Atlas of diatoms (Bacillariophyta) from diverse habitats in remote regions of western Canada

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Abstract

High-resolution LM images of diatoms from remote regions of western Canada are presented as a contribution to our knowledge of diatom floristics, ecology and biogeography in North America. Approximately 600 taxa are imaged in 132 plates. Genera with the most taxa are Cymbella (19 taxa), Cymbopleura (29), Encyonema (23), Encyonopsis (15), Eunotia (77), Gomphonema (42), Navicula (47), Neidium (20), Nitzschia (35), Pinnularia (50) and Stauroneis (34). Diatoms were collected from diverse habitats in four of North America’s major biomes: Arctic tundra, taiga, Rocky Mountains and Pacific rainforest. Many of the photographed taxa could not be identified to species and are likely new to science. Other taxa may represent new records for North America or Canada. Images of voucher specimens are keyed to individual collection sites. Detailed descriptions of the collection sites include GPS coordinates, colour photographs, vegetation, algal substrates, elevations, pH, temperature and conductivity. Samples were collected from natural substrates in fresh to brackish, flowing and standing waters. Voucher slides are deposited in the Montana Diatom Collection (Helena) and the University of Montana Herbarium (Missoula). Cleaned diatom frustules have been deposited in the Diatom Herbarium of the Academy of Natural Sciences of Philadelphia.

Keywords
diatoms, Canada, North America, biogeography, floristics, ecology, Rocky Mountains, tundra, taiga
Introduction

From 2009 to 2017, the authors collected 96 diatom samples from a variety of fresh- and brackish-, standing- and flowing-water habitats in remote regions of western Canada (Fig. 1). Collection sites were located in four of North America’s major biomes: Arctic tundra, taiga, Rocky Mountains and Pacific rainforest. Representative specimens from those collections are presented here in a series of high-resolution photographic plates as a contribution to our knowledge of diatom floristics, ecology and biogeography in North America.

This atlas is intended as a resource for the study of diatom floristics, diatom biogeography and diatom ecology. It is not intended as a taxonomic resource nor as a definitive account of taxa richness. Priority was given to imaging unknown, unusual, uncommon and visually distinctive taxa and, of the ones that were photographed, only clean, good quality images were used. If a good quality image of a taxon was not available, we did not include that taxon in the atlas. For this reason, we expect that most of the included taxa can be identified from the images alone. For practical reasons, images are presented without written descriptions.

This atlas of diatom images is comparable to Schmidt’s Atlas (A. Schmidt 1874–1959), but with three significant differences: (1) this atlas addresses only diatoms from western Canada; (2) illustrations are high-resolution (600 dpi) digital images rather than line drawings; and (3) detailed descriptions are provided for many of the collection sites, including GPS coordinates, colour photographs, terrestrial and aquatic vegetation, algal substrata, elevations, pH, water temperature and conductivity. This atlas might also be thought of as a preliminary illustrated checklist of diatoms from western Canada that are included in the Montana Diatom Collection.
Methods

Samples were collected from rivers, streams, lakes, pools, bogs, fens, beaver ponds and wet meadows in six regions of western Canada (Fig. 1). Most of the samples are from remote locations accessible only by hiking or by kayak or canoe. Elevations at collection sites range from sea level to over 2000 m a.s.l. Many of the sampled water bodies are not named on topographic maps. In these cases, locally descriptive place names are provided by the sampler. Temperature, pH and conductivity were measured in the field with an YSI 556 Multi Probe System or a Eutech Instruments Oakton pH Tester, Model 30. Colour photographs were taken of most collection sites. The Oakton pH meter was calibrated once annually before each field season against standard solutions of pH 4.01 and pH 7.01. However, sampling trips were long and conducted under challenging conditions. The meter may have gone out of calibration and readers should be cautioned about readings other than those taken in Waterton Park.

At each site, diatoms were collected from all available near-shore substrata, including aquatic macrophytes, mosses, rocks, fine sediments and woody debris. Subsamples were combined with ambient water in a single container and preserved with iodine before transport to the laboratory, where they were treated with 30% hydrogen peroxide ($H_2O_2$) to remove organic matter. After several rinses in distilled water,
cleaned diatom material was dried on cover slips and mounted permanently on glass slides using Naphrax.

Slides were examined under LM with differential interference contrast optics and images were captured using a Leica DM LB2 research microscope and a Spot Insight monochrome digital camera (Model 14.0). Slides examined for this study are deposited in the Montana Diatom Collection (MDC) in Helena and the University of Montana Herbarium in Missoula (MONTU). Vials of cleaned and dried diatom frustules have been deposited in the Diatom Herbarium of the Academy of Natural Sciences (Drexel University) in Philadelphia.

Imaged diatoms were identified by the first author to the lowest practical taxonomic unit using available identification resources. None of the species is described as new to science, but many are designated as unknowns (e.g. *Navicula* sp.) or as comparable to another taxon (cf.). Alternative identifications by reviewers (Acknowledgements) are given in brackets in the figure captions along with the reviewer’s initials, thereby giving readers other options for identification.

**Format**

In keeping with the intended use of this atlas as a resource for the study of diatom floristics and biogeography, images of taxa are presented separately for each of the six regions (Fig. 1). Regions (site descriptions and diatom plates) are presented in the order in which they were sampled, first Waterton Lakes National Park (2009), followed by Haida Gwaii (2013, 2017), Clearwater River (2014), Coppermine River (2015), Baillie-Back Rivers (2016) and Hood River (2017). A master list of taxa and index to the plates is provided in a table at the end of the atlas (Appendix 2).

Taxa are presented in general phylogenetic order following the classification scheme of Round et al. (1990). Centric diatoms are presented first, then araphids, then monoraphids and finally biraphids. The order of genera in the biraphid group may vary from region to region. An effort was made to group species of the same or similar genera on the same plate, but sometimes species of dissimilar genera are presented on the same plate in order to conserve space.

When possible, multiple specimens of a taxon are presented in size-reduction series. However, this was not always possible for rare and uncommon taxa. In general, the number of specimens displayed on a plate is proportional to the relative abundance of that taxon in that region.

**Descriptions of collecting sites**

The following sections describe the geographic regions that were sampled and the collecting sites in each region.
Waterton Lakes National Park (Figures 2–14, Appendix 1: Plates 1–17)

Waterton Lakes National Park protects 505 km\(^2\) of the southern Canadian Rocky Mountains in south-western Alberta, ranging in elevation from 1,290 to 2,910 m a.s.l. The park forms part of the Crown of the Continent ecosystem, where several different ecological regions meet, leading to extremely high biological diversity. Here you can find species from the Great Plains, the Rocky Mountains and the Pacific Northwest. The park contains 45 different vegetation types, including grasslands, shrub lands, wetlands, lakes, spruce-fir, pine and aspen forests and alpine areas. Waterton lies within the Canadian Rockies ecoregion, which extends into western Montana as Glacier National Park and the Bob Marshall Wilderness complex.

The following description was taken from Woods et al. (2002):

“The Canadian Rockies ecoregion is composed of high, wet mountains. Significant portions are covered by snowfields and glaciers. Glaciated terrain is common and characterized by U-shaped valleys, montanes, cirques, tarns, and outwash features. This ecoregion extends into northern Montana from Alberta and British Columbia. The ecoregion is generally higher and more snow- and ice-covered than the Northern Rockies, and portions are strongly influenced by moist maritime air masses. Melting snow and rainfall are abundant at higher elevations. Some surplus water is stored in glacial deposits, unconsolidated mountain valley fill, and permeable sedimentary rocks. However, areas underlain by crystalline rocks lack sufficient groundwater storage capacity to prevent overland runoff or to develop groundwater supplies; in these places, base flow is meager and high elevation streams generally flow only during rain and snow melt periods. The highest elevations are treeless, glaciated alpine areas. The potential natural vegetation is mostly subalpine fir, Douglas-fir, and Engelmann spruce. Soils are thin or absent on upper mountain slopes but become deeper and more developed below, especially west of the Continental Divide. Recreation, forestry, and mining are common land uses”.

In the spring and summer of 2009, 41 samples of benthic diatoms were collected from waters in Waterton Lakes National Park, the Canadian component of the Waterton-Glacier International Peace Park (Table 1, Figures 2–14). The samples were collected in the course of scheduled pond and stream monitoring and assessment projects. All samples consisted of some surface water and scraping of a submerged object. One objective of benthic diatom sampling was to determine the presence and extent in the Park of *Didymosphenia geminata* (Lyngbye) M. Schmidt (“Didymo” or “rock snot”), which at the time was reported in large numbers from many streams in adjacent Glacier National Park (Bahls 2007, Schweiger et al. 2011). Didymo was detected in 14 samples collected from Waterton Lakes National Park in 2009; all of the Waterton samples that contained Didymo were from flowing waters, including the Waterton River, Belly River and several smaller streams.
### Table 1.

Samples collected from Waterton Lakes National Park in 2009. MDC = Montana Diatom Collection; MONTU = University of Montana Herbarium; NA = data not available.

| Sample Numbers | Water Body Name                          | Latitude (°N) | Longitude (°W) | Slide Numbers | Water Quality Variables |
|----------------|------------------------------------------|---------------|----------------|---------------|-------------------------|
| 4520           | Cameron Lake at border                   | 49.0000       | -114.0578      | 123-59        | 39-88                   |
| 4531           | Stable Pond                              | 49.0683       | -113.8900      | 123-89        | 40-14                   |
| 4532           | Blakiston Roadside Pond                  | 49.1069       | -113.9811      | 123-90        | 40-15                   |
| 4533           | Blakiston Beaver Pond A                  | 49.0928       | -113.8864      | 123-91        | 40-16                   |
| 4534           | Blakiston Beaver Pond B                  | 49.0961       | -113.8925      | 123-92        | 40-17                   |
| 4535           | Linnet Lake                              | 49.0614       | -113.9047      | 123-93        | 40-18                   |
| 4536           | Maskinonge Picnic Area Ponds            | 49.1114       | -113.8397      | 123-94        | 40-19                   |
| 4537           | Waterton River Pond A                    | 49.1319       | -113.8300      | 123-95        | 40-20                   |
| 4538           | Waterton River Pond B                    | 49.1308       | -113.8314      | 123-96        | 40-21                   |
| 4539           | Lonesome Lake                            | 49.0736       | -113.8931      | 123-97        | 40-22                   |
| 4540           | Sofa Wetland A                           | 49.0656       | -113.7450      | 123-98        | 40-23                   |
| 4541           | Lower Giant's Mirror Pond                | 49.0522       | -113.6861      | 123-99        | 40-24                   |
| 4542           | Sofa Wetland B                           | 49.0672       | -113.7625      | 123-100       | 40-25                   |
| 4543           | Indian Springs Pond                      | 49.1297       | -113.8731      | 124-1         | 40-26                   |
| 4544           | Buffalo Springs Pond                     | 49.1253       | -113.8531      | 124-2         | 40-27                   |
| 4545           | Waterton River                           | 49.1089       | -113.8503      | 124-3         | 40-28                   |
| 4546           | Cameron Creek                            | 49.0453       | -113.9133      | 124-4         | 40-29                   |
| 4547           | Belly River                              | 49.0475       | -113.6889      | 124-5         | 40-30                   |
| 4548           | Cameron Creek                            | 49.0786       | -113.9669      | 124-6         | 40-31                   |
| 4549           | Lost Horse Creek                         | 49.1211       | -113.9983      | 124-7         | 40-32                   |
| 4550           | Coppermine Creek                         | 49.1047       | -113.9603      | 124-8         | 40-33                   |
| 4551           | Hell Roaring Creek                       | 49.0219       | -113.8989      | 124-9         | 40-34                   |
| 4552           | Boundary Creek                           | 48.9961       | -113.9047      | 124-10        | 40-35                   |
| 4553           | Blakiston Creek                          | 49.0739       | -113.8689      | 124-11        | 40-36                   |
| 4554           | Belly River tributary                    | 49.0300       | -113.6792      | 124-12        | 40-37                   |
| 4555           | Bertha Creek                             | 49.0344       | -113.9253      | 124-13        | 40-38                   |
| 4556           | Bertha Creek                             | 49.0325       | -113.9125      | 124-14        | 40-39                   |
| 4557           | Crooked Creek                            | 49.0647       | -113.7564      | 124-15        | 40-40                   |
| 4558           | Blakiston Creek                          | 49.1058       | -113.9814      | 124-16        | 40-41                   |
| 4559           | Crooked Creek                            | 49.1167       | -113.8294      | 124-17        | 40-42                   |
| 4560           | Sofa Creek                               | 49.0775       | -113.8386      | 124-18        | 40-43                   |
| 4561           | Akamina Pools                            | 49.0314       | -114.0428      | 124-19        | 40-44                   |
| 4562           | Cameron Lake Pools                       | 49.0200       | -114.0469      | 124-20        | 40-45                   |
Figure 2. The centrepiece of Waterton Lakes National Park is Waterton Lake, which extends southwards for 11 km from the Prince of Wales Hotel in Alberta, Canada (right centre) to the Goat Haunt Ranger Station at the far end of the lake in Montana, USA (middle distance). Waterton Lake at Goat Haunt is the type locality of *Cymatopleura internationale* Bahls (2013). Photo credit: Parks Canada.
Figures 3–8. Representative flowing-water habitats sampled for diatoms in Waterton Lakes National Park 3 Belly River (4547) 4 Rowe Creek (4563) 5 Bertha Creek (4555, 4556) 6 Bauerman Creek (4565, 4566) 7 Crooked Creek (4559) 8 Cameron Creek (4546, 4548). Photos credit: Parks Canada.
Figures 9–14. Representative standing-water habitats sampled for diatoms in Waterton Lakes National Park
9 Blakiston Beaver Pond B (4534) 10 Summit Lake (4569) 11 Lower Giant’s Mirror Pond (4541) 12 Blakiston
Roadside Pond (4532) 13 Lost Lake (4568) 14 Sofa Wetland B (4542). Photos credit: Parks Canada.

Haida Gwaii Archipelago (Queen Charlotte Islands) (Figures 15–28, Appendix 1:
Plates 18–37)

The Haida Gwaii Archipelago lies about 500 km northwest of Vancouver Island and
is separated from the British Columbia mainland by the 70 to 100 km-wide Hecate
Strait (Fig. 1). The Archipelago consists of a 300 km-long, north-south trending group
of islands in the shape of a “V”. Along the western branch of the “V” is a mountain range with summits over 1,100 m elevation. Higher elevations on the archipelago support mountain hemlock and alpine tundra vegetation; lower elevations are dominated by coastal red cedar, pine, western hemlock and Sitka spruce (Banner et al. 1989).

The coastline along the eastern edge of Haida Gwaii has fluctuated dramatically since 12,000 years BP (Josenhans et al. 1995, 1997). At that time, sea level was about 150 m lower than it is today. By 9,000 years BP, the sea level had risen sharply to 15 m higher than today and remained at that level until about 5,000 years BP, falling to current levels by about 2,000 years BP. These fluctuations are the result of interplay between isostatic, eustatic and tectonic forces in the area. As a result of these fluctuations, Holocene archaeological sites (9,000–5,000 years BP) are stranded in the forest well above their original coastal locations. Diatom remains in sediments of coastal fresh-water ponds include evidence of past salt-water intrusions (Pienitz et al. 2003).

Six samples were collected from freshwater habitats in July 2013 and another three samples were collected from fresh and brackish waters in May 2017 (Table 2). The three samples collected in 2017 were originally numbered 1, 2 and 3 but are re-numbered 7, 8 and 9 here to avoid confusion with the 2013 samples. Sites sampled in 2013 were accessed from the coast by kayak; sites sampled in 2017 were accessed by inland routes. The following descriptions of the sample sites are taken from the field notes of Beverly Boynton.

**Fresh-water samples, July 2013**

All samples included squeezed vegetation, a scraped rock or stick, surface water and a few ml of iodine added. Samples were taken well above any tidal influence. Sites would all have infrequent human visitation (maybe less than yearly, or even never), especially since I (BB) walked upstream further than needed if people were getting drinking water.

Sample #1, Harriet Harbour stream pool (Fig. 15) July 11, 2013
52°17.422’N, 131°12.799’W Elevation near sea level
Flowing stream, sample from a pool. Mature western hemlock forest with some western red cedar and red alder, plus salal, grasses, mosses. The abandoned Jedway mine is to the west and north, but this stream seems to be outside their operations. (Jedway was an iron-copper mine, last operating in 1969.) Rock scrapings, plus vegetation squeeze, surface water.

Sample #2, Island Bay stream pool (Fig. 16) July 13, 2013
52°21.130’N, 131°24.643’W Elevation 20 m
Clear water, pools interspersed with small fast-flowing rocky cascades. Western hemlock, western red cedar, salal, mosses, ferns. Vegetation squeeze was of short black and green mosses, scraping was of a submerged stick with filamentous green vegetation (algae?) and surface slime.
Sample #3, lake on Mt. Yatza (front cover, Figs 17, 18) July 14, 2013
52°20.533’N, 131°26.172’W Elevation 550 m
Vegetation squeeze consisted of roots of submerged sedge and black moss; scraping from a submerged rock and surface water. Many sundews on shore, along with grasses, sedges.

Sample #4, lake on Juan Perez Sound/De La Beche Inlet (Fig. 19) July 20, 2013
52°33.121’N, 131°38.422’W Elevation 10 m
Site is 170 m from sea by GPS straight line, beyond the outlet choked with deadfall and yellow pond lilies (no ducks, but other birds seen on the lake, many dragonflies). Clear water, rocky (granite?), moss and sediment on bottom, some submerged grass-like plants. Forested around lake with western hemlock, western red cedar, no Sitka spruce or shore pines. Vegetation squeeze of dirty moss, rock scrape, surface water. Probably very few have been here, with good reason as even though it was a short distance, it was a vicious bushwhack.

Sample #5, stream pool on west end of Kostan Inlet (Fig. 20) July 20, 2013
52°34.752’N, 131°42.999’W Elevation 11 m
A pool just below a riffle. Open ground with grasses, in forest of western hemlock, Sitka spruce, western red cedar, red alder. Rocky shore and stream bottom. Hard to squeeze water from the brown moss on some rocks, no submerged plants or other vegetation. Squeezed what I could, added some water from near bottom, scraped rock with brown moss and slime, surface water.

Sample #6, stream pool east of Lyell Point (Fig. 21) July 22, 2013
52°42.456’N, 131°43.033’W Elevation 116 m
Stream scant but brisk flow into a small pool. Clear water, brown moss and rocks. Forest of red alder, western hemlock, western red cedar, salal, mosses, ferns. Squeezed brown moss (which was longer and easier to squeeze than previous samples), scraped a rock, surface water. Probably no one has been to this particular place.

Fresh- and brackish-water samples, May 2017

All samples included squeezed vegetation, a scraped rock or stick, surface water and a few ml of iodine added. According to locals, May was more rainy and cooler than usual.

Sample #7, roadside bog off Route BC-16 W (Figs 22–25) May 9, 2017
53°55.629’N, 132°06.419’W Elevation 48 m pH 4.36, T 10.6 °C
Large bog area, mostly dry, with scattered shore pine, tiny western red cedar with yellowish needles, scattered small common juniper and black crowberry, grasses, bog rosemary, Labrador tea, bog cranberry, Sphagnum and other mosses, lichen. Deep layer of peat (dug 0.3 m down with more peat below). Sample from a small area of standing water ~2 m square. Sunny, except where grassy edges of water
block the sun. This bog is in the Queen Charlotte Lowlands, on northeast Graham Island, an area quite unlike the topography of the rest of Haida Gwaii, which has a central forested plateau area and mountain ranges. This lowland area is part of the Hecate Depression and includes the Argonaut Plain.

Sample #8, East Limestone Island forest bog (Fig. 26) May 14, 2017
52°54.645’N, 131°36.868’W Elevation 33 m pH 7.6, T 10.8 °C
East Limestone Island is a small limestone island off the east coast of Haida Gwaii. The sample is from a bog with standing water, at the base of a huge Sitka spruce uprooted during a blow down in 2010. The site seems too far from ocean to get sea spray or surge tides. Mosses, grasses, ferns. Sunny when sun in the east, then shady. Thimbleberry, a few other forbs not yet budding.

Sample #9, mouth of river entering Rennell Sound (Fig. 27) May 20, 2017
53°24.543’N, 132°31.821’W Elevation 0 m pH 7.40, T 12.2 °C
Brackish (?) sample. River mouth is directly facing Rennell Sound, tide was rising (still had 1–2 hours to go), wind was blowing into the Sound from Pacific Ocean. Rainy and foggy as often is the case on west coast Haida Gwaii. There was a faint current in middle of the river, slack/eddy on edges where sample was taken (about 15 m from the Sound itself). Sand and gravel bottom and on surrounding land, with a submerged dead western red cedar at sample site providing the scrape; a few clumps of green algae floating around provided the vegetation squeeze.

Table 2. Samples collected from Haida Gwaii Archipelago in 2013 and 2017. BB = Beverly Boynton; MDC = Montana Diatom Collection; MONTU = University of Montana Herbarium.

| Sample Number | Habitat Type | Latitude (°N) | Longitude (°W) | Slide Numbers |
|---------------|--------------|---------------|----------------|---------------|
|               |              | MDC           | BB             | MDC           | MONTU         |
| 5062          | stream pool  | 52.2903       | -131.2133      | 127-55        | 42-61         |
| 5063          | stream pool  | 52.3522       | -131.4108      | 127-56        | 42-62         |
| 5064          | small lake   | 52.3422       | -131.4361      | 127-57        | 42-63         |
| 5065          | large lake   | 52.5519       | -131.6403      | 127-58        | 42-64         |
| 5066          | stream pool  | 52.5792       | -131.7164      | 127-59        | 42-65         |
| 5067          | stream pool  | 52.7075       | -131.7172      | 127-60        | 42-66         |
| 6888          | bog          | 53.9272       | -132.1070      | 136-27        | 49-62         |
| 6889          | bog          | 52.9108       | -131.6145      | 136-28        | 49-63         |
| 6890          | river mouth  | 53.4090       | -132.5304      | 136-29        | 49-64         |
Figures 15–21. Haida Gwaii collection sites in 2013 15 Site 1 (5062) 16 Site 2 (5063) 17, 18 Site 3 (5064) 19 Site 4 (5065) 20 Site 5 (5066) 21 Site 6 (5067). Photo credits: Beverly Boynton, D. Moore (15), Hope Sneller Moore (17).
Clearwater River Corridor (Figures 29–41, Appendix 1: Plates 38–55)

The following account is taken from the field notes of Beverly Boynton:

Sampling was done in June 2014 while on a 20-day canoe trip from the headwaters of the Clearwater River in Saskatchewan (Forrest Lake) to its confluence...
with the Athabasca River in Alberta (Fig. 1), estimated to be about 480 river kilometres. Moser et al. (2004) reported on the ecology of diatoms in lakes of Wood Buffalo National Park, which is located about 200 km northwest of the Clearwater/Athabasca River confluence.

The first six samples are from the boreal forest of the Canadian Shield. This area is largely an open-canopy jack pine, black spruce and white spruce forest, with extensive areas of lichens. There are also numerous shrubs, including willows, alders, birch and some forbs. The soil is shallow, i.e. often just an inch (2.5 cm) of forest detritus, on top of deep sand. The area has almost no rocks of any size that we saw (except in rapids) until we were almost off the Shield. The Shield itself is Precambrian granitic rock.

