Late Holocene paleoseismology of a site in the region of maximum submergence during the 1964 Mw 9.2 Alaska earthquake

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Abstract

Sediment archives of co-seismic deformation from regions of maximum co-seismic displacement act as key datasets for the development and constraint of models of surface elevation change associated with Holocene great earthquakes. We present new lithologic and biostratigraphic investigations of a previously thought lost core from Portage, at the head of Turnagain Arm, upper Cook Inlet, which is within the zone of maximum co-seismic subsidence during the AD 1964 Alaska earthquake. Quantitative analysis of diatoms preserved over six peat-silt couplets prior to the AD 1964 earthquake show six phases of rapid relative sea-level rise. Radiocarbon dates from each contact show that all six correlate with independently modelled ages of great earthquakes recorded in the Prince William Sound segment of the Aleutian megathrust during the last 4000 years. As with the other sites in upper Cook Inlet, there is no evidence for an earthquake between the penultimate great earthquake, ~880 a BP, and AD 1964 in contrast to those separately recorded at Kodiak Island and Katalla. Correlation of the six earthquakes at Portage with those at Girdwood, and no evidence for additional peat-silt couplets, support our previous interpretation that the extra three peat-silt couplets at Girdwood lacking evidence of intertidal sedimentation represent local scale changes in environment rather than coseismic subsidence and short recurrence intervals of great earthquakes

Introduction and Aims

Portage, Alaska, holds a unique position in late Quaternary paleoseismology. It lies along the axis of maximum coseismic subsidence in the 1964 Mw 9.2 great Alaska earthquake (Plafker, 1969). Holocene sediment sequences reveal multiple earthquake cycles over the last 4000 years (Bartsch-Winkler et al., 1983; Combellick, 1986), providing analogues for a seminal paper in coastal paleoseismology that first identified the seismic hazard from subduction zone earthquakes in the Pacific Northwest of Canada and the USA (Atwater, 1987).

Portage lies at the confluence of three glaciated catchments that originate in the Chugach and Kenai Mountains of south-central Alaska and provide large amounts of sediment to the head of the Turnagain Arm fjord (Figure 1). Extensive tidal flats of non-cohesive fine-grained sediment, mainly coarse silt to fine sand, cover ~90% of the intertidal zone southeast of Girdwood. This is a macrotidal system, with the tide station at Anchorage having a maximum range close to 11 m. Following ~2.5 m subsidence at Portage in 1964, comprising 1.5 m tectonic subsidence and ~ 1.0 m due to ground shaking and consolidation of unconsolidated sediments, high sediment input rapidly buried and preserved the 1964 marsh surface, with the much of the accommodation space infilled within the next 10 years (Atwater et al., 2001; Ovenshine et al., 1976). Rapid sedimentation over longer timescales, more than 90 m during the Holocene (Bartsch-Winkler et al., 1983), means that records longer than a few hundred years require cores through thick, unconsolidated sediment sequences. As a result, studies of multiple earthquake cycles at Portage are limited to cores collected with motorised drilling rigs rather than transects of hand-drilled cores or sampling of tidal-bank exposures (Combellick, 1991; Combellick, 1994; Combellick and Reger, 1994). Despite the early interest it has proved difficult to reliably correlate the Holocene paleoseismic record from Portage with those from other locations in the 1964 segment of the Alaska-Aleutian megathrust (Carver and Plafker, 2008; Combellick, 1994).

In 1985, borehole drilling at two sites in Turnagain Arm, one at Girdwood and one at Portage, confirmed the presence of multiple organic layers interbedded with tidal clastic deposits below the 1964 soil horizon (Combellick, 1991). The organic layers, ranging from peat with well-preserved plant remains and minimal or no clastic component to organic clay-silt, typically have an abrupt upper contact and are overlain by predominantly silt or fine sand clastic units. In contrast, the contact at the base of each organic layer unit is usually gradual. Whatever their precise lithology, common usage refers to each set as a peat-silt couplet. The 1985 core at Portage contained five pre-1964 peat-silt couplets in 12.5 m of sediment, and radiocarbon ages indicated deposition during the last 4500 years. The core was not continuous and the radiocarbon ages of the abrupt contacts poorly correlated with those obtained from other sites in the region (Bartsch-Winkler and Schmoll, 1987). A second core at Portage, and another one at Girdwood, was commissioned in 1988, using a motorised drilling rig capable of recovering a more continuous sequence (Combellick, 1991). These cores had excellent recovery, with few unsampled intervals between the 1m sections, and provided more than 16 m of undisturbed sediment at Portage. Fine laminations within many of the clastic horizons were very well preserved, suggesting intertidal sedimentation, and supported the original hypothesis of multiple cycles of coseismic subsidence and gradual interseismic recovery, superimposed upon glacio-isostatic relative sea-level change. But the radiocarbon chronologies from the 1988 cores at Girdwood and Portage failed to solve the earlier discrepancies between the sites, with no clear correlation of events, or indeed the number of events, indicating coseismic submergence (Combellick, 1991; Combellick, 1994; Combellick and Reger, 1994).

Subsequent investigations at Girdwood provided more detailed analyses (Hamilton and Shennan, 2005; Shennan et al., 2008), where in contrast to Portage the clastic units are sometimes exposed in intertidal outcrops, generally thinner, finer grained and possible to sample with hand cores. Utilising microfossil data and AMS radiocarbon dating of *in situ* plant macrofossils rather than bulk peat ages we were able to differentiate those couplets that record coseismic submergence from those that did not. We could correlate the ages for coseismic submergence between sites across Cook Inlet, including Girdwood, Bird Point and Anchorage, but not Portage (Shennan and Hamilton, 2006). One of the key approaches in these studies was to trace the lateral continuity of peat-silt couplets at each site prior to assessing correlations between sites. Five characteristics combine to make this a more difficult task at Portage: the high rate of sedimentation, the coarser nature of most of the clastic units, the lack of outcrops exposing peat-silt couplets below 1964, the sheer size of the marshes and the major fluvial inputs in comparison to the other sites. Channel migration of multiple streams traversing the subsiding Portage marsh over the late Holocene has reworked the intertidal deposits, replacing them with coarser deltaic sediments in many areas.

It was thought that the 1988 Portage core had been lost or destroyed, but it was found in 2008, repackaged and transferred to the Alaska Division of Geological & Geophysical Surveys' Geologic Materials Center for archiving. Initial analyses revealed the samples to be in good condition, and we undertook sampling for diatom and AMS radiocarbon dating. In order to preserve these important cores for future research we limited the number of samples and volume of sediment taken in order to address the key hypotheses relating to the identification of coseismic subsidence and the chronology of events. This approach leaves the whole of the 16 m core available for future analyses.

The aims of this paper are: determine the evidence for rapid or gradual submergence across the contact for each peat-silt couplet at Portage; determine the chronology; evaluate the hypothesis of repeated episodes of coseismic submergence separated by interseismic uplift; assess the chronology and magnitude of submergence between couplets at Portage with those from other locations in the 1964 rupture zone; and consider the implications of these on whether great earthquake ruptures in south-central Alaska are controlled by persistent segment boundaries.

Methods

Combellick (1991) provides full details of the coring, logging, sampling and initial analysis of the 1988 core. When we sampled the archived core, in 2012 and 2013, we noted minor shrinkage through desiccation. It was usually was less than 2 cm for a 1 m section, but it does mean that some of the depths recorded differ slightly to those in the original report. For diatom samples we used a scalpel to cut a small, 3 to 5 mm thick, sample from the core, having first scraped off the surface 1 mm. For radiocarbon dating samples we picked individual plant macrofossils, targeting leaves or stem/root nodes wherever possible. AMS radiocarbon dating was carried out at the NSF Arizona Laboratory, with ages calibrated using CALIB (Stuiver et al., 2013).

For the diatom analyses presented here we use primarily quantitative methods using transfer function approaches, developed and successfully applied at other sites in south central Alaska (Hamilton and Shennan, 2005; Watcham et al., 2013). We complement them with qualitative comparisons to modern surface sample data taken at Portage (Zong et al., 2003). These surface samples are not part of the transfer function dataset as they were surveyed to a temporary benchmark that was later destroyed and therefore have imprecise elevation control with reference to present tide levels. For the transfer function models we use a regional-scale modern training set collected from a wide range of marshes across ~1000 km of south central Alaska in order to seek the best fit between fossil and modern diatom assemblages. Diatom sums for fossil samples range from ~100 to 250 valves (see Supplementary Information). We use three models, constrained by the lithology of the Holocene sediment sequence (Table 1); one for peat sediment, a second for organic silt units and silt units with visible plant rootlets, and a third for silt and laminated silt-fine sand units with no rootlets (Hamilton and Shennan, 2005). We assess goodness of fit between each fossil sample and the modern dataset with a dissimilarity coefficient, using the 20th percentile of the dissimilarity values for the modern samples as the cut-off between 'close' and 'poor' modern analogues for fossil samples, and the 5th percentile as the threshold for defining 'good' modern analogues. For reconstruction of the elevation at which the fossil sediment was laid down, termed paleo marsh surface elevation, we present sample-specific 95.4 % error terms. The extensive tidal flats of noncohesive fine-grained sediment prevented us making direct measurements of low water elevations in order to quantify the modification of the tidal regime up to the head of the estuary. Therefore, we use measurements of high tide levels at Girdwood to calibrate the elevation reconstructions from the diatom transfer function models using the methods described previously by Hamilton and Shennan (2005).

