USDA-NRCS NJ-NYC Tidal Marsh Sampling 2015

Tidal marshes provide important habitat and shoreline stabilization, and act as a filter between upland areas and open water. They sequester significant amounts of carbon. Once considered unproductive land in need of "reclamation," only recently have these areas been appreciated for the full extent of their ecosystem services. Hill (1982) estimated that tidal marshes occupy 288,000 hectares of the coastal fringe of the northeastern US, with the greatest expanse from Maryland to New Jersey. Current NRCS surveys indicate 86,786 hectares (214,454 acres) of tidal marsh in New Jersey, a little more than 4% of the state's land area. A similar figure (215,040 acres) was reported in the original 1-inch-per-mile surveys conducted in NJ from 1911 to 1927 (Lee, 1934), although an earlier account by Smock (1893) listed 119,989 hectares (296,500 acres). About 93% of the currently mapped area is salt marsh; the remaining 7% is fresh water tidal marsh. Salt marsh comprises 2% of the land area of New York City. Efforts to restore tidal marsh, by the USDI-National Park Service, the NYC Department of Parks and Recreation and others, are ongoing in Jamaica Bay, Spring Creek, and along the Bronx River, among other sites in the City.

Tidal marsh formation is a postglacial phenomenon. Organic matter accumulation in the marshes began about 4000 years ago, when the rise in sea level decreased enough to allow vegetation of the tidal flats (Hill, 1982). Jaworski (1985) proposed separation of NJ tidal marshes into *estuarine* and *protected coastal* marshes, based on salinity, sediment source, depositional energy. The former group includes those areas along the lower portions of the Great Egg Harbor, Mullica, Delaware, and Raritan Rivers, along with the Hackensack Meadowlands; the latter extend from Barnegat Bay to Cape May (Tedrow, 1986).

Important properties used to differentiate tidal marsh soils in soil taxonomy include the presence of sulfidic materials and the depth and thickness of organic and inorganic layers. Currently there are 8 soil series mapped in NJ salt marshes, and 2 soil series in freshwater tidal marshes.

Soil series mapped in NJ salt marshes include:

Ipswich Euic, mesic Typic Sulfihemists (northern NJ)
Westbrook Loamy, mixed, euic, mesic Terric Sulfihemists (northern NJ)
Pawcatuck Sandy or sandy-skeletal, mixed, euic, mesic Terric Sulfihemists
Sandyhook Sandy, mixed, mesic Haplic Sulfaquents
Transquaking Euic, mesic Typic Sulfihemists (southern NJ)
Mispillion Loamy, mixed, euic, mesic Terric Sulfihemists (southern NJ)
Appoquinimink Fine-silty, mixed, active, nonacid, mesic Thapto-Histic Sulfaquents
Broadkill Fine-silty, mixed, active, nonacid, mesic Typic Sulfaquents

Soil series in NJ fresh water marshes:

Mannington Fine-silty, mixed, active, nonacid, mesic Thapto-Histic Hydraquents
Nanticoke Fine-silty, mixed, active, nonacid, mesic Typic Hydraquents

Most of the map units in NJ tidal marsh areas are complexes containing two or more major soil series or components. There is little characterization (laboratory) data for either our salt or freshwater marsh soils. Such data is needed to accurately depict the properties of these soils in our Web Soil Survey database, to provide reliable resource inventory information as well as dependable interpretations and ratings for use and management of these soils.

The objective of this project is to begin collecting characterization data for our tidal marsh soils in a cooperative effort with some of our partner agencies. It will initiate long term monitoring of tidal marsh properties at sites where our cooperators have established sediment elevation tables

(SETs) and collected supplemental site information. The New York City Department of Parks & Recreation, the Meadowlands Environmental Research Institute, the Barnegat Bay Partnership and the U.S. Academy of Natural Sciences all have established sediment elevation tables at selected sites in NYC and NJ. Marsh sites will be sampled from these sites by horizon to approximately 2 meters and samples will be sent to the USDA-NRCS Kellogg Soil Survey Laboratory in Lincoln, NE, for complete physical, chemical and mineralogical analyses. The data will help in understanding depositional and pedological processes, and to some extent the anthropogenic effects, taking place in the tidal areas, and provide the foundation for an evaluation of our tidal marsh mapping and for the long term monitoring of soil change.

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Tedrow, J.C.F. 1986. Soils of New Jersey. R.E. Krieger, Malabar, FL. 480 p.