Monitoring at the New London Disposal Site
1992-1998
Volume I

Disposal Area Monitoring System DAMOS

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Science Applications International Corporation

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Science Applications International Corporation
221 Third Street
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US Army Corps of Engineers-New England District
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13. ABSTRACT

Science Applications International Corporation (SAIC) conducted monitoring surveys of the New London Disposal Site (NLDS) in August, 1992; August, 1995; September, 1997; and July, 1998, as part of the Disposal Area Monitoring System (DAMOS) Program. Field operations in each survey year included data collection of one or more of the following: precisionbathymetric surveys, Remote Ecological Monitoring of the Seafloor (REMOTS) sediment-profile surveys, and surface and near-bottom dissolved oxygen determinations. Since its inception in 1977, the Disposal Area Monitoring System (DAMOS) Program has investigated dredging and dredged material disposal practices in an effort to minimize adverse physical, chemical, and biological impacts. DAMOS utilizes a flexible, tiered management approach centered around comprehensive environmental monitoring to oversee the placement of sediments at nine open water disposal sites along the coast of New England. Active disposal sites are surveyed on a regular basis to ensure the effects of dredged material disposition on the benthic habitat are localized and temporary. There has been an active dredged material disposal site near New London since at least 1955. DAMOS monitoring of the New London Disposal Site started in 1977 when the program was established. In 1996, the boundary of the New London Disposal Site shown in DAMOS graphics was shifted in accordance with the Final Programmatic Environmental Impact Statement, resulting in a 0.2 nmi northerly shift of the disposal site. The new, northern region was surveyed in 1997.

The New London disposal site has been used for on-going disposal throughout the 1990's, including unconfined disposal of suitable sediments, and capped disposal of unsuitable sediments. This report, Volume I, summarizes the disposal and monitoring activities conducted from the 1991-1992 dredging season through monitoring in July, 1998. This information is presented as a single report to provide a clear, concise picture of use of the New London Disposal Site during this time-frame and to include important monitoring information related to the dredged material mounds. Additional disposal and monitoring information related to the U.S. Navy Seawolf Mound during this time period are to be presented in Volume II.

During the 1991-1992 disposal season, the NLDS received a total barge volume of 104,200 m³ of dredged material generated from four separate projects in the eastern Long Island Sound region. Disposal resulted in creation of two disposal mounds, the Dow/Stonington (D/S) mound, consisting of unsuitable dredged material (Dow and Stonington sediments) and suitable cap material (Dow sediments), and the NL-91 mound immediately north of the D/S mound.

Bathymetric surveys and REMOTS data, which were fully developed using pre- and post-capbathymetric survey data analyzed in 1994-1995, showed that due to errors in navigation, while some cap material covered the D/S mound, most of the cap material was deposited approximately 250 m east of the mound. Following the misplacement of some of the cap material, additional cap material has been deposited at the site as it becomes available, to steadily increase cap thickness over the mound. REMOTS surveys of the D/S mound conducted in 1992, 1995, 1997, and 1998, showed no adverse impactsstrong signs of benthic community recovery and the continued presence of a stable benthic community, minimizing concern about potential adverse effects. During the 1994-1995 dredging season, two new capped mounds were created at the NLDS, including the U.S. Coast Guard Academy (USCGA) mound, and New London 1994 (NL-94) mound. Although monitoring in August, 1995, indicated the NLDS area was experiencing low oxygen bottom waters, it appeared to be part of a regional, seasonalhypoxia event that is unrelated to dredged material disposal. The benthic community at the newly formed disposal mounds was comparable to the reference areas. Additional disposal activities conducted at the New London Disposal Site during this time frame consist of creation of theSeawolf mound with sediments from the New London Naval Submarine Base, the Thames River navigational channel, and two smaller dredging projects. Monitoring of this mound conducted in 1997 and 1998 is discussed in Volume II.

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Regulatory Branch
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696 Virginia Road
Concord, MA 01742-2751

Submitted by:
Science Applications International Corporation
Admiral's Gate
221 Third Street
Newport, RI 02840
(401) 847-4210

US Army Corps of Engineers®
New England District

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EXECUTIVE SUMMARY

Science Applications International Corporation (SAIC) conducted monitoring surveys of the New London Disposal Site (NLDS) in August 1992; August 1995; September 1997; and July 1998, as part of the Disposal Area Monitoring System (DAMOS) Program. Field operations in each survey year included data collection of one or more of the following: precision bathymetric surveys, Remote Ecological Monitoring of the Seafloor (REMOTS®) sediment-profile surveys, and surface and near-bottom dissolved oxygen determinations.

Since its inception in 1977, the Disposal Area Monitoring System (DAMOS) Program has investigated dredging and dredged material disposal practices in an effort to minimize adverse physical, chemical, and biological impacts. DAMOS utilizes a flexible, tiered management approach centered around comprehensive environmental monitoring to oversee the placement of sediments at nine open water disposal sites along the coast of New England. Active disposal sites are surveyed on a regular basis to ensure the effects of dredged material disposition on the benthic habitat are localized and temporary.

There has been an active dredged material disposal site near New London since at least 1955. DAMOS monitoring of the New London Disposal Site started in 1977 when the program was established. In 1996, the boundary of the New London Disposal Site shown in DAMOS graphics was shifted in accordance with the Final Programmatic Environmental Impact Statement, resulting in a 0.2 nmi northerly shift of the disposal site. The new, northern region was surveyed in 1997.

The New London disposal site has been used for on-going disposal throughout the 1990's, including unconfined disposal of suitable sediments, and capped disposal of unsuitable sediments. This report summarizes the disposal and monitoring activities conducted from the 1991-1992 dredging season through monitoring in July 1998. This information is presented as a single report to provide a clear, concise picture of use of the New London Disposal Site during this time frame and to include important monitoring information related to the dredged material mounds.

During the 1991-1992 disposal season, the NLDS received a total barge volume of 104,200 m^3 of dredged material generated from four separate projects in the eastern Long Island Sound region. Disposal resulted in creation of two disposal mounds, the Dow/Stonington (D/S) mound, consisting of unsuitable dredged material (Dow and Stonington sediments) and suitable cap material (Dow sediments), and the NL-91 mound immediately north of the D/S mound.

Bathymetric surveys and REMOTS® data, which were fully developed using pre- and post-cap bathymetric survey data analyzed in 1994-1995, showed that due to errors in navigation, while some cap material covered the D/S mound, most of the cap material was deposited approximately 250 m east of the mound. Following the misplacement of some of the cap material, additional cap material has been deposited at the site as it becomes available, to steadily increase cap thickness over the mound. REMOTS® surveys of the D/S mound conducted in 1992, 1995, 1997, and 1998, showed no adverse impacts, strong signs of benthic community recovery, and the continued presence of a stable benthic community.

During the 1994-1995 dredging season, two new capped mounds were created at the NLDS, including the U.S. Coast Guard Academy (USCGA) mound, and New London 1994 (NL-94) mound. Although monitoring in August, 1995, indicated the NLDS area was experiencing low oxygen bottom waters, it appeared to be part of a regional, seasonal hypoxia event that is unrelated to dredged material disposal. The benthic community at the newly formed disposal mounds was comparable to the reference areas. The NL-94 cap was augmented with additional material during the 1996-97 disposal season, and healthy benthic recolonization was evident by the September 1997, surveys.

Additional disposal activities conducted at the New London Disposal Site during this time frame consist of creation of the Seawolf Mound with sediments from the New London Naval Submarine Base, the Thames River navigational channel, and two smaller dredging projects. Monitoring of this mound conducted in 1997 and 1998 is discussed in a separate DAMOS report.

1.0 INTRODUCTION

This report summarizes disposal and monitoring activities conducted at the New London Disposal Site (NLDS) from the 1991-1992 dredging season through monitoring in July 1998. This information is presented as a single report to provide a clear, concise picture of use of the New London Disposal Site during this time frame and to include important monitoring information related to the dredged material mounds. This report (Volume I) covers all disposal, monitoring and management activities at the NLDS over the indicated period except those associated with the U.S. Navy Seawolf mound, which will be presented separately in Volume II.

1.1 Background

Monitoring of the impacts associated with the subaqueous disposal of sediments dredged from harbors, inlets, and bays in the New England region has been overseen by the Disposal Area Monitoring System (DAMOS) Program since its inception in 1977. The goals of the DAMOS Program pertain to detailed investigation and reduction of any adverse physical, chemical, and biological effects on the benthic environment associated with dredged material disposal activities. The activity sponsored by DAMOS helps to ensure that the effects of sediment deposition over pre-defined areas of seafloor are local and temporary. A flexible, tiered management protocol is applied in the long-term monitoring of sediment disposal at ten open-water dredged material disposal sites along the coast of New England (Germano et al. 1994).

There has been an active dredged material disposal site near New London since at least 1955. Disposal activity was focused on 19 disposal sites in Long Island Sound (LIS) until the mid-1970s, when they were reduced to four regional sites, including New London (Fredette et al. 1993). The Navy began detailed environmental assessment of the New London site in 1973 (U.S. Navy 1973, 1975). In 1977, the DAMOS Program assumed the monitoring responsibility for active disposal sites in New England including the New London Disposal Site (NLDS).

The New London Disposal Site (NLDS) is an active open-water dredged material disposal site located 5.38 km (3.1 nmi) south of Eastern Point, Groton, Connecticut. This site has been monitored under the DAMOS Program since 1977 (NUSC 1979; Figure 1-1). Centered at 41° 16.306´ N, 72° 04.571´ W (NAD 83), the 3.42 km^2 NLDS has water depths which range from 14 m over the NL-RELIC Mound to 24 m at the southern disposal site boundary.

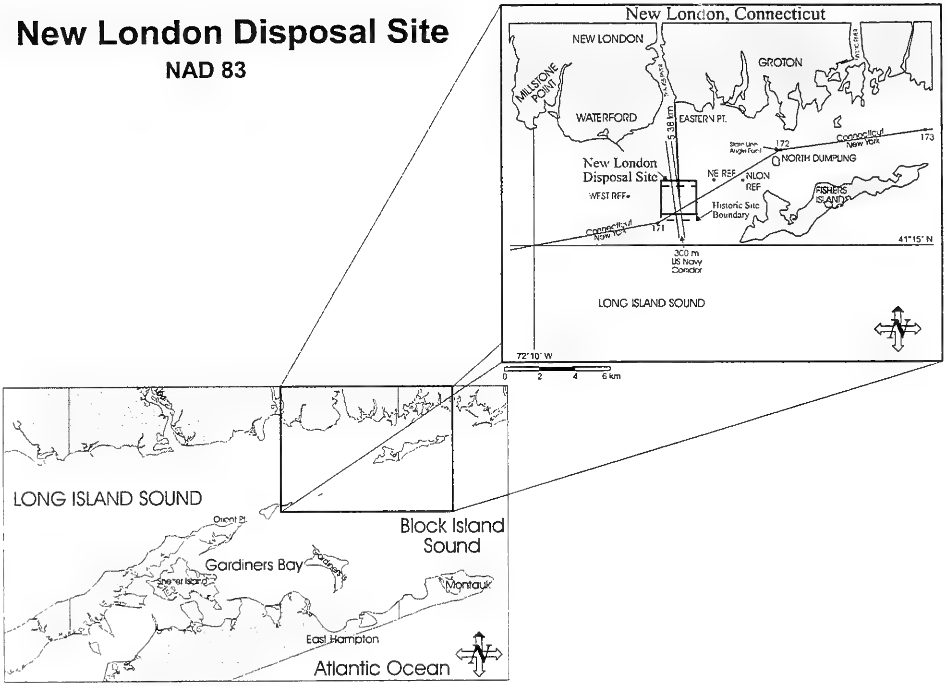

Figure 1-1. Location of the New London Disposal Site

From 1977 to 1992, DAMOS conducted monitoring surveys based on a 1 nmi (nautical mile) square disposal site centered at 41° 16.100' N, 72° 04.600' W (SAIC 1988). In 1982, the Final Programmatic Environmental Impact Statement (FPEIS) for the disposal of dredged material in the LIS region recommended the continued use of the four existing disposal sites in LIS, including New London (USACE 1982). These four sites had been identified prior to the completion of the FPEIS by the Connecticut-New York Interim Plan (NERBC 1980). The Interim Plan identified center coordinates for a slightly different location (0.2 nmi due north of the DAMOS coordinates). As of 1 January 1996, DAMOS adopted the new center coordinates as defined in the Interim Plan as 41° 16.300' N, 72° 04.600' W in North Atlantic Datum 1927 (NAD 27). It is unknown why the original DAMOS center coordinates were not in agreement with the Interim Plan, but no projects were directed to the southern edge of the site during this period, so the change has had no effect on disposal site management or monitoring. This change corrects the slight discrepancy and brings DAMOS in agreement with the FPEIS. Similar changes have been made to the Central Long Island Sound Disposal Site and the Cornfield Shoals Disposal Site.

The location of NLDS intersects with two important management boundaries: a 300-m wide submarine transit corridor; and the New York-Connecticut state boundary (Figure 1-1). The submarine transit corridor has been established to minimize conflict between submarine traffic to, and from, the submarine base in Groton, CT and disposal buoys that may not be seen when submarines transit submerged. The state boundary affects state regulatory authority under the Coastal Zone Management Act (CZMA) and the issuance of state water quality certification for disposal permits (Carey 1998). Under the CZMA, states must concur that disposal activities in their state waters are consistent with their federally approved Coastal Zone Management Plans before permits are issued by the USACE.

The long-term observation of the effects of disposed dredged material is facilitated by the construction of distinct sediment mounds within a disposal site. Development of disposal mounds is achieved by directing barges to predetermined locations typically marked by surface buoys, which have taut-line moorings to maximize position stability. When necessary, mounds are constructed in phases to allow for capping of material deemed unsuitable for open-water disposal. Capping is a subaqueous containment method that utilizes material determined to be suitable for open-water disposal (hereafter referred to as capping dredged material, or CDM) to overlay and isolate deposits of unacceptably-contaminated dredged material (UDM) from the surrounding environment (Fredette 1994).

Recent disposal activity has been located to take advantage of the bottom topography created by historical disposal mounds. Two management objectives have been sought: creation of a "bowl" by placement of mounds in a "ring"; and constraint on the spread of dredged material disposed at the site. The lateral spread of dredged material disposed through the water column is strongly affected by bottom slope (Bokuniewicz et al. 1978). By placement of the taut-wire moored disposal buoys, disposal activity can be directed to specific locations and thereby limit the horizontal spread of material by filling depressions or confining material between adjacent, older mounds. Minimizing lateral spreading of mounds can increase site capacity and reduce the volume of material required for capping. Additionally, in order to reduce the potential effects of bottom currents and storm-generated waves, sediment mounds at the NLDS are developed in a broad, flat manner, maintaining a minimum water depth of 14 meters. This minimum depth also allows for the safe passage of deep draft Navy vessels transiting through the disposal site (NUSC 1979). Presently, there are 10 discernible mounds (NL-95 is merged with the Seawolf Mound) within the boundaries of the disposal site (Figure 1-2).

The Thames River, located in southeastern Connecticut, discharges fresh water and sediment from the interior of eastern Connecticut into Long Island Sound. The mile-wide basin of the lower Thames River and New London Harbor is utilized by military, commercial, and recreational vessels seeking protection from the open waters of Long Island Sound (Figure 1-1). Maintenance dredging of New London Harbor and adjacent coastal areas, overseen by the NAE, is required to insure navigable waterways and adequate dockage for deep draft vessels. Most of the material generated from dredging operations is transported by barge and deposited at the New London Disposal Site (NLDS) in Long Island Sound.

Disposal of dredged material occurred within and around the NLDS area for a number of years before the inception of the DAMOS Program. The formation of the NL-RELIC Mound was a result of dredging and disposal of sediments from the Thames River and New London Harbor prior to 1977 and during the early 1980s (NUSC 1979; SAIC et al. 1985). The area surrounding the NLDS is subject to moderate to high bottom currents (maximum bottom current of 55 $cm \cdot s^{-1}$) relative to other containment disposal sites in Long Island Sound (Waddell et al. 1999). However, the shelter provided by Fisher's Island, the southern fork of Long Island and the Connecticut shoreline protect the disposal site from the effects of major storm waves. This inference is supported by the fact that many historic disposal mounds have remained stable in both height and shape over at least ten years, and in some cases (such as NL-RELIC) twenty years or more (Figure 1-2).

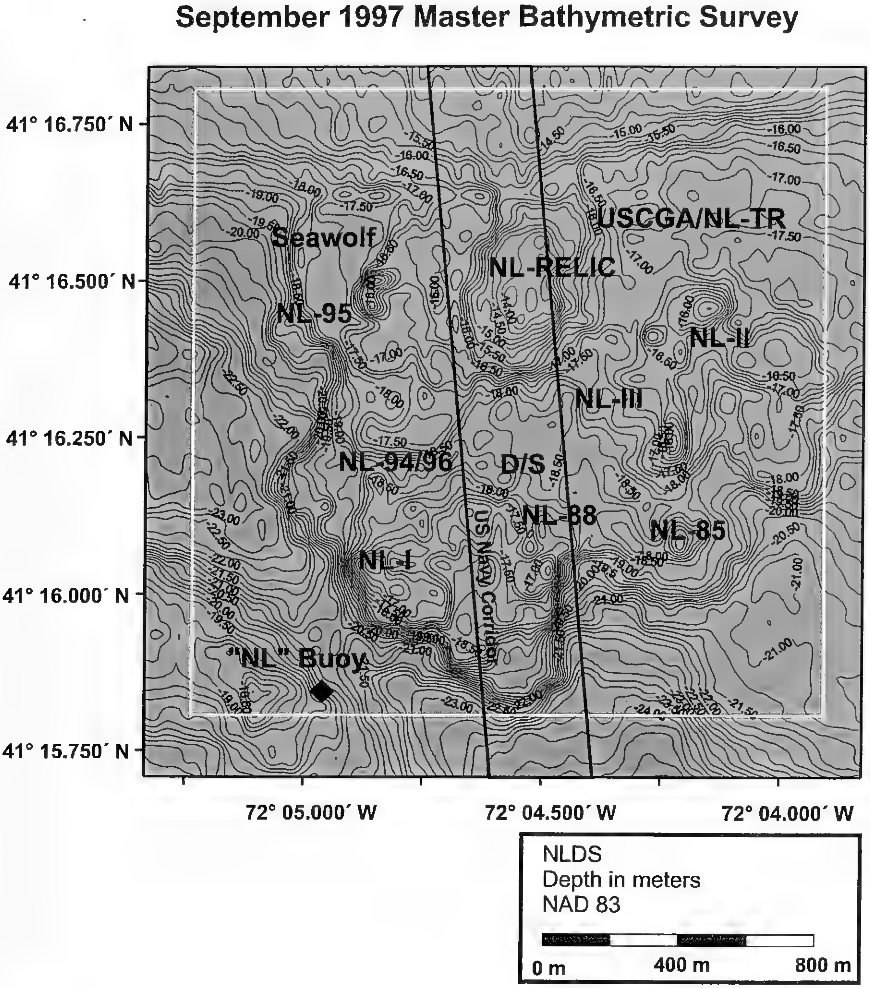

Figure 1-2. Bathymetric chart of New London Disposal Site (contour interval = 0.25 m)

1.2 Dredged Material Disposal Mounds

In September 1997, Science Applications International Corporation (SAIC) conducted a master bathymetric survey at the NLDS (Figure 1-2). The master bathymetric survey provides a reference frame for locating the disposal and monitoring activities conducted from 1991-1998. For each mound complex, the disposal history will be described followed by a summary of monitoring activities. A timeline of all of these activities (Figure 1-3) has been provided to summarize the events; details of the survey methods are provided in Section 2.0.

The September 1997 master bathymetric survey also marked the conversion from the horizontal navigational reference system of the North American Datum of 1927 (NAD 27) to the North American Datum of 1983 (NAD 83) for all future bathymetric surveys conducted at this site (see Methods section).

1.2.1 Dow/Stonington and 1991-1992 Disposal Activity

A series of buoy positions and disposal activities occurred between the fall of 1991 and spring of 1992 (Figure 1-3). These activities resulted in formation of a small, flat mound complex (designated the New London-91 and Dow/Stonington mound complex) that lies within the center of NLDS surrounded and protected by slightly higher mounds (Figure 1-2). The surface of this mound complex shows little relief and has been consistent in character throughout the six-year period covered by this report. Most of the complex has an upper layer of sand mixed with shells and pebbles in some areas. This surface has been rapidly colonized by a stable benthic community after each sequence of disposal.

The history of disposal within this area is complicated and needs to be described in detail before presenting the survey results. The taut-wired buoy "NDA" was first deployed for the 1991-1992 disposal season by SAIC on 26 September 1991 at coordinates 41°16.239' N, 72°04.486' W (NDA #1; Figure 1-3).

The sediments deposited at the NDA buoy were dredged from the Gwen Mor . Marina in the Mystic River and Port Niantic, Inc. in the Niantic River. An estimated barge volume of 5,700 m³ of dredged material was deposited in close proximity to the NDA buoy before it was struck and dragged off-station by a U.S. Navy submarine transiting through NLDS (Appendix A1).

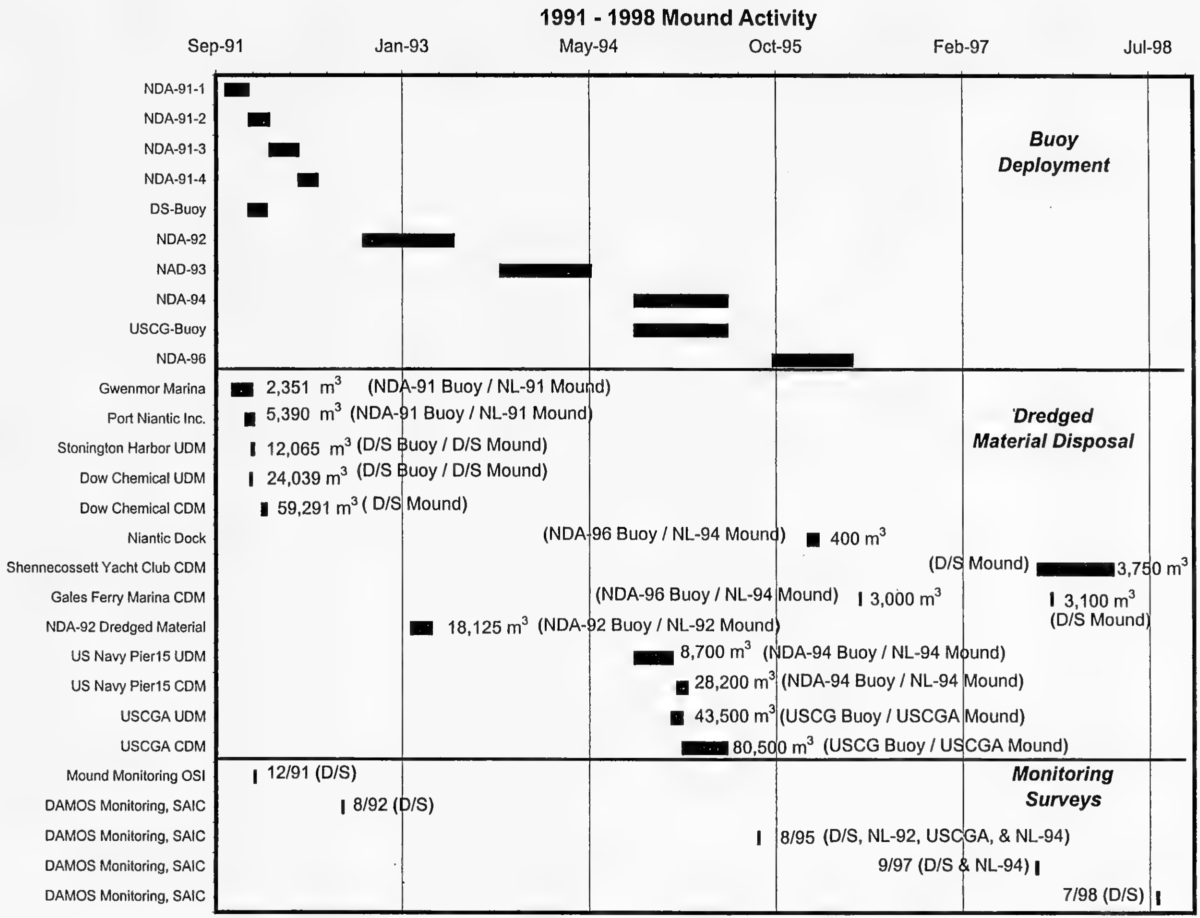

Figure 1-3. Timeline of disposal and monitoring activity

On 27 November 1991, the NDA buoy was re-positioned at 41°16.251' N, 72°04.497' W (NDA #2). A second, smaller buoy, "D/S", was placed 175 m south of NDA #2 at coordinates 41°16.162' N, 72°04.468' W (Figure 1-3; Appendix A, Table 1). From 28 November to 12 December 1991, 3,100 m^3 of additional material from Gwen Mor Marina and Port Niantic, Inc. were deposited at the second NDA buoy location (Appendix A1).

The D/S buoy was deployed in support of a sediment capping project, marking the deposition point for material generated from dredging operations at Stonington Harbor, CT, and the Dow Chemical Company's Allyns Point Plant in Gale's Ferry, CT. During the Dow/Stonington capping project, disposal of UDM commenced on 2 December 1991 and continued through 12 December 1991. Within those 10 days, an estimated barge volume of 12,000 m^3 of material from Stonington Harbor, as well as 24,000 m^3 of dredged material from Dow Chemical Company's Allyns Point facility, was deposited in close proximity to the D/S buoy (Appendix A2). Upon conclusion of UDM deposition, a precap bathymetric survey was performed for the Dow Chemical Company by Ocean Surveys Incorporated (OSI) of Old Saybrook, Connecticut.

The detected UDM deposit was then targeted for capping with an estimated barge volume of 59,300 m^3 of CDM from the Dow Chemical project. A series of seven capping points (A-G) were developed to control the CDM dispersal pattern in order to efficiently cover the 36,100 m^3 of UDM to a desired sediment cap thickness of 50-100 cm. However, due to an apparent error, the positions of the seven capping points were misinterpreted. As a result, cap material was released both over the mound and east of the initial D/S sediment deposit. On 15 January 1992, capping operations were concluded, and a postcap bathymetric survey was conducted in August 1992.

At the conclusion of the capping project, the disposal buoys were scheduled to be repositioned at the request of the U.S. Coast Guard and the U.S. Navy. The U.S. Coast Guard stated that U.S. Navy vessels frequently transit through the area and the disposal buoys posed a hazard to navigation. The NDA buoy was repositioned on 22 January 1992 at 41°16.252' N, 72°04.756' W, a position outside a newly designated U.S. Navy shipping lane (NDA #3; Figure 1-3). The smaller D/S buoy, which was scheduled for removal from NLDS, was not found in the area. It is believed that the D/S buoy was removed from the site by a U.S. Navy submarine passing through NLDS on approximately 14 January 1992.

The NDA buoy was repositioned, again at the U.S. Navy's request, on 10 April 1992, to its final location of 41°16.163' N, 72°04.996' W, 475 m west of the U.S. Navy corridor that transects NLDS (NDA #4; Figure 1-3). No disposal was reported at the third or fourth NDA buoy locations.

In summary, during the 1991-1992 disposal season, a total of 8,800 m^3 of dredged material was disposed at NDA buoy locations #1 and #2 (Appendix A1). A total barge volume of 95,400 m^3 of sediment associated with the Dow/Stonington capping project was deposited near the center of NLDS (Appendix A2).

A small dredged material disposal mound, which did not require capping, was formed at 41°16.577' N, 72°04.862' W. This mound (the NL-91 Mound) was formed when 16,800 m^3 of dredged material suitable for unconfined open-water disposal was released at the NDA 92 buoy between 6 February and 2 April 1993.

Although the NDA-97 buoy was deployed in September 1997 at 41° 16.233´ N, 72° 04.906´ W (NAD 83) over the NL-94 mound area, disposal was actually directed to capping points over the NL-91 and D/S mound complex during the 1997–1998 season in order to augment the cap. DAMOS surveys conducted in 1992 and 1995 indicated that although a layer of sand covered much of the original Dow/Stonington material, additional cap material should be placed on the mound complex to ensure unsuitable material was isolated from the marine environment. An estimated barge volume of 3,750 m^3 of suitable sediment dredged from Shennecossett Yacht Club was deposited over the mound from 10 September 1997 to 9 April 1998. In addition, approximately 3,100 m^3 of dredged material from Gales Ferry Marina was deposited at the capping points from 15 to 18 October 1997. Buoys are not placed in this region to avoid potential obstruction of the 300-m wide submarine transit corridor. Therefore, accurate disposal was dependent upon the navigation to pre-determined points via GPS or LORAN-C. The total barge volume of 6,850 m^3 of CDM was placed in the northern region of the NL-91 and D/S mound complex during the 1997-98 disposal season[1].

1.2.2 USCGA and NL-94 Disposal Mounds

In January 1995, 43,500 m^3 of UDM was released at a USCG buoy (41°16.490' N, 72°04.290' W). This material was then covered with 80,500 m^3 of capping dredged material (CDM). The USCG buoy was located approximately 180 m west of the historic NL-TR Mound apex. The USCGA Mound incorporated most of the NL-TR Mound's

[1] During the 1998-2000 disposal seasons, over 20,000 m^3 of CDM from a number of projects was placed at the D/S mound to augment the cap. Monitoring of the D/S mound was conducted during the summer of 2000, including bathymetric and REMOTS® surveys. The results of these surveys will be published in a subsequent report.

western flank. The USCGA Mound was laterally confined by the NL-RELIC Mound to the west and the NL-II Mound to the east (Figure 1-3). The NL-94 Mound was formed when 8,700 m^3 of UDM from Pier 15 at the U.S. Navy Submarine Base was released at the NDA-94 buoy (41°16.270' N, 72°04.890' W). This UDM, which was released between 26 December 1994 and 5 January 1995, was covered by 28,200 m^3 of CDM between 17 January and 14 February 1995. The southern flank of the NL-94 Mound abuts the historic NL-I Mound.

In addition to the material disposed at the NL-94 Mound during the 1994–95 disposal season, additional material was placed in this location during the 1996–97 disposal season. In September 1996, a disposal buoy (NDA-96) was deployed at 41° 16.234´ N, 72° 05.912´ W (41° 16.228´ N, 72° 04.941´ W; NAD 27), approximately 80 m west-southwest of the NDA-94 buoy location (Figure 1-2). An estimated barge volume of 3,400 m^3 of material dredged from the Niantic River as well as Gales Ferry Marina in the Thames River was deposited at the NDA 96 buoy, to add to the existing NL-94 Mound.

