

# Ballard Street Salt Marsh Restoration Project

## Saugus, Massachusetts

### Project Characteristics:

- *Tide and salinity data observations*
- *Literature and modeling peer review*
- *RTK-GPS marsh survey*
- *Detailed hydrodynamic and salinity modeling*
- *Simulation of various engineering alternatives*
- *Modeling of complex flow control structures*
- *Recommended modeling scenarios, engineering alternatives, and management guidance*

Woods Hole Group is working for the Massachusetts Division of Ecological Restoration (DER) on the restoration of a salt marsh system in Saugus, Massachusetts. The study assists the Project Team in evaluating the level of restoration potential in the Ballard Street marsh system through:

- Observation of site-specific tide data
- Simulation of all the existing flow control structures in the system
- Verification of the proposed flow control structure design and necessary flood storage needs
- Assessment of a number of approaches for modifying the hydraulic structures (as needed) to arrive at a conceptual design that meets the overarching goals of the project.

Water surface elevation and salinity data were collected at six (6) locations throughout the system, which consists of a leaky tidal flap gate at the entrance



to the Saugus River and multiple culverts throughout the system. A RTK-GPS survey was conducted to resolve the elevations of the marsh plains, tidal creeks, and critical infrastructure surrounding the system. The bathymetric and topographic information were used to develop a modeling grid of the system. Tide and salinity data were used to calibrate and validate a hydrodynamic and salinity model of the system. Model simulation were developed for normal tidal conditions, storm conditions (both rainfall and coastal storm surge), and sea level rise scenarios. Calibrated model results were subsequently used to evaluate proposed design conditions, including previous recommendations by scientific evaluations, as well as other potential design scenarios. Alternatives included: assessment of potential flow control structures; evaluation of potential flood storage increases through excavation of marsh plain area; and reconfiguration of the various culverts throughout the system.