The last three samples are from the Western Canada Sedimentary Basin (depositions from inland seas advancing and retreating). This area has numerous outcrops and gorges of limestone and dolomite. The soil is much deeper, organic soil with clay, supporting a mixed forest of closed-canopy paper birch, white spruce, balsam poplar and a great many shrubs and forbs.

Both areas are topographically fairly flat (especially on the Shield), with an enormous number of shallow gouges from the Laurentide Ice Sheet, which are filled with water. One does not need to walk far to encounter a bog, fen, marsh, swamp, pond, lake or creek. Drainage is generally poor because of the flatness. The hydrology is still quite young and sorting itself out and still influenced by post-glacial rebound.

No samples came from the Clearwater River itself or from areas that seemed to be receiving flow from the River. Because of the low number of people on most sections of the river, along with most people’s general distaste for spending time in bogs, fens, marshes and swamps, the specific sampling sites are probably rarely if ever visited and did not seem to be disturbed. Mosquitoes and blackflies were moderately bad in general on this trip, but were not worse at the sampling sites and posed little problem for the Slime Crew (my husband assisted with some collecting). As always, seeking out these microhabitats added immensely to the interest of the trip; botany and geology were highlights.

All samples consisted of some surface water, a vegetation squeeze and scraping of a submerged object. There were no rocks to scrape and the sticks (when found) had only a minimal slimy feel. If sediment was present on the surface, it was sampled.

Coordinates are WGS84, latitude-longitude in degrees and decimal minutes, elevation in metres. Unfortunately, my camera drowned after the first week; pictures are then from my Itouch; however, the last nine days were quite overcast and I barely was able to keep my Itouch recharged from my Solio. All samples are from the watershed of the Clearwater River.

Sample #1, bog near Naomi Lake (Fig. 29) June 8, 2014
57°38.383’N, 109°02.102’W Elevation 498 m pH 6.2, T not taken
Looks like I forgot the iodine on this; I added some on July 1. Area of small bogs within a larger area of semi-open jack pine, reindeer moss and Labrador tea. In the bog: mountain cranberry, Labrador tea, lichens, mosses.
Sample #2, bog near outlet of Dell Lake (Figs 30, 31) June 9, 2014
57°35.342’N, 108°51.487’W Elevation 480 m pH 4.6, T not taken
Clear, sunny, no obvious flow. *Sphagnum* blanket with a lot of leatherleaf, some larch, small balsam fir, Labrador tea, cottongrass, cloudberry.

Sample #3, bog between Lloyd Lake and First Gorge (Fig. 32) June 13, 2014
57°10.563’N, 108°38.360’W Elevation 470 m pH 4.96, T not taken
*Sphagnum* moss, sunny, clear, no obvious flow. A few small jack pine and black spruce, a lot of bog birch, sedges, bog rosemary and bog laurel. Elk scat in the water.

Sample #4, fen adjacent to a lake (Figs 33, 34) June 14, 2014
57°05.537’N, 108°19.593’W Elevation 453 m no pH or T taken
Looks like I forgot the iodine on this; I added some on July 1. Extensive area of standing water adjacent to a lake. Moss, *Sphagnum*, bog rosemary, bog birch, leather leaf, jack pine, river birch, a few sedges, Labrador tea. Sediment on surface.

Sample #5, wet grassy meadow near Granite Gorge (Figs 35, 36) June 16, 2014
57°00.298’N, 108°26.680’W Elevation 439 m pH 6.89, T 16.2 °C
The Clearwater runs through Granite Gorge with big rapids, then a fairly large arm doubles back to end at edge of sample site meadow. Samples are at an elevation such that it probably does not get flooded from the river (this was a high water year while we were there). The grass is thick with wet muck and some standing water. My sample is near base of a steep-sloped bench of jack pines and paper birch, with a few small balsam poplars, plus lichens, mosses, cranberries, kinnikinnick etc. One picture shows a small flow of water coming off the bench to sample site. Sample site has marsh cinquefoils, bog birch, grasses, willows, dwarf raspberry. Sample taken from a small area of open water with no obvious flow, sunny, clear. Some specks of sediment floating on top, plus 10 × 10 cm blobs of red-brown stuff floating. Some (natural?) oil seeps here. Bottom is muck and debris. [The Alberta tar sands are about 100 km northwest of here.]

Sample #6, swamp above Olsen Rapid (Fig. 37) June 17, 2014
56°55.749’N, 108°39.526’W Elevation 437 m pH 5.22, T 13.9 °C Swamp with mature jack pine, alive in water. A few grasses. Water clear, no obvious flow, surface has clusters of bubbles (amphibian eggs?). Bottom mucky with organic detritus. Swamp is within a mature jack pine forest with the usual lichens, cranberries, dwarf blueberries, many wild lily of the valley and bunchberries. Some fireweed, mosses, Saskatoon (service berry).

Sample #7, small stream (Figs 38, 39) June 20, 2014
56°46.338’N, 109°17.041’W Elevation 371 m pH 7.7, T 21.5 °C
Small semi-shaded, slowly-flowing stream, clear water, draining towards Clearwater. Birch, willow and alder forest, with mosses, currant, strawberry, horsetails, *Mertensia*. Bottom was leafy detritus, muck. Sample was from a still pool. Still on the Shield, pink granitic rock with frequent outcrops.
Figures 36–41. Collection sites along the Clearwater River corridor 36 Site 5 (6277) 37 Site 6 (6278) 38, 39 Site 7 (6279) 40 Site 8 (6280) 41 Site 9 (6281). Photos credit: Beverly Boynton.
Sample #8, wet meadow above bend in Clearwater (Fig. 40) June 22, 2014
56°41.860’N, 109°58.600’W Elevation 304 m pH 7.52, T 18.7 °C
Depression in meadow with standing water, no visible flow, clear, sunny. Willows, cattails, grasses, plumed false Solomon seal, patches of mosses in water along with detritus on bottom. This was the only such extensive wet meadow we saw on the trip and it was in the Western Sedimentation Basin, with the river now in a wide valley with wooded ridges on either side of the valley. No outcrops or boulders and the sandy benches were quite infrequent. Shrubs and trees were bigger and more diverse, with soil much deeper (black, a lot of organic material before reaching clay-sand). Grass was 1–1.5 m tall, thick, meadow rue. Many pools of water in the entire area.

Sample #9, pool near Greentree Provincial Campground (Fig. 41) June 24, 2014
56°39.233’N, 110°57.320’W Elevation 256 m pH 7.52, T 12.7 °C
In woods (birch, balsam poplar, alder, balsam fir), standing water, no obvious flow, shady. Immediate area around this was pretty flat. Dwarf raspberry, currants, grasses, horsetails. Brown and green algae blobs on surface, bottom has muck and detritus.

### Table 3. Samples collected from the Clearwater River corridor, June 2014. BB = Beverly Boynton; MDC = Montana Diatom Collection; MONTU = University of Montana Herbarium.

| Sample Number | Habitat Type       | Latitude (°N) | Longitude (°W) | Slide Numbers |
|---------------|--------------------|---------------|----------------|---------------|
| MDC | BB | Slide Numbers |
| MDC | MONTU |
| 6273 | 1 | bog | 57.6397 | -109.0350 | 131-34 | 46-40 |
| 6274 | 2 | Sphagnum bog | 57.5892 | -108.8581 | 131-35 | 46-41 |
| 6275 | 3 | Sphagnum bog | 57.1761 | -108.6394 | 131-36 | 46-42 |
| 6276 | 4 | fen | 57.0922 | -108.3267 | 131-37 | 46-43 |
| 6277 | 5 | wet grassy meadow | 57.0050 | -108.4447 | 131-38 | 46-44 |
| 6278 | 6 | swamp | 56.9292 | -108.6589 | 131-39 | 46-45 |
| 6279 | 7 | small stream | 56.7722 | -109.2839 | 131-40 | 46-46 |
| 6280 | 8 | wet meadow | 56.6978 | -109.9767 | 131-41 | 46-47 |
| 6281 | 9 | shady pool | 56.6539 | -110.9553 | 131-42 | 46-48 |

Coppermine River Corridor (Figures 42–57, Appendix 1: Plates 56–76)
The following account is taken from the field notes of Beverly Boynton:

Sampling was done while on a 28-day canoe trip on the Coppermine River (Fig. 1), from Point Lake near the headwaters, to its mouth in Coronation Gulf of the Arctic Ocean, about 450 river kilometres. All samples were from fresh water, none closer to the
Arctic Ocean than about 10 km; no samples were taken from the Coppermine River itself. Only sample #1 was from Northwest Territories; the rest are from Nunavut, Canada.

The trip began in the upper Coppermine, which is a system of lakes on Arctic tundra, above the treeline. At Redrock Lake, the Coppermine leaves the tundra to enter white spruce forest with willow and birch shrubs. Treeline and its transition zone follow the protected river valley up to the Coppermine Mountains, though tundra predominates in places beyond the river valley. At Big Bend, the trees thin and become shorter. Past the Coppermine Mountains, the terrain is predominantly tundra vegetation of grasses and sedges, lichens, willows and smaller birch shrubs.

The entire trip was on the Canadian Shield, though this Precambrian granitic rock was not always visible due to postglacial till and sediment deposition. A huge glacial lake, Lake Coppermine, formed during deglaciation when a lobe of the ice sheet blocked the Coppermine’s outlet to the sea. This lake extended from Fairy River to Rocky Defile and has left behind lake sediments of marl. Further downriver, the Coppermine cuts through sandstone, limestone and dolomite, forming gorges. The river then goes through the Muskox Intrusion, which was formed during the Proterozoic from mantle plumes. This is one of the globe’s largest basalt flood plains and consists of rock types such as gabbro, which is the rock type from Escape Rapids to Coronation Gulf (Dredge 2001).

Place names were non-existent, so descriptive terms are used here.

Sample #1, grassy meadow at Wolf Camp (Fig. 42) July 20, 2015
65.8268°N, 114.3896°W Elevation 350 m pH 8.18, T 12 °C
Standing water, about 10 m × 5 m, in a large, sunny grassy meadow with a few willows. About 100 m from river. No visible surface inlet/outlet. Beyond the meadow, there is a small ridge with granitic bedrock outcrops. Water is clear, with bottom of Sphagnum moss. Surrounded by red and green moss, grasses, no forbs. Sample: surface water, Sphagnum squeeze, scraped slimy stick.

Sample #2, Coppermine tributary at marl bluff (Figs 43, 44) July 24, 2015
66.3652°N, 114.4949°W Elevation 281 m pH 8.38, T 19.2 °C
Small, sluggish tributary of Coppermine River, about 105 m above the confluence. Sunny area with grey clay on bottom and on stream bank (strong reaction to HCl). Some cotton grass, grasses, no forbs; further away are white spruce, birch shrubs, buffalo berry, marl bluffs. Water is clear, with a small fish. Sample: surface water, superficial bottom sediment, squeezed grass roots, scraped branch and twig.

Sample #3, small lake at Orchid Camp (Figs 45, 46) July 26, 2015
66.7441°N, 115.3878°W Elevation 282 m pH 8.6, T 22.4 °C
Multiple little lakes about 113 m from Coppermine. Sunny, maybe 1 m deep, Sphagnum moss, surrounded by cotton grass, mosses, birch shrubs, white spruce. In a low area, no obvious surface inlet/outlet. Twinflowers, squirrel egg yellow orchid and yellow lady’s slipper orchid nearby.
Sample #4, small stream at Bear Skull Camp (Figs 47, 48) July 28, 2015
66.8800°N, 116.3331°W Elevation 288 m pH 7.5, T 17.4 °C
Small meandering stream of still water in large, sunny, hummocky meadow between two long sandy eskers. Maybe 0.6 m deep, *Sphagnum* and aquatic grasses on bottom. Sample: surface water, grass root squeeze, scraped a branch.

Sample #5, tundra pool (Fig. 49) July 30, 2015
67.2461°N, 116.3628°W Elevation 489 m pH 8.1, T 17.2 °C
Sunny area of hummocks with pools of standing water, surrounded by sedges, grasses, no forbs, rocky. Maybe 0.3 m deep, muddy bottom with decaying vegetation. Clear water, no surface inlet/outlet noted. Split a rock, good reaction from HCl; green specks on split surface may have been copper ore. About 7 km from Coppermine River.

Sample #6, Red Sand Lake (Fig. 50) July 30, 2015
67.2528°N, 116.3602°W Elevation 472 m pH 8.0, T 20.5 °C
Lake 6.9 km from Coppermine. Clear water with surface algae, sunny, about 15 cm deep at edge. Surrounded by grasses, sedges, no forbs. Sample: surface water, poor squeeze of hard-to-pull grasses, scraped a slimy rock. Bottom with reddish-brown colour [iron-oxidizing bacteria?].

Sample #7, September Mountains Lake (Fig. 51) August 1, 2015
67.1936°N, 115.7955°W Elevation 440 m pH 8.3, T 17.4 °C
Lake with clear water, sunny. *Sphagnum* moss and mud on bottom, surrounded by aquatic grasses. About 3.7 km from Coppermine. Sample: surface water, grass squeeze, no sticks or accessible stones to scrape.

Table 4. Samples collected from the Coppermine River corridor, July/August 2015. BB = Beverly Boynton; MDC = Montana Diatom Collection; MONTU = University of Montana Herbarium.

| Sample Numbers | Habitat Type | Latitude (°N) | Longitude (°W) | Slide Numbers |
|----------------|--------------|---------------|----------------|---------------|
| MDC | BB | | | MDC | MONTU |
| 6824 | 1 | lake | 65.8268 | -114.3896 | 135-62 | 48-97 |
| 6825 | 2 | stream | 66.3652 | -114.4949 | 135-63 | 48-98 |
| 6826 | 3 | lake | 66.7441 | -115.3878 | 135-64 | 48-99 |
| 6827 | 4 | stream | 66.8800 | -116.3331 | 135-65 | 48-100 |
| 6828 | 5 | pool | 67.2461 | -116.3628 | 135-66 | 49-1 |
| 6829 | 6 | lake | 67.2528 | -116.3602 | 135-67 | 49-2 |
| 6830 | 7 | lake | 67.1936 | -115.7955 | 135-68 | 49-3 |
| 6831 | 8 | lake | 67.3350 | -115.7965 | 135-69 | 49-4 |
| 6832 | 9 | lake | 67.6181 | -115.4367 | 135-70 | 49-5 |
| 6833 | 10 | lake | 67.7657 | -115.3817 | 135-71 | 49-6 |
Figures 42–49. Collection sites along the Coppermine River corridor 42 Site 1 (6824) 43, 44 Site 2 (6825) 45, 46 Site 3 (6826) 47, 48 Site 4 (6827) 49 Site 5 (6828). Photos credit: Beverly Boynton.

Sample #8, Coppermine Mountains Lake (Figs 52, 53) August 3, 2015
67.3350°N, 115.7965°W Elevation 435 m pH 8.2, T 14.8 °C
Small lake with clear water, surrounded by aquatic grasses, sedges. Bottom with reddish-brown algae-like growth [iron-oxidising bacteria?]. About 4 km from Coppermine. Sample: surface water, squeezed grass roots, scraped rocks from bottom.
Figures 50–57. Collection sites along the Coppermine River corridor 50 Site 6 (6829) 51 Site 7 (6830) 52, 53 Site 8 (6831) 54, 55 Site 9 (6832) 56, 57 Site 10 (6833). Note mats of iron-oxidising bacteria in Figs 50, 53, 56, 57. Photos credit: Beverly Boynton.

Sample #9, Escape Rapids Lake (Figs 54, 55) August 6, 2015
67.6181°N, 115.4367°W Elevation 145 m pH 6.76, T 18 °C
Moderately large lake in tundra in wet, hummocky area. No definite inlet, outlet. This is now in the area of post-glacial marine sedimentation from sea level changes;
fresh water sample may be influenced by marine sediments. Clear water, sunny, aquatic plants, grasses, sedges, willows, marsh cinquefoils. Mud and algae on bottom. Sample is from a quiet backwater on a very windy day. Sample: surface water, plant squeeze, no rocks or sticks to scrape.

Sample #10, Bloody Falls Tundra Lake (Figs 56, 57) August 8, 2015  
67.7657°N, 115.3817°W Elevation 72 m pH 8.17, T 11.3 °C One of many small lakes in area of tundra and hummocks. Red sand, rocks, and algae [iron-oxidising bacteria?] on bottom. Clear water, sunny, some insects in water. Grasses, sedges, willows surround the lake. Sample: surface water, grass squeeze, scraped non-slimy rock.

Baillie & Back River Corridors (Figures 58–72, Appendix 1: Plates 77–108)

The following account is taken from the field notes of Beverly Boynton:

Sampling was done while on a 26-day canoe trip that went from a lake on the Baillie River (a main tributary of the Back River), to the Baillie’s confluence with the Back River, then down the Back River, passing through Pelly Lake and ending on Mission Island in Upper Garry Lake, about 445 river km from our starting point (Fig. 1). Elevation at our put-in on the Baillie was 284 m, about 168 m near the confluence of the Baillie and Back Rivers (a 120 m drop over about 185 km), then the Back essentially becomes flatwater, with an elevation at our take out on Mission Island of 148 m (a drop of only 20 m over the final 260 km). All samples are fresh water from Nunavut.

The sampling area is subarctic tundra on the Canadian Shield, with continuous permafrost and a thin active layer of reportedly acidic soil. There are some areas of granitic outcrops, but most of the river corridor is covered with extensive deposits from de-glaciation of the Laurentide Ice Sheet, including sandy eskers, large sand flats and areas of mostly sorted till and sediments. In addition, there are extensive areas of peat, with sphagnum moss and other mosses. Lichen species were fairly ubiquitous. The area is well above the treeline, except for one small area on the Baillie that has a relic stand of white spruce. The shrubs include dwarf birch, small willow species, red alder and various Ericaceae species. Other plants included grasses, sedges and the expected flora for subarctic bogs, fens and uplands.

Annual precipitation is low, making this area a polar desert, but during summer, snow melt and thawing of the active layer results in waterlogged soil and a network of lakes, streams, rivers and wetlands. Throughout the collection area were numerous ponds, pools of standing water, wet peatlands and wet to moist areas of hummocks and patterned ground, in addition to dry uplands.

From local reports, May and June were rainy months, at least in Yellowknife, about 480 km to the west of our put-in. The Back clearly had high waters, as most dry riverbeds noted on maps were covered with water. The Back drains a huge area and, being a lowlands
river on permafrost, the accumulated water is slow to discharge into the Arctic Ocean. We had a number of high wind days that kept us from paddling and a few periods of rain. Place names are my own descriptive terms, sometimes adding nearby names from Canadian maps.

Sample #1, pond in wetland near the Baillie River (Figs 58, 59) July 4, 2016
64°53.020’N, 105°46.733’W Elevation 239 m pH 7.9, T 22 °C
A small, shallow, sunny tundra pool, about 10 m by 5 m, in a large wetland with plenty of mosquitoes, situated on a terrace above the Baillie River. No surface inlet or outlet seen. Clear water, red-brown algae and sediments [iron-oxidising bacteria] on bottom. Surrounding vegetation includes dwarf birch, willow, Labrador tea, grass, sedges. Further away from river and pond is a ridge with granitic outcrops. Sample: surface water, grass and algae squeeze, scraped stick.

Sample #2, pond near Merganser Camp off the Baillie River (Fig. 60) July 6, 2016
64°53.118’N, 105°04.829’W Elevation 214 m pH 7.15, T 18.6 °C
Tundra pond in a large, flat, sunny area of moist hummocks with no standing water between them. No surface inlet or outlet seen. Clear water, brown algae and sediments on bottom. Surrounding vegetation includes dwarf birch, willow, Labrador tea, cloudberry, mountain avens, pink and yellow louseworts, bog rosemary, grass, and sedges including cotton grass. Further away from the river and pond is a ridge with granitic outcrops. Sample: surface water, squeezed vegetation and scrape.

Sample #3, backwater on the Baillie (Fig. 61) July 8, 2016
64°57.726’N, 104°35.904’W Elevation 198 m pH 7.1, T 19.4 °C
Still backwater in sunny area on the Baillie River, in an area of flooding. Clear water, river bottom of sand and fine silt, submerged aquatic plants. Sand and boulders on shoreline, but no plants. Sample: surface water, rooted submerged plant squeeze, scraped rock.

Sample #4, pond near Mud Beach Camp off the Back (Fig. 62) July 11, 2016
65°57.726’N, 103°35.828’W Elevation unknown pH 6.4, T 23.9 °C
Tundra pond in sunny area. Surrounding vegetation includes willow, Labrador tea, yellow lousewort, bog rosemary, aquatic grasses, sedges, mosses.

Sample #5, pond near Hill Camp off the Back (Fig. 63) July 12, 2016
65°23.521’N, 103°23.291’W Elevation 189 m pH 6.2, T 22.7 °C
Tundra pond in sunny area, with short grasses, forbs and shrubs further from the pond. Clear water, bottom with red-coloured sediments [probably colonies of iron-oxidising bacteria]. Vegetation surrounding the pond includes dwarf birch, willow, Labrador tea, yellow lousewort, bog rosemary, cloudberry, mosses. Sample taken on windy day from lee end.
Table 5. Samples collected from the Baillie and Back River corridors, July 4–July 26, 2016. BB = Beverly Boynton; MDC = Montana Diatom Collection; MONTU = University of Montana Herbarium.

| Sample Numbers | Habitat Type          | Latitude (°N) | Longitude (°W) | Slide Numbers |
|----------------|-----------------------|---------------|----------------|--------------|
| MDC | BB | | | | |
| 6856 | 1 | pool in wetland | 64.8837 | -105.7789 | 135-94 | 49-29 |
| 6857 | 2 | pond | 64.8853 | -105.0805 | 135-95 | 49-30 |
| 6858 | 3 | river backwater | 64.9621 | -104.5984 | 135-96 | 49-31 |
| 6859 | 4 | pond | 65.9621 | -103.5971 | 135-97 | 49-32 |
| 6860 | 5 | pond | 65.3920 | -103.3882 | 135-98 | 49-33 |
| 6861 | 6 | pool | 65.6039 | -102.6807 | 135-99 | 49-34 |
| 6862 | 7 | river backwater | 65.9111 | -101.8610 | 135-100 | 49-35 |
| 6863 | 8 | wetland | 65.9405 | -101.4412 | 136-1 | 49-36 |
| 6864 | 9 | pond | 65.8964 | -101.0479 | 136-2 | 49-37 |
| 6865 | 10 | wetland | 65.8989 | -101.0356 | 136-3 | 49-38 |
| 6866 | 11 | small stream | 65.9063 | -100.7711 | 136-4 | 49-39 |

Sample #6, pool near Inuksuk Camp off the Back (Fig. 64) July 14, 2016
65°36.231’N, 102°40.844’W Elevation 205 m pH 6.44, T 18.7 °C
Small pool of standing water in area of moist hummocks, atop a bedrock granite ridge. Clear water, grasses and mosses in water and on bottom (intermittent standing water). Surrounding vegetation includes dwarf birch, Labrador tea, alpine azalea, cloudberry, sedges, cottongrass, mosses, lichens. Sample: surface water, squeezed aquatic grasses.

