

**The Montauk Peninsula:  
Data and Preliminary Interpretations  
of the Ditch Plains Area**

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**Introduction**

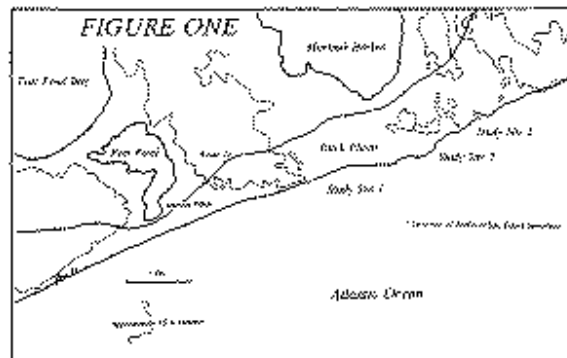
Sirkin, (1982) notes that the Montauk Peninsula, from Hither Hills to Montauk Point, is a recessional moraine of late Wisconsinan age. The topography of this moraine is suggestive of a deranged drainage pattern (Jones, et al., 1995). In such areas fresh water becomes impounded over relatively impermeable sediments in low areas surrounded by areas of higher relief. Haphazardly scattered shallow marshes and ponds, and few surface drainage features characterize the terrain.

Along both the north and south coasts of the peninsula, bluffs are actively eroding; in low areas along these coasts the bluffs are interspersed with dunes. These dunes might mark the sites of meltwater channels formed at the height of the last glaciation (Sirkin, 1991). On the other hand, Nieter et al. (1975) call these low areas "inter-morainal" swales. These low areas today contain ponds in various stages of succession, marshes, as well as what appear to be abandoned stream beds.

Marine incursions in the early Holocene flooded these low areas. The rising ocean of several thousand years ago produced inlets in the areas of present low relief at Napeague Harbor, Fort Pond Bay and Montauk Harbor. Coastal sedimentation on the Atlantic side has sealed off all the inlets and united the former islands. Napeague Harbor, Fort Pond Bay and Montauk Harbor are relict inlets open to Gardiners Bay to the north.

Extensive erosion of the Atlantic-facing recessional moraine has produced steep bluffs in which observations

reveal exposures of varied stratigraphic features, such as clay lenses, iron-cemented sand lenses, folded sediments, and peat-bearing, late-Pleistocene to early-Holocene, lacustrine deposits. Erosion has also recently exposed deeply buried wood specimens. This paper will discuss the areas of peat and wood exposures, the identification of some of the wood specimens, and their radiocarbon dating. In addition, the paper will present data from two excavations in the former inlet to the east of the recessional moraine at Ditch Plains.

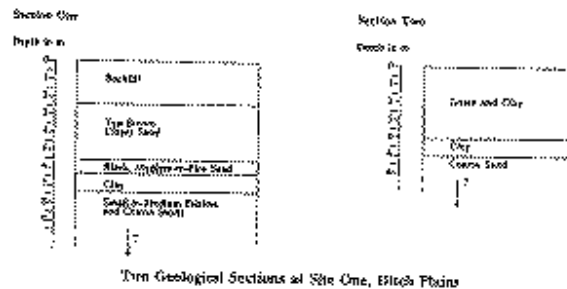


### Locations and Site Descriptions

This paper discusses three sites on the Montauk Peninsula: Site 1 is an area of low relief between Montauk Harbor to the north and the ocean to the south, marked by low ocean-front dunes at Ditch Plains; Site 2 is the higher recessional moraine to the east of Site 1, and is characterized by eroding 5-20 m bluffs; and Site 3, is an area of low relief immediately to the east of Site 2 (Figure One). The recessional moraine, roughly indicated by the 15 m contour on Figure One, becomes obvious immediately to the east of Site 1 and continues for approximately 1.5 km; it then becomes obscure at Site 3, where there is a peat deposit on the seaward side of an actively eroding dune that fronts a small marsh to the north.

