

Diatom zones (NPD)

NPD 13

Core, section, interval (cm)

U1419.A.1H-CC

DATE: 2013/July/10

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

***Cheetoceros* Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

closed copora +  
sponge F

Forgun IF  
hand +

Diatom zones (NPD)

HPD12

Core, section, interval (cm)

U14 19. A 2H-CC

DATE: 2013/July/ 10

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X (present), B (barren)

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- Achnanthes lineariformis*
- Achnanthes* spp.
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- Actinocyclus ingens**
- Actinocyclus ingens* f. **nodus**
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- Actinocyclus robustus*
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- Actinoptychus vulgaris*
- Actinoptychus* spp.
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- Asteromphalus* spp.
- Azpeitia biradiata*
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- Bacterosira bathyomphala*
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- Bacterosira* spp.
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- Cavitatus* spp.
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- Cestodiscus* spp.
- Cocconeis californica*
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- Stephanopyxis lurreis*
- Stephanopyxis* spp.
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Cheetoceros Reating Spores

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*Delphineis* spp.

Core, section, interval (cm)

U14 19A - 3H-1W, 189cm

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**Proboscia curvirostris**  
*Proboscia interposita*  
*Proboscia praerbarbolii*  
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*Pseudonitzschia sertata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
**Pyxidicula zabelinae**

DATE: 2013/July/10

OBSERVER's NAME AF SK IS

RELATIVE ABUNDANCE OF EACH TAXON

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

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praebergonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii** F 4  
**Shionodiscus praestostrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp. - 1  
*Suirella* 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* F 3  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida* - 1  
**Thalassiosira grunowii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamica**  
*Thalassiosira mediaconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperi**  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Fraguones

Rest spore -

Diatom zones (NPD)

*Wanda*

Core, section, interval (cm)

U14 (9 A - 5H - 2U / 100) an

DATE: 2013/July/10

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

*Wanda*  
*slw & Bansen*

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

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

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

*Fragum*

*Rest spore*

Diatom zones (NPD)

NPDR

TOTAL PRESERVATION

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

Core, section, interval (cm)

U14 19A-3H-9W, 100a

TOTAL ABUNDANCE:

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

DATE: 2013/July/10

OBSERVER'S NAME AF SK IS

RELATIVE ABUNDANCE of EACH TAXON

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

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatulus
- Actinocyclus ellipticus
- Actinocyclus ingens
- Actinocyclus ingens f. nodus
- Actinocyclus ingens f. planus
- Actinocyclus oculatus
- Actinocyclus ochotensis
- Actinocyclus octonarius
- Actinocyclus robustus
- Actinocyclus tsugaruensis
- Actinocyclus spp.
- Actinoptychus senarius
- Actinoptychus vulgaris
- Actinoptychus spp.
- Araniscus lewisianus
- Araniscus spp.
- Asteromphalus darwinii
- Asteromphalus oligocenicus
- Asteromphalus parvulus
- Asteromphalus robustus
- Asteromphalus spp.
- Azpeitia biradiata
- Azpeitia komurae
- Azpeitia nodulifera
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- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus
- Coscinodiscus rhombicus
- Coscinodiscus symbolophorus
- Cosmodiscus insignis
- Crucidenticula ikebei
- Crucidenticula kanayae
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- Crucidenticula paranicobarica
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- Cyclotella spp.
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- Delphineis spp.

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- Denticulopsis dimorpha var. areolata
- Denticulopsis hustedii
- Denticulopsis hyalina
- Denticulopsis katayamae
- Denticulopsis lauta
- Denticulopsis praedimorpha var. minor
- Denticulopsis praedimorpha var. praedimorpha
- Denticulopsis praehyalina
- Denticulopsis praekatayamae
- Denticulopsis praelauta
- Denticulopsis simonsenii
- Denticulopsis tanimurae
- Denticulopsis vulgaris
- Denticulopsis spp.
- Diploneis bombus
- Diploneis puella
- Diploneis smithii
- Diploneis suborbicularis
- Diploneis spp.
- Distephanosira architecturalis
- Distephanosira spp.
- Ellerbeckia sol
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- Mediaria splendida
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- Navicula menisculus
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- Rocella semigelida
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- Rouxia naviculoidea
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- Shionodiscus trifultus
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- Stephanopyxis horridus
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- Stephanopyxis spp.
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- Thalassiosira fraga
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- Thalassiosira grunowii
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- Thalassiosira mediaconveza
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- Thalassiosira nordenskioldii
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- Thalassiosira praeyabei
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- Thalassiosira yabei
- Thalassiosira spp.
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- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

60.0 < 6.0  
 1.0 > 2.0  
 2.0 > 3.0  
 3.0 > 4.0  
 4.0 > 5.0

Rest spore

closed capsule

58 F

100

Diatom zones (NPD)

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

Core, section, Interval (cm)

U141 9A 3H - 64g 10a

DATE: 2013/July/10

OBSERVER's NAME AF SK IS

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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- Denticulopsis dimorpha var. dimorpha**
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- Denticulopsis hyalina**
- Denticulopsis katayamae**
- Denticulopsis lauta**
- Denticulopsis praedimorpha var. minor**
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- Denticulopsis praeahyalina**
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- Denticulopsis simonsenii**
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- Denticulopsis vulgaris**
- Denticulopsis* spp.
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- Eunotia* spp.
- Fragilaria construens*
- Fragilaria* spp.
- Fragilariopsis cylindrus*
- Fragilariopsis dolotulus**
- Fragilariopsis fossilis**
- Fragilariopsis oceanica*
- Fragilariopsis pilocena**
- Fragilariopsis* spp.
- Goniothecium decoratum*
- Goniothecium rogersii*
- Goniothecium* spp.
- Grammatophora* spp.
- Halamphora costata*
- Hyalodiscus obsoletus*
- Hyalodiscus* spp.
- Ikebea tenuis**
- Kisseleviella carina*
- Kisseleviella ezoensis*
- Kolzumia tatsunokuchensis**
- Kozloviella minor*
- Lisitzinia ornata*
- Medlaria magna**
- Medlaria splendida**
- Melosira albicans*
- Navicula elginensis*
- Navicula lyroides*
- Navicula menisculus*
- Navicula salinarum*
- Neodenticula kamtschatica**
- Neodenticula kolzumii**
- Neodenticula seminiae**
- Nitzschia challengerii*
- Nitzschia jouseae**
- Nitzschia palea*
- Nitzschia reinholdii**
- Nitzschia rolandii**
- Odontella aurita*
- Odontella* spp.
- Paralia sulcata*
- Paralia* spp.
- Podosira stelligera*
- Porosira glacialis*
- Proboscia barboi**
- Proboscia curvirostris**
- Proboscia interposita*
- Proboscia praebarboi*
- Pseudodimmerograma elegans*
- Pseudonitzschia seriata*
- Pseudopyxilla americana*
- Pseudotriceratium radiosoreticulatum*
- Pyxidula zabelinae**

- Rhaphoneis amphicerus*
- Rhaphoneis* spp.
- Rhizosolenia hebetata f. hiemalis*
- Rhizosolenia hebetata f. semispina*
- Rhizosolenia norvegica*
- Rhizosolenia praeborgonii**
- Rhizosolenia setigera*
- Rhizosolenia* spp.
- Roperia tessellata*
- Rocella gelida*
- Rocella praenitida*
- Rocella semigelida*
- Rocella vigilans*
- Rouxia californica**
- Rouxia granda*
- Rouxia isopolica*
- Rouxia naviculoides*
- Rouxia obesa*
- X *Shionodiscus oestrupii* - 1
- X *Shionodiscus praeoestrupii* - 1
- Shionodiscus trifidulus* - 3
- Stephanopyxis dimorpha*
- Stephanopyxis horridus**
- Stephanopyxis turris*
- Stephanopyxis* spp.
- Surirella* spp.
- Thalassionema bacillaris*
- Thalassionema nitzschioides*
- Thalassionema nitzschioides var. incurvatum*
- Thalassionema nitzschioides var. inflatum*
- Thalassionema nitzschioides var. parvum*
- Thalassionema pseudonitzschioides*
- Thalassionema schraderi**
- Thalassionema* spp.
- Thalassiosira antiqua**
- Thalassiosira bioculata*
- Thalassiosira castanea**
- Thalassiosira convexa**
- Thalassiosira decipiens*
- Thalassiosira dubiosa*
- X *Thalassiosira eccentrica* - 2
- Thalassiosira fasciculata*
- Thalassiosira fraga*
- Thalassiosira gravida*
- Thalassiosira grunowii**
- Thalassiosira hyalina*
- Thalassiosira irregularata*
- Thalassiosira jacksonii**
- X **Thalassiosira jouseae** - 1
- Thalassiosira leptopus*
- Thalassiosira lineata*
- Thalassiosira lusca*
- Thalassiosira manifesta*
- Thalassiosira marujamica**
- Thalassiosira mediaconvexa*
- Thalassiosira minutissima**
- Thalassiosira miocenica*
- Thalassiosira nordenskiöldii*
- Thalassiosira orientalis*
- Thalassiosira praefraga*
- Thalassiosira praenidulus*
- Thalassiosira praeyabei*
- Thalassiosira robusta*
- Thalassiosira sancettae*
- Thalassiosira singularis**
- Thalassiosira temperlei**
- Thalassiosira umaensis*
- Thalassiosira undulosa*
- Thalassiosira yabei**
- Thalassiosira* spp. - 5
- Thalassiothrix longissima*
- Thalassiothrix* spp.
- Trachyneis aspera*
- Trachyneis* spp.
- Yoshidaia divergens*
- Yoshidaia* spp.

Chaeoceros Resting Spores 0  
TOTAL of VEGETATIVE CELLS 13

fragrant

sponge -

Diatom zones (NPD)

U14

Core, section, interval (cm)

U14 19. A. 34cc

DATE: 2013/July/ 10

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Cheetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Sponge - nanot

Diatom zones (NPD)

undet

Core, section, interval (cm)

U14 9 A 5H-CC

DATE: 2013/July 10

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

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

Sponge IF

Hand +



Diatom zones (NPD)

undet.

Core, section, interval (cm)

U14 19. A. 6HCC

DATE: 2013/July/ 10

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

**Chesteroceros Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

Sponge - nahot

## Diatom zones (NPD)

BARREN

## TOTAL PRESERVATION

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

TRACE

## Core, section, interval (cm)

U14/9A-8H-CC

## TOTAL ABUNDANCE:

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

DATE: 2013/July/ 10

OBSERVER'S NAME AF SK (S)

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

Undet.

Core, section, interval (cm)

U14 19A-9H-CC

DATE: 2013/July/ 10

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

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

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

closed copula

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

U14 19A-104-1W 15cm

DATE: 2013/July/13

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaeofocera Resting Spores  
TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14 19A 10H-2W 100cm

## TOTAL ABUNDANCE:

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

DATE: 2013/July/13

OBSERVER'S NAME AF SK IS

## 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.  
*Actinopterychus senarius*  
*Actinopterychus vulgaris*  
*Actinopterychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligogenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischabensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsonii***  
*Delphineis surirella*  
*Delphineis* spp.