1.3 Monitoring Activity

1.3.1 August 1992 Monitoring Survey

SAIC conducted a monitoring survey at NLDS from 7 to 9 August 1992 as part of the DAMOS Program. The field efforts were concentrated over the central region of the disposal site and consisted of precision bathymetry, Remote Ecological Monitoring of the Seafloor (REMOTS®) sediment-profile photography, and dissolved oxygen (DO) measurements to provide information on the effects of the sediment deposition that occurred in 1991-1992.

The objectives of the August 1992 New London Disposal Site survey were to

- delineate the extent and characterize the topography of recently deposited dredged material around the Dow/Stonington and NDA disposal points since the June 1991 survey;
- assess the recolonization status of benthic biota and determine the spatial limits of the recently deposited sediment;
- determine near-bottom and surface dissolved oxygen concentrations at the active disposal mound and reference areas.

The 1992 monitoring scheme at NLDS was designed to verify the following predictions based in part on the tiered DAMOS monitoring protocol:

- Based on a disposal simulation model, sediment deposited in proximity to the D/S buoy during the 1991-1992 season should result in the formation of a capped mound having a radius of approximately 250 m;

- A sediment cap of suitable material, 50-100 cm thick, should exist over the material dredged from Dow Chemical Company and Stonington Harbor, CT;

- Benthic recolonization over the active disposal area should consist primarily of Stage I organisms (small pioneering polychaetes). Recolonization on the flanks of the NL-91 and D/S mound complex and NDA disposal mounds and the reference sites should be primarily Stage II and Stage III (tubicolous amphipods and larger burrowing deposit feeders);

- Near-bottom dissolved oxygen concentrations at stations within the disposal site should be comparable to dissolved oxygen concentrations at reference area stations.

1.3.2 August 1995 Monitoring Survey

A survey was conducted by SAIC at NLDS from 23 to 26 August 1995 aboard the M/V *UCONN*. The survey investigated three capped mounds: the U.S. Coast Guard Academy (USCGA) mound, the New London 1994 (NL-94) mound, and the NL-91 and D/S mound complex. One mound that did not require capping was also surveyed, the New London 1992 (NL-92) mound. The survey was designed to measure the areal extent of the dredged material at the USCGA, NL-94 and NL-92 mounds, assess the recolonization status of the benthic community at the capped mounds, and determine the effectiveness of capping operations.

Prior to the survey, predictions were made regarding the health of the benthic community and the geometry of the disposal mounds (Germano et al. 1994). It was expected that the benthic community at the most recent disposal mounds would be in the early stages of recolonization. Benthic infauna at the NL-91 and D/S mound complex were predicted to be similar to infauna at the reference areas. The data from this survey showed that the benthic community at the most recent mounds and at the relic NL-91 and D/S mound complex reflected ambient benthic conditions. Based on the amount of material slated to be released at the buoys, mounds NL-94 and USCGA were predicted to be 1.6 m high and 100 m wide (NL-94) and 4.5 m high and 300 m wide (USCGA) if disposed on a level seafloor. Bathymetric measurements of the actual seafloor showed the mounds to be shorter with a more complex shape than predicted by computer models.

1.3.3 September 1997 Monitoring Survey

The specific objectives of the September 1997 New London Disposal Site monitoring survey were to:

- Assess the benthic recolonization status of the NL-94 mound, as well as the NL-91 and D/S mound complex, relative to the three reference areas surrounding NLDS;
- Perform a detailed master bathymetric survey of the region surrounding NLDS as defined by the 1982 FPEIS;
- Document and delineate the changes in bottom topography (accumulation and consolidation) in the areas of concentrated disposal since August 1995.

Analyses of data collected during the September 1997 field effort at NLDS were used to test two hypotheses consistent with the DAMOS Tiered Monitoring Protocols (Germano et al. 1994). First, it was hypothesized that the past two years of disposal activity at NLDS had resulted in the formation of a wide sediment mound encompassing material deposited at the NDA-95 buoy, while the limited volume of material deposited at the NDA-96 buoy had broadened the southwest apron of the NL-94 Mound. Second, a healthy benthic assemblage with Stage III individuals was expected at the older disposal mounds, including the NL-91 and D/S mound complex, as well as the NL-94 Mound.

1.3.4 July 1998 Monitoring Survey

Field operations at the NLDS in July 1998 consisted of a 1000 × 1000 m bathymetric survey and REMOTS® sediment-profile photography. These surveys repeated those conducted in 1997.

The objectives of the 1998 monitoring surveys were to:

- Assess the benthic recolonization status of the NL-91 and D/S mound complex relative to the three reference areas surrounding the NLDS and to the 1997 survey;

- Map the extent of fresh capping dredged material over the NL-91 and D/S mound complex.

Analyses of data collected during the July 1998 field effort at the NLDS were used to test hypotheses consistent with the DAMOS Tiered Monitoring Protocols (Germano et al. 1994). First, a healthy benthic assemblage with Stage III individuals were expected over the older areas of the NL-91 and D/S mound complex. Where new capping material had been placed over the mound complex, Stage I and II organisms were predicted to be common, representing the early phase of recolonization. Finally, a new layer of capping dredged material was expected to be detected in REMOTS® stations over the northern and possibly western region of the NL-91 and D/S mound complex.

1.3.5 NLDS Northern Region

In 1996, DAMOS adopted the NLDS programmatic EIS boundaries which resulted in a northerly shift of the NLDS boundaries. A baseline characterization of the seafloor between latitudes 41° 16.606´ N and 41° 16.806´ N and longitudes 72° 03.907´ W and 72° 05.234´ W was required to ensure adequate comparisons with future datasets (Figure 1-2). The 1997 survey over this 0.685 km^2 area was conducted to provide detailed information pertaining to bathymetric features and sedimentary characteristics within the Northern Region. In addition, REMOTS® data were collected over the Northern Region of NLDS to provide baseline characterization of the sediments prior to dredged material disposal.

2.0 METHODS

Over the period 1992 to 1998, four environmental monitoring surveys occurred at the NLDS. In general, field surveys under the DAMOS program are conducted in the summer, following the dredged material disposal season (1 October to 31 May), to verify placement of materials and evaluate environmental effects associated with the disposal activities. Typical survey objectives include determining the distribution of dredged material on the seafloor and progress in recolonization by benthic organisms.

Precision bathymetry and REMOTS® sediment-profile photography have been employed as the standard tools for tracking the placement of dredged material, examining long term fate of individual sediment deposits, and assessing biological conditions at the disposal sites relative to nearby reference areas. These methods were developed in the context of a rigorous tiered monitoring approach (Germano et al. 1994). Utilizing these monitoring techniques, comprehensive monitoring surveys were conducted at NLDS in August 1992, August 1995, September 1997, and July 1998 (Table 2-1). The bathymetric and REMOTS® sediment-profile photography survey grids at NLDS varied from year to year based on changes in the active areas within the disposal site and the overall management strategy.

2.1 Bathymetry and Navigation

This report chronicles six years (1992-1998) of disposal and survey activity at NLDS. Within this time period, the instrumentation and analysis procedures employed by SAIC evolved in a manner that best utilized advances in technology and presentation of data. This evolution was tightly controlled in order to increase the efficiency of survey operations while continuing to provide accurate and comparable data relative to previous monitoring surveys.

Since the inception of the DAMOS Program, all survey results and reported station locations have been referenced to the North American Datum of 1927 (NAD 27). As the use of high precision Differential Global Positioning System (DGPS) data has become more widespread, an effort to utilize the most recent datum (the North American Datum of 1983 [NAD 83]) has been instituted. Consequently, this document transitions between the use of NAD 27 and NAD 83 at NLDS. All survey results, reported station locations, and disposal site boundaries pre-dating the 1997 Master Bathymetric survey, are referenced to NAD 27 unless otherwise noted.

Table 2-1
Summary of Bathymetry and REMOTS® Surveys conducted at NLDS 1992-1998

YEAR	AREA	NUMBER OF SAMPLES	PATTERN
1992			
Bathymetry	1600 m X 1600 m Bathymetry (NAD 27)		
REMOTS® Sediment Profile Photography	NL-91 & D/S	41	Radial around NDA-91-2
	W-REF	13	Cross-Shaped
	NE-REF	13	Cross-Shaped
	NLON-REF	13	Cross-Shaped
1995			
Bathymetry	1600 m X 1600 m Bathymetry (NAD 27)		
REMOTS® Sediment Profile Photography	NL-91 and D/S mound complex	13	Cross-Shaped
	USCGA Mound	13	Cross-Shaped
	NL-94 Mound	15	Radial
	W-REF	6	Random
	NE-REF	5	Random
	NLON-REF	4	Random
1997			
Bathymetry	2100 m X 2100 m Master Bathymetry (NAD 83)		
REMOTS® Sediment Profile Photography	NL-91 and D/S mound complex	13	Cross-Shaped
	NL-94 Mound	15	Radial
	W-REF	4	Random
	NE-REF	5	Random
	NLON-REF	4	Random
1998			
REMOTS® Sediment Profile Photography	NL-91 and D/S mound complex	13	Cross-Shaped
	W-REF	4	Random
	NE-REF	5	Random
	NLON-REF	4	Random

2.1.1 1992 and 1995 Survey Activity

During the 1992 and 1995 survey efforts, SAIC's Integrated Navigation and Data Acquisition System (INDAS) was used for precision navigation and data collection (Table 2-2). This system utilized a Hewlett Packard 9920 series computer to provide real-time navigation, as well as collect position, depth, and time data for later analysis. INDAS was interfaced with a Del Norte Model 542 Trisponder® System that provided real-time positioning to an accuracy of ±3.0 m. The Del Norte Trisponder System is based on multiple range (range-range) measurements from shore-based remote stations in order to triangulate vessel position at a frequency of 1 Hz. SAIC established two shore stations along the Connecticut coast at the known benchmarks of Millstone Nuclear Power Station (41°18.312' N, 72°09.873' W) and New London Lighthouse (41°18.991' N, 72°05.414' W) for the survey operations performed at NLDS (Figure 1-1). In order to facilitate comparisons with previous data sets, all positioning information was referenced to the horizontal control of North American Datum of 1927 (NAD 27). A detailed description of the navigation system and its operation can be found in the DAMOS navigation and bathymetry reference report (Murray and Selvitelli 1996).

In August 1992, SAIC completed a bathymetric survey over a 1600 m × 1600 m survey area centered at 41°16.235' N, 72°04.492' W. This survey required 65 lanes at 25 m lane spacing to cover the 2.56 km² area (Figure 2-1). This was an identical grid used for bathymetric surveys in June-July 1990 and June 1991, permitting depth differences to be calculated relative to previous surveys. In-depth analysis of the D/S mound was accomplished by re-gridding the bathymetric data to a 500 m × 670 m area surrounding the disposal buoy positions (Figure 2-1).

The 1600 m × 1600 m survey area was reoccupied in August 1995 to determine the changes in seafloor topography resulting from the deposition of sediments from October 1992 through June 1995. This survey area was later divided into smaller analysis areas (NL-92 mound, NL-94 mound, USCGA mound) to yield better-defined depth difference comparisons with the August 1992 survey (Figure 2-1).

2.1.2 1997 and 1998 Survey Activity

In 1997, a new master bathymetric survey of the disposal site utilized a different positioning and survey system. Bathymetric data were collected with the use of SAIC's Portable Integrated Navigation and Survey System (PINSS) during the September 1997 survey, as well as the effort in July 1998 (Table 2-2). This system utilizes a Toshiba® 3200DX series computer to provide real-time navigation, as well as collect position, depth, and time data for later analysis. A Magnavox MX4200D GPS receiver was interfaced to a

Table 2-2
Summary of Survey Equipment Employed by SAIC for Bathymetric Surveys at NLDS

Year	Positioning System	Echosounder	Data Acquisition System	Speed of Sound Profiler	Data Processing System
1992	Range/Range: Del Norte 542 Transponder	Odom DF3200 Echotrac (208kHz)	SAIC INDAS HP 9920 PC	Seacat SBE 19-01 CTD Probe	SAIC HDAS
1995	Range/Range: Del Norte 542 Transponder	Odom DF3200 Echotrac (208kHz)	SAIC INDAS HP 9920 PC	Seacat SBE 19-01 CTD Probe	SAIC HDAS
1997	DGPS: Magnavox MX4200D GPS w/ Leica MX41R Beacon	Odom DF3200 Echotrac (208kHz)	SAIC PINSS Toshiba 3200DX	Seacat SBE 19-01 CTD Probe	SAIC HDAS
1998	DGPS: Trimble 4000 GPS w/ Leica MX41R Beacon	Odom DF3200 Echotrac (208kHz)	SAIC PINSS Toshiba 3200DX	Seacat SBE 19-01 CTD Probe	SAIC HDAS

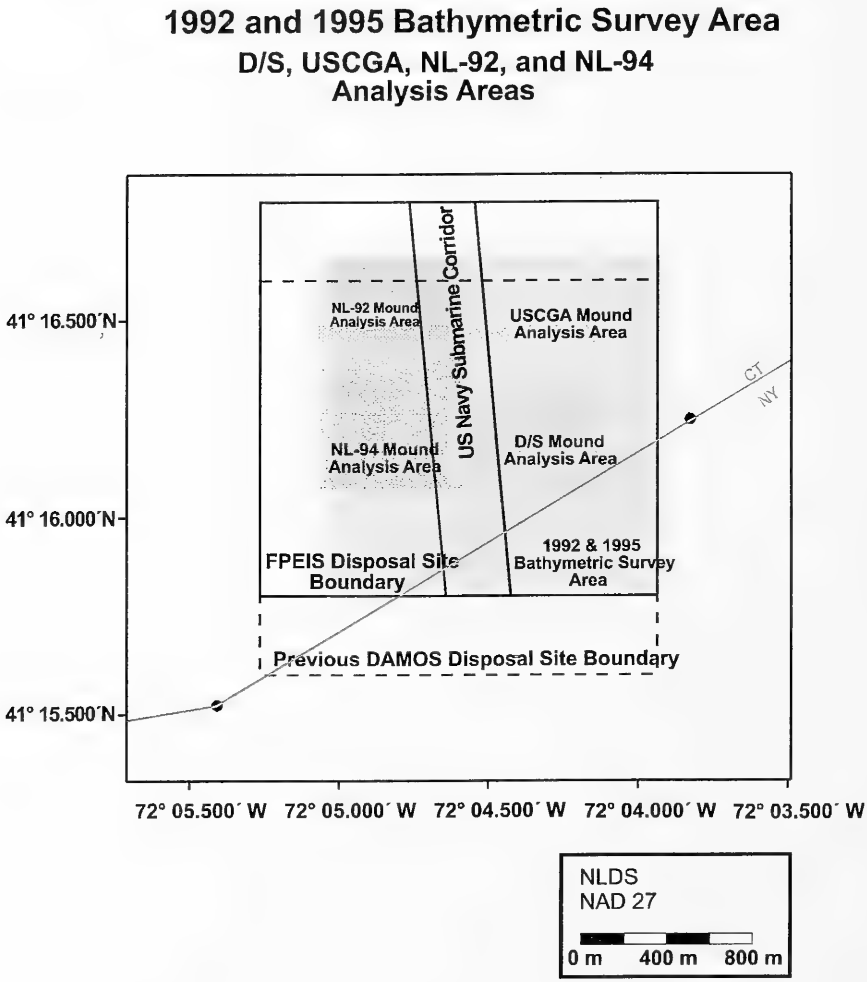

Figure 2-1. Location of the 1992 and 1995 bathymetric survey area over NLDS, relative to the disposal site boundaries, analysis areas for individual mounds, and the New York and Connecticut State Line (NAD 27)

Leica MX41R differential beacon receiver to obtain positioning data at an accuracy of ±3 m in the horizontal control of NAD 83.

The GPS receiver utilized signals emitted from a constellation of satellites that provides positioning data to an accuracy of ±100 m. In order to increase the accuracy of the raw GPS data, a differential beacon receiver was used to collect and decode corrections from a shore-based station. Signals broadcast from the U.S. Coast Guard differential beacon at Montauk Point, New York (293 kHz) were utilized for satellite corrections due to its geographic position relative to NLDS. When merged with the satellite data, the correctors provide differential GPS positions to an accuracy of ±3 m with an update rate of 1 Hz.

The bathymetric survey area occupied in September 1997 was centered at 41° 16.274′ N 72° 04.580′ W (NAD 83). This survey was performed to characterize all the bathymetric features within the confines of the disposal site. A total of 85 lanes, oriented east-west with a 25 m lane spacing, were occupied during the September 1997 field operations to provide a detailed bathymetric chart of the 4.41 km^2 area (2100 × 2100 m; Figure 2-2). No bathymetric data were collected over the project mounds during the 1998 survey effort.

2.1.3 Bathymetric Data Collection

An ODOM DF3200 Echotrac® Survey Fathometer with a narrow beam, 208 kHz transducer measured individual depths to a resolution of 3.0 cm (0.1 ft) as described in DAMOS Contribution No. 48 (SAIC 1985). The fathometer is interfaced directly with the navigation system. Depth soundings were collected along the individual survey lanes, adjusted for transducer depth, and transmitted to INDAS/PINSS at a frequency of 10 Hz. The soundings were averaged by the navigation system, merged with positional and time information, and recorded at a frequency of 1 Hz. Survey vessel speed and course were tightly controlled (2 to 3 meters per second) to ensure adequate numbers of depth values collected along the survey lane.

A Seabird Instruments, Inc. SEACAT SBE 19-01 Conductivity, Temperature, and Depth (CTD) Probe was used to obtain sound velocity measurements at the start, midpoint, and end of each survey day. The data collected by the CTD were bin-averaged to 1 meter depth bins to account for any pycnoclines (rapid changes in density creating distinct layers within the water column). A mean sound velocity was then calculated using the bin-averaged values. The mean sound velocity was recorded and later used in the post-processing of the bathymetric data.

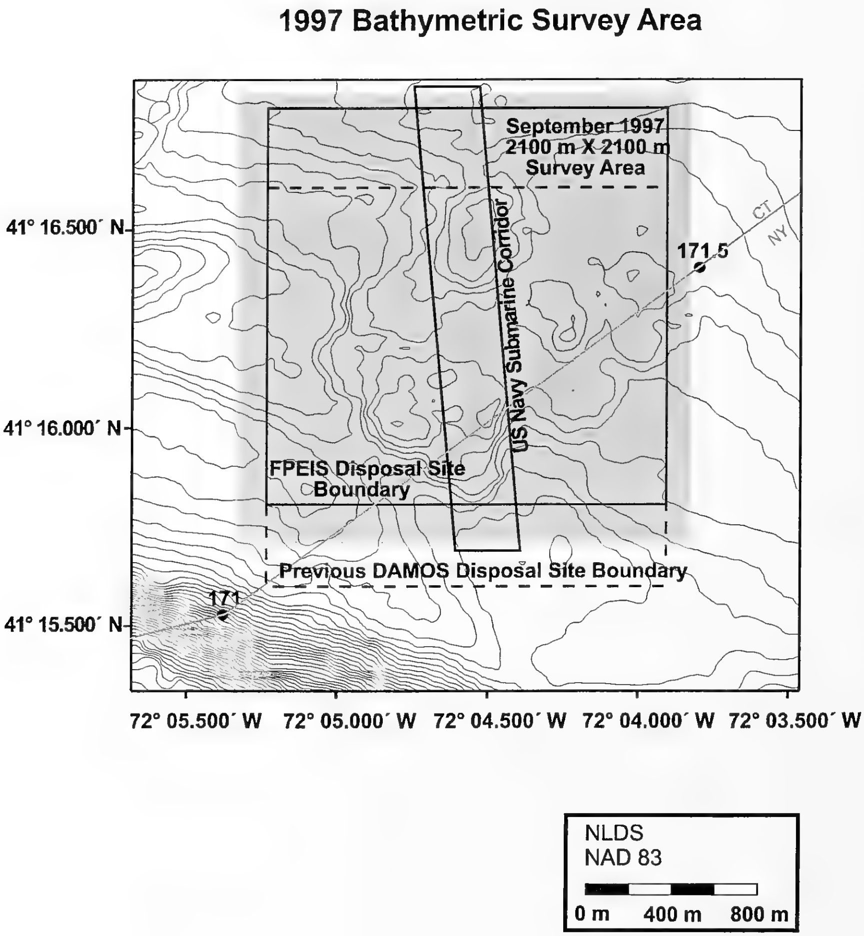

Figure 2-2. Location of the 1997 master bathymetric survey area over NLDS, relative to the disposal site boundaries and the New York and Connecticut State Line (NAD 83)

2.1.4 Bathymetric Data Processing

During data analysis, the raw bathymetric data from INDAS/PINSS were corrected for changes in tidal height and sound velocity. In 1992, these data were standardized to Mean Low Water. Tidal height corrections were based on the observed National Oceanic and Atmospheric Administration (NOAA) data for the New London, Connecticut, tidal station. The 1995 and subsequent surveys utilized six-minute observed tidal data obtained via the National Oceanographic and Atmospheric Administration (NOAA), Ocean and Lake Levels Division's National Water Level Observation Network.

Observed tide data are downloaded through the Internet in a station datum or referenced to Mean Lower Low Water (MLLW) and based on Coordinated Universal Time. For the 1995 and 1997 NLDS surveys, data from the NOAA tide station 8461490 in New London Harbor, New London, Connecticut were downloaded in the MLLW datum and corrected to local time. Tide differences based on the entrance to West Harbor, Fishers Island, New York, were applied to the observed data.

In August 1995, tidal data were also collected on-site with a Seabird Instruments, Inc. SBE 26-03 Sea Gauge wave and tide recorder. The tide gauge recorded pressure values every six minutes and provided, after conversion, a constant record of tidal variations in the survey area. These observed tidal data were later used to compare and verify the corrected NOAA data.

The bathymetric data were analyzed using SAIC's Hydrographic Data Analysis System (HDAS), Version 1.03. Raw bathymetric data were imported into HDAS, corrected for sound velocity, and standardized to MLLW using the NOAA observed tides. The bathymetric data were then processed to produce depth models of the survey area. A model is a depth matrix used to generate graphical representations of the survey area (i.e., three-dimensional plots and depth contours). A detailed discussion of the bathymetric data acquisition and analysis is given in the DAMOS navigation and bathymetry reference report (Murray and Selvitelli 1996).

The depth model for each bathymetric survey performed over NLDS was then subjected to depth difference routines in HDAS to detect and quantify changes in seafloor topography over time. The end result of the depth difference comparison is a graphical representation of a disposal mound or mounds. However, due to a variety of factors (tidal corrections, changes in sound velocity through the water column, the slope of the bottom, and vertical motion of the survey vessel) comparisons of sequential bathymetric surveys can only reliably detect changes in depth of 20 cm or greater. These factors often introduce artifacts that may appear to be small areas of depth increase or decrease. As a result, the lateral extent of a disposal mound or apron is often below the threshold of the bathymetric data products. Other monitoring techniques are often employed to define the thinner margins of the disposal mound (i.e., sediment-profile photography).

2.2 REMOTS® Sediment Profile Photography

REMOTS® sediment-profile photography is a benthic sampling technique used to detect and map the distribution of thin (<20 cm) dredged material layers, map benthic disturbance gradients, and monitor the process of benthic recolonization over the disposal mound. This is a reconnaissance survey technique used for rapid collection, interpretation and mapping of data on physical and biological seafloor characteristics. REMOTS® utilizes a Benthos Model 3731 Sediment-Profile Camera, designed to obtain undisturbed, vertical cross-section photographs (*in situ* profiles) of the upper 15 to 20 cm of the seafloor, for analysis and interpretation.

The REMOTS® hardware consists of a wedge-shaped optical prism having a standard 35mm-camera mounted horizontally above in a watertight housing (Figure 2-3). The prism resembles an inverted periscope, with a clear Plexiglas window measuring 15 cm wide and 20 cm high and an internal mirror mounted at a 45° angle to reflect the image in the window up to the camera. Light is provided by an internal strobe that resides within the optical prism. In order to equalize pressure and reduce refraction, the prism is filled with distilled water. The prism sits inside a stainless steel external frame, and the entire assembly is lowered to the seafloor using a standard winch mounted aboard the survey vessel. Upon contact with the bottom, the prism descends slowly into the seafloor, cutting a vertical cross-section profile of the upper 15 to 20 cm of sediment, and a photograph is taken of the sediment in contact with the window. The resulting 35-mm slides (images) showing relatively undisturbed sediment profiles are then analyzed for a standard suite of measured parameters (Rhoads and Germano 1982; 1986).

Computer-aided analysis of each REMOTS® sediment profile image yielded a series of measurements. The standard measured parameters include sediment grain size major mode, camera prism penetration depth (an indirect measure of sediment bearing capacity/density), small-scale surface boundary roughness, depth of the apparent redox potential discontinuity (RPD), infaunal successional stage, and Organism-Sediment Index (a summary parameter reflecting the overall benthic habitat quality). A detailed description of REMOTS® photograph acquisition and interpretive rationale is given in DAMOS Contribution No. 60 (Parker and Revelas 1989), as well as in Rhoads and Germano (1982; 1986). The following paragraphs provide brief descriptions of the interpretive framework and methods used for the various measurement parameters.

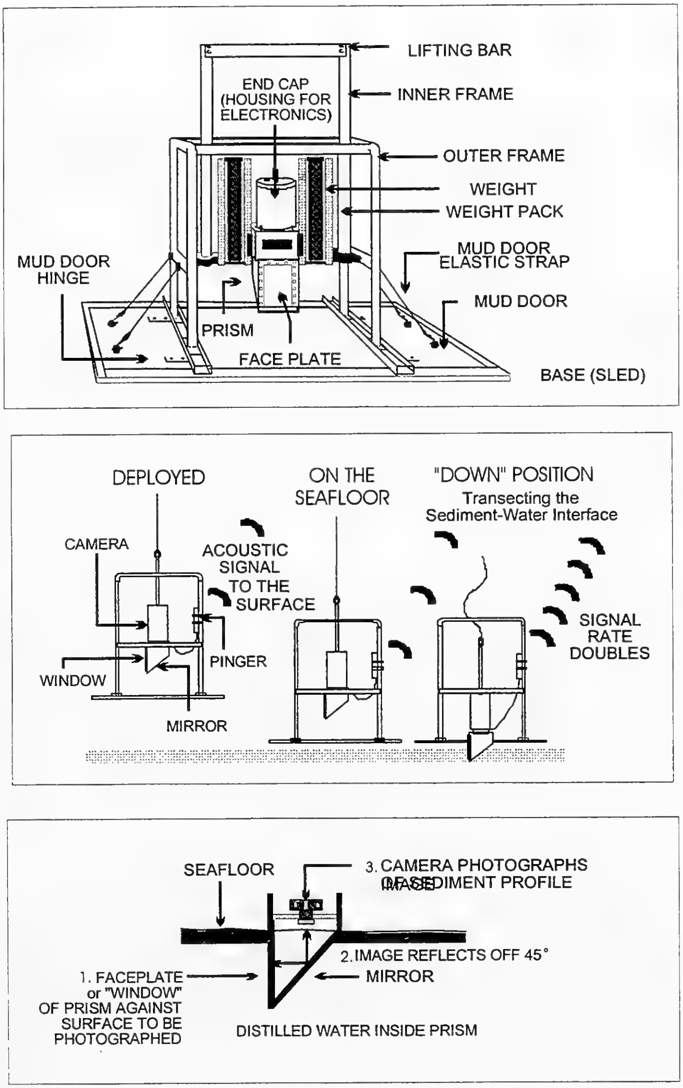

Figure 2-3. Schematic diagram of Benthos, Inc. Model 3731 REMOTS® sediment-profile camera and sequence of operation on deployment.

The sediment grain size major mode values are visually estimated from the REMOTS® photographs by overlaying a grain size comparator that is at the same scale. For REMOTS® analysis, sediment grain size major mode is expressed in phi units. This measurement represents the dominant grain size in the entire frame (field of view) and may not distinguish layers of coarser or finer material. However, the results presented in this report for 1992 and 1997 explicitly record distinct layers separately from major mode. A grain size scale for sediments has been provided in Table 2-3, to allow easy conversion between phi units, millimeters, and standard sieve sizes.

The REMOTS sediment profile camera consists of an optical prism, which penetrates the bottom under a static driving force imparted by its own weight. The penetration depth into the bottom depends on the force exerted by the optical prism and the bearing strength of the sediment. If the weight of the camera prism is held constant, the change in penetration depth over a surveyed site will reflect changes in geotechnical properties of the bottom. In this sense, the camera prism acts as a static-load penetrometer. The depth of penetration of the optical prism into the bottom can be a useful parameter, because dredged and capped materials often will have different shear strengths and bearing capacities.

Small-scale surface boundary roughness is the amount of surface relief at the sediment-water interface, and is calculated by measuring the vertical distance between the high and low points of the interface in each sediment-profile photograph. Boundary roughness can be categorized as biological, physical, or indeterminate. Biological disturbances, typically the result of macrofaunal activity, usually result in only a small increase is boundary roughness (<1 cm). A mature and undisturbed benthic environment tends to have biological boundary roughness. Physical disturbances can be anthropogenic in origin (for example, by bottom trawling or dredged material disposal) or attributed to natural processes such as wave and current motion.

The Apparent Redox Potential Discontinuity (RPD) depth is the boundary between oxygenated sediment and the underlying hypoxic or anoxic sediment. The RPD depth is a sensitive indicator of the biological mixing depth, infaunal successional status, and within-station patchiness (Revelas et al. 1987). The RPD is determined by measuring the thickness of the high reflectance sediment layer at the sediment-water interface formed by light-colored oxygenated or oxidized sediment.