Boulders are frequent on the beach face seaward of the moraine, as well as in the intertidal and farther offshore. These boulders mark a portion of the former extent of the recessional moraine, now obliterated through erosion. Seaward of areas of low relief boulders appear absent. It is possible, however, that they are present, but buried under the sediments that united the Montauk islands into the present peninsula.

**FIGURE TWO**



## Data and Observations

### Site One: Ditch Plains

The recessional moraine at Ditch Plains lowers to the east and eventually terminates at the site of a former inlet. This area of low relief extends east for about 1.4 km and is topographically related to Montauk Harbor to the north.

A dune exists in this area and during the winter of 1993-1994 erosion exposed a peat layer below the dune. Continued erosion of the area during the winter and spring of 1996 exposed wood embedded in the peat. This wood was dated at 2,120 YBP (Table One) and appears to be wild black cherry (*Prunus serotina*, an identification that is not inconsistent with vegetational communities found in a near-coastal environment, as the vegetation at that time was essentially that of today (Davis, 1969).

The basic stratigraphy of the two excavations in the area is presented in Figure Two. Section One is located approximately 400 m east of the terminus of the Ditch Plains portion of the recessional moraine, while Section Two is located toward the eastern side of the former inlet. The sedimentary sequences at both sites appear generally consistent with a shoaling, low energy environment such as would have existed in a shallow inlet. Some strata are composed of small-to-medium sized pebbles and coarse sands that imply occasional high-energy events that may be related to storms.

### Site Two: The Eastern Recessional Moraine

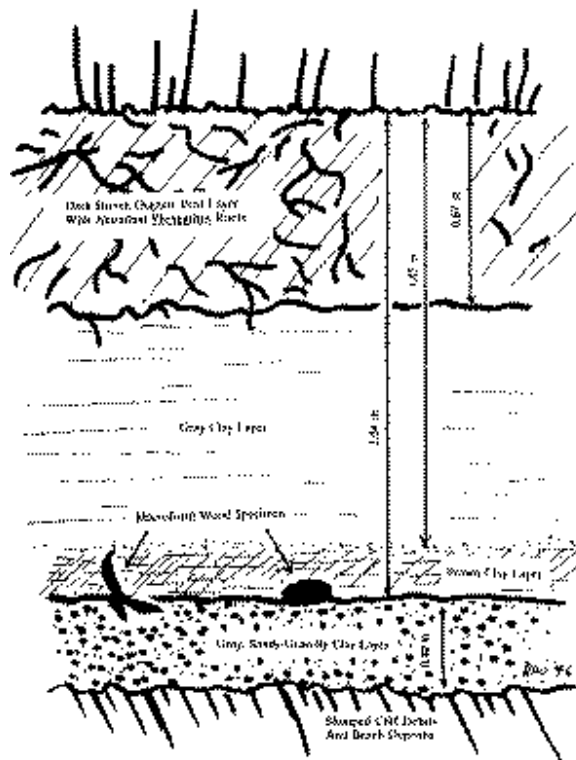
The relief increases immediately to the east of Site 1 and the moraine becomes the major topographic feature. Approximately 0.75 km to the east of Site 1 recent erosion

has exposed lacustrine sediments in the bluffs. The data (Figure Three) show that this deposit is a late-Pleistocene to Holocene pond bottom, filled with organic and inorganic sediments. The present surface of the deposit supports a senescent phragmites (*P. communis*) marsh. The thickness of all the exposed sediments is approximately 2.5 m. The bottom of the former pond is situated approximately 1 m above sea level.

The upper 0.87 m of the exposure is a dark brown peat-like layer, permeated with many phragmites roots. This overlays a 0.98 m gray clay unit which grades quickly into a 0.19 m brown clay layer. The lowest layer is 0.4 m of sand and gravel with small amounts of gray clay.