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praeahyalina***  
***Denticulopsis praeatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsonii***  
***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 dolium***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisztinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatica***  
***Neodenticula kozumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmergrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
***Pyxidicula zabelinae***

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

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

注) vege. cells 50殻カウ:ト

Diatom zones (NPD)

NPD 12

TOTAL PRESERVATION

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

Core, section, interval (cm)

U14 19A-10H-3W 17cm

TOTAL ABUNDANCE:

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

DATE: 2013/July/13

OBSERVER'S NAME AF SK IS

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

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

R2 T

R2 T

F6 T

R1

R2 T

R X T F

R2 T

A-C 426/100  
213/50

closed  
← 10.0 11.0 12.0 13.0 14.0 →

Cheetoceros Resting Spores  
TOTAL OF VEGETATIVE CELLS

50

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19A-104-XW 100cm

DATE: 2013/July/13

OBSERVER'S NAME AF SK IS

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

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

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

Cheetoceros Resting Spores
TOTAL OF VEGETATIVE CELLS

92

100

10

Diatom zones (NPD)

NPD-12

Core, section, interval (cm)

U119A 10H-CC

DATE: 2013/July 10

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

- Denticulopsis crassa
Denticulopsis dimorpha var. dimorpha
Denticulopsis dimorpha var. areolata
Denticulopsis hustedii
Denticulopsis hyalina
Denticulopsis katayamae
Denticulopsis laeta
Denticulopsis praedimorpha var. minor
Denticulopsis praedimorpha var. praedimorpha
Denticulopsis praehyalina
Denticulopsis praekatayamae
Denticulopsis praekatae
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.
Fragilariaopsis cylindrus
Fragilariaopsis dolifera
Fragilariaopsis fossilis
Fragilariaopsis oceanica
Fragilariaopsis pilocena
Fragilariaopsis spp.
Goniothecium decoratum
Goniothecium rogersii
Goniothecium spp.
Grammatophora spp.
Halamphora costata
Hyalodiscus obsoletus
Hyalodiscus spp.
Ikebea tenuis
Kisseleviella carina
Kisseleviella ezoensis
Kolzumia tatsunokuchiensis
Kozloviella minor
Lisitzinia ornata
Mediaria magna
Mediaria splendida
Melosira albicans
Navicula elginensis
Navicula lyroides
Navicula menisculus
Navicula salinarum
Neodenticula kamtschatica
Neodenticula kolzumii
Neodenticula seminiae
Nitzschia challengerii
Nitzschia jouseae
Nitzschia palea
Nitzschia reinholdii
Nitzschia rolandii
Odontella aurita
Odontella spp.
Paralia sulcata
Paralia spp.
Podosira stelligera
Porosira glacialis
Proboscia barbol
Proboscia curvirostris
Proboscia interposita
Proboscia praeparbol
Pseudodimmerogramma elegans
Pseudonitzschia seriata
Pseudopyxilla americana
Pseudotriceratium radiosoreticulatum
Pyxidicula zabelinae

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

Silica closed
7.0 8.0 sponge
91

Chaetoceros Resting Spores
TOTAL of VEGETATIVE CELLS

100

79
91



Diatom zones (NPD)

NPD 12  
TOTAL PRESERVATION  
G (good), M (moderate), P (poor)

Core, section, interval (cm)

U14 19A-11H-CC

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

DATE: 2013/July/ 10

OBSERVER's NAME AF SK IS

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

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatulus T
- Actinocyclus ellipticus
- Actinocyclus ingens
- Actinocyclus ingens 1. nodus
- Actinocyclus ingens 1. 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 oligocenica
- Azpeitia praenodulifera
- Azpeitia salisburyana
- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus +
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus
- Coscinodiscus rhombicus
- Coscinodiscus symbolophorus
- Cosmodiscus insignis
- Crucidenticula ikebei
- Crucidenticula kanayae
- Crucidenticula nicobarica
- Crucidenticula paranicobarica
- Crucidenticula sawamurae
- Cyclotella striata
- Cyclotella meneghiniana
- Cyclotella spp.
- Cymbella cistula
- Cymbella minuta
- Cymbella subaequalis
- Cymbella spp.
- Delphineis angustata
- Delphineis ischaboensis
- Delphineis kippae
- Delphineis sachalinensis
- Delphineis simonsenii
- Delphineis surirella
- Delphineis spp.

- Denticulopsis crassa
- Denticulopsis dimorpha var. dimorpha
- Denticulopsis dimorpha var. areolata
- Denticulopsis hustedii
- Denticulopsis hyalina
- Denticulopsis katayamae
- Denticulopsis lauta
- Denticulopsis praedimorpha var. minor
- Denticulopsis praedimorpha var. praedimorpha
- Denticulopsis praehyalina
- Denticulopsis praekatayamae
- Denticulopsis praelauta
- Denticulopsis simonsenii
- Denticulopsis tanimurae
- Denticulopsis vulgaris
- 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 dolioleus
- Fragilariopsis fossilis
- Fragilariopsis oceanica
- Fragilariopsis plocena
- Fragilariopsis spp.
- Goniothecium decoratum
- Goniothecium rogersii
- Goniothecium spp.
- Grammatophora spp.
- Halamphora costata
- Hyalodiscus obsoletus T
- Hyalodiscus spp.
- Ikebea tenuis
- Kisseleviella carina
- Kisseleviella ezoensis
- Kolzumia tatsunokuchiensis
- Kozloviella minor
- Lisitzinia ornata
- Mediaria magna
- Mediaria splendida
- Melosira albicans
- Navicula elginensis
- Navicula lyroides
- Navicula menisculus
- Navicula salinarum
- Neodenticula kamtschatica
- Neodenticula kolzumii
- Neodenticula seminiae
- Nitzschia challengerii
- Nitzschia jouseae
- Nitzschia palea
- Nitzschia reinholdii
- Nitzschia rolandii
- Odontella aurita
- Odontella spp.
- Paralia sulcata
- Paralia spp.
- Podosira stelligera
- Porosira glacialis
- Porosira glacialis
- Proboscia barboi
- Proboscia curvirostris
- Proboscia interposita
- Proboscia praebarboi
- Pseudodimmerogramma elegans
- Pseudonitzschia senata
- Pseudopyxilla americana
- Pseudotriceratium radiosoreticulatum
- Pyxidula zabellinae

- Rhaphoneis amphiceros
- Rhaphoneis spp.
- Rhizosolenia hebetata f. hiemalis
- Rhizosolenia hebetata f. semispina
- Rhizosolenia norwegica
- Rhizosolenia praeborgonii
- Rhizosolenia setigera
- Rhizosolenia spp.
- Roperia tessellata
- Rocella gelida
- Rocella praenitida
- Rocella semigelida
- Rocella vigilans
- Rouxia californica
- Rouxia granda
- Rouxia isopolica
- Rouxia naviculoides
- Rouxia obesa
- R3 Shionodiscus oestrupii F
- R2 Shionodiscus praeoestrupii T
- Shionodiscus trifidus
- Stephanopyxis dimorpha
- Stephanopyxis horridus
- Stephanopyxis turris
- Stephanopyxis spp.
- Surirella spp.
- Thalassionema bacillarum
- F14 Thalassionema nitzschioides
- Thalassionema nitzschioides var. incurvatum
- Thalassionema nitzschioides var. inflatum
- Thalassionema nitzschioides var. parvum
- Thalassionema pseudonitzschioides
- Thalassionema schraderi
- Thalassionema spp.
- Thalassiosira antiqua
- Thalassiosira bioculata
- Thalassiosira castanea
- Thalassiosira convexa
- Thalassiosira decipiens
- Thalassiosira dubiosa
- Thalassiosira eccentrica
- Thalassiosira fasciculata
- Thalassiosira fraga
- Thalassiosira gravida
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregulara
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus
- Thalassiosira lineata
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marujamica
- Thalassiosira mediaconvexa
- Thalassiosira minutissima
- Thalassiosira miocenica
- Thalassiosira nordenskioldii
- Thalassiosira orientalis
- Thalassiosira praefraga
- Thalassiosira praenidulus
- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperei
- Thalassiosira umaeniensis
- Thalassiosira undulosa
- Thalassiosira yabei
- Thalassiosira spp.
- Thalassiothrix longissima
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.
- C33 Chaetoceros Resting Spores
- TOTAL of VEGETATIVE CELLS

closed Dino sili o  
6.0 7.0 8.0  
8.2

100

Diatom zones (NPD)

Core, section, interval (cm)

DATE: 2013/July/10

U14 19A-12H-9c

OBSERVER's NAME AF SK IS

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

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

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

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

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

- Rhaphoneis amphicerus
- Rhaphoneis spp.
- Rhizosolenia hebetata f. hiemalis
- Rhizosolenia hebetata f. semispina
- Rhizosolenia norvegica
- Rhizosolenia praebregonii
- Rhizosolenia setigera
- Rhizosolenia spp.
- Roperia tessellata
- Rocella gelida
- Rocella praenitida
- Rocella semigelida
- Rocella vigilans
- Rouxia californica
- Rouxia granda
- Rouxia isopolica
- Rouxia naviculoides
- Rouxia obesa
- R1 Shionodiscus oestrupii -
- R3 Shionodiscus praecoestrupii
- Shionodiscus trifultus F
- Stephanopyxis dimorpha
- R1 Stephanopyxis horridus -
- Stephanopyxis turris -
- Stephanopyxis spp. -
- Surirella spp.
- Thalassionema bacillarum
- R2 Thalassionema nitzschioides T
- 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 TF
- Thalassiosira fasciculata
- Thalassiosira fraga
- Thalassiosira gravida
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregularata
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus
- Thalassiosira lineata
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marujamca
- Thalassiosira mediacconvexa
- Thalassiosira minutissima
- Thalassiosira miocenica
- Thalassiosira nordenskioldii
- Thalassiosira orientalis
- Thalassiosira praefraga
- Thalassiosira praenidulus
- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperei
- Thalassiosira umaeniensis
- Thalassiosira undulosa
- Thalassiosira yabei
- Thalassiosira spp. TF
- R3 Thalassiothrix longissima
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

Cheetoceros Resting Spores #TF 9  
TOTAL of VEGETATIVE CELLS 20

Closed cap  
← → ←  
27.0 21.0 20.0  
9 15 20

sponge silico Diatoms

## Diatom zones (NPD)

B

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14 19A-137-CC

## TOTAL ABUNDANCE:

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

DATE: 2013/July/10

OBSERVER'S NAME AF SK IS

## 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.  
*Actinopterychus senarius*  
*Actinopterychus vulgaris*  
*Actinopterychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmioliscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

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

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

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

Fragments

Diatom zones (NPD)

undet.

Core, section, interval (cm)

U14 19A-15H-CC

DATE: 2013/July/10

OBSERVER'S NAME (AF) SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

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

Fragment

sponge T

0  
2

## Diatom zones (NPD)

B

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14 19A-17H-CC

## TOTAL ABUNDANCE:

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

DATE: 2013/July/10

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praehyalina***  
***Denticulopsis praeKatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis lanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilaropsis cylindrus*  
***Fragilaropsis dolioles***  
***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 tatsunokuchensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Mediaria magna***  
***Mediaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamschatkica***  
***Neodenticula kolzumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praebarboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidula zabelinae***

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

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

fraguene

sponge

## Diatom zones (NPD)

## 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.  
*Actinocyclus senarius*  
*Actinocyclus vulgaris*  
*Actinocyclus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
*Cavitatus jouseanus*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmidiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Delphineis* spp.