Sample #7, eddy on the Back River (Fig. 65) July 19, 2016
65°54.663’N, 101°51.659’W Elevation 156 m pH 7.28, T 13.6 °C
Sunny area in a backwater of the Back River. Clear water, fine silt bottom. Aquatic plants in water. Sample: surface water, squeeze submerged roots/stems, difficult scrape of submerged rock.

Sample #8, wetland near Pelly Monument Camp at Pelly Lake (Fig. 66) July 20, 2016
65°56.431’N, 101°26.474’W Elevation 158 m pH 7.17, T 16.2 °C
Sunny area of patterned ground, filled with clear standing water. Vegetation includes aquatic plants, grasses, mosses, a few forbs, but no shrubs. Much goose scat, feathers, many molting geese ran off upon our arrival. Sample: surface water, squeezed submerged roots.
Figures 58–63. Collection sites along the Baillie and Back River corridors 58, 59 Site 1 (6856) 60 Site 2 (6857) 61 Site 3 (6858) 62 Site 4 (6859) 63 Site 5 (6860). Note microbial mat of red iron-oxidising bacteria in 59 Photos credit: Beverly Boynton.

Sample #9, pond on tundra near Cabin Camp (Figs 67, 68) July 22, 2016
65°53.784’N, 101°02.873’W Elevation 166 m pH 6.80, T, 15.7 °C
Long tundra pond in a swath of moist hummocks with cottongrass, situated between two granite ridges. Water possibly has channels that connect with Pelly Lake. Sunny, sediments and algae on bottom. Vegetation includes a few dwarf birch, Labrador tea, cottongrass, grass, moss. Many mosquitoes, a pair of red-necked phalaropes and snow buntings flew by. Sample: surface water, plant squeeze, rock scrape.
Figures 64–68. Collection sites along the Baillie and Back River corridors 64 Site 6 (6861) 65 Site 7 (6862) 66 Site 8 (6863) 67, 68 Site 9 (6864). Photos credit: Beverly Boynton.

Sample #10, Pelly Cove wetland (Figs 69, 70) July 24, 2016
65°53.931’N, 101°02.134’W Elevation 179 m pH 6.9, T 11.6 °C
Sunny area of clear water, bottom with sediments and Sphagnum moss, algae, surrounded by granite rocks. Vegetation includes Labrador tea, mountain cranberry, bog rosemary, grasses and mosses.

Sample #11, Mission Island rivulet (Figs 71, 72) July 26, 2016
65°54.380’N, 100°46.266’W Elevation 166 m pH 6.6, T 13.5 °C
Sample from pool of clear still water, partly shaded by willows, in small creek flowing down a broad swale between two tundra ridges. Bottom with algae, sediments, mosses. Surrounding vegetation includes willow, Potentilla, grass, moss. Sample: surface water, grass squeeze, scraped stick.
Hood River Corridor (Figures 73–97, Appendix 1: Plates 109–132)

The following account is taken from the field notes of Beverly Boynton:

Sampling was done while on a 27-day, 300-km canoe trip in Nunavut, from the headwaters of the Hood River to the north end of the peninsula dividing the Hood River mouth in Arctic Sound from Baillie Bay (both are in Bathurst Inlet of Coronation Gulf of the Arctic Ocean). Elevation at our put-in is 414 m and the mouth of the Hood is at sea level.

The Hood River is on the Central Continental Arctic portion of North America, on the Precambrian Canadian Shield. It lies between the Contwoyto Plateau to the south (a 450 m high plateau of gently rolling drift) and the Tree River uplands to the north and west (a lower, dissected granite plateau of smooth rock-knob hills with deep valleys) and flows through isolated, rugged tundra. For most of its length, the Hood is less than 150 km south of Coronation Gulf of the Arctic Ocean as it runs west to east. There are many areas of Precambrian granitic outcrops, but much of the surface along the river corridor is covered with extensive deposits from de-glaciation of the
Laurentide Ice Sheet, with areas of sorted and unsorted till and sediment, including sandy eskers, sand, mud and clay flats.

The lower half of the Hood has some metamorphic rocks of quartzite and slate, with clay tills. The Wilberforce Hills to the east are the dissected edge of the Contwoyto Plateau. About 50 km from its mouth, the Hood turns abruptly to the north in its run to the coast. The river then lies in a broad flood plain with evidence of previous salt-water incursions from when sea levels were higher.

Bathurst Inlet is a physiographic division of the Shield, with a major NNE to SSW fault forming the boundary between the uplands and the Coronation Gulf Lowlands. It is a complex submerged valley, a 200 km-long extension of the Coronation Gulf lowlands penetrating the Shield, with west-dipping diabase and basalt sills, often overlying basalt. The Queen Maud Lowlands lie to the east of the Inlet.

The river is all above the Arctic Circle, well above the treeline, with continuous permafrost and a thin active layer of soil. Lichen species were ubiquitous as were Ericaceae spp., dwarf birch, willow, alder, sedges and grasses. Mosses seemed less extensive than seen on other barren grounds trips; we identified 50 species of arctic wildflowers.

Unfortunately, strong headwinds prevented us from paddling to the actual estuary of the Hood in Arctic Sound and, even more disappointing, a hike to the tip of the peninsula ended on tall undercut bluffs that prevented a descent to the ocean at the northernmost point. For this reason, the final Hood River sample was about 8 km upstream from Arctic Sound and the first Bathurst Inlet sample (on east side of the peninsula) was perhaps half a mile to the south of the headlands of the peninsula.

The Hood River was very low this season, presumably due to low winter snow, an early snow and ice melt off and lack of rain. Compared to a personal account by friends who paddled the river in 2013 and found it to be low water, this year the river was much lower.

There is considerable research being done on the arctic freshwater system in the face of climate change. Significant changes include rising surface air temperatures, warming permafrost and shrub encroachment on the northern tundra. Storage and cycling of fresh water on land has changed along with precipitation, river discharge, lake abundance and size and soil moisture.

In total, 16 samples of benthic diatoms were collected from water bodies along the Hood River corridor. (There is no sample #10.) The following field notes describe the sampling sites. Datum is WGS84, coordinates are latitude-longitude in degrees and decimal minutes; elevation is in metres. Place names are my own (BB) descriptive terms, sometimes adding nearby names from Canadian maps.

Sample #1, lake near headwaters of the Hood River (Figs 73, 74) July 2, 2017
66°34.513’N, 112°52.756’W Elevation 426 m pH 8.18, T 18.2 °C
Lake in dry uplands with no defined inlet/outlet, but surrounded by various low ridges with granite bedrock. Scrape was on rock with leafy black algae; water was clear but with glops of gold/brown floating on surface. Usual dwarf birch, Ericaceae, forbs mosses, lichens.
Sample #2, lake near Windy Point Camp, headwaters of the Hood River (Fig. 75) July 4, 2017
66°36.929'N, 112°28.089'W Elevation 415 m pH 5.72, T 15.9 °C
Lake in dry uplands with granite outcrops and boulders, in a valley between two ridges. Dwarf birch, sedges, bog rosemary, Labrador tea, cottongrass, mountain cranberry, lichens and mosses. Brown sediments and algae on bottom.

Sample #3, flowing stream (Fig. 76) Elevation unknown July 4, 2017
66°36.929'N, 112°28.089'W (coordinates approximate) pH 5.95, T 11.1 °C
Briskly flowing stream with bed of small granite boulders, sunny with some shade from banks. Sample is from a flat area of stream that is maybe an area of springs (the stream flows down a pretty good gradient for the area). Sample is from a quiet side pool. Green mosses, some sedges, tall willows.

Sample #4, moist hummocks (Figs 77, 78) July 8, 2017
66°39.164'N, 111°53.829'W Elevation 380 m pH 5.7, T 12.2 °C
Red moss, Vaccinium, scattered dwarf birch and Labrador tea. The tundra in general seems very dry this season. Sample was just an ooze in the hummocks.

Sample #5, large lake with short outlet to Hood (Figs 79, 80) July 8, 2017
66°38.165'N, 111°52.434'W Elevation 376 m pH 6.73, T 20.6 °C

Sample #6, wet meadow near Kapolak Camp (Figs 81, 82) July 11, 2017
66°37.970'N, 111°26.082'W Elevation 372 m pH 5.9, T 13.1 °C
Sedges, mosses, bottom with sediments and brown moss, sunny. In area of dwarf birch, Labrador tea.

Sample #7, Wright River (Figs 83, 84) July 15, 2017
66°50.173’N, 110°23.237’W Elevation 285 m pH 7.4, T 16.9 °C
Quiet pool on edge Wright River, a major tributary to the Hood River. Water clear, sunny, brown algae on rocks, no vegetation in water, the usual dwarf birch and tundra vegetation.

Sample #8, Wilberforce Hills, lake (Figs 85, 86) July 20, 2017
67°03.819’N, 108°40.383’W Elevation 273 m pH 7.24, T 11.8 °C
Large sunny lake with inlet from relatively high hills to the east and short outlet into the Hood River. Granite on shore, dwarf birch, willow, mosses, lichens, sedges, Ericaceae.

Sample #9, Hood River below Wilberforce Falls (Fig. 87) July 22, 2017
67°06.931’N, 108°49.194’W Elevation 35 m pH 6.80, T 15.7 °C
Tiny eddy with sand and gravel bottom, no plants or algae visible.
Figures 73–78. Collection sites along the Hood River corridor 73, 74 Site 1 (6898) 75 Site 2 (6899) 76 Site 3 (6900) 77, 78 Site 4 (6901). Photos credit: Beverly Boynton.

Sample #10, James River moist meadow (Fig. 88) July 23, 2017
67°12.274′N, 108°48.547′W Elevation 33 m pH 6.28, T 8.4 °C
Sample from standing water in a moist meadow to south of James River, a main tributary of the Hood River. Sedges, clear, sunny.

Sample #11, James River lake (Figs 89, 90) July 23, 2017
67°11.910′N, 108°50.912′W Elevation 236 m pH 7.26, T 13.0 °C
Figures 79–84. Collection sites along the Hood River corridor 79, 80 Site 5 (6902) 81, 82 Site 6 (6903) 83, 84 Site 7 (6904). Photos credit: Beverly Boynton.

Sample from a moderately large lake that drains into the James River, though drainage was dry. No definite inlet noted, but is in basin of granite ridges. Sunny area, but had started to rain.

Sample #12, Red Sediment Lake (Figs 91, 92) July 27, 2017
67°23.024’N, 108°51.758’W (coordinates approximate) pH 8.5, T 13.7 °C
Sample from area of tundra on the peninsula that divides the final 8 km of the Hood River and its estuary from Baillie Bay. Dwarf birch, Ericaeae, sedges, cottongrass, heather, cranberry, willow. Includes a benthic sample.
Figures 85–90. Collection sites along the Hood River corridor 85, 86 Site 8 (6905) 87 Site 9 (6906) 88 Site 11 (6907) 89, 90 Site 12 (6908). Photo credits: Beverly Boynton, Raymond White (Fig. 88).

Sample #13, ice wedge (Fig. 93) July 27, 2017
67°23.307’N, 108°51.931’W Elevation 23 m pH 5.9, T 16.1 °C
Moderately large ice wedge with standing water, on tundra of the peninsula that divides the final 8 km of the Hood River and its estuary from Baillie Bay. Dwarf birch, Ericaceae.

Sample #14, Arctic Sound of Bathurst Inlet (Fig. 94) July 27, 2017
67°24.994’N, 108°51.572’W Elevation 0 m pH 6.6, T 13.5 °C
Sample from sandy beach, with moderately strong north winds causing small surf. Area is somewhat south and east from the head of the peninsula that divides the final 8 km of the Hood River and its estuary from Baillie Bay. Tried to get surface water. No plants, sunny.
Sample #15, mare’s tail flooded area, Baillie Bay (Figs 95, 96) July 27, 2017
67°24.752’N, 108°51.423’W Elevation 0 m pH 8.5, T 18.0 °C
Mud flat flooded with water, with mare’s tails, sample from west side of Baillie Bay.

Sample #16, Hood River at last camp (Fig. 97) July 28, 2017
67°22.472’N, 108°53.183’W Elevation 5 m pH 7.14, T 9.6 °C
Sandy shore of Hood River, about 8 km upstream from its mouth in Arctic Sound.