Results

We recorded six distinct organic layers in the archive core (Figure 2), each with a clear, abrupt, upper contact and directly comparable to those originally described. For ease of reference we shall refer to these as event 1 to event 6, testing the original hypothesis that these contacts represented coseismic submergence (Combellick, 1991). We could not identify a layer of disseminated fine organic material recorded in the original core at almost 16 m depth and saw only one, rather than two layers of sedge leaf and stem fragments in the upper 3 m. The peat layer just below 6 m depth crossed two of the original 1 m sample tubes. The top of the lower one had silt that was originally described as not in place. Our interpretation of the archive core agrees with that conclusion and we show this peat as a single layer in figure 2.

Submergence of the marshes in 1964 is indicated in the core by interlayered brown-grey silt and silty fine sand with disseminated fine organic material, probably sedge blades and roots (Figure 2). A sample of these gave a modern radiocarbon age, calibrated as AD 1954 to 1957 (Table 2). Other locations at Portage, including intertidal outcrops, record the submerged 1964 marsh surface as a 1 to 2 cm organic mud, with rooted plant remains (Atwater et al., 2001; Combellick, 1991), rather than a thick peat horizon as seen at Girdwood, Bird Point and Anchorage (Shennan et al., 2008; Shennan and Hamilton, 2006). We sampled all six peat-silt couplets below this horizon; following sections describe briefly the results for each, labelling them event 1 to event 6. Figures 3, 4 and 5 show, respectively, the nature of the peat-silt contact for each event; summary diatom data (full data tables in supplementary information); and the transfer function estimates of elevation change across each contact.

Event 1: Peat contact 388 cm

The sharp peat-silt contact and clear change in diatom assemblages indicate a rapid change in environment, with submergence estimated at ~1.9 ± 0.9 m (2σ) using our transfer function model. This is very similar to AD 1964, 1.5 m tectonic subsidence and up to an additional 1.0 m from ground shaking and consolidation of unconsolidated sediments, and the estimates for the penultimate great earthquake at Girdwood (Shennan and Hamilton, 2006).

Event 2: Peat contact 620 cm

Although the there is a distinct boundary at 620 cm, the silt content of the uppermost part of the peat layer and organic staining in the lowermost 4 cm of the overlying silt suggest possible sediment mixing at the boundary. Diatom assemblages below the contact (Figure 4) are predominately freshwater, the first two samples above the contact are mixed, while those above are distinctly intertidal. The transfer function model indicates submergence 1.3 ± 1.0 m from the top of the peat to the sample directly above, in the organic silt with mixed diatom assemblage. If we exclude the organic silt, subsidence between the top of the peat and the silt sample 5 cm above the contact is 2.1 ± 1.0 m. The large error term is in part due to the poor analogues between the modern and most of the fossil samples.

Event 3: Peat contact 756 cm

The undulating boundary at the top of the peat layer suggests possible erosion of the contact. The abrupt change from predominantly freshwater diatom species in the peat to marine and brackish species in the silt unit suggests rapid submergence, estimated at 2.2 ± 0.9 m by the transfer function model. Figure 3 shows the distinct laminations in the silt unit directly above the contact. These are very similar to those described above the 1964 buried marsh soil described by Atwater et al. (2001).

Event 4: Peat contact 924 cm

This contact is very clear and the overlying silt has distinct laminations (Figure 3). Diatom assemblages show a rapid change from predominantly freshwater species to marine and brackish species across the contact. With good or close modern analogues, the transfer function model indicates subsidence of 2.0 ± 0.9 m.

Event 5: Organic silt contact 1108 cm

This contact is less distinct than the four above, as it occurs at a change from organic silt with visible organic macrofossils to slightly laminated silt. Diatom assemblages change across the contact, but they are less distinctive than those across the contacts higher in the core. The transfer function model estimates submergence of 1.8 ± 1.0 m.

Event 6: Organic silt contact 1264 cm

This contact occurs at the top of a thin organic silt, with distinct, organic remains. It grades down into to silt with scattered but visible organic remains, to ~13.15 m depth. Given the variable nature of the organic content it is unclear whether the top of the unit is at 1264 cm, where we took the sample for radiocarbon dating, or ~2 cm higher at the change to the distinctly laminated unit (Figure 3). Changes in diatom frequencies indicate submergence, estimated at 1.2 ± 1.0 m between the samples from 1264 and 1262 cm, or 2.0 ± 1.0 m between the samples from 1264 and 1260 cm (Figures 4 and 5).

Chronology

By using AMS radiocarbon dating of plant macrofossils that we could pick with the aid of a microscope we now see a coherent chronology, with the exception of one sample (Table 2, figure 2). For the peat contact at 756 cm we obtained two very different ages. This illustrates the susceptibility of using single macrofossils, in this case a *Sphagnum* stem with leaves attached, as there is always chance that they may not be *in situ*. This is especially the case for a core sample rather than an outcrop. In this case all of the other samples form a coherent sequence in stratigraphic order and we suggest that the older sample at 756 cm, from a very sharp contact with possible erosion (see above), reflects a macrofossil eroded from an older peat layer. Therefore we do not consider this out of sequence sample further. The other samples resolve the difficulties faced by the original chronology based on bulk peat samples (Combellick, 1991), with the contacts at 756 and 924 cm having statistically different age ranges in contrast to the statistically identical bulk ages.

Testing the hypothesis of multiple cycles of coseismic subsidence and interseismic uplift

Numerous earlier studies have discussed the different processes that may combine to produce multiple peat-silt couplets with abrupt contacts and have set out criteria to assess the evidence for marsh submergence during a great earthquake and interseismic uplift between them (e.g.Atwater, 1987; Hamilton and Shennan, 2005; Nelson et al., 1996). With just a single borehole it is not possible to validate one of the key criteria, the lateral continuity of a peat-silt couplet. Therefore we must use the remaining criteria to assess whether coseismic subsidence is a reasonable explanation for the sequences we observe. With the single borehole we can only reject or retain the coseismic hypothesis; we cannot prove that it is the only explanation. The remaining criteria are suddenness of subsidence; amount of vertical motion; and synchroneity with other sites (Nelson et al., 1996). Presence of tsunami sediments may also help in some locations but is highly unlikely given the location of Portage with respect to the trench axis (Figure 1) and the geomorphological setting of Turnagain Arm. No tsunami occurred in upper Cook Inlet in 1964.

Three of the events described above, events 1, 3 and 4, show strong evidence of sudden submergence, with sharp peat-silt contacts, and estimates of vertical change in the range of 1.9 to

2.2 ± 0.9 m which together are consistent with rapid subsidence of high marsh or freshwater marsh to intertidal flat. Event 5 also shows a clear vertical change, and even though the lithologic change is less distinct we consider this consistent with rapid subsidence of a low marsh into intertidal flat. Event 2 shows a change from freshwater peat, with a formation elevation between 1 and 2 m above MHHW, to tidal flat sedimentation, ~0.4 m below MHHW, across 5 cm of what seems to be reworked organic silt. High rates of sediment input (Atwater et al., 2001; Bartsch-Winkler et al., 1983) and active tidal processes, including sediment transport by winter ice (Hamilton et al., 2005) make sediment reworking always a possibility. We would normally aim to trace a stratigraphic boundary along a section or between boreholes to evaluate this. With just the single core to analyse it still seems reasonable, in this setting, to conclude that event 2 also indicates rapid subsidence. Event 6 is the most equivocal, but the change in elevation from ~ 1m above MHHW to 1 m below MHHW across 4 cm of sediment is also consistent with rapid subsidence.

In order to consider the synchroneity of these submergence events we can compare the radiocarbon ages (Table 2 and figure 2), with a chronology derived from the analysis of all sites across the region (Shennan et al., In review). This regional analysis used a Bayesian modelling approach (Lienkaemper and Bronk Ramsey, 2009) of all radiocarbon ages that provide minimum or maximum ages to constrain events that may indicate coseismic subsidence or uplift. Figure 6 shows the six most recent events that could be traced at a minimum of two locations, one site indicating uplift and at least one indicating subsidence. Given these constraints we attributed these to six great earthquakes during the last 4000 years, in addition to the 1964 earthquake (Shennan et al., In review). When we overlay the ages obtained from the Portage core, which are not included in the regional model and therefore independent for this analysis, we see that they all fit within the joint probability ranges for the six earthquakes. Therefore we conclude that all six events at Portage record coseismic subsidence.

Multiple events in a single core fit with a model of repeated cycles of coseismic subsidence, rapid post-seismic sedimentation and interseismic uplift. Differences in the sedimentology of the six events also reflect coastline migration and net sediment accumulation at the head of the estuary. The oldest two events represent more seaward, low marsh and tidal flat paleo-environments than the younger ones, with high marsh and freshwater marsh prior to submergence. Observations post 1964 indicate ~0.3 m land uplift by 1975 (Brown et al., 1977) and 0.7 m by 1995-2000 (Freymueller et al., 2008). Without both elevation reconstructions and a high resolution age model throughout the whole interval between earthquake horizons it is not possible to quantify the separate contributions of regional sea-level rise caused by eustatic and glacio-isostatic changes, sediment accumulation, sediment compaction and vertical land motions, but the multiple events in one core clearly indicate net submergence over multiple earthquake cycles (Figure 2). With recurrence intervals in the range 420 to 880 years (Shennan et al., In review) the rate of uplift observed in the decades after 1964 is unlikely to represent that of a whole interseismic period as it would lead to full recovery of the tectonic subsidence within a little over 100 years and there would be evidence of emergence above the elevations estimated from the transfer function model reconstructions (Figure 5).