## Core, section, interval (cm)

U14 19A-19H-CC

## TOTAL ABUNDANCE:

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

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

DATE: 2013/July/10

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## TOTAL PRESERVATION

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

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

## Core, section, interval (cm)

U14 10A-21X-CC

## TOTAL ABUNDANCE:

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

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

DATE: 2013/July/10

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NRD)

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

## Core, section, interval (cm)

U14 19A-23x-cc  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

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

DATE: 2013/July/10

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

Cheetoceros Resting Spores  
 TOTAL of VEGETATIVE CELLS



## Diatom zones (NPD)

## Core, section, interval (cm)

DATE: 2013/July/10

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

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

Fragumel

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

U14 19.A.26x cc

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

***Cheetoceros* Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

sponge +

## Diatom zones (NPD)

Bahren

## Core, section, interval (cm)

U14 19. A. 27x cc

DATE: 2013/July/ 11

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

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

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

Barken

## Core, section, interval (cm)

U14 19. A. Z8XCC

DATE: 2013/July 11

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

*Denticulopsis crassa*  
*Denticulopsis dimorpha* var. *dimorpha*  
*Denticulopsis dimorpha* var. *areolata*  
*Denticulopsis hustedii*  
*Denticulopsis hyalina*  
*Denticulopsis katayamae*  
*Denticulopsis lauta*  
*Denticulopsis praedimorpha* var. *minor*  
*Denticulopsis praedimorpha* var. *praedimorpha*  
*Denticulopsis praevalina*  
*Denticulopsis praekatayamae*  
*Denticulopsis praelauta*  
*Denticulopsis simonsonii*  
*Denticulopsis tanimurae*  
*Denticulopsis vulgaris*  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
*Fragilariopsis dolioles*  
*Fragilariopsis fossilis*  
*Fragilariopsis oceanica*  
*Fragilariopsis pilocena*  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
*Ikebea tenuis*  
*Kisseleviella canina*  
*Kisseleviella ezoensis*  
*Kolzumia tatsunokuchlensis*  
*Kozloviella minor*  
*Lisztinia ornata*  
*Mediaria magna*  
*Mediaria splendida*  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
*Neodenticula kamschatica*  
*Neodenticula kolzumii*  
*Neodenticula seminiae*  
*Nitzschia challengeri*  
*Nitzschia jouseae*  
*Nitzschia palea*  
*Nitzschia reinholdii*  
*Nitzschia rolandii*  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
*Proboscia barbol*  
*Proboscia curvirostris*  
*Proboscia interposita*  
*Proboscia praerbarbol*  
*Pseudodimmergrana elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosreticulatum*  
*Pyxidicula zabelinae*

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

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

Burren

Core, section, interval (cm)

U14 19.A. 29xCC

DATE: 2013/July/ 11

OBSERVER's NAME AF (SK) IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaetoceros Reesting Spores

TOTAL of VEGETATIVE CELLS

Sponge f

Diatom zones (NPD)

NPD 12

TOTAL PRESERVATION

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

FRAGMENTS

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

Core, section, interval (cm)

U14 19B-1H-CC

TOTAL ABUNDANCE:

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

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

DATE: 2013/July/ 14

OBSERVER'S NAME AF SK IS

RELATIVE ABUNDANCE OF EACH TAXON

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

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

Cheetoceros Resting Spores

TOTAL OF VEGETATIVE CELLS

sponge closed cap

全菌見下

TEF R 13

Diatom zones (NPD)

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

全周

Core, section, interval (cm)

U14 19B 2H-2W, 100cm

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

DATE: 2013/July/19

OBSERVER'S NAME AF SK IS

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

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

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

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

R

R

R

R

X

R

R

R

R

R

T

T

T

T

T

T

T

4

26



Diatom zones (NPD)

NPPI2  
 TOTAL PRESERVATION  
 G (good), M (moderate), P (poor)

Core, section, interval (cm)

U14 19, B, ZHCC  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaetoceros Resting Spores T 2  
 TOTAL of VEGETATIVE CELLS 19

sponge T  
 closed copula +  
 foram -



Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19B-3H-CC

DATE: 2013/July 11

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

全圖見作

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

R2

R8 F17

R1

R5 R1

R9

F31

R2

R2

R10

R3

R6

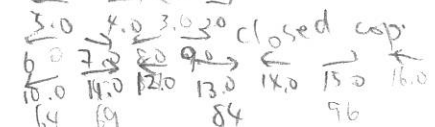
F62

Silica

sponge

closed cap

x200



Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

100

Diatom zones (NPD)

undef.

Core, section, interval (cm)

U14 19. B 4Hcc

DATE: 2013/July/ 11

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praecoestrupii***  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***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 praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temporei***  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Cheateoceros* Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

Sponge F -  
closed cupura +

Diatom zones (NPD)

undet.

Core, section, interval (cm)

U14 18-5H-1W, 10cm

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

Jouse  
Bauer

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

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

***Cheetoceros* Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

sponge -  
fragments

## Diatom zones (NPD)

B

## Core, section, interval (cm)

U14 19B-5H-2W, 100m

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

*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 oligocenic*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmodiscus insignis***  
*Crucidentacula ikebei*  
*Crucidentacula kanayae*  
*Crucidentacula nicobarica*  
*Crucidentacula paranicobarica*  
*Crucidentacula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

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

DATE: 2013/July/ 11

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## TOTAL 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 oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbotophorus*  
**Cosmidiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis surirella*  
*Delphineis* spp.

## Core, section, interval (cm)

U14 19B - SW - SW, 109cm

## TOTAL ABUNDANCE:

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

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

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
**Rhizosolenia praeborgonii**  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
**Rouxia californica**  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
**Shionodiscus oestrupii**  
**Shionodiscus praecoestrupii**  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
**Stephanopyxis horridus**  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Suirella* 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 grunovii**  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
**Thalassiosira jacksonii**  
**Thalassiosira jouseae**  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
**Thalassiosira marujamka**  
*Thalassiosira mediacconvexa*  
**Thalassiosira minutissima**  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
**Thalassiosira singularis**  
**Thalassiosira temperii**  
*Thalassiosira umaicensis*  
*Thalassiosira undulosa*  
**Thalassiosira yabei**  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidala divergens*  
*Yoshidala* spp.

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

B

## Core, section, interval (cm)

U14 19B-5H-4u, 100cm

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
*Rhizosolenia praeborgonii*  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
*Rouxia californica*  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
*Shionodiscus ostrupii*  
*Shionodiscus praecoestrupii*  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
*Stephanopyxis horridus*  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Suriella* 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 grunovii*  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
*Thalassiosira jacksonii*  
*Thalassiosira jouseae*  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
*Thalassiosira marujamca*  
*Thalassiosira mediaconvexa*  
*Thalassiosira minutissima*  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
*Thalassiosira singularis*  
*Thalassiosira temperi*  
*Thalassiosira umaeniensis*  
*Thalassiosira undulosa*  
*Thalassiosira yabei*  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

*Chelecoeros Resting Spores*  
TOTAL of VEGETATIVE CELLS

Fraguener

Diatom zones (NPD)

*under*

Core, section, interval (cm)

U1419B-57-2w 98cm

DATE: 2013/July/11

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

*Y almost B*

TOTAL ABUNDANCE:

M (>60%), A (20-60%), C (5-20%)  
F (2-5%), R (32%), B (no diatoms)

RELATIVE ABUNDANCE of EACH TAXON

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

*under*

*Y almost B*

*Flagellum*

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

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

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norwegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii***  
***Shionodiscus praeoestrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schradri***  
*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 marjamae***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temporei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

***Chefoceros* Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

U14 19B-5H-CC

DATE: 2013/July/ 11

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

全周 2.5%

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

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

**Chaetoceros Resting Spores**

TOTAL of VEGETATIVE CELLS



Diatom zones (NPD)

MPD12

Core, section, interval (cm)

U14 19.B. 04cc

DATE: 2013/July/ 11

OBSERVER'S NAME AF (SK) IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

- Denticulopsis crassa
- Denticulopsis dimorpha var. dimorpha
- Denticulopsis dimorpha var. areolata
- Denticulopsis hustedii
- Denticulopsis hyalina
- Denticulopsis katayamae
- Denticulopsis lauta
- Denticulopsis praedimorpha var. minor
- Denticulopsis praedimorpha var. praedimorpha
- Denticulopsis praehyalina
- Denticulopsis praekatayamae
- Denticulopsis praelauta
- Denticulopsis simonsenii
- Denticulopsis tanimurae
- Denticulopsis vulgaris
- Denticulopsis spp.
- Diploneis bombus
- Diploneis puella
- Diploneis smithii
- Diploneis suborbicularis
- Diploneis spp.
- Distephanosira architecturalis
- Distephanosira spp.
- Ellerbeckia sol
- Ellerbeckia spp.
- Eunotia pectinalis var. minor
- Eunotia praerupta var. praerupta
- Eunotia spp.
- Fragilaria construens
- Fragilaria spp.
- Fragilaropsis cylindrus
- Fragilaropsis dolioles
- 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
- Kozumia tatsunokuchiensis
- Kozloviella minor
- Lisitzinia ornata
- Medlaria magna
- Medlaria splendida
- Melosira albicans
- Navicula elginensis
- Navicula lyroides
- Navicula menisculus
- Navicula salinarum
- Neodenticula kamtschatica
- Neodenticula kolzumii
- Neodenticula seminae
- Nitzschia challengerii
- Nitzschia jouseae
- Nitzschia palea
- Nitzschia reinholdii
- Nitzschia rolandii
- Odontella aurita
- Odontella spp.
- Paralia sulcata
- Paralia spp.
- Podosira stelligera
- Porosira glacialis
- Proboscia barboi
- Proboscia curvirostris
- Proboscia interposita
- Proboscia praeboroi
- Pseudodimmerogramma elegans
- Pseudonitzschia seriata
- Pseudopyxilla americana
- Pseudotraceratium radiosreticulatum
- Pyxidicula zabelinae

- Rhaphoneis amphicerous
- Rhaphoneis spp.
- Rhizosolenia hebetata f. hiemalis
- Rhizosolenia hebetata f. semipinna
- Rhizosolenia norwegica
- Rhizosolenia praeboroni
- 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 praecostrupii
- Shionodiscus trifidulus
- Stephanopyxis dimorpha
- Stephanopyxis horridus
- Stephanopyxis turris
- Stephanopyxis spp.
- Surirella spp.
- Thalassionema bacillarum
- Thalassionema nitzschioides
- Thalassionema nitzschioides var. incurvatum
- Thalassionema nitzschioides var. inflatum
- Thalassionema nitzschioides var. parvum
- Thalassionema pseudonitzschioides
- Thalassionema schraderi
- Thalassionema spp.
- Thalassiosira antiqua
- Thalassiosira bioculata
- Thalassiosira castanea
- Thalassiosira convexa
- Thalassiosira decipiens
- Thalassiosira dubiosa
- Thalassiosira eccentrica
- Thalassiosira fasciculata
- Thalassiosira fraga
- Thalassiosira gravida
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregulara
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus
- Thalassiosira lineata
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marjamicca
- Thalassiosira mediaconvexa
- Thalassiosira minutissima
- Thalassiosira miocenica
- Thalassiosira nordenskioldii
- Thalassiosira orientalis
- Thalassiosira praefraga
- Thalassiosira praenidulus
- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperei
- Thalassiosira umaoiensis
- Thalassiosira undulosa
- Thalassiosira yabei
- Thalassiosira spp.
- Thalassiothrix longissima
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

closed copula + sponge

silice - foran

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

79

Diatom zones (NPD)

un doc

Core, section, interval (cm)

U14 19B-DH-24, 2cm

DATE: 2013/July/11

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

X  
X

X

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

Sponge F

Diatom zones (NPD)

under

Core, section, interval (cm)

U14 19B-7H-2W, 100 cm

DATE: 2013/July 11

OBSERVER'S NAME (AF) SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

- Denticulopsis crassa*
- Denticulopsis dimorpha var. dimorpha**
- Denticulopsis dimorpha var. areolata**
- Denticulopsis hustedii**
- Denticulopsis hyalina**
- Denticulopsis katayamae**
- Denticulopsis lauta**
- Denticulopsis praedimorpha var. minor**
- Denticulopsis praedimorpha var. praedimorpha**
- Denticulopsis praeahalina**
- Denticulopsis praekatayamae**
- Denticulopsis praelauta**
- Denticulopsis simonsenii**
- Denticulopsis tanimurae**
- Denticulopsis vulgaris**
- Denticulopsis* spp.
- Diploneis bombus*
- Diploneis puella*
- Diploneis smithii*
- Diploneis suborbicularis*
- Diploneis* spp.
- Distephanosira architecturalis*
- Distephanosira* spp.
- Ellerbeckia sol*
- Ellerbeckia* spp.
- Eunotia pectinalis* var. *minor*
- Eunotia praerupta* var. *praerupta*
- Eunotia* spp.
- Fragilaria construens*
- Fragilaria* spp.
- Fragilaropsis cylindrus*
- Fragilaropsis dolioles**
- 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*
- Kozumia tatsunokuchiensis**
- Kozloviella minor*
- Lisitzinia ornata*
- Medlaria magna**
- Medlaria splendida**
- Melosira albicans*
- Navicula elginensis*
- Navicula lyroides*
- Navicula menisculus*
- Navicula salinarum*
- Neodenticula kamschatka**
- Neodenticula kozumii**
- Neodenticula saminae**
- Nitzschia challengerii*
- Nitzschia jouseae**
- Nitzschia palea*
- Nitzschia reinholdii**
- Nitzschia rolandii**
- Odontella aurita*
- Odontella* spp.
- Paralia sulcata*
- Paralia* spp.
- Podosira stelligera*
- Porosira glacialis*
- Proboscia barboi**
- Proboscia curvirostris**
- Proboscia interposita*
- Proboscia praebarboi*
- Pseudodimmerogramma elegans*
- Pseudonitzschia seriata*
- Pseudopyxilla americana*
- Pseudotriceratium radiosoreticulatum*
- Pyxidicula zabelinae**