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Plate 1. Waterton. 1–5 *Stephanodiscus alpinus* (4520, 4546). 2–3 and 4–5 are of the same valves 6 *Orthoseira roeseana* (4531) 7 *Lindavia antiqua* (4520) 8–11 *Cyclotella distinguenda* (4533) 12, 13 *Lindavia praetermissa* (4544) 14, 15 *Aulacoseira alpigena* (4569) 16–19 *Aulacoseira nivalis* (4569) 20 *Aulacoseira italic* (4536) 21–24 *Lindavia affinis* (4520). Scale bars: 10 µm.
Plate 2. Waterton. 1–3 Staurosirella lapponica (4520, 4532, 4542) 4 Staurosira sp. (4545) 5 Staurosirella sp. [cf. S. pinnata] (4568) 6 Pseudostaurosira brevistriata var. inflata (4533) 7 Staurosira oldenburgioides (4562) 8 Staurosirella sp. [cf. S. leptostauron] (4562) 9 Staurosira construens (4542) 10 Diatoma moniliiformis (4547) 11, 12 Meridion lineare (4532) 13 Tabellaria flocculosa (4520) 14 Eunotia juettnerae [E. bilunaris PH] (4538) 15 Eunotia arcus (4542) 16 Eunotia botuliformis (4520) 17 Eunotia rhomboidea (4569) 18 Fragilaria sp. (4520) 19 Fragilaria crotonensis (4532) 20, 22 Fragilaria tenera (4532) 21 Fragilaria nanana (4520) 23 Ulnaria ulna (4546) 24 Synedra sp. [cf. S. acus var. delicatissima] (4520). Scale bars: 10 µm.
Plate 3. Waterton. 1–4 Karayevia clevei var. botttnica (4545) 5 Euocconeis alpestris (4533) 6, 7 Achnanthidium sp. (4546, 4547) 8, 9 Platessa conspicua (4539) 10, 11 Rossithidium pusillum (4520) 12 Cocconeis pseudothumensis (4545) 13 Diadesmis perpusilla (4520) 14 Brachysira microcephala (4520) 15, 16 Psammothidium sp. [cf. P. daonense PH] (4569) 17, 18 Psammothidium curtissimum [P. saccula PH] (4520) 19 Geissleria (?) sp. (4520) 20, 21 Geissleria similis (4520, 4570) 22, 23 Geissleria paludosa (4520, 4542) 24–26 Mastogloia grevillei (4533) 27 Reimeria sp. [R. sinuata PH] (4520) 28–30 Cavinula davisiae (4562) 31, 32 Diatomella balfouriana (4562) 33 Luticola mutica (4561). Scale bars: 10 µm.
Plate 4. Waterton. 1 Sellaphora pupula (4570) 2 Sellaphora laevissima (4568) 3–6 Sellaphora parapupula (4520, 4531, 4542) 7 Craticula sardiniana (4543) 8 Craticula johnstoniae (4561) 9 Aneumastus rostratus (4547) 10 Aneumastus tusculus (4540) 11 Frustulia amosseana (4543) 12 Frustulia saxonica (4569). Scale bars: 10 µm.
Plate 5. Waterton. 1, 2 Delicata delicatula (4534) 3 Halamphora contensis (4543) 4, 5 Amphora copulata (4542, 4562) 6 Amphora sp. (4543) 7 Amphora pediculus (4562) 8 Amphora thumensis (4545) 9 Cymbella neoleptoceros (4542) 10 Cymbella stigmaphora (4534) 11–15 Cymbella excisiformis (4546). Valves in this population have two stigmata 16 Cymbella neocistula var. islandica (4520) 17 Cymbella proxima (4520) 18 Cymbella neocistula (4534) 19 Cymbella alpestris (4541) 20, 21 Cymbella hantzschiana (4534) 22 Cymbella cosleyi (4520). Scale bars: 10 µm.
Plate 6. Waterton. 1–4 *Encyonema* sp. (4543, 4569) 5–7 *Encyonema procerum* [*E. silesiacum* sensu lato PH] (4542) 8 *Encyonema temperei* [cf. *E. temperei* PH] (4542) 9 *Encyonema hebridicum* (4569) 10 *Encyonema norvegicum* (4542) 11 *Encyonema minutum* (4520) 12 *Encyonema ventricosum* (4568) 13 *Encyonema hamsherae* (4570) 14–16 *Encyonema hintzii* (4539, 4542) 17 *Encyonopsis montana* (4545) 18 *Encyonopsis* sp. (4569) 19 *Encyonopsis* sp. (4569) 20 *Encyonopsis subminuta* (4520) 21 *Encyonopsis alpina* [*E. microcephala* PH] (4547) 22–26 *Encyonema ventricosum* (4520, 4568) 27 *Kurtkrammeria aequalis* (4569) 28–34 *Encyonema fogedii* (4520). Scale bars: 10 µm.
Plate 7. Waterton. 1 Cymbopleura hybrida (4533, 4545) 2, 3 C. angustata [C. angustata var. tenuis PH] (4533, 4544) 4 C. lapponica (4533, 4547) 5 C. oblongata (4533, 4546, 4547) 6 C. incerta [C. incerta var. grunowii PH] (4547) 7 C. rupicola [cf. C. rupicola PH] (4547) 8 C. heilprinensis [cf. C. heilprinensis PH] (4534) 9 C. subaequalis [cf. C. florentina PH] (4533, 4534, 4547) 10, 11 C. amphicephala [C. similiformis PH] (4520) 12, 13 C. similiformis (4533, 4547) 14 C. subcuspidata (4534, 4542) 15 C. apiculata (4540) 16 C. rainierensis [= Cymbella gondwana] (4569) 17 C. lata (4545) 18 C. anglica (4520). Scale bars: 10 µm.
Plate 8. Waterton. 1–3 Gomphonema sarcophagus [Fig. 3 Gomphonema sp. PH] (4532, 4536) 4, 5 Gomphonema multipunctatum (4536) 6, 7 Gomphonema hebridense (4531, 4539) 8 Gomphonema minutum (4520) 9 Gomphonema exilissimum (4532) 10 Gomphonema sp. (4539) 11 Gomphonema auritum (4570) 12 Gomphonema pygmaeum (4520) 13 Didymosphenia geminata (4547) 14 Gomphonema longilineare [G. cymbelliclinum PH] (4547) 15 Gomphonema acidoclinatum (4543) 16, 17 Gomphonema subclavatum (4536, 4538, 4540) 18 Gomphonema affine (4531) 19 Gomphonema sp. (4536). Scale bars: 10 µm.
Plate 9. Waterton. 1 Gomphosinica geitleri (4520) 2 Gomphonema sp. [cf. G. capitatum] (4543) 3 Gomphonema angusticephalum (4542) 4–7 Gomphonema pala (4539) 8 Gomphonema sp. (4520) [cf. Gomphonema angusticlavatum or cf. G. subclavatum (KJ)] 9 Gomphonema capitatum (4532) 10 Gomphonema subtile (4542) 11 Gomphonema brebissonii sensu lato (4543) 12, 13 Gomphonema truncatum sensu lato (4545) 14 Gomphonema anglicum (4542) 15–20 Gomphonema sp. [G. sublaticollum (KJ)] (4562, 4570). Scale bar: 10 µm.
Plate 10. Waterton. 1 *Placoneis abiskoensis* (4542, 4545) 2, 3 *Diploneis parma* (4520) 4 *Diploneis pseudovalis* (4543) 5 *Diploneis oculata* (4533) 6 *Diploneis oblongella* (4533) 7 *Neidomorpha binodiformis* (4533) 8 *Neidium apiculatum* (4542) 9 *Neidium fogedii* (4543) 10 *Neidium affine var. longiceps* [Neidium sp. PH] (4570) 11 *Neidium sp.* (4543) 12 *Neidium dubium* (4520, 4542) 13 *Neidium affine* [Neidium potapovae PH] (4569) 14 *Neidium bisulcatum* (4532). Scale bars: 10 µm.
Plate 11. Waterton. 1–4 *Navicula caroliniae* (4532, 4539, 4570) 5–8 *N. seibigiana* (4533) 9–13 *N. trilatena* (4533) 14 *N. arctotenelloides* (4520) 15 *N. antonii* (4570) 16 *N. richardtiana* (4570) 17 *N. veneta* [cf. *N. veneta* PH] (4570) 18 *N. lundii* (4562) 19 *N. upsaliensis* (4545) 20 *N. reinhardtii* (4545) 21 *N. leptostriata* (4569) 22 *N. (Placoneis) amphibola* (4540) 23 *N. lenzii* (4545) 24 *N. subhamulata* (4520) 25 *N. viridulacalis* (4568) 26 *N. trivialis* (4533) 27 *N. tripunctata* (4562) 28 *N. weberi* (4520) 29 *N. schweigeri* (4546, 4568) 30, 31 *N. wildii* (4534, 4545, 4547, 4568) 32 *N. cryptotenella* (4520) 33 *N. notha* [*Navicula* sp. PH] (4533, 4540, 4541, 4542) 34 *N*. sp. (4520) 35 *N. libonensis* (4545). Scale bars: 10 µm.
Plate 12. Waterton. 1–3 Encyonopsis czarneckii [E. alpina or E. subminuta PH] (4533) 4 Encyonopsis cesatii (4533) 5, 6 Navicula vulpina (4520) 7, 8 Navicula aurora (4520) 9 Navicula weberi (4520) 10 Caloneis tenuis (4520) 11 Caloneis sp. (4532). Scale bar: 10 µm.
Plate 13. Waterton. 1 Pinnularia brebissonii (4570) 2 Pinnularia borealis (4561) 3 Caloneis sp. [C. bacillum sensu lato PH] (4531) 4 Pinnularia borealis var. scalaris (4561) 5 Pinnularia rabenhorstii (4561) 6 Caloneis schumanniana (4543, 4547) 7 Pinnularia crucifera (4543) 8 Pinnularia isostauron (4561) 9 Pinnularia lunata (4531) 10 Caloneis tenuis (4520) 11 Caloneis undulata [Caloneis sp. PH] (4520, 4540, 4543) 12 Pinnularia obscura (4568) 13 Pinnularia sudetica (4569) 14 Pinnularia microstauron (4537, 4543) 15 Pinnularia viridis [P. complexa var. minor PH] (4531) 16 Pinnularia biceps (4569, 4570) 17 Pinnularia anglica [P. biceps PH] (4534) 18 Pinnularia septentrionalis (4568) 19 Pinnularia turbulenta (4534) 20 Pinnularia pseudosuchlandtii (4569). Scale bar: 10 µm.
Plate 14. Waterton. 1 Stauroneis separanda (4532) 2 Stauroneis kriegeri (4562) 3 Stauroneis sp. (4535) 4 Stauroneis smithii (4562) 5 Stauroneis lauenburgiana (4532) 6 Stauroneis kootenai (4561) 7 Stauroneis heinii (4541, 4561) 8 Stauroneis phoenicenteron (4532, 4539) 9 Stauroneis circumborealis (4561) 10 Stauroneis gracilis (4532, 4539). Scale bars: 10 µm.
Plate 15. Waterton. 1 Stauroneis sp. [cf. S. silvahassiaca] (4543) 2 Stauroneis reichardii (4561, 4570) 3 Stauroneis vandevijveri (4533, 4534, 4539, 4570) 4 Stauroneis siberica (4520) 5 Stauroneis pikuni (4532) 6 Stauroneis jarensis (4532) 7 Stauroneis acuta (4539) 8 Stauroneis akamina (4561) 9 Stauroneis amphicephala (4542) 10 Stauroneis pax (4530, 4547) 11 Stauroneis conspicua (4520, 4533, 4534). Scale bars: 10 µm.
Plate 16. Waterton. 1 Nitzschia inconspicua (4520) 2 Nitzschia lacuum (4542) 3, 4 Nitzschia bacillum (4520, 4533) 5 Nitzschia fonticola var. pelagica [Nitzschia bacillum PH] (4520) 6 Nitzschia acidoclinata (4540) 7 Nitzschia alpina (4568) 8, 9 Nitzschia perminuta (4541, 4542) 10 Nitzschia sp. [Nitzschia palea sensu lato PH] (4533) 11 Nitzschia palea (4520) 12 Nitzschia diversa or N. gesneri (4536, 4542) 13 Nitzschia vermicularis (4562) 14 Nitzschia gracilis (4520) 15 Nitzschia regula var. robusta (4547) 16 Nitzschia frauenfeldii (4541) 17 Nitzschia radicula (4539) 18 Nitzschia amphibia (4541) 19 Nitzschia sinuata (4540) 20 Nitzschia pura (4520) 21 Hantzschia abundans (4531) 22, 23 Hantzschia elongata (4531, 4540, 4541). Scale bars: 10 µm. Note different scale for images in figures 22 and 23.
Plate 17. Waterton. 1 Epithemia turgida var. granulata (4541) 2 Rhopalodia gibba (4533) 3 Epithemia adnata (4532) 4–6 Epithemia smithii (4520, 4535) 7 Denticula kuetzingii (4544) 8 Rhopalodia operculata (4570) 9 Epithemia sp. (4543) 10–14 Epithemia argus (4541, 4543). Scale bars: 10 µm.
Plate 18. Haida Gwaii. 1 Thalassiosira sp.? (6890) 2, 3 Melosira nummuloides (6890) 4 Coscinodiscus sp. (6890) 5 Aulacoseira sp. (5064) 6 Aulacoseira crassipunctata (5065) 7 Fragilaria vaucheriae (5067) 8–10 Fragi-
laria capucina var. rumpens (5063, 5066, 5067) 11 Fragilaria capucina (5066) 12–15 Frigilariforma polygonata (?) (5064) 16–28 Tabellaria flocculosa 16–18 5066 19–21 5063 22–25 6890 26–28 5064. Scale bar: 10 µm.
Plate 19. Haida Gwaii. 1–3 Diatoma tenuis (5062) 4–6 Odontidium mesodon (5066, 6890) 7–10 Tabularia fasciculata [Fig. 10 Tryblionella sp.? PH] (6890) 11 Ulnaria sp. (6890) 12–16 Hannaea arcus (6890). Scale bars: 10 µm; scale bar on plate applies to images without scale bars; note different scales of images 7–10.
Plate 20. Haida Gwaii. 1, 2 Semiorbis rotundus (5064) 3–11 Peronia fibula 3–5 5064 6–11 5065 12–15 Actinella punctata (5064) 16–21 Eunotia bidentula (5064, 5066) 22 Eunotia islandica (5064). Scale bars: 10 µm.
Plate 21. Haida Gwaii. 1 *Eunotia diadema* (5064, 5065, 5067) 2 *E. tetraodon* (5065) 3, 4 *E. neoborealis* [*E. fennica* PH] (5063) 5 *E. superbiddens* (5064) 6–8 *E. metamonodon* (5063, 5065, 5067). Scale bars: 10 µm. Note different scales of 7 and 8; scale bar on plate applies to images without scale bars.
Plate 22. Haida Gwaii. 1–4 *Eunotia flexuosa* (5063, 5066, 5067) 5–8 *E. naegelii* (5063, 5065, 5066, 6890) 9 *E. bilunaris* (5064, 5067) 10 *Eunotia* sp. [cf. *E. mertensiae*] (5062) 11, 12 *Eunotia* sp. [cf. *E. julma*] [cf, *Eunotia furyae* PH] (5063). Scale bar: 10 µm.
Plate 23. Haida Gwaii. 1–8 Eunotia lewisi (5064, 6888) 9–15 E. paludosa (5064, 6888) 16–18 E. super-paludosa (5064) 19–28 E. incisa (5063, 5064, 5066, 5067) 29 Eunotia sp. [cf. E. incisa] (5064) 30, 31 Eunotia sp. [cf. E. boreotenuis] (5064) 32 E. arculus (5064) 33–36 E. minor (5063) 37, 38 Eunotia sp. [cf. E. minor] (5062) 39–41 E. botuliformis (5066) 42, 43 Eunotia sp. [cf. E. arcofallax] [cf. E. rhomboidea PH] (5064) 44 E. subarcuatoides (5063). Scale bar: 10 µm.
Plate 24. Haida Gwaii. 1 Achnanthidium kriegeri (5066) 2–4 Achnanthidium minutissimum (5063, 5066, 6890) 5–11 Rossithidium pusillum (5063, 5065, 5067) 12, 13 Planothidium delicatulum (6890) 14, 15 Psammothidium nivale (6890) 16, 17 Eucocconeis flexella (5065, 5066) 18 Cocconeis sp. (5062) 19, 20 Cocconeis placentula (5062) 21 Nupela tenuicephala (5064) 22 Unknown genus (5063) 23, 24 Luticola sp. (6889) 25, 26 Luticola mutica (6890) 27–29 Kobayasiella parasubtilissima (5064, 6888) 30 Cavinula pseudocutiformis (5065) 31 Diploneis elliptica (5062, 5065) 32 Diploneis finnica (5065). Scale bar: 10 µm.
Plate 25. Haida Gwaii. 1–7 Brachysira sp. [cf. B. neoacuta PH] (5065, 5067) 8–11 B. brebissonii (5063, 5064, 5065) 12–14 B. sp. [cf. B. neoacuta PH] (5065) 15–27 B. procera [PH] or B. ocalanensis (5063, 5065, 5066, 5067) 28–30 B. sp. (5064, 5065). Scale bar: 10 µm.
Plate 26. Haida Gwaii. 1 *Frustulia saxonica* (5064, 6888) 2–7 *Frustulia crassinervia* (5063, 5064, 5065, 5066, 5067, 6888) 8 *Frustulia quadrisinuata* (5063) 9 *Decussata placenta* (5067). Scale bar: 10 µm.
Plate 27. Haida Gwaii. 1 Neidium amphigomphus (5064) 2 Neidium fossum (6890) 3, 4 Neidium affine (5064) 5 Neidium sp. [N. occidentale PH] (5064) 6 Cymbopleura fluminea [C. hybrida or C. lineare PH] (5063) 7 Cymbopleura sp. (5063) 8 Cymbopleura subcuspidata (5065). Scale bars: 10 μm.
Plate 28. Haida Gwaii. 1–8 Cymbella neocistula (5062, 5063, 5066, 6890) 9, 10 Delicata alpestris (5063) 11, 12 Cymbella proxima (5062, 5063). Scale bars: 10 µm.
Plate 29. Haida Gwaii. 1–6 Encyonema silesiacum (5062, 5065, 5066) 7 E. fogedii [E. silesiacum var. PH] (5066) 8 E. minutiforme [E. silesiacum var. PH] (5067) 9 E. vulgare (5067) 10–14 E. latum (5065). Scale bars: 10 µm.
Plate 30. Haida Gwaii. 1–5 Encyonema perpusillum (5064) 6–11, 13 Encyonopsis cesattii (5062, 5065) 12 Encyonopsis subminuta [E. microcephala var. PH] (5065) 14 Encyonopsis stafsholtii (5063) 15–17 Encyonema perigracile (5065) 18 Encyonema hebridicum (5064) 19–22 Encyonema neogracile (5063, 5067) 23 Encyonema sp. (5064) 24 Kurtkrammeria treinishii (5065) 25 Kurtkrammeria lacsoglacialis (5064). Scale bar: 10 µm.
Plate 31. Haida Gwaii. 1–3 Gomphonema louisiananum (5065) 4 G. sp. [cf. G. pumilum] [cf. G. ob-stipum PH] (5065) 5 G. kobayasii (5062) 6 G. sp. [cf. G. minusculum] (5062) 7–9 G. sp. (5063, 5067) 10–13 G. micropus (5062, 5067) 14 G. sp. [cf. G. citera] (6890) 15 G. exilissimum (5067) 16 G. sp. (6890) 17, 18 G. sp. (5063) 19 G. gracile (5067) 20 G. procerum (5065) 21, 22 G. laticollum [G. italicum sensu stricto PH] (5065) 23 G. clavatum (5067) 24, 25 G. duplipunctatum (5063, 5066). Scale bars: 10 µm.
Plate 32. Haida Gwaii. 1–6 *Navicula gregaria* (6888, 6889, 6890) 7 *Navicula eidrigiana* (6890) 8 *Navicula exilis* (6889) 9, 10 *Navicula leptostriata* (5064) 11, 12 *Stauroneis heinii* (5065, 6889) 13 *Navicula radiosa* (5065) 14, 15 *Navicula angusta* (5063) 16–18 *Navicula cryptotenella* (5063, 5065). Scale bars: 10 µm.
Plate 33. Haida Gwaii. 1, 2 Caloneis tenuis (5065, 5067) 3 cf. Caloneis bacillum (6890) 4 Pinnularia subcapitata (6890) 5 Pinnularia microstauron var. angusta [P. submicrostauron or P. microstauron var. rostrata PH] (5064) 6 Pinnularia microstauron (5064) 7–9 Pinnularia lata (5064) 10 Pinnularia decrescens [P. decrescens var. rhombarea PH] (5067). Scale bars: 10 µm.
Plate 34. Haida Gwaii. 1, 2 Pinnularia transversa [Fig. 1 P. viridis morphotype PH] (5064) 3 P. mesogongyla [P. gigas PH] (5065) 4 P. viridiformis [P. viridis PH] (5064). Scale bars: 10 µm.
Plate 35. Haida Gwaii. 1 *Pinnularia neomajor* (5065) 2 *P. rupestris* (5064) 3–6 *P. stomatophora* (5062, 5065, 5067). Scale bar: 10 µm.
Plate 36. Haida Gwaii. 1–6 *Epithemia smithii* (5065). Scale bars: 10 \( \mu \text{m} \).
Plate 37. Haida Gwaii. 1 Rhopalodia gibba (5065) 2–4 Nitzschia linearis (6889) 5 Nitzschia recta (6890) 6, 7 Nitzschia angustata (5065) 8 Nitzschia liebetruthii (6890) 9 Nitzschia sp. [cf. N. microcephala] [cf. N. fonticola PH] (5064) 10 Nitzschia gracilis (5064) 11, 12 Nitzschia pusilla (6889) 13 Entomoneis paludosa (6890) 14 Denticula kuetzingii (5065) 15, 16 Nitzschia pseudofonticola (5062, 5065). Scale bar: 10 μm.
Plate 38. Clearwater. 1 *Aulacoseira alpigena* (6273) 2 *Aulacoseira subarctica* (?) (6276) 3–5 *Aulacoseira ambiguа* (6275, 6276) 6, 7 *Aulacoseira italica* (6277) 8 *Lindavia praetermissa* (6277) 9, 10 *Tabellaria flocculosa* (6279) 11–14 *Fragilariforma nitzschioides* (6281) 15–17 *Meridion circulare* (6279, 6281) 18 *Fragilaria* sp. [*Ulnaria* sp. PH] (6281) 19, 20 *Synedra famelica* (?) (6280). Scale bar: 10 µm.
Plate 39. Clearwater. 1, 2 Planothidium apiculatum (6277) 3, 4 Planothidium sp. (6276) 5, 6 Eunotia para-tridentula (6279) 7 Eunotia sp. (6276) 8 Eunotia circumborealis (6279) 9, 10 Eunotia minor (6277, 6279) 11 Eunotia serra (6276) 12–14 Eunotia bidens (6276, 6279) 15 Eunotia triodon (6276). Scale bar: 10 µm.
Plate 40. Clearwater. 1 cf. Eunotia faba [PH] (6279) 2, 3 E. incisa (6275, 6277) 4 E. flexuosa (6276) 5 E. eurycephala [E. flexuosa PH] (6276) 6 E. sp. (6277) 7 E. sp. (6276) 8–11 E. ambivalens (6276, 6278). Scale bars: 10 µm.
Plate 41. Clearwater. 1 Eunotia sp. [cf. E. dorofoynae PH] (6279) 2 E. julma (6276) 3–8 E. nyman-niana [E. elegans PH] (6274, 6276, 6279) 9 E. sp. [cf. E. nymanniana] (6277) 10 E. monnieri [E. sp. PH] (6279) 11–13 E. mucophila (6276) 14–16 E. sp. [E. monnieri PH] (6276, 6277) 17, 18 E. ambivalens [E. bilunaris PH] (6279). Scale bar: 10 µm.
Plate 42. Clearwater. 1–7 Eunotia superpaludosa (6274, 6276) 8, 9 E. praerupta (6279) 10 E. groenlandica [E. pseudogroenlandica PH] (6274) 11 E. fallax [E. paludosa PH] (6279) 12–19 E. ursamatoris (6278, 6279). Scale bar: 10 µm.
Plate 43. Clearwater. 1, 2 Cymbella aspera (6277) 3 Cymbella (Cymbopleura?) naviculacea [syn. Encyonopsis grunowii] (6277) 4–6 Cymbella sp. (6280) 7 Halamphora coraensis [H. obscura PH] (6280) 8–11 Cymbella hantzschiana (6280). Scale bars: 10 µm (specimens in images 1 and 2 are at a different scale than the others).
Plate 44. Clearwater. 1 *Cymbopleura crassipunctata* (6277) 2 *C. apiculata* (6277) 3 *C. subcuspidata* (6277) 4, 5 *C. rainierensis* [= *Cymbella gondwana*? (6277) 6–8 *C. fluminea* (6277) 9 *C. naviculiformis* (6277) 10–12 *C. stauroneiformis* (6277, 6279). Scale bars: 10 µm (specimen in image 1 is at a different scale than the others).
Plate 45. Clearwater. 1 Encyonema neogracile (6277) 2 Encyonema hebridicum (6273) 3 Encyonema fogedii (6279) 4 Encyonema minutum (6277) 5-10 Gomphonema micropus (6281) 11 Gomphonema duplexpunctatum (6277) 12-15 Gomphonema brebissonii (6276, 6277) 16-20 Gomphonema distans (6279) 21 Gomphonema parvulum (6277) 22, 23 Gomphonema auritum (6276, 6277) 24-28 Gomphonema subclavatum (6280) 29 Gomphonema insigniforme (6276) 30 Gomphonema sp. [cf. G. bukcyasonum PH] (6277). Scale bars: 10 µm.
Plate 46. Clearwater. 1 Craticula cuspidata (6277) 2 Neidium amphigomphus (6276) 3 Neidium sp. (6277) 4 Neidium sp. (6276) 5 Neidium ampliatum [cf. N. affine PH] (6277) 6 Neidium bisulcatum (6279) 7 Sellaphora sp. (6279) 8 Luticola mutica (6281) 9 Boreozonacola olympica (6277) 10 Sellaphora (?) sp. (6281) 11 Cavinula pseudoscutiformis (6278) 12 Adlafia minuscula? (6277) 13–15 Craticula budding (6280) 16 Sellaphora rectangularis (6277) 17 Placoneis explanata (6277) 18, 19 Placoneis elginensis (6277). Scale bar: 10 µm.
Plate 47. Clearwater. 1 Stauroneis gracilis (6276) 2, 3 Stauroneis amphicephala (6277) 4 Stauroneis neohyalina (6277) 5 Stauroneis acidoclinata (6279) 6 Frustulia saxonica (6276) 7–9 Mastogloia elliptica (6280) 10 Halamphora sp., 11 Halamphora borealis (6280) 12–14 Navicymbula pusilla [Encyonema sp.? PH] (6280). Scale bar: 10 µm.
Plate 48. Clearwater. 1, 2 Navicula oblonga (6280) 3 N. peregrina (6280) 4, 5 N. kefvingensis (6280) 6–10 N. libonensis (6280) 11 N. aurora (6277). Scale bar: 10 µm.
Plate 49. Clearwater. 1 Navicula radiosa (6277) 2 Navicula rhynchocephala (6277) 3 Navicula cryp-
tocephala [cf. N. cryptocephala PH] (6277) 4–8 Navicula trilatera (6280) 9 Pinnularia ignobilis [cf. Chamaepinnularia krookii PH] (6280) 10–12 Pinnularia brebissonii (6280) 13 Pinnularia lenticula [cf. P. lenticula PH] (6278) 14, 15 Pinnularia viridiformis (6280). Scale bar: 10 µm.
Plate 50. Clearwater. 1–3 Pinnularia sp. [cf. P. genkalii] (6279) 4, 5 P. neomajor (6276, 6277). Scale bars: 10 µm (specimen in image 4 is at a different scale than the others).
Plate 51. Clearwater. 1–7 *Pinnularia subcapitata* var. *elongata* (6275, 6279) 8–13 *P. obscura* (6279) 14–18 *P. gibbiformis* (6276) 19 *P. acrosphaeria* (6277) 20, 21 *P. sp. [P. biceps sensu lato PH] (6276, 6278) 22 *P. sp. [P. viridiformis sensu lato PH] (6279). Scale bar: 10 μm.
**Plate 52.** Clearwater. 1, 2 Pinnularia sp. [cf. *P. subpulchra*] [cf. *Caloneis arctica* PH] (6277) 3, 4 *P. nodosa* (6279) 5 P. sp. [cf. *P. sudetica* or *persudetica* PH] (6279) 6, 7 *P. ivaloensis* (6279) 8–10 *P. spitsbergensis* (6276, 6279) 11 P. sp. [cf. *P. spitsbergensis*] (6276) 12, 13 *P. stomatophora* (6277) 14–16 P. sp. [cf. *P. graciloides* var. *triundulata*] [cf. *P. subgibba* PH] (6277). Scale bar: 10 µm.
Plate 53. Clearwater. 1 * Rhopalodia gibba* (6277) 2, 3 * Entomoneis paludosa* (6280) 4–7 * Epithemia argus* (6277). Images 4 and 5 are the same specimen at high and low focus. Scale bar: 10 μm.
Plate 54. Clearwater. 1 Stenopterobia curvula (6276) 2, 3 Nitzschia kittii (6280) 4 Nitzschia linearis (6280) 5 Nitzschia commutata (6280) 6, 7 Nitzschia radicula [N. fossilis PH] (6280) 8 Nitzschia perspicua [cf. N. bergii PH] (6280) 9 Nitzschia perminuta (6277) 10, 11 Nitzschia amphibia (6280) 12 Nitzschia palea (6277). Scale bars: 10 µm (images 2 and 3 are at different scales than the others).
Plate 55. Clearwater. 1, 2 Hantzschia elongata (6280) 3–5 H. vivacior (6280) 6 H. sp. (6279) 7 H. amphioxys [H. amphioxys sensu lato PH] (6278). Scale bars: 10 µm (images 1, 3 and 5 are at different scales than the others).
Plate 56. Coppermine. 1–3 *Lindavia radiosa* [L. antiqua PH] (6830, 6831) 4, 5 *Lindavia antiqua* (6830, 6831) 6 *Lindavia michiganiana* (6832) 7 *Lindavia intermedia* (6830) 8, 9 *Staurosirella* sp. [cf. *S. pinnata*] (6832) 10–13 *Fragilaria* spp. [cf. *F. vaucheriae*] [F. capucina PH] (6832, 6833) 14–17 *Tabellaria flocculosa* (6830, 6831, 6832) 18–20 *Ulnaria* sp. (6832) (all three images are of the same specimen; image 18 is at a different scale) 21–24 *Tabellaria fenestrata* [T. flocculosa var. linearis PH] (6828, 6830, 6831, 6832) 25 *Diatoma tenuis* (6832) 26–28 *Fragilaria* spp. [cf. *F. capucina*] (6832, 6833) 29, 30 *Eucocconeis laevis* (6826, 6830, 6833) 31, 32 *Eucocconeis flexella* (6827, 6831, 6833). Scale bars: 10 µm.
Plate 57. Coppermine. 1–4 *Eunotia islandica* (6828) 5 *E. sp.* (6833) 6 *E. mucophila* (6833) 7–9 *E. altimon-tana* (6828, 6830, 6831) 10, 11 *E. arcus* (6833) 12 *E. ursamaioris* [*E. praerupta* PH] (6824). Scale bar: 10 µm.
Plate 58. Coppermine. 1–6 Eunotia excelsa (6826, 6828) 7–13 E. arcubus [E. arcus PH (small forms only)] (6831, 6833). Scale bar: 10 µm.
Plate 59. Coppermine. 1–4 Brachysira sp. [cf. B. microcephala] (6830) 5 Brachysira sp. [cf. B. microcephala (6827) 6, 7 Brachysira zellensis (6830) 8, 9 Brachysira sp. [B. microcephala form 1 PH] (6830) 10 Placoneis (?) sp. (6832) 11 Hippodonta hungarica (6832) 12 Hygroptera balfouriana (6827) 13 Cavinula pseudosculiformis (6832) 14, 15 Kobayasiella micropunctata [cf. K. subtilissima PH] (6827, 6830, 6831) 16 Kobayasiella jaagii (6830) 17 Diploneis krammeri (6833) 18 Placoneis amphibola (6828) 19 Aneumastus tusculus (6830, 6831) 20, 21 Sellaphora alastos (6832) 22, 23 Sellaphora sp. [S. rectangularis PH] (6832). Scale bar: 10 µm.
Plate 60. Coppermine. 1–6 Cymbella sp. [cf. C. cleve-eulerae] [C. neocistula var. PH] (6830, 6831, 6833) 7–12 C. botellus (6826, 6829, 6830) 13–16 C. cleve-eulerae (6826, 6828, 6830, 6831, 6833) 17 C. subturgidula (6833). Scale bars: 10 µm.
Plate 61. Coppermine. 1, 2 \textit{Cymbella neocistula} (6824, 6831) 3–6 \textit{C. krammeri} (6826, 6827, 6829, 6830, 6833) 7–15 \textit{C. cleve-eulerae} (6826, 6828, 6830, 6831, 6833). Scale bars: 10 µm.
Atlas of diatoms from diverse habitats in remote regions of western Canada

