DIATOM ANALYSES FOR SEVENMILE CREEK CORE I AND FERRY CREEK CORES H AND S

Sevenmile Creek Core I

(Diatoms listed in parentheses are rare)

Sample: SM 97 I - 40-40.5 cm
Description: weathered cream-colored organic mud
Pertinent diatom species: *Cosmioneis pusilla*, *Pinnularia lagerstedtii*, *Luticola mutica*, *Pinnularia viridis*, *Paralia sulcata*, *Rhopalodia acuminata*
Environment: brackish high marsh or low-to-high marsh transition
Special notes: diatom assemblage very similar to 50-50.5 cm. Dominantly high marsh species with occurrences of lower-intertidal species.

Sample: SM 97 I - 48-48.5 cm
Description: oxidized mud
Pertinent diatom species: *Paralia sulcata*, *Campylodiscis echineis*, *Dimeregramma minor*, *Fallacia cryptolyra*, *Opephora minor* (*Luticola mutica*, *Luticola muticoides*, *Pinnularia lagerstedtii*, *Fallacia pygmaea*, *Cosmioneis pusilla*).
Environment: probably tidal flat
Special notes: marsh species present, but rare and not well-preserved (allochthonous).

Sample: SM 97 I - 50-50.5 cm
Description: peat
Pertinent diatom species: *Cosmioneis pusilla*, *Pinnularia lagerstedtii*, *Paralia sulcata*, *Fragilaria* spp.; *Nitzschia commutata*
Environment: brackish high marsh
Special notes: 

Sample: SM 97 I - 60-60.5 cm
Description: mud or sandy mud
Pertinent diatom species: *Opephora minor*, *Achnanthes delicatula*; *Paralia sulcata* in chains; *Fallacia cryptolyra* (Caloneis westii, *Nitzschia acuminata* )
Environment: tidal flat
Special notes: well-preserved sandy tidal-flat species; *Paralia sulcata* in chains
Sample: SM 97 I - 70-70.1 cm  
Description: oxidized mud  
Pertinent diatom species: Opephora minor, Fallacia cryptolyra, Paralia sulcata, Lyrella lyra, Catenula adhaerens  
Environment: tidal flat  
Special notes: consistent with assemblages from sandy tidal flats

Sample: SM 97 I - 75-75.5 cm  
Description: sandy organic mud  
Pertinent diatom species: Achnanthes delicatula, Opephora minor, Actinoptychus senarius, Paralia sulcata, Dimeregramma minor; Cocconeis scutellum, Synedra fasciculata, Fallacia cryptolyra  
Environment: probably tidal flat  
Special notes: diatoms not abundant, mostly sandy tidal flat species, and most fractured. Rare freshwater species also present (allochthonous).

Sample: SM 97 I - 79-79.5 cm  
Description: dark brown organic mud; soil 3 (1700 yr BP)  
Pertinent diatom species: eunotia spp, Cosmioneis pusilla, Pinnularia lagerstedtii, cymmen; Pinnularia viridis, Navicula elegans  
Environment: freshwater to slightly brackish marsh  
Special notes: diverse oligohalobous (indifferent) assemblage.

Sample: SM 97 I - 90-90.5 cm  
Description: mud  
Pertinent diatom species: Caloneis westii, Nitzschia spp., Navicula spp., Achnanthes brevipes, Diploneis interrupta, Nitzschia cf. commutata, Navicula digitoradiata  
Environment: low marsh or tidal flat adjacent to a marsh  
Special notes: mix of species typically found in estuarine low marshes.

Sample: SM 97 I - 110-110.5 cm  
Description: muddy soil; oxidized silty clay loam  
Pertinent diatom species: Paralia sulcata, (Tryblionella granulata, Caloneis westii; Coscinodiscus marginatus, sponge spicules)  
Environment: indeterminate  
Special notes: preservation very poor. Paralia sulcata common, but no other diatoms in significant numbers. Could be residual upland deposit, or poorly preserved intertidal deposit.

Sample: SM 97 I 116.5-117 cm  
Description: weakly developed soil  
Pertinent diatom species: Pinnularia lagerstedtii, Paralia sulcata, Cosmioneis pusilla, navlan, Tryblionella debilis, Nitzschia commutata  
Environment: probably brackish high marsh.  
Special notes: poor preservation; diatoms appear leached.