Successional stage mapping is based upon the hypothesis that organism-sediment interactions follow a predictable successional sequence after a major seafloor disturbance (Rhoads and Germano 1986). A disturbance can be any type of event that induces seafloor

Table 2-3
Grain Size Scales for Sediments

ASTM (Unified) Classification[1]	U.S. Std. Sieve[2]	Size in mm	Phi (Ø) Size	Wentworth Classification[3]
Boulder		4096.	-12.0	
		1024.	-10.0	Boulder
	12 in (300 mm)	256.	-8.0	
		128.	-7.0	Large Cobble
		107.64	-6.75	
Cobble		90.51	-6.5	Small Cobble
	3 in (75mm)	76.11	-6.25	
		64.00	-6.0	
		53.82	-5.75	
		45.26	-5.5	
		38.05	-5.25	Very Large Pebble
Coarse Gravel		32.00	-5.0	
		26.91	-4.75	
		22.63	-4.5	
	3/4 in (19 mm)	·19.03	-4.25	Large Pebble
		16.00	-4.0	
		13.45	-3.75	
		11.31	-3.5	
		9.51	-3.25	Medium Pebble
Fine Gravel	2.5	8.00	-3.0	
	3	6.73	-2.75	
	3.5	5.66	-2.5	
	4 (4.75 mm)	4.76	-2.25	Small Pebble
	5	4.00	-2.0	
	6	3.36	-1.75	
Coarse Sand	7	2.83	-1.5	
	8	2.38	-1.25	
	10 (2.0 mm)	2.00	-1.0	Granule
	12	1.68	-0.75	
	14	1.41	-0.5	
	16	1.19	-0.25	
	18	1.00	0.0	Very Coarse Sand
	20	0.84	0.25	
Medium Sand	25	0.71	0.5	
	30	0.59	0.75	
	35	0.50	1.0	Coarse Sand
	40 (0.425 mm)	0.420	1.25	
	45	0.354	1.5	
	50	0.297	1.75	
	60	0.250	2.0	Medium Sand
	70	0.210	2.25	
	80	0.177	2.5	
	100	0.149	2.75	
Fine Sand	120	0.125	3.0	
	140	0.105	3.25	Fine Sand
	170	0.088	3.5	
	200 (0.075 mm)	0.074	3.75	
	230	0.0625	4.0	
	270	0.0526	4.25	Very Fine Sand
	325	0.0442	4.5	
Fine-grained Soil:	400	0.0372	4.75	
		0.0312	5.0	
Clay if PI ³ 4 and plot of PI vs.		0.0156	6.0	Coarse Silt
LL is on or above "A" line*		0.0078	7.0	
Silt if PI < 4 and plot of PI vs.		0.0039	8.0	
LL is below "A" line*		0.00195	9.0	Medium Silt
		0.00098	10.0	
		0.00049	11.0	Fine Silt
*and the presence of organic matter		0.00024	12.0	Very Fine Silt
does not influence LL.		0.00012	13.0	Coarse Clay
		0.000061	14.0	Medium Clay
				Fine Clay

1. ASTM Standard D 2487-92. This is the ASTM version of the Unified Soil Classification System. Both systems are similar (from ASTM (1993)).
2. Note that British Standard, French, and German DIN mesh sizes and classifications are different.
3. Wentworth sizes (in inches) cited in Krumbein and Sloss (1963).

erosion, changes seafloor chemistry, or causes major reorganization of the resident benthos. These perturbations can be natural events (i.e., strong currents or a passing storm) or anthropogenic events (i.e., dredged material disposal or power plant effluent).

Pioneering assemblages (Stage I) usually consist of dense aggregations of near-surface living, tube-dwelling polychaetes. These organisms begin to populate a sediment deposit within days of a benthic disturbance, as they readily exploit the competition free space. Due to their limited interaction with the sediment, these organisms are usually associated with a shallow RPD.

In more stable environments Stage I assemblages are replaced by infaunal deposit feeders or larger tube dwellers (Stage II). Typical Stage II organisms in Long Island Sound include shallow-dwelling bivalves and tubicolous amphipods. In general, tubicolous amphipods are common in eastern Long Island Sound. The presence of dense aggregations of these amphipods (*Ampelisca* sp.) in the area surrounding NLDS has been identified as a cyclical phenomenon as the spring-summer and over-winter populations mature, reproduce, and decline. As a result, the timing of the individual REMOTS® surveys over the years have documented the amphipod populations in eastern Long Island Sound during different stages of the life cycle.

Stage III biota represent a high-order successional stage and are usually associated with areas of seafloor that is not usually subject to surface disturbances. Stage III assemblages (infaunal invertebrates) are typically head-down deposit feeders whose feeding behavior usually results in distinctive subsurface voids. The foraging activities of Stage III organisms are capable of introducing oxygen-rich bottom water to the sediment at depths approaching 10-20 cm below the sediment-water interface. As a result, the bioturbational activity of Stage III organisms tends to cause the deepening of the RPD.

A multi-parameter REMOTS® Organism-Sediment Index (OSI) has been constructed to characterize habitat quality (Table 2-4). Habitat quality is defined relative to two end-member standards. The lowest value is given to those sediments which have low or no dissolved oxygen in the overlying bottom water, very shallow RPD depth, no apparent macrofaunal life, and methane gas present in the sediment. The REMOTS® OSI value for such a condition is minus 10 (-10). At the other end of the scale, an aerobic bottom with a deep RPD, evidence of a mature macrofaunal assemblage, and no apparent methane gas bubbles at depth will have a OSI value of plus 11 (+11). OSI values of +6 or less are indicative of chronically stressed benthic habitats and/or those that have experienced recent disturbance (i.e., erosion, sediment transport, dredged material disposal, hypoxia, intense demersal predator foraging, etc.; Rhoads and Germano 1982).

Table 2-4
Calculation of REMOTS® Organism Sediment Index Value

A. CHOOSE ONE VALUE:

Mean RPD Depth	Index Value
0.00 cm	0
> 0 - 0.75 cm	1
0.75 - 1.50 cm	2
1.51 - 2.25 cm	3
2.26 - 3.00 cm	4
3.01 - 3.75 cm	5
> 3.75 cm	6

B. CHOOSE ONE VALUE:

Successional Stage	Index Value
Azoic	-4
Stage I	1
Stage I ® II	2
Stage II	3
Stage II ® III	4
Stage III	5
Stage I on III	5
Stage II on III	5

C. CHOOSE ONE OR BOTH IF APPROPRIATE:

Chemical Parameters	Index Value
Methane Present	-2
No/Low Dissolved Oxygen**	-4

REMOTS® ORGANISM-SEDIMENT INDEX = Total of above subset indices (A+B+C)

RANGE: -10 - +11

** **Note**: This is not based on a Winkler or polarigraphic electrode measurement. It is based on the imaged evidence of reduced, low reflectance (i.e., high oxygen demand) sediment at the sediment-water interface.

2.2.1 NL-91 and the Dow/Stonington (D/S) Mound Complex

The NL-91 and D/S Mound complex was developed as part of a dredged material capping project during the 1991-92 disposal season. These mounds were first monitored using REMOTS® sediment-profile photography in August 1992. Three replicate photographs were collected at each of 41 REMOTS® stations radially distributed around the NDA-91-2 buoy position (Figure 2-4A; Table 2-4). The name of each station in Figure 2-4 represents its distance (in meters) from the center (CTR) station. Many of these stations extend out to historic disposal mounds placed during the last three decades.

Follow-on surveys (1995, 1997, and 1998) focused primarily on the D/S sediment deposit. As a result, the survey grid was modified to evaluate the recovery of the capped mound. A cross-shaped, 13-station REMOTS® grid was established over the capped mound and centered at the D/S buoy position (41°16.160' N, 72°04.470' W; NAD 27; Figure 2-4B). Once again, three replicate photographs were obtained at each REMOTS® station.

This smaller, 13-station REMOTS® grid was re-occupied in 1997 and 1998, replicating the August 1995 monitoring activity. The change in positioning systems and horizontal control (NAD 27 to NAD 83) resulted in a change in the units of the survey center (41° 16.168′ N 72° 04.439′ W; NAD 83; Table 2-4). However, there was no alteration of the REMOTS® survey grid relative to seafloor features and operations performed in previous years, only a change in the reported coordinate system (Figure 2-4B).

2.2.2 USCGA Mound

The USCGA mound was first examined using sediment-profile photography in August 1995. A 13-station, cross-shaped grid, with a southeast extension, centered at 41°16.480' N, 72°04.290' W (NAD 27) was established over the USCGA mound (Figure 2-5; Table 2-5). Due to the findings of the August 1995 effort, no follow-on surveys were conducted in 1997 or 1998.

2.2.3 NL-94 Mound

The NL-94 mound was subjected to detailed investigation using REMOTS® sediment-profile photography in August 1995 and September 1997. A 15-station, modified radial grid centered on the NDA-94-1 buoy position (41°16.240' N, 72°04.890' W; NAD 27) was established over the NL-94 mound. The REMOTS® stations extended up to 150 m

Table 2-5
Coordinates of REMOTS® Sampling Stations at the NL-91 and D/S Mound Complex over the period 1992-

1992 NAD27

Area	Station	Latitude	Longitude
NL-91 D/S Mound Complex 1992 41° 16.251'N 72° 04.497'W	CTR	41° 16.251'N	72° 04.497'W
	100N	41° 16.305'N	72° 04.497'W
	200N	41° 16.359'N	72° 04.497'W
	300N	41° 16.413'N	72° 04.497'W
	400N	41° 16.467'N	72° 04.497'W
	100NE	41° 16.289'N	72° 04.447'W
	200NE	41° 16.327'N	72° 04.369'W
	300ENE	41° 16.313'N	72° 04.299'W
	400ENE	41° 16.333'N	72° 04.233'W
	100E	41° 16.251'N	72° 04.426'W
	200E	41° 16.251'N	72° 04.354'W
	300E	41° 16.251'N	72° 04.282'W
	400E	41° 16.251'N	72° 04.211'W
	500E	41° 16.251'N	72° 04.139'W
	600E	41° 16.251'N	72° 04.068'W
	400ESE	41° 16.168'N	72° 04.233'W
	500ESE	41° 16.147'N	72° 04.166'W
	600ESE	41° 16.126'N	72° 04.100'W
	100SE	41° 16.212'N	72° 04.447'W
	200SE	41° 16.174'N	72° 04.396'W
	300SE	41° 16.136'N	72° 04.354'W
	400SE	41° 16.098'N	72° 04.295'W
	500SE	41° 16.059'N	72° 04.244'W
	600SE	41° 16.021'N	72° 04.193'W
	300SSE	41° 16.101'N	72° 04.415'W
	400SSE	41° 16.051'N	72° 04.388'W
	500SSE	41° 16.001'N	72° 04.360'W
	100S	41° 16.197'N	72° 04.497'W
	200S	41° 16.142'N	72° 04.497'W
	300S	41° 16.088'N	72° 04.497'W
	400S	41° 16.034'N	72° 04.497'W
	500S	41° 15.980'N	72° 04.497'W
	600S	41° 15.926'N	72° 04.497'W
	100SW	41° 16.212'N	72° 04.548'W
	200SW	41° 16.174'N	72° 04.599'W
	100W	41° 16.251'N	72° 04.569'W
	200W	41° 16.251'N	72° 04.641'W
	300W	41° 16.251'N	72° 04.712'W
	400W	41° 16.251'N	72° 04.784'W
	100NW	41° 16.289'N	72° 04.548'W
	200NW	41° 16.327'N	72° 04.594'W

1995 NAD27

Area	Station	Latitude	Longitude
D/S Mound 1995 41° 16.162' N 72° 04.468' W	CTR	41° 16.162' N	72° 04.468' W
	100N	41° 16.216' N	72° 04.468' W
	200N	41° 16.270' N	72° 04.468' W
	300N	41° 16.324' N	72° 04.468' W
	100S	41° 16.108' N	72° 04.468' W
	200S	41° 16.054' N	72° 04.468' W
	100E	41° 16.162' N	72° 04.396' W
	200E	41° 16.162' N	72° 04.325' W
	300E	41° 16.162' N	72° 04.253' W
	400E	41° 16.162' N	72° 04.182' W
	500E	41° 16.162' N	72° 04.110' W
	100W	41° 16.162' N	72° 04.540' W
	200W	41° 16.162' N	72° 04.611' W

1997-1998 NAD83

Area	Station	Latitude	Longitude
D/S Mound 1997 41° 16.168' N 72° 04.439' W	CTR	41° 16.168' N	72° 04.439' W
	100N	41° 16.222' N	72° 04.439' W
	200N	41° 16.276' N	72° 04.439' W
	300N	41° 16.330' N	72° 04.439' W
	100S	41° 16.114' N	72° 04.439' W
	200S	41° 16.060' N	72° 04.439' W
	100E	41° 16.168' N	72° 04.367' W
	200E	41° 16.168' N	72° 04.296' W
	300E	41° 16.168' N	72° 04.224' W
	400E	41° 16.168' N	72° 04.153' W
	500E	41° 16.168' N	72° 04.081' W
	100W	41° 16.168' N	72° 04.511' W
	200W	41° 16.168' N	72° 04.582' W

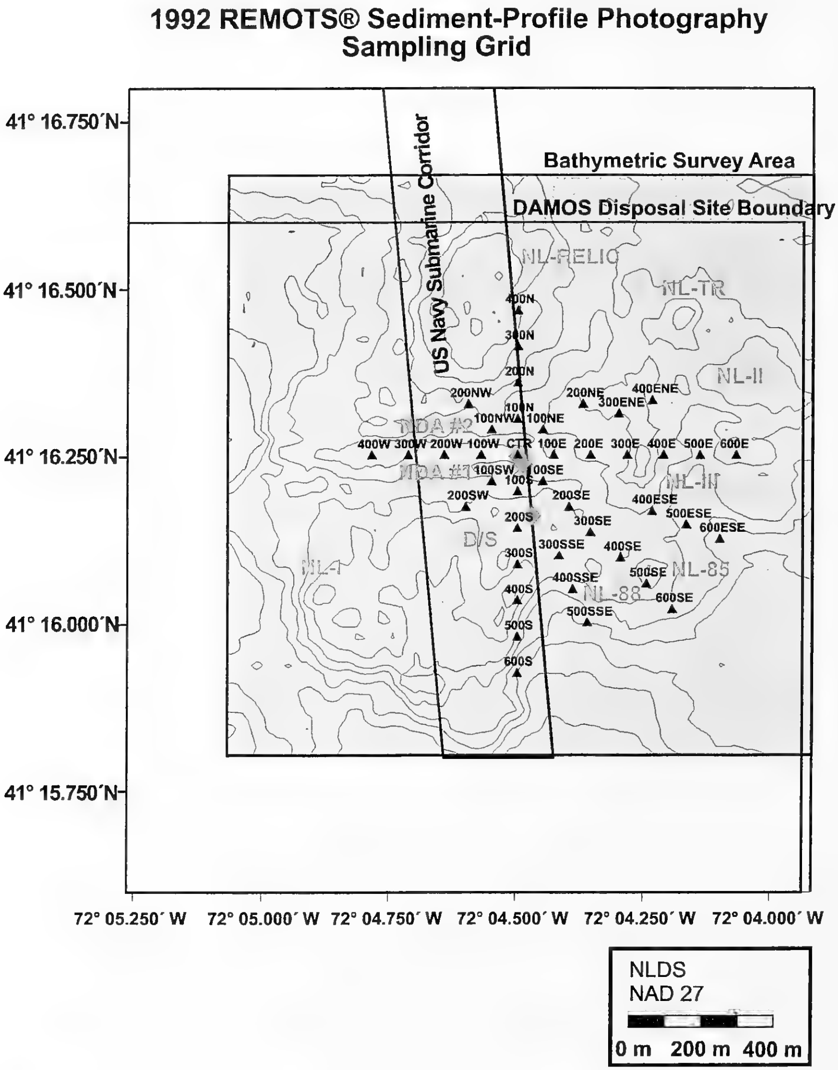

Figure 2-4A. Distribution of the 1992 REMOTS® sediment-profile photography stations (41) over the NL-91 and D/S mound complex, relative to the DAMOS disposal site boundary and the US Navy submarine corridor

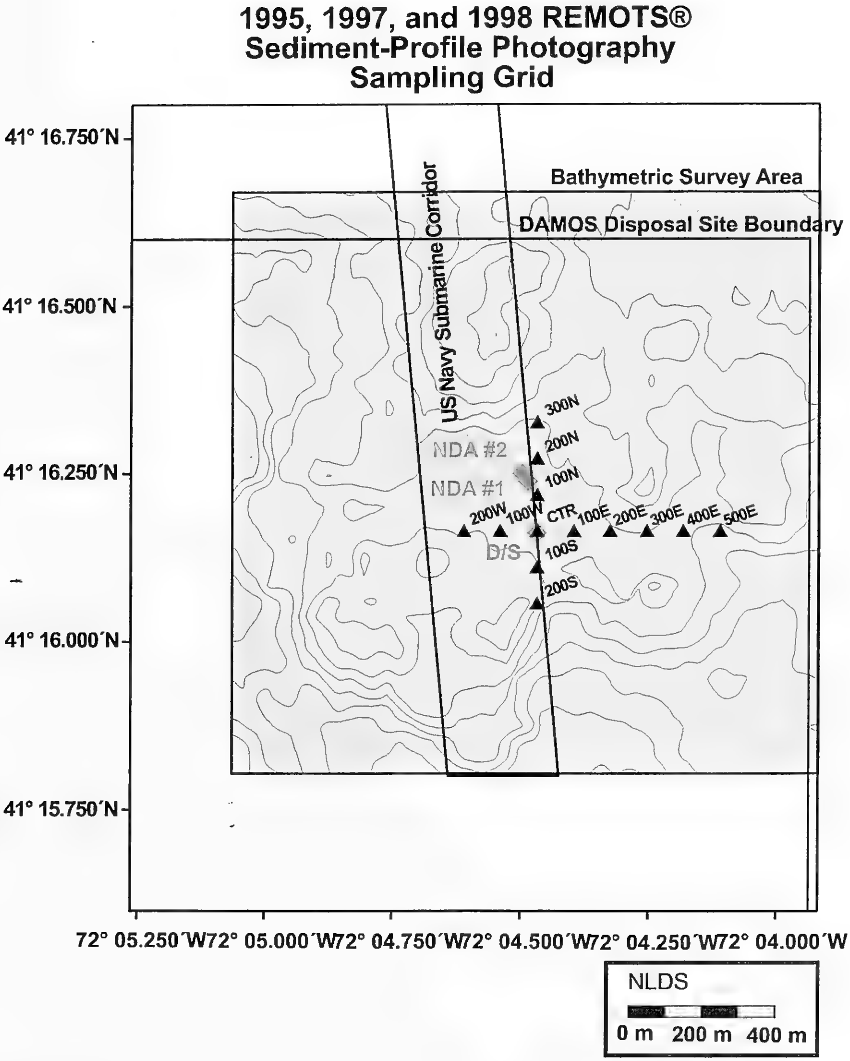

Figure 2-4B. Distribution of 1995, 1997, and 1998 REMOTS® sediment-profile photography stations (13) over the NL-91 and D/S mound complex, relative to disposal site boundary and the US Navy submarine corridor

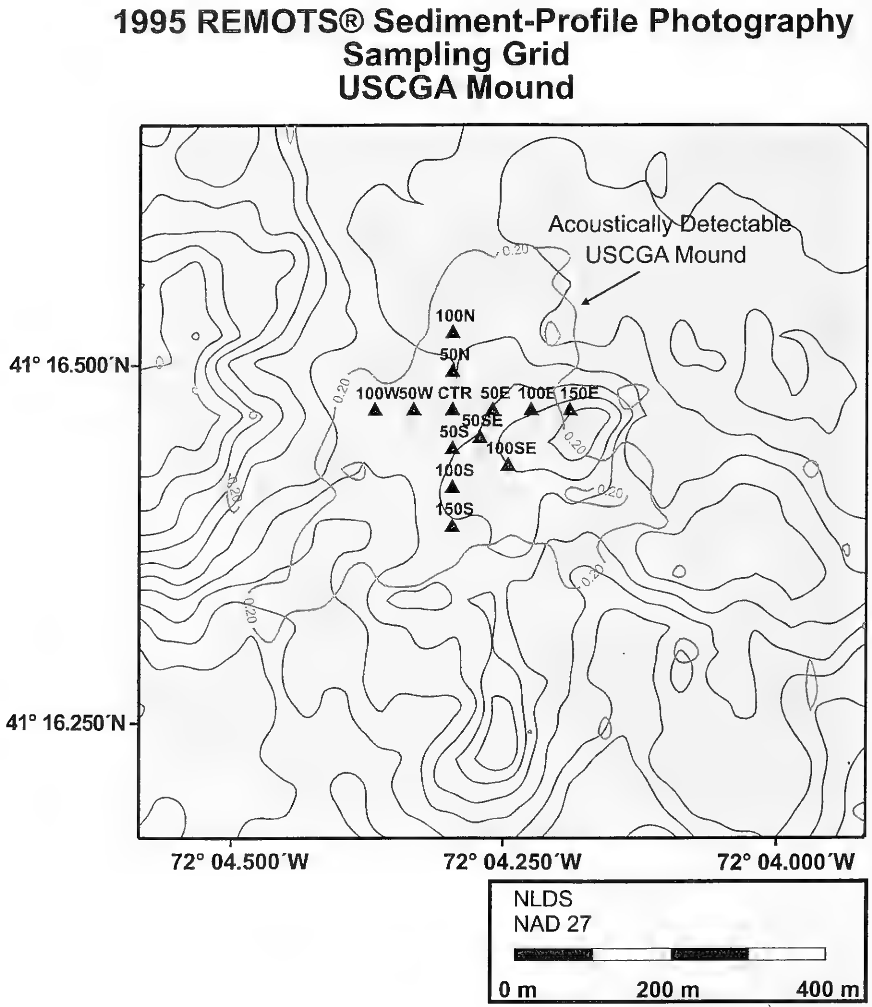

Figure 2-5. Distribution of 1995 REMOTS® sediment-profile photography stations (13) over the USCGA mound, relative to the detectable margins of the mound

from the center of the capped mound (Figure 2-6; Table 2-6A). The 1997 field effort reported the survey center as 41° 16.244´ N 72° 04.864´ W in NAD 83. The 15-station, radial pattern was re-occupied in September 1997 to allow comparisons between the data sets (Table 2-6).

2.2.4 Northern Region

Due to the northerly shift in the surveyed NLDS boundaries in 1996, baseline characterization of the sediments within the region north of the NL-Relic mound was required. In September 1997, REMOTS® data were collected over the Northern Region to evaluate the benthic habitat conditions within the sediments before they received any further direct deposition of dredged material (this region received material prior to DAMOS monitoring). In order to cover the 0.685 km^2 area of seafloor efficiently, a total of 11 stations were occupied along two parallel, east-west trending lines. Five stations, spaced 410 m apart, were established along the northern line (latitude 41° 16.779´ N; NAD 83) while the southern line (latitude 41° 16.633´ N; NAD 83) was composed of six stations, spaced at 350 m intervals (Figure 2-7; Table 2-7).

2.2.5 NLDS Reference Areas

Data from three reference areas (NLON REF, NE REF, and WEST REF) are used for comparison of ambient eastern Long Island Sound sediments relative to the material deposited at NLDS through disposal operations. These three established reference areas are often sampled as part of sediment chemistry and benthic habitat surveys at NLDS. From 1992 through 1998, the NLDS reference areas were sampled as part of the sediment-profile photography surveys of the various project mounds within the disposal site.

In 1992, three 13-station REMOTS® grids were occupied at the NLDS reference areas: W-REF, NE-REF, and NLON-REF (Figure 2-8; Table 2-8). The REMOTS® sampling grids over the NLDS reference areas formed a cross-shaped pattern with a center station and three additional stations along each of four arms spaced at 100 m intervals. The surveys over NLON REF, NE REF, and WEST REF were centered at 41°16.660' N, 72°02.000' W, 41°16.680' N, 72°03.400' W, and 41°16.200' N, 72°06.000' W (NAD 27) respectively.

In 1995 and subsequent surveys, the sampling rationale at the NLDS reference areas changed somewhat, as a random sampling pattern was introduced (Figure 2-8). Four to six stations were randomly selected within a 300 meter radius of the center of each reference area. A total of fifteen REMOTS® stations (STA) were sampled at NLON REF, NE REF, and WEST REF in 1995. NLON REF was sampled at four randomly selected stations.

Table 2-6
USCGA Mound
REMOTS® Stations Coordinates

1995 NAD27			
Area	**Station**	**Latitude**	**Longitude**
USCGA 1995 41° 16.468′ N 72° 04.297′ W	CTR	41° 16.468′ N	72° 04.297′ W
	50N	41° 16.495′ N	72° 04.297′ W
	100N	41° 16.522′ N	72° 04.297′ W
	50S	41° 16.441′ N	72° 04.297′ W
	100S	41° 16.414′ N	72° 04.297′ W
	150S	41° 16.387′ N	72° 04.297′ W
	50E	41° 16.468′ N	72° 04.261′ W
	100E	41° 16.468′ N	72° 04.225′ W
	150E	41° 16.468′ N	72° 04.190′ W
	50SE	41° 16.449′ N	72° 04.272′ W
	100SE	41° 16.430′ N	72° 04.246′ W
	50W	41° 16.468′ N	72° 04.333′ W
	100W	41° 16.468′ N	72° 04.369′ W

Table 2-7
NL94 Mound
REMOTS® Stations Coordinates

A

1995 NAD27			
Area	**Station**	**Latitude**	**Longitude**
NL-94 1995 41° 16.238′ N 72° 04.893′ W	CTR	41° 16.238′ N	72° 04.893′ W
	50N	41° 16.265′ N	72° 04.893′ W
	50NE	41° 16.257′ N	72° 04.868′ W
	100NE	41° 16.276′ N	72° 04.842′ W
	100E	41° 16.238′ N	72° 04.821′ W
	50SE	41° 16.219′ N	72° 04.868′ W
	100SE	41° 16.200′ N	72° 04.842′ W
	150SE	41° 16.181′ N	72° 04.817′ W
	50S	41° 16.211′ N	72° 04.893′ W
	50SW	41° 16.219′ N	72° 04.918′ W
	100SW	41° 16.200′ N	72° 04.944′ W
	100W	41° 16.238′ N	72° 04.965′ W
	50NW	41° 16.257′ N	72° 04.918′ W
	100NW	41° 16.276′ N	72° 04.944′ W
	150NW	41° 16.295′ N	72° 04.969′ W

B

1997 NAD83			
Area	**Station**	**Latitude**	**Longitude**
NL-94 1997 41° 16.244′ N 72° 04.864′ W	CTR	41° 16.244′ N	72° 04.893′ W
	50N	41° 16.271′ N	72° 04.893′ W
	50NE	41° 16.263′ N	72° 04.868′ W
	100NE	41° 16.282′ N	72° 04.842′ W
	100E	41° 16.244′ N	72° 04.821′ W
	50SE	41° 16.225′ N	72° 04.868′ W
	100SE	41° 16.206′ N	72° 04.842′ W
	150SE	41° 16.187′ N	72° 04.817′ W
	50S	41° 16.244′ N	72° 04.893′ W
	50SW	41° 16.219′ N	72° 04.918′ W
	100SW	41° 16.200′ N	72° 04.944′ W
	100W	41° 16.238′ N	72° 04.965′ W
	50NW	41° 16.257′ N	72° 04.918′ W
	100NW	41° 16.276′ N	72° 04.944′ W
	150NW	41° 16.295′ N	72° 04.969′ W

Table 2-8
New London Disposal Site
Northern Region
REMOTS® Stations Coordinates

1997 NAD83			
Area	**Station**	**Latitude**	**Longitude**
NLDS North Region 1997	N1	41° 16.633′ N	72° 03.945′ W
	N2	41° 16.779′ N	72° 03.988′ W
	N3	41° 16.633′ N	72° 04.196′ W
	N4	41° 16.779′ N	72° 04.282′ W
	N5	41° 16.633′ N	72° 04.446′ W
	N6	41° 16.779′ N	72° 04.576′ W
	N7	41° 16.633′ N	72° 04.697′ W
	N8	41° 16.779′ N	72° 04.869′ W
	N9	41° 16.633′ N	72° 04.948′ W
	N10	41° 16.779′ N	72° 05.162′ W
	N11	41° 16.633′ N	72° 05.198′ W

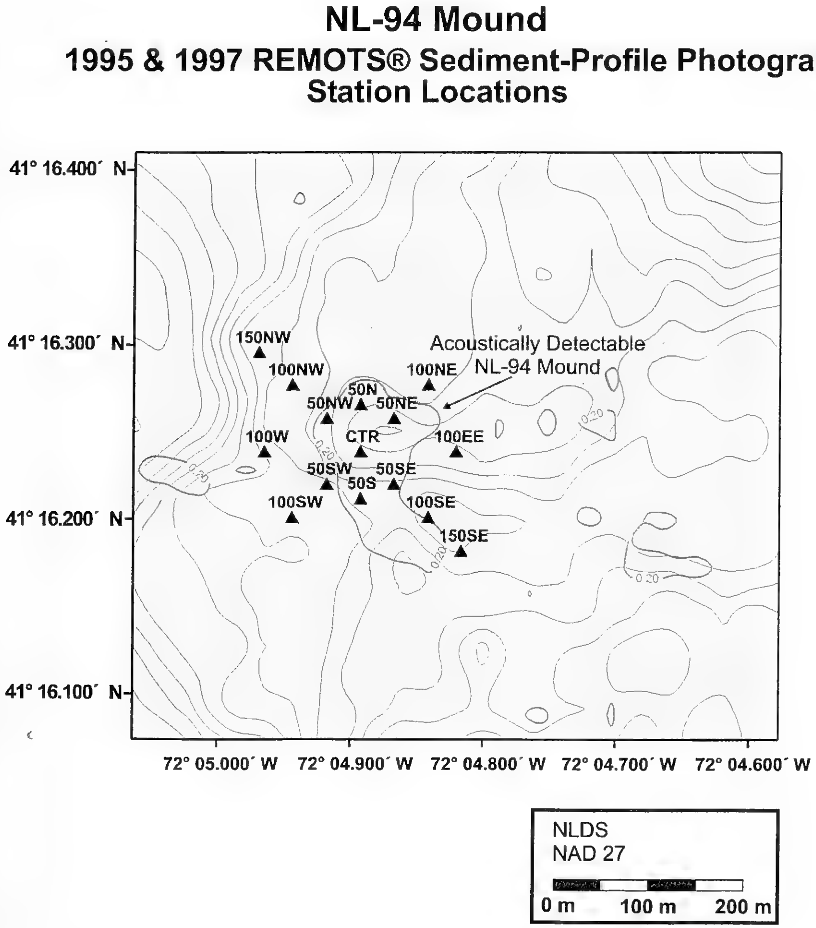

Figure 2-6. Distribution of 1995 and 1997 REMOTS® sediment-profile photography stations (13) over the NL-94 mound, relative to the detectable margins of the mound

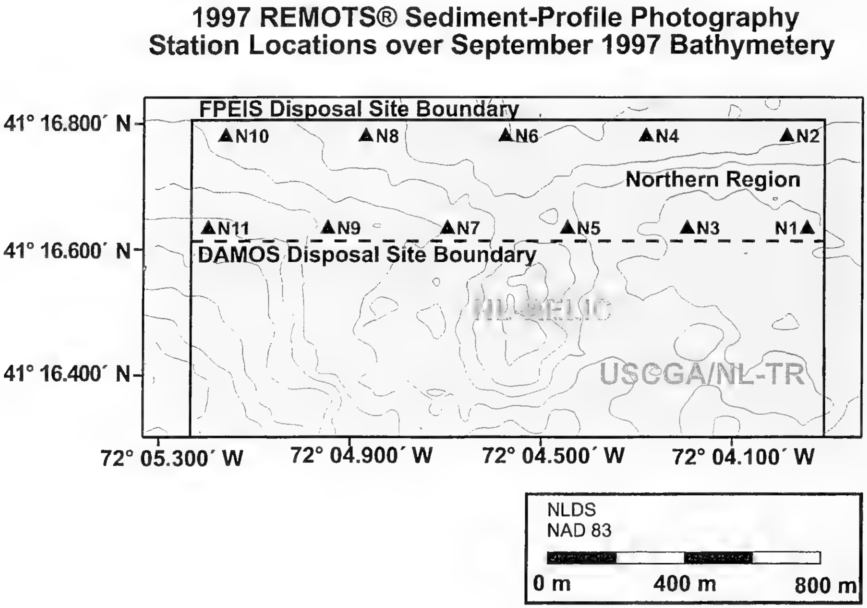

Figure 2-7. Distribution of 1997 REMOTS® sediment-profile photography stations (11) over the Northern Region, relative to the FPEIS disposal site boundary and historic disposal mounds

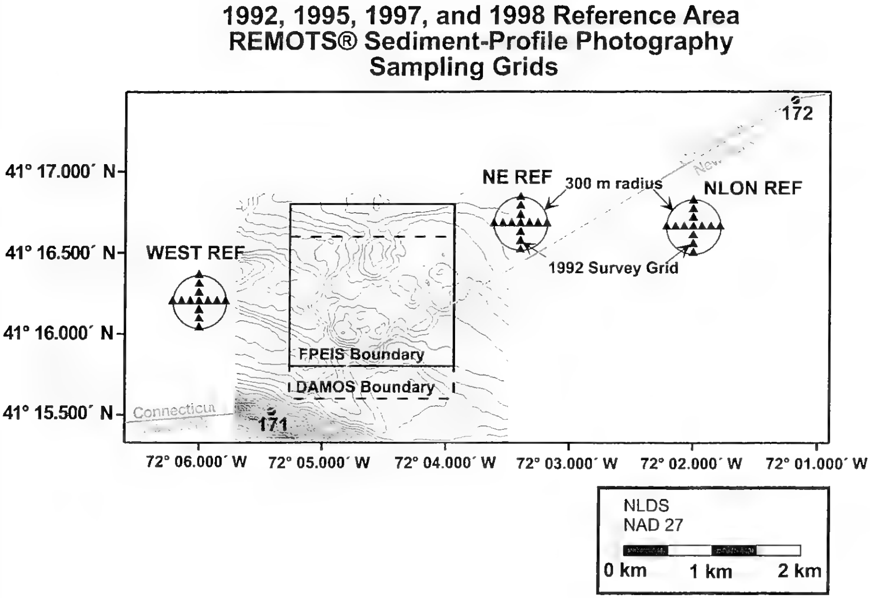

Figure 2-8. Location of the NLDS reference areas and distribution 1992 reference area REMOTS® sediment-profile photography stations (39), relative to the NLDS site boundaries and New York-Connecticut State Line

WEST REF was sampled at six randomly selected stations (STA5 falling outside the 300 m sampling radius). NE REF was sampled at five randomly selected stations (STA1 falling outside the 300 m sampling radius; Table 2-8).