Implications for rupture zone dimensions and segment boundaries

A number of other studies provide evidence for changes in the spatial extent of uplift and subsidence or for different amounts of vertical motion during late Holocene great earthquakes. Most of these relate to sites towards the periphery of the 1964 rupture zone, including Kodiak Island (Carver and Plafker, 2008), Kenai, Kasilof and Anchorage (Hutchinson and Crowell, 2007; Shennan and Hamilton, 2006), and Katalla (Shennan et al., 2014) or beyond the 1964 rupture zone east of Cape Yakataga (Shennan et al., 2009) and suggest possible difference in rupture extent and plate segmentation. The location of Portage, central within the zone of subsidence in 1964, does not help constrain models of the extent of the rupture zone but the reconstructions of elevation change will constrain models of surface deformation. For example, if earlier earthquakes did involve a greater rupture area then the slip on the plate interface did not produce significantly greater subsidence at Portage than in 1964.

The Portage record also enhances two other aspects of the paleoseismic record of southcentral Alaska. As with the other sites in upper Cook Inlet, there is no evidence for an earthquake between the penultimate great earthquake, ~880 a BP, and 1964 in contrast to those separately recorded at Kodiak Island (Carver and Plafker, 2008) and Katalla (Shennan et al., 2014). Also, the correlation of the six earthquakes at Portage with those at Girdwood, and no evidence for additional peat-silt couplets, support our previous interpretation that the extra three peat-silt couplets at Girdwood lacking evidence of intertidal sedimentation represent local scale changes in environment rather than coseismic subsidence and short recurrence intervals (Shennan et al., 2008).

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FIGURE CAPTIONS

Figure 1: A. Tectonic setting of southcentral Alaska and location of Portage(Po). Dashed lines indicate extent of subsidence in 1964, including Cook Inlet, and uplift, extending to the megathrust and including the initial epicentre in Prince William Sound (PWS). B. Location map of Portage and other sites along Turnagain Arm of Cook Inlet.

Figure 2: Stratigraphy of Portage core TA8 and new AMS radiocarbon ages (Table 2). Full core description in Combellick (1991), although depths may differ slightly from those recorded in 2012-2013. Sample age shown in *grey* considered anomalously old (see main text for details).

Figure 3: Stratigraphic contacts of the six events identified, cm scale. Top of peat-silt contact indicated by dark line on scale.

Figure 4: Summary diatom diagram of samples counted from Portage core TA8, showing only the most abundant species. Blue shows species that favour marine and brackish water. See Supplementary Information for full data. Horizontal line indicates top contact of the dated horizon.

Figure 5: Transfer function model reconstructions of elevation change across each contact. Error bars indicate 95.4% confidence range. Table 1 indicates which model is used for each sample. Circles with black fill = good modern analogue; grey fill = close and white fill = poor modern analogue.

Figure 6: Age probability distribution functions (solid lines) for six great earthquakes identified for the Prince William Sound segment of the Aleutian Megathrust (Shennan et al., 2014) and the ages for the events recorded at Portage (dashed and dotted lines; Table 2 and figure 2). Standardised areas under each graph. Letters indicate sites at which the earthquakes are recorded: A – Anchorage; B – Bird Point; C – Copper River Delta (located in the 1964 zone of uplift east of Prince William Sound, Figure 1); G – Girdwood; P – Portage.

Table 1: Summary statistics for transfer function models used to reconstruct paleo marsh surface elevations. All models use modern samples from the regional-scale dataset covering sites across south-central Alaska. Site details of modern samples and model development in Hamilton and Shennan (2005) and Watcham et al., (2013) and the full data set and model performance statistics are available at https://www.dur.ac.uk/geography/slru/sea_level_data/ .

	Model 1	Model 2	Model 3
Lithology of fossil sample	Peat	Silt / clay with herbaceous rootlets	Silt, no visible rootlets or laminated clay, silt & fine sand
Number of samples in modern training set	100	206	255
Number of components in weighted averaging partial least squares model[1]	2	2	2
Squared correlation between bootstrap predicted and observed values (r^2)	0.75	0.68	0.76
Root mean squared error of prediction (bootstrap RMSEP)	6.31	11.27	17.48
Improvement in RMSEP over one-component model	14.7%	11.4%	10.5%
RMSEP scaled to tidal range at Girdwood	0.21 m	0.38 m	0.59 m
Core samples to which the model applies (see figure 5)	Peat samples for events 1, 3 and 4	Organic silt / silt-peat, events 2, 5 and 6; lowest 2 samples event 4	Samples from above all event contacts; one sample below event 2 contact

[1] We assess model performance using boot-strapped r^2, scatterplots of observed and predicted values, and RMSEP, with the best models being those with the highest r^2 value, a linear distribution of observed plotted against predicted values, and the lowest RMSEP, but only if the RMSEP was improved by at least 5% with the addition of an extra component.

Table 2: AMS radiocarbon results. Note the age of sample TA8-13-5 lies out of stratigraphic sequence (Figure 2 and discussion in text)

Laboratory Code	Sample	Description of material	Depth below surface (cm)	m MHHW	c^{14} BP	1σ	$\delta^{13}C$	Calibrated age range BP (95%)		
AA101902	TA8-13-13	Small plant fragments	149	2.28	$F^{14}C$ 1.0313	0.0047	-28.4	AD 1954	to	AD 1957
AA101890	TA8-13-1	*Sphagnum* leaves - top of peat	388	-0.11	981	54	-24.3	745	to	1046
AA101891	TA8-13-2	*Sphagnum* leaves - top of peat	388.5	-0.115	1016	39	-24.1	797	to	1051
AA101892	TA8-13-3	Leaves at contact, silt on one side	621	-2.44	1570	39	-24.8	1377	to	1540
AA101893	TA8-13-4	Single stem / root nodule - top of peat	621	-2.44	1625	40	-25.1	1409	to	1611
AA101894	*TA8-13-5*	*Sphagnum stem with leaves - top of peat*	*756*	*-3.79*	*3434*	*50*	*-26.0*	*3574*	*to*	*3833*
AA101895	TA8-13-6	Herbaceous and woody rootlets from same level as TA8-13-6	756	-3.79	2130	40	-26.1	1995	to	2303
AA101896	TA8-13-7	*Sphagnum* leaves - top of peat	924	-5.47	2617	70	-21.3	2472	to	2871
AA101897	TA8-13-8	*Sphagnum* leaves - top of peat	924	-5.47	2529	50	-22.9	2368	to	2752
AA101898	TA8-13-9	herbaceous leaf/stem - top of peat	1108	-7.31	2996	42	-25.4	3044	to	3339
AA101899	TA8-13-10	Small herbaceous leaves/stems - top of peat	1109	-7.32	2916	42	-25.3	2930	to	3213
AA101900	TA8-13-11	Herbaceous leaf fragments coated in silt	1264	-8.87	3345	43	-25.4	3472	to	3688
AA101901	TA8-13-12	Stem/root nodule: probably *Triglochin*	1270	-8.93	3393	43	-28.9	3484	to	3821