- Rhaphoneis amphiceros*
- Rhaphoneis* spp.
- Rhizosolenia hebetata* f. *hiemalis*
- Rhizosolenia hebetata* f. *semipinna*
- Rhizosolenia norvegica*
- Rhizosolenia praebergonii**
- Rhizosolenia setigera*
- Rhizosolenia* spp.
- Roperia tessellata*
- Rocella gelida*
- Rocella praenitida*
- Rocella semigelida*
- Rocella vigilans*
- Rouxia californica**
- Rouxia granda*
- Rouxia isopolica*
- Rouxia naviculoides*
- Rouxia obesa*
- Shionodiscus oestrupii** (EIT 12)
- Shionodiscus praeoestrupii**
- Shionodiscus trifultus*
- Stephanopyxis dimorpha*
- Stephanopyxis horridus**
- Stephanopyxis turris* (EIT 12)
- Stephanopyxis* spp. (EIT 13)
- Surirella* spp.
- Thalassionema bacillaris*
- Thalassionema nitzschioides*
- Thalassionema nitzschioides* var. *incurvatum*
- Thalassionema nitzschioides* var. *inflatum*
- Thalassionema nitzschioides* var. *parvum*
- Thalassionema pseudonitzschioides*
- Thalassionema schraderi**
- Thalassionema* spp.
- Thalassiosira antiqua**
- Thalassiosira bioculata*
- Thalassiosira castanea**
- Thalassiosira convexa**
- Thalassiosira decipiens*
- Thalassiosira dubiosa*
- Thalassiosira eccentrica*
- Thalassiosira fasciculata* (F 4)
- Thalassiosira fraga*
- Thalassiosira gravida*
- Thalassiosira grunowii**
- Thalassiosira hyalina*
- Thalassiosira irregulara*
- Thalassiosira jacksonii**
- Thalassiosira jouseae**
- Thalassiosira leptopus*
- Thalassiosira lineata*
- Thalassiosira lusca*
- Thalassiosira manifesta*
- Thalassiosira marujamica**
- Thalassiosira mediaconvexa*
- Thalassiosira minutissima**
- Thalassiosira miocena*
- Thalassiosira nordenskioldii*
- Thalassiosira orientalis*
- Thalassiosira praepraga*
- Thalassiosira praenidulus*
- Thalassiosira praeyabei*
- Thalassiosira robusta*
- Thalassiosira sancettae*
- Thalassiosira singularis**
- Thalassiosira temperlei**
- Thalassiosira umaensis*
- Thalassiosira undulosa*
- Thalassiosira yabei**
- Thalassiosira* spp. (T 2)
- Thalassiothrix longissima*
- Thalassiothrix* spp.
- Trachyneis aspera*
- Trachyneis* spp.
- Yoshidaia divergens*
- Yoshidaia* spp.



X Shionodiscus oestrupii (EIT 12)

X Stephanopyxis turris (EIT 12)

X Surirella spp. (EIT 13)

X Thalassiosira eccentrica (F 4)

X Thalassiosira leptopus (- 1)

X Thalassiosira yabei (T 2)

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

17 X  
95

sponge F  
closed copula

Rest spore (EIT)

## Diatom zones (NPD)

BARRÉN

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14-19B7H-YW.100

## TOTAL ABUNDANCE:

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

DATE: 2013/July/ 12

OBSERVER'S NAME AF SK IS

## 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. *plenus***  
***Actinocyclus oculatus***  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus isugaruensis*  
*Actinocyclus* spp.  
*Actinoptychus senarius*  
*Actinoptychus vulgaris*  
*Actinoptychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwinii*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradifata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenicus*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jouseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbiophorus*  
***Cosmioliscus insignis***  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

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

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

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14 19B-7H-CC

## TOTAL ABUNDANCE:

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

DATE: 2013/July/ 11

OBSERVER'S NAME AF SK (S)

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

## Chaetoceros Resting Spores

## TOTAL of VEGETATIVE CELLS

sponge

## Diatom zones (NPD)

Rakrph

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14 19.B SHZw/00

## TOTAL ABUNDANCE:

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

DATE: 2013/July/12

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

***Chesteroceros* Resting Spores**

## TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

*Barren*

Core, section, interval (cm)

U14 *19.B. 8H4w/00*

DATE: 2013/July/ *12*

OBSERVER'S NAME AF *SK* IS

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

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

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

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

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

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

**Chaetoceros Resting Spores**

TOTAL of VEGETATIVE CELLS

*Sponge -*

## Diatom zones (NPD)

NPD 12

## 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 oclonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*Actinopterychus senarius*  
*Actinopterychus vulgaris*  
*Actinopterychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
**Azpeitia komurae**  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
**Cavitatus jouseanus**  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
**Cosmodiscus insignis**  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischabensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
**Delphineis simonsenii**  
*Delphineis sunirella*  
*Delphineis* spp.

## Core, section, interval (cm)

U14 19, B, 8HCC

## TOTAL ABUNDANCE:

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

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

DATE: 2013/July/ 11

OBSERVER'S NAME AF (SK) IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

closed copura 4



## Diatom zones (NPD)

Bakren

## Core, section, interval (cm)

U14 19.3 9H9C

DATE: 2013/July/ 11

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19B 10H-1W 26cm

DATE: 2013/July/ 13

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

注) SOVege colls

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

- Denticulopsis crassa
Denticulopsis dimorpha var. dimorpha
Denticulopsis dimorpha var. areolata
Denticulopsis hustedii
Denticulopsis hyalina
Denticulopsis katayamae
Denticulopsis lauta
Denticulopsis praedimorpha var. minor
Denticulopsis praedimorpha var. praedimorpha
Denticulopsis praehyalina
Denticulopsis praekatayamae
Denticulopsis praelauta
Denticulopsis simonsenii
Denticulopsis tanimurae
Denticulopsis vulgaris
Denticulopsis spp.
Diploneis bombus
Diploneis puella
Diploneis smithii
Diploneis suborbicularis
Diploneis spp.
Distephanosira architecturalis
Distephanosira spp.
Ellerbeckia sol
Ellerbeckia spp.
Eunotia pectinalis var. minor
Eunotia praeurupta var. praeurupta
Eunotia spp.
Fragilaria construens
Fragilaria spp.
Fragilariopsis cylindrus
Fragilariopsis dololius
Fragilariopsis fossilis
Fragilariopsis oceanica
Fragilariopsis pilocana
Fragilariopsis spp.
Goniothecium decoratum
Goniothecium rogersii
Goniothecium spp.
Grammatophora spp.
Halamphora costata
Hyalodiscus obsoletus
Hyalodiscus spp.
Ikobea 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 kamschatica
Neodenticula kolzumii
Neodenticula seminae
Nitzschia challengeri
Nitzschia jouseae
Nitzschia palea
Nitzschia reinholdii
Nitzschia rolandii
Odontella aurita
Odontella spp.
Paralia sulcata
Paralia spp.
Podosira stelligera
Porosira glacialis
Proboscia barbol
Proboscia curvirostris
Proboscia interposita
Proboscia praebarboi
Pseudodimmerogramma elegans
Pseudonitzschia seriata
Pseudopyxilla americana
Pseudotruncatum radiosoreticulatum
Pyxidicula zabelinae

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

R2
R3
R1
R6
R1
R2
R1
R18
R1

closed cap silica sponge

202rs/100Jc

101/50

Handwritten bar chart with 10 bars of varying heights.

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

100

61/31 47
5.0
4.0

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19B 10H-2W 100cm

DATE: 2013/July 13

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

(注) 50 vege cells

- Achnanthes groenlandica*
- Achnanthes inflata*
- Achnanthes lanceolata*
- Achnanthes lineariformis*
- Achnanthes* spp.
- X- *Actinocyclus curvatus*
- Actinocyclus ellipticus*
- Actinocyclus ingens*
- Actinocyclus ingens* f. *nodus*
- Actinocyclus ingens* f. *planus*
- Actinocyclus ocellatus*
- R1 *Actinocyclus ochotensis*
- Actinocyclus octonarius*
- Actinocyclus robustus*
- Actinocyclus tsugaruensis*
- Actinocyclus* spp.
- Actinoptychus senarius*
- Actinoptychus vulgaris*
- Actinoptychus* spp.
- Araniscus lewisianus*
- Araniscus* spp.
- Asteromphalus darwini*
- Asteromphalus oligocenicus*
- Asteromphalus parvulus*
- Asteromphalus robustus*
- Asteromphalus* spp.
- Azpeitia biradiata*
- Azpeitia komurae*
- Azpeitia nodulifera*
- Azpeitia oligocenic*
- Azpeitia praenodulifera*
- Azpeitia salisburyana*
- Azpeitia tabularis*
- Azpeitia vetustissima*
- Azpeitia* spp.
- R1 *Bacterosira bathyomphala*
- Bacterosira fragilis*
- Bacterosira* spp.
- Cavitatus exiguus*
- Cavitatus jouseanus*
- Cavitatus lanceolatus*
- Cavitatus linearis*
- Cavitatus miocenicus*
- Cavitatus rectus*
- Cavitatus* spp.
- Cestodiscus kugleri*
- Cestodiscus trochus*
- Cestodiscus* spp.
- Cocconeis californica*
- Cocconeis costata*
- Cocconeis scutellum*
- Cocconeis* spp.
- Coscinodiscus asteromphalus*
- Coscinodiscus marginatus*
- Coscinodiscus oculus-iridis*
- Coscinodiscus radiatus*
- Coscinodiscus rhombicus*
- Coscinodiscus symbolophorus*
- Cosmodiscus insignis*
- Crucidenticula ikebei*
- Crucidenticula kanayae*
- Crucidenticula nicobarica*
- Crucidenticula parnicobarica*
- Crucidenticula sawamurae*
- Cyclotella striata*
- Cyclotella meneghiniana*
- Cyclotella* spp.
- Cymbella cistula*
- Cymbella minuta*
- Cymbella subaequalis*
- Cymbella* spp.
- Delphineis angustata*
- Delphineis ischaboensis*
- Delphineis kippae*
- Delphineis sachalinensis*
- Delphineis simonsenii*
- Delphineis surirella*
- Delphineis* spp.