Plate 62. Coppermine. 1–4 Cymbopleura tundraphila (6830, 6833) 5 C. geofriedii [cf. C. geofriedii PH] (6830) 6–9 C. incerta var. spitsbergensis (6830, 6831, 6833) 10–12 C. incerta (6826, 6829, 6831) 13–15 C. oblongata (6828, 6830, 6833) 16–21 C. incertiformis var. linearis (6830, 6833) 22–24 C. rupicola (6830) 25–27 C. stauroneiformis (6828, 6830, 6833) 28–30 C. angustata (6829, 6830, 6831, 6833) 31 C. amphicephala (6833) 32–34 C. hybrida (6833). Scale bars: 10 µm.
Plate 63. Coppermine. 1–4 *Cymbopleura heilprinensis* (6828, 6829, 6831, 6833) 5–8 *Cymbella designata* [syn. *Cymbopleura citriformis*] (6829, 6830, 6831) 9 *Cymbopleura tynnii* (6828, 6831) 10 *Cymbopleura apiculata* (6832) 11 *Cymbopleura lata* (6830) 12, 13 *Cymbopleura austriaca* (6824). Scale bars: 10 µm.
Plate 64. Coppermine. 1–6 Encyonema norvegicum (6829, 6830, 6833) 7–14 Delicata canadensis (6829, 6830, 6833) 15, 16 Halamphora conaensis (6829, 6831) 17 Encyonema hebridicum (6829) 18 Encyonema ventricosum (6832) 19 Encyonema silesiacum (6831) 20 Encyonema paucistriatum (6833) 21 Amphora lange-bertalotii (6826) 22–26 Encyonema hintzii or Encyonema vulgare (6827, 6830, 6831, 6832, 6833). Scale bar: 10 µm.
Plate 65. Coppermine. 1 Encyonopsis sp. [cf. E. angusta] (6830) 2–12 E. inuatorum (6830, 6831, 6833) 13–18 E. stafsholtii (6827, 6829, 6830, 6831, 6833) 19, 20 E. sp. [cf. E. neerlandica] (6831, 6833) 21 E. sp. [cf. E. descripta] (6833) 22–27 E. cesatiformis [E. cesatii sensu stricto PH] (6826, 6830, 6831, 6833) 28–31 E. lacuscaerulei (6829, 6830). Scale bars: 10 µm.
Plate 66. Coppermine. 1 Gomphonema micropus (6828) 2, 3 G. lateripunctatum (6826, 6833) 4–12 G. lagerheimii (6830, 6831, 6833) 13–20 G. distans (6828, 6830) 21 G. caperatum (6828) 22–28 G. nathorstii [G. angustatum var. undulatum sensu Foged PH] (6828). Scale bars: 10 µm.
Plate 67. Coppermine. 1–4 Gomphonema sp. [cf. G. capitatum] (6833) 5 G. brebissonii (6830) 6, 7 G. sp. [cf. G. interpositum] (6832, 6833) 8 G. subtile (6833) 9 G. subtile var. sagitta (6833) 10, 11 G. sp. (6830, 6831) 12–18 G. coronatumaceum (6830, 6831). Scale bars: 10 µm.
Plate 68. Coppermine. 1–3 Navicula reinhardtii (6832) 4 N. sieminskiae [cf. N. sieminskiae PH] (6833) 5, 6 N. notha (6830, 6833) 7, 8 N. radiosa (6832, 6833) 9–11 N. tripunctata var. arctica (6830, 6831, 6832) 12–14 N. vulpina (6831, 6833). Scale bars: 10 µm.
Plate 69. Coppermine. 1 Neidium productum (6828, 6833) 2 N. foisum (6828, 6831) 3, 5 N. affine var. undulatum (6832) 4 N. temperei (6831, 6833). Scale bar: 10 µm.
Plate 70. Coppermine. 1–2 Caloneis sp. [cf. C. falcifera] [C. falcifera PH] (6828, 6831) 3, 4 Caloneis fusus (6828) 5, 6 Caloneis sp. [cf. C. fasciata] (6831, 6832) 7, 8 Caloneis (Pinnularia) sp. [Chamaepinnularia sp.? PH] (6828) 9 Caloneis tenuis (6830) 10 Pinnularia sp. [cf. P. pseudogibba] (6828) 11 Caloneis obtusa [C. obtusa sensu lato PH] (6824) 12 Pinnularia grunowii (6833) 13 Pinnularia pseudosuchlandii [P. brebissonii PH] (6826, 6831, 6833) 14 Pinnularia decrescens (6832) 15 Pinnularia sp. (6828). Scale bars: 10 μm.
Plate 71. Coppermine. 1, 2 Pinnularia genkalii (6833) 3 P. spitsbergensis (6833) 4 P. sp. [cf. P. lokana] (6832) 5 P. viridiformis (6832) 6 P. rupestris [cf. P. rupestris PH] (6832). Scale bar: 10 µm.
Plate 72. Coppermine. 1–3 *Stauroneis kuelbsii* or *S. superkuelbsii* [*S. gracilis* sensu lato PH] (6828, 6830, 6833) 4 *S. gracilis* (6832) 5 *S. reichardtii* [*S. aniceps* PH] (6833). Scale bars: 10 µm.
Plate 73. Coppermine. 1–6 *Stauroneis hyperborea* (6831, 6833). Scale bars: 10 µm.
Plate 74. Coppermine. 1–5 Stauroneis superhyperborea [syn. S. obtusa var. lapponica Hustedt PH] (6828). Scale bars: 10 µm.
Plate 75. Coppermine. 1 Nitzschia frustulum [N. alpina PH] (6832) 2 Nitzschia sp. [cf. N. lanceolata] (6830) 3 Nitzschia amphibia (6832) 4 Nitzschia perminuta (6831) 5 Nitzschia radicula (6832) 6 Nitzschia sinuata (6828) 7 Nitzschia fossilis [cf. N. fossilis PH] (6831) 8 Hantzschia hyperborea (6828) 9 Hantzschia elongata (6828) (note different scale) 10 Hantzschia vivacior (6828) 11 Nitzschia regula var. robusta (6831) 12–14 Nitzschia angustata (6831, 6833). Scale bars: 10 µm.
Plate 76. Coppermine. 1–3 Epithemia smithii (6826, 6827) 4 Denticula tenuis (6830) 5 Cymatopleura solea (6832) 6 Rhopalodia gibba (6832) 7 Denticula sp. [cf. D. valida] (6831) 8–10 Denticula kuetzingii (6830, 6833). Scale bars: 10 µm.
Plate 77. Baillie-Back. 1 Tabellaria flocculosa (6864) 2–4 Aulacoseira subarctica (6858, 6864) 5 Linda-
via intermedia (6858) 6 Rossithidium petersenii (6859) 7 Achnanthidium sp. (6858) 8, 9 Planothidium
frequentissimum (6856) 10, 11 Psammothidium marginulatum (6864) 12–17 Fragilariforma constricta
(6864) 18–21 Tabellaria fenestrata [T. flocculosa planktonic form sensu Koppen PH] (6857, 6858, 6859)
22, 23 Eucocconeis flexella (6857) 24, 25 Eucocconeis depressa (6857). Scale bar: 10 µm.
Plate 78. Baillie-Back. 1, 2 Eunotia curtagrunowii morphotype I \( [E. \text{ praerupta var. laticeps} = E. \text{ laticeps PH}] \) (6861) 3–5 E. curtagrunowii morphotype II (6856, 6857) 6–9 E. arcus (6858, 6863) 10–13 E. ar-cubus (6856, 6857, 6858) 14 E. sp. [cf. E. soleirolii] (6857) 15–18 E. praerupta or E. mayamae (6866). Scale bars: 10 µm.
Plate 79. Baillie-Back. 1–5 *Eunotia pseudepectinalis* (6856, 6857, 6859, 6865) 6–8 *E. pectinalis* (6862). Scale bars: 10 µm.
Plate 80. Baillie-Back. 1–7 Eunotia paralleladubia (6857, 6861, 6864, 6865). Scale bar: 10 µm.
Plate 81. Baillie-Back. 1–5 (6?). *Eunotia metamonodon* (6856, 6857, 6860, 6862, 6865). Scale bars: 10 µm.
Plate 82. Baillie-Back. 1–8 *Eunotia mayamae* (6856) 9 *E. curtogrunowii* morphotype I [*E. praerupta* var. *laticeps* = *E. laticeps* PH] (6866). Scale bar: 10 µm.
Plate 83. Baillie-Back. 1–7 Eunotia elegans [E. nymanniana sensu lato PH] (6856, 6857, 6860) 8, 9 Eunotia neocompacta (6859, 6864) 10 Eunotia septentrionalis (6858) 11 Eunotia ursamatoris [E. ursamatoris sensu lato PH] (6862) 12 Peronia fibula (6865) 13 Eunotia minor (6862, 6865) 14 Eunotia braeldei (6862) 15 Eunotia sp. [cf. E. ursamatoris] (6862) 16 Eunotia lapponica (6862) 17, 18 Eunotia silesioscandica (6858, 6862) 19–21 Eunotia neoborealis (6864, 6865) 22–24 Eunotia denticulata (6857). Scale bars: 10 µm.
Plate 84. Baillie-Back. 1 *Eunotia diadema* (6862) 2–12 *E. semicircularis* [*E. triodon* var. *semicircularis* PH] (6857, 6859, 6865). Scale bars: 10 µm.
Plate 85. Baillie-Back. 1, 2 Eunotia diodon (6865) 3–7 E. islandica (6861, 6864) 8, 9 E. suecica [Fig. 9 E. bigibboidea PH](6861) 10 E. perminuta (6861) 11, 12 E. sp. (6859, 6865) 13–16 E. circumborealis (6856, 6859, 6860, 6865) 17, 18 E. superbibdens (6861, 6866). Scale bars: 10 μm.
Plate 86. Baillie-Back. 1–8 *Eunotia sarek* (6856, 6863, 6866) 9 *E. pseudopapilio* (6861). Scale bars: 10 µm.
Plate 87. Baillie-Back. 1 Eunotia pseudoflexuosa (6860) 2 E. eurycephala (6860) 3, 4 E. ambivalens (6866) 5 E. latitaenia (6859) 6, 7 E. juettnerae [E. bilunaris PH] (6860, 6864) 8–10 E. borealpina (6859) 11, 12 E. incisa (6862). Scale bars: 10 µm.
Plate 88. Baillie-Back. 1–4 *Eunotia bilunaris* (6856, 6860, 6863) 5–7 *E. valida* (6856, 6862) 8–12 *E. naegelii* (6860, 6861, 6862) 13–16 *E. pseudogroenlandica* (6860, 6862) 17–22 *E. botuliformis* (6857, 6864) 23 *E. rhomboidea [E. paludosa PH]* (6860) 24, 25 *E. paludosa* (6861, 6864) 26–28 *E. scandiorussica* (6856, 6860) 29–31 *E. boreotenuis [E. subarcuatoides PH]* (6865) 32–36 *E. subarcuatoides* (6856, 6857, 6860, 6864). Scale bars: 10 µm.
Plate 89. Baillie-Back. 1–5 Brachysira sp. (6863, 6864, 6865) 6–8 Brachysira sp. (6862, 6865) 9–11 Cavinula scutiformis (6862, 6863) 12 Cavinula jaernefeltii (6863) 13 Fallacia (?) sp. [Sellaphora (?) sp. PH] (6862) 14 Geissleria schoenfeldii (6862) 15 Geissleria sp. [cf. G. moseri] (6862) 16 Geissleria tectissima (6862) 17 Criculata sp. (6862) 18 Frustulia crassinervia (6857) 19, 20 Sellaphora sp. (6862) 21 Sellaphora sp. (6862) 22, 23 Sellaphora parapupula (6856, 6860) 24 Sellaphora sp. [S. rectangularis PH] (6856) 25 Sellaphora sp. (6858) 26 Sellaphora sp. (6862). Scale bar: 10 µm.
Plate 90. Baillie-Back. 1–10 Encyonema paucistriatum (6856, 6857) 11 E. ventricosum (6858) 12–18 E. lunatum [E. lunatum var. alaskensis PH] (6857, 6860, 6863) 19, 20 E. willeyorum (6858) 21 E. neogracile (6864) 22–24 E. hintzii or E. vulgare [E. vulgare PH] (6858, 6862, 6866) 25–32 E. sibericum (6857, 6860, 6865). Scale bars: 10 µm.
Plate 91. Baillie-Back. 1–6 Delicata canadensis (6857, 6858) 7–13 Encyonopsis inuitorum (6856, 6857) 14–17 Encyonopsis cesattiformis [E. cesattii PH] (6856, 6857, 6865, 6866) 18–21 Encyonopsis cesattii (6857) 22 Encyonopsis stafsholtii (6856) 23 Encyonopsis sp. [cf. E. czarneckii] (6858) 24–29 Kurtkrammeria pseudoamphioxys (6856) 30–35 Kurtkrammeria neoamphioxys (6856, 6857). Scale bars: 10 µm.
Plate 92. Baillie-Back. 1 Cymbopleura heilprinensis [Cymbella (Cymbopleura) designata = Cymbopleura citriformis PH] (6857) 2 Cymbella (Cymbopleura) designata = Cymbopleura citriformis (6857) 3 Cymbella proxima (6858) 4 Cymbella krammeri or C. neocistula var. lunata [? PH] (6857) 5, 6 Cymbella neocistula (6857, 6858) 7–11 Cymbella cleve-eulerae [C. neocistula var. PH] (6857, 6862). Scale bar: 10 µm.
Plate 93. Baillie-Back. 1–3 *Cymbopleura neoheteropleura* (6860). Scale bar: 10 µm.
Plate 94. Baillie-Back. 1 *Cymbopleura stauroneiformis* (6857) 2 *C. angustata* (6857) 3 *C. incerta* var. *spitsbergensis* (6857) 4 *C. sp.* (6862) 5–8 *C. incertiformis* var. *linearis* (6856) 9 *C. anglica* (6862) 10 *C. neoheteropleura* (6857) 11 *C. apiculata* (6858) 12, 13 *C. tynnii* (6856, 6857, 6859, 6863) 14 *C. fluminea* (6858, 6866). Scale bar: 10 µm.
Plate 95. Baillie-Back. 1–7 Gomphonema lagerheimii sensu lato (6856, 6857, 6860, 6862) 8–12 G. astridae (6856, 6860) 13, 14 G. lateripunctatum (6858) 15, 16 G. sp. [cf. G. capitatum] (6857, 6858) 17, 18 G. brebissonii (6856, 6863) 19 G. coronatumaceum (6857) 20, 21 G. sp. (6857) 22 G. gracile (6856) 23 G. sp. (6862). Scale bar: 10 µm.
Plate 96. Baillie-Back. 1–6 *Lacustriella lacustris* (6862) 7, 8 *Lacustriella* sp. (6862). Scale bars: 10 µm.
Plate 97. Baillie-Back. 1 Kobayasiella okadae (6857) 2 Kobayasiella micropunctata (6859) 3–5 Kobayasiella jaagii [K. jaagii sensu lato PH] (6857) 6 Navicula subconcentrica [cf. N. cryptocephala sensu lato PH] (6858) 7 Navicula cryptocephala [cf. N. cryptocephala PH] (6856) 8, 9 Navicula notha (6857) 10 Navicula vulpina (6857) 11, 12 Navicula tripunctata var. arctica (6857) 13 Navicula venerablis (6862) 14–17 Navicula exilis (6856, 6857). Scale bar: 10 µm.
Plate 98. Baillie-Back. 1–6 Neidiopsis vekhovii (6856, 6858, 6859, 6862, 6865) 7–9 Neidiopsis wulffii (6862) 10–13 Neidium ladogensis (6862) 14–16 Neidium alaskaense (6862) 17–21 Neidium holstii (6858, 6862). Scale bars: 10 µm.
Plate 99. Baillie-Back. 1 Neidium sp. (6862) 2, 3 N. apiculatum (6862) 4 N. fossum [N. sp. PH] (6862) 5 N. affine var. humerus (6862) 6 N. fossum (6858) 7 N. amphigomphus (6863) 8 N. ampliatum [N. ampliatum sensu lato PH] (6856, 6864) 9 N. fossum (6863). Scale bar: 10 µm.
Plate 100. Baillie-Back. 1, 2 Neidium sp. (6858, 6862) 3 N. sp. [cf. N. bisulcatum var. baicalense PH] (6862) 4 N. sp. (6862) 5 N. temperet (6863) 6, 7 N. affine var. longiceps [Fig. 6 N. longiceps. Fig. 7 N. sp. PH] (6858, 6862) 8 N. affine (6858) 9 N. bergii (6862) 10, 11 N. sp. (6859, 6860, 6863) 12, 13 N. hitchcockii (6862, 6863) 14, 15 N. bisulcatum [Fig. 15 cf. N. bisulcatum PH] (6856, 6862, 6864, 6865, 6866) 16 N. ampliatum [N. ampliatum sensu lato PH] (6856, 6864). Scale bar: 10 µm.
Plate 101. Baillie-Back. 1 Chamaepinnularia bergeri (6857) 2 Caloneis sp. (6862) 3 Caloneis silicula (6866) 4–7 Caloneis fusus (6866) 8 Pinnularia marchica (6862) 9 Pinnularia krammeri (6856) 10 Pinnularia grunowii (6863) 11 Pinnularia lata (6863) 12 Pinnularia borealis [cf. P. rabenhorstii PH] (6862) 13, 14 Pinnularia sp. [cf. P. microstauron] (6857) 15, 16 Pinnularia biceps (6857). Scale bar: 10 µm.
Plate 102. Baillie-Back. 1–9 Pinnularia sp. [cf. P. sinistra] [P. sinistra PH] (6856, 6857, 6864) 10 P. macilenta (6857, 6858) 11–13 P. subgibba (6856, 6857, 6859) 14–16 P. crucifera (6856, 6857, 6859). Scale bar: 10 µm.
Plate 103. Baillie-Back. 1–4 Pinnularia spitsbergensis (6866) 5–7 P. genkaii (6866). Scale bar: 10 µm.
Plate 104. Baillie-Back. 1–3 Pinnularia sinistra (6859) [Figs 2 and 3 are the same specimen] 4 P. sp. [cf. P. similiformis PH] (6866) 5 P. latilaeensis [cf. P. latilaeensis PH] (6866) 6, 7 P. divergens var. sublinearis (6862) 8–10 P. sp. [cf. P. decrescens] (6866). Scale bar: 10 µm.
Plate 105. Baillie-Back. 1 *Stauroneis heinii* (6863) 2 *S. angustilancea* (6858) 3, 4 *S. kuelbsii* (6857, 6858) 5 *S. anceps* (6864). Scale bar: 10 µm.
Plate 106. Baillie-Back. 1 Stauroneis fluminea (6863) 2 S. gracilis (6856) 3 S. boyntoniae (6862) 4 S. amphicephala (6856) 5 S. anceps [S. anceps sensu lato PH] (6856) 6 S. reichardtii (6856, 6864) 7 S. livingstonii (6862) 8 S. prominula [= S. ignorata = S. biundulata PH] (6862). Scale bar: 10 µm.
Plate 107. Baillie-Back. 1–3 Stauroneis circumborealis (6856, 6864). Scale bars: 10 μm.
Plate 108. Baillie-Back. 1 Hantzschia elongata or H. vivacior (6856) 2 Stenopterobia anceps (6860) 3 Surirella linearis (6858) 4 Nitzschia gracilis (6862) 5 Nitzschia palea var. tenuirostris [N. palea var. tenuirostris sensu lato PH] (6857) 6 Nitzschia acidoclinata (6856) 7, 8 Nitzschia perminuta (6856, 6865) 9 Nitzschia alpina (6858) 10–12 UFOs (unidentified floating objects; desmids? Closterium?) (6860).
Scale bar: 10 µm.
Plate 109. Hood. 1, 2 Lindavia radiosa (6898) 3 Lindavia antiqua (6898) 4 Lindavia affinis (6904) 5 Hannaea superiorensis (6906) 6 Ulnaria sp. (6907) 7 Fragilaria crotonensis (6908) 8 Fragilaria sepes (6898) 9–14 Fragilaria sp. (6900, 6904, 6909) 15–19 Fragilaria sp. [F. vaucheriae sensu Tuji PH] (6900) 20 Stauroforma exiguiiformis (6905) 21 Stauroforma sp. (6912) 22 Orthoseira roeseana (6904) 23 Discostella pseudostelligera (6908) 24–26 Tabellaria flocculosa (6898, 6900) 27–33 Tabellaria fenestrata [Figs 27–29 T. flocculosa PH] (6898, 6906). Scale bars: 10 µm.
Plate 110. Hood. 1–4 *Psammothidium marginulatum* (6900) 5–7 *Achnanthidium duthiei* [A. sp. PH] (6904) 8–13 *Achnanthidium kriegeri* (6900) 14 *Achnanthidium minutissimum* (6912) 15–17 *Rossithidium petersenii* (6900) 18 *Cocconeis rugosa* (6898) 19–22 *Eucocconeis flexella* (6898, 6907) 23, 24 *Eucocconeis depressa* (6907) 25 *Nupela* (?) sp. (6899) 26 *Eucocconeis alpestris* (6909) 27, 28 *Eucocconeis laevis* (6909). Scale bar: 10 µm.
Plate 111. Hood. 1 Eunotia pseudopapilio (6898) 2 E. semicircularis (6899) 3 E. bidens (6898) 4 E. superbidens (6908) 5–10 E. mihoi [E. sp. PH] (6900) 11–13 E. perminuta (6900) 14 E. circumborealis [E. rhomboidea PH] (6900) 15 E. implicata (6900) 16 E. herkiniensis (6905) 17, 18 E. suecica (6900) 19 E. dorofeyukae (6898) 20 E. didon (6905) 21 E. sarek (6901). Scale bar: 10 µm.
Plate 112. Hood. 1 *Eunotia julma* (6898) 2 *E. pseudepectinalis* (6898) 3 *E. maior* [or *E. metamonodon PH*] (6905) 4 *E. metamonodon* (6898) 5 *E. paralleladubia* (6899) 6 *E. pseudoflexuosa* (6898) 7 *E. mucophila* (6905) 8 *E. fallax* (6898) 9, 10 *E. boreotenuis* [Fig. 9 *E. sp. PH*] (6900, 6907) 11 *E. intermedia* (6900) 12 *E. glacialis* [E. minor PH] (6907) 13 *E. curtagrunowii* (6900) 14–16 *E. botuliformis* (6900) 17–19 *E. incisa* (6900) 20, 21 *E. fusta* (6905) 22, 23 *E. nymanniana* (6898, 6905) 24 *E. exigua* [E. sp. PH] (6900). Scale bar: 10 µm.
Plate 113. Hood. 1–7 Eunotia ursamaioris (6900) 8 E. minor [or E. rhomboidea PH] (6900) 9–12 E. arcus (6898, 6899, 6907) 13–16 E. arcubus (6898, 6907) 17–21 E. praerupta (6901, 6903). Scale bar: 10 µm.
Plate 114. Hood. 1–6 Brachysira sp. (6898, 6904, 6908) 7–10 Brachysira sp. (6905) 11 Brachysira microcephala (6913) 12, 13 Brachysira sp. [cf. Brachysira calcicola] (6900) 14–17 Brachysira styriaca (6898, 6908) 18 Brachysira arctoborealis (6905) 19–22 Caloneis fusus (6898, 6904, 6906, 6912) 23–27 Caloneis tenuis [? PH] (6904, 6908) 28 Caloneis obtusa (6908) 29 Caloneis silicula (6912) 30–32 Auneustus tusculus (6906, 6909). Scale bar: 10 µm.
Plate 115. Hood. 1 Cymbella arctica (6904) 2–6 C. krammeri (6898, 6904, 6906, 6909) 7–12 C. botellus (6904, 6906). Scale bar: 10 µm.
Plate 116. Hood. 1–5 Cymbella arctica (6904). Scale bar: 10 µm.
Plate 117. Hood. 1–14 *Cymbella cleve-eulerae* (6898, 6905, 6909). Scale bar: 10 μm.
Plate 118. Hood. 1 Cymbella proxima (6904) 2 Cymbella hantzschiana (6898) 3, 4 Cymbella designata (6898, 6906) [= Cymbopleura citriformis] 5 Cymbella sp. (6904) 6–10 Delicata canadensis (6898, 6904) 11, 12 Delicata delicatula (6904) 13 Cymbella aspera (6912). Scale bar: 10 µm.
Plate 119. Hood. 1, 2 Cymbopleura heilprinensis (6907, 6909) 3 C. tundraphila (6904) 4 C. hybrida (6908) 5, 6 C. fluminea (6905, 6912) 7 C. rupicola (6909) 8, 9 C. sp. (6909) 10 C. neoheteropleura (6898) 11, 12 C. tynnii (6907, 6912) 13, 14 C. angustata (6900, 6904) 15 C. stauroneiformis (6898). Scale bar: 10 µm.
Plate 120. Hood. 1, 2 *Gymbopleura neoheteropleura* (6907) 3, 7 *C. apiculata* (6906, 6907) 4 *C. incerta* var. *spitsbergensis* [C. sp. PH] (6904) 5 *C. tundraphila* (6904) 6 *C. stauroneiformis* (6905). Scale bar: 10 μm.
Plate 121. Hood. 1–4 *Cymbopleura incerta* var. *spitsbergenensis* (6904, 6907, 6912) 5 *Cymbopleura incertiformis* (6905) 6 *Cymbopleura oblongata* (6907). 7–10 (11, 12). *Cymbopleura incertiformis* var. *linearis* (6898, 6903, 6906, 6907, 6908) 13–23 *Encyonopsis* (*Cymbopleura?*) *grunowii* [= *Cymbella naviculacea*] (6899, 6904). Scale bar: 10 μm.
Plate 122. Hood. 1 Encyonema sibericum (6903, 6906) 2–4 E. lunatum (6898, 6907, 6912) 5–7 E. paucistriatum (6899, 6900, 6912) 8 E. hebridicum [E. hebridicum sensu lato PH] (6905) 9 E. norvegicum (6907, 6909) 10, 11 E. elginense (6907, 6908, 6909) 12, 13 E. perminutum (6898, 6902) 14 E. ventricosum 15–17 E. silesiacum (6902). (6898, 6904, 6913) 18–24 E. hintzii (6898, 6906, 6907, 6908, 6909, 6912). Scale bar: 10 µm.
Plate 123. Hood. 1, 2 Encyonopsis inuitorum (6898, 6904) 3–5 Encyonopsis falaisensis (6904, 6909) 6–9 Encyonopsis sp. (6898, 6904) 10–12 Encyonopsis descripta (6904, 6909) 13–17 Encyonopsis cesatiformis (6899, 6904, 6905, 6907, 6912) 18–22 Encyonopsis stafsholtii (6904, 6905, 6907, 6908) 23 Kurtkrammeria pseudoamphioxys (6905) 24 Kurtkrammeria neoamphioxys (6905) 25–30 Encyonopsis cesatti (6904, 6905, 6907, 6912). Scale bar: 10 µm.
Plate 124. Hood. 1, 2 Gomphonema astridae (6906) 3, 4 G. sp. (6907) 5–9 G. lagerheimii sensu lato (6898, 6905, 6906, 6907, 6908, 6912) 10–13 G. lateripunctatum (6904) 14 G. sarcophagus [G. sp. PH] (6904) 15 G. gracile (6907) 16 G. sp. [cf. G. pygmaeum] (6912) 17 G. exilissimum (6913) 18 G. sp. [cf. G. minusculum] (6900) 19–22 G. sp. [cf. G. capitatum] (6904, 6906, 6913) 23 G. laticollum (6898) 24 G. acuminatum (6904) 25–28 G. sp. [cf. G. interpositum] [cf. G. montanum PH] (6907, 6908, 6909). Scale bar: 10 µm.
**Plate 125.** Hood. 1 Geissleria moseri (6898) 2, 3 Hygropetra balfouriana (6904) 4 Frustulia vulgaris (6913) 5 Frustulia crassinervia (6899, 6900, 6905) 6 Sellaphora sp. (6909) 7 Sellaphora rectangularis (6909) 8 Sellaphora pupula (6909) 9, 10 Sellaphora parapupula (6903, 6907, 6909) 11, 12 Amphora copulata (6908, 6912) 13 Muelleria bachmannii (6908) 14, 15 Diploneis arctica [D. ovalis ssp. arctica PH] (6907, 6908) 16 Diploneis parma (6908) 17 Kobayasiella micropunctata (6903, 6905) 18 Kobayasiella jaagii [K. micropunctata PH] (6907) 19 Decusata placenta (6898). Scale bars: 10 µm.
Plate 126. Hood. 1–4 Pinnuavis sp. [cf. Pinnuavis elegans f. crowbillensis PH] (6912). Scale bars: 10 µm.
Plate 127. Hood. 1, 2 Navicula salinarum (6912, 6913) 3 N. gregaria (6913) 4 N. vandamii (6913) 5 N. hanseatica subsp. hanseatica (6911) 6 N. hanseatica subsp. circumarctica (6912) 7 N. trivialis (6913) 8–11 N. slesvicensis (6912, 6913) 12–17 N. eidrigiana (6906, 6912) 18–24 N. vaneei (6904, 6906, 6912). Scale bars: 10 µm.
Plate 128. Hood. 1, 2 Navicula notha (6898, 6909) 3–5 N. cryptocephala (6898, 6906, 6912, 6913) 6 N. tridentula (6909) 7 N. angusta (6906) 8–12 N. tripunctata var. arctica (6898, 6906, 6907, 6912, 6908) 13, 14 N. vulpina (6898, 6906) 15–19 N. radios a (6904, 6906, 6912, 6913). Scale bar: 10 µm.
Plate 129. Hood. 1, 12 Neidium bisulcatum (6899, 6908, 6912) 2 N. affine [N. potapovae PH] (6908) 3, 4 N. sp. [cf. N. septentrionale] (6902, 6912) 5, 10 N. fossum (6905, 6908) 6, 9 N. ampliatum [N. sp. PH] (6899, 6906) 7 N. productum (6898) 8 N. sp. [cf. N. septentrionale] (6907) 11 N. temperei (6907, 6909). Scale bar: 10 µm.
Plate 130. Hood. 1–4 Pinnularia sp. [cf. P. sinistra] (6898, 6899, 6901, 6903, 6906) 5–7 P. subpulchra (6899) 8 P. crucifera (6909) 9–11 P. spitsbergensis (6898, 6906, 6907, 6908) 12 P. sp. [cf. P. lokana] [cf. P. gibba sensu lato PH] (6906, 6907, 6912) 13 P. divergens (6899) 14 P. biceps (6898) 15 P. decrescens (6899, 6907) 16 P. anglica (6906, 6907) 17 P. grunowii (6906, 6907) 18 P. birnirkiana (6912). Scale bar: 10 µm.
Plate 131. Hood. 1 Stauroneis livingstonii (6913) 2, 3 Stauroneis smithii var. incisa [S. sp. PH] (6912) 4 Staurophora sp. (6912) 5 Stauroneis gracilis (6906) 6 Stauroneis kuelbhii (6898, 6903, 6906) 7 Stauroneis hyperborea [PH] (6906, 6909) 8 Stauroneis amphicephala (6903, 6906) 9 Stauroneis reichardtii (6898) 10 Stauroneis jarensis (6903, 6904, 6906, 6907). Scale bar: 10 μm.
Plate 132. Hood. 1–3 Nitzschia alpina (6898, 6904) 4, 5 Nitzschia frustulum (6908, 6912) 6, 7 Nitzschia acidoclinata (6898, 6899) 8 Nitzschia sp. [cf. N. fossilis] (6911) 9, 10 Nitzschia angustata (6898, 6904, 6909) 11 Nitzschia nana (6912) 12 Denticula kuetzingii var. rumrichae (6906) 13 Nitzschia regula var. robusta (6904) 14 Nitzschia sp. [cf. N. bacillum] (6898) 15 Nitzschia perminuta (6912) 16 Nitzschia suchlandtii [N. gracilis sensu lato PH] (6900) 17 Denticula kuetzingii (6898, 6904) 18 Denticula valida [D. kuetzingii PH] (6909) 19–21 Epithemia smithii (6898, 6902, 6908) 22 Surirella brebissonii (6913). Scale bars: 10 µm.
### Table 7. List of taxa and index to plates.

| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Baillie/Back | Hood |
|--------------------------------------------|----------|-------------|------------|------------|--------------|------|
| Achnanthidium Kützing                      | 3        |             |            |            |              | 77   |
| Achnanthidium duthiei (Steenivas) Edlund   |          |             |            |            |              | 110  |
| Achnanthidium kriegeri (Krasske) Hamilton, Antoniades & Siver | 24       |             |            |            |              | 110  |
| Achnanthidium minutissimum (Kützing) Czarnecki | 24       |             |            |            |              | 110  |
| Actinella punctata Lewis                   |          |             |            |            |              |      |
| Adlaia minuscula (Grunow) Lange-Bertalot   |          |             |            |            |              | 46   |
| Amphora Ehrenberg in Kützing               |          |             |            |            |              | 5    |
| Amphora copulata (Kützing) Schoem & Archibald | 5        |             |            |            |              | 125  |
| Amphora lange-bertalottii Levkov & Metzelin |          |             |            |            |              | 64   |
| Amphora pediculus (Kützing) Grunow         |          |             |            |            |              | 5    |
| Amphora thumensis (Mayer) Cleve-Euler      |          |             |            |            |              | 5    |
| Aneumastus rostratus (Hustedt)             |          |             |            |            |              |      |
| Aneumastus tusculus (Ehrenberg) Mann & Stickle | 4        |             |            |            |              | 59   |
| Aneumastus tusculus (Ehrenberg) Mann & Stickle | 4        |             |            |            |              | 114  |
| Aulacoseira Thwaites                      |          |             |            |            |              |      |
| Aulacoseira alpigena (Grunow) Krammer      | 1        |             |            |            |              | 38   |
| Aulacoseira ambigua (Grunow) Simonsen      |          |             |            |            |              | 38   |
| Aulacoseira crassipunctata Krammer         |          |             |            |            |              |      |
| Aulacoseira italica (Ehrenberg) Simonsen   | 1        |             |            |            |              | 38   |
| Aulacoseira nivalis (W. Smith)             |          |             |            |            |              |      |
| English & Potapova                         |          |             |            |            |              |      |
| Aulacoseira subarctica (O. Müller) Haworth |          |             |            |            |              |      |
| Boreozonacola olympica (Sovereign)         |          |             |            |            |              |      |
| Lange-Bertalot et al.                     |          |             |            |            |              | 46   |
| Brachysira Kützing                         |          |             |            |            |              |      |
| Brachysira arctoborealis Wolfe & Kling     |          |             |            |            |              |      |
| Brachysira brebissonii Ross in Hartley     | 3        |             |            |            |              | 25   |
| Brachysira calicola Lange-Bertalot         |          |             |            |            |              |      |
| Brachysira microcephala (Grunow) Compère   | 3        |             |            |            |              | 59   |
| Brachysira ocalanensis Shayler & Siver     |          |             |            |            |              | 25   |
| Brachysira procera Lange-Bertalot & Moser  |          |             |            |            |              | 25   |
| Brachysira styriaca (Grunow) Ross in Hartley |          |             |            |            |              |      |
| Brachysira zellensis (Grunow) Round & Mann |          |             |            |            |              | 59   |
| Caloneis Cleve                             |          |             |            |            |              |      |
| Caloneis bacillum (Grunow) Cleve           |          |             |            |            |              |      |
| Caloneis falcifera                         |          |             |            |            |              |      |
| Lange-Bertalot, Genkal & Vekhov           |          |             |            |            |              |      |

**Appendix 2: Index to diatom images**
| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Ballie/Back | Hood |
|-------------------------------------------|----------|-------------|------------|------------|-------------|------|
| *Caloneis fasciata* (Lagerstedt) Cleve    |          | 70          |            |            |             |      |
| *Caloneis fusus* Hamilton & Antoniades in Antoniades et al. |          | 70          | 101        | 114        |             |      |
| *Caloneis obtusa* (W. Smith) Cleve        |          | 70          |            | 114        |             |      |
| *Caloneis schumanniana* (Grunow) Cleve    |          |             |            |            | 13          |      |
| *Caloneis silicula* (Ehrenberg) Cleve     |          |             | 101        | 114        |             |      |
| *Caloneis tenuis* (Gregory) Krammer       |          | 12, 13      | 33         | 70         | 114         |      |
| *Caloneis undulata* Skvortzow & Meyer     |          |             |            |            | 13          |      |
| *Cavinula daviesiae* Bahls                 |          |             |            |            |             | 89   |
| *Cavinula jaernefeltii* (Hustedt) Mann & Stickel |          |             |            |            |             |      |
| *Cavinula pseudoscutiformis* (Hustedt) Mann & Stickel |          | 24          | 46         | 59         |             |      |
| *Cavicula scutiformis* (Grunow) Mann & Stickel |          |             |            |            | 89          |      |
| *Chamaepinnularia bergeri* (Krasske) Lange-Bertalot |          |             |            |            | 101         |      |
| *Cocconeis* Ehrenberg                     |          | 24          |            |            |             |      |
| *Cocconeis placentula* Ehrenberg          |          | 24          |            |            |             |      |
| *Cocconeis pseudothumensis* Reichardt      |          |             |            |            | 3           | 110  |
| *Cocconeis rugosa* Sovereign              |          |             |            |            |             |      |
| *Coscinodiscus* Ehrenberg                 |          |             |            |            | 18          |      |
| *Craticula* Grunow                        |          |             |            |            |             | 89   |
| *Craticula buderii* (Hustedt) Lange-Bertalot |          |             |            |            | 46          |      |
| *Craticula cuspidata* (Kützing) Mann       |          |             |            |            | 46          |      |
| *Craticula johnstoniae* Bahls              |          |             |            |            | 4           |      |
| *Craticula sardiniana* Bahls               |          |             |            |            | 4           |      |
| *Cyclotella distinguenda* Hustedt           |          |             |            |            | 1           |      |
| *Cymatopleura solea* (Brébisson) W. Smith |          |             |            |            | 76          |      |
| *Cymbella Agardh*                         |          | 43          | 60         | 118        |             |      |
| *Cymbella alpestris* Krammer               |          |             |            |            | 5           |      |
| *Cymbella americana* A. Schmidt            |          |             |            |            | 7           | 44   |
| *Cymbella arctica* (Lagerstedt) A. Schmidt |          |             |            |            |             |      |
| *Cymbella aspera* (Ehrenberg) H. Peragallo |          |             |            |            | 43          | 118  |
| *Cymbella botellus* (Lagerstedt) A. Schmidt |          |             |            |            | 60          | 115  |
| *Cymbella cleve-eulerae* Krammer           |          | 60, 61      | 92         | 117        |             |      |
| *Cymbella cosleyi* Bahls                   |          |             |            |            | 5           |      |
| *Cymbella designata* Krammer               |          |             |            |            | 63          | 92   |
| *Cymbella excisiformis* Krammer            |          |             |            |            | 5           |      |
| *Cymbella hantzschiana* Krammer            |          |             |            |            | 5           | 43   |
| *Cymbella krammeri* Bahls                  |          |             |            |            | 61          | 92   |
| *Cymbella naviculacea* Grunow              |          |             |            |            | 43          | 121  |
| *Cymbella neocistula* Krammer              |          |             |            |            | 5           | 28   |
| *Cymbella neocistula var. islandica* Krammer |          |             |            |            | 5           | 61   |
|
| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Baillie/Back | Hood |
|------------------------------------------|----------|-------------|------------|------------|--------------|------|
| *Cymbella neoleptoceros* Krammer          | 5        |             |            |            |              |      |
| *Cymbella proxima* Reimer in Patrick & Reimer | 5        | 28          | 92         | 118        |              |      |
| *Cymbella stigmaphora* Østrup             | 5        |             |            |            |              |      |
| *Cymbella subturgidula* Krammer          |          | 60          |            |            |              |      |
| *Cymbopleura* Krammer                    | 27       |             | 94         | 119        |              |      |
| *Cymbopleura amphicephala* (Naegeli) Krammer | 7        |             | 62         |            |              |      |
| *Cymbopleura anglica* (Lagerstedt) Krammer | 7        |             |            | 94         |              |      |
| *Cymbopleura angustata* (W. Smith) Krammer | 7        |             | 62         | 94         | 119          |      |
| *Cymbopleura apiculata* Krammer          | 7        |             | 44         | 63         | 94           | 120  |
| *Cymbopleura austriaca* (Grunow) Krammer |          |             |            |            | 63           |      |
| *Cymbopleura citriformis* Krammer        | 63       |             | 92         | 118        |              |      |
| *Cymbopleura crassipunctata* Krammer     |          |             |            |            |              | 44   |
| *Cymbopleura fluminea* (Patrick & Freese) Lange-Bertalot & Krammer | 27       | 44          | 94         | 119        |              |      |
| *Cymbopleura gefriedii* Reichardt in Krammer |          |             |            |            | 62           |      |
| *Cymbopleura heilprinensis* Foged        | 7        |             | 63         | 92         | 119          |      |
| *Cymbopleura hybrida* (Grunow) Krammer   | 7        |             | 62         | 94         | 120          |      |
| *Cymbopleura incerta* (Grunow) Krammer   | 7        |             | 62         | 94         |              |      |
| *Cymbopleura incerta var. spitsbergenis* Krammer |          |             |            |            | 120, 121     |      |
| *Cymbopleura incertiformis* Krammer      |          |             |            |            |              | 121  |
| *Cymbopleura incertiformis var. linearis* (Fontell) Krammer |          |             |            |            | 62, 94       | 121  |
| *Cymbopleura laponica* (Grunow) Krammer  | 7        |             |            |            |              |      |
| *Cymbopleura lata* (Grunow) Krammer      | 7        |             |            |            | 63           |      |
| *Cymbopleura naviculiformis* (Auerswald) Krammer |          |             |            |            |              | 44   |
| *Cymbopleura neoheteropleura* Krammer    |          |             |            |            | 93, 94       | 119, 120 |
| *Cymbopleura oblongata* Krammer          | 7        |             | 62         | 121        |              |      |
| *Cymbopleura rainierensis* (Sovereign) Bahls | 7        |             | 44         |            |              |      |
| *Cymbopleura rupicola* (Grunow) Krammer  | 7        |             | 62         | 119        |              |      |
| *Cymbopleura similiformis* Krammer       | 7        |             |            |            |              |      |
| *Cymbopleura stauroeneiformis* (Lagerstedt) Krammer |          |             |            |            | 44, 62, 94  | 119, 120 |
| *Cymbopleura subaequalis* (Grunow) Krammer | 7        |             |            |            |              |      |
| *Cymbopleura subcuspidata* (Krammer) Krammer | 7        | 27          | 44         |            |              |      |
| *Cymbopleura tunadrphila* Bahls           |          |             |            |            | 62           | 119, 120 |
| *Cymbopleura tynii* (Krammer) Krammer    |          |             |            |            | 63, 94       | 119  |
| *Decussata placenta* (Ehrenberg) Lange-Bertalot & Metzeltin |          |             |            |            | 26           | 125  |
| *Delicata alpestris* (Krammer) Bahls      |          |             |            |            | 28           |      |
| *Delicata canadenis* Bahls                |          |             |            |            | 64           | 91, 118 |
| Taxa | Waterton | Haida Gwaii | Clearwater | Coppermine | Ballie/Back | Hood |
|------|----------|-------------|------------|------------|-------------|------|
| Delicata delicatula (Kützing) Krammer | 5 | | | | | 118 |
| Denticula Kützing | | | 75, 76 | | | |
| Denticula kuetzingii Grunow | 17 | 37 | 76 | | 132 | |
| Denticula kuetzingii var. rumrichae Krammer | | | | | | 132 |
| Denticula tenuis Kützing | | | | 76 | | |
| Denticula valida (Pedicino) Grunow | | | 76 | | 132 | |
| Diadema perpusilla (Grunow) Mann | 3 | | | | | |
| Diatomella ballourianna Greville | 3 | | | | | |
| Didymosphenia geminata (Lyngbye) M. Schmidt | 8 | | | | | |
| Diploneis arctica (Lange-Bertalot) Lange-Bertalot & Fuhrmann | | | | | 125 |
| Diploneis elliptica (Kützing) Cleve | | | 24 | | | |
| Diploneis finnica (Ehrenberg) Cleve | | | 24 | | | |
| Diploneis krammeri Lange-Bertalot & Reichardt | | | | 59 | | |
| Diploneis oblongella (Naegeli in Kützing) Cleve-Euler | | | | 10 | | |
| Diploneis oculata (Brébisson) Cleve | | | 10 | | 125 | |
| Diploneis parma Cleve | | | 10 | | | |
| Diploneis pseudovalis Hustedt | | | 10 | | | |
| Discostella pseudostelligera (Hustedt) Houk & Klee | | | | 109 | | |
| Encyonema Kützing | 6 | 30 | | | | |
| Encyonema elginense (Krammer) Mann | | | | 122 | | |
| Encyonema fogedii Krammer | 6 | 29 | 45 | | | |
| Encyonema hamsherae Winter & Bahls | | | 6 | | | |
| Encyonema hebridicum (Gregory) Grunow in Cleve & Möller | 6 | 30 | 45 | 64 | | 122 |
| Encyonema hintzii Krammer | 6 | | 64 | 90 | | 122 |
| Encyonema latum Krammer | | | 29 | | | |
| Encyonema lunatum (W. Smith) Van Heurck | | | 90 | | 122 | |
| Encyonema minutiforme Krammer | | | | 29 | | |
| Encyonema minutum (Hilse in Rabenhorst) Mann | 6 | | 45 | | | |
| Encyonema neagracile Krammer | 30 | 45 | | | 90 | |
| Encyonema norvegicum (Grunow) Mayer | 6 | | 64 | | 122 | |
| Encyonema paucistriatum (Cleve-Euler) Mann | | | 64 | 90 | | 122 |
| Encyonema perigracile Krammer | | | 30 | | | |
| Encyonema perminutum Krammer | | | | 122 | | |
| Encyonema perpusillum (Cleve-Euler) Mann | | | 30 | | | |
| Encyonema procerum Krammer | 6 | | | | 90 | 122 |
| Encyonema sibericum Krammer | | | | | | |