Sample: SM 97 I - 122-122.5 cm
Description: mud/soil transition
Pertinent diatom species: Diploneis interrupta dominant, Nitzschia sigma, Caloneis westii, Rhopalodia acuminata, Scoliopleura tumida, Luticola mutica, Nitzschia commutata, Nitzschia sigma;
Environment: brackish low marsh
Special notes: Diploneis interrupta dominant

Sample: SM 97 I - 140-140.5 cm
Description: mud overlying sand
Pertinent diatom species: Trachyneis aspera, Scoliopleura tumida, Paralia sulcata, Delphineis karstenii
Environment: tidal flat
Special notes: diatoms very rare, unusually well preserved. Large Scoliopleura, Trachyneis, Paralia, Delphineis. Transport unlikely because large, delicate species are intact.

Sample: SM 97 I 153-153.5 cm
Description: sandy mud
Pertinent diatom species: Paralia sulcata, Tryblionella granulata
Environment: indeterminate (possibly brackish tidal flat)
Special notes: diatoms very rare; sample possibly winnowed or initially a low-productivity environment.

Sample: SM 97 I - 155-155.7 cm
Description: fine sand
Pertinent diatom species: fragments only
Environment: indeterminate
Special notes: very rare diatom fragments; transported material?

Sample: SM 97 I - 157-157.5 cm
Description: peaty mud
Pertinent diatom species: (delphinei karstenii, Paralia sulcata, caloneis molaris, Pinnularia lagerstedtii, Thalassionema nitzschioides)
Environment: indeterminate (subaerial soil?)
Special notes: diatoms are very rare and mostly dissolved.

Sample: SM 97 I - 210-210.5 cm
Description: mud
Pertinent diatom species: Achnanthes delicatula, Tryblionella granulata, Cocconeis peltoides, Paralia sulcata, Gyrosigma balticum, Delphineis karstenii
Environment: tidal flat
Special notes: diatom assemblage consistent with sandy tidal-flat environment

Sample: SM 97 I - 215-215.5 cm
Description: mud
Pertinent diatom species: (Paralia sulcata, Tryblionella constricta, Odontella aurita, Caloneis westii, but also single specimens of Cosmioneis pusilla, Luticola mutica, Caloneis bacillum)
Environment: Indeterminate (tidal flat?)
Special notes: diatoms rare. Possibly rapidly deposited sediment; no coherent assemblage.

Sample: SM 97 I - 216.5-217 cm
Description: peat
Pertinent diatom species: Navicula cincta, Cosmioneis pusilla, Pinnularia lagerstedtii, Diploneis pseudaovalis Navicula peregrina, Caloneis bacillum; Nitzschia dissipata, Navicula phyllepta, Nitzschia commutata
Environment: brackish high marsh
Special notes: probably low-gradient high marsh near or slightly above MHHW

Sample: SM 97 I - 290-290.5 cm
Description: dark olive gray mud
Pertinent diatom species: Paralia sulcata, Gyrosigma balticum, Thalassiosira pacifica, Thalassiosira eccentrica, Delphineis karstenii, Thalassionema nitzschioides, Scoliopleura tumida, Endictya hendeyi
Environment: tidal flat
Special notes: diverse assemblage

Sample: SM 97 I - 299.5-300 cm
Description: sandy mud
Pertinent diatom species: Paralia sulcata, Tryblionella litoralis, Catenula adhaerens; Fallacia pygmaea
Environment: Indeterminate
Special notes: diatoms very rare, most diatoms fragmented; may indicate transport.

Sample: SM 97 I - 301-302 cm
Description: peat
Pertinent diatom species: Cosmioneis pusilla, Nitzschia dissipata, Nitzschia commutata, Navicula lanceolata, Diploneis pseudaovalis, Pinnularia lagerstedtii
Environment: high marsh or low-to-high marsh transition
Special notes: dominated by high-marsh species, but with common occurrences of species from lower in the intertidal zone. Possibly a high or transitional marsh with fairly regular tidal inundation.

Sample: SM 97 I - 320.5-321 cm
Description: small sand layer in mud
Pertinent diatom species:
Environment: indeterminate (brackish)
Special notes: basically devoid of diatoms; only rare specimens and fragments

Sample: SM 97 I - 340-340.5 cm
Description: light gray mud
Pertinent diatom species: *Tryblionella* spp., *Caloneis bacillum*, *Gyrosigma eximium*, *Achnanthes brevipes*, *Gyrosigma acuminata*; *Delphineis karstenii*; *Scoliopleura tumida*; *Gyrosigma balticum*, *Nitzschia sigma*; *Gyrosigma eximium*, *Actinoptychus senarius*
Environment: tidal flat
Special notes: in contrast to the dark gray mud at 360 cm, this deposit has a diverse diatom assemblage. Higher productivity? Better preservation? Finer grainsize? Higher elevation, i.e., closer to marsh and above channel currents?