The random sampling protocol continued for the 1997 and 1998 field efforts with NLON REF (41°16.666´ N, 72° 01.971´ W) and WEST REF (41° 16.206´ N, 72° 05.971´ W) each being sampled at four randomly selected stations. NE REF (41° 16.686´ N, 72° 03.371´W) was sampled at five randomly selected stations. However, the center coordinates and target station locations were reported in the horizontal control of NAD 83 (Figure 2-8; Table 2-8).

2.3 Dissolved Oxygen Sampling

All dissolved oxygen (DO) sampling activities were conducted 8 and 9 August 1992 and included CTD casts and Niskin bottle water sampling. Profiles were completed at one station over the D/S mound (200 SW) and one station at each of the three reference areas (Figure 2-9). In addition, surface and near-bottom water samples were collected at each DO Station and subjected to Winkler titration to verify the CTD values.

A Sea-Bird Electronics, Inc., Model SBE 19-01 CTD equipped with a centrifugal pump and a SBE 13 Dissolved Oxygen Sensor was used to collect water column and near bottom water quality data (temp, salinity, pressure, density, dissolved oxygen concentrations). The CTD was allowed to equilibrate in ambient surface water for two minutes before performing a cast. The descent rate was controlled to yield sufficient data for each 1 meter horizon within the water column. As the CTD probe approached the bottom, the unit was allowed to rest approximately 1 meter above the seafloor for a period of one or more minutes before beginning the ascent. Upon retrieval from the water, data was downloaded to a Toshiba® 3200T personal computer for analysis.

Water samples were taken simultaneously with the CTD DO profile. A pair of 5-liter Niskin bottles were tripped one meter below the air-water interface and one meter above the sediment-water interface. A 300 ml subsample was taken from each Niskin bottle, preserved, and titrated within twelve hours using the modified Winkler titration (Strickland and Parsons 1972; Parsons et al. 1984). During routine quality assurance review of the data, it was determined that the dissolved oxygen sensor on the CTD was experiencing a malfunction that resulted in erroneous readings. Therefore, only the Winkler titration DO determinations are presented in this report.

The measurements obtained over two days during the August 1992 survey provide a very limited, "snapshot" view of dissolved oxygen conditions within the disposal site and

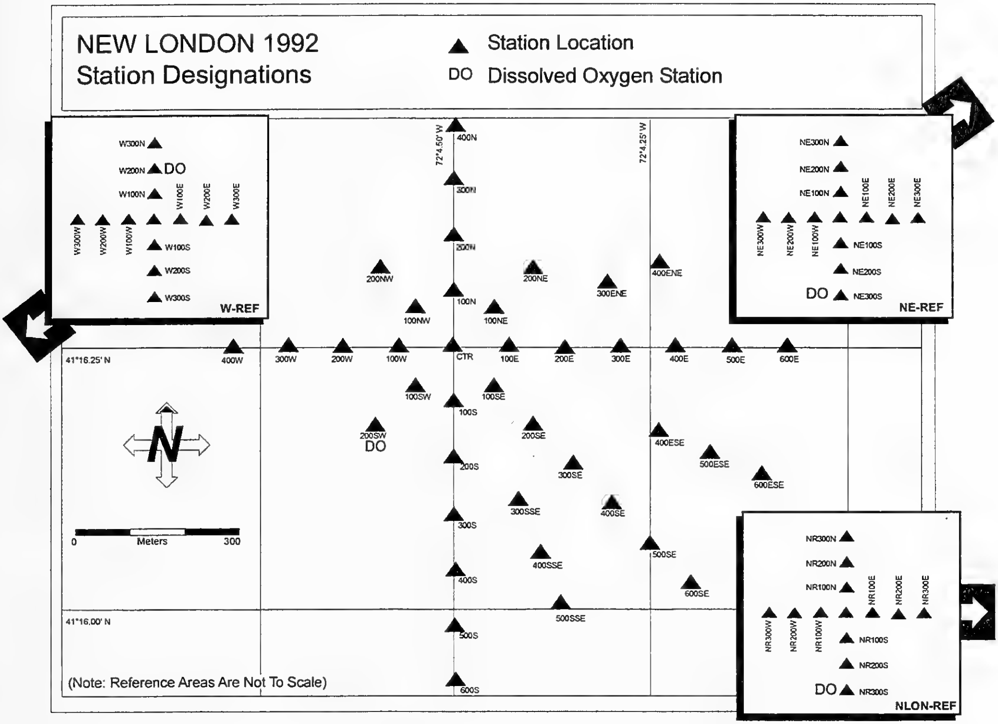

Figure 2-9. Locations selected for water column (CTD) profiles, as well as near surface and near bottom water samples for dissolved oxygen concentrations during the August 1992 field operations

at the reference areas. Continuous monitoring over the course of several weeks or months was determined to be much more useful for interpreting possible correlations between bottom-water DO concentrations and benthic habitat quality. By examining the longer-term trends in bottom water DO concentrations, conclusions related to any degradation over time or irregularities in benthic recolonization at NLDS could be based on localized (dredged material related) or regional (seasonal hypoxia) effects.

The Connecticut Department of Environmental Protection (CTDEP) sponsors a comprehensive DO monitoring program within Long Island Sound. Water quality data are collected from 18 stations on a bi-weekly basis throughout the year. As summer approaches and hypoxic conditions begin to impact Long Island Sound, the program intensifies its sampling efforts by incorporating a total of 48 stations. These data were made available to the DAMOS Program for the 1995 and subsequent surveys to document the trends in bottom-water DO concentrations and evaluate REMOTS® sediment-profile photography results relative to this information. Therefore, DAMOS did not conduct its own DO monitoring at the site after 1992.

Table 2-9
NLDS Reference Areas
REMOTS® Stations Coordinates

A — 1992, NAD27

Area	Station	Latitude	Longitude
NLON REF 1992 41° 16.660′N 72° 02.000′W	CTR	41° 16.660′N	72° 02.000′W
	100N	41° 16.714′N	72° 02.000′W
	200N	41° 16.768′N	72° 02.000′W
	300N	41° 16.822′N	72° 02.000′W
	100S	41° 16.606′N	72° 02.000′W
	200S	41° 16.552′N	72° 02.000′W
	300S	41° 16.498′N	72° 02.000′W
	100E	41° 16.660′N	72° 01.928′W
	200E	41° 16.660′N	72° 01.857′W
	300E	41° 16.660′N	72° 01.785′W
	100W	41° 16.660′N	72° 02.072′W
	200W	41° 16.660′N	72° 02.143′W
	300W	41° 16.660′N	72° 02.215′W
NE REF 1992 41° 16.680′N 72° 03.400′W	CTR	41° 16.680′N	72° 03.400′W
	100N	41° 16.734′N	72° 03.400′W
	200N	41° 16.788′N	72° 03.400′W
	300N	41° 16.842′N	72° 03.400′W
	100S	41° 16.626′N	72° 03.400′W
	200S	41° 16.572′N	72° 03.400′W
	300S	41° 16.518′N	72° 03.400′W
	100E	41° 16.680′N	72° 03.328′W
	200E	41° 16.680′N	72° 03.257′W
	300E	41° 16.680′N	72° 03.185′W
	100W	41° 16.680′N	72° 03.472′W
	200W	41° 16.680′N	72° 03.543′W
	300W	41° 16.680′N	72° 03.615′W
WEST REF 1992 41° 16.200′N 72° 06.000′W	CTR	41° 16.200′N	72° 06.000′W
	100N	41° 16.254′N	72° 06.000′W
	200N	41° 16.308′N	72° 06.000′W
	300N	41° 16.362′N	72° 06.000′W
	100S	41° 16.146′N	72° 06.000′W
	200S	41° 16.092′N	72° 06.000′W
	300S	41° 16.038′N	72° 06.000′W
	100E	41° 16.200′N	72° 05.928′W
	200E	41° 16.200′N	72° 05.857′W
	300E	41° 16.200′N	72° 05.785′W
	100W	41° 16.200′N	72° 06.072′W
	200W	41° 16.200′N	72° 06.143′W
	300W	41° 16.200′N	72° 06.215′W

B — 1995, NAD27

Area	Station	Latitude	Longitude
NLON REF 1995 41° 16.660′N 72° 02.000′W	STAT. 1	41° 16.662′ N	72° 01.992′ W
	STAT. 2	41° 16.531′ N	72° 02.107′ W
	STAT. 3	41° 16.657′ N	72° 01.996′ W
	STAT. 4	41° 16.729′ N	72° 02.018′ W
NE REF 1995 41° 16.680′N 72° 03.400′W	STAT. 1	41° 16.681′ N	72° 03.400′ W
	STAT. 2	41° 16.697′ N	72° 03.364′ W
	STAT. 3	41° 16.652′ N	72° 03.209′ W
	STAT. 4	41° 16.712′ N	72° 03.290′ W
	STAT. 5	41° 16.730′ N	72° 03.244′ W
WEST REF 1995 41° 16.200′N 72° 06.000′W	STAT. 1	41° 16.213′N	72° 06.054′W
	STAT. 2	41° 16.258′N	72° 05.890′W
	STAT. 3	41° 16.155′N	72° 06.164′W
	STAT. 4	41° 16.213′N	72° 06.016′W
	STAT. 5	41° 16.183′N	72° 06.963′W
	STAT. 6	41° 16.183′N	72° 06.063′W

C — 1997, NAD83

Area	Station	Latitude	Longitude
NLON REF 1997 41° 16.666′N 72° 01.971′W	STAT. 1	41° 16.707′ N	72° 01.963′ W
	STAT. 2	41° 16.568′ N	72° 02.046′ W
	STAT. 3	41° 16.695′ N	72° 01.895′ W
	STAT. 4	41° 16.562′ N	72° 02.838′ W
NE REF 1997 41° 16.686′N 72° 03.371′W	STAT. 5	41° 16.663′ N	72° 03.313′ W
	STAT. 6	41° 16.684′ N	72° 03.373′ W
	STAT. 7	41° 16.765′ N	72° 03.360′ W
	STAT. 8	41° 16.693′ N	72° 03.544′ W
	STAT. 9	41° 16.675′ N	72° 03.254′ W
WEST REF 1997 41° 16.206′N 72° 05.971′W	STAT. 10	41° 16.208′N	72° 05.925′W
	STAT. 11	41° 16.331′N	72° 05.851′W
	STAT. 12	41° 16.200′N	72° 05.978′W
	STAT. 13	41° 16.172′N	72° 05.849′W

3.0 RESULTS

3.1 D/S and NL-91 Disposal Mounds

3.1.1 Bathymetry

The August 1992 precision bathymetric survey showed a minimum depth of 13.0 m over the NL-Relic mound to the north and a maximum depth of 23.5 m along the southern edge of the survey area (Figure 3-1). At a contour interval of 0.25 m, the seven inactive disposal mounds located within the New London Disposal Site (NL-RELIC, NL-I, NL-II, NL-III, NL-85, NL-88, and NL-TR) were clearly defined.

The August 1992 bathymetric survey was performed following the placement of capping dredged material (CDM) associated with the Dow/Stonington project. A comparison of this survey with the baseline survey of June 1991 (conducted prior to any placement of either UDM or CDM) resulted in detection of an irregularly shaped mound approximately 500 m in diameter (Figure 3-2). The depth difference plot revealed a mound complex with four distinct peaks. Two of the larger peaks, with heights of 0.7 m and 0.5 m, corresponded to the placement of the D/S and NDA buoys (NDA-91-1 and NDA-91-2) . The NL-91 and D/S mound complex is composed of 8,800 m^3 of material deposited at the NDA buoy from 26 September 1991 to 22 January 1992. The other two peaks, approximately 250 m east-northeast of the D/S buoy, had mound heights of 0.5 m and 0.4 m. These mounds were developed over the southwestern flank of the historic NL-III mound, and spread into the slightly deeper areas between the NL-III and NL-85 mounds. They were connected to the western lobe of the NL-91 and D/S mound complex by a narrow ridge of dredged material.

In December 1991, a bathymetric survey was performed for the Dow Chemical Company by Ocean Surveys Incorporated, Old Saybrook, CT. This "precap" survey, conducted following the placement of UDM but before the placement of CDM, covered a 940 m $\times$ 840 m area centered on the D/S buoy (Figure 3-3). By incorporating this precap survey into the existing SAIC data set, a mound development time-series was produced. This time-series data set provided a perspective on the placement of material and resulting changes in bathymetry.

The Ocean Surveys Incorporated bathymetry data were re-gridded to a 500 m $\times$ 670 m area along with SAIC's June 1991 and August 1992 bathymetric surveys to focus the depth difference analysis. Close examination of the June 1991 bathymetry showed a relatively flat area with no major topographic features capable of influencing the distribution or spread of material within the immediate vicinity of the disposal points

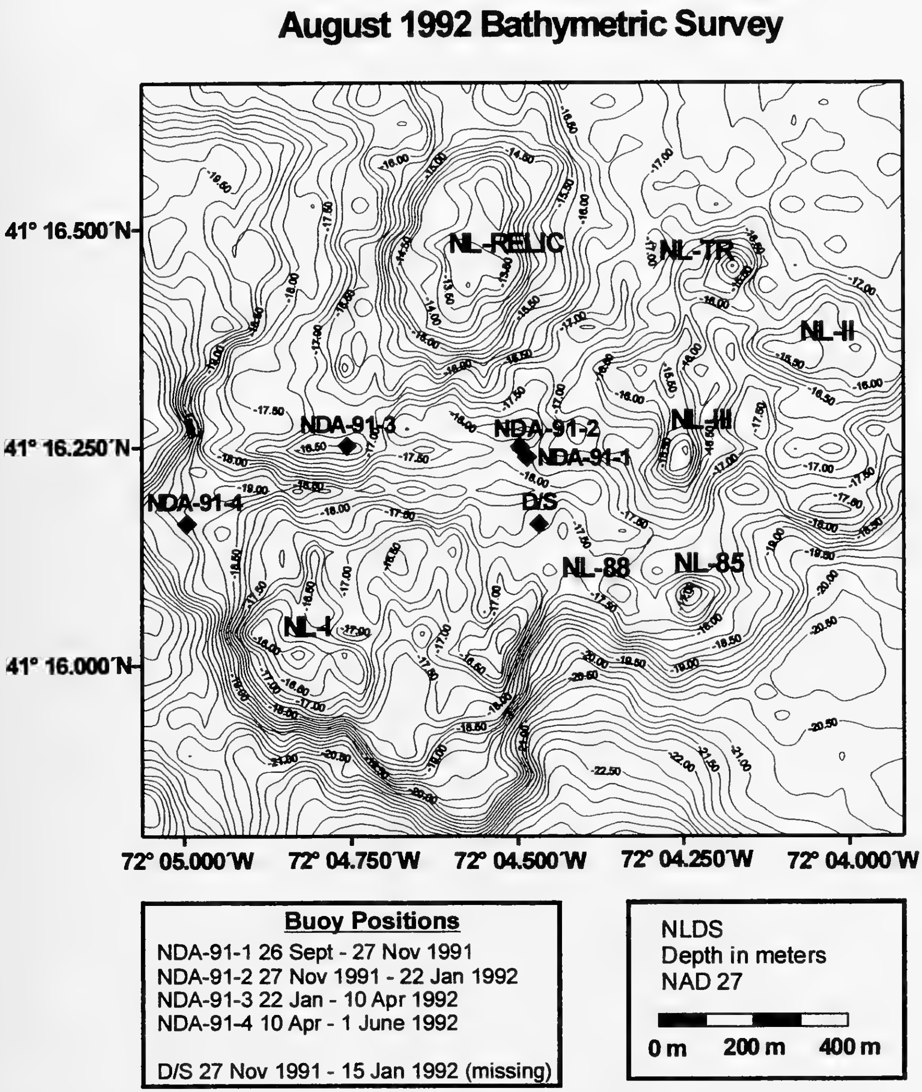

Figure 3-1. Bathymetric contour plot of the 1600 m x 1600 m survey area over the New London Disposal Site, August 1992. A 0.25 m contour interval shows current and relic disposal mounds

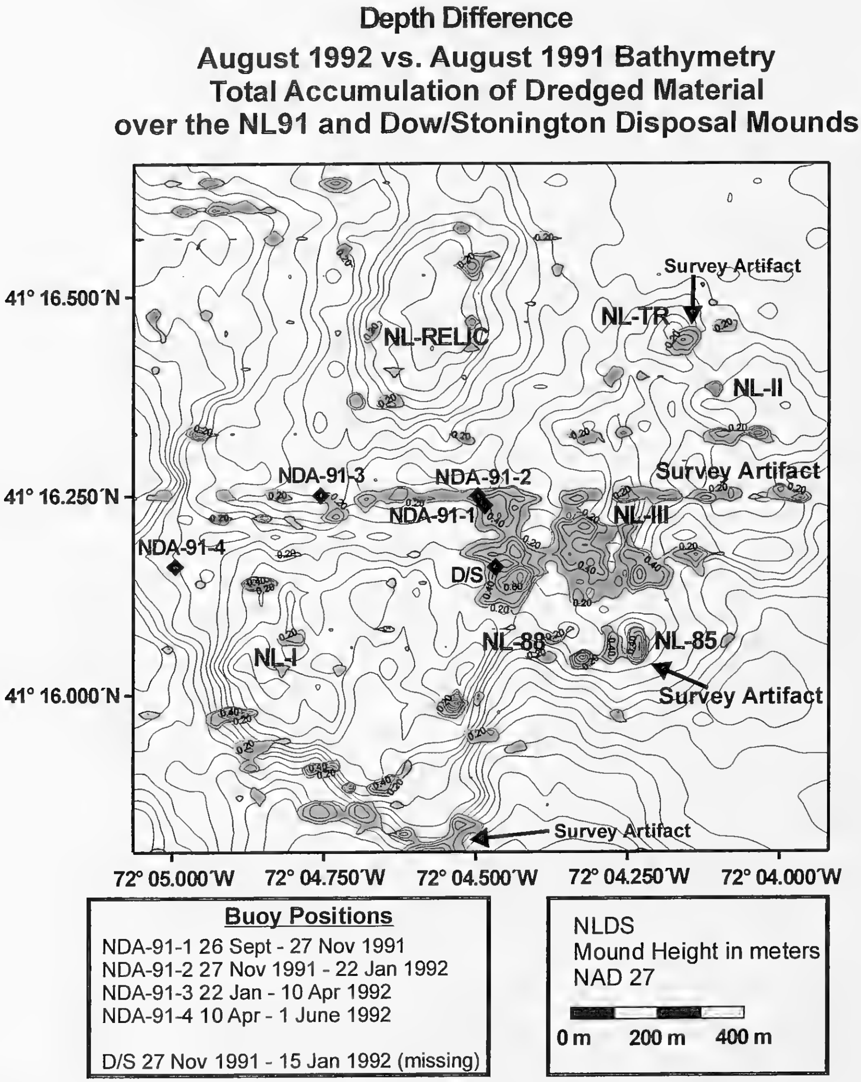

Figure 3-2. Bathymetric contour plot of depth differences between the June 1991 and August 1992 surveys in the vicinity of the Dow/Stonington mound, complete with plotted positions of the 1991-1992 disposal buoys, 0.1 m contour interval, depth in meters

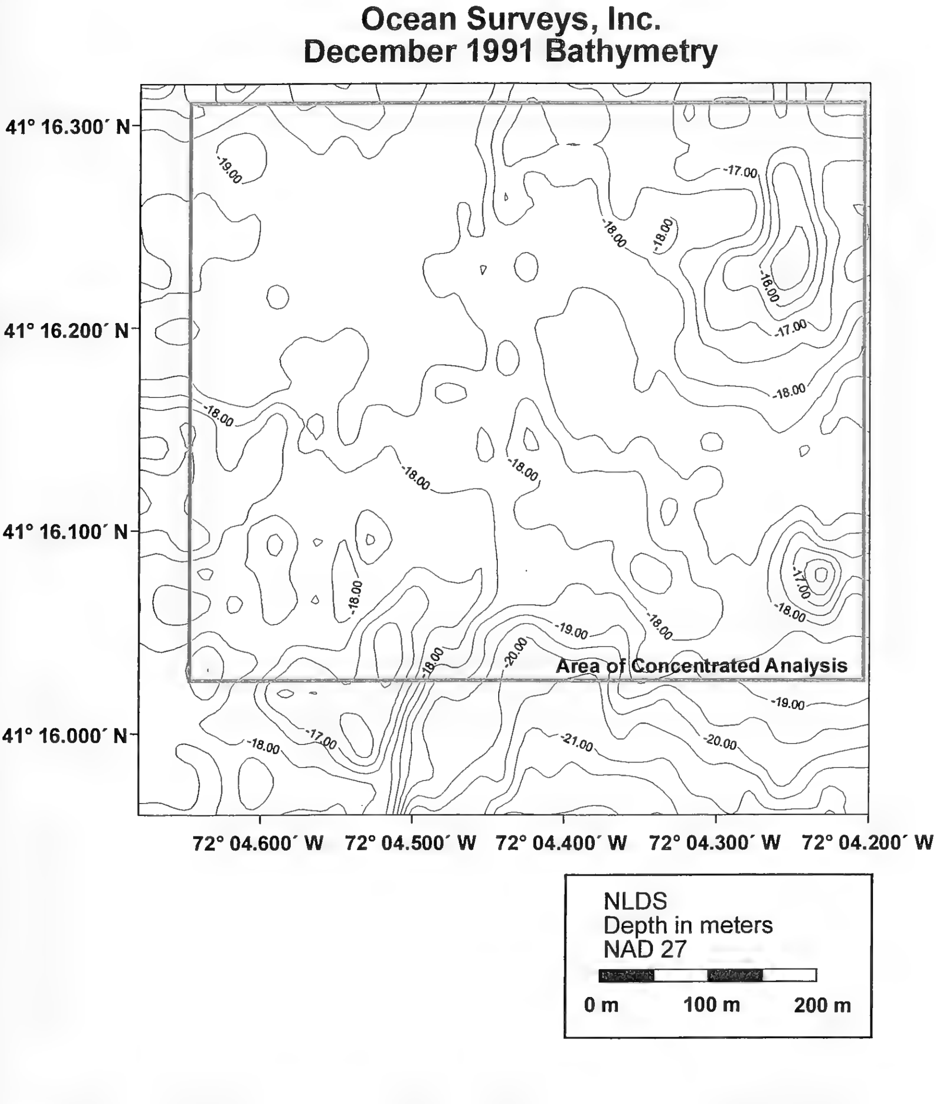

Figure 3-3. Bathymetric contour plot of the 940 m × 840 m survey conducted at the New London Disposal Site by Ocean Surveys Incorporated in December 1991, 0.5 m contour interval

(Figure 3-4). Depth difference calculations between SAIC's June 1991 and OSI's December 1991 surveys showed the accumulation of dredged material to a thickness of 1.0 m around the D/S and NDA buoy locations (Figure 3-5; Appendix A1).

According to the DAMOS disposal logs, the Gwen Mor Marina and Port Niantic material was repeatedly deposited south and east of the NDA #1 and #2 buoy locations. The majority of Dow Chemical Company and Stonington Harbor UDM was reportedly disposed on the eastern side of the D/S buoy, consistent with the depth difference plot. The smaller mounds (0.4 to 0.8 m high) to the east of the larger deposit probably represent Gwen Mor Marina and Port Niantic dredged material released while the NDA #1 buoy was off-station, due to contact with a U.S. Navy submarine.

Comparisons were then made between the re-gridded August 1992 postcap bathymetric survey performed by SAIC (Figure 3-6) and Ocean Survey Incorporated's December 1991 precap survey. The depth difference calculations showed the buildup of CDM to a maximum thickness of 0.8 m approximately 350 m to the east of the D/S buoy, with increases in depth of CDM up to 20–40 cm throughout the survey area (Figure 3-7). It appears much of the CDM dredged from the Dow Chemical Company's Allyns Point facility was actually released somewhat east of the UDM deposit (Figure 3-8). As a result, the final, irregularly shaped bottom feature was formed by the coalescing of three sediment deposits (NDA suitable material, D/S UDM, and D/S CDM; Figure 3-9).

Detailed analysis of the 1995 and 1997 bathymetric surveys showed no significant difference in the size or shape of the NL-91 and D/S mound complex since 1992. Given the low profile of the capped mound as detected in August 1992, large-scale consolidation of the sediment deposit was not anticipated.

3.1.2 REMOTS® Sediment-Profile Photography

In the August 1992 sediment-profile photography survey over the NL-91 and D/S mound complex, 41 stations were occupied to examine surface sediment composition, document benthic recolonization, and delineate the aerial extent of the disposal mound apron. Follow-on surveys in August 1995, September 1997, and July 1998 consisted of a truncated 13-station grid to facilitate long-term monitoring. A complete set of REMOTS® image analysis results for these four surveys is presented in Appendix B; the survey results are summarized below.