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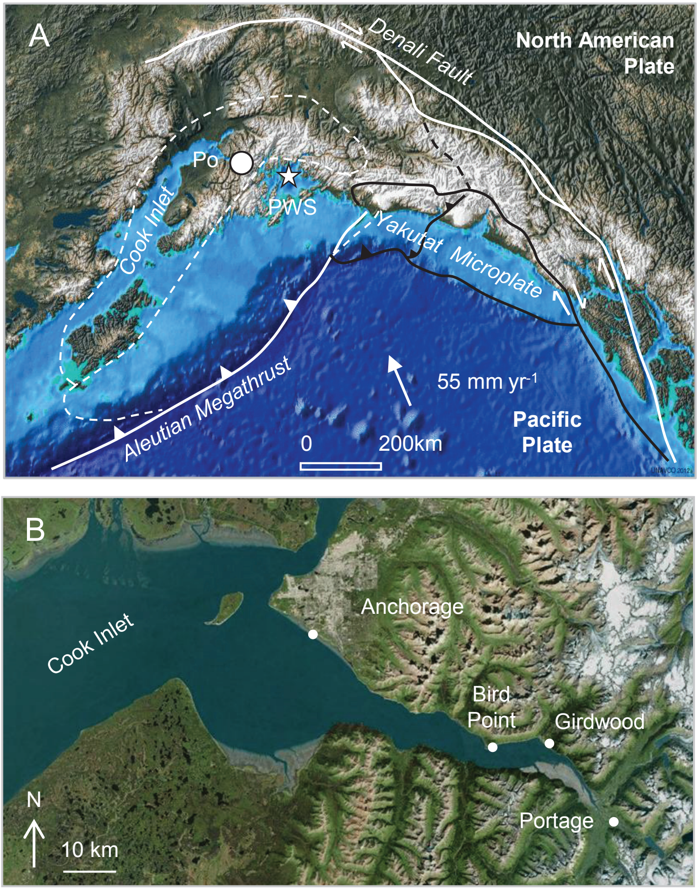
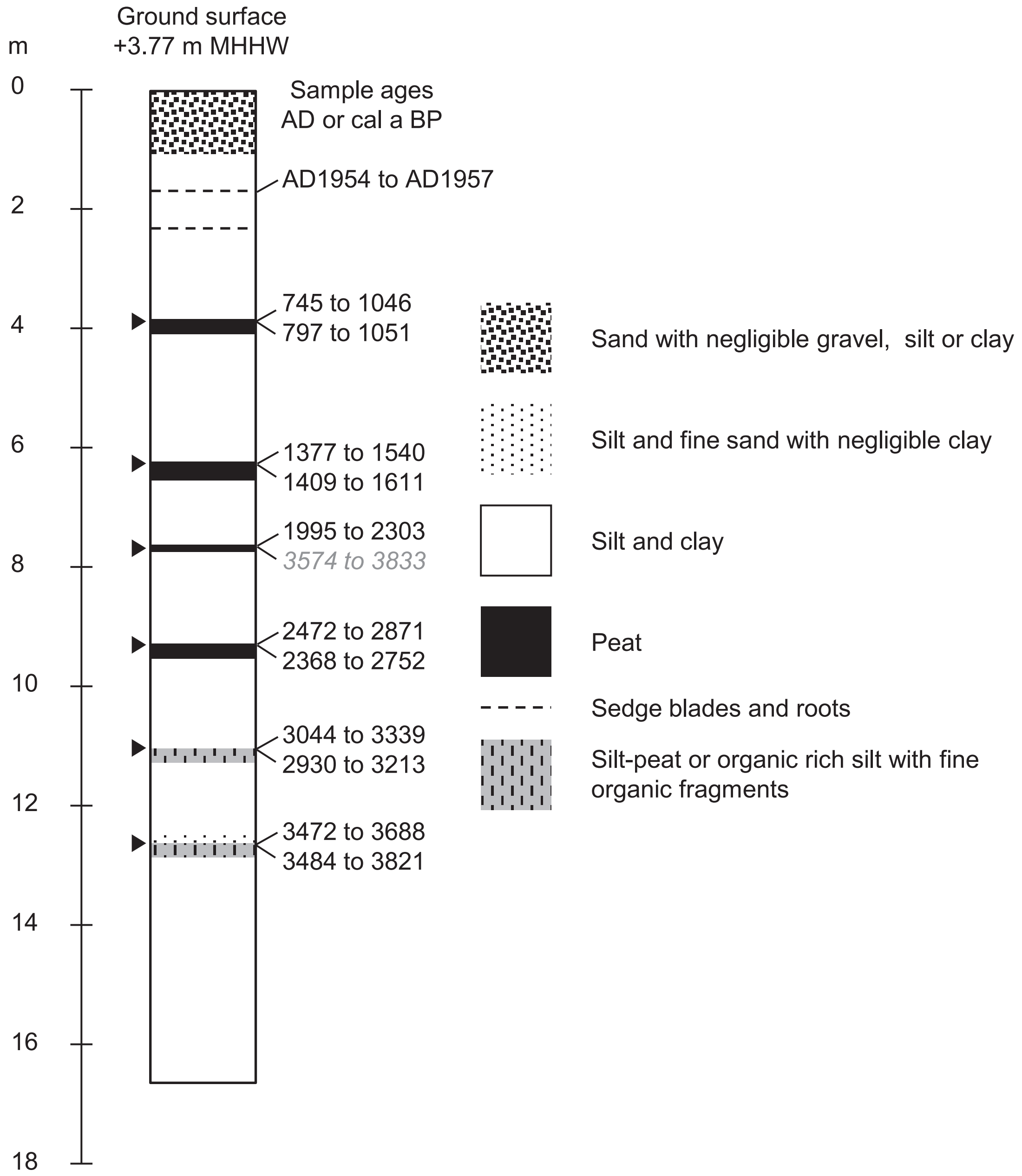