Sample: SM 97 I -- 360-360.5 cm
Description: dark gray mud in bioturbated zone
Pertinent diatom species: *Paralia sulcata*
Environment: indeterminate (possibly sandy tidal flat)
Special notes: diatoms rare overall, with a few sand flat species. Sample indicative of overall low productivity, or post-deposition winnowing.

Sample: SM 97 I -- 390-390.5 cm
Description: dark gray mud
Pertinent diatom species: *Paralia sulcata* (*Nitzschia sigma*; *Opephora minor*, *Tryblionella granulata*, *Endictya hendeyi*, *Thalassionema nitzschioides*)
Environment: tidal flat or subtidal channel
Special notes: diatoms very rare overall; sandflat species very rare, much less frequent than 360 cm

Sample: SM 97 I - 400-400.4 cm
Description: mud; abundant woody debris and shells
Pertinent diatom species: *Paralia sulcata*, (*Achnanthes delicatula*, *Cocconeis diminuta*, *Dimeregramma minor*, *Catenula adhaerens*, *Opephora minor*)
Environment: sandy tidal flat or shallow subtidal channel
Special notes: diatoms rare overall. Possibly low-productivity sand flat deposit.

Sample: SM 97 I - 410-410.5 cm
Description: fine-to-very-fine sandy loam
Pertinent diatom species: *Paralia sulcata* (*Dimeregramma marina*, *Tryblionella granulata*, *Trachyneis aspera*, *Thalassionema nitzschioides*)
Environment: probably tidal flat
Special notes: diatoms sparse except for *Paralia*. Possibly an environment more coarse-grained than is most conducive to high diatom productivity.

Sample: SM 97 I - 417-417.5 cm
Description: sand
Pertinent diatom species: *Paralia sulcata*
Environment: indeterminate (estuarine)
Special notes: diatoms very rare; possible winnowing.

Sample: SM 97 I - 418.5-419 cm
Description: peat
Pertinent diatom species: *Pinnularia lagerstedtii, Cosmioneis pusilla, Diploneis psuedovalis (Delphineis karstenii, Frustulia vulgaris, Caloneis bacillum, Navicula spp., Paralia sulcata*)
Environment: brackish high marsh
Special notes: mostly high marsh species, but lower intertidal species also present in small numbers. Probably high marsh close to MHHW with regular tidal inundation.

Sample: SM 97 I - 460-460.5 cm
Description: light gray mud overlying dark gray mud
Pertinent diatom species: *Nitzschia sigma, Achnanthes delicatula, Cocconeis diminuta, Tryblionella spp.*, common planktonic diatoms
Environment: tidal flat
Special notes: diverse diatom assemblage; planktonic diatoms common.

Sample: SM 97 I - 500-500.5 cm
Description: mud
Pertinent diatom species: *Gyrosigma balticum, Mastogloia eximium, Tryblionella granulata, Caloneis westii, Achnanthes delicatula, Cocconeis diminuta, Lyrella lyra*
Environment: tidal flat
Special notes: mix of sand flat and mud flat assemblages.

Sample: SM 97 I - 520-520.5 cm
Description: sandy loam
Pertinent diatom species: *Paralia sulcata (Tryblionella granulata)*
Environment: indeterminate
Special notes: *Paralia sulcata* common and *Tryblionella granulata* rare, other diatoms absent. Remnant assemblage, possibly reworked or winnowed.

Sample: SM 97 I - 527-528 cm
Description: pulsed sand
Pertinent diatom species: *Paralia sulcata, (Achnanthes delicatula, Cocconeis diminuta, Dimeregramma minor, Catenula adhaerens, Opephora minor)*
Environment: tidal flat
Special notes: diatoms very rare, mainly *Paralia sulcata*, but other sand flat species also present. Consistent with interpretation as either as sandy tidal flat or tsunami deposit.

Sample: SM 97 I - 531-531.5 cm
Description: peat
Pertinent diatom species: *Cosmioneis pusilla, Nitzschia commutata, Pinnularia lagerstedtii, (Diploneis psuedovalis, Navicula spp., Thalassionema nitzschioides)*
Environment: brackish high marsh
Special notes:

Sample: SM 97 I - 673-673.5 cm
Description: mud containing clam shells
Pertinent diatom species: *Synedra fasciculata, Delphineis karstenii, Odontella obnuta, Thalassionema nitzschioides, Gyrosigma balticum, Actinoptychus senarius*
Environment: tidal flat or shallow subtidal channel
Special notes: diatoms rare overall; rare planktonic species in addition to tidal flat species.