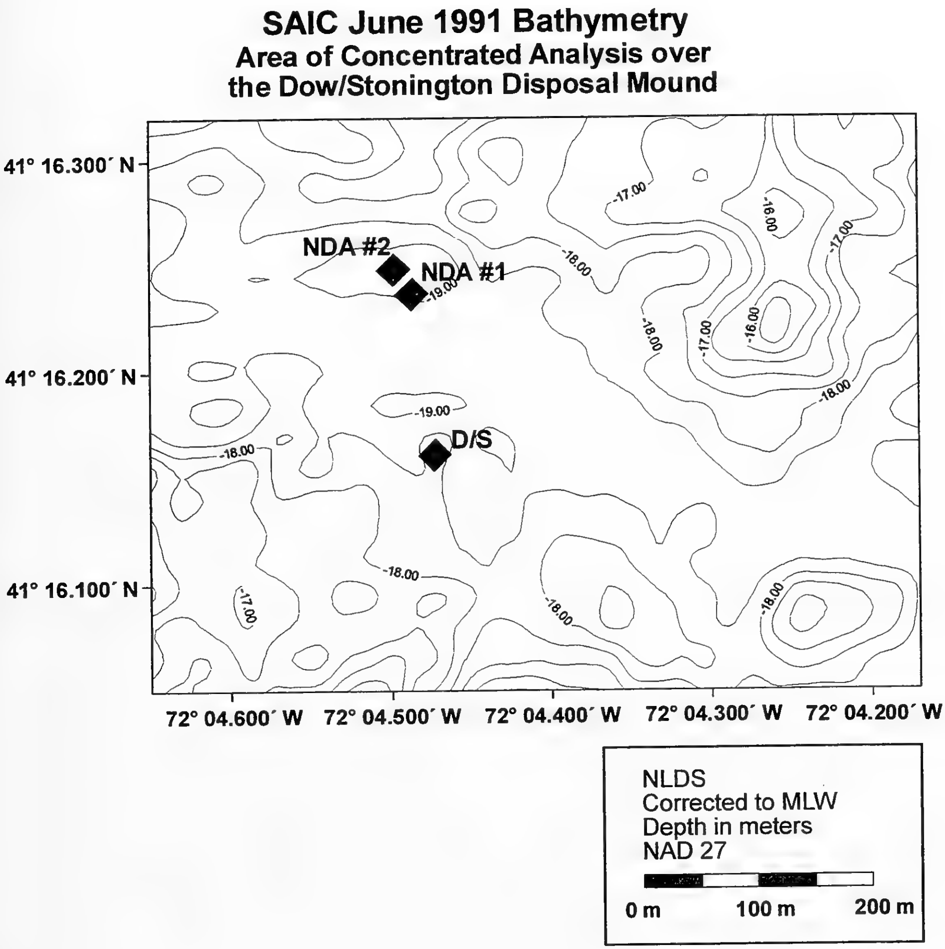

Figure 3-4. Bathymetric contour plot of the June 1991 survey conducted by SAIC, re-gridded to a 500 m × 670 m analysis area, 0.5 m contour interval, depth in meters

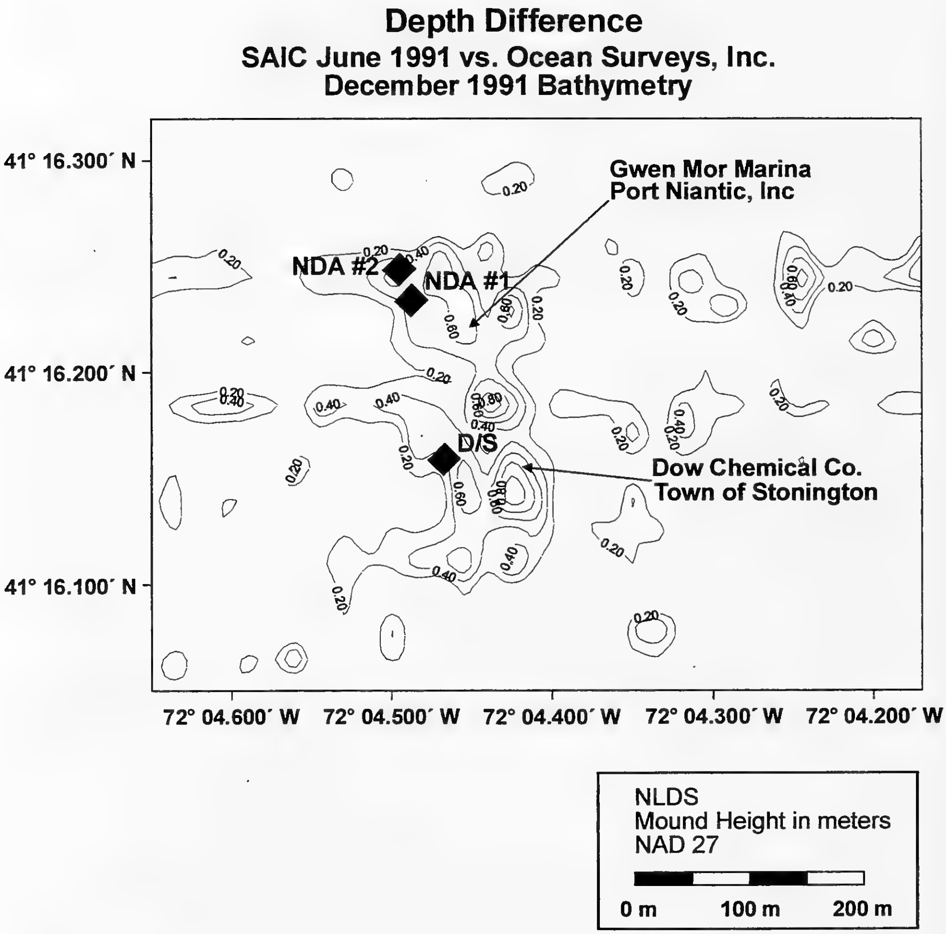

Figure 3-5. Bathymetric contour plot of the depth differences between the SAIC June 1991 and OSI December 1991 surveys showing accumulation of dredged material at the precap stage of development, 0.2 m contour interval

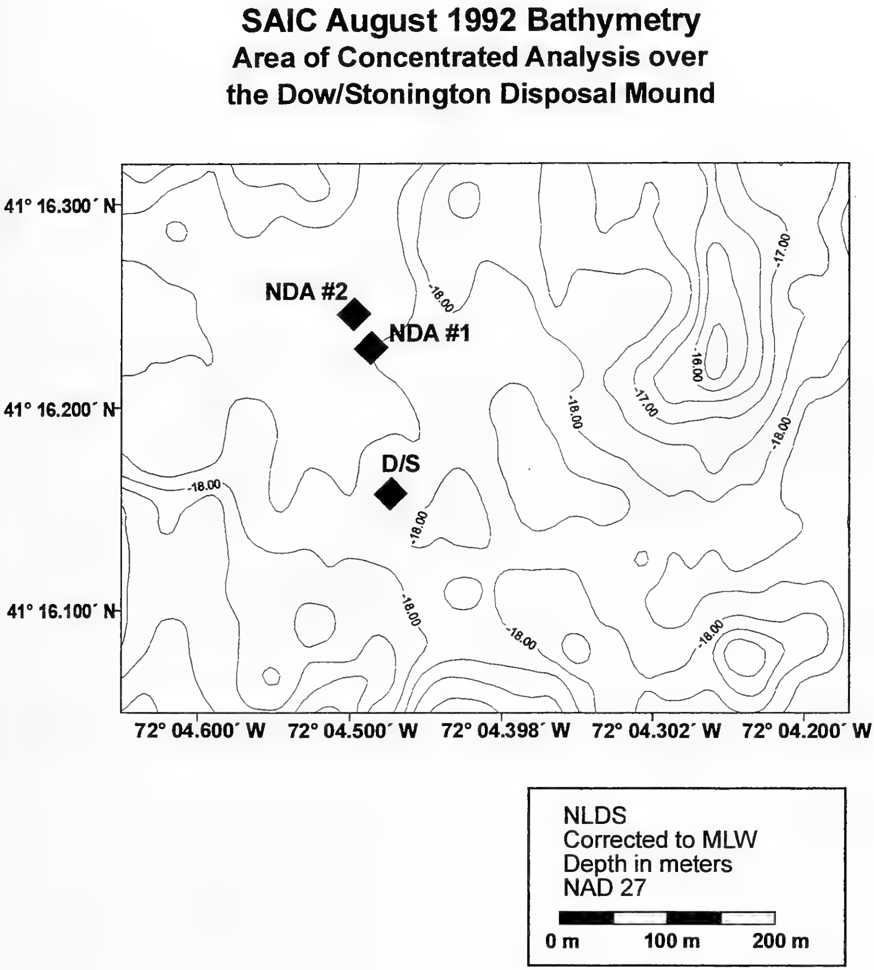

Figure 3-6. Bathymetric contour plot of the August 1992 survey conducted by SAIC, re-gridded to a 500 m × 670 m analysis area, 0.5 m contour interval, depth in meters

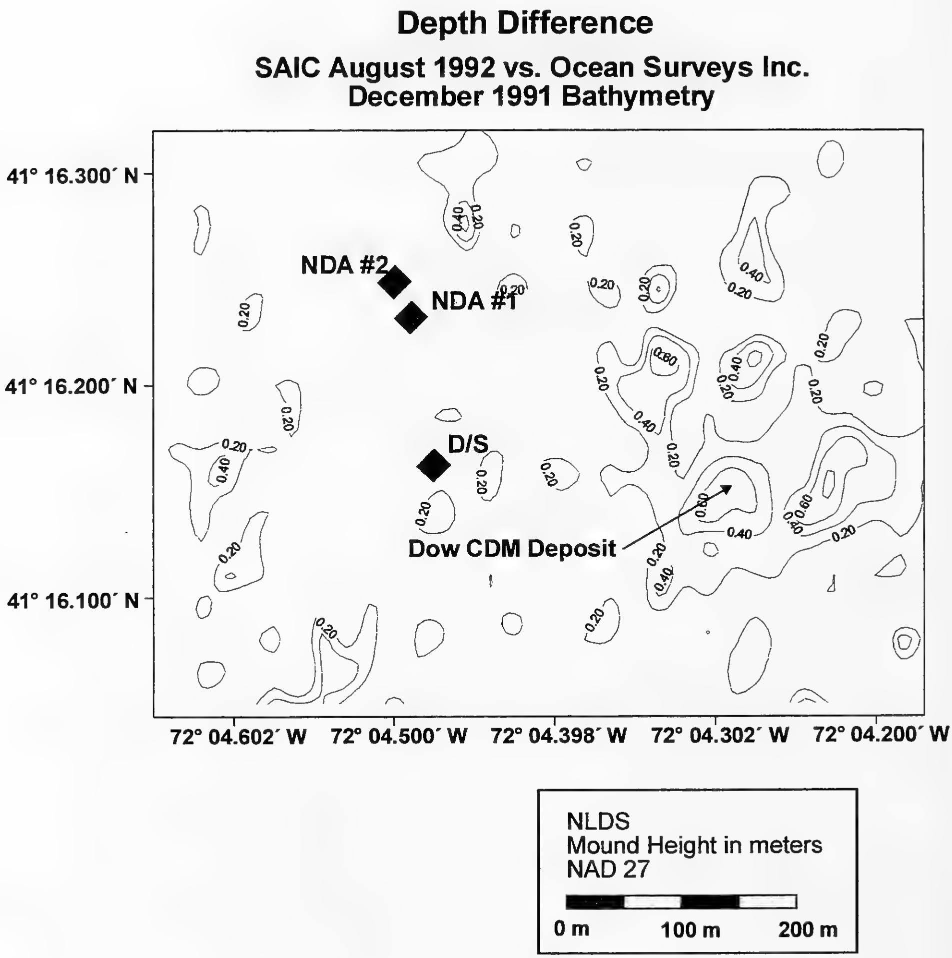

Figure 3-7. Bathymetric contour plot of the depth differences between the SAIC August 1992 and OSI December 1991 surveys showing accumulation of CDM at the postcap stage of development, 0.2 m contour interval

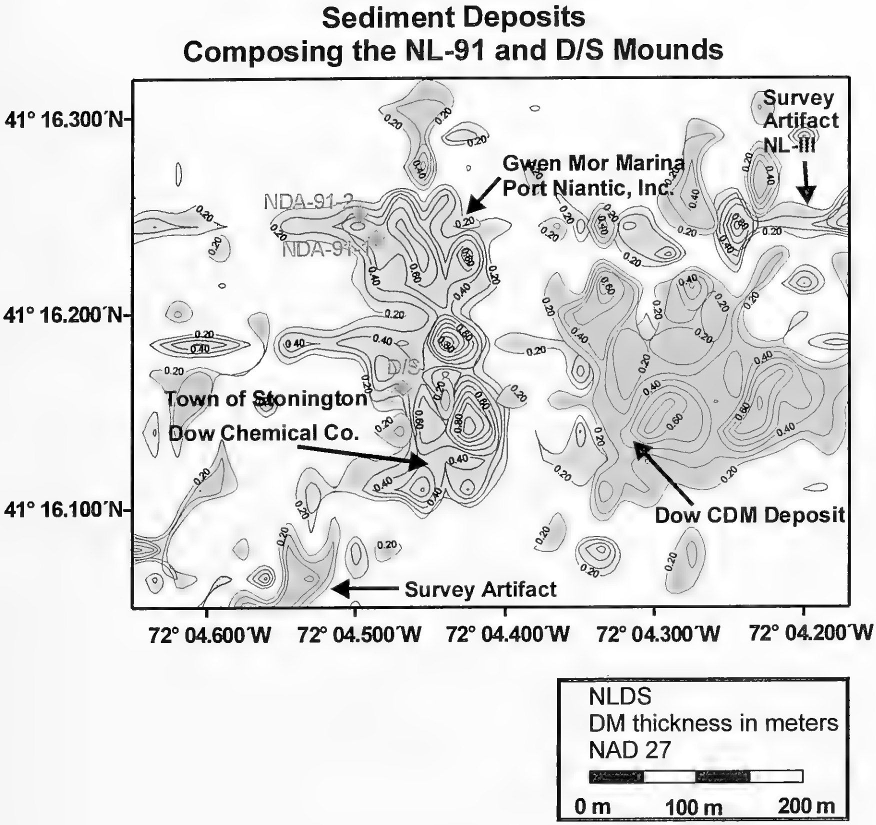

Figure 3-8. Depth difference comparison displaying the sediment deposits formed during the 1991-92 disposal season. Gray shading represents sediment placed prior to mid-December 1991. Yellow shading represents sediment deposited from mid-December to mid-January 1992. It is likely that many of the smaller areas of apparent accumulation surrounding the central deposit are the result of survey artifacts and are considered artificial.

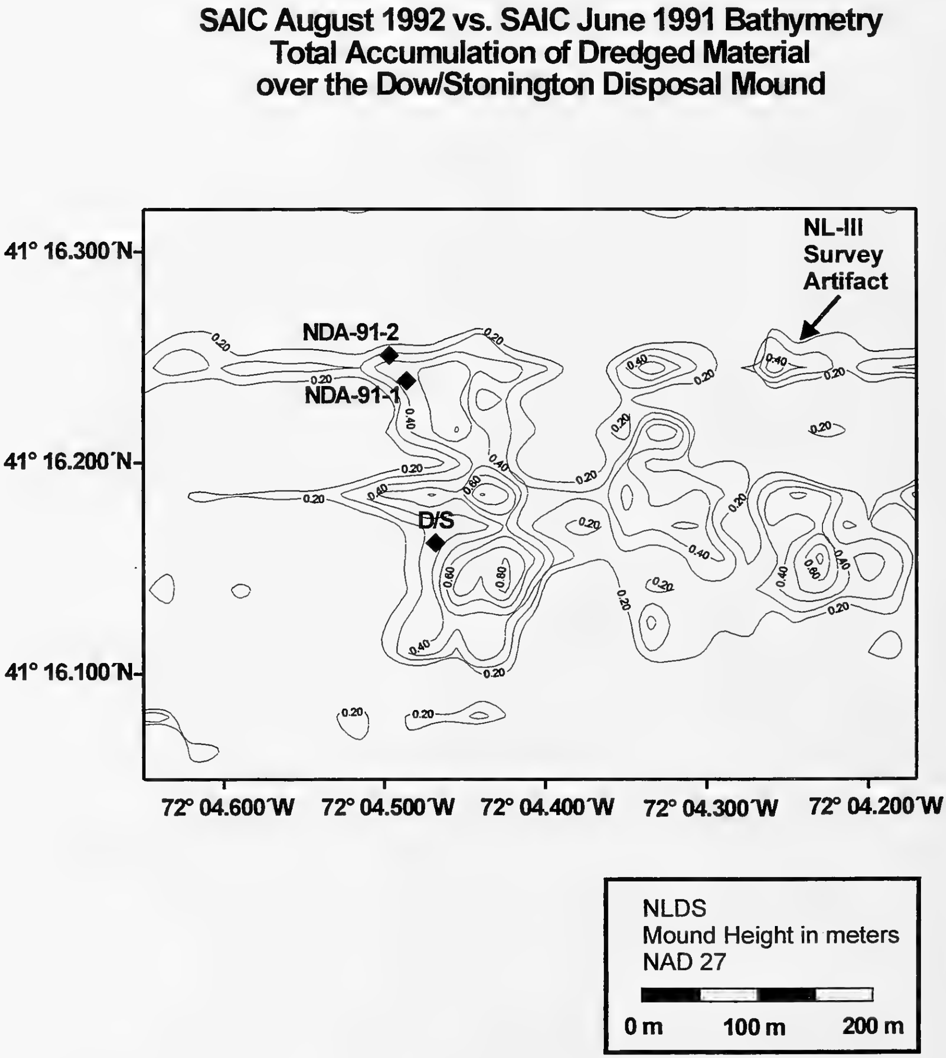

Figure 3-9. Bathymetric contour plot of the depth difference between the SAIC August 1992 and SAIC June 1991 surveys showing total accumulation of dredged material within the 500 m × 670 m analysis area, 0.2 m contour interval

3.1.2.1 August 1992 Survey

REMOTS® photographs detected recently deposited dredged material extending 400 m south, and 500 m southeast of the survey center (Figure 3-10). The majority of the material deposited in close proximity to the D/S buoy was composed of black silty sand with a varying silt-clay fraction. Dredged material layers with chaotic sedimentary fabrics, anomalous grain size distributions, and low optical reflectance were presumed to be recently deposited or "fresh" (1991-1992 disposal season) dredged material. Boundaries for the distribution of the fresh dredged material were determined by mapping the spread of the darker NDA-91 and D/S material relative to the lighter and biologically re-worked, historic dredged material of the inactive NL-III, NL-88, and NL-85 mounds (Figure 3-11).

Differentiation between unsuitable dredged material and cap material through REMOTS® photography was difficult due to the similar lithology of the Dow Chemical sediments. However, a layer of high optical reflectance fine sand originating from the material deposited at the NDA-91 buoy was visible at stations extending to 100 m north, 400 m south, 400 m west, and 500 m east of the survey center (Figure 3-12). The depth of the overlying sand varied from 1.27 cm to 7.03 cm at stations 100N and the grid center, respectively.

At peripheral portions of the survey, there was a noticeable lack of fine sand at stations 300SE through 500SE and all the ESE stations, as well as stations 200N, 400N, 500S, 500SSE, 600E, 200NE, and 100NE (Figure 3-10). The sediment profiles of these stations consisted of thin layers of reworked dredged material over black silt (Figure 3-13). The majority of REMOTS® survey stations had layers of fresh or historic dredged material thicker than the penetrating depth of the REMOTS® camera. The detection of ambient sediments was not anticipated based upon the location of the REMOTS® grid relative to the historic NLDS disposal mounds.

The major modal grain size over the disposal site ranged from granule/coarse sand (-1.0 phi) to very fine silt and clay sized particles (phi sizes ≥4; Figure 3-14). The coarsest sediment, consisting of very coarse and coarse sands, was located at the survey center, and stations within 300 m south and 100 m east (Table 3-1). As expected, REMOTS® camera prism penetration depth was lowest at those stations with a surface sediment layer consisting of coarser grained sands, granules, and shell.

Silt-clay (>4 phi) was the dominant grain size major mode at 17 of the 41 REMOTS® stations occupied. These stations typically showed a distinct stratigraphy in which a surface layer of medium and fine sand (1-2 phi) was overlying very fine silts and clay (≥4 phi; Figure 3-14). The most frequently observed sediment was very fine sand

Table 3-1

NL-91 and D/S Mound Complex REMOTS® Sediment-Profile Photography Results Summary for the 1992 Survey

Mound/ Ref Area	Location	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)	Number of Reps w/ Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NL-91	100e	4.18	>4.56	5	1.69	I	Stage I	2 to 3	3.8	4	0.78
NL-91	100n	3.81	>4.33	3	INDET	I	Stage I	3 to 4	INDET	INDET	1.04
NL-91	100ne	7.04	>7.66	3	1.87	I,II,III	Stage I ON Stage III	>4	5.67	6	1.50
NL-91	100nw	7.83	5.11	2	2.60	I,II,III	Stage I ON Stage III	>4	7	6	2.64
NL-91	100s	6.95	>7.49	3	2.60	I,III	Stage I ON Stage III	2 to 3	5	5	1.07
NL-91	100se	6.89	>8.22	3	1.37	I	Stage I	>4	3.67	4	3.12
NL-91	100sw	2.16	0.00	0	2.40	I	Stage I	3 to 4	5	5	0.82
NL-91	100w	9.38	>9.82	2	INDET	I,II	Stage II	3 to 4	INDET	INDET	0.85
NL-91	200e	9.97	>10.64	3	1.02	II,III	Stage II ON Stage III	3 to 4	5	5	1.33
NL-91	200n	4.36	>4.84	3	1.29	I,III	Stage III	>4	4	4	0.96
NL-91	200ne	9.38	>9.82	3	2.03	I,III	Stage I ON Stage III	>4	7	8	0.89
NL-91	200nw	9.94	6.77	2	3.70	I,II,INDET	Stage II	>4	7.5	7.5	1.46
NL-91	200s	12.71	>13.12	3	1.25	II	Stage II	3 to 4	5	5	0.83
NL-91	200se	8.05	>8.31	1	1.13	II	Stage II	3 to 4	6	6	0.61
NL-91	200sw	5.01	>5.84	2	1.23	I,II	Stage II	3 to 4	5	5	1.72
NL-91	200w	6.94	>7.27	3	1.48	I	Stage I	3 to 4	3.33	3	0.65
NL-91	300e	5.89	>6.22	2	1.62	I	Stage I	3 to 4	5	5	0.66
NL-91	300ene	4.16	0.82	1	0.73	I,III	Stage I ON Stage III	3 to 4	4.5	4.5	1.20
NL-91	300n	4.18	>4.39	2	0.89	I,III	Stage I ON Stage III	3 to 4	5.5	5.5	0.42
NL-91	300s	10.07	>10.36	3	INDET	I	Stage I	1 to 2	INDET	INDET	0.58
NL-91	300se	17.05	>18.15	3	0.42	II	Stage II	>4	4.33	4	2.21
NL-91	300sse	11.65	10.88	2	0.78	I,II	Stage II	>4	3.5	3.5	0.47
NL-91	300w	1.76	>2.53	2	0.80	INDET	INDET	>4	INDET	INDET	1.52
NL-91	400e	9.48	>9.79	3	1.08	II,III	Stage II ON Stage III	3 to 4	7	7	0.62
NL-91	400ene	7.52	1.19	1	1.00	I	Stage I	3 to 4	3	3	1.41
NL-91	400n	3.63	>4.13	3	INDET	I, III	Stage I ON Stage III	>4	INDET	INDET	1.00
NL-91	400s	4.18	2.43	1	1.08	I	Stage I	3 to 4	3	3	0.83
NL-91	400se	13.18	>13.76	4	0.34	II	Stage II	>4	3	4	1.15
NL-91	400ese	17.07	>17.50	3	0.45	I,II	Stage I -> II	>4	2.33	2	0.85
NL-91	400sse	9.65	0.00	0	1.20	I,II,III	Stage II ON Stage III	2 to 3	5.33	4	0.92
NL-91	400w	3.53	>3.92	3	0.77	I	Stage I	3 to 4	3	3	0.77
NL-91	500e	8.75	6.86	2	1.74	I,II,III	Stage II ON Stage III	3 to 4	7	7	1.00
NL-91	500s	7.07	0.00	0	1.41	II,III	Stage II ON Stage III	>4	8	8	1.33
NL-91	500se	16.86	>17.70	2	0.35	I	Stage I	>4	2	2	1.69
NL-91	500ese	11.56	>12.27	2	0.74	I,II	Stage II	>4	4	4	1.42
NL-91	500sse	10.31	0.00	3	1.58	II,III	Stage II ON Stage III	>4	7.33	7	0.72
NL-91	600e	10.63	>11.08	3	0.69	I,II,III	Stage II ON Stage III	>4	6.33	6	0.89
NL-91	600s	11.06	0.00	0	1.32	I,III	Stage III	3 to 4	7.33	7	1.41
NL-91	600se	10.44	4.51	1	0.82	I,II	Stage II	3 to 4	4	4	1.72
NL-91	600ese	11.87	>12.30	3	0.26	I,II	Stage II	3 to 4	3.67	4	0.86
NL-91	ctr	7.58	5.02	2	1.96	I,III	Stage I ON Stage III	1 to 2	5.67	5	0.51
AVG		8.38	7.06	2.24	1.29				4.94	4.89	1.13
MAX		17.07	>18.15	5	3.70				8	8	3.12
MIN		1.76	0.00	0	0.26				2	2	0.42

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

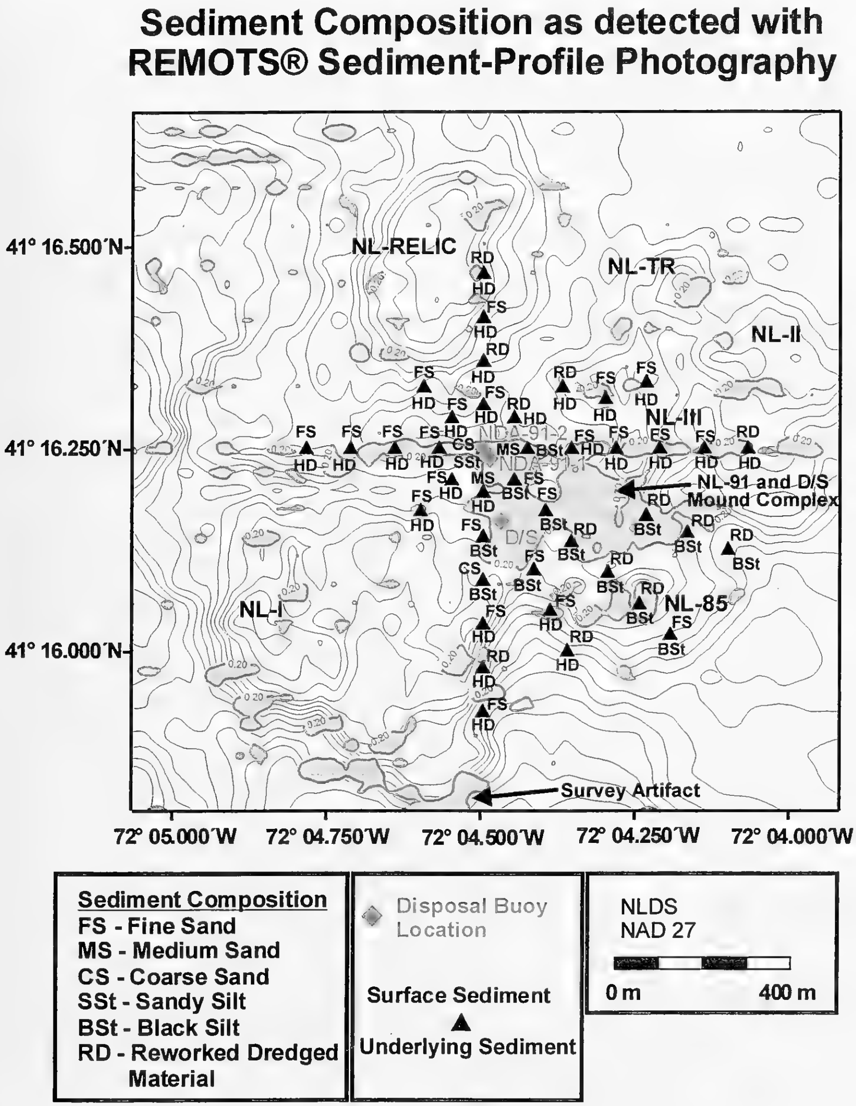

Figure 3-10. Distribution map of surface sediment type over fresh and/or historic dredged material in the vicinity of the new NL-91 and D/S mound at NLDS

Extent of Disposal Mound Aprons
Based on REMOTS® Sediment-Profile Photography

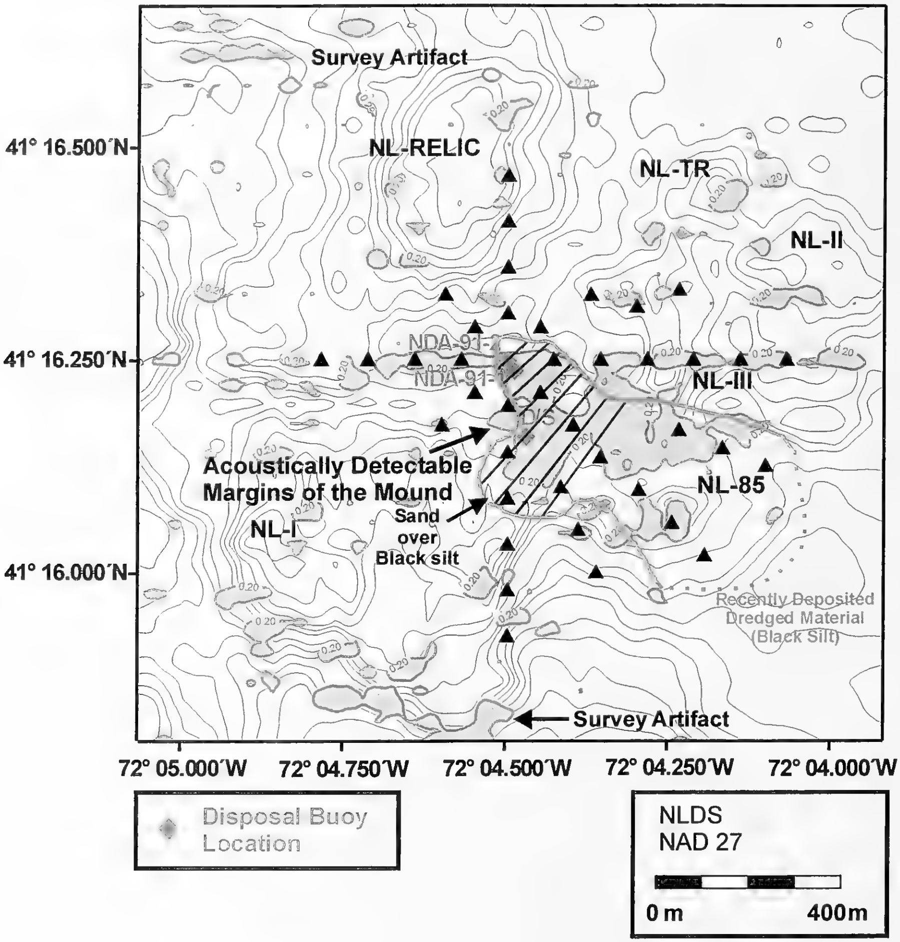

Figure 3-11. Countour lines based on sediment stratigraphy as detected with REMOTS® sediment-profile photography

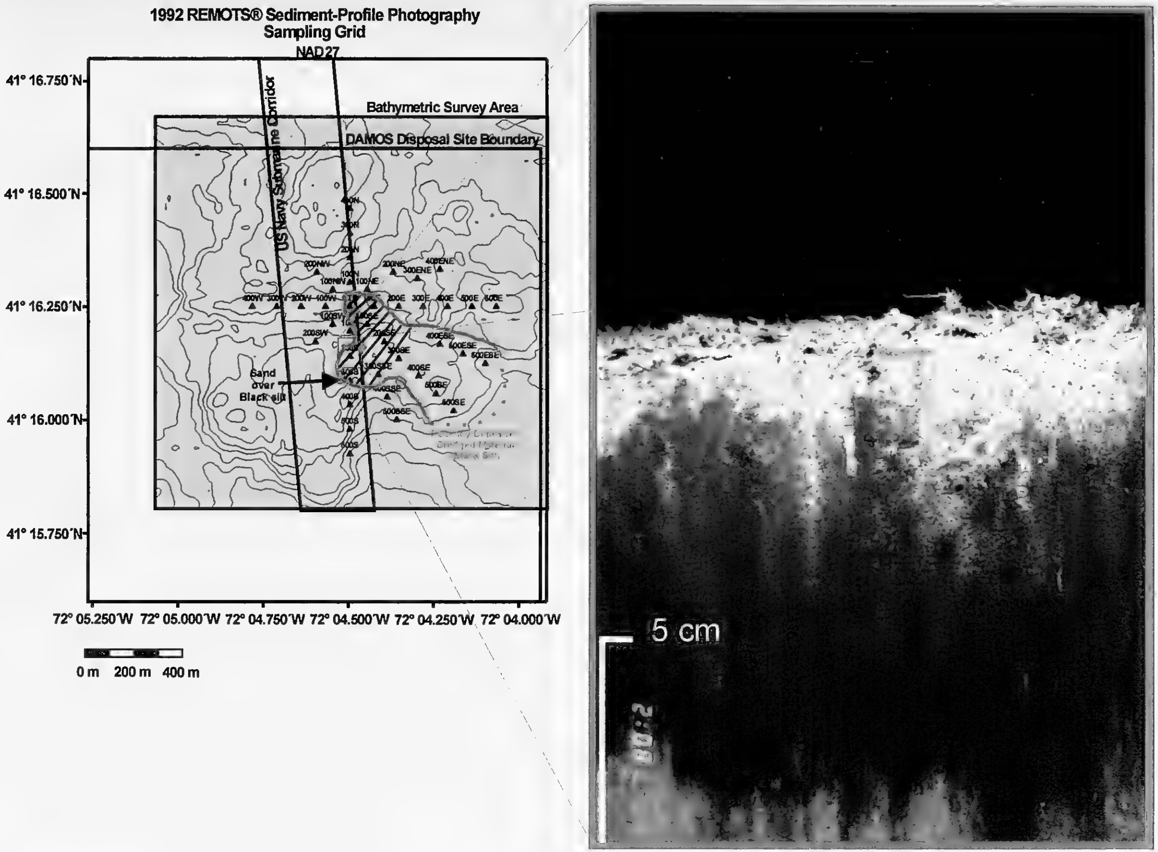

Figure 3-12. REMOTS® photograph of Station 200S depicting a sand layer over fresh dredged material