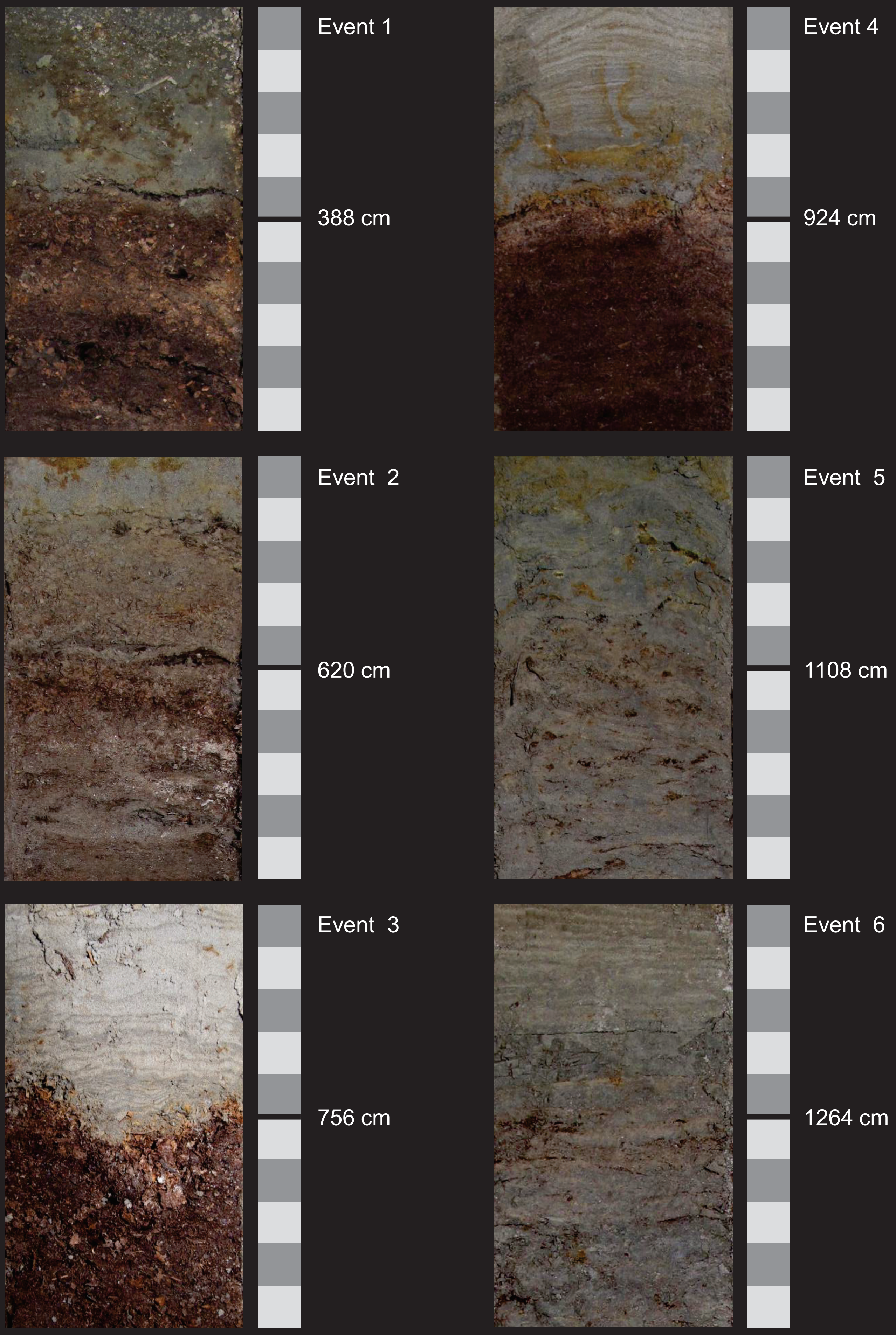
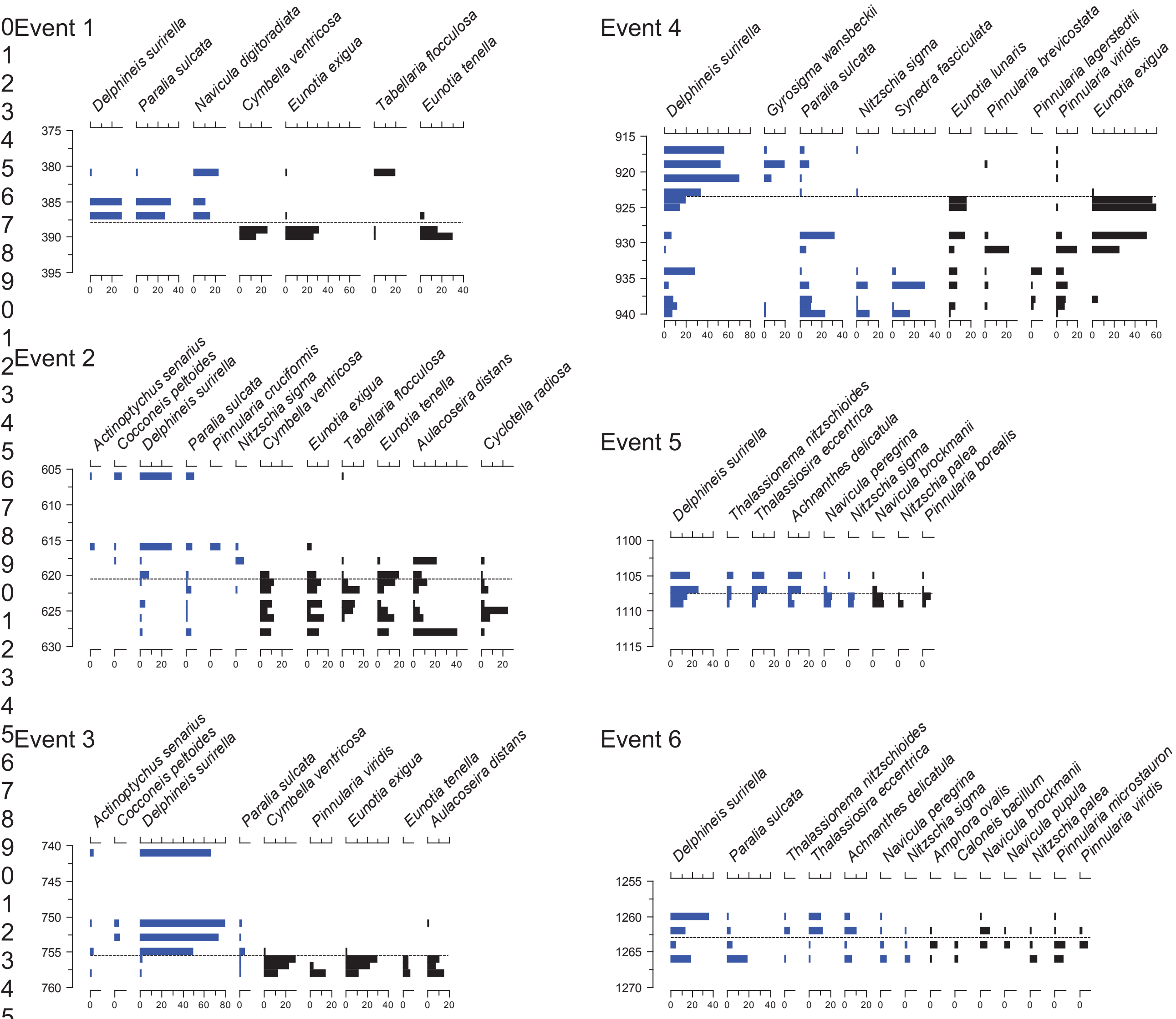
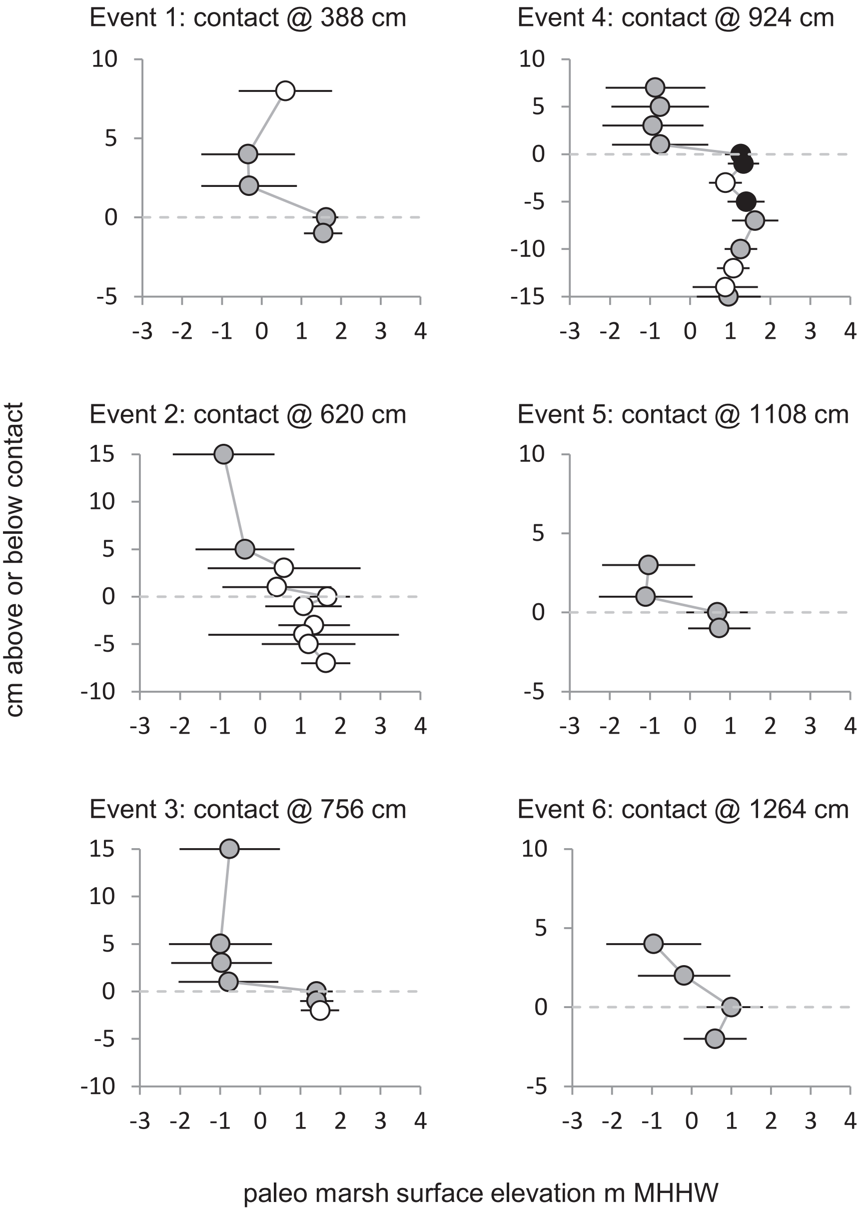
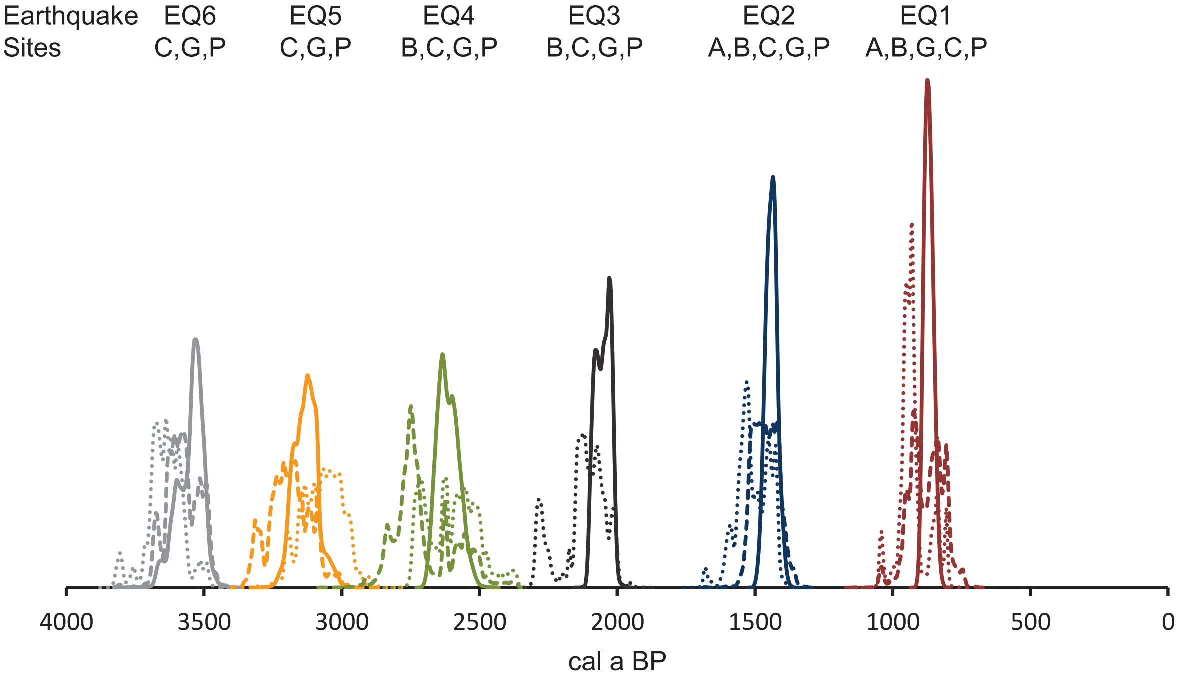

