticula paranicobarica**Crucidenticula sawamurae**Cyclotella striata**Cyclotella meneghiniana**Cymbella cistula**Cymbella minuta**Cymbella subaequalis**Delphineis angustata**Delphineis ischaboensis**Delphineis kippae**Delphineis sachalinensis**Delphineis simonsenii**Delphineis surirella**Denticulopsis crassa**Denticulopsis dimorpha var. dimorpha**Denticulopsis dimorpha var. areolata**Denticulopsis hustedtii**Denticulopsis hyalina**Denticulopsis katayamiae**Denticulopsis lauta**Denticulopsis praedimorpha var. minor**Denticulopsis praedimorpha var. praedimorpha**Denticulopsis praehyalina**Denticulopsis praekatayamiae**Denticulopsis praeflava**Denticulopsis simonsenii**Denticulopsis tanimurae**Denticulopsis vulgaris**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**Fragilarlopsis dolloides**Fragilarlopsis fossils**Fragilariopsis oceanica**Fragilariopsis pilocena**Fragilariopsis spp.**Goniothecium decoratum**Goniothecium rogersii**Goniothecium spp.**Grammatophora spp.**Halamphora costata**Hydrodiscus obsoletus**Hydrodiscus spp.**Ikebea tenuis**Kisseleviella carina**Kisseleviella ezoensis**Kolzumia tatsunokuchiensis**Kozloviella minor**Lisztinia ornata**Medilaria magna**Medilaria splendida**Melosira albicans**Navicula elginensis**Navicula lyraoides**Navicula menisculus**Navicula salinarum**Neodenticula kamtschatka**Neodenticula kolzumii**Neodenticula seminae**Nitzschia challengerii**Nitzschia cylindrica**Nitzschia jouseae**Nitzschia palea**Nitzschia reinholdii**Nitzschia rolandii**Odontella aurita**Paralia sulcata**Paralia spp.**Podosira stelligera**Porosira glacialis**Proboscia barbata**Proboscia curvirostris**Proboscia interposita**Proboscia praearboei**Pseudodimmerogramma elegans**Pseudonitzschia seriata**Pseudopyxilla americana**Pseudotriceratium radiosoreticulatum**Pyxidicula zabeliae**Raphoneis amphiceros*

DATE: 2013 / June / 20

OBSERVER's NAME AKEMI

## RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

X (present), B (barren)

R Rhizosolenia hebetata f. hiemalis +

Rhizosolenia hebetata f. semispina

Rhizosolenia norwegica

Rhizosolenia praebergonii

Rhizosolenia setigera

Roperia tessellata

Rocella gelida

Rocella praevertita

Rocella semigelida

Rocella vigilans

Rouda californica

Rouxia granda

Rouxia isopolica

Rouxia naviculoides

Rouxia obesa

Shionodiscus oestrupil

Shionodiscus praeoestrupil

Shionodiscus trifultus

Stephanopyxis dimorpha

Stephanopyxds horridus

Stephanopyxis turris

Stephanopyxis bacillaris

Thalassionema nitzschioide

Thalassionema nitzschioide var. incurvatum

Thalassionema nitzschioide var. inflatum

Thalassionema nitzschioide var. parvum

Thalassionema pseudonitzschioide

Thalassionema schradet +

R T SP ELDPLK 202

10/11/2013

10/11/2013

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 marumjica

Thalassiosira mediaconvexa

Thalassiosira mihutissima

Thalassiosira miocenica

Thalassiosira nordenskioldii

Thalassiosira orientalis

Thalassiosira praefraga

Thalassiosira praenudulus

Thalassiosira praeybabei

Thalassiosira robusta

Thalassiosira sanctaeiae

Thalassiosira singularis

Thalassiosira temperat

Thalassiosira umaoiensis

Thalassiosira undulosa

Thalassiosira yabel

Thalassiosira spp.

Thalassiothrix longissima +

Trachyneis aspera

Trachyneis spp.

Yoshidai divergens

Yoshidai spp.

T. hiroakiensis? +

10/11/2013

Chaetoceros Resting Spores +

TOTAL of VEGETATIVE CELLS +

10/11/2013

Rock +

119714 C marginatus