As part of a multi-partner demonstration project in response to Superstorm Sandy, the USACE Philadelphia District (NAP) dredged 45,000 CY of sediment from the New Jersey Intracoastal Waterway from November 2015 through February 2016 and placed it on 14 ha of a nearby marsh owned by the New Jersey Department of Environmental Protection (NJDEP). Placement depths ranged from a few centimeters to nearly 1 m in marsh pools to achieve the biological target elevation determined by the project partners.

**Project background**

**Learning together**

After construction, the partner organizations continued to work together to learn as much as possible from the demonstration TLP project. NJDEP, The Nature Conservancy, GreenVest, Princeton Hydro, and The Wetlands Institute collected data related to vegetation growth and infaunal, fish, and bird use. ERDC and NAP leveraged funds to monitor the elevation change and sediment consolidation after placement, surface and shallow groundwater levels, and soil physical and biogeochemical properties in the former marsh surface and the dredged material layer. These data feed two model development efforts focused on updating existing tools to simulate wetland TLP: PSDDF and MEM.

**Monitoring elevation change after placement**

To quantify elevation change of the marsh surface, time-series terrestrial lidar scanning was employed in conjunction with pre-construction survey information. Elevation analysis also provides information pertaining to changes in inundation time and marsh function, i.e., sediment deposition on the marsh surface.

**Modeling settling and consolidation with PSDDF**

Since settling and consolidation occur rapidly in the months after placement, engineers must define the construction target elevation required to achieve the biological target elevation defined by the design team. A model developed for confined placement of dredged material (PSDDF model) is being evaluated for its suitability to predict consolidation for thin layer placement in a marsh setting. Dredged material thickness was measured in core samples taken at Avalon at different time periods, as well as corresponding geotechnical analysis of grain size and water content with depth. Consolidation was also estimated based on elevation differences between lidar surveys. Consolidation at various locations will be modeled using PSDDF and compared to the measured data. Laboratory testing is being performed to evaluate the impacts of vegetation and water table fluctuations on consolidation.

**Turning lessons learned into guidance**

The data, models, and lessons-learned from this effort will be combined with knowledge from other projects and organizations to develop engineering TLP guidance. The guidance document, scheduled to be completed by the end of 2018, will be a snapshot of the current state of TLP engineering practice for both wetland and shallow open water settings. Several knowledge and technology gaps were identified through the course of this effort and are targets for future R&D tasks.