

## EXECUTIVE SUMMARY

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As part of the Disposal Area Monitoring System (DAMOS) Program, Science Applications International Corporation (SAIC) conducted an environmental monitoring survey over the Central Long Island Sound Disposal Site (CLDS) in June 2001. Field operations consisted of a single-beam bathymetric survey and sediment-profile imaging surveys over the most recently formed dredged material disposal mounds, as well as several historic bottom features. The bathymetric data were used to document changes in seafloor topography resulting from the placement of dredged sediments during the 2000–01 disposal season. The sediment-profile images were used to examine the benthic recolonization status and habitat conditions over individual disposal mounds relative to three CLDS reference areas and to the results of previous monitoring efforts.

The June 2001 bathymetric survey was performed over a 1.0 km<sup>2</sup> area located near the center of CLDS and encompassed the new CLIS 99 and CLIS 00 disposal mounds. The CLIS 99 Mound was formed during the 1999–2000 disposal season by the placement of 86,000 m<sup>3</sup> of sediment. The morphology of the CLIS 99 Mound was originally documented during the September 2000 multibeam bathymetric survey over CLDS. The CLIS 00 Mound is the most recent disposal mound at CLDS and was the product of 71,000 m<sup>3</sup> of dredged material placed on the CLDS seafloor. Depth difference calculations based on comparisons with the September 2000 multibeam bathymetric survey indicated the presence of a small, conical-shaped disposal mound corresponding to the CDA 00 buoy position. The CLIS 00 Mound displayed a mound height of 3 m at the apex and an acoustically detectable footprint approximately 200 m in diameter. In addition, the depth difference comparison detected pockets of consolidation over the flank of the CLIS 99 Mound, located 200 m north of CLIS 00.

The sediment profile imaging results for the active area of CLDS indicated the CLIS 00 Mound was rapidly colonized by benthic infauna, with both Stage I surface dwellers and Stage III deposit feeders found in relative abundance. The depth of oxygenation within the sediment was deeper than expected for a new disposal mound, with an average redox potential discontinuity (RPD) depth of 2.3 cm. The Organism-Sediment Index (OSI) value calculated for the CLIS 00 Mound (+6.7) was lower than the composite value for the CLDS reference areas (+8.2), but still indicative of an undisturbed benthic habitat and suggesting habitat recovery was progressing more rapidly than anticipated.

The findings for the CLIS 99 Mound were quite similar to the CLIS 00 results as both Stage I pioneering polychaetes and evidence of Stage III activity were detected in the replicate images. The average RPD depth calculated for the CLIS 99 Mound was identical to the composite value for the CLDS reference areas (3 cm) during the June 2001 survey. The median OSI values derived from the CLIS 99 sediment profile images were fairly high, ranging from +4 to +11 with an overall average value of +6.9. These results

## EXECUTIVE SUMMARY (continued)

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indicate the CLIS 99 Mound and surrounding seafloor is recovering from the placement of dredged sediments as anticipated.

Two historic bottom features were also subjected to environmental monitoring operations during the June 2001 survey. The CLIS 1997/1998 Mound Complex and New Haven 1993 (NHAV 93) Mound both showed improved benthic habitat conditions relative to previous surveys. Both mounds displayed evidence of a stable benthic infaunal population and deeper RPD depths, yielding higher OSI values. The conditions over the CLIS 97/98 Mound Complex exceeded those detected at the CLDS reference areas, as an average OSI value of +9.6 was calculated for the 21 stations occupied in June 2001. The average OSI value for the NHAV 93 Mound in June 2001 (+7.2) was below the composite value calculated for the CLDS reference areas (+8.5). However, the benthic habitat conditions detected over the NHAV 93 Mound in June 2001 were essentially identical to those documented in September 1999. These results indicate a continued improvement in habitat conditions relative to the 1997 survey, as demonstrated by deeper RPDs and increased abundance of Stage III organisms.

Previous monitoring efforts have revealed that the sediments comprising the surface of the NHAV 93 Mound contain high levels of organic matter, which promotes an increased sediment oxygen demand as this material decomposes over time. Numerous sediment-profile imaging surveys performed over NHAV 93 have indicated this high sediment oxygen demand has a distinct impact on benthic habitat conditions during the summer months when bottom water dissolved oxygen concentrations typically decrease. Despite the improved conditions detected over the majority of the NHAV 93 in June 2001, Station 200S continues to demonstrate benthic habitat quality lower than what would be expected for a seven-year-old dredged material deposit. Some spatial variability was identified in the three replicate photographs collected at Station 200S, but the overall trend suggests an alternative management approach (i.e., comprehensive testing, cap augmentation, etc.) is prudent.