- Denticulopsis crassa*
- Denticulopsis dimorpha* var. *dimorpha*
- Denticulopsis dimorpha* var. *areolata*
- Denticulopsis hustedii*
- Denticulopsis hyalina*
- Denticulopsis katayamae*
- Denticulopsis lauta*
- Denticulopsis praedimorpha* var. *minor*
- Denticulopsis praedimorpha* var. *praedimorpha*
- Denticulopsis praehyalina*
- Denticulopsis praekatayamae*
- Denticulopsis praelauta*
- Denticulopsis simonsenii*
- Denticulopsis tanimurae*
- Denticulopsis vulgaris*
- Denticulopsis* spp.
- Diploneis bombus*
- Diploneis puella*
- Diploneis smithii*
- Diploneis suborbicularis*
- Diploneis* spp.
- Distephanosira architecturalis*
- Distephanosira* spp.
- Ellerbeckia sol*
- Ellerbeckia* spp.
- Eunotia pectinalis* var. *minor*
- Eunotia praerupta* var. *praerupta*
- Eunotia* spp.
- Fragilaria construens*
- Fragilaria* spp.
- Fragilariopsis cylindrus*
- Fragilariopsis dololus*
- Fragilariopsis fossilis*
- Fragilariopsis oceanica*
- Fragilariopsis plocana*
- Fragilariopsis* spp.
- Goniothecium decoratum*
- Goniothecium rogersii*
- Goniothecium* spp.
- Grammatophora* spp.
- Halamphora costata*
- Hyalodiscus obsoletus*
- Hyalodiscus* spp.
- Ikebea tenuis*
- Kisseleviella carina*
- Kisseleviella ezoensis*
- Kozumia tatsunokuchiensis*
- Kozloviella minor*
- Lisitzinia ornata*
- Medlaria magna*
- Medlaria splendida*
- R1 *Melosira albicans*
- Navicula elginensis*
- Navicula lyroides*
- Navicula menisculus*
- Navicula salinarum*
- Neodenticula kamtschatica*
- Neodenticula kolzumii*
- F17 *Neodenticula seminae*
- Nitzschia challengerii*
- Nitzschia jouseae*
- Nitzschia palea*
- Nitzschia reinholdii*
- Nitzschia rolandii*
- Odontella aurita*
- Odontella* spp.
- R5 *Paralia sulcata*
- Paralia* spp.
- Podosira stelligera*
- Porosira glacialis*
- Porosira* spp.
- Proboscia barboi*
- Proboscia curvirostris*
- Proboscia interposita*
- Proboscia praebarboi*
- Pseudodimmerogramma elegans*
- Pseudonitzschia seriata*
- Pseudopyxilla americana*
- Pseudotriceratium radiosreticulatum*
- Pyxidicula zabelinae*

- Rhaphoneis amphiceros*
- Rhaphoneis* spp.
- R2 *Rhizosolenia hebetata* f. *hiemalis*
- Rhizosolenia hebetata* f. *semispina*
- Rhizosolenia norvegica*
- Rhizosolenia praeborgonii*
- Rhizosolenia setigera*
- Rhizosolenia* spp.
- Roperia tessellata*
- Rocella gelida*
- Rocella praenitida*
- Rocella semigelida*
- Rocella vigilans*
- Rouxia californica*
- Rouxia granda*
- Rouxia isopolica*
- Rouxia naviculoides*
- Rouxia obesa*
- R1 *Shionodiscus oestrupii*
- R2 *Shionodiscus praecoestrupii*
- Shionodiscus trifultus*
- Stephanopyxis dimorpha*
- R1 *Stephanopyxis horrida*
- R3 *Stephanopyxis turris*
- Stephanopyxis* spp.
- Surirella* spp.
- Thalassionema bacillaris*
- F1X *Thalassionema nitzschioides*
- Thalassionema nitzschioides* var. *incurvatum*
- Thalassionema nitzschioides* var. *inflatum*
- Thalassionema nitzschioides* var. *parvum*
- Thalassionema pseudonitzschioides*
- Thalassionema schraderi*
- Thalassionema* spp.
- Thalassiosira antiqua*
- Thalassiosira bioculata*
- Thalassiosira castanea*
- Thalassiosira convexa*
- Thalassiosira decipiens*
- Thalassiosira dubiosa*
- Thalassiosira eccentrica*
- Thalassiosira fasciculata*
- Thalassiosira fraga*
- Thalassiosira gravida*
- Thalassiosira grunowii*
- Thalassiosira hyalina*
- Thalassiosira irregulara*
- Thalassiosira jacksonii*
- R1 *Thalassiosira jouseae*
- Thalassiosira leptopus*
- Thalassiosira lineata*
- Thalassiosira lusca*
- Thalassiosira manifesta*
- Thalassiosira marjamic*
- Thalassiosira mediacconvexa*
- Thalassiosira minutissima*
- Thalassiosira miocenic*
- Thalassiosira nordenskioldii*
- Thalassiosira orientalis*
- Thalassiosira praefraga*
- Thalassiosira praenidulus*
- Thalassiosira praeyabei*
- Thalassiosira robusta*
- Thalassiosira sancellae*
- Thalassiosira singularis*
- Thalassiosira temporei*
- Thalassiosira umaensis*
- Thalassiosira undulosa*
- R1 *Thalassiosira yabei*
- Thalassiosira* spp.
- Thalassiothrix longissima*
- Thalassiothrix* spp.
- Trachyneis aspera*
- Trachyneis* spp.
- Yoshidaia divergens*
- Yoshidaia* spp.

236vs/100vc

118/50

118 [Handwritten symbols]

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

89/1467/27  
11.5 12.5 13.5 14.5

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14GB 104-2. 132cm

DATE: 2013/July/13

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Handwritten annotations: R2, R3, C33, X+, F11, etc. next to taxon names.

Handwritten box: 196/100vc

Handwritten bar chart showing relative abundance of vegetative cells.

Chaeoceros Resting Spores
TOTAL of VEGETATIVE CELLS

100

83/45 185/0/3
5.0 6.0 7.0

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19B 10H-3W 42 cm

DATE: 2013/July/13

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

3) 50 vege cells

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

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

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

R T 2
R T 2
R T 2
R T 2
R T 2

162/100

81/50vc

Handwritten notes at the bottom right.

Spring Dino

18.0 15.0 20.0 21.0
72/47

Cheateoceros Resting Spores
TOTAL OF VEGETATIVE CELLS

50

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19 B 11H-1W 106 cm

DATE: 2013/July/13

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

R6

R1

F10 R1

R2 R6

F21

R1

R1

F16

F30

165/100vc

Chaetoceros Resting Spores TOTAL of VEGETATIVE CELLS

100

closed siliw

70

注) Vege cells 50 殻カウナ

Diatom zones (NPD)

NPD 12

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

Core, section, interval (cm)

U14 19B 11H-2W 33cm

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

DATE: 2013/July/ 13

OBSERVER'S NAME AF SK IS

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

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

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

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

A-C 272 / 100

136 / 50

Handwritten notes and diagrams at the bottom right, including a series of small rectangular boxes and lines.

Cheetoceros Resting Spores  
TOTAL OF VEGETATIVE CELLS

50

Silico closed cap  
128 / 48  
14.0 15.0

Diatom zones (NPD)

NPD12

Core, section, interval (cm)

U14 19B 114-2W, 53cm

DATE: 2013/July/12

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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- Denticulopsis praedimorpha var. minor
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- Fragilariopsis fossilis
- Fragilariopsis oceanica
- Fragilariopsis pilocana
- Fragilariopsis spp.
- Goniothecium decoratum
- Goniothecium rogersii
- Goniothecium spp.
- Grammatophora spp.
- Halamphora costata
- Hyalodiscus obsoletus
- Hyalodiscus spp.
- Ikebea tenuis
- Kisseleviella carina
- Kisseleviella ezoensis
- Kozumia tatsunokuchensis
- Kozloviella minor
- Lisitzinia ornata
- Medlaria magna
- Medlaria splendida
- Melosira albicans
- Navicula elginensis
- Navicula lyroides
- Navicula menisculus
- Navicula salinarum
- Neodenticula kamschatkica
- Neodenticula kozumii
- Neodenticula seminae
- Nitzschia challengerii
- Nitzschia jouseae
- Nitzschia palea
- Nitzschia reinholdii
- Nitzschia rolandii
- Odontella aurita
- Odontella spp.
- Paralia sulcata
- Paralia spp.
- Podosira stelligera
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- Proboscia barboi
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- Rhaphoneis amphicerous
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- Rhizosolenia spp.
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- Rocella praenitida
- Rocella semigelida
- Rocella vigilans
- Rouxia californica
- Rouxia granda
- Rouxia isopolica
- Rouxia naviculoides
- Rouxia obesa
- R3 Shionodiscus oestrupii F
- R3 Shionodiscus praecoestrupii F
- R3 Shionodiscus trifultus F
- Stephanopyxis dimorpha
- Stephanopyxis horridus
- Stephanopyxis turris
- Stephanopyxis spp.
- Surirella spp.
- Thalassionema bacillaris
- R5 Thalassionema nitzschioides F
- Thalassionema nitzschioides var. incurvatum
- Thalassionema nitzschioides var. infatum
- Thalassionema nitzschioides var. parvum
- Thalassionema pseudonitzschioides
- Thalassionema schraderi
- Thalassionema spp.
- Thalassiosira antiqua
- Thalassiosira bioculata
- Thalassiosira castanea
- Thalassiosira convexa
- Thalassiosira decipiens
- Thalassiosira dubiosa
- R2 Thalassiosira eccentrica T
- Thalassiosira fasciculata
- Thalassiosira fraga
- F6 Thalassiosira gravida F
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregularata
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus
- Thalassiosira lineata
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marumamka
- Thalassiosira mediaconvexa
- Thalassiosira minutissima
- Thalassiosira miocenica
- Thalassiosira nordenskioldii
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- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperoi
- Thalassiosira umaeniensis
- Thalassiosira undulosa
- Thalassiosira yabei
- Thalassiosira spp.
- R Thalassiothrix longissima T2
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

Cheetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

F8 FEF

R3 FEF  
R3 FEF  
F8 FEF

R1 XNW.SP

F17 FEF  
C35 FEF

164  
A FEF  
100

silico closed cap Dinos

5.0



Diatom zones (NPD)

NPD12

Core, section, interval (cm)

U14 19B-114-CC

DATE: 2013/July/11

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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



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- Achnanthes spp.
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- Actinocyclus ingens
- Actinocyclus ingens 1. nodus
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- Actinocyclus oculatus
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- Actinocyclus octonarius
- Actinocyclus robustus
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- Trachyneis aspera
- Trachyneis spp.
- Yoshidaia divergens
- Yoshidaia spp.

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

6X  
70

Fragment  
sponge IET  
closed copula  
Anomni

Auracosira species Rese spore IET 6

## Diatom zones (NPD)

## 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.  
*Actinopterychus senarius*  
*Actinopterychus vulgaris*  
*Actinopterychus* spp.  
*Araniscus lewisianus*  
*Araniscus* spp.  
*Asteromphalus darwini*  
*Asteromphalus oligocenicus*  
*Asteromphalus parvulus*  
*Asteromphalus robustus*  
*Asteromphalus* spp.  
*Azpeitia biradiata*  
***Azpeitia komurae***  
*Azpeitia nodulifera*  
*Azpeitia oligocenic*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
***Cavitatus jousseanus***  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
***Cosmidiscus insignis***  
*Crucidentula ikebei*  
*Crucidentula kanayae*  
*Crucidentula nicobarica*  
*Crucidentula paranicobarica*  
*Crucidentula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
***Delphineis simonsenii***  
*Delphineis surirella*  
*Delphineis* spp.

## Core, section, interval (cm)

U14 19B-19H-19C

## TOTAL ABUNDANCE:

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

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis lauta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praeohyalina***  
***Denticulopsis praekatayamae***  
***Denticulopsis praelauta***  
***Denticulopsis simonsenii***  
***Denticulopsis lanimurae***  
***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 praeurpta* var. *praeurpta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolotus***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis plocena***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchlensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula menisculus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminiae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barbol***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praeborboi*  
*Pseudodimmerogramma elegans*  
*Pseudonitzschia seriata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidicula zabelinae***

DATE: 2013/July 11

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLSFraguere  
form

## Diatom zones (NPD)

BARRÉN

## Core, section, interval (cm)

U14 19B 15H-2W 100cm

DATE: 2013/July/ 12

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

**Chaetoceros Resting Spores**

TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19B-15H-3W 98 cm

DATE: 2013/July/ 12

OBSERVER's NAME AF SK (IS)

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

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

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

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

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

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

R1  
 R5  
 C20  
 R2  
 F9  
 F9  
 C22  
 R7  
 R7  
 R1  
 F9  
 R1  
 C34  
 TOTAL of VEGETATIVE CELLS 100

15  
 10

## Diatom zones (NPD)

B

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14 19B-15H-CC

## TOTAL ABUNDANCE:

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

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Inguene

Diatom zones (NPD)

BARREN

Core, section, interval (cm)

U1419B-16H-1W 87 cm

DATE: 2013/July/ 12

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

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

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

sponge

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

U14 19B-16H-2W 100 cm

DATE: 2013/July 12

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

**Chesteros Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARRREN

## Core, section, interval (cm)

U14 19 B - 19H - 1W 50 cm

DATE: 2013/July/ 12

OBSERVER's NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

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

Sponge



## Diatom zones (NPD)

BARKEN

## Core, section, interval (cm)

U14 19B-19H2W 100

DATE: 2013/July/ 12

OBSERVER's NAME AF SK (S)

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

**Chesteroceros Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

U14 19B 19H-3W 50cm

DATE: 2013/July/ 12

OBSERVER's NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

*Achnanthes groenlandica*  
*Achnanthes inflata*  
*Achnanthes lanceolata*  
*Achnanthes lineariformis*  
*Achnanthes* spp.  
*Actinocyclus curvatulus*  
*Actinocyclus ellipticus*  
*Actinocyclus ingens*  
*Actinocyclus ingens 1. nodus*  
*Actinocyclus ingens 1. planus*  
*Actinocyclus oculatus*  
*Actinocyclus ochotensis*  
*Actinocyclus octonarius*  
*Actinocyclus robustus*  
*Actinocyclus tsugaruensis*  
*Actinocyclus* spp.  
*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 oligocena*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
*Cavitatus jouseanus*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmodiscus insignis*  
*Crucidentula ikebei*  
*Crucidentula kanayae*  
*Crucidentula nicobarica*  
*Crucidentula paranicobarica*  
*Crucidentula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsenii*  
*Delphineis surirella*  
*Delphineis* spp.