Atlas of diatoms from diverse habitats in remote regions of western Canada
| Taxa                                              | Waterton | Haida Gwaii | Clearwater | Coppermine | Ballie/Back | Hood  |
|---------------------------------------------------|----------|-------------|------------|------------|-------------|-------|
| Encyonema silesiacum (Bleisch) Mann              |          | 29          | 64         | 122        |             |       |
| Encyonema temperei Krammer                       |          |             | 6          |            |             |       |
| Encyonema ventricosum (Agardh) Grunow in A. Schmidt et al. |          | 6          | 64         | 90         | 122        |       |
| Encyonema vulgare Krammer                        |          |             | 29         | 64         | 90          |       |
| Encyonema willeyorum Bahls                       |          |             |            |            | 90          |       |
| Encyonopsis Krammer                              |          | 6          | 65         | 91         | 123        |       |
| Encyonopsis alpina Krammer & Lange-Bertalot      |          |             | 6          |            |             |       |
| Encyonopsis angusta Krammer & Lange-Bertalot     |          |             |            | 65         |            |       |
| Encyonopsis cesatiformis Krammer                 |          | 65         | 91         | 123        |             |       |
| Encyonopsis cesatii (Rabenhorst) Krammer         | 12       | 30          | 91         | 123        |             |       |
| Encyonopsis czarneki (Bals)                      |          |             |            | 123        |             |       |
| Encyonopsis descripta (Hustedt) Krammer           |          | 65         | 123        |             |             |       |
| Encyonopsis falaisensis (Grunow) Krammer          |          | 65         | 123        |             |             |       |
| Encyonopsis grunowii Krammer                     |          |             |            | 123        |             |       |
| Encyonopsis insularum Bahls                      |          | 65         | 91         | 123        |             |       |
| Encyonopsis lacuscaerulei Bahls                  |          |             |            | 65         |             |       |
| Encyonopsis montana Bahls                        |          | 6          |            |             |             |       |
| Encyonopsis neerlandica Van de Vijver et al.     |          |             |            | 65         |             |       |
| Encyonopsis stafsholtii Bahls                    |          | 30          | 65         | 91         | 123        |       |
| Encyonopsis subminuta Krammer & Reichardt        | 6        | 30          |            |             |             |       |
| Entomoneis paludosa (W. Smith) Reimer            |          | 37          | 53         |             |             |       |
| Epithemia Brébisson                              |          | 17          |            |             |             |       |
| Epithemia adnata (Kützing) Brébisson             |          | 17          |            |             |             |       |
| Epithemia argus (Ehrenberg) Kützing               |          | 17          | 53         |             |             |       |
| Epithemia smithii Carruthers                      | 17       | 36          | 76         | 132        |             |       |
| Epithemia turgida var. granulata (Ehrenberg) Brun |          |             |            |             |             |       |
| Eucocconeis alpestris (Brun) Lange-Bertalot       |          | 3          |            | 110        |             |       |
| Eucocconeis depressa (Cleve) Lange-Bertalot       |          |            |            | 77         | 110        |       |
| Eucocconeis flexella (Kützing) Meister            |          | 24          | 56         | 77         | 110        |       |
| Eucocconeis laevis (Ostrup) Lange-Bertalot        |          | 56          |            |             |             |       |
| Eunotia Ehrenberg                                 |          | 21, 22, 23  | 39, 40, 41 | 57         | 78, 83, 85  |       |
| Eunotia altimontana Lange-Bertalot, Pavlov & Levkov |          |            |            | 57         |             |       |
| Eunotia ambivalens Lange-Bertalot & Tagliaventi   |          | 40, 41      |            | 87         |             |       |
| Eunotia arcofallax Lange-Bertalot                 |          | 23          |            |             |             |       |
| Eunotia arcubus Nörpel-Schempp & Lange-Bertalot   |          | 58          | 78         | 113        |             |       |
| Eunotia arculus Lange-Bertalot & Nörpel-Schempp   |          | 23          |            |             |             |       |
| Taxa                                      | Waterton | Hadia Cove | Clearwater | Coppermine | Baffin/Back | Hood |
|-------------------------------------------|----------|------------|------------|------------|-------------|------|
| *Eunotia arcus* (Ehrenberg) W. Smith      | 2        | 57         | 78         | 113        |             |      |
| *Eunotia bidens* Ehrenberg                | 39       |            |            |            |             | 111  |
| *Eunotia bidentula* W. Smith              | 20       |            |            |            |             |      |
| *Eunotia bilunaris* (Ehrenberg) Schaarschmidt | 22     | 88         |            |            |             |      |
| *Eunotia borealpina* Lange-Bertalot & Nörpel-Schempp | 87   |            |            |            |             |      |
| *Eunotia boreotenuis* Nörpel-Schempp & Lange-Bertalot | 23   | 88         |            | 112        |             |      |
| *Eunotia botuliformis* Wild, Nörpel-Schempp & Lange-Bertalot | 2  | 23         | 88         | 112        |             |      |
| *Eunotia braendlei* Lange-Bertalot & Werum | 83       |            |            |            |             |      |
| *Eunotia circumborealis* Lange-Bertalot & Nörpel-Schempp | 39   | 85         |            | 111        |             |      |
| *Eunotia curtgrunowi* Nörpel-Schempp & Lange-Bertalot | 78, 82  |            |            |            |             | 112  |
| *Eunotia denticulata* (Brébisson) Rabenhorst | 83       |            |            |            |             |      |
| *Eunotia diadema* Ehrenberg               | 21       |            |            | 84         |             |      |
| *Eunotia diodon* Ehrenberg                | 85       |            |            | 111        |             |      |
| *Eunotia dorefeyukae* Lange-Bertalot & Kulikovskiy | 111       |            |            |            |             |      |
| *Eunotia elegans* Østrup                  | 83       |            |            |            |             |      |
| *Eunotia eurycephala* (Grunow) Nörpel-Schempp & Lange-Bertalot | 40  | 87         |            |            |             |      |
| *Eunotia excelsa* (Krasske) Nörpel         | 58       |            |            |            |             |      |
| *Eunotia exigua* (Brébisson) Rabenhorst   |          |            |            | 112        |             |      |
| *Eunotia faba* Ehrenberg                  | 40       |            |            | 112        |             |      |
| *Eunotia fallax* A. Cleve                 | 42       |            |            | 112        |             |      |
| *Eunotia flexuosa* (Brébisson in Kützing) Kützing | 22, 40 |            |            |            |             |      |
| *Eunotia glacialis* Meister               |          |            |            |            |             | 112  |
| *Eunotia groenlandica* Nörpel-Schempp & Lange-Bertalot | 42 |            |            |            |             |      |
| *Eunotia herkiniensis* Grunow              |          |            |            | 111        |             |      |
| *Eunotia implicata* Nörpel-Schmp, Alles & Lange-Bertalot | 111       |            |            |             |             |      |
| *Eunotia incisa* Gregory                  | 23       | 40         | 87         | 112        |             |      |
| *Eunotia intermedia* (Krasske) Nörpel-Schempp & Lange-Bertalot | 112  |            |            |            |             |      |
| *Eunotia islandica* Østrup                | 20       | 57         | 85         |            |             |      |
| *Eunotia juettneriae* Lange-Bertalot       | 2        |            | 87         |            |             |      |
| *Eunotia julma* Lange-Bertalot            | 22       | 41         |            | 112        |             |      |
| *Eunotia lapponica* Grunow                |          |            |            | 83         |             |      |
| *Eunotia latituativa* Kobayasi, Ando & Nagumo | 87       |            |            |            |             |      |
| *Eunotia lewissii* Siver & Hamilton       | 23       |            |            |            |             |      |
| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Baillie/Back | Hood |
|-------------------------------------------|----------|-------------|------------|--------------|------|
| *Eunotia maior* (W. Smith) Rabenhorst    |          |             |            |              | 112  |
| *Eunotia mayame* Lange-Bertalot, Bak & Witkowski |          |             |            |              |      |
| *Eunotia metemtiensae* Lange-Bertalot    |          |             |            |              | 22   |
| *Eunotia metamonodon* Lange-Bertalot     |          |             |            |              | 21   |
| *Eunotia mihi* Lange-Bertalot, Pavlov & Levkov |          |             |            |              | 81   |
| *Eunotia minor* (Kützing) Grunow         |          |             |            |              | 111  |
| *Eunotia monnieri* Lange-Bertalot & Tagliaventi |      |             |            |              |      |
| *Eunotia mucophila* (Lange-Bertalot et al.) Lange-Bertalot |          |             |            |              | 41   |
| *Eunotia naegeli* Migula                 |          |             |            |              | 22   |
| *Eunotia neoborealisa* Lange-Bertalot    |          |             | 83         |              |      |
| *Eunotia neocompacta* Mayama             |          |             |            |              | 83   |
| *Eunotia nymansiana* Grunow              |          |             | 41         |              |      |
| *Eunotia paludosa* Grunow                |          |             | 23         |              | 88   |
| *Eunotia paralleladubia* Lange-Bertalot & Mayama |      |             |            |              | 80   |
| *Eunotia paratricentula* Lange-Bertalot & Kulikovsky | |             | 39         |              | 112  |
| *Eunotia pectinalis* (Kützing) Rabenhorst |          |             |            |              | 79   |
| *Eunotia perminuta* (Grunow) Patrick     |          |             | 85         |              | 111  |
| *Eunotia praerupta* Ehrenberg            |          |             | 42         |              | 78   |
| *Eunotia pseudoflexuosa* Hustedt          |          |             | 87         |              | 112  |
| *Eunotia pseudogroenlandica* Lange-Bertalot & Tagliaventi | |             |            |              | 88   |
| *Eunotia pseudopapilio* Lange-Bertalot & Nörpel-Schempp | |             |            |              | 86   |
| *Eunotia pseudopectinalis* Hustedt        |          |             | 79         |              | 112  |
| *Eunotia rhomboidea* Hustedt              |          |             | 2          |              | 88   |
| *Eunotia sarenk* Berg                    |          |             |            |              | 86   |
| *Eunotia scandiorussica* Kulikovsky et al. |      |             |            |              | 88   |
| *Eunotia semicircularis* (Ehrenberg)      |          |             |            |              | 84   |
| *Eunotia septentrionalis* Østrup          |          |             |            |              | 83   |
| *Eunotia serra* Ehrenberg                |          |             |            |              | 39   |
| *Eunotia silesioscandica* Lange-Bertalot & Sienkiewicz |          |             |            |              | 83   |
| *Eunotia solerioli* (Kützing) Rabenhorst  |          |             |            |              | 78   |
| *Eunotia subarcuatooides* Alles, Nörpel & Lange-Bertalot | |             | 23         |              | 88   |
| *Eunotia suecica* A. Cleve               |          |             | 85         |              | 111  |
| *Eunotia superbidens* Lange-Bertalot      | 21       |             |            |              | 85   |

Note: The table lists various species of *Eunotia* along with their habitats and references.
| Taxa | Waterton | Haida Gwaii | Clearwater | Coppermine | Baille/Back | Hood |
|------|----------|-------------|------------|------------|-------------|------|
| *Eunotia superpaludosa* Lange-Bertalot | 23 | 42 | | | | |
| *Eunotia tetraodon* Ehrenberg | 21 | | | | | |
| *Eunotia triodon* Ehrenberg | | | 39 | | | |
| *Eunotia ursumperatoris* Lange-Bertalot & Nöpel-Schempp | | 42 | 57 | 83 | 113 | |
| *Eunotia valida* Hustedt | | | | | 88 | |
| *Fallacia* Stickle & Mann | | | | | 89 | |
| *Fragilaria* Lyngbye | 2 | | 38 | 56 | | 109 |
| *Fragilaria capucina* Desmazières | | | | 18 | 56 | |
| *Fragilaria capucina var. rumpens* (Kützing) Lange-Bertalot | | | | | 18 | |
| *Fragilaria crotonensis* Kitton | 2 | | | | | 109 |
| *Fragilaria nanana* Lange-Bertalot | 2 | | | | | |
| *Fragilaria sepes* Ehrenberg | | | | | | 109 |
| *Fragilaria tenua* (W. Smith) Lange-Bertalot | 2 | | | | | |
| *Fragilaria vauchierae* (Kützing) Petersen | | | | 18 | 56 | |
| *Fragilariforma constricta* (Ehrenberg) Williams & Round | | | | | | 77 |
| *Fragilariforma nitzschioides* (Grunow) Lange-Bertalot | | | | | 38 | |
| *Fragilariforma polygonata* (Cleve-Euler) Kingston et al. | | | | | 18 | |
| *Frustulia amoseana* Lange-Bertalot in Rumrich et al. | | | | | 4 | |
| *Frustulia crassinervia* (Brébisson) Lange-Bertalot & Kramer | | | | 26 | 89 | 125 |
| *Frustulia quadririmata* Lange-Bertalot | 26 | | | | | |
| *Frustulia saxonica* Rabenhorst | | 4 | 26 | 47 | | |
| *Frustulia vulgaris* (Thwaites) De Toni | | | | | | 125 |
| *Geissleria* Lange-Bertalot & Metzeltin | 3 | | | | | 89 |
| *Geissleria moesi* Metzeltin, Witkowski & Lange-Bertalot | | | | | | 89 125 |
| *Geissleria paludosa* (Hustedt) Lange-Bertalot & Metzeltin | 3 | | | | | |
| *Geissleria schoenfeldii* (Hustedt) Lange-Bertalot & Metzeltin | | | | | | 89 |
| *Geissleria similis* (Krasske) Lange-Bertalot & Metzeltin | 3 | | | | | |
| *Geissleria tectissima* (Lange-Bertalot) Lange-Bertalot | | | | | | 89 |
| *Gomphonema geitleri* Kociolek & Stoermer | 9 | | | | | |
| *Gomphonema* Ehrenberg | 8, 9 | 31 | 45 | 67 | 95 | 124 |
| *Gomphonema acidoclinatum* Lange-Bertalot & Reichardt | 8 | | | | | |
| *Gomphonema acuminatum* Ehrenberg | | | | | | 124 |
| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Baillie/Back | Hood |
|-------------------------------------------|----------|-------------|------------|------------|--------------|------|
| *Gomphonema affine* Kützing               | 8        |             |            |            |              |      |
| *Gomphonema anglicum* Ehrenberg           | 9        |             |            |            |              |      |
| *Gomphonema angusticephalum* Reichardt & Lange-Bertalot | 9 |              |            |            |              |      |
| *Gomphonema astridae* Reichardt & Lange-Bertalot |         |              |            |            |              | 95   |
| *Gomphonema auritum* Braun                | 8        |             | 45         |            |              |      |
| *Gomphonema brebissonii* Kützing           | 9        |             | 45         | 67         | 95           |      |
| *Gomphonema caperatum* Ponader & Potapova |        |              |            |            |              | 66   |
| *Gomphonema capitatum* Ehrenberg          | 9        |             | 67         | 95         | 124          |      |
| *Gomphonema citera* Hohn & Hellerman      |          |             |            |            |              | 31   |
| *Gomphonema clavatum* Ehrenberg           |          |             |            |            |              | 31   |
| *Gomphonema coronatumaceum* Bahls         |          |             |            |            |              | 67   |
| *Gomphonema distans* (Cleve-Euler) Lange-Bertalot & Reichardt |   |            |            |            |              | 45   |
| *Gomphonema duplexpunctatum* Lange-Bertalot & Reichardt |   |              |            |            |              | 31   |
| *Gomphonema exilissimum* (Grunow) Lange-Bertalot & Reichardt |   |            |            |            |              | 8    |
| *Gomphonema gracile* Ehrenberg            |          |            |            |            |              | 31   |
| *Gomphonema hebridense* Gregory           |          |            |            |            |              | 124  |
| *Gomphonema insigniforme* Reichardt & Lange-Bertalot |   |              |            |            |              |      |
| *Gomphonema interpositum* Reichardt       |          |            | 67         |            | 124          |      |
| *Gomphonema kobyasii* Kociolek & Kingston |          |            |            |            |              | 31   |
| *Gomphonema lateripunctatum* Reichardt & Lange-Bertalot |   |            |            |            |              | 66, 71 |
| *Gomphonema laticollum* Reichardt         | 9        |            | 31         |            | 124          |      |
| *Gomphonema longilineare* Reichardt       |          |            |            |            |              | 8    |
| *Gomphonema louisiananum* Kalinsky        |          |            |            |            |              | 31   |
| *Gomphonema micropus* Kützing              |          |            |            |            |              | 31   |
| *Gomphonema minusculum* Krasske           |          |            |            |            |              | 31   |
| *Gomphonema minutum* (Agardh) Agardh       |          |            |            |            |              | 31   |
| *Gomphonema multipunctatum* Bahls          |          |            |            |            |              | 31   |
| *Gomphonema nathorstii* Foged              |          |            |            |            |              | 66   |
| *Gomphonema pala* Reichardt                |          |            |            |            |              | 9    |
| *Gomphonema parvulum* Kützing              |          |            |            |            |              | 45   |
| *Gomphonema procercum* Reichardt & Lange-Bertalot |   |              |            |            |              |      |
| *Gomphonema pumilum* (Grunow) Reichardt & Lange-Bertalot |   |            |            |            |              |      |
| *Gomphonema pygmaeum* Kociolek & Stoermer  |          |            |            |            |              | 8    |
| *Gomphonema sarcophagus* Gregory          |          |            |            |            |              | 124  |
## Taxa