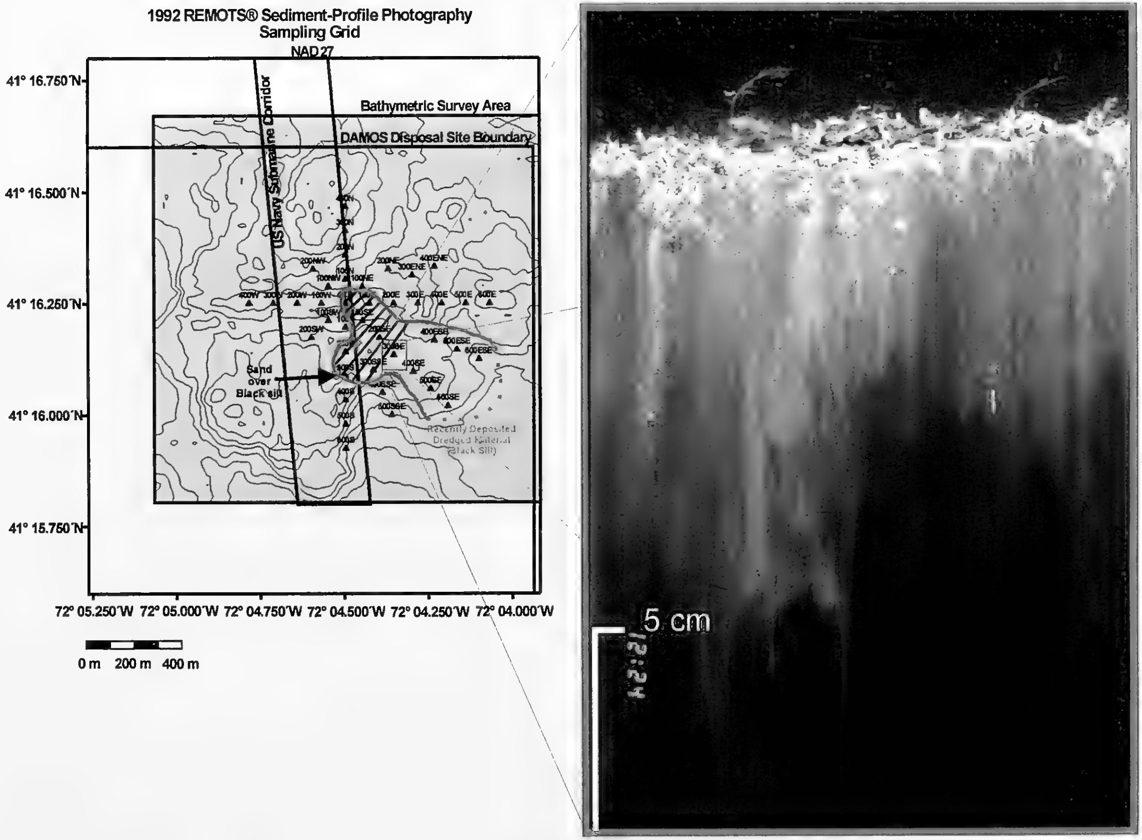

Figure 3-13. REMOTS® photograph of Station 300SE depicting a layer of biologically reworked dredged material over fresh dredged material

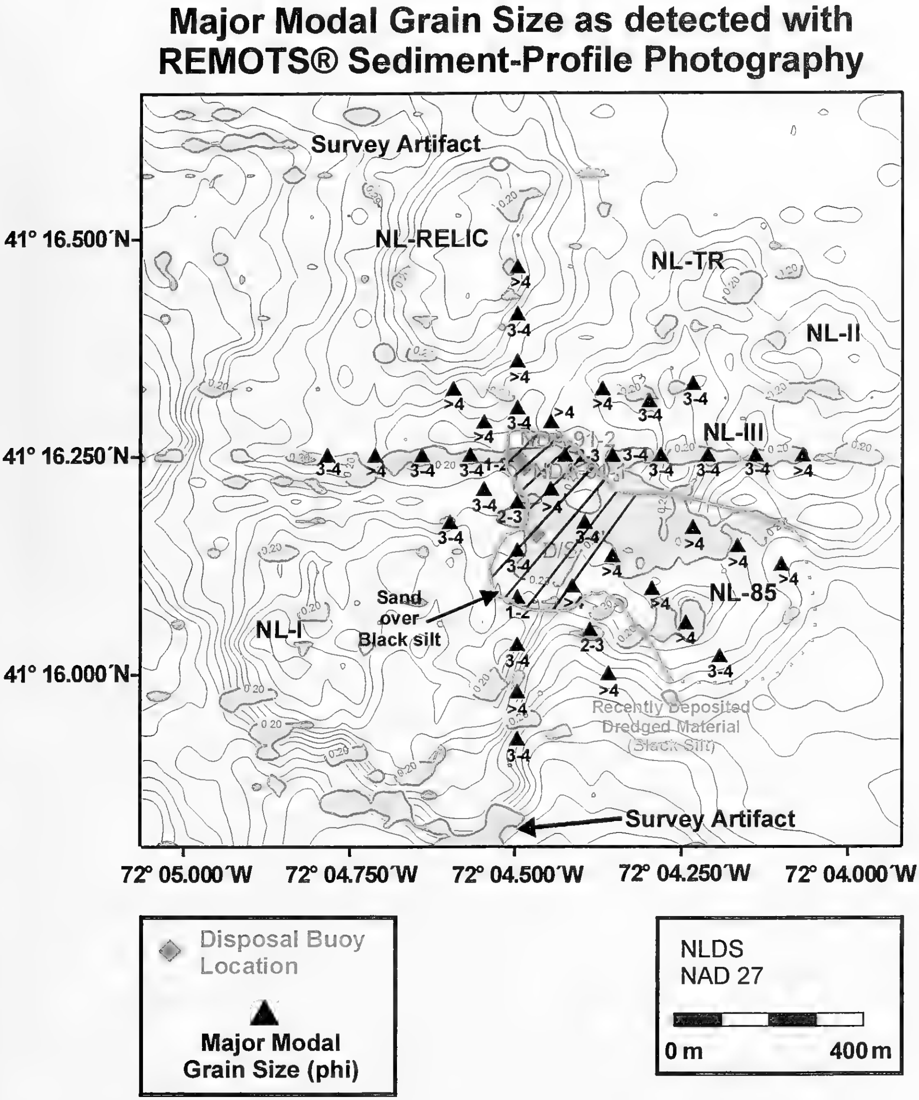

Figure 3-14. Spatial distribution of major modal grain size for the 1992 REMOTS® sediment-profile photography stations over the NL-91 and D/S mound complex

(3-4 phi), with many replicate images displaying small pebbles and recently dredged shells within a sandy matrix. These sediments were found extending out to 400 m west, 500 m east and south, and 200 m southwest of the NL-91 center. Isolated pockets of fine sand were found 300 m north, as well as 600 m south and 600 m southeast (Figure 3-14). Station 400S, lying on a relatively steep bathymetric slope, displayed evidence of a harder bottom with shell, pebble, and hydrozoan growth at the sediment water interface (Figure 3-15).

Within NLDS, mean boundary roughness values ranged from 0.4 cm to 3.1 cm. Two stations on the mound flanks, 100NW and 100SE, showed the highest roughness values of 2.6 cm and 3.1 cm (Table 3-1). Seventy-eight percent of the stations at the disposal site were classified as having a biological boundary roughness, while 22 percent had a physical boundary roughness. Ninety-four percent of the reference stations had a biological boundary roughness while six percent were physical in nature.

The mean apparent RPD depths at NLDS ranged from 0.3 cm at Stations 500SE and 600ESE to 3.7 cm at Station 200NW with a majority (33%) of stations exhibiting RPD depths within the 1.5 to 2.0 cm range (Figure 3-16; Table 3-1). No evidence of a redox rebound layer (recent reduction in the depth of oxidized sediments) was detected in any REMOTS® image collected during the 1992 survey over the NL-91 and D/S mound complex.

In general, the area surrounding the D/S mound showed strong signs of benthic community recovery with a diverse population of Stages I, II, and III assemblages (Figure 3-17). Twenty-five of the forty-one stations sampled displayed some combination of Stage I, II, or III assemblages (Table 3-1). Eight stations displayed healthy Stage I populations progressing to Stage II. Stage II was denoted by the presence of distinct tubes of the amphipod *Ampelisca* sp. at the sediment surface (Figure 3-18). Three stations (7%) exhibited Stage II individuals colonizing the surface sediment while Stage III assemblages were actively feeding in the layers below the sediment-water interface. Finally, six stations had representatives from all three end-member assemblages present in the REMOTS® photographs.

Eight stations (20%), including the survey center, had Stage I individuals inhabiting the sediments over a population of Stage III organisms (Figure 3-17). Apparently, by occupying the sub-surface sediment layers, Stage III individuals (deposit feeders) were able to survive a modest disposal event and migrate up through the thin layer (0.2 m to 0.3 m) of newly deposited sediment. Fifteen of the remaining REMOTS® stations sampled possessed an exclusive population of Stage I (27%) or Stage II (10%) individuals. Exclusive Stage I populations were found at eleven stations. Stations 200 m south and

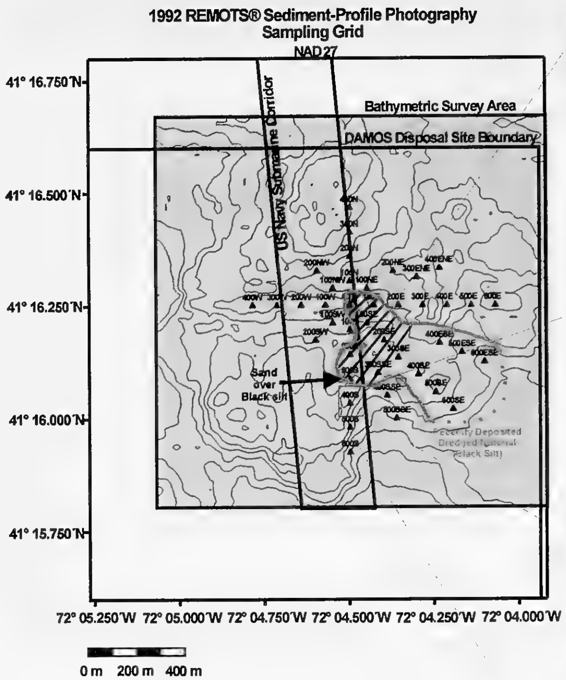

Figure 3-15. REMOTS® photograph of Station 400S depicting a layer of pebble and shell over reworked dredged material

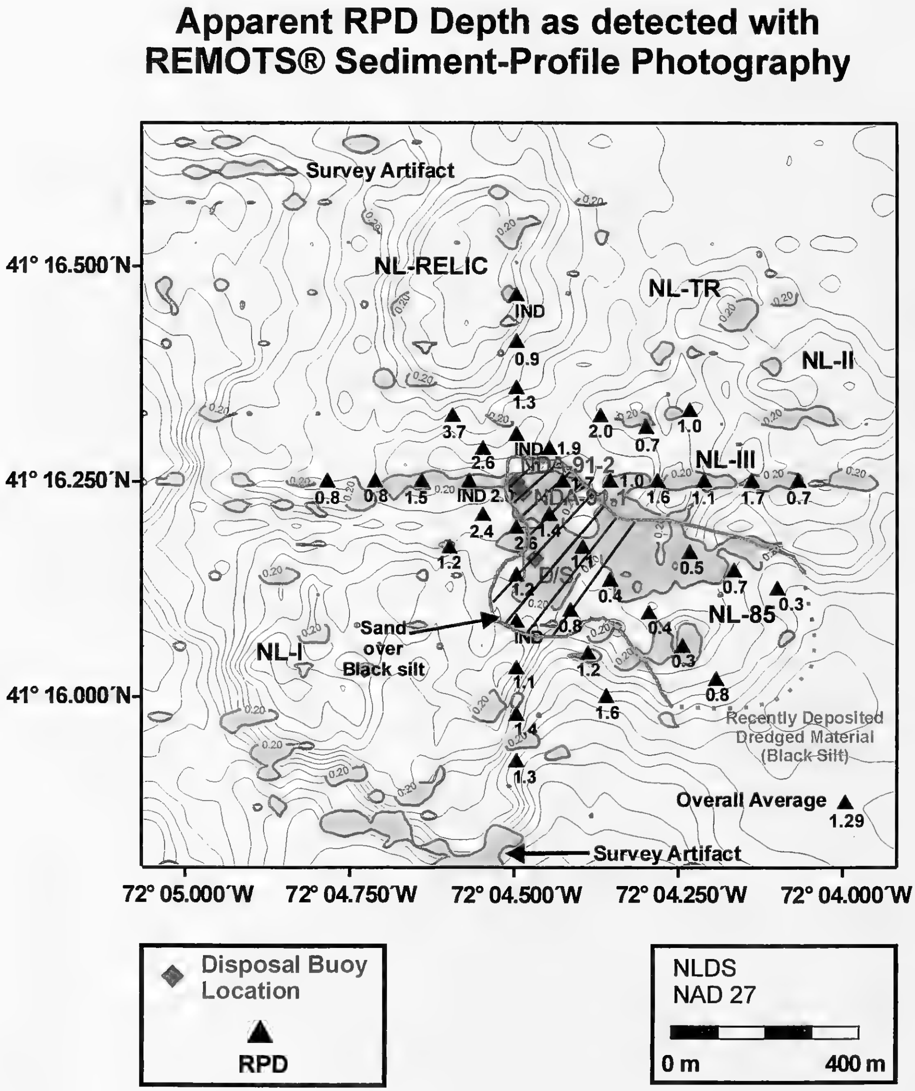

Figure 3-16. Spatial distribution of Redox Potential Discontinuity depths for the 1992 REMOTS® stations on the disposal mound

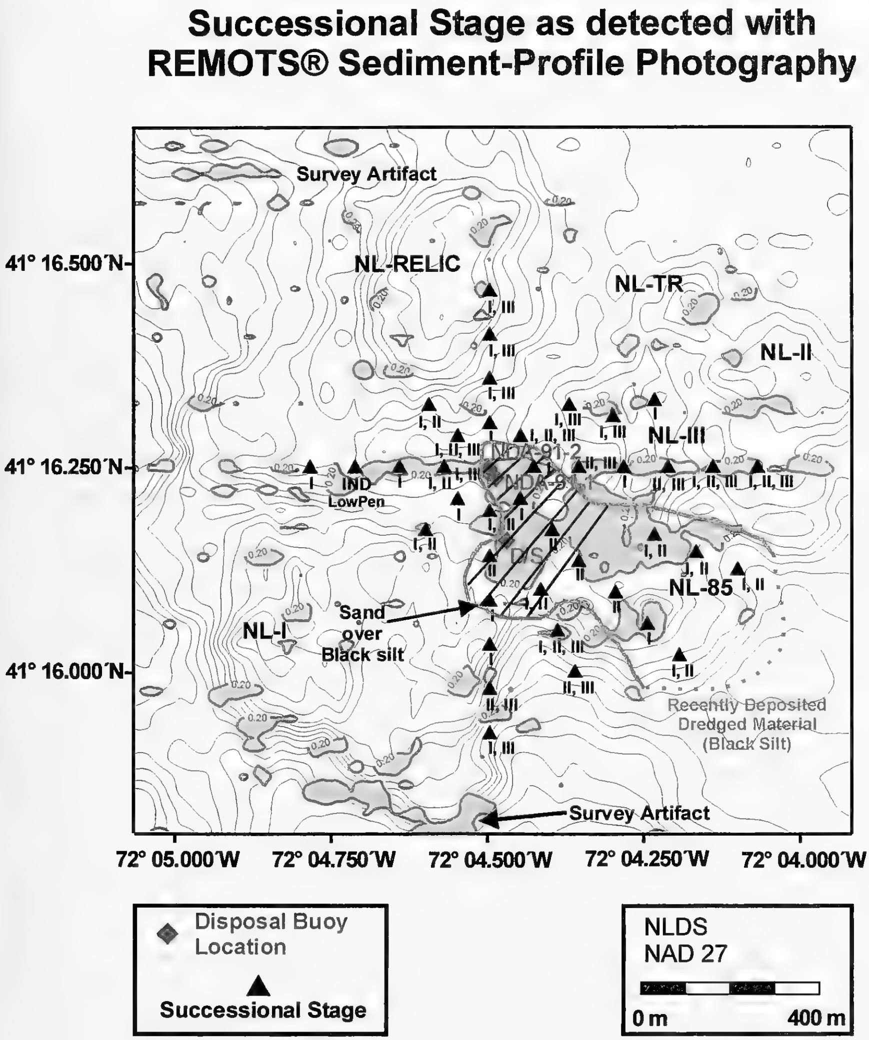

Figure 3-17. Spatial distribution map of successional stage status for the NL-91 and D/S mound complex

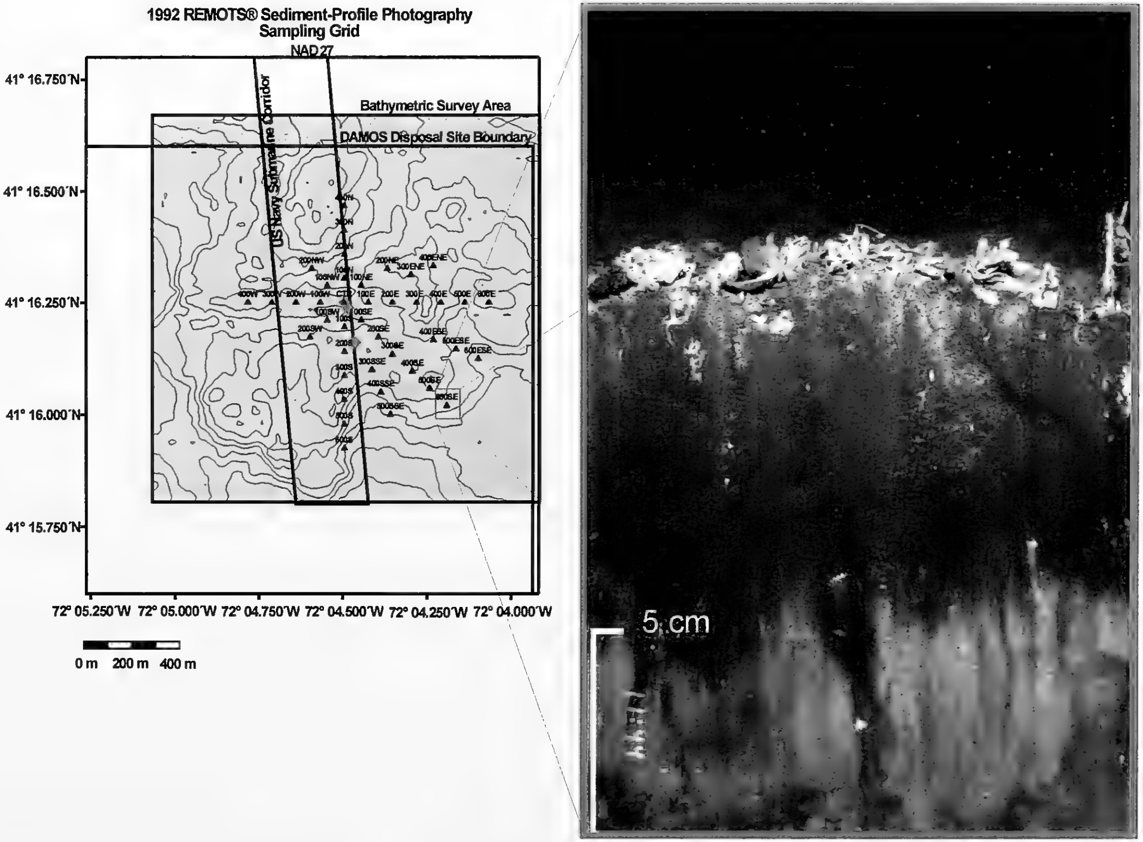

Figure 3-18. REMOTS® photograph of Station 600SE depicting a healthy Stage II community consisting of the tube-dwelling amphipod *Ampelisca sp.* recolonizing fresh dredged material

200 m, 300 m, and 400 m southeast of the survey center were inhabited solely by Stage II assemblages. One station (300W) produced no benthic infauna data due to shallow camera penetration depths. Because of the diversity in benthic infaunal recolonization status of the disposal mound and the widespread presence of Stage II organisms, the overall successional stage of the disposal mound can be characterized as a solid Stage II population advancing to Stage III.

Based in part on the relatively advanced successional status and moderate RPD depths, the median OSI values over the disposal site ranged from +2.0 to +8.0 (Figure 3-19; Table 3-1). The higher OSI values were found on the perimeter of the REMOTS® sampling grid and were randomly distributed. No methane or low DO conditions were observed in any of the replicate images.

3.1.2.2 August 1995 Survey

The August 1995 REMOTS® sediment-profile survey at the NL-91 and D/S mound complex was used to map the aerial extent of dredged material and determine benthic recolonization levels relative to the 1992 findings. The REMOTS® sampling grid occupied in 1995 was reduced to a modified 13-station cross grid and shifted south-southeast relative to the 1992 grid (Figures 2-4A and 2-4B). The center point was based on the D/S buoy position, and station placement was designed to cover the two lobate sections of the NL-91 and D/S mound complex.

Recently deposited dredged material was detected in nine of the thirteen REMOTS® sediment-profile stations across the NL-91 and D/S mound complex. Dredged material thickness was greater than camera penetration along the east-west transect, as well as at stations 100S and 100N (Figure 3-20). The surface sediments at Stations 300N, 200N, 100W, and 200S appear to have been reworked significantly since 1992, losing the typical characteristics of recently deposited sediments. As a result, these stations were classified as being composed of historic dredged material. The average penetration depths ranged from 4.5 cm to 15.1 cm. The stations with the shallowest camera penetration (<10 cm) displayed sediment with a higher sand component. Most of the stations with camera penetration greater than 10 cm had dredged material greater than penetration.

The major modal grain size at eight of thirteen stations over the NL-91 and D/S mound complex was classified as 4 to 3 phi (very fine sand; Table 3-2). Three stations (100E, 400E, and 300N) were composed entirely of fine-grained sediments (>4 phi; silt/clay). The two stations with coarser grained sediment were 200W (3 to 2 phi, fine sand) and 200S (<-1 phi, granules and pebbles; Figure 3-21). A stratigraphic pattern consisting of a surface layer of very fine sand overlaying mud at depth was observed at all stations except 100W, 100N,

Table 3-2

NL-91 and D/S Mound Complex REMOTS® Sediment-Profile Photography Results Summary for the 1995 Survey

Mound/ Ref. Area	Location	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)	Number of Reps w/ Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NL-91 & D/S	100E	14.85	>14.13	3	1.34	I,II,III	ST_II_ON_III	>4	7.33	7	1.34
NL-91 & D/S	100N	12.09	4.73*	1	3.28	II,III	ST_II_ON_III	4 to 3	9.33	9	1.36
NL-91 & D/S	100S	13.07	>12.06	3	1.48	II,III	ST_II_ON_III	4 to 3	6.67	7	1.57
NL-91 & D/S	100W	8.66	0.00	0	2.98	I,II,III	ST_II_ON_III	4 to 3	9.33	9	2.20
NL-91 & D/S	200E	15.15	>14.64	3	3.47	II,III	ST_II_ON_III	4 to 3	10	10	0.71
NL-91 & D/S	200N	9.94	0.00	0	1.68	II,III	ST_II_ON_III	4 to 3	7.67	8	0.83
NL-91 & D/S	200S	4.47	0.00	0	0.98	I,II,III	ST_II_ON_III	2 to 1	7	7	4.76
NL-91 & D/S	200W	9.45	5.98	3	1.96	II,III	ST_II_ON_III	3 to 2	8.33	8	1.55
NL-91 & D/S	300E	14.36	>14.12	3	1.87	II,III	ST_II_ON_III	4 to 3	7.33	7	1.20
NL-91 & D/S	300N	14.78	0.00	0	3.48	II,III	ST_II_ON_III	>4	8.67	9	1.11
NL-91 & D/S	400E	14.36	14.22	3	1.27	II,III	ST_II_ON_III	>4	6	6	1.44
NL-91 & D/S	500E	13.09	8.82	2	1.86	II,III	ST_II_ON_III	4 to 3	8	8	1.59
NL-91 & D/S	CTR	13.33	>12.27	3	3.00	II,III	ST_II_ON_III	4 to 3	9.67	9	1.73
AVG		12.12	7.77	1.85	2.20				8.10	8	1.65
MAX		15.15	>14.64	3	3.48				10	10	4.76
MIN		4.47	0.00	0	0.98				6	6	0.71

* Dredged material detected in one of three replicate images and determined to be greater than penetration.

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

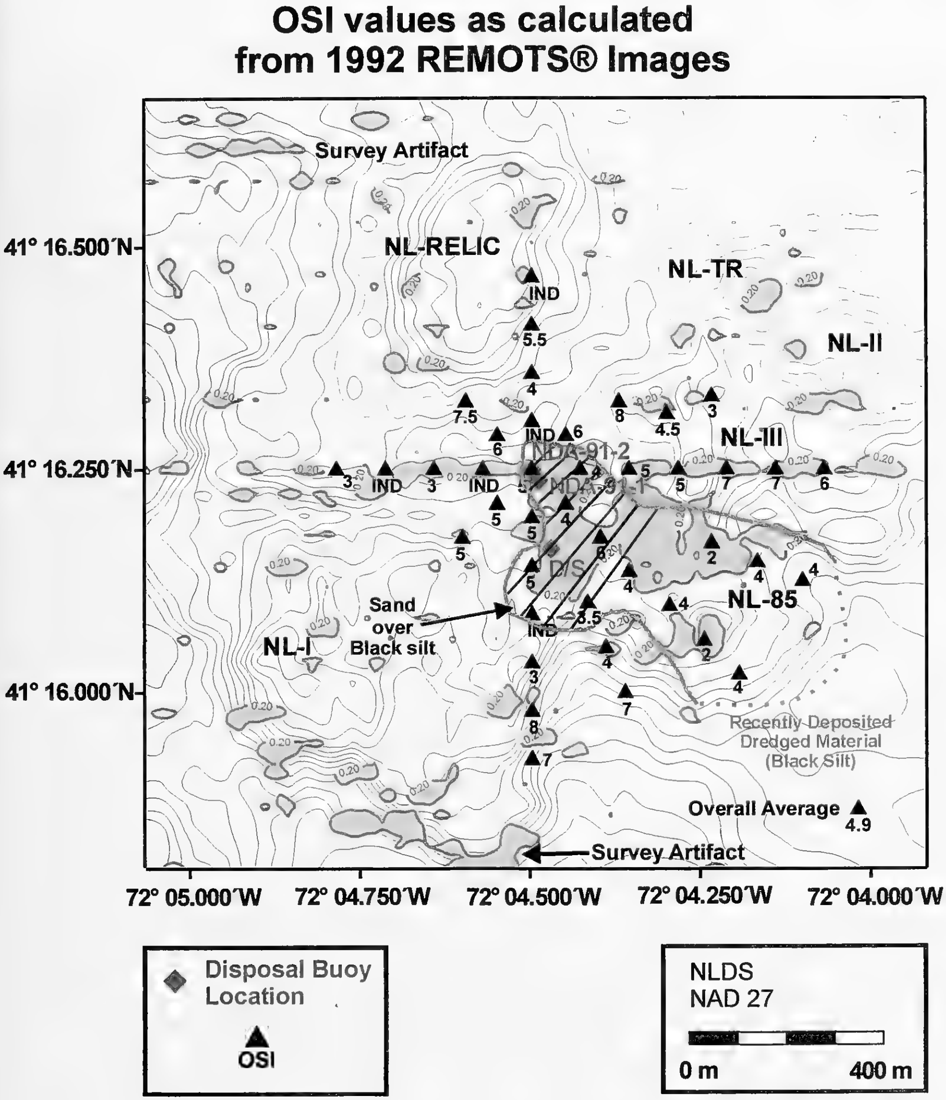

Figure 3-19. Distribution map of Organism Sediment Index (OSI) values over the NL-91 and D/S mound complex as detected in the August 1992 REMOTS® sediment-profile photography survey

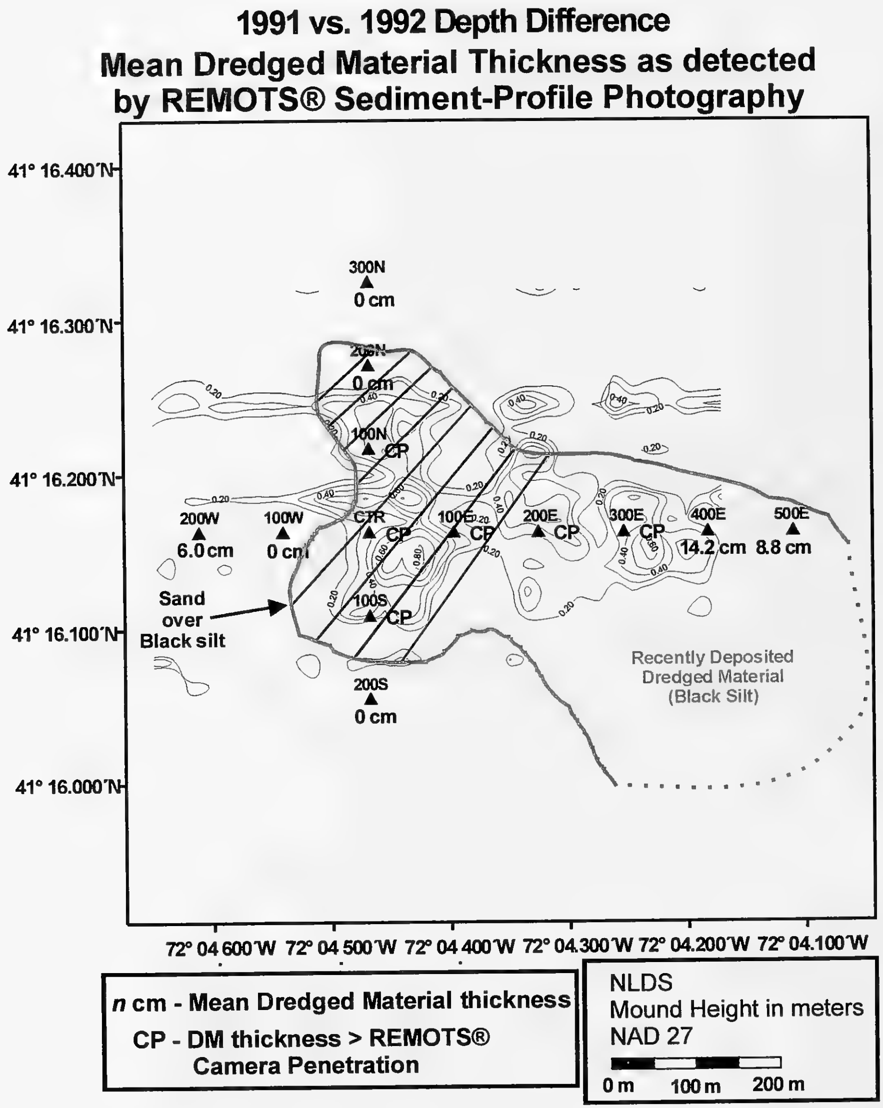

Figure 3-20. Mean dredged material thickness at 1995 REMOTS® sediment-profile photography stations over the NL-91 and D/S mound complex, relative to the August 1992 detectable margins

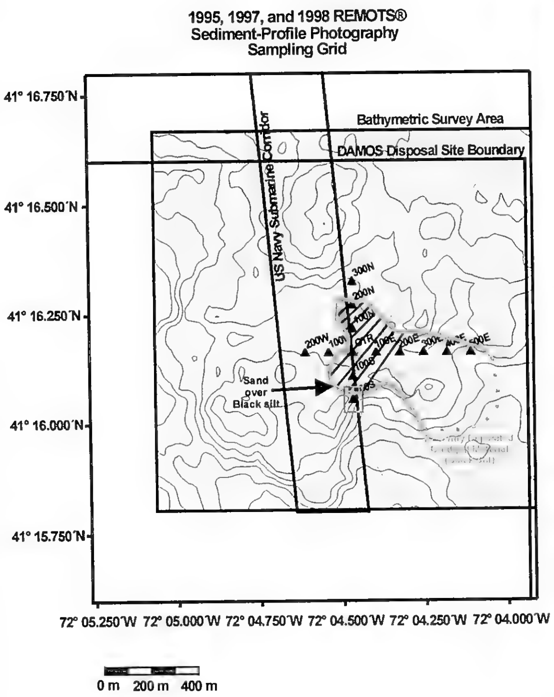

Figure 3-21. REMOTS® photograph of Station 200S depicting a layer of pebble and shell over reworked dredged material

200N, and 300N, where the layer of sand may have been incorporated into the sediment or was obscured by decaying amphipod tube mats.