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

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

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

Diatom zones (NPD) **B**

## Core, section, interval (cm)

U14 **19B-19H-CC**DATE: 2013/July **11**OBSERVER'S NAME **AF SK IS**

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

**Chaetoceros Resting Spores**

TOTAL of VEGETATIVE CELLS

Fragment

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19C - 24-2W, 100cm

DATE: 2013/July/12

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

R1

R1

R2

R1

R2

R2

R1

R2

R1

R1

R2

R1

C 73

F 8

R1

Silicas Dina

close a

0.7 1.2

100

Chaetoceros Resting Spores
TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

NPD12

Core, section, interval (cm)

U14 19C-2H-3w, 93cm

DATE: 2013/July 12

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaetoceros Resting Spores 49

TOTAL of VEGETATIVE CELLS 100

←0.0  
→1.0  
←2.0  
→3.0  
←4.0

closed copla  
John

Rest. spore  
sponge

Handwritten symbols and marks

Diatom zones (NPD)

NPD12

Core, section, interval (cm)

U149C-2H-3 ag 15cm

DATE: 2013/July/13

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatulus
- Actinocyclus ellipticus
- Actinocyclus ingens
- Actinocyclus ingens 1. nodus
- Actinocyclus ingens 1. planus
- Actinocyclus oculatus
- Actinocyclus ochotensis
- Actinocyclus oclonarius +2
- Actinocyclus robustus
- Actinocyclus tsugaruensis
- Actinocyclus spp. 1
- Actinoptychus senarius
- Actinoptychus vulgaris
- Actinoptychus spp.
- Araniscus lewisianus
- Araniscus spp.
- Asteromphalus darwinii
- Asteromphalus oligocenicus
- Asteromphalus parvulus
- Asteromphalus robustus
- Asteromphalus spp.
- Azpeitia biradiata
- Azpeitia komurae
- Azpeitia nodulifera
- Azpeitia oligocenica
- Azpeitia praenodulifera
- Azpeitia salisburyana
- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum 1
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus 1
- Coscinodiscus rhombicus
- Coscinodiscus symbotophorus
- Cosmidiscus insignis
- Crucidentricula ikebei
- Crucidentricula kanayae
- Crucidentricula nicobarica
- Crucidentricula parnicobarica
- Crucidentricula sawamurae
- Cyclotella striata
- Cyclotella meneghiniana
- Cyclotella spp.
- Cymbella cistula
- Cymbella minuta
- Cymbella subaequalis
- Cymbella spp.
- Delphineis angustata
- Delphineis ischaboensis
- Delphineis kippae
- Delphineis sachalinensis
- Delphineis simonsenii
- Delphineis surirella
- Delphineis spp.

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

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

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

fovan  
sponge JET  
closed copla

X Rest

FF  
30

Diatom zones (NPD)

undet

Core, section, interval (cm)

U14 190-214-240, 00 cm

DATE: 2013/July/ 12

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata f. hiemalis*  
*Rhizosolenia hebetata f. semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praerbergonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus oestrupii*** T 2  
***Shionodiscus praeostrupii*** T 1  
*Shionodiscus trifidus*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschioides*  
*Thalassionema nitzschioides* var. *incurvatum*  
*Thalassionema nitzschioides* var. *inflatum*  
*Thalassionema nitzschioides* var. *parvum*  
*Thalassionema pseudonitzschioides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica* J F 4  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunowii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamica***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocenica*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperei***  
*Thalassiosira umaciensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

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

Rose -

Diatom zones (NPD)

undef

Core, section, interval (cm)

U14 190 - 311 - CC0

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

Achnanthes groenlandica  
Achnanthes inflata  
Achnanthes lanceolata  
Achnanthes lineariformis  
Achnanthes spp.  
Actinocyclus curvatus  
Actinocyclus ellipticus  
**Actinocyclus ingens**  
**Actinocyclus ingens f. nodus**  
**Actinocyclus ingens f. planus**  
**Actinocyclus oculatus**  
Actinocyclus ochotensis  
Actinocyclus octonarius  
Actinocyclus robustus  
Actinocyclus tsugaruensis  
Actinocyclus spp.  
Actinoptychus senarius  
Actinoptychus vulgaris  
Actinoptychus spp.  
Araniscus lewisianus  
Araniscus spp.  
Asteromphalus darwinii  
Asteromphalus oligocenicus  
Asteromphalus parvulus  
Asteromphalus robustus  
Asteromphalus spp.  
Azpeitia biradiata  
**Azpeitia komurae**  
Azpeitia nodulifera  
Azpeitia oligocenica  
Azpeitia praenodulifera  
Azpeitia salisburyana  
Azpeitia tabularis  
Azpeitia vetustissima  
Azpeitia spp. F 3  
Bacterosira bathyomphala  
Bacterosira fragilis  
Bacterosira spp.  
Cavitatus exiguus  
**Cavitatus jouseanus**  
Cavitatus lanceolatus  
Cavitatus linearis  
Cavitatus miocenicus  
Cavitatus rectus  
Cavitatus spp.  
Cestodiscus kugleri  
Cestodiscus trochus  
Cestodiscus spp.  
Cocconeis californica  
Cocconeis costata  
Cocconeis scutellum  
Cocconeis spp.  
Coscinodiscus asteromphalus  
Coscinodiscus marginatus  
Coscinodiscus oculus-iridis  
Coscinodiscus radiatus  
Coscinodiscus rhombicus  
Coscinodiscus symbotophorus T 2  
**Cosmodiscus insignis**  
Crucidentacula ikebei  
Crucidentacula kanayae  
Crucidentacula nicobarica  
Crucidentacula paranicobarica  
Crucidentacula sawamurae  
Cyclotella striata  
Cyclotella meneghiniana  
Cyclotella spp.  
Cymbella cistula  
Cymbella minuta  
Cymbella subaequalis  
Cymbella spp.  
Delphineis angustata  
Delphineis ischaboensis  
Delphineis kippae  
Delphineis sachalinensis  
**Delphineis simonsenii**  
Delphineis surirella  
Delphineis spp.

**Denticulopsis crassa**  
**Denticulopsis dimorpha var. dimorpha**  
**Denticulopsis dimorpha var. areolata**  
**Denticulopsis hustedii**  
**Denticulopsis hyalina**  
**Denticulopsis katayamae**  
**Denticulopsis lauta**  
**Denticulopsis praedimorpha var. minor**  
**Denticulopsis praedimorpha var. praedimorpha**  
**Denticulopsis praehtyalina**  
**Denticulopsis praehtyalinae**  
**Denticulopsis praelata**  
**Denticulopsis simonsenii**  
**Denticulopsis tanimurae**  
**Denticulopsis vulgaris**  
Denticulopsis spp.  
Diploneis bombus  
Diploneis puella  
Diploneis smithii  
Diploneis suborbicularis  
Diploneis spp.  
Distephanosira architecturalis  
Distephanosira spp.  
Ellerbeckia sol  
Ellerbeckia spp.  
Eunotia pectinalis var. minor  
Eunotia praerupta var. praerupta  
Eunotia spp.  
Fragilaria construens  
Fragilaria spp.  
Fragilaropsis cylindrus  
**Fragilaropsis dololus**  
**Fragilaropsis fossilis**  
Fragilaropsis oceanica  
**Fragilaropsis pilocena**  
Fragilaropsis spp.  
Goniothecium decoratum  
Goniothecium rogersii  
Goniothecium spp.  
Grammatophora spp.  
Halamphora costata  
Hyalodiscus obsoletus  
Hyalodiscus spp.  
**Ikebea tenuis**  
Kisseleviella carina  
Kisseleviella ezoensis  
**Koizumia tatsunokuchensis**  
Kozloviella minor  
Lisitzinia ornata  
**Mediaria magna**  
**Mediaria splendida**  
Melosira albicans  
Navicula elginensis  
Navicula lyroides  
Navicula menisculus  
Navicula salinarum  
**Neodenticula kantschatica**  
**Neodenticula koizumii**  
**Neodenticula saminae**  
Nitzschia challengerii  
**Nitzschia jouseae**  
Nitzschia palea  
**Nitzschia reinholdii**  
**Nitzschia rolandii**  
Odontella aurita  
Odontella spp.  
Paralia sulcata  
Paralia spp.  
Podosira stelligera  
Porosira glacialis T 2  
**Proboscia barboi**  
**Proboscia curvirostris**  
Proboscia interposita  
Proboscia praeborboi  
Pseudodimmerogramma elegans  
Pseudonitzschia seriata  
Pseudopyxilla americana  
Pseudotriceratium radiosoreticulatum  
**Pyxidula zabelinae**

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

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

fragments sponge T



Diatom zones (NPD)

uhdet

Core, section, interval (cm)

U14 19.0.44-cc

DATE: 2013/July/ 12

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

sponge T  
closed copora +

☆ -

15

## Diatom zones (NPD)

B

## TOTAL PRESERVATION

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

## Core, section, interval (cm)

U14 19C-54-CC

## TOTAL ABUNDANCE:

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

DATE: 2013/July/11

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

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

Fragmente

## Diatom zones (NPD)

BARREN

## Core, section, interval (cm)

U14 19C 64-CC

DATE: 2013/July/12

OBSERVER's NAME AF SK (S)

## TOTAL PRESERVATION

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

FRAGMENT

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

***Denticulopsis crassa***  
***Denticulopsis dimorpha* var. *dimorpha***  
***Denticulopsis dimorpha* var. *areolata***  
***Denticulopsis hustedii***  
***Denticulopsis hyalina***  
***Denticulopsis katayamae***  
***Denticulopsis laeta***  
***Denticulopsis praedimorpha* var. *minor***  
***Denticulopsis praedimorpha* var. *praedimorpha***  
***Denticulopsis praealyalina***  
***Denticulopsis praeatayamae***  
***Denticulopsis praelaeta***  
***Denticulopsis simonsenii***  
***Denticulopsis tanimurae***  
***Denticulopsis vulgaris***  
*Denticulopsis* spp.  
*Diploneis bombus*  
*Diploneis puella*  
*Diploneis smithii*  
*Diploneis suborbicularis*  
*Diploneis* spp.  
*Distephanosira architecturalis*  
*Distephanosira* spp.  
*Ellerbeckia sol*  
*Ellerbeckia* spp.  
*Eunotia pectinalis* var. *minor*  
*Eunotia praerupta* var. *praerupta*  
*Eunotia* spp.  
*Fragilaria construens*  
*Fragilaria* spp.  
*Fragilariopsis cylindrus*  
***Fragilariopsis dolioles***  
***Fragilariopsis fossilis***  
*Fragilariopsis oceanica*  
***Fragilariopsis pilocana***  
*Fragilariopsis* spp.  
*Goniothecium decoratum*  
*Goniothecium rogersii*  
*Goniothecium* spp.  
*Grammatophora* spp.  
*Halamphora costata*  
*Hyalodiscus obsoletus*  
*Hyalodiscus* spp.  
***Ikebea tenuis***  
*Kisseleviella carina*  
*Kisseleviella ezoensis*  
***Kozumia tatsunokuchiensis***  
*Kozloviella minor*  
*Lisitzinia ornata*  
***Medlaria magna***  
***Medlaria splendida***  
*Melosira albicans*  
*Navicula elginensis*  
*Navicula lyroides*  
*Navicula meniscus*  
*Navicula salinarum*  
***Neodenticula kamtschatica***  
***Neodenticula kozumii***  
***Neodenticula seminae***  
*Nitzschia challengerii*  
***Nitzschia jouseae***  
*Nitzschia palea*  
***Nitzschia reinholdii***  
***Nitzschia rolandii***  
*Odontella aurita*  
*Odontella* spp.  
*Paralia sulcata*  
*Paralia* spp.  
*Podosira stelligera*  
*Porosira glacialis*  
***Proboscia barboi***  
***Proboscia curvirostris***  
*Proboscia interposita*  
*Proboscia praeparboi*  
*Pseudodimmergrana elegans*  
*Pseudonitzschia senata*  
*Pseudopyxilla americana*  
*Pseudotriceratium radiosoreticulatum*  
***Pyxidula zabelinae***