Sample: SM 97 I - 674-675.5 cm
Description: peat
Pertinent diatom species: *Caloneis westii, Caloneis bacillum, Diploneis smithii var. rhombica, Diploneis interrupta, Rhopalodia musculus, Melosira nummuloides, Gyrosigma eximium, (Cosmioneis pusilla)*
Environment: brackish low marsh
Special notes: 

Sample: SM 97 I - 774-774.5 cm
Description: mud
Pertinent diatom species: *(Delphineis karstenii, Paralia sulcata, Tryblionella granulata; Tryblionella apiculata, Thalassiosira spp., Odontella aurita; Actinoptychus senarius)*
Environment: probably tidal flat
Special notes: diatoms rare, possibly because of sandy tidal flat environment not conducive to high diatom productivity.

Sample: SM 97 I - 775.5-776 cm
Description: peaty mud
Pertinent diatom species: *Caloneis westii, Rhopalodia musculus, Nitzschia sigma, Delphineis karstenii, Melosira nummuloides, Navicula digitoradiata, Trachyneis aspera*
Environment: brackish low marsh
Special notes: mix of low marsh species and species found in nearshore tidal flats.

Ferry Creek Core S

Sample: BA97-S:85-85.5 cm
Description: brown mud
Pertinent diatom species: *Gomphonema parvulum, Fragilaria sp., Cocconeis placentula, Achnanthes lanceolata*
Environment: Freshwater wetland, possibly shallow pond or river bank
Special notes: Freshwater deposit, diatoms present but rare, fragments common; shallow pond/river

Sample: BA97S: 128-128.5 cm
Description: Sandy mud
Pertinent diatom species: *Eunotia pectinalis, E. monodon, Aulacoseira granulata*
Environment: Freshwater
Special notes: Freshwater deposit. Possibly ephemeral pond?

Sample: BA97S: 130-130.5 cm
Description: brown muddy soil
Pertinent diatom species: *Eunotia pectinalis*
Environment: Indeterminate (possibly freshwater)
Special notes: Poor preservation. Diatoms basically absent; diatom fragments very rare.

Sample: BA97S: 175-175.5 cm
Description: mud
Pertinent diatom species: *Pinnularia* spp.
Environment: Freshwater
Special notes: Diatoms very rare

Sample: BA97S: 187-187.5 cm
Description: Mud mixed with forest litter, above event horizon
Pertinent diatom species:
Environment: Indeterminate (possibly upland)
Special notes: Diatoms basically absent with exception of *P. cf. viridis*.

Sample: BA97S: 210.5-211.5 cm
Description: sand with forest litter
Pertinent diatom species:
Environment: Indeterminate (possibly upland)
Special notes: Barren

Ferry Creek Core H

Sample: BA98H: 150-151 cm
Description: loamy sand
Pertinent diatom species: *Eunotia* spp., *Pinnularia* spp.
Environment: Probably freshwater wetland
Special notes: Very rare fragments of freshwater diatoms

Sample: BA98H: 178-179 cm
Description: coarse sand and pebbles
Pertinent diatom species:
Environment: Indeterminate
Special notes: Barren

Sample: BA97H : 420-421 cm
Description: Sand at peat/sand couplet
Pertinent diatom species:
Environment: Indeterminate
Special notes: Barren

Sample: BA97H: 430-430.5 cm
Description: dark brown muddy soil
Pertinent diatom species: *Eunotia minor, Diploneis smithii, Gophonema* sp.,
Environment: Freshwater wetland
Special notes:
Sample: BA97H: 490-490.5 cm
Description: mud
Pertinent diatom species: *Eunotia minor*, *Eunotia spp.*, *Epithemia* sp.
Environment: Freshwater wetland
Special notes: Freshwater diatoms only; very rare, mostly broken

Sample: BA97H: 560-560.5
Description: mud
Pertinent diatom species:
Environment: Indeterminate
Special notes: Barren

Sample: BA97H: 590-590.5 cm
Description: mud
Pertinent diatom species:
Environment: Indeterminate
Special notes: Barren

Sample: BA97H: 619-619.5 cm
Description: mud
Pertinent diatom species:
Environment: Indeterminate
Special notes: Fragments of possible freshwater species

Sample: BA97H: 640-640.5 cm
Description: mud
Pertinent diatom species:
Environment: Indeterminate
Special notes: Barren