| Taxon                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Bailey/Back | Hood |
|--------------------------------------------|----------|-------------|------------|------------|-------------|------|
| *Gomphonema subclavatum* Grunow            | 8        | 45          |            |            |             |      |
| *Gomphonema subtile* Ehrenberg             | 9        |             | 67         |            |             |      |
| *Gomphonema subtile var. sagitta* (Schumann) Cleve | 9        |             | 67         |            |             |      |
| *Gomphonema truncatum* Ehrenberg           | 9        |             |            |            |             |      |
| *Gomphosinica geitleri* (Kociolek & Stoermer) Kociolek et al. | 9        |             |            |            |             |      |
| *Halophora borealis* (Kützing) Levkov      |          |             |            | 47         |             |      |
| *Halophora coraensis* (Foged) Levkov       | 5        | 43          | 64         |            |             |      |
| *Hannaea arcus* (Ehrenberg) Patrick        | 19       |             |            |            |             |      |
| *Hannaea superiorensis* Bixby, Edlund & Stoermer | 109      |             |            |            |             |      |
| *Hantzschia* Grunow                        |          |             |            |            | 55          |      |
| *Hantzschia abundans* Lange-Bertalot       | 16       |             |            |            |             |      |
| *Hantzschia amphioxys* (Ehrenberg) Grunow  | 55       |             |            |            |             |      |
| *Hantzschia elongata* (Hantzsch) Grunow    | 16       | 55          | 75         | 108        |             |      |
| *Hantzschia hyperborea* (Grunow) Lange-Bertalot | 75       |             |            |            |             |      |
| *Hantzschia vivacia* Lange-Bertalot        |          | 55          | 75         |            |             |      |
| *Hippodonta hungarica* (Grunow) Lange-Bertalot et al. | 59       |             |            |            |             |      |
| *Hydroptera balfouriana* (Grunow) Krammer & Lange-Bertalot | 59       | 125         |            |            |             |      |
| *Karayevia clevei var. bottnica* (Cleve) Bukhtiyarova | 3        |             |            |            |             |      |
| *Kobayasiella jaagii* (Meister) Lange-Bertalot | 59       | 97          | 125        |            |             |      |
| *Kobayasiella micropunctata* (Germain) Lange-Bertalot | 59       | 97          | 125        |            |             |      |
| *Kobayasiella okadae* (Skvortzow) Lange-Bertalot | 97       |             |            |            |             |      |
| *Kobayasiella parasubtilissima* (Kobayasi & Nagumo) Lange-Bertalot | 24       |             |            |            |             |      |
| *Kurtkrammeria aequalis* (W. Smith) Bahls  | 6        |             |            |            |             |      |
| *Kurtkrammeria lacusglacialis* Bahls       | 30       |             |            |            |             |      |
| *Kurtkrammeria neamphioxys* (Krammer) Bahls | 91       | 123         |            |            |             |      |
| *Kurtkrammeria pseudoamphioxys* Bahls      | 91       | 123         |            |            |             |      |
| *Kurtkrammeria treinisii* Bahls             | 30       |             |            |            |             |      |
| *Lacustriola* Lange-Bertalot, Kulikovskiy & Metzeltin | 96       |             |            |            |             |      |
| *Lacustriola lacustris* (Gregory) Lange-Bertalot & Kulikovskiy | 96       |             |            |            |             |      |
| *Lindavia affinis* (Grunow) Nakov et al.   | 1        | 109         |            |            |             |      |
| *Lindavia antiqua* (W. Smith) Nakov et al. | 1        | 56          | 109        |            |             |      |
| *Lindavia intermedia* (Manguin) Nakov et al. | 56       | 77          |            |            |             |      |
| Taxa                                    | Waterton | Haida Gwaii | Clearwater | Coppermine | Ballie/Back | Hood |
|----------------------------------------|----------|-------------|------------|------------|-------------|------|
| Lindavia michiganiana (Skvortzow)      |           |             |            | 56         |             |      |
| Nakov et al.                           |           |             |            |            |             |      |
| Lindavia praetermissa (Lund) Nakov et al. | 1        | 38          |            |            |             |      |
| Lindavia radiosa (Grunow) De Toni & Forti |           |             | 56         | 109        |             |      |
| Luticola Mann                          |           |             |            | 24         |             |      |
| Luticola mutica (Kützing) Mann         | 3        | 24          | 46         |            |             |      |
| Mastogloia elliptica (Agardh) Cleve    |           |             |            | 47         |             |      |
| Mastogloia gregilaei W. Smith          |           |             |            |            |             |      |
| Melosira nummuloidea (Dillwyn) Agardh  | 18       |             |            |            |             |      |
| Meridion circulare (Greville) Agardh   | 38       |             |            |            |             |      |
| Meridion lineare Williams              | 2        |             |            |            |             |      |
| Muellera bachmannii (Hustedt) Spaulding & Stoermer |           |             |            |            |             | 125  |
| Navicula Bory                          | 11       |             |            |            |             |      |
| Navicula amphibola Cleve               | 11       | 59          |            |            |             |      |
| Navicula angusta Grunow                |           |             |            | 128        |             |      |
| Navicula antonii Lange-Bertalot        | 11       |             |            |            |             |      |
| Navicula arctotenuelloides             |           |             |            |            |             |      |
| Lange-Bertalot & Metzeltin             | 11       |             |            |            |             |      |
| Navicula aurora Sovereign              | 12       | 48          |            |            |             |      |
| Navicula caroliniae Bahls              | 11       |             |            |            |             |      |
| Navicula cryptocephala Kützing         |           |             |            |            |             | 128  |
| Navicula cryptotenella Lange-Bertalot  | 11       | 32          |            |            |             |      |
| Navicula eidrigiana Carter             | 32       |             |            |            |             | 127  |
| Navicula exilis Kützing                | 32       | 97          |            |            |             |      |
| Navicula gregaria Donkin               | 32       |             |            |            |             | 127  |
| Navicula hanseatica subsp. circarctica |           |             |            |            |             | 127  |
| Lange-Bertalot                         |           |             |            |            |             |      |
| Navicula hanseatica subsp. hanseatica |           |             |            |            |             | 127  |
| Lange-Bertalot & Stachura              |           |             |            |            |             |      |
| Navicula kefvingensis Ehrenberg        |           |             |            |            |             | 48   |
| Navicula leptostriata Jørgensen        | 11       | 32          |            |            |             |      |
| Navicula lenzii Hustedt                |           |             |            |            |             | 11   |
| Navicula libonensis Schoeman           | 11       | 48          |            |            |             |      |
| Navicula lundii Reichardt              | 11       |             |            |            |             |      |
| Navicula notha Wallace                 | 11       |             |            | 68         | 97          | 128  |
| Navicula oblonga (Kützing) Kützing     |           |             |            |            |             | 48   |
| Navicula peregrina (Ehrenberg) Kützing |           |             |            |            |             | 48   |
| Navicula radios Kützing                | 32       | 49          | 68         |            |             | 128  |
| Navicula reichardtiana Lange-Bertalot  | 11       |             |            |            |             |      |
| Navicula reichardtii (Grunow) Grunow   | 11       |             | 68         |            |             |      |
| Navicula rhynechocephala Kützing       |           |             |            | 49         |            |      |
| Navicula salinarum Grunow              |           |             |            |            |             | 127  |
| Navicula schweigeri Bahls              | 11       |             |            |            |             |      |
| Taxa | Waterton | Haida Gwaii | Clearwater | Coppermine | Baffin/Back | Hood |
|------|----------|-------------|------------|------------|-------------|------|
| *Navicula seibigiana* Lange-Bertalot | 11 | | | | | |
| *Navicula sieminskiae* Lange-Bertalot & Witkowski | | | | 68 | | |
| *Navicula sleviceensis* Grunow | | | | | | 127 |
| *Navicula subconcentrica* Lange-Bertalot | | | | | 97 | |
| *Navicula subhamulata* Grunow in Van Heurck | | | | | 11 | |
| *Navicula tridentula* Krasske | | | | | | 128 |
| *Navicula trilatera* Bahls | 11 | | | | 49 | |
| *Navicula tripunctata* (O. F. Müller) Bory | | | | | 11 | |
| *Navicula tripunctata* var. arctica Patrick & Freese | | | 68 | 97 | | 128 |
| *Navicula trivialis* Lange-Bertalot | 11 | | | | | 127 |
| *Navicula upsaliensis* (Grunow) M. Peragallo | | | | | 11 | |
| *Navicula vandamii* Schoeman & Archibald | | | | | | 127 |
| *Navicula vaneei* Lange-Bertalot | | | | | | 127 |
| *Navicula venerabilis* Hohn & Hellerman | | | | | | 97 |
| *Navicula veneta* Kützing | | | | | | 11 |
| *Navicula viridulacalcis* Lange-Bertalot | | | | | 11 | |
| *Navicula vulpina* Kützing | | | 12 | 68 | 97 | 128 |
| *Navicula weberi* Bahls | 11, 12 | | | | | |
| *Navicula wiliotii* Lange-Bertalot | 11 | | | | | |
| *Navicymbula pusilla* (Grunow) Krammer | | | | | | 47 |
| *Neidiomorpha binodiformis* (Krammer) Cantonati et al. | 10 | | | | | |
| *Neidiopsis vekhovii* Lange-Bertalot & Genkal | | | | | | 98 |
| *Neidiopsis wulfsii* (Petersen) Lange-Bertalot | | | | | | 98 |
| *Neidium Pfizter* | 10 | 27 | 46 | | 99, 100 | 129 |
| *Neidium affine* (Ehrenberg) Pfizter | 10 | 27 | | | 100 | 129 |
| *Neidium affine* var. humerus Reimer | | | | | | 99 |
| *Neidium affine* var. longiceps (Gregory) Cleve | 10 | | | | | 100 |
| *Neidium affine* var. undulatum (Grunow) Cleve | | | | | | 69 |
| *Neidium alaskaense* Foged | | | | | | 98 |
| *Neidium amphigomphus* (Ehrenberg) Pfizter | 27 | 46 | | | | 99 |
| *Neidium ampliatum* (Ehrenberg) Krammer | | | 46 | | 99, 100 | 129 |
| *Neidium apiculatum* Reimer | 10 | | | | | 99 |
| *Neidium bergii* (Cleve-Euler) Krammer | | | | | | 100 |
| *Neidium bisulcatum* (Lagerstedt) Cleve | 10 | | 46 | | 100 | 129 |
| *Neidium dubium* (Ehrenberg) Cleve | 10 | | | | | |
| *Neidium foedrii* Bahls | 10 | | | | | |
| *Neidium foalum* Lefebvre & Hamilton | 27 | | 69 | 99 | | 129 |
| *Neidium hitchcockii* (Ehrenberg) Cleve | | | | | | 100 |
| *Neidium bolitii* (Cleve) Krammer | | | | | | 98 |
| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Ballie/Back | Hood  |
|-------------------------------------------|----------|-------------|------------|------------|-------------|-------|
| Neidium ladogense (Cleve) Foged           |          |             |            |            |             | 98    |
| Neidium productum (W. Smith) Cleve        |          |             |            |            |             | 129   |
| Neidium septentrionale Cleve-Euler        |          |             |            |            |             | 129   |
| Neidium temperei Reimer                   |          |             |            |            |             | 129   |
| Nitzschia Hassall                         | 16       | 37          | 75         |            |             | 132   |
| Nitzschia acidochinata Lange-Bertalot     | 16       |             |            |            |             | 132   |
| Nitzschia alpina Hustedt                  | 16       |             |            |            |             | 132   |
| Nitzschia angustata (W. Smith) Grunow     | 16       |             |            |            |             | 132   |
| Nitzschia bacillum Hustedt                | 16       |             |            |            |             | 132   |
| Nitzschia commutata Grunow                | 16       |             |            |            |             | 132   |
| Nitzschia diversa Hustedt                 | 16       |             |            |            |             | 132   |
| Nitzschia fonticola var. pelagica Hustedt | 16       |             |            |            |             | 132   |
| Nitzschia fossili Grunow                  | 16       |             |            |            |             | 132   |
| Nitzschia frauenfeldii (Grunow) Grunow    | 16       |             |            |            |             | 132   |
| Nitzschia frustulum (Kützing) Grunow      | 16       |             |            |            |             | 132   |
| Nitzschia gesneri Hustedt                 | 16       |             |            |            |             | 132   |
| Nitzschia gracilis Hantzsch               | 16       |             |            |            |             | 132   |
| Nitzschia inconspicua Grunow              | 16       |             |            |            |             | 132   |
| Nitzschia kirtlii Grunow                  | 16       |             |            |            |             | 132   |
| Nitzschia lacuum Lange-Bertalot           | 16       |             |            |            |             | 132   |
| Nitzschia lanceolata W. Smith             | 16       |             |            |            |             | 132   |
| Nitzschia liebetrubiib Rabenhorst         | 16       |             |            |            |             | 132   |
| Nitzschia linearis (Agardh) W. Smith      | 16       |             |            |            |             | 132   |
| Nitzschia microcephala Grunow             | 16       |             |            |            |             | 132   |
| Nitzschia nana Grunow                     | 16       |             |            |            |             | 132   |
| Nitzschia palea (Kützing) W. Smith        | 16       |             |            |            |             | 132   |
| Nitzschia palea var. tenuirostris Grunow  | 16       |             |            |            |             | 132   |
| Nitzschia perminuta (Grunow) Peragallo    | 16       |             |            |            |             | 132   |
| Nitzschia perspicua Cholnoky              | 16       |             |            |            |             | 132   |
| Nitzschia pseudofonticola Hustedt         | 16       |             |            |            |             | 132   |
| Nitzschia pura Hustedt                    | 16       |             |            |            |             | 132   |
| Nitzschia pusilla Grunow                  | 16       |             |            |            |             | 132   |
| Nitzschia radicula Hustedt                | 16       |             |            |            |             | 132   |
| Nitzschia recta Hantzsch                  | 16       |             |            |            |             | 132   |
| Nitzschia regula var. robusta Hustedt     | 16       |             |            |            |             | 132   |
| Nitzschia sinuata (Thwaites in W. Smith)  | 16       |             |            |            |             | 132   |
| Nupela Vyerman & Compére                  | 16       |             |            |            |             | 132   |
| Nupela tenuicephala (Hustedt) Lange-Bertalot | 16       |             |            |            |             | 132   |
| Odontidium mesodon (Ehrenberg) Kützing    | 16       |             |            |            |             | 132   |
| Orthoeira roseana (Rabenhorst) Pfitzer    | 16       |             |            |            |             | 132   |
| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Ballie/Back | Hood |
|-------------------------------------------|----------|-------------|------------|------------|-------------|------|
| *Peronia fibula* (Brébisson in Kützing) Ross |          |             |            |            |             | 83   |
| *Pinnuavis* Bourreelly                     |          |             |            |            |             | 126  |
| *Pinnuavis elegans* (W. Smith) Okuno       |          |             |            |            |             | 126  |
| *Pinnularia* Ehrenberg                     | 70       | 70, 71      |            | 101, 102, 104 | 130        |
| *Pinnularia acrophaeria* W. Smith          |          |             |            |            |             | 51   |
| *Pinnularia anglica* Krammer               | 13       |             |            |            |             | 130  |
| *Pinnularia biceps* Gregory                | 13       |             |            | 101         | 130         |
| *Pinnularia birmirkiana* Patrick & Freese  |          |             |            |            |             | 130  |
| *Pinnularia borealis* Ehrenberg            | 13       |             |            | 101         |             | 130  |
| *Pinnularia borealis* var. *scalaris* (Ehrenberg) Rabenhorst | 13       |             |            |            |             |      |
| *Pinnularia brebissonii* (Kützing) Rabenhorst | 13  |             |            | 49          |             |      |
| *Pinnularia crucifera* Cleve-Euler         | 13       |             |            | 102         | 130         |
| *Pinnularia decrescens* (Grunow) Krammer   | 33       |             |            | 70          | 130         |
| *Pinnularia diversgens* W. Smith           |          |             |            |            |             | 130  |
| *Pinnularia diversgens* var. *sublinearis* Cleve |          |             |            |            |             |      |
| *Pinnularia genkalii* Krammer & Lange-Bertalot | 50       |             |            | 71          | 103         |
| *Pinnularia gibbiformis* Krammer           |          |             |            |            |             | 51   |
| *Pinnularia graciloides* var. *triundulata* (Fontell) Krammer | 52       |             |            |            |             |      |
| *Pinnularia ignobilis* (Krasske) Cleve-Euler |          |             |            |            |             | 49   |
| *Pinnularia isostauron* (Ehrenberg) Cleve   | 13       |             |            |            |             | 104  |
| *Pinnularia iovalensis* Krammer             |          |             |            |            |             | 52   |
| *Pinnularia krammeri* Metzeltin             |          |             |            |            |             | 101  |
| *Pinnularia latilaensis* Foged              |          |             |            |            |             | 104  |
| *Pinnularia lata* (Brébisson) Rabenhorst   | 33       |             |            | 101         |             |      |
| *Pinnularia lenticula* Cleve-Euler          |          |             |            | 49          |             |      |
| *Pinnularia lokana* Krammer                 |          |             |            | 71          | 130         |
| *Pinnularia lunata* Krammer & Lange-Bertalot | 13       |             |            |            |             |      |
| *Pinnularia macilenta* Ehrenberg            |          |             |            | 102         |             |      |
| *Pinnularia marchica* Schönfelder           |          |             |            | 101         |             |      |
| *Pinnularia mesogongyla* Ehrenberg          |          |             |            | 34          |             |      |
| *Pinnularia microstauron* (Ehrenberg) Cleve | 13       | 33          |            | 101         |             |      |
| *Pinnularia microstauron* var. *angusta* Krammer | 33       |             |            |            |             |      |
| *Pinnularia neomajor* Krammer               |          |             |            | 35          | 50          |
| *Pinnularia nodosa* (Ehrenberg) W. Smith    |          |             |            | 52          |             |      |
| *Pinnularia obscura* Krasske                | 13       |             |            | 51          |             |      |
| *Pinnularia pseudogibba* Krammer            |          |             |            | 70          |             |      |
| *Pinnularia pseudosuchlandtii* Bahls        | 13       |             |            | 70          |             |      |
| Taxa                                      | Waterton | Haida Gwaii | Clearwater | Coppermine | Baillie/Back | Hood |
|-------------------------------------------|----------|-------------|------------|------------|--------------|------|
| *Pinnularia rabenhorstii* Hilse           | 13       |             |            |            |              |      |
| *Pinnularia rupestris* Hantzsch in Rabenhorst |          | 35          | 71         |            |              |      |
| *Pinnularia septentrionalis* Krammer      | 13       |             |            |            |              |      |
| *Pinnularia sinistra* Krammer             |          |             |            | 102, 104   | 130          |      |
| *Pinnularia spitsbergensis* Cleve         |          | 52          | 71         | 103        | 130          |      |
| *Pinnularia stomatophora* (Grunow) Cleve  | 35       | 52          |            |            |              |      |
| *Pinnularia subcapitata* Gregory          | 33       |             |            |            |              |      |
| *Pinnularia subcapitata var. elongata* Krammer |          | 51          |            |            |              |      |
| *Pinnularia subgibba* Krammer             |          |             |            |            |              |     102 |
| *Pinnularia subpulchra* Krammer           | 52       |             |            |            |              | 130 |
| *Pinnularia sudetica* Hilse               | 13       |             |            |            |              |      |
| *Pinnularia transversa* (A. Schmidt) Mayer |          | 34          |            |            |              |      |
| *Pinnularia turbulenta* (Cleve-Euler) Krammer |          | 13          |            |            |              |      |
| *Pinnularia viridiformis* Krammer         | 34       | 49          | 71         |            |              |      |
| *Pinnularia viridis* (Nitzsch) Ehrenberg  | 13       |             |            |            |              |      |
| *Placoneis* Mereschkowsky                 |          |             |            |            |              | 59   |
| *Placoneis abiskoensis* (Hustedt) Lange-Bertalot & Metzeltin | 10 | | | | |
| *Placoneis amphibola* (Clevé) Cox         | 11       |             |            |            |              | 59   |
| *Placoneis elginsis* (Gregory) Cox        |          |             |            |            |              | 46   |
| *Placoneis explanata* (Hustedt) Mayama    |          |             |            |            |              | 46   |
| *Planothidium* Round & Bukhtiyarova       |          |             |            |            |              | 39   |
| *Planothidium apiculatum* (Patrick) Lange-Bertalot |          |             |            |            |              | 39   |
| *Planothidium delicatulum* (Kützing) Round & Bukhtiyarova |          |             |            |            |              | 24   |
| *Planothidium frequentissimum* (Lange-Bertalot) Lange-Bertalot |          |             |            |            |              | 77   |
| *Platessa conspicua* (Mayer) Lange-Bertalot |          | 3           |            |            |              |      |
| *Psammothidium curtissimum* (Carter) Aboal |          | 3           |            |            |              |      |
| *Psammothidium daonense* (Lange-Bertalot) Lange-Bertalot |          | 3           |            |            |              |      |
| *Psammothidium marginulatum* (Grunow) Bukhtiyarova & Round |          |             |            |            |              | 77   |
| *Psammothidium nivale* Potapova & Enache  |          |             |            |            |              | 110  |
| *Pseudostaurosira brevistriata* var. *inflata* (Pantocsek) Hartley |          | 2           |            |            |              |      |
| Reimeria Kociolek & Stoermer              | 3        |             |            |            |              |      |
| *Rhopalodia gibba* (Ehrenberg) O. Müller  | 17       | 37          | 53         | 76         |              |      |
| *Rhopalodia operculata* (Agardh) Hákansson |          | 17          |            |            |              |      |
| *Rosithidium petersenii* (Hustedt) Aboal  | 77       | 110         |            |            |              |      |
| *Rosithidium pusillum* (Grunow) Round & Bukhtiyarova |          | 3           | 24          |            |              |      |
| *Sellaphora* Mereschkowsky                | 46       | 59          | 89         | 125        |              |      |
| Taxa                                                                 | Waterton | Haida Gwaii | Clearwater | Coppermine | Ballie/Back | Hood |
|----------------------------------------------------------------------|----------|-------------|------------|------------|-------------|------|
| *Sellaphora alastos* (Hohn & Hellerman) Lange-Bertalot & Metzeltin  |          |             |            | 59         |              |      |
| *Sellaphora laevissima* (Kützing) Mann                               |          |             |            | 4          |              |      |
| *Sellaphora parapupula* Lange-Bertalot                               |          |             |            | 4          | 89          | 125  |
| *Sellaphora pupula* (Kützing) Mereschkowsky                           |          |             |            | 4          |              | 125  |
| *Sellaphora rectangularis* (Gregory) Lange-Bertalot & Metzeltin      |          |             |            | 46         |              | 125  |
| *Seniorbis rotundus* Reid & Williams                                 |          |             |            | 20         |              |      |
| *Stauroforma* Flower, Jones & Round                                   |          |             |            |            | 109         |      |
| *Stauroforma exiguiformis* (Lange-Bertalot) Flower, Jones & Round     |          |             |            |            | 109         |      |
| *Stauroneis* Ehrenberg                                               | 14, 15   |             |            |            |              |      |
| *Stauroneis acidoclinata* Lange-Bertalot & Werum                      |          |             |            | 47         |              |      |
| *Stauroneis acuta* W. Smith                                          | 15       |             |            |            |              |      |
| *Stauroneis akamina* Bahls                                           | 15       |             |            |            |              |      |
| *Stauroneis amphicephalu* Kützing                                     | 15       | 47          | 106        | 131        |              |      |
| *Stauroneis anceps* Ehrenberg                                         | 105, 106 |             |            |            |              |      |
| *Stauroneis angustilancea* Lange-Bertalot & Metzeltin                 |          |             |            |            | 105         |      |
| *Stauroneis boyntoniae* Bahls                                         |          |             |            |            | 106         |      |
| *Stauroneis circumborealis* Lange-Bertalot & Krammer                  | 14       |             |            | 107        |              |      |
| *Stauroneis conspicua* Metzeltin & Lange-Bertalot                     | 15       |             |            |            |              |      |
| *Stauroneis fluminea* Patrick & Freese                                |          |             |            |            | 106         |      |
| *Stauroneis gracilis* Ehrenberg                                       | 14       | 47          | 72         | 106        | 131         |      |
| *Stauroneis heinii* Lange-Bertalot & Krammer                         | 14       | 32          | 105        |            |             |      |
| *Stauroneis hyperborea* Lange-Bertalot & Krammer                      |          |             |            | 73         | 131         |      |
| *Stauroneis jarenisi* Lange-Bertalot, Cavacini, Tagliaventi & Alfinito|          |             |            | 15         | 131         |      |
| *Stauroneis kootenai* Bahls                                          | 14       |             |            |            |              |      |
| *Stauroneis kriegeri* Patrick                                        | 14       |             |            |            |              |      |
| *Stauroneis kuelbsii* Lange-Bertalot                                 |          |             |            | 72         | 105         | 131  |
| *Stauroneis lauenburgiana* Hustedt                                    | 14       |             |            |            |              |      |
| *Stauroneis livingstonii* Reimer                                      |          |             |            | 106        | 131         |      |
| *Stauroneis neohyalina* (M. Peragallo & Brun) Lange-Bertalot & Krammer|          |             |            | 47         |              |      |
| *Stauroneis pax* Bahls                                               | 15       |             |            |            |              |      |
| *Stauroneis phoenicenteron* (Nitzsch) Ehrenberg                       | 14       |             |            |            |              |      |
| *Stauroneis pikuni* Bahls                                            | 15       |             |            |            |              |      |
| *Stauroneis prominula* (Grunow) Hustedt                               |          |             |            |            | 106         |      |
| *Stauroneis reichardtii* Lange-Bertalot, Cavacini, Tagliaventi & Alfinito | 15     | 72          | 106        | 131        |             |      |
| Taxa                                                        | Waterton | Haida Gwaii | Clearwater | Coppermine | Baillie/Back | Hood |
|------------------------------------------------------------|----------|-------------|------------|------------|--------------|------|
| *Stauroneis separanda*                                     |          |             |            |            |              |      |
| Lange-Bertalot & Werum                                     | 14       |             |            |            |              |      |
| *Stauroneis siberica* (Grunow)                             |          |             |            |            |              |      |
| Lange-Bertalot & Krammer                                   | 15       |             |            |            |              |      |
| *Stauroneis silvahassica*                                  |          |             |            |            |              |      |
| Lange-Bertalot & Werum                                     | 15       |             |            |            |              |      |
| *Stauroneis smitii*                                         |          |             |            |            |              |      |
| Grunow                                                     | 14       |             |            |            |              |      |
| *Stauroneis smithii* var. *incisa* Pantocsek               |          |             |            |            |              | 131  |
| *Stauroneis superhyperborea*                               |          |             |            |            |              | 74   |
| Van de Vijver, Beyens & Lange-Bertalot                    |          |             |            |            |              |      |
| *Stauroneis vandevijveri* Bahls                           | 15       |             |            |            |              |      |
| *Staurophora*                                              |          |             |            |            |              | 131  |
| Mereschkovsky                                              |          |             |            |            |              |      |
| *Staurosina construens* Ehrenberg                         | 2        |             |            |            |              |      |
| *Staurosina construens* var. *venter* (Ehrenberg) Hamilton|          |             |            |            |              |      |
| *Staurosirella*                                             |          |             |            |            |              |      |
| Williams & Round                                           | 2        |             |            |            |              |      |
| *Staurosirella lapponica* (Grunow)                         |          |             |            |            |              | 56   |
| Williams & Round                                           | 2        |             |            |            |              |      |
| *Staurosirella leptostauron* (Ehrenberg)                   |          |             |            |            |              | 56   |
| Williams & Round                                           | 2        |             |            |            |              |      |
| *Staurosirella pinnata* (Ehrenberg)                        |          |             |            |            |              | 56   |
| Williams & Round                                           | 2        |             |            |            |              |      |
| *Stenopterobia anceps* (Lewis) Brébisson in Van Heurck    |          |             |            |            |              | 108  |
| *Stenopterobia curvula* (W. Smith) Krammer                 |          |             |            |            |              | 54   |
| *Stephanodiscus alpinus* Hustedt                           | 1        |             |            |            |              |      |
| *Surirella*                                                 |          |             |            |            |              |      |
| *brebissonii* Krammer & Lange-Bertalot                     |          |             |            |            |              | 132  |
| *Surirella*                                                 |          |             |            |            |              |      |
| *linearis* W. Smith                                        |          |             |            |            |              | 108  |
| *Syneidra* Ehrenberg                                       | 2        |             |            |            |              |      |
| *Synedra acus var. delicatissima* (W. Smith) Rabenhorst     |          |             |            |            |              | 54   |
| *Syneidra famelica* Kützing                                 |          |             |            |            |              | 38   |
| *Tabellaria fenestrata* (Lyngbye) Kützing                   |          |             |            | 56         | 77           | 109  |
| *Tabellaria flocculosa* (Roth) Kützing                      | 2        | 18          | 38          | 56         | 77           | 109  |
| *Tabularia fasciculata* (Agardh) Williams & Round          |          |             |            |            |              |      |
| *Thalassosira Cleve*                                       | 18       |             |            |            |              |      |
| *Ulnaria* (Kützing) Compére                                | 19       | 56          |            |            |              | 109  |
| *Ulnaria ulna* (Nitzsch) Compére                           | 2        |             |            |            |              |      |
| *Unknown genus*                                             | 24       |             |            |            |              | 108  |