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

***Cheetoceros* Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

Diatom zones (NPD)

Under

Core, section, interval (cm)

U14 19C 7H-CC

DATE: 2013/July/ 12

OBSERVER's NAME AF SK (IS)

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

*Chaetoceros* Resting Spores  
TOTAL of VEGETATIVE CELLS

5 pages

Diatom zones (NPD)

NPD12  
 TOTAL PRESERVATION  
 G (good), M (moderate), P (poor)

Core, section, interval (cm)

U14 19.C.84CC  
 TOTAL ABUNDANCE:  
 M (>60%), A (20-60%), C (5-20%)  
 F (2-5%), R (<2%), B (no diatoms)

DATE: 2013/July 12

OBSERVER'S NAME AF (SK) IS

RELATIVE ABUNDANCE of EACH TAXON

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

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

Sponge T

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

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

Chaetoceros Resting Spores  
 TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

## TOTAL 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 biradiata*  
*Azpeitia komurae*  
*Azpeitia nodulifera*  
*Azpeitia oligocenica*  
*Azpeitia praenodulifera*  
*Azpeitia salisburyana*  
*Azpeitia tabularis*  
*Azpeitia vetustissima*  
*Azpeitia* spp.  
*Bacterosira bathyomphala*  
*Bacterosira fragilis*  
*Bacterosira* spp.  
*Cavitatus exiguus*  
*Cavitatus jouseanui*  
*Cavitatus lanceolatus*  
*Cavitatus linearis*  
*Cavitatus miocenicus*  
*Cavitatus rectus*  
*Cavitatus* spp.  
*Cestodiscus kugleri*  
*Cestodiscus trochus*  
*Cestodiscus* spp.  
*Cocconeis californica*  
*Cocconeis costata*  
*Cocconeis scutellum*  
*Cocconeis* spp.  
*Coscinodiscus asteromphalus*  
*Coscinodiscus marginatus*  
*Coscinodiscus oculus-iridis*  
*Coscinodiscus radiatus*  
*Coscinodiscus rhombicus*  
*Coscinodiscus symbolophorus*  
*Cosmodiscus insignis*  
*Crucidenticula ikebei*  
*Crucidenticula kanayae*  
*Crucidenticula nicobarica*  
*Crucidenticula paranicobarica*  
*Crucidenticula sawamurae*  
*Cyclotella striata*  
*Cyclotella meneghiniana*  
*Cyclotella* spp.  
*Cymbella cistula*  
*Cymbella minuta*  
*Cymbella subaequalis*  
*Cymbella* spp.  
*Delphineis angustata*  
*Delphineis ischaboensis*  
*Delphineis kippae*  
*Delphineis sachalinensis*  
*Delphineis simonsonii*  
*Delphineis surirella*  
*Delphineis* spp.

## Core, section, interval (cm)

U14 19c-9H-2W, 100a

## TOTAL ABUNDANCE:

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

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

DATE: 2013/July/13

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

## Cheetoceros Resting Spores

TOTAL of VEGETATIVE CELLS

Fraguere

## Diatom zones (NPD)

## Core, section, interval (cm)

DATE: 2013/July/13

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

OBSERVER'S NAME (AF) SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

**Cheetoceros Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

## Diatom zones (NPD)

NPP12

## Core, section, interval (cm)

U14 19. C. 9HCC

DATE: 2013/July 12

OBSERVER'S NAME AF SK IS

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

***Chesteroceros* Resting Spores**  
**TOTAL of VEGETATIVE CELLS**

sponge F



Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19C-10H-CC

DATE: 2013/July/ 12

OBSERVER's NAME AF SK IS

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

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

*Rhaphoneis amphicerus*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praebraegonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopolica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
R ***Shionodiscus oestrupii*** —  
R ***Shionodiscus praeoestrupii***  
*Shionodiscus trifolius* —  
*Stephanopyxis dimorpha*  
***Stephanopyxis horridus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp. —  
*Surirella* spp.  
*Thalassionema bacillarum*  
R *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*  
R *Thalassiosira gravida* —  
R ***Thalassiosira grunowii*** T  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marujamca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskiöldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenitidula*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temperlei***  
*Thalassiosira umaiensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores T 2  
TOTAL of VEGETATIVE CELLS 16

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19C - 11H-CC

DATE: 2013/July/12

OBSERVER'S NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

Denticulopsis crassa  
Denticulopsis dimorpha var. dimorpha  
Denticulopsis dimorpha var. areolata  
Denticulopsis hustedtii  
Denticulopsis hyalina  
Denticulopsis katayamae  
Denticulopsis lauta  
Denticulopsis praedimorpha var. minor  
Denticulopsis praedimorpha var. praedimorpha  
Denticulopsis praehyalina  
Denticulopsis praekatayamae  
Denticulopsis praelauta  
Denticulopsis simonsenii  
Denticulopsis tanimurae  
Denticulopsis vulgaris  
Denticulopsis spp.  
Diploneis bombus  
Diploneis puella  
Diploneis smithii  
Diploneis suborbicularis  
Diploneis spp.  
Distephanosira architecturalis  
Distephanosira spp.  
Ellerbeckia sol  
Ellerbeckia spp.  
Eunotia pectinalis var. minor  
Eunotia praerupta var. praerupta  
Eunotia spp.  
Fragilaria construens  
Fragilaria spp.  
Fragilaria cylindrus  
Fragilaria dolius  
Fragilaria fossilis  
Fragilaria oceanica  
Fragilaria pilocana  
Fragilaria 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  
Medlaria magna  
Medlaria splendida  
Melosira albicans  
Navicula elginensis  
Navicula lyroides  
Navicula menisculus  
Navicula salinarum  
Neodenticula kamtschatica  
Neodenticula kolzumii  
Neodenticula seminiae  
Nitzschia challengerii  
Nitzschia jouseae  
Nitzschia palea  
Nitzschia reinholdii  
Nitzschia rolandii  
Odontella aunita  
Odontella spp.  
Paralia sulcata  
Paralia spp.  
Podosira stelligera  
Porosira glacialis  
Proboscia barbol  
Proboscia curvirostris  
Proboscia interposita  
Proboscia praebarbol  
Pseudodimmergramma elegans  
Pseudonitzschia senata  
Pseudopyxilla americana  
Pseudotriceratium radiosoreticulatum  
Pyxidula zabelinae

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

R1  
R2  
R3  
F1  
X1  
R1

R2  
C28  
X3

115  
100

close  
2.0

Chesteroceros Resting Spores  
TOTAL of VEGETATIVE CELLS



Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14-19C-12H-3W 38 cm

DATE: 2013/July/ 13

OBSERVER's NAME AF SK JS

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

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

RELATIVE ABUNDANCE OF EACH TAXON

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

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

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

- Rhaphoneis amphicerous
Rhaphoneis spp.
Rhizosolenia hebetata 1. hiemalis
Rhizosolenia hebetata 1. semispina
Rhizosolenia norvegica
Rhizosolenia praerbergonii
Rhizosolenia setigera
Rhizosolenia spp.
Roperia lesselata
Rocella gelida
Rocella praenitida
Rocella semigelida
Rocella vigilans
Rouxia californica
Rouxia granda
Rouxia isopolica
Rouxia naviculoides
Rouxia obesa
Shionodiscus oestrupii
Shionodiscus praeeostrupii
Shionodiscus trifidulus
Stephanopyxis dimorpha
Stephanopyxis horridus
Stephanopyxis turris
Stephanopyxis spp.
Suriella spp.
Thalassionema bacillaris
Thalassionema nitzschioides
Thalassionema nitzschioides var. incurvatum
Thalassionema nitzschioides var. inflatum
Thalassionema nitzschioides var. parvum
Thalassionema pseudonitzschioides
Thalassionema schradri
Thalassionema spp.
Thalassiosira antiqua
Thalassiosira bioculata
Thalassiosira castanea
Thalassiosira convexa
Thalassiosira decipiens
Thalassiosira dubiosa
Thalassiosira eccentrica
Thalassiosira fasciculata
Thalassiosira fraga
Thalassiosira gravida
Thalassiosira grunowii
Thalassiosira hyalina
Thalassiosira irregulara
Thalassiosira jacksonii
Thalassiosira jouseae
Thalassiosira leptopus
Thalassiosira lineata
Thalassiosira lusca
Thalassiosira manifesta
Thalassiosira marjameica
Thalassiosira mediaconvexa
Thalassiosira minutissima
Thalassiosira miocenica
Thalassiosira nordenskioldii
Thalassiosira orientalis
Thalassiosira praefraga
Thalassiosira praenidulus
Thalassiosira praeyabei
Thalassiosira robusta
Thalassiosira sancettae
Thalassiosira singularis
Thalassiosira temporei
Thalassiosira umaoiensis
Thalassiosira undulosa
Thalassiosira yabei
Thalassiosira spp.
Thalassiothrix longissima
Thalassiothrix spp.
Trachyneis aspera
Trachyneis spp.
Yoshidaia divergens
Yoshidaia spp.

R2 T

R1

R5

R3

R1

F10

F33

R2

R2

R4

R2

R2

0126

Handwritten tally marks and notes at the bottom right.

Chaetoceros Resting Spores TOTAL of VEGETATIVE CELLS

100

S. lico

77 4.0 5.0

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19C-12H-9C

DATE: 2013/July/12

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

全角

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

R X  
R O  
R 8  
R  
R I  
R 3



**Chaetoceros Resting Spores**

TOTAL of VEGETATIVE CELLS

Dino sponge

4.0

35

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U149c-13H-207 100m

DATE: 2013/July/13

OBSERVER's NAME AF SK IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatus IF 4
- Actinocyclus ellipticus
- Actinocyclus ingens
- Actinocyclus ingens f. nodus
- Actinocyclus ingens f. planus
- Actinocyclus oculatus
- Actinocyclus ochotensis
- Actinocyclus oclonarius
- Actinocyclus robustus
- Actinocyclus tsugaruensis
- Actinocyclus spp.
- Actinoptychus senarius
- Actinoptychus vulgaris
- Actinoptychus spp.
- Araniscus lewisianus
- Araniscus spp.
- Asteromphalus darwinii
- Asteromphalus oligocenicus
- Asteromphalus parvulus
- Asteromphalus robustus
- Asteromphalus spp.
- Azpeitia biradiata
- Azpeitia komurae
- Azpeitia nodulifera
- Azpeitia oligocenica
- Azpeitia praenodulifera
- Azpeitia salisburyana
- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus
- Coscinodiscus rhombicus
- Coscinodiscus symbolophorus T 2
- Cosmodiscus insignis
- Crucidenticula ikebei
- Crucidenticula kanayae
- Crucidenticula nicobarica
- Crucidenticula paranicobarica
- Crucidenticula sawamurae
- Cyclotella striata
- Cyclotella meneghiniana
- Cyclotella spp.
- Cymbella cistula
- Cymbella minuta
- Cymbella subaequalis
- Cymbella spp.
- Delphineis angustata
- Delphineis ischaboensis
- Delphineis kippae
- Delphineis sachalinensis
- Delphineis simonsenii
- Delphineis surirella
- Delphineis spp.

