

Water Quality Monitoring for the Providence River and Harbor Dredging Project

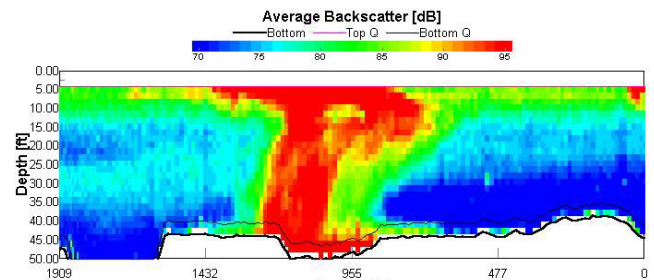
Project Characteristics

- *ADCP Application to Detect a Sediment Plume*
- *Dredge/CAD Disposal Plume and Mixing Zone Monitoring*
- *Turbidity, Heavy Metals, Toxicity, DO, Salinity, and Temperature Sampling*
- *Quick Turn-around Compliance Reporting to USACE*
- *Sampling and Analysis Plan, Site Safety and Health Plan, and Quality Assurance Plan*

Woods Hole Group Environmental Laboratories is the prime contractor for an IDIQ contract with the U.S. Army Corps of Engineers New England District. One of the Tasks completed under this contract was monitoring of the Providence River dredging project. Teaming with Aubrey Consulting, Inc., CR Environmental, and ENSR, WHG completed the water quality monitoring associated with dredging and dredge material disposal in the Providence River, a tidal water body.

The project consisted of dredging and disposal of 3.9 million c.y. of sediment to maintain navigation, including contaminated fine-grained material unsuitable for offshore disposal. As such, approximately 1 million c.y. was disposed by a 5,000 c.y. Scow in 5 confined aquatic disposal (CAD) cells up to -95 ft MLLW in depth. Water quality monitoring was required during dredging and disposal to ensure that dredging and capping of the unsuitable material was conducted in a manner that did not result in unacceptable impacts to water quality (i.e., that sediment plume and associated contaminants did not extend beyond the approved mixing zone).

Monitoring operations required boats and qualified staff on-site during specific portions of the dredging and disposal operation. The teams were equipped with water



quality monitoring equipment including turbidity, conductivity, temperature, depth, and dissolved oxygen (DO) sensors, as well as a RD Instruments acoustic Doppler current profilers (ADCP). Data were collected and viewed in real-time on-board the vessel so that the field crew could respond to the track of the plume. A unique application of the ADCP was implemented that allowed for the backscatter echo intensity data to be used to detect the level of sedimentation in the water column. These data provided a basis for determining the existence of the sediment plume generated during dredging and disposal operations. In-field, real-time decisions were made based on the field data and close communications with the dredge contractor, USACE, and environmental regulatory staff. Data were then reported in graphical and written format within days of each field operation. Data were used to document compliance of the project with permit requirements, and to improve the dredging and disposal operation.