The Massachusetts Bay Disposal Site (MBDS) was monitored by Science Applications International Corporation (SAIC) in the fall of 2000 as part of the Disposal Area Monitoring System (DAMOS). Field operations were concentrated over the active northeastern quadrant of the disposal site and consisted of precision bathymetric and Remote Ecological Monitoring of the Seafloor (REMOTS®) surveys. These surveying techniques were employed to document changes in seafloor topography relative to the 1993 baseline survey, as well as monitor the recolonization of the seafloor subjected to the deposition of large volumes of dredged material.

A total of five discrete dredged material disposal mounds (MBDS-A through MBDS-E) currently exist within the confines of MBDS. These mounds were developed by the placement of approximately 3.57 million cubic meters of sediments removed from the harbors and waterways along the Atlantic Coast of Massachusetts over a seven-year period. By far, the largest single contributor of dredged material was the Boston Harbor Navigation Improvement Project (BHNIP). This infrastructure improvement project yielded approximately 2.5 million cubic meters of Boston Blue Clay and glacial till mechanically dredged from the bottom of Boston Harbor in order to provide the specified control depth, as well as construct large Confined Aquatic Disposal (CAD) cells.

Beginning in January 1994 and continuing through 2000, the DAMOS disposal buoy "MBDA" was strategically placed at several locations surrounding a natural seafloor depression on the MBDS seafloor. Individual disposal mounds of various sizes were developed in close proximity to the MBDA buoy positions in an effort to create a ring of mounds and form an artificial containment cell. Once complete, the artificial containment cell could be used to limit the lateral spread of a future dredged material deposit or be employed as part of a future subaqueous capping project. The success of this mound-complex management strategy was documented during the 1993-94 disposal season at the Central Long Island Sound Disposal Site (CLDS) and has since been adopted at many of the subaqueous dredged material disposal sites in the New England region.

The results of the fall 2000 field effort indicated the formation of four new disposal mounds on the MBDS seafloor since September 1993. The largest disposal mound (MBDS-C) displayed a height of 10 m at the mound apex and a diameter of approximately 750 m along its northwest-southeast axis. Composed of an estimated barge volume of 1.38 million cubic meters of dredged material, the MBDS-C Mound had coalesced with the somewhat older MBDS-B Mound (composed of 850,000 m^3 of sediment) to form a solid beam along the eastern margin of the containment cell.

REMOTS® sediment-profile images were collected over the MBDS-B and MBDS-C Mounds to examine surface sediment composition and evaluate the benthic recolonization status over each disposal mound. The images confirmed the presence of dredged material

throughout the survey grid with much of the deposited sediment composed of high-reflectance Boston Blue Clay. Past environmental monitoring surveys at subaqueous dredged material disposal sites have shown that sediments of a glaciomarine origin (i.e., Boston Blue Clay) tend to be very cohesive and devoid of organic matter. Although a firm substrate is ideal for surface dwelling, Stage I benthic infauna and epifauna, this type of material can impede the development of a stable Stage III (burrowing and deposit feeding) population. As a result, dredged material mounds showing a high percentage of glacial clay in the surficial layers often display a slower rate of benthic recolonization relative to typical marine sediment deposits.

In accordance with expectations, the surface sediments of the MBDS-B and MBDS-C Mounds displayed a benthic infaunal community composed primarily of Stage I pioneering polychaetes with some occurrence of Stage III head-down deposit feeders. A spatial trend was noted between the two disposal mounds surveyed as a higher occurrence of Stage III activity was noted at the somewhat older MBDS-B Mound, relative to the stations surrounding the newer MBDS-C Mound. Oftentimes, the depth of bioturbation within the surface sediments was limited to the depth and distribution of clay within the sediment column. Redox Potential Discontinuity (RPD) depths ranging from 1.5 cm to 4.7 cm were detected across the surface of the placed sediments and were often limited by the presence of firm clay, as well.

The benthic community status over the MBDS-B and MBDS-C Mounds appeared to be recovering as anticipated, with Organism Sediment Index (OSI) values ranging from +4.5 to +10, but were lower relative to the surrounding reference areas. The benthic habitat conditions over the two disposal mounds are expected to continue to recover over the next several years, as Stage III activity becomes more widespread and RPD depths deepen as the glacial clay is biologically reworked and additional silts are incorporated through natural deposition.

In general, the benthic environment at the MBDS reference areas continues to display typical background conditions with OSI values ≥+6. However, a comparison of the 2000 sediment-profile photography results with previous data sets show lower OSI values than observed in earlier surveys. The reduced OSI values were linked to a decline in the abundance of Stage III organisms at the SE-REF and FG-23 references areas, relative to historic findings. The low abundance of Stage III organisms was most noticable at reference area FG-23 where some benthic disturbance due to lobster fishing activity was noted.