

# Dredged Material Simulations for Pipeline Burial in Long Island Sound



## CLIENT:

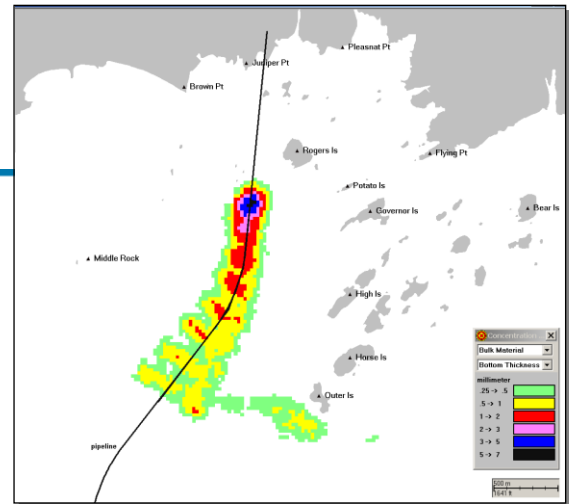
Islander East Pipeline Company, LLC through Natural Resource Group, Inc.

## PROJECT #:

2002-036

## PROJECT ELEMENTS:

- Dredge disposal modeling
- Current profiling using HYDROMAP
- SSFATE sediment modeling
- LTFATE deposition pattern modeling



## PROBLEM. PURPOSE.

Islander East Pipeline Company, LLC is seeking permits to install a 24 in natural gas pipeline from Branford, CT to Wading River, NY under Long Island Sound. The installation of the pipeline will require a series of different construction techniques along the route. Horizontal directional drilling below the seabed will extend from both shores to transition basins and a mechanical plow will be used to create a trench across Long Island Sound.

## SCIENCE. SERVICES. SOLUTIONS.

The purpose of ASA's analysis was twofold:

- 1) to evaluate the transport and deposition of sediment lost during dredging
- 2) to evaluate the potential erosion of the dredged material mounds around the basins and trenches during the construction period.

To generate the necessary currents for the area, ASA's HYDROMAP was applied to central Long Island Sound and driven by tides.

To assess the effects of dredging the transition basins and adjacent trenches ASA used SSFATE (Suspended Sediment FATE), a model that simulates the suspended sediment distribution in the water column and deposition patterns on the bottom. This model was jointly developed with the U.S. Army Corps of Engineers. The model uses characteristics of the material to be dredged and tracks, via a particle based approach, the transport and fate, both in the water column and on the bottom. Concern was raised that the resulting deposition from dredging activities would result in a sediment layer sufficient to suffocate benthic animals. Output from SSFATE revealed a pattern that was affected by the tides with highest deposition in the transition basin.

A model, LTFATE (Long Term FATE), was applied to estimate the deposition patterns of material eroded from the mounds. LTFATE is a U.S. Army Engineer model that was developed to determine the short- and long-term stability of dredged material mounds. The model uses sediment characteristics of the mound material along with local current and wave conditions to estimate the evolution of the mound bathymetry (erosion) over time.

## PRODUCTS. RESULTS.

Output from LTFATE shows the erosion and deposition patterns around the basins and trenches. The eroded material deposits around the mound, both in the basins and trenches, as well as in the surrounding area. Highest deposition occurs adjacent to the mound. The deposition pattern is offset, consistent with the mean current directions.