The range of replicate-averaged boundary roughness values over the 1995 REMOTS® stations ranged from 0.7 cm to 4.8 cm, with the highest values at 200S (4.8 cm) caused by the presence of pebbles and shell lag (Table 3-2). Boundary roughness in the majority of the replicate images that were analyzed was less than 2 cm and often attributed to biogenic activity.

Replicate averaged RPD values over the NL-91 and D/S mound complex ranged from nearly 1.0 cm to 3.5 cm, with an overall average of 2.2 cm (Figure 3-22; Table 3-2). The shallowest RPDs were concentrated along the southern (100S, 200S) and eastern (100E, 300E, 400E, 500E) legs of the sample grid. The center station (CTR) displayed a relatively deep RPD of 3.0 cm, however, Station 300N demonstrated the deepest replicate averaged RPD value of 3.48 cm.

The presence of an RPD rebound layer was noted at several stations (CTR, 100S, 100E, 200E, 300E, 400E, and 500E). This rebound layer is the result of the RPD becoming shallower within the surface sediment several days to weeks before the REMOTS® sediment-profile photography survey. The reduction in RPD depth is often related to a decrease in bottom water DO concentrations, in association with a seasonal increase in oxygen demand (biological and chemical) within the surface sediments.

Stage III benthic communities were observed in at least one replicate photograph from all REMOTS® stations over the NL-91 and D/S mound complex. The dominant biological assemblage was Stage II on III as the August 1995 survey results indicated by the presence of decaying or disturbed amphipod tube mats (Figure 3-23A). At Stations 300E, 300N, and 400E one or two replicates contained only evidence of Stage II organisms (amphipods). Stage I on III was noted in replicate images from stations nearer the center of the mound (100E) and historic dredged material off the disposal mound (200N, 100W, 200S; Figures 3-23B and 3-24).

Organism Sediment Index values at the NL-91 and D/S mound complex ranged from +6 to +10, with an overall average of +8.0 (Figure 3-22; Table 3-2). The lowest OSI value (+6) was calculated for Station 400E primarily due to a shallow RPD depth in one replicate image, although the area surrounding 400E is still considered quite healthy. The highest OSI of +10 was generated for Station 200E, reflecting a Stage II on III successional stage and deep RPD depths in all three replicate images. There was no visible evidence of low apparent DO levels in the sediment at any of the stations, although methane gas bubbles were observed in one replicate image at Station 100S.

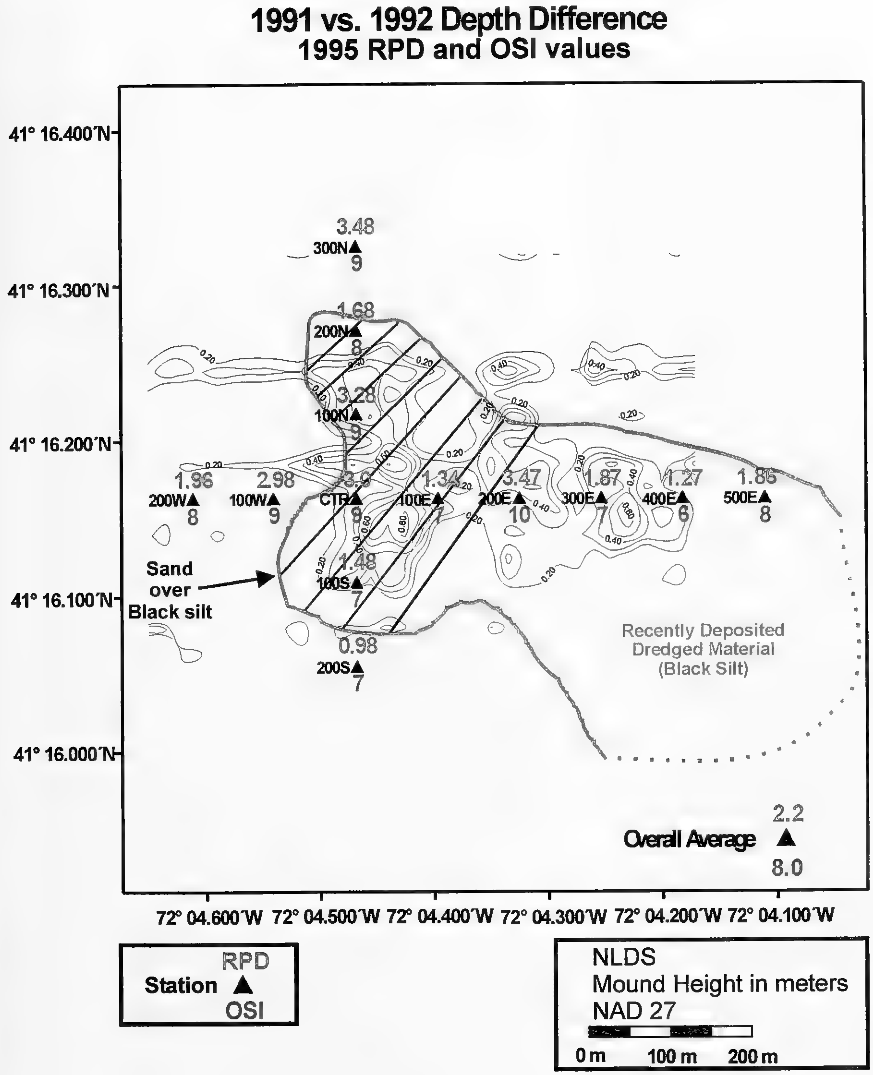

Figure 3-22. Spatial distribution of mean redox potential discontinuity depths over the NL-91 and D/S mound complex as detected by the 1995 REMOTS® sediment-profile photography survey, relative to the 1992 detectable margins of the mound

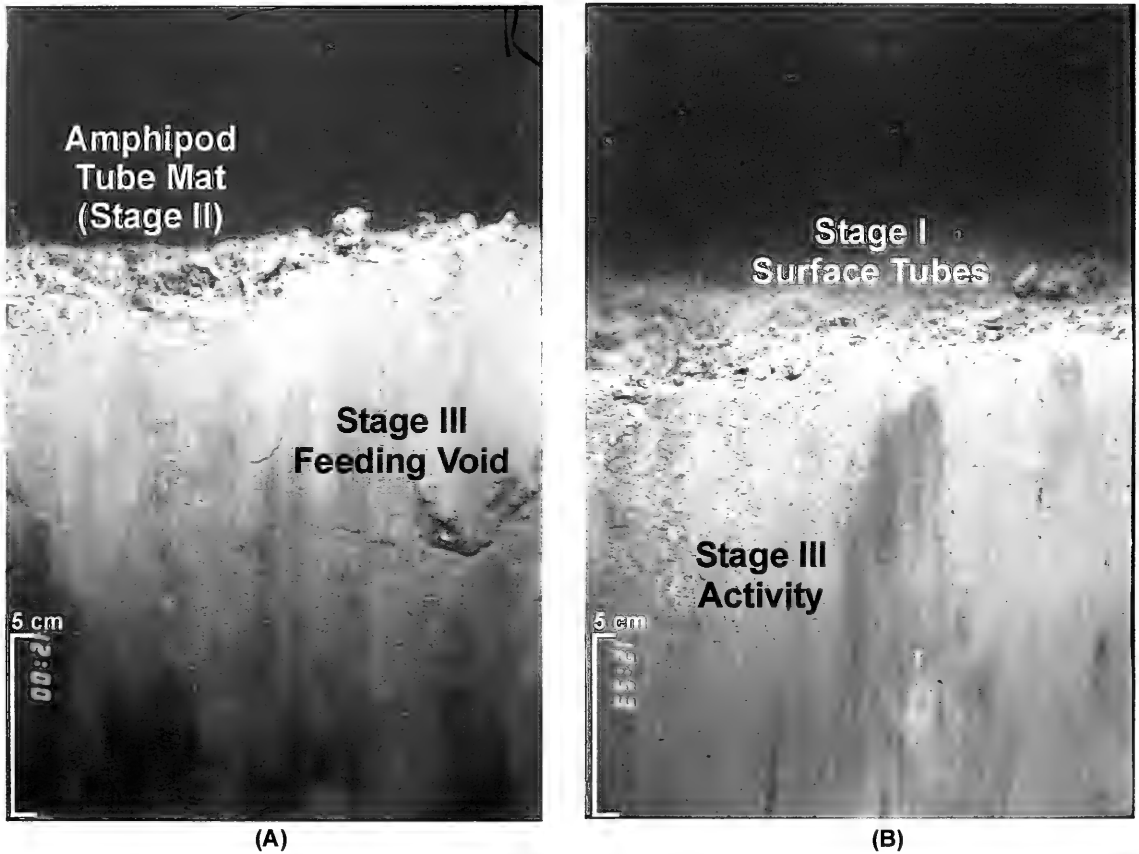

Figure 3-23. REMOTS photographs showing Stage II on Stage III at (A) CTR and Stage I on III at (B) 200N on the D/S mound

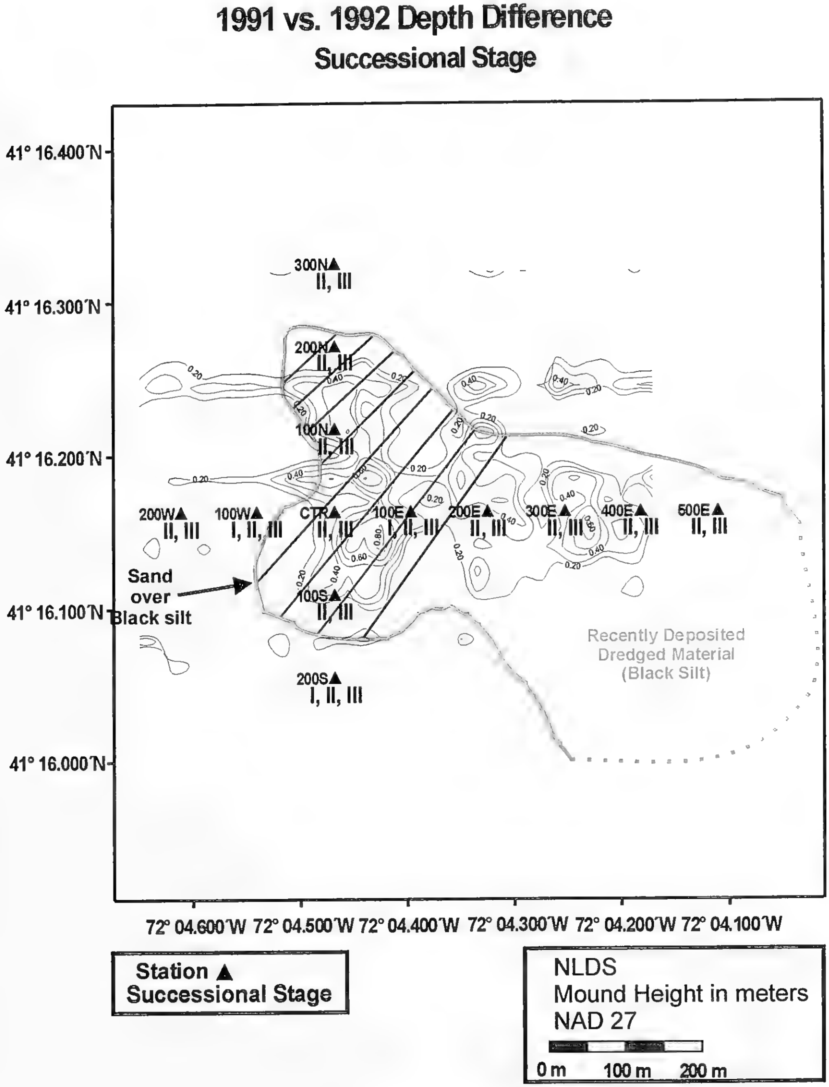

Figure 3-24. Spatial distribution map of successional stage status for the August 1995 REMOTS® sediment-profile photography stations occupied over the NL-91 and D/S mound complex, relative to the detectable margins of the mound

3.1.2.3 September 1997 Survey

In September 1997, a second follow-up REMOTS® sediment profile photography survey was conducted to document the continued benthic recovery over the NL-91 and D/S mound complex. Station locations were based on the same modified 13-station grid occupied in August 1995 (Figure 2-4B).

Recent and/or historic dredged material was both detected and greater than the penetration of the camera prism in all replicates, with averaged thickness ranging from 6.8 to 18.2 cm (overall average of 14.2 cm). The replicate-averaged mean camera penetration over the mound was somewhat deeper than the previous survey. As a result, the images displayed more layering of material relative to the 1995 survey, with fine sand over reworked dredged material, over fine organic silt at several stations (Figure 3-25A).

As in previous years, fine to very fine sand characterized the sediment over the NL-91 and D/S mound complex (Table 3-3). The major modal grain size was 4 to 3 phi (very fine sand) in most photographs, with a mix of silt-clay in nine of the 42 images. Station 200W displayed medium-grained sand (2 phi), along with shell fragments and remnants of decaying amphipod tube mats (Figure 3-25B). Surface sand overlying fine-grained sediment (sand-over-mud stratigraphy) was noted at every station over the disposal mound. Granule and pebble sized grains were noted at the sediment-water interface in multiple replicates collected at Stations 100S and 200S (Figure 3-26A & B).

The replicate-averaged boundary roughness values ranged from 0.6 to 2.2 cm (Table 3-3). In contrast to samples collected in 1995, boundary roughness was primarily attributed to physical forces, although some surface disturbances were indeterminant or caused by biogenic activity. Evidence of physical disturbance of the surface included abundant disturbed amphipod tube mats, surface scour, and shell lag deposits. Individual replicates at Stations 200N (a) and 300N (b and c) showed evidence of winnowing of fines at the sediment surface.

The replicate-averaged apparent RPD ranged from 1.0 to 6.7 cm (4.47 average; Figure 3-27). Stations 200E, 400E, and 300N had a visible redox rebound layer ranging from 5 cm to 10 cm below the sediment-water interface, indicating a recent reduction in the RPD depth.

The successional status was advanced, showing healthy Stage II or Stage II on III communities inhabiting the sediments of the NL-91 and D/S mound complex (Figure 3-28). Some of the photographs were identified as Stage I to II due to the presence of disturbed and

Table 3-3
NL-91 and D/S Mound Complex REMOTS® Sediment-Profile Photography Results Summary for the 1997 Survey

Mound/ Ref. Area	Station	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)**	Number of Reps w/Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NL-91 & D/S	100E	11.50	>14.82	3	5.53	I,II,III	ST_I_ON_III	4 to 3	10	10	1.23
NL-91 & D/S	100N	14.32	>14.18	3	6.74	II,III	ST_II_TO_III	4 to 3	10.67	11	1.97
NL-91 & D/S	100S	10.87	>10.97	3	2.19	II,III	ST_II_ON_III	4 to 3	8.5	8.5	1.02
NL-91 & D/S	100W	17.14	>17.26	3	6.11	I,II,III	ST_II_ON_III	4 to 3	10.33	11	1.78
NL-91 & D/S	200E	15.10	>15.45	3	4.92	II	ST_II	4 to 3	8.33	9	1.18
NL-91 & D/S	200N	6.70	>6.82	3	3.24	I,II,III	ST_II_ON_III	4 to 3	7	7	1.94
NL-91 & D/S	200S	6.94	>6.91	3	3.79	I,II,III	ST_II_ON_III	4 to 3	11	11	1.24
NL-91 & D/S	200W	15.49	>15.53	3	4.57	I,II,III	ST_I_ON_III	4 to 3	8.5	8.5	2.22
NL-91 & D/S	300E	14.20	>14.11	3	5.29	I,II,III	ST_I_ON_III	4 to 3	8	8	1.13
NL-91 & D/S	300N	17.70	>17.56	3	1.03	I,II	ST_II	>4	2	2	1.31
NL-91 & D/S	400E	15.52	>15.35	5	4.23	I,II,III	ST_II_ON_III	>4	7	7	0.64
NL-91 & D/S	500E	16.94	>16.82	4	4.32	II,III	ST_II_ON_III	4 to 3	9	9	1.04
NL-91 & D/S	CTR	18.42	>18.23	3	6.17	II,III	ST_II_ON_III	4 to 3	10	10	1.29
AVG		13.53	>14.15	3.23	4.47				8.49	8.62	1.38
MAX		17.70	>18.23	5	6.74				11	11	2.22
MIN		6.70	>6.82	3	1.03				2	2	0.64

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

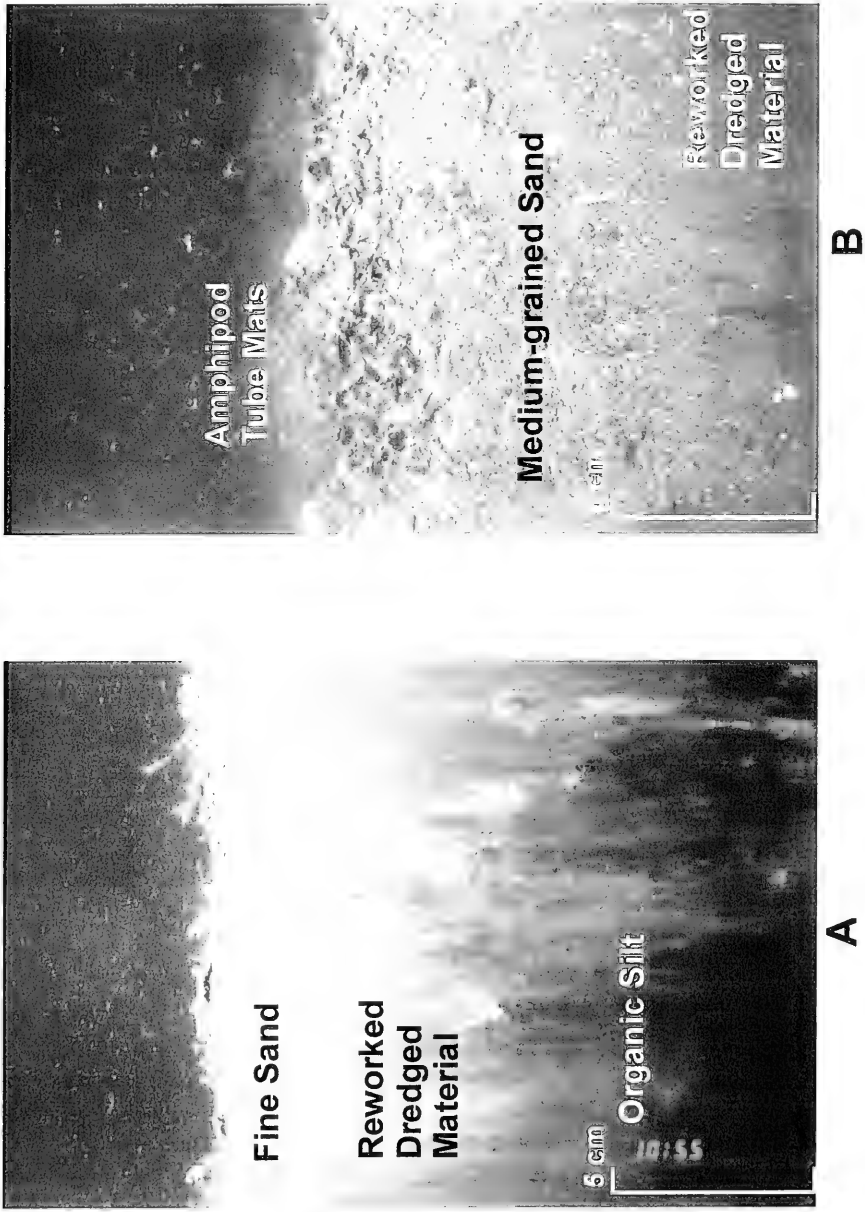

Figure 3-25. 1997 REMOTS® images from Stations 200E (A) and 200W (B) depicting dredged material layering and medium-grained sand in the surface layer, respectively

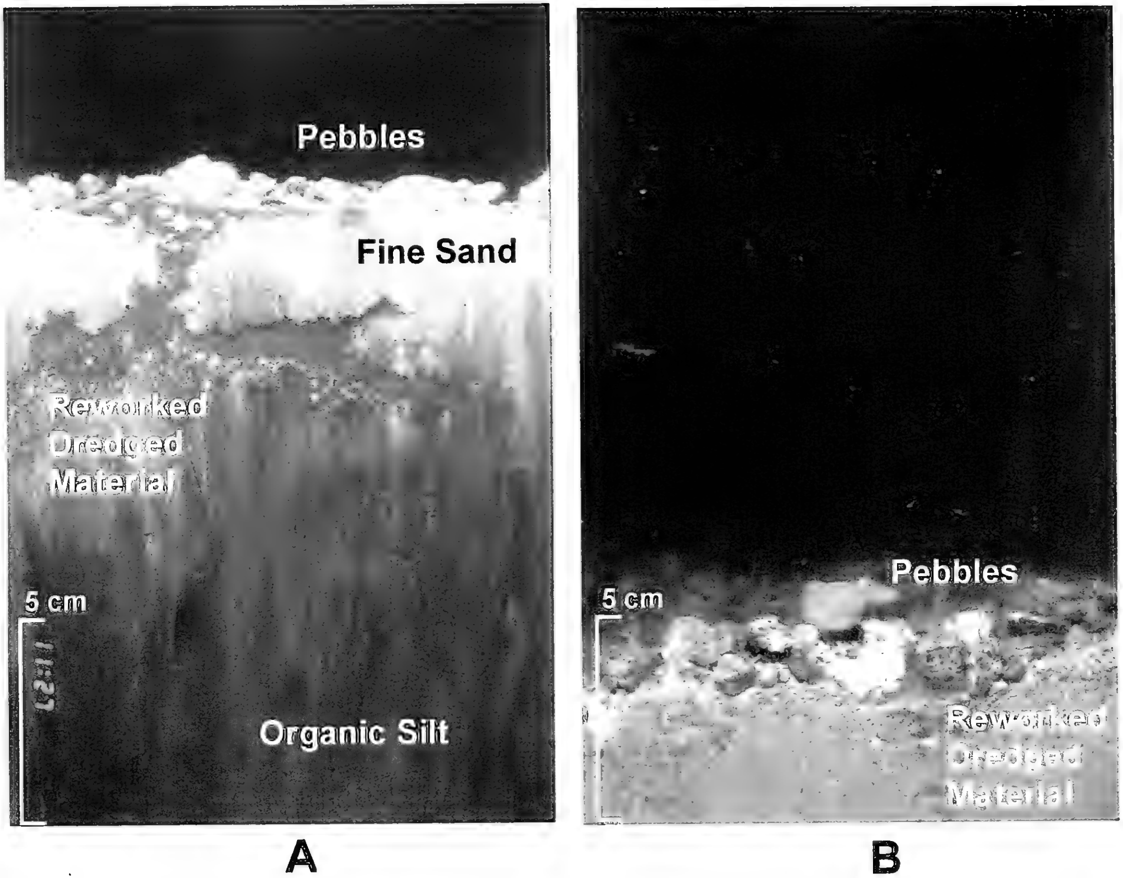

Figure 3-26. 1997 REMOTS® images collected at the NL-91 and D/S mound complex Stations 100S (A) and 200S (B) displaying a surface layer of pebbles over reworked material

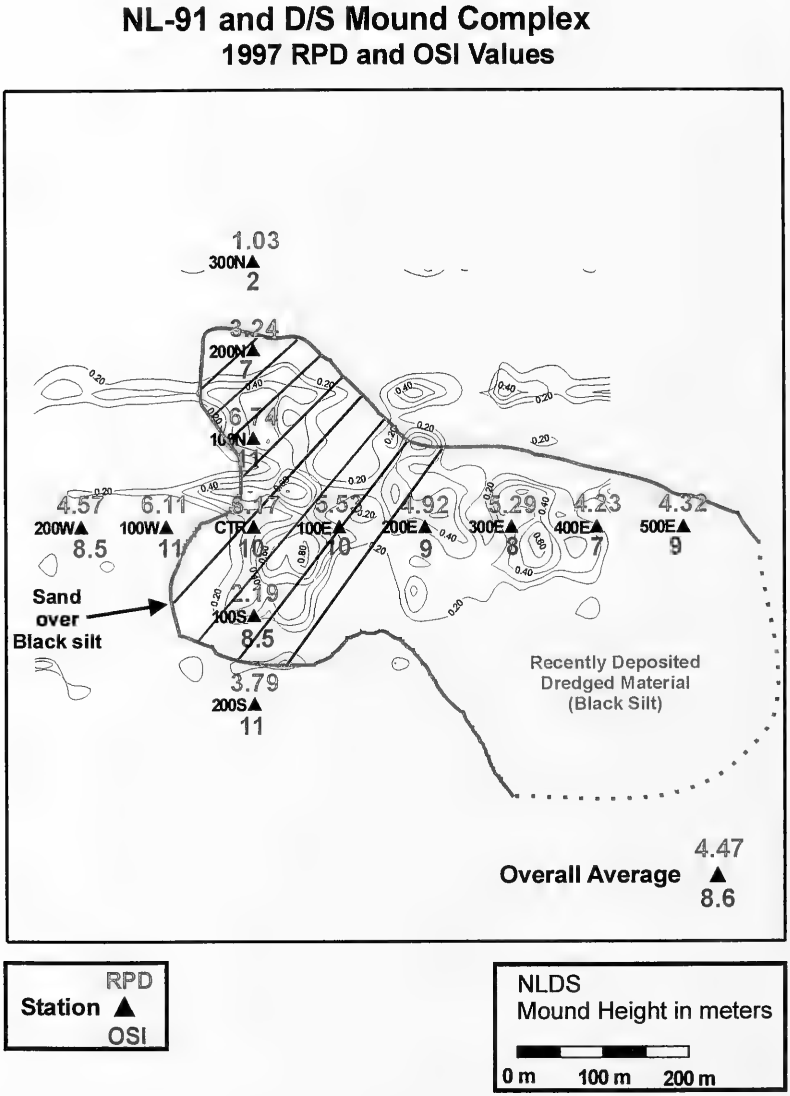

Figure 3-27. Distribution map of mean RPD (red) and median OSI (blue) values calculated for the 1997 survey over the NL-91 and D/S mound complex, relative to the 1992 disposal mound footprint

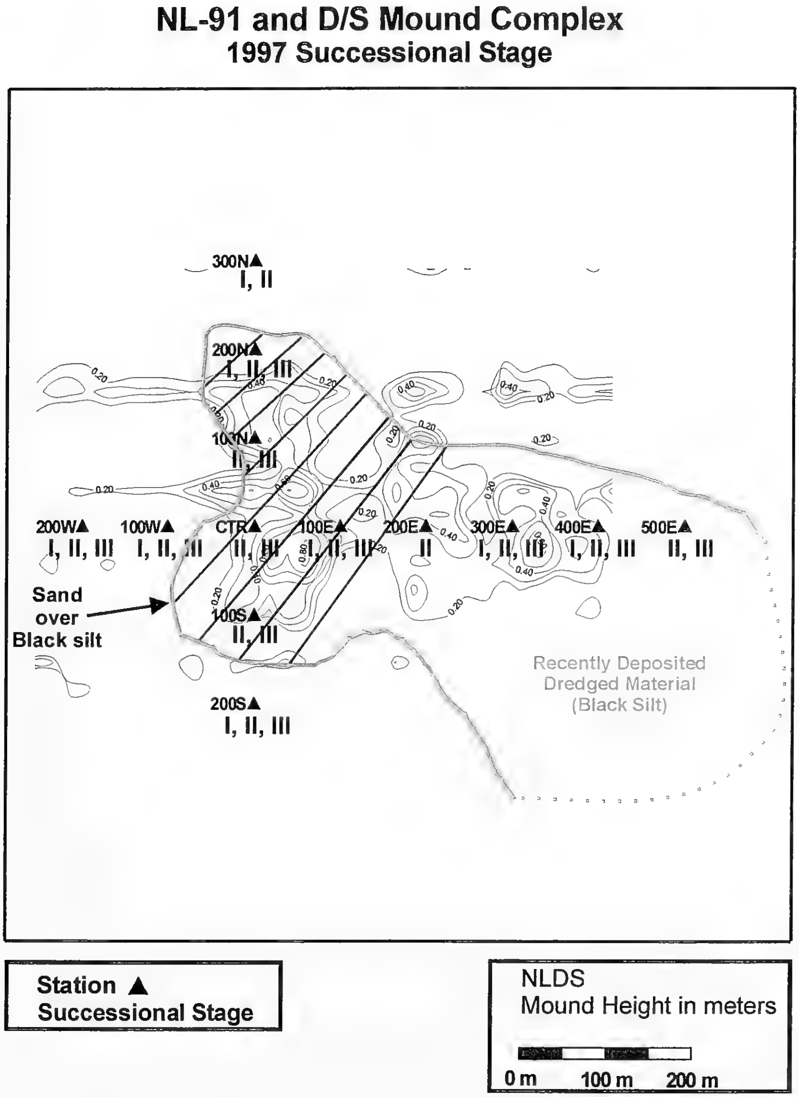

Figure 3-28. Distribution map of successional stage calculated for the 1997 survey over the NL-91 and D/S mound complex, relative to the 1992 disposal mound footprint

decaying amphipod (*Ampelisca*) tube mats. Stage III organisms were present in 19 of the 42 replicates and represented at all stations except 300N and 200E.