A
Denali Fault
North American Plate
Po
PWS
Cook Inlet
Yakutat Microplate
Aleutian Megathrust
55 mm yr-1
Pacific Plate
0
200km
B
Anchorage
Cook Inlet
Bird Point
Girdwood
Portage
N
10 km


Ground surface
+3.77 m MHHW
m
0
2
4
6
8
10
12
14
16
18
Sample ages
AD or cal a BP
AD1954 to AD1957
745 to 1046
797 to 1051
1377 to 1540
1409 to 1611
1995 to 2303
3574 to 3833
2472 to 2871
2368 to 2752
3044 to 3339
2930 to 3213
3472 to 3688
3484 to 3821
Sand with negligible gravel, silt or clay
Silt and fine sand with negligible clay
Silt and clay
Peat
Sedge blades and roots
Silt-peat or organic rich silt with fine organic fragments


Event 1
388 cm
Event 4
924 cm
Event 2
620 cm
Event 5
1108 cm
Event 3
756 cm
Event 6
1264 cm


Event 1
Delphineis surirella
Paralia sulcata
Navicula digitoradiata
Cymbella ventricosa
Eunotia exigua
Tabellaria flocculosa
Eunotia tenella
375
380
385
390
395
0 20 0 20 40 0 20 0 20 0 20 40 60 0 20 0 20 40
Event 2
Actinoptychus senarius
Cocconeis peltoides
Delphineis surirella
Paralia sulcata
Pinnularia cruciformis
Nitzschia sigma
Cymbella ventricosa
Eunotia exigua
Tabellaria flocculosa
Eunotia tenella
Aulacoseira distans
Cyclotella radiosa
605
610
615
620
625
630
0 0 0 20 0 0 0 0 20 0 20 0 20 0 20 0 20 40 0 20
Event 3
Actinoptychus senarius
Cocconeis peltoides
Delphineis surirella
Paralia sulcata
Cymbella ventricosa
Pinnularia viridis
Eunotia exigua
Eunotia tenella
Aulacoseira distans
740
745
750
755
760
0 0 0 20 40 60 80 0 0 20 0 20 0 20 40 0 0 20
Event 4
Delphineis surirella
Gyrosigma wansbeckii
Paralia sulcata
Nitzschia sigma
Synedra fasciculata
Eunotia lunaris
Pinnularia brevicostata
Pinnularia lagerstedtii
Pinnularia viridis
Eunotia exigua
915
920
925
930
935
940
0 20 40 60 80 0 20 0 20 40 0 20 0 20 40 0 20 0 20 0 0 20 0 20 40 60
Event 5
Delphineis surirella
Thalassionema nitzschioides
Thalassiosira eccentrica
Achnanthes delicatula
Navicula peregrina
Nitzschia sigma
Navicula brockmanii
Nitzschia palea
Pinnularia borealis
1100
1105
1110
1115
0 20 40 0 0 20 0 20 0 0 0 0 0
Event 6
Delphineis surirella
Paralia sulcata
Thalassionema nitzschioides
Thalassiosira eccentrica
Achnanthes delicatula
Navicula peregrina
Nitzschia sigma
Amphora ovalis
Caloneis bacillum
Navicula brockmanii
Navicula pupula
Nitzschia palea
Pinnularia microstauron
Pinnularia viridis
1255
1260
1265
1270
0 20 40 0 20 40 0 0 20 0 20 0 0 0 0 0 0 0 0 0


Event 1: contact @ 388 cm
10
5
0
-5
-3 -2 -1 0 1 2 3 4
Event 4: contact @ 924 cm
10
5
0
-5
-10
-15
-3 -2 -1 0 1 2 3 4
Event 2: contact @ 620 cm
15
10
5
0
-5
-10
-3 -2 -1 0 1 2 3 4
Event 5: contact @ 1108 cm
10
5
0
-5
-3 -2 -1 0 1 2 3 4
Event 3: contact @ 756 cm
15
10
5
0
-5
-10
-3 -2 -1 0 1 2 3 4
Event 6: contact @ 1264 cm
10
5
0
-5
-3 -2 -1 0 1 2 3 4
cm above or below contact
paleo marsh surface elevation m MHHW


Earthquake
Sites
EQ6
C,G,P
EQ5
C,G,P
EQ4
B,C,G,P
EQ3
B,C,G,P
EQ2
A,B,C,G,P
EQ1
A,B,G,C,P
4000
3500
3000
2500
2000
1500
1000
500
0
cal a BP

Depth	**381**	**385**	**387**	**389**	**390**	**606**	**616**	**618**	**620**	**621**	**622**	**624**	**625**	**626**	**628**	**655**	**657**	**659**	**661**	**671**	**682**	**702**	**721**	**731**	**741**
Sum	98	101	109	126	109	102	101	103	115	108	115	110	102	138	114	96	105	94	100	101	101	101	100	102	100
Actinoptychus senarius	0.0	3.0	0.9	0.0	0.0	1.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.0	2.0	2.0	5.9	1.0	2.0	4.0
Caloneis brevis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cocconeis peltoides	1.0	0.0	0.0	0.0	0.0	6.9	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	2.0	6.9	9.9	0.0	0.0	0.0	0.0
Delphineis surirella	2.0	32.7	32.1	0.0	0.0	77.5	58.4	1.0	8.7	1.9	0.0	5.5	0.0	1.4	2.6	2.1	0.0	22.3	10.0	37.6	57.4	58.4	77.0	70.6	67.0
Diploneis smithii	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	52.0	0.0	0.0	0.0	0.0	0.0	0.0
Gyrosigma wansbeckii	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	3.0	3.0	2.0	0.0
Navicula distans	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula palpebralis	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Navicula forcipata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula species 1	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia socialis	0.0	1.0	0.9	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Odontella aurita	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	2.0
Paralia sulcata	1.0	32.7	27.5	0.0	0.0	7.8	5.9	0.0	2.6	0.9	5.2	0.9	2.0	0.7	5.3	1.0	1.0	8.5	4.0	18.8	16.8	18.8	11.0	11.8	9.0
Pinnularia cruciformis	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plagiogramma vanheurckii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surirella fastuosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Thalassionema nitzschioides	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thalassiosira eccentrica	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	6.9	1.0	0.0	0.0	0.0	0.0
Achnanthes delicatula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cyclotella striata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diploneis interrupta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula digitoradiata	23.5	11.9	15.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	18.0	8.9	2.0	0.0	0.0	1.0	10.0
Navicula peregrina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula salinarum	2.0	2.0	0.9	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia obtusa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia sigma	0.0	0.0	0.0	0.0	0.0	0.0	3.0	7.8	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	3.2	5.0	2.0	2.0	1.0	0.0	0.0	1.0
Nitzschia vitrea	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Rhopalodia operculata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surirella ovalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	1.0	1.0	0.0	0.0	0.0	0.0
Synedra fasciculata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amphora veneta	4.1	2.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0
Luticola mutica	9.2	4.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula cari var cincta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia frustulum	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Nitzschia tryblionella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes exigua	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	5.5	0.0	0.0	0.0	1.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes lanceolata	0.0	0.0	0.0	0.8	0.9	0.0	0.0	0.0	1.7	0.0	0.0	5.5	4.9	0.7	0.9	0.0	0.0	0.0	0.0	1.0	1.0	1.0	3.0	3.9	2.0
Amphora ovalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Caloneis bacillum	0.0	0.0	0.0	0.0	0.0	0.0	3.0	16.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Caloneis ventricosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ceratoneis arcus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cymbella affinis	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.9	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Depth	**381**	**385**	**387**	**389**	**390**	**606**	**616**	**618**	**620**	**621**	**622**	**624**	**625**	**626**	**628**	**655**	**657**	**659**	**661**	**671**	**682**	**702**	**721**	**731**	**741**
Sum	98	101	109	126	109	102	101	103	115	108	115	110	102	138	114	96	105	94	100	101	101	101	100	102	100
Cymbella cistula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cymbella ventricosa	0.0	0.0	0.0	26.2	15.6	0.0	0.0	0.0	8.7	13.0	10.4	11.8	6.9	13.0	10.5	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Diploneis ovalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Epithemia turgida	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia germainii	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia lunaris	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia pectinalis	1.0	0.0	0.0	0.8	0.9	0.0	0.0	0.0	3.5	0.9	5.2	2.7	1.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria construens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	1.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Fragilaria vaucheriae	7.1	0.0	0.0	0.8	4.6	2.9	5.0	7.8	6.1	5.6	10.4	10.0	8.8	5.8	3.5	15.6	8.6	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.0
Fragilariforma virescens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	2.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gomphonema acuminatum	0.0	0.0	0.0	0.8	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Gomphonema gracile	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meridion circulare	1.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula begeri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula brockmanii	4.1	1.0	0.9	0.0	0.9	0.0	0.0	1.0	0.0	0.0	0.0	0.9	0.0	0.7	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Navicula pupula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.2	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula pusilla	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula radiosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.6	0.0	0.9	0.0	0.0	0.0	1.8	0.0	0.0	10.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula tripunctata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula viridula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia fruticosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia linearis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia palea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Nitzschia palustris	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia abaujensis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	2.6	1.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia borealis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia brevicostata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia intermedia	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia lagerstedtii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia mesolepta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia microstauron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia viridis	0.0	0.0	0.0	0.8	0.0	0.0	0.0	5.8	0.9	1.9	0.0	0.0	1.0	0.7	0.0	21.9	30.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pseudostaurosira brevistriata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stauroneis anceps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stauroneis phoenicentron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Staurosirella pinnata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0
Synedra ulna	0.0	1.0	0.0	0.0	0.9	0.0	0.0	2.9	1.7	1.9	0.0	0.0	2.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
Achnanthes conspicua	1.0	0.0	0.0	2.4	2.8	0.0	0.0	0.0	7.0	7.4	5.2	5.5	4.9	10.1	0.0	7.3	0.0	0.0	0.0	0.0	0.0	3.0	0.0	2.0	3.0
Eunotia exigua	1.0	0.0	1.8	31.7	26.6	0.0	5.0	0.0	8.7	13.9	10.4	14.5	3.9	15.9	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia praerupta	0.0	0.0	0.0	3.2	2.8	0.0	0.0	0.0	8.7	6.5	0.9	10.0	6.9	5.8	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria leptostauron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Frustulia rhomboides	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Depth	**381**	**385**	**387**	**389**	**390**	**606**	**616**	**618**	**620**	**621**	**622**	**624**	**625**	**626**	**628**	**655**	**657**	**659**	**661**	**671**	**682**	**702**	**721**	**731**	**741**
Sum	98	101	109	126	109	102	101	103	115	108	115	110	102	138	114	96	105	94	100	101	101	101	100	102	100
Nitzschia gracilis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	4.3	0.0	0.0	0.0	0.0	3.1	0.0	6.4	0.0	1.0	1.0	0.0	0.0	0.0	0.0
Pinnularia subcapitata	0.0	0.0	0.0	0.0	0.0	2.0	3.0	8.7	0.9	5.6	5.2	0.9	2.9	2.2	0.0	0.0	3.8	4.3	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Pinnularia subsolaris	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tabellaria fenestrata	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tabellaria flocculosa	20.4	0.0	0.0	0.8	0.9	1.0	0.0	1.9	0.9	6.5	16.5	11.8	10.8	2.9	0.0	0.0	8.6	0.0	1.0	1.0	0.0	0.0	2.0	2.9	0.0
Navicula ramosissima	2.0	5.9	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neidium bisulcatum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cyclotella meneghiniana	2.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.9	1.0	0.0	0.0	0.0	0.0	0.0	1.0	2.0	1.0	0.0
Caloneis westii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia tenella	0.0	0.0	4.6	16.7	30.3	0.0	0.0	2.9	20.9	16.7	6.1	3.6	9.8	15.2	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria construens var. binodis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula capitata var. hungarica	2.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	4.3	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia major	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aulacoseira distans	3.1	0.0	0.0	6.3	6.4	0.0	0.0	22.3	7.8	13.0	5.2	0.9	5.9	9.4	41.2	2.1	2.9	1.1	0.0	5.0	0.0	0.0	0.0	1.0	0.0
Navicula subtilissima	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilariforma constricta	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes clevei	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cyclotella radiosa	0.0	0.0	3.7	3.2	2.8	0.0	0.0	3.9	0.9	3.7	7.0	3.6	25.5	8.7	3.5	2.1	23.8	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Fragilaria construens var. venter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula ignota var. palustris	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0