The site provided four wood specimens (Table One), some relatively large (>1 kg wet weight). The specimen taken from the upper peat-like layer was dated at 1,635 YBP and might be wild black cherry or red cedar (*Juniperus virginiana*), while the others, all taken at the horizon 2.0 m below the surface, were dated at 11,490, 11,760 and 12,210 YBP. The 12,210 and 11,490 YBP specimens have been positively identified as spruce (*Picea* sp.). The specimen dated at 11,760 YBP is apparently also spruce. This is consistent with the pollen record, which indicates that spruce was present on Long Island until approximately 9,000 YBP (Sirkin, 1971). Under the taiga conditions at that time, black spruce (*P. mariana*) is the most plausible identification.

FIGURE THREE



Cross-section of Lacustrine Deposits at Site Two

#### Site Three: The Eastern Swale

Approximately 0.75 km to the east of Site 2 the relief lowers and the moraine again appears to subside, then reforms approximately 0.5 km further east. This area of low relief is not a former inlet, but rather an extensive marsh fed by groundwater and possible former intermittent surface flow from the north. Beach sediments and an actively eroding dune impound the marsh on the south.

Seaward of the dune, on the beach face, is an exposed peat layer associated with the marsh, apparently a remnant of deposits in a larger marsh, now partly destroyed by erosion. In this peat are wood fragments; both wood and peat were collected and dated. The peat was dated at 10,290 YBP and the wood at 5,455 YBP (Table One). The wood again appears to be wild black cherry or red cedar.

The age of the peat requires it to be fresh water in origin, since at 10,000 YBP the ocean margin was many km to the south. Its exposure at current sea level precludes the

possibility of Site 3 being a former inlet; instead it has been a fresh water environment since the beginning of the Holocene.

TABLE ONE: Dates and Radiocarbon Data for Study Sites

| Sample  | Location/Notes   | Material                               | "C-14"       |
|---------|--|--|--------------|
| No. 1-1 | Site One, Collected 1975   | Wood (Oak Branch?)                     | 2,423 ± 89   |
| No. 2-1 | 200 g. below surface at level of 1000 yrs. (see page 21 of "1996" report) Collected 1975 | "Wood" (Wood "Oak Branch"?)            | 1,335 ± 27   |
| No. 2-2 | At "1000" level (see page 21 of "1996" report) Collected 1975                            | Spores                                 | 28,400 ± 120 |
| No. 2-3 | 200 g. below surface at level of 1150 Collected 1975                                     | "Wood" (Spruce?)                       | 15,786 ± 120 |
| No. 2-4 | Sampled between 2000 and 1100 yrs. Collected 1975  | Spores                                 | 12,229 ± 190 |
| No. 3-1 | Site Three, about 0.3 m below surface of exposed soil. Collected 1975                    | "Wood" (Wood "Oak Branch"?) (Red oak?) | 2,415 ± 114  |
| No. 3-2 | Site Three, about 1.0 m below surface of exposed soil. Collected 1975                    | Peat                                   | 10,240 ± 200 |

\* All ages "C-14-corrected"

### Summary

The stratigraphy of the excavations at Ditch Plains appears to be consistent with the concept of a former inlet between the Atlantic and Montauk Harbor to the north. The wood, with its date and possible identifications, implies and is consistent with a coastal beach community at least 2,000 years old.

The stratigraphy of the lacustrine exposure at Site 2 and the associated wood specimens confirm the accepted regional pattern of late-Pleistocene to Holocene climate with its associated community types. It also is evidence for the deranged drainage expected at the end of the Pleistocene.

The exposures at Site 3 preclude the possibility of a local minor marine inlet existing here at any time since the end of the Pleistocene.

### Acknowledgements

Andrew Harrison and Donna Nessel participated in much of the field work for this study. The Forest Products Laboratory, USDA Forest Service, Madison, Wisconsin, provided the two definite wood identifications. Geochron Laboratories, Cambridge, Massachusetts, performed the radiocarbon dating; funding for the radiocarbon dating of all samples was provided by the 1996 New York State Summer Institute-Suffolk Community College.

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