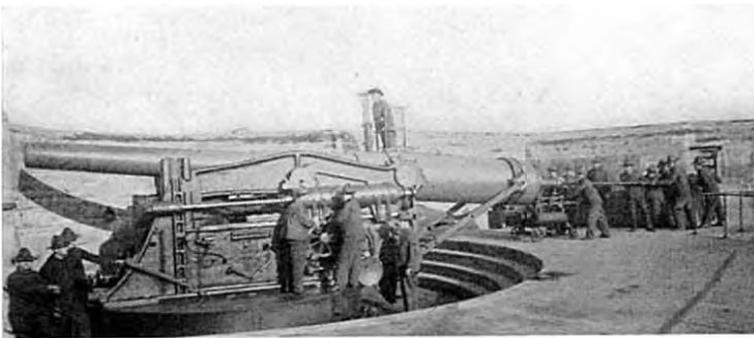


Welcome to Plum Island – 9 June 2017

The visit will be hosted by Long Island Association of Professional Geologists (LIAPG) Member and Plum Island Animal Disease Center's (PIADC) Environmental Protection Manager Tom Dwyer, PG. We will start with a "meet and greet" and introduction of PIADC personnel, followed by briefings about the PIADC mission and Plum Island geology. This visit will culminate in a tour of the island which will emphasize the geologic processes that created the island and its landforms.



Plum Island is an approximately 840-acre island located off the eastern end of the North Fork of Long Island. The island is wholly owned by the federal government and is located within the township of Southold, Suffolk County, New York. The island is approximately 2.9 miles long (east to west) and varies in width (north to south) from 0.2-miles wide at its eastern end to 1.7-miles wide at its western edge. The island is separated from the mainland by an approximately 1.5-mile wide body of water known as Plum Gut to the west of Plum Island. These waters are characterized by extremely strong currents as the tide flows in and out of Long Island Sound. To the south lies Block Island Sound and to the north is Long Island Sound.



A Big Gun at Fort Terry, Plum Island



The island was used mainly for farming by numerous private land-owners until the U.S. Army purchased it in 1897 for the creation of a coastal artillery fortification, named Fort Terry, to protect the entrance to Long Island Sound. Fort Terry operated until WWII, after which it was deemed surplus and transferred to the U.S Department of Agriculture in 1954 for construction of a laboratory. The U.S. Department of Homeland Security took ownership of the island and facilities in 2003. Many of the Fort Terry building are still present but in disrepair. The extensive network of coastal artillery gun batteries remains. The last of the guns however, were removed for use during WWII.

The principal mission of PIADC is to develop and maintain diagnostic capability for animal diseases not found in the United States and to research the prevention and control of these diseases. The facility was established with restricted access from the mainland; strict security practices; and bio-containment laboratories designed with multiple layers of physical and procedural barriers to contain microorganisms. The laboratories are classified as Biological Safety Level 3 (BSL-3).

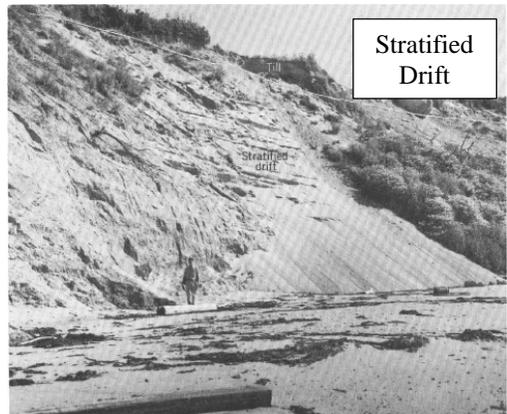




Plum Island Geology

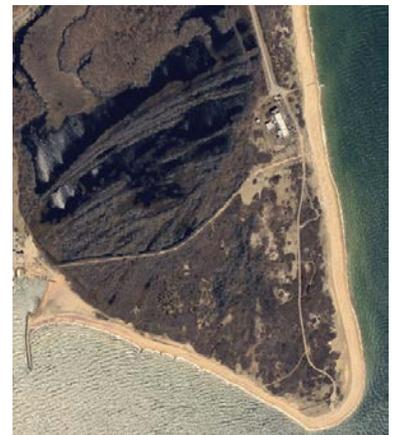
The geography and geology of Plum Island is a reflection of its glacial history. Plum Island and Long Island are composed of deposits from the Hudson-Ontario lobe of the Laurentide Ice sheet laid down during the Wisconsin stage of the late Pleistocene. After passing over the area and deposits of earlier ice advances, the movement of the ice front was checked by increased melting. This released the accumulation of rock debris held in the ice, and the material pushed ahead of it created a ridge of sand and gravel along the ice front referred to as the Ronkonkoma moraine. This moraine runs from New York City eastward and includes the South Fork of Long Island and Block Island to the east. Melt-water spread a broad apron of well-sorted sand and gravel south of the moraine. The ice

front stalled once more during its retreat and deposited another, much higher ridge of material known as the Harbor Hill moraine, which includes Long Island's North Fork, Plum Island, Little Gull and Great Gull Islands, and Fishers Island to the east. In this location, rapid melt-water deposited large, coalescing fans of stratified drift and gravel that make up the core of the Harbor Hills Moraine. A broad outwash channel removed some of these deposits on Plum Island when the glacier retreated northward again. The ice front retreated rapidly north until a subsequent re-advance deposited a thin veneer of unstratified silt, sand, gravel and boulders on the previously deposited material. The accumulation of stratified drift was an obstacle to the thin re-advancing ice, so that most material was deposited on the northern side of the ridge, creating the rocky north shore of Plum Island. Melt-water scoured the existing outwash channel, filling it with sand and gravel that now serves as the island's sole-source aquifer.



In recent times, wave erosion removed large amounts of the drift material and waves and tides have re-deposited the material in the form of low beach ridges on the southern part of the island. These linear ridges are striking features on aerial photos and represent a succession of paleo-shorelines.

Plum Island has a sole-source, shallow aquifer recharged solely by precipitation. The Plum Island wetlands are groundwater



discharge areas with a water-table elevation of 0.5 to 1.0 feet above mean sea level (amsl). The highest elevation of the water table is approximately 2.5 feet amsl in the north-center area of the island. The thickness of the aquifer is likely no greater than approximately 100 feet, as calculated using the Ghyben-Herzberg Principle. The sole-source aquifer is rigorously protected from contamination due to potential accidental release of harmful materials within the watershed; and, by carefully managing withdrawal to avoid salt-water intrusion or upconing.