- Denticulopsis crassa
- Denticulopsis dimorpha var. dimorpha
- Denticulopsis dimorpha var. areolata
- Denticulopsis hustedii
- Denticulopsis hyalina
- Denticulopsis katayamae
- Denticulopsis lauta
- Denticulopsis praedimorpha var. minor
- Denticulopsis praedimorpha var. praedimorpha
- Denticulopsis praehyalina
- Denticulopsis praekatayamae
- Denticulopsis praelauta
- Denticulopsis simonsenii
- Denticulopsis tanimurae
- Denticulopsis vulgaris
- Denticulopsis spp.
- Diploneis bombus
- Diploneis puella
- Diploneis smithii
- Diploneis suborbicularis
- Diploneis spp.
- Distephanosira architecturalis
- Distephanosira spp.
- Ellerbeckia sol
- Ellerbeckia spp.
- Eunotia pectinalis var. minor
- Eunotia praerupta var. praerupta
- Eunotia spp.
- Fragilaria construens
- Fragilaria spp.
- Fragilariopsis cylindrus
- Fragilariopsis dolioles
- Fragilariopsis fossilis
- Fragilariopsis oceanica
- Fragilariopsis pilocena
- Fragilariopsis spp.
- Goniothecium decoratum
- Goniothecium rogersii
- Goniothecium spp.
- Grammatophora spp.
- Halamphora costata
- Hyalodiscus obsoletus
- Hyalodiscus spp.
- Ikebea tenuis
- Kisseleviella carina
- Kisseleviella ezoensis
- Koizumia tatsunokuchensis
- Kozloviella minor
- Lisitzinia ornata
- Mediaria magna
- Mediaria splendida
- Melosira albicans
- Navicula elginensis
- Navicula lyroides
- Navicula menisculus
- Navicula salinarum
- Neodenticula kamtschatka
- Neodenticula koizumii
- Neodenticula seminae IF 5
- Nitzschia challengerii
- Nitzschia jouseae
- Nitzschia palea
- Nitzschia reinholdii
- Nitzschia rolandii
- Odontella aurita
- Odontella spp.
- Paralia sulcata IF IF IF 16
- Paralia spp.
- Podosira stelligera
- Porosira glacialis
- Proboscia barbol
- Proboscia curvirostris
- Proboscia interposita
- Proboscia praeraboli
- Pseudodimmerograma elegans
- Pseudonitzschia seriata
- Pseudopyxilla americana
- Pseudotriceratium radiosoreticulatum
- Pyxidicula zabelinae

- Rhaphoneis amphicerus
- Rhaphoneis spp.
- Rhizosolenia hebetata f. hiemalis F 3
- Rhizosolenia hebetata f. semispina
- Rhizosolenia norvegica
- Rhizosolenia praebergonii
- Rhizosolenia setigera
- Rhizosolenia spp.
- Ropenia tessellata
- Rocella gelida
- Rocella praenitida
- Rocella semigelida
- Rocella vigilans
- Rouxia californica
- Rouxia granda
- Rouxia isopolica
- Rouxia naviculoides
- Rouxia obesa
- Shionodiscus oestrupii IF 8
- Shionodiscus praeoestrupii
- Shionodiscus trifolius
- Stephanopyxis dimorpha
- Stephanopyxis horridus
- Stephanopyxis lurrei T 3
- Stephanopyxis spp. IF 4
- Surirella spp.
- Thalassionema bacillaris
- Thalassionema nitzschioides
- Thalassionema nitzschioides var. incurvatum
- Thalassionema nitzschioides var. inflatum
- Thalassionema nitzschioides var. parvum
- Thalassionema pseudonitzschioides
- Thalassionema schraderi
- Thalassionema spp.
- Thalassiosira antiqua
- Thalassiosira bioculata
- Thalassiosira castanea
- Thalassiosira convexa
- Thalassiosira decipiens
- Thalassiosira dubiosa
- Thalassiosira eccentrica
- Thalassiosira fasciculata
- Thalassiosira fraga
- Thalassiosira gravida
- Thalassiosira grunowii
- Thalassiosira hyalina
- Thalassiosira irregularata
- Thalassiosira jacksonii
- Thalassiosira jouseae
- Thalassiosira leptopus
- Thalassiosira lineata
- Thalassiosira lusca
- Thalassiosira manifesta
- Thalassiosira marujamica
- Thalassiosira mediaconvexa
- Thalassiosira minutissima
- Thalassiosira miocenica
- Thalassiosira nordenskioldii
- Thalassiosira orientalis
- Thalassiosira praefraga
- Thalassiosira praenidulus
- Thalassiosira praeyabei
- Thalassiosira robusta
- Thalassiosira sancettae
- Thalassiosira singularis
- Thalassiosira temperei
- Thalassiosira umaicensis
- Thalassiosira undulosa
- Thalassiosira yabei F 3
- Thalassiosira spp.
- Thalassiothrix longissima
- Thalassiothrix spp.
- Trachyneis aspera
- Trachyneis spp.
- Yoshidalia divergens
- Yoshidalia spp.

Chesteroceros Resting Spores 34

TOTAL of VEGETATIVE CELLS 79

Fragments  
sponge IET  
foram

X Rest. IF IF IF IF IF IF

Diatom zones (NPD)

NPD 12

Core, section, interval (cm)

U14 19. C. 134cc

DATE: 2013/July/ 12

OBSERVER's NAME AF (SK) IS

TOTAL PRESERVATION

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

TOTAL ABUNDANCE:

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

RELATIVE ABUNDANCE of EACH TAXON

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

- Achnanthes groenlandica
- Achnanthes inflata
- Achnanthes lanceolata
- Achnanthes lineariformis
- Achnanthes spp.
- Actinocyclus curvatulus F
- Actinocyclus ellipticus
- Actinocyclus ingens**
- Actinocyclus ingens f. nodus
- Actinocyclus ingens f. planus
- Actinocyclus oculatus
- Actinocyclus ochotensis T
- 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 IF
- Azpeitia oligocenica
- Azpeitia praenodulifera
- Azpeitia salisburyana
- Azpeitia tabularis
- Azpeitia vetustissima
- Azpeitia spp.
- Bacterosira bathyomphala
- Bacterosira fragilis IF
- Bacterosira spp.
- Cavitatus exiguus
- Cavitatus jouseanus**
- Cavitatus lanceolatus
- Cavitatus linearis
- Cavitatus miocenicus
- Cavitatus rectus
- Cavitatus spp.
- Cestodiscus kugleri
- Cestodiscus trochus
- Cestodiscus spp.
- Cocconeis californica
- Cocconeis costata
- Cocconeis scutellum
- Cocconeis spp.
- Coscinodiscus asteromphalus
- Coscinodiscus marginatus
- Coscinodiscus oculus-iridis
- Coscinodiscus radiatus
- Coscinodiscus rhombicus
- Coscinodiscus symbolophorus
- Cosmidiscus insignis**
- Crucidenticula ikebei
- Crucidenticula kanayae
- Crucidenticula nicobarica
- Crucidenticula paranicobarica
- Crucidenticula sawamurae
- Cyclotella striata
- Cyclotella meneghiniana
- Cyclotella spp.
- Cymbella cistula
- Cymbella minuta
- Cymbella subaequalis
- Cymbella spp.
- Delphineis angustata
- Delphineis ischaboensis
- Delphineis kippae
- Delphineis sachalinensis
- Delphineis simonseni**
- Delphineis surirella
- Delphineis spp.

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

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

TOTAL of VEGETATIVE CELLS

SP = 48 R I E F

Foram T

35

## Diatom zones (NPD)

Barren

## Core, section, interval (cm)

U14 19.2-19.4cc

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

DATE: 2013/July/12

OBSERVER'S NAME AF (SK) IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

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



## Diatom zones (NPD)

Barker

## Core, section, interval (cm)

U14 19. C. 15/HCC

## TOTAL PRESERVATION

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

## TOTAL ABUNDANCE:

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

DATE: 2013/July/12

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

***Chaetoceros* Resting Spores**

TOTAL of VEGETATIVE CELLS

## Diatom zones (NPD)

undet

## TOTAL PRESERVATION

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

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

## Core, section, interval (cm)

U14 19. C 164 cc

## TOTAL ABUNDANCE:

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

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

DATE: 2013/July/12

OBSERVER'S NAME AF SK IS

## RELATIVE ABUNDANCE of EACH TAXON

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

*Rhaphoneis amphiceros*  
*Rhaphoneis* spp.  
*Rhizosolenia hebetata* f. *hiemalis*  
*Rhizosolenia hebetata* f. *semispina*  
*Rhizosolenia norvegica*  
***Rhizosolenia praeborgonii***  
*Rhizosolenia setigera*  
*Rhizosolenia* spp.  
*Roperia tessellata*  
*Rocella gelida*  
*Rocella praenitida*  
*Rocella semigelida*  
*Rocella vigilans*  
***Rouxia californica***  
*Rouxia granda*  
*Rouxia isopatica*  
*Rouxia naviculoides*  
*Rouxia obesa*  
***Shionodiscus ostrupii***  
***Shionodiscus praecostrupii***  
*Shionodiscus trifolius*  
*Stephanopyxis dimorpha*  
***Stephanopyxis horrkus***  
*Stephanopyxis turris*  
*Stephanopyxis* spp.  
*Surirella* spp.  
*Thalassionema bacillaris*  
*Thalassionema nitzschoides*  
*Thalassionema nitzschoides* var. *incurvatum*  
*Thalassionema nitzschoides* var. *inflatum*  
*Thalassionema nitzschoides* var. *parvum*  
*Thalassionema pseudonitzschoides*  
***Thalassionema schraderi***  
*Thalassionema* spp.  
***Thalassiosira antiqua***  
*Thalassiosira bioculata*  
***Thalassiosira castanea***  
***Thalassiosira convexa***  
*Thalassiosira decipiens*  
*Thalassiosira dubiosa*  
*Thalassiosira eccentrica*  
*Thalassiosira fasciculata*  
*Thalassiosira fraga*  
*Thalassiosira gravida*  
***Thalassiosira grunovii***  
*Thalassiosira hyalina*  
*Thalassiosira irregularata*  
***Thalassiosira jacksonii***  
***Thalassiosira jouseae***  
*Thalassiosira leptopus*  
*Thalassiosira lineata*  
*Thalassiosira lusca*  
*Thalassiosira manifesta*  
***Thalassiosira marjamicca***  
*Thalassiosira mediaconvexa*  
***Thalassiosira minutissima***  
*Thalassiosira miocena*  
*Thalassiosira nordenskioldii*  
*Thalassiosira orientalis*  
*Thalassiosira praefraga*  
*Thalassiosira praenidulus*  
*Thalassiosira praeyabei*  
*Thalassiosira robusta*  
*Thalassiosira sancettae*  
***Thalassiosira singularis***  
***Thalassiosira temporei***  
*Thalassiosira umaensis*  
*Thalassiosira undulosa*  
***Thalassiosira yabei***  
*Thalassiosira* spp.  
*Thalassiothrix longissima*  
*Thalassiothrix* spp.  
*Trachyneis aspera*  
*Trachyneis* spp.  
*Yoshidaia divergens*  
*Yoshidaia* spp.

Chaetoceros Resting Spores  
TOTAL of VEGETATIVE CELLS

Diatom zones (NPD)

Barren

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

Trace

Core, section, interval (cm)

U14 19. C. 174cc

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

DATE: 2013/July

OBSERVER'S NAME AF SK IS

RELATIVE ABUNDANCE of EACH TAXON

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

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

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

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

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

sponge

## Diatom zones (NPD)

BARREN

## TOTAL PRESERVATION

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

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

## TOTAL ABUNDANCE:

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

## Core, section, interval (cm)

U14 19C-19H-CC

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

DATE: 2013/July/12

OBSERVER'S NAME AF SK (S)

## RELATIVE ABUNDANCE of EACH TAXON

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

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

## Chaetoceros Resting Spores

TOTAL of VEGETATIVE CELLS