

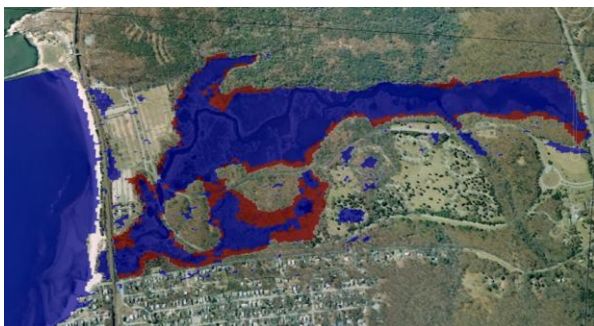
# Hydrodynamic Analysis and Engineering Design for the Restoration of Bride Brook Estuary, Rocky Neck State Park, East Lyme, CT

## Project Characteristics

- Hydraulic & Hydrologic Modeling
- Project Management
- Coastal Processes Modeling
- Emergency Services for Coastal Structures
- Environmental Permitting
- Coastal and Hydraulic Engineering Design
- Coastal Processes Data Collection
- Construction Oversight

The Woods Hole Group (WHG) was contracted by Save the Sound to investigate the hydrodynamic characteristics of the Bride Brook estuarine system and evaluate potential alternatives to restore more natural conditions to a system that has been structured since the early 20<sup>th</sup> century. Historically, Bride Brook was one of the largest anadromous fish runs the state of Connecticut. However, since the construction of the twin elliptical culverts at the mouth of the estuary in 1934, alewife numbers declined. This decrease has been attributed to the reduced tidal flow and water column light caused by the 200-foot long structure, which obscures the fish passage upstream. Therefore, the primary objective of this project was to determine an engineered alternative to the existing structure that could effectively restore the tidal regime and fish passage of the Bride Brook estuary.

The project required detailed coastal processes data collection, H&H modeling, engineering design, emergency engineering services during a failure of the existing structure due to a coastal storm, and construction oversight.



2005-128\_Bride Brook



The existing twin 36” pipe culverts (buried beneath the dune system) and associated coastal structures were failing and a new design was required to maintain tidal exchange, fish passage, and to stabilize the beach. Woods Hole Group collected data, developed a detailed hydrodynamic and hydraulic model of the system, developed alternatives, and completed a unique engineering design that consisted of both open channel flow to improve fish passage and box culvert to maintain the coastal protection afforded by the coastal dune. The design was constructed by the CTDEEP in 2010 and has successfully restored fish passage to the Bride Brook system. Alewife fish counts through the system doubled after construction (in both 2010 and 2011), with 2011 being the largest on record. Since construction, the structure has held up to recent extreme storms, including hurricane Sandy. This project was also one of 50 coastal restoration projects chosen by NOAA for funding by ARRA.

More details can be found at:

<http://longislandsoundstudy.net/2010/04/bride-brook-restoration-project/>