

EXECUTIVE SUMMARY

In August 2014, a survey of the Western Long Island Sound Disposal Site (WLDS) was conducted to characterize seafloor topography at the disposal site, to document the condition and distribution of dredged material at recent and historic disposal target locations, and to assess the status of benthic community recolonization at recently formed disposal mounds (WLDS Mounds M and N). In order to meet these objectives, acoustic and imaging data were collected and conditions at disposal mounds were compared to three established reference areas. Additional data were collected for the purpose of revising the WLDS Site Management and Monitoring Plan, a periodic requirement for the U.S. Environmental Protection Agency for designated offshore dredged material disposal sites.

Specifically, acoustic measurements (bathymetric, backscatter, and side-scan sonar) were collected to characterize the shape of disposal mounds and other features on the seafloor influenced by placement of these materials. Sediment-profile imaging (SPI) and plan-view (PV) imaging were used to capture images that reveal further details about the physical conditions of the sediment, as well as important indicators of seafloor (benthic) biological habitat and post-disposal recovery. Benthic grab samples provided sediment that was analyzed for grain size composition (e.g., silt, sand, gravel, etc.), total organic carbon content, and for the identification of species found living within the sediment. These grab samples provided data that will be used to inform the revision of the Site Management and Monitoring Plan for WLDS.

Acoustic results show that dredged material has accumulated at the two northeast placement locations. For the most part, depths have not changed in other regions of the site since last surveyed in 2005. However, a small area of recent deposits of dredged material were found between Mounds G and F and were most likely placed during the 2009-2010 season. Results show features consistent with dredged material disposal throughout the site in addition to disposal mounds, including traces of barge deposition and lines of disposal craters and ring features of pits or craters around disposal target locations.

SPI images show the presence of dredged material at disposal mound locations, as well as evidence of benthic recovery. Benthic recovery is indicated by the presence of a subsurface infaunal community that reworks the sediment in characteristic ways that are discernable in the images. PV images show the opening of the burrows created by this community, in addition to tracks made by a mobile epifaunal community. The depth of the oxidized sediment [i.e., apparent redox potential discontinuity (aRPD)] was significantly less deep at disposal mounds than at reference areas. However, there was no difference between the successional stages of the respective benthic communities at reference and disposal mound areas. These differences indicate that benthic recolonization is progressing at Mounds M and N but is not complete as of this 2014 survey.

Results from the grab samples support SPI/PV results confirming a benthic community consisting of polychaetes, bivalves, gastropods, and nemertean. Diverse infaunal communities occupied both reference and disposal mound locations with the two dominant taxa being the polychaete *Nephtys incisa* and the bivalve *Nucula proxima*. Diversity and

EXECUTIVE SUMMARY (CONTINUED)

abundance varied somewhat between locations, but both show signs of a robust benthic community.

Based on the findings of the 2014 WLDS survey, our recommendations are:

- R1. The presence of stable mounds and normal benthic recolonization indicate no need for remediation actions or change in dredged material placement approach;
- R2. Continue monitoring efforts consistent with Tiered Monitoring Protocols based on volume placed at site;
- R3. Future monitoring efforts should be scheduled earlier in the summer (i.e., June) due to the frequency of hypoxia in Long Island Sound, usually reaching its peak late in the summer.