Depth	**751**	**753**	**755**	**756**	**757**	**758**	**823**	**883**	**903**	**917**	**919**	**921**	**923**	**924**	**925**	**929**	**931**	**934**	**936**	**938**	**939**	**940**	**941**	**942**	**943**
Sum	100	102	109	150	187	125	223	231	200	214	171	158	191	155	199	205	237	104	214	158	219	168	238	228	229
Actinoptychus senarius	1.0	0.0	3.7	0.0	0.0	0.8	3.6	7.4	2.0	2.3	0.0	1.3	2.6	0.0	0.0	1.5	0.0	1.0	0.0	2.5	2.3	0.0	0.8	0.0	0.4
Caloneis brevis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.6	0.0	0.0	0.0
Cocconeis peltoides	4.0	4.9	0.0	0.0	0.0	0.0	0.0	4.3	6.0	1.9	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.9	0.4
Delphineis surirella	85.0	73.5	50.5	2.7	0.0	1.6	53.8	49.8	60.0	56.1	52.6	70.3	34.0	20.6	15.1	6.8	1.7	28.8	4.7	8.9	11.9	8.3	5.9	1.3	5.2
Diploneis smithii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0
Gyrosigma wansbeckii	2.0	2.9	0.0	0.0	0.0	0.0	0.0	0.4	2.5	2.8	19.9	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.2	0.0	1.8	0.0
Navicula distans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula palpebralis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula forcipata	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	4.8	1.7	11.0	0.0
Navicula species 1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.3	3.5	1.3
Nitzschia socialis	1.0	1.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Odontella aurita	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Paralia sulcata	1.0	5.9	33.0	0.0	0.0	0.0	23.8	19.5	4.5	18.7	11.7	5.7	24.1	0.0	0.0	1.0	1.7	3.8	3.3	3.8	7.8	8.3	6.3	1.8	3.1
Pinnularia cruciformis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plagiogramma vanheurckii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surirella fastuosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thalassionema nitzschioides	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	1.5	0.5	0.0	1.3	3.1	0.0	0.0	0.0	0.8	1.0	0.0	2.5	0.5	0.6	0.0	0.0	0.0
Thalassiosira eccentrica	0.0	1.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0	0.5	0.0	0.0	2.6	0.0	0.0	0.0	0.0	2.9	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Achnanthes delicatula	0.0	1.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	1.9	0.0	0.0	7.9	0.0	0.0	0.0	0.0	1.9	0.0	3.2	0.0	0.0	0.0	0.0	0.9
Cyclotella striata	0.0	0.0	0.0	0.0	0.0	0.0	4.0	3.9	4.5	0.0	0.0	0.0	4.7	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diploneis interrupta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula digitoradiata	0.0	0.0	0.9	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula peregrina	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.2	3.0	4.7	0.0	1.3	1.6	0.0	0.0	0.0	0.0	1.9	0.5	5.1	3.7	7.7	6.3	5.7	9.6
Navicula salinarum	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia obtusa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia sigma	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.4	0.0	0.0	2.1	0.0	0.0	0.0	0.0	1.9	10.3	1.9	0.9	11.9	5.5	0.0	1.7
Nitzschia vitrea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rhopalodia operculata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Surirella ovalis	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Synedra fasciculata	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	31.3	0.0	1.4	17.3	15.5	6.1	9.6
Amphora veneta	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Luticola mutica	0.0	2.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula cari var cincta	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	13.6	0.0
Nitzschia frustulum	0.0	1.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia tryblionella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes exigua	0.0	0.0	0.0	0.0	1.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes lanceolata	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amphora ovalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.0	0.0	0.0	1.0	1.4	0.6	0.5	0.0	3.8	0.9	0.0
Caloneis bacillum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Caloneis ventricosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ceratoneis arcus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Cymbella affinis	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Depth	**751**	**753**	**755**	**756**	**757**	**758**	**823**	**883**	**903**	**917**	**919**	**921**	**923**	**924**	**925**	**929**	**931**	**934**	**936**	**938**	**939**	**940**	**941**	**942**	**943**
Sum	100	102	109	150	187	125	223	231	200	214	171	158	191	155	199	205	237	104	214	158	219	168	238	228	229
Cymbella cistula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5	0.0	0.0	0.0	0.0
Cymbella ventricosa	0.0	0.0	0.9	30.0	23.5	12.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Diploneis ovalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.4
Epithemia turgida	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.4	0.0	0.0	0.6	0.9	0.0	0.0	0.0	0.0
Eunotia germainii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0
Eunotia lunaris	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	16.1	16.6	15.1	5.1	7.7	7.9	0.0	6.4	0.6	0.0	0.0	0.0
Eunotia pectinalis	0.0	0.0	0.0	0.0	3.2	0.0	0.9	0.0	0.0	1.4	0.6	0.0	1.0	0.6	1.0	0.0	1.3	1.9	2.8	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria construens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria vaucheriae	3.0	2.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilariforma virescens	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gomphonema acuminatum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gomphonema gracile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0
Meridion circulare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula begeri	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula brockmanii	0.0	0.0	0.9	0.7	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	4.8	0.9	3.8	1.8	1.2	2.1	9.2	10.5
Navicula pupula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.9	0.0	0.6	0.5	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.4	1.3	0.0
Navicula pusilla	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.4	2.1	1.8	1.3
Navicula radiosa	0.0	0.0	0.0	0.7	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula tripunctata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula viridula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.9	0.9
Nitzschia fruticosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.6	0.0	1.2	1.3	2.6	7.4
Nitzschia linearis	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Nitzschia palea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	1.9	2.8	2.5	0.5	8.3	5.9	8.8	4.4
Nitzschia palustris	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	2.5	0.0	0.4
Pinnularia abaujensis	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia borealis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	1.0	0.5	3.8	3.2	1.8	2.1	8.8	10.0
Pinnularia brevicostata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	0.0	0.0	0.0	3.4	22.8	1.0	3.3	0.0	2.3	0.0	0.0	0.4	4.4
Pinnularia intermedia	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia lagerstedtii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.9	4.4	2.3	0.0	0.0	0.0	3.1
Pinnularia mesolepta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.6	0.0	0.9	0.0
Pinnularia microstauron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.5	0.0	0.6	0.6	0.0	0.0	1.0	2.0	5.5	1.9	0.0	1.3	1.4	2.4	2.9	3.5	3.1
Pinnularia viridis	0.0	0.0	0.0	0.0	3.2	15.2	1.3	0.0	0.0	0.5	1.2	1.3	0.0	0.0	0.5	5.4	24.9	7.7	10.7	8.9	8.2	1.2	13.9	1.8	0.9
Pseudostaurosira brevistriata	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stauroneis anceps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	3.3	1.3	0.5	4.2	1.3	2.6	0.0
Stauroneis phoenicentron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Staurosirella pinnata	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	3.5	0.0	1.8	1.3	1.0	0.0	0.0	0.0	0.0	1.9	0.0	1.3	0.9	1.8	0.0	0.0	0.4
Synedra ulna	0.0	1.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes conspicua	0.0	0.0	0.0	10.7	15.5	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia exigua	0.0	0.0	0.9	30.0	23.5	12.8	0.0	0.0	0.0	0.0	0.0	0.0	2.1	56.8	63.3	51.2	25.3	0.0	0.0	5.7	0.0	0.0	0.0	0.0	0.0
Eunotia praerupta	0.0	0.0	0.0	2.7	3.7	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria leptostauron	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Frustulia rhomboides	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.6	0.5	1.8	0.8	0.0	0.0

Depth	**751**	**753**	**755**	**756**	**757**	**758**	**823**	**883**	**903**	**917**	**919**	**921**	**923**	**924**	**925**	**929**	**931**	**934**	**936**	**938**	**939**	**940**	**941**	**942**	**943**
Sum	100	102	109	150	187	125	223	231	200	214	171	158	191	155	199	205	237	104	214	158	219	168	238	228	229
Nitzschia gracilis	0.0	1.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia subcapitata	0.0	0.0	0.0	2.7	2.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.4	3.4	0.0	0.0	1.9	1.4	1.2	0.0	0.0	0.0
Pinnularia subsolaris	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tabellaria fenestrata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tabellaria flocculosa	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.7	0.5	0.9	0.6	0.0	1.0	2.6	0.0	0.0	0.4	1.0	0.5	8.2	9.1	0.0	0.0	0.0	0.0
Navicula ramosissima	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Neidium bisulcatum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cyclotella meneghiniana	0.0	0.0	1.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	5.8	3.7	10.8	9.1	3.0	2.9	0.0	8.3
Caloneis westii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia tenella	0.0	0.0	0.0	5.3	5.9	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria construens var. binodis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	6.1	3.2	0.0	0.0	3.8	3.9	7.0
Navicula capitata var. hungarica	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia major	0.0	0.0	0.0	0.0	1.6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aulacoseira distans	1.0	0.0	0.0	11.3	7.5	16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula subtilissima	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilariforma constricta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes clevei	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	3.2	0.0	0.0	0.0	0.0	0.9
Cyclotella radiosa	1.0	0.0	0.0	0.7	0.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria construens var. venter	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0	0.0	2.8	6.4	1.3	8.9	0.0	0.0	0.0	0.4	0.0	0.9	7.6	3.2	4.2	10.1	5.3	2.6
Navicula ignota var. palustris	0.0	0.0	0.0	1.3	0.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Depth	**944**	**945**	**949**	**959**	**979**	**999**	**1083**	**1105**	**1107**	**1108**	**1109**	**1147**	**1148**	**1149**	**1260**	**1262**	**1264**	**1266**
Sum	224	227	230	226	237	228	212	181	209	183	185	143	175	156	194	198	169	150
Actinoptychus senarius	0.4	4.4	2.2	7.5	7.2	6.6	7.1	7.2	4.3	1.1	3.2	2.8	7.4	4.5	7.7	1.5	1.2	2.7
Caloneis brevis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cocconeis peltoides	0.4	0.0	0.0	5.8	5.9	6.6	2.4	2.2	3.3	3.8	1.1	3.5	3.4	7.1	0.5	0.0	0.0	0.7
Delphineis surirella	8.9	11.0	19.6	24.3	25.3	33.8	29.2	18.8	26.8	15.8	12.4	15.4	25.1	24.4	36.1	14.1	5.3	19.3
Diploneis smithii	0.0	0.0	0.0	0.4	0.0	0.4	0.0	0.6	0.0	1.1	0.0	0.7	0.0	0.6	0.0	0.0	0.0	0.0
Gyrosigma wansbeckii	0.0	0.4	0.0	0.0	0.0	0.0	1.4	1.7	1.0	0.0	1.1	0.0	0.0	0.0	0.5	0.0	0.6	0.0
Navicula distans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula palpebralis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula forcipata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.9	0.5	1.1	0.0	0.0	0.0	1.0	2.0	2.4	0.0
Navicula species 1	3.1	3.1	2.6	2.2	0.0	0.0	0.0	2.8	3.8	4.4	5.4	7.0	1.7	3.8	1.0	0.5	2.4	3.3
Nitzschia socialis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Odontella aurita	0.0	0.4	0.0	0.0	0.4	0.0	0.5	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Paralia sulcata	5.4	18.9	3.5	31.4	33.8	18.9	9.4	19.9	11.0	8.2	7.6	10.5	6.3	10.9	23.2	9.6	5.9	12.0
Pinnularia cruciformis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Plagiogramma vanheurckii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surirella fastuosa	0.0	0.4	0.0	0.4	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	1.8	5.3
Thalassionema nitzschioides	0.4	0.4	0.0	2.2	0.0	0.4	1.4	6.1	3.8	3.8	2.7	2.8	1.1	5.8	1.5	5.6	0.0	1.3
Thalassiosira eccentrica	0.0	0.0	3.9	4.9	7.2	3.1	5.7	11.6	13.9	4.9	3.2	7.7	16.6	7.7	11.3	12.6	1.2	2.0
Achnanthes delicatula	0.0	0.0	0.0	2.2	3.0	6.6	5.7	13.8	12.4	3.8	6.5	2.8	3.4	5.1	5.2	11.6	2.4	7.3
Cyclotella striata	0.0	11.0	2.6	1.8	1.7	1.3	24.1	4.4	1.9	5.5	3.2	14.7	18.9	19.2	4.1	3.0	0.6	4.0
Diploneis interrupta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula digitoradiata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula peregrina	2.2	2.6	20.0	4.9	4.2	13.2	4.7	1.7	3.3	8.2	7.6	16.1	2.3	2.6	0.5	1.5	3.6	6.0
Navicula salinarum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia obtusa	0.0	0.4	0.0	0.4	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia sigma	1.3	0.9	2.6	4.4	7.6	1.8	4.7	1.1	0.0	6.0	5.4	10.5	8.6	4.5	0.0	0.5	2.4	4.7
Nitzschia vitrea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rhopalodia operculata	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Surirella ovalis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Synedra fasciculata	2.7	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	2.2	0.0	0.7	0.0	0.0	0.0	0.0	3.6	0.0
Amphora veneta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Luticola mutica	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula cari var cincta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	2.5	10.7	2.0
Nitzschia frustulum	4.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia tryblionella	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes exigua	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes lanceolata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amphora ovalis	0.4	0.4	0.4	0.4	0.0	0.4	0.5	0.0	1.0	1.1	1.1	0.0	0.6	0.0	0.0	0.5	7.1	0.7
Caloneis bacillum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.3
Caloneis ventricosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ceratoneis arcus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Cymbella affinis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Depth	**944**	**945**	**949**	**959**	**979**	**999**	**1083**	**1105**	**1107**	**1108**	**1109**	**1147**	**1148**	**1149**	**1260**	**1262**	**1264**	**1266**
Sum	224	227	230	226	237	228	212	181	209	183	185	143	175	156	194	198	169	150
Cymbella cistula	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cymbella ventricosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diploneis ovalis	2.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Epithemia turgida	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia germainii	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia lunaris	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia pectinalis	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria construens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria vaucheriae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilariforma virescens	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gomphonema acuminatum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gomphonema gracile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meridion circulare	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula begeri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula brockmanii	4.5	4.8	0.0	0.0	0.0	0.4	0.5	0.6	3.8	9.3	10.8	0.0	0.0	0.0	0.5	10.1	7.7	0.0
Navicula pupula	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.6	3.2	0.0	0.0	0.0	0.0	1.0	5.3	0.0
Navicula pusilla	2.2	0.4	0.9	0.4	0.0	0.0	0.0	0.0	0.5	2.2	3.2	0.0	0.0	0.0	0.5	1.0	1.2	3.3
Navicula radiosa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula tripunctata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Navicula viridula	1.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia fruticosa	8.9	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia linearis	1.3	3.1	1.3	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitzschia palea	13.4	4.4	9.6	0.9	0.8	0.0	0.0	0.0	0.0	1.1	5.4	0.0	0.0	0.0	0.0	1.0	2.4	7.3
Nitzschia palustris	0.9	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.0
Pinnularia abaujensis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia borealis	10.3	9.7	7.0	0.9	0.0	0.0	0.0	1.1	0.5	7.7	3.2	2.1	1.7	1.3	0.0	0.0	0.0	2.0
Pinnularia brevicostata	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia intermedia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pinnularia lagerstedtii	8.9	10.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.5	2.4	0.7
Pinnularia mesolepta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0
Pinnularia microstauron	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.5	3.2	0.0	0.0	0.0	0.5	1.5	10.1	8.7
Pinnularia viridis	2.7	2.6	0.0	0.0	0.4	0.0	0.0	0.0	0.5	0.0	0.5	0.7	0.0	0.0	0.0	2.5	8.3	0.0
Pseudostaurosira brevistriata	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stauroneis anceps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	0.0
Stauroneis phoenicentron	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Staurosirella pinnata	1.8	1.3	13.0	1.8	0.0	0.9	1.4	0.0	0.0	2.7	0.0	0.7	1.7	0.0	0.5	0.0	0.0	0.0
Synedra ulna	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Achnanthes conspicua	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia exigua	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eunotia praerupta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fragilaria leptostauron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.6	0.0	0.5	0.0	0.0
Frustulia rhomboides	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.5	2.0	0.0	0.0