The median OSI values ranged from +2 to +11, with an overall average of +8.6 for the entire NL-91 and D/S mound complex (Figure 3-27). The only station displaying a median OSI value of < +6 (indicating continued disturbance) was Station 300N (OSI +2) primarily due to the lack of Stage III organisms and shallow RPD depths. Conditions indicative of low bottom water DO concentrations were observed in sediments at three stations. One or more of the replicate images collected from stations 100E, 300E, and 300N displayed shallow RPD depths and dark, sulfidic sediment located at or near the sediment-water interface, suggesting a recent reduction in available oxygen. However, the presence of Stage III individuals and moderate to deep RPD depths in other replicate images obtained from stations 100E and 300E contributed to high OSI values, +10 and +8, respectively. The highest OSI (+11) was calculated for Stations 100N, 100W, and 200S, reflecting a Stage II on III successional stage and deep RPD depths in all three replicate images collected for each station.

3.1.2.4 July 1998 Survey

REMOTS® results from the 1998 survey over the NL-91 and D/S mound complex were used to document the placement of supplemental cap material during the 1997-1998 disposal season. In addition, REMOTS® sediment-profile photography was used to evaluate the benthic recolonization over the center of the disposal mound and continue assessment of the overall recovery of the dredged material deposit. The 13-station sampling grid established in 1995 was reoccupied, and three replicate photographs were collected at each station.

Dredged material was detected in layers having a thickness which exceeded the camera prism penetration depth at all stations, with minimum dredged material layer thickness ranging from 6.4 cm to 14.6 cm (overall average of 11.9 cm). Apparent new dredged material was observed over the northern and central areas of the original NL-91 deposit (Figure 3-29). The thickness of new material was measured in the REMOTS® photographs, where fresh material over older deposits was clearly evident (Figure 3-30).

The DAMOS Capping model was used to calculate the footprint of the 1997-98 sediment deposit on the NLDS seafloor and forecast where new material would accumulate. Based on reported barge volumes and disposal positions, the model predicted the footprint would consist of two overlapping deposits (represented as circles on Figure 3-30) with diameters of 400 m (5,650 m^3 reported volume) and 300 m (1,200 m^3 reported volume). The circles encompass the majority of the REMOTS® sediment-profile

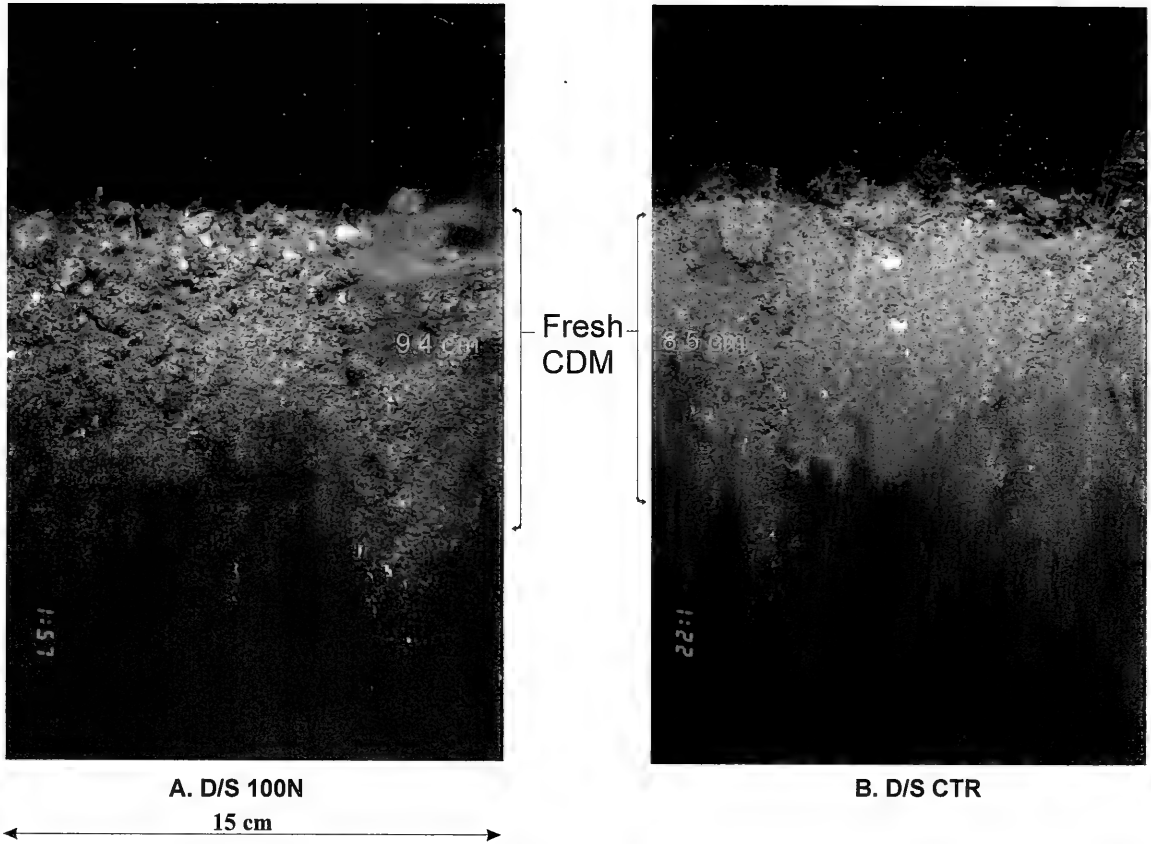

Figure 3-29. Evidence of recently disposed capping dredged material (CDM) over the NL-91 and D/S Mound Complex

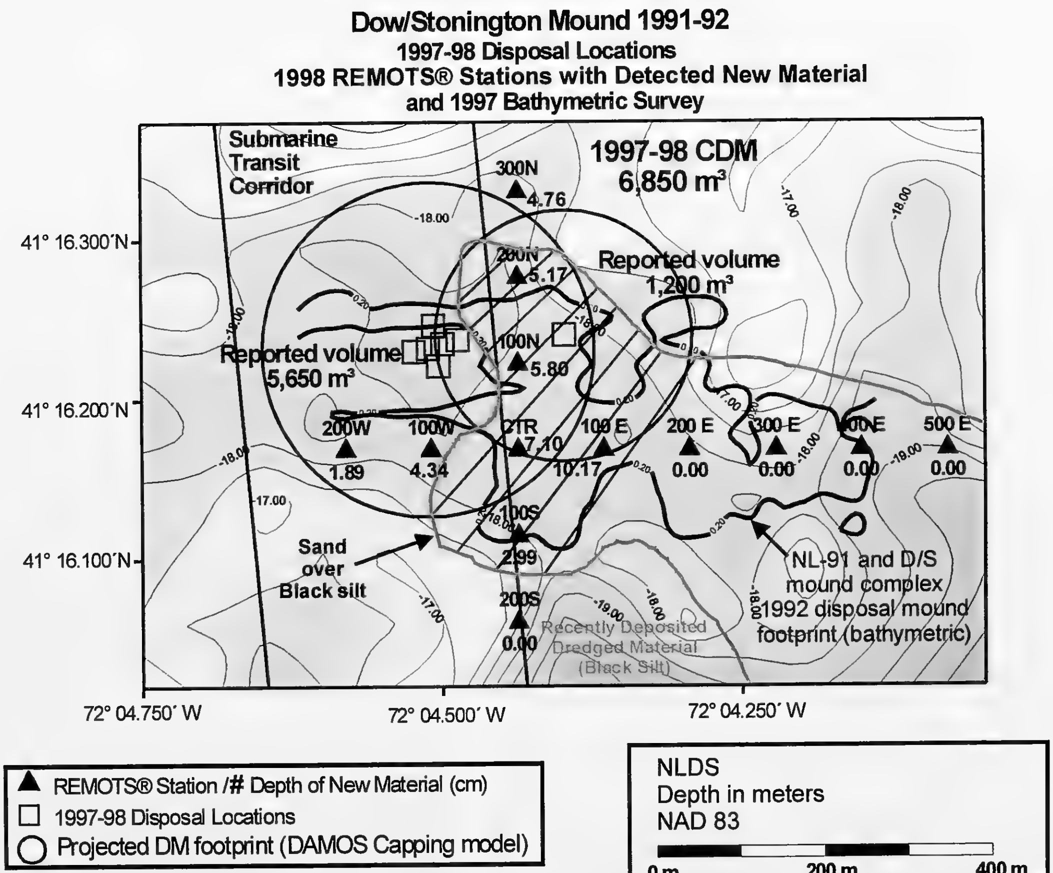

Figure 3-30. CDM disposal locations and projected footprint of new dredged material on the seafloor vs. depth of new material at REMOTS® stations over the NL-91 and D/S Mound Complex

photography stations that display accumulation of new material. Thin layers of material were observed at two stations falling outside the predicted area of accumulation (Stations 300N and 100S). The presence of this material at these stations suggests a thin layer on the margins of the new deposit spread 25 m to 50 m beyond the radius predicted by the model.

The replicate-averaged mean camera penetration at the NL-91 and D/S mound complex ranged from 6.5 to 15.8 cm, with an overall average of 12.4 cm (Table 3-4). As in previous surveys, fine to very fine sand characterized the surface sediments over the mound. The major modal grain size was 4 to 3 phi (very fine sand) in most photographs. Surface sand overlying fine-grained sediment (sand-over-mud stratigraphy) was noted over the majority of the NL-91 and D/S mound complex. Sand, pebbles and hydrozoans were noted once again at Station 200S, consistent with the findings of prior surveys (Figure 3-31).

The replicate-averaged boundary roughness values ranged from 1.0 to 3.2 cm, with an average of 1.5 cm (Table 3-4). Boundary roughness was attributed to a combination of physical and biogenic forces. Evidence of physical disturbance and possible winnowing of the surface included abundant disturbed amphipod tube mats, surface scour, and shell lag deposits.

The apparent redox potential discontinuity (RPD) was measured on each photograph to determine the depth of penetration of oxygen into the sediment (Figure 3-32; Table 3-4). The replicate-averaged apparent RPD depths over the NL-91 and D/S mound complex ranged from 1.2 to 6.1 cm (3.6 average). No stations over the mound displayed any visible redox rebound layers.

The successional status was advanced, showing healthy Stage II or Stage II on III communities inhabiting the sediments of the disposal mound. Some stations showed a slight decline in successional stage relative to data collected in 1997. The reference area showed a similar decline in comparisons between the 1997 and 1998 dataset (Table 3-12). Stage III organisms were present in 15 of the 39 replicates distributed among eight stations (Figure 3-33). The remainder of the July 1998 photographs were classified as Stage I, or Stage I to II if amphipod (*Ampelisca*) tube mats were present.

Median OSI values ranged from +3.0 to +11.0, with an overall average of +7.5 for the NL-91 and D/S mound complex (Figure 3-32; Table 3-4). The only median OSI values of < +6.0 (indicating continued disturbance) occurred at Stations 300E and 400E. The low OSI values were due in part to shallow RPDs, disturbed amphipod tube mats and

Table 3-4
NL-91 and D/S Mound Complex REMOTS® Sediment-Profile Photography Results Summary for the 1997 and 1998 Surveys

Mound/ Ref. Area	Station	Camera Penetration Mean (cm)		Dredged Material Thickness Mean (cm)**		Number of Reps w/Dredged Material		RPD Mean (cm)		Successional Stages Present		Highest Stage Present		Grain Size Major Mode (phi)		OSI Median		Boundary Roughness	
		1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
NL-91 & D/S	100E	11.50	13.97	>18.23	>14.01	3	3	5.53	6.07	I,II,III	I,II,III	ST_I_ON_III	ST_II_ON_III	4 to 3	4 to 3	10	9	1.23	1.24
NL-91 & D/S	100N	14.32	12.85	>14.82	>13.34	3	3	6.74	6.07	II,III	I,II	ST_II_TO_III	ST_II	4 to 3	4 to 3	11	6	1.97	3.15
NL-91 & D/S	100S	10.87	14.65	>14.18	>14.57	3	3	2.19	2.67	II,III	II	ST_II_ON_III	ST_II	4 to 3	>4	8.5	7	1.02	1.61
NL-91 & D/S	100W	17.14	11.40	>10.97	>11.59	3	3	6.11	3.23	I,II,III	II,III	ST_II_ON_III	ST_II_ON_III	4 to 3	4 to 3	11	9	1.78	1.02
NL-91 & D/S	200E	15.10	13.96	>17.26	>13.92	3	3	4.92	3.54	II	I,II,III	ST_II	ST_II_ON_III	4 to 3	4 to 3	9	10	1.18	1.18
NL-91 & D/S	200N	6.70	9.80	>15.45	>9.71	3	3	3.24	2.90	I,II,III	I,II,III	ST_II_ON_III	ST_II_ON_III	4 to 3	4 to 3	7	8	1.94	1.13
NL-91 & D/S	200S	6.94	6.51	>6.82	>6.41	3	3	3.79	2.59	I,II,III	I,II,III	ST_II_ON_III	ST_II_ON_III	4 to 3	4 to 3	11	7	1.24	1.51
NL-91 & D/S	200W	15.49	8.53	>6.91	>8.38	3	3	4.57	3.90	I,II,III	I,II,III	ST_I_ON_III	ST_II_ON_III	4 to 3	4 to 3	8.5	9	2.22	1.84
NL-91 & D/S	300E	14.20	13.87	>15.53	>13.51	3	3	5.29	1.17	I,II,III	I	ST_I_ON_III	ST_I	4 to 3	>4	8	3	1.13	1.28
NL-91 & D/S	300N	17.70	11.42	>14.11	>11.39	3	3	1.03	5.97	I,II	I,II,III	ST_II	ST_II_ON_III	>4	4 to 3	2	11	1.31	1.81
NL-91 & D/S	400E	15.52	14.56	>17.56	>14.35	5	3	4.23	1.19	I,II,III	I,II	ST_II_ON_III	ST_II	>4	>4	7	3	0.64	1.49
NL-91 & D/S	500E	16.94	15.83	>15.35	9.56	4	2	4.32	2.61	II,III	II,III	ST_II_ON_III	ST_II_ON_III	4 to 3	>4	9	7	1.04	1.63
NL-91 & D/S	CTR	18.42	13.82	>16.82	>13.87	3	3	6.17	5.14	II,III	I,II	ST_II_ON_III	ST_I_TO_II	4 to 3	4 to 3	10	8	1.29	1.01
AVG		13.91	12.40	>14.15	>11.89	3.23	2.92	4.47	3.62							9	7.46	1.39	1.53
MAX		18.42	15.83	>18.23	>14.57	5	3	6.74	6.07							11	11	2.22	3.15
MIN		6.70	6.51	>6.82	>6.41	3	2	1.03	1.17							2	3	0.64	1.01

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

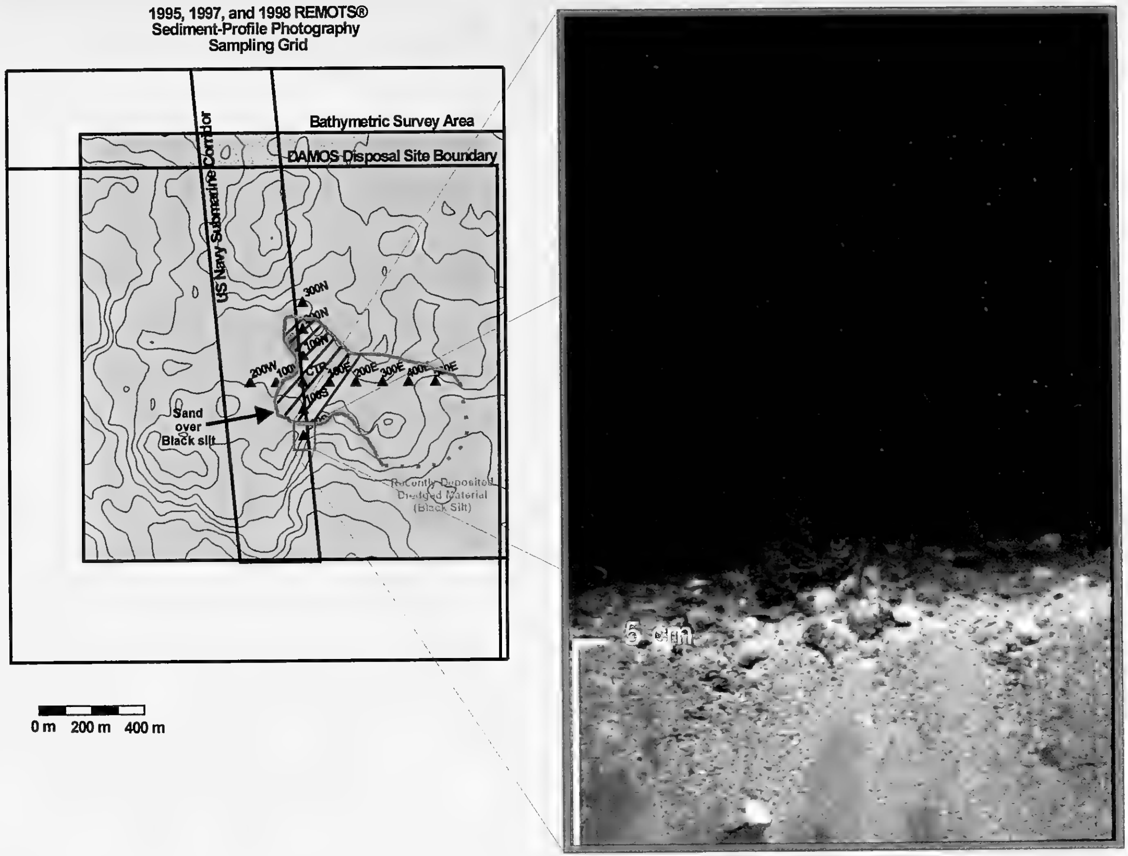

Figure 3-31. REMOTS® photograph of Station 200S depicting a layer of pebble and shell over reworked dredged material

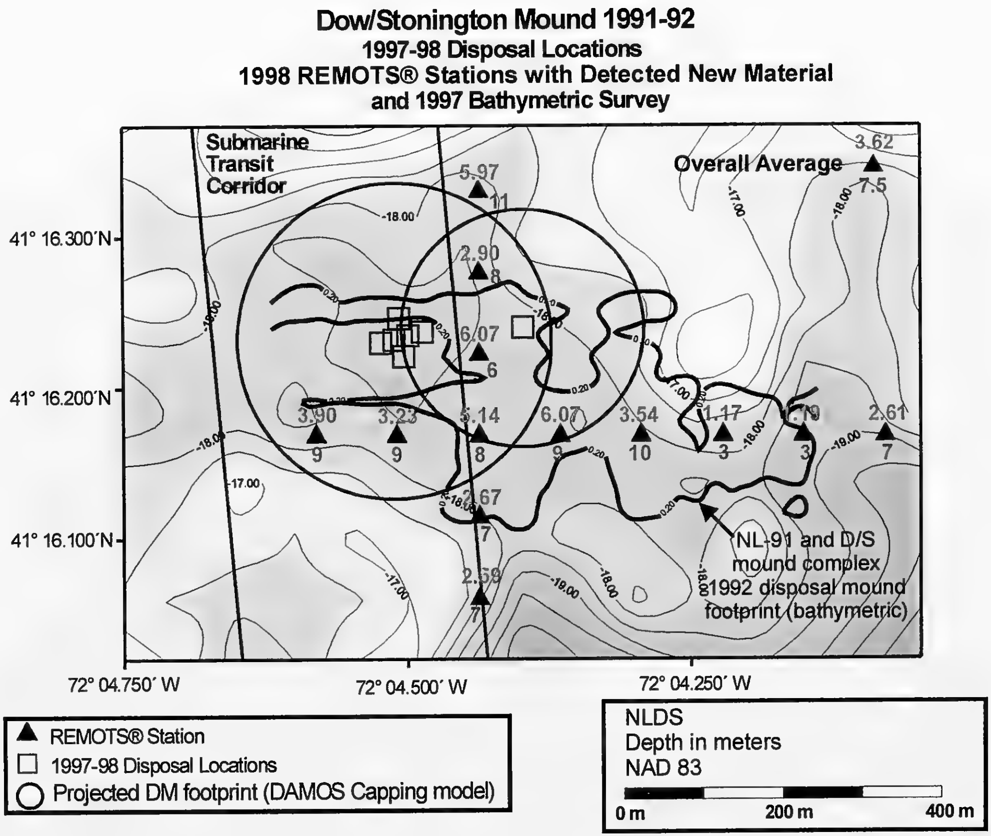

Figure 3-32. Distribution map of mean RPD (red) and median OSI (blue) values calculated for the 1998 survey over the NL-91 and D/S mound complex, relative to the 1992 disposal mound footprint and the predicted footprint of new material deposited during the 1997-98 disposal season

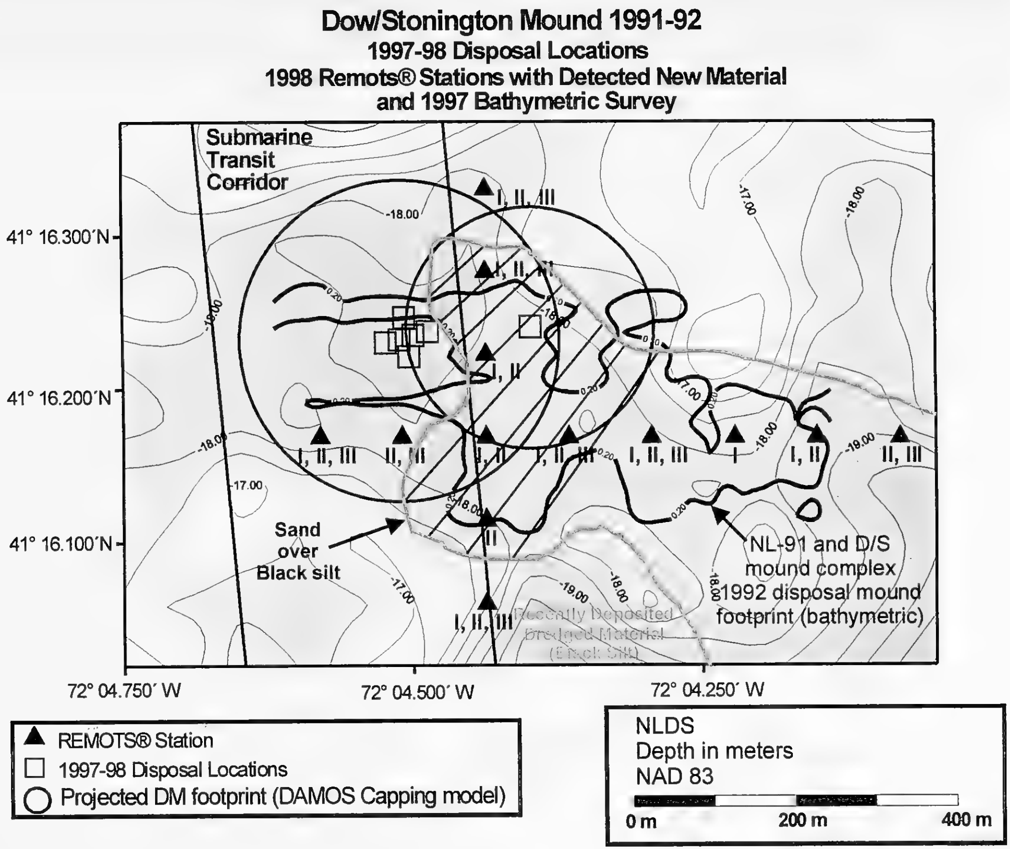

Figure 3-33. Distribution map of successional stage calculated for the 1998 survey over the NL-91 and D/S mound complex, relative to the 1992 disposal mound footprint and the predicted footprint of new material deposited during the 1997-98 disposal season

lack of clear evidence of recent Stage III activity. There were no indications of low DO conditions within the surface sediments, and no methane detected.

3.1.3 August 1992 Dissolved Oxygen Measurements

Near-bottom (approximately 1 m above the bottom) dissolved oxygen concentrations sampled on 7 August 1992 at the disposal site and the three reference areas ranged from 7.3 mg/L to 7.8 mg/L. Dissolved oxygen concentrations in the top two meters of the water column were slightly higher than those measured in near-bottom waters, ranging from 7.7 mg/L to 8.1 mg/L. The concentrations of dissolved oxygen were uniformly distributed throughout the disposal site and reference areas. These concentrations are not limiting to benthic organisms (Tyson and Pearson 1991).

3.2 USCGA Disposal Mound

3.2.1 Bathymetry

The USCGA dredged material disposal mound was formed when 124,000 m^3 of dredged material from the Eagle Pier project at the U.S. Coast Guard Academy was released at NLDS between the historic NL-TR and NL-RELIC disposal mounds. A 1600 m × 1600 m precision bathymetric survey was conducted in August 1995 to document changes in seafloor topography relative to the survey performed in August 1992 (Figures 3-34 and 3-35).

A 0.86 km^2 area surrounding the USCGA buoy was selected as an area of detailed analysis to facilitate accurate depth difference calculations. The material dredged from the US Coast Guard Academy was sequentially deposited, forming an irregularly shaped sediment mound 420 m wide and 1 m high at the apex (Figure 3-36). There was a 0.5 m high ridge of sediment that extended approximately 320 m southwest from the center of the mound. Another lobe of sediment extended 350 m from the mound center to the north-northeast and was 190 m wide.

3.2.2 REMOTS® Sediment-Profile Photography

A 13-station REMOTS® sediment-profile photography survey was completed over the USCGA mound in August 1995 to document the benthic recolonization status. A complete set of REMOTS® image analysis results for the August 1995 survey of the USCGA mound is presented in Appendix B.

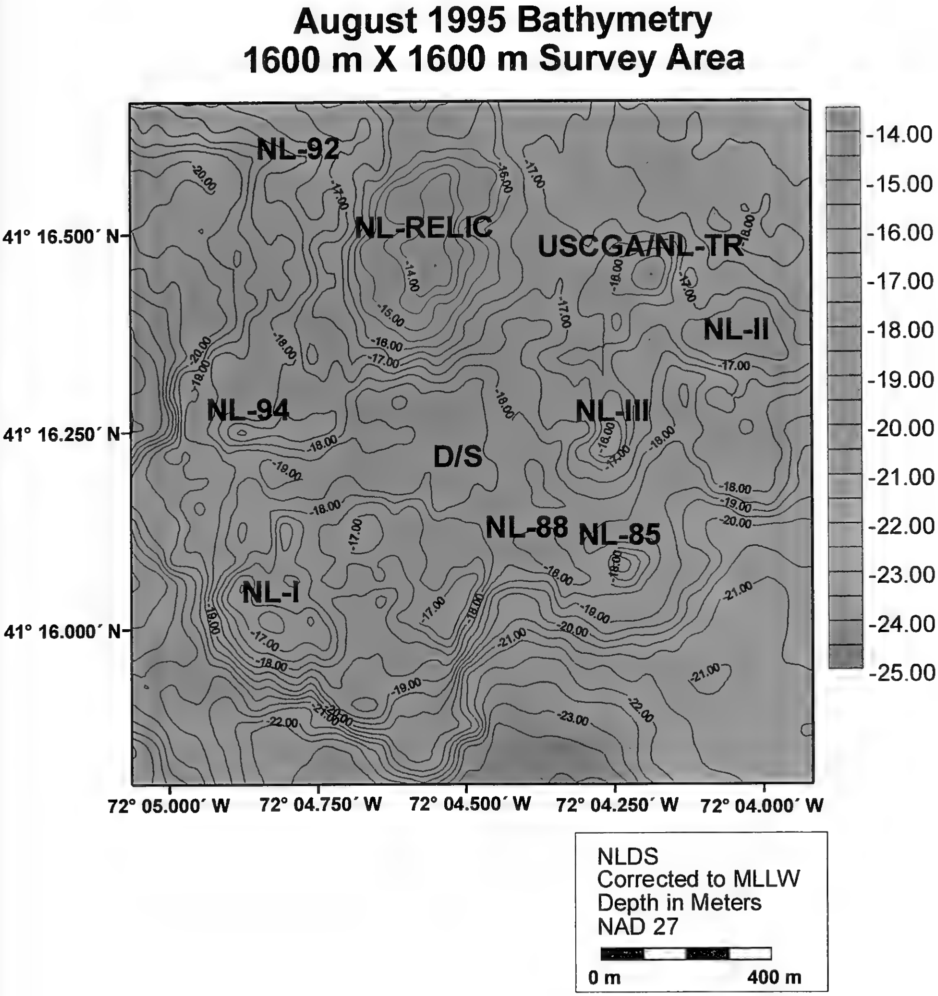

Figure 3-34. Bathymetric chart of the 1600 m × 1600 m survey area, August 1995 results, 0.5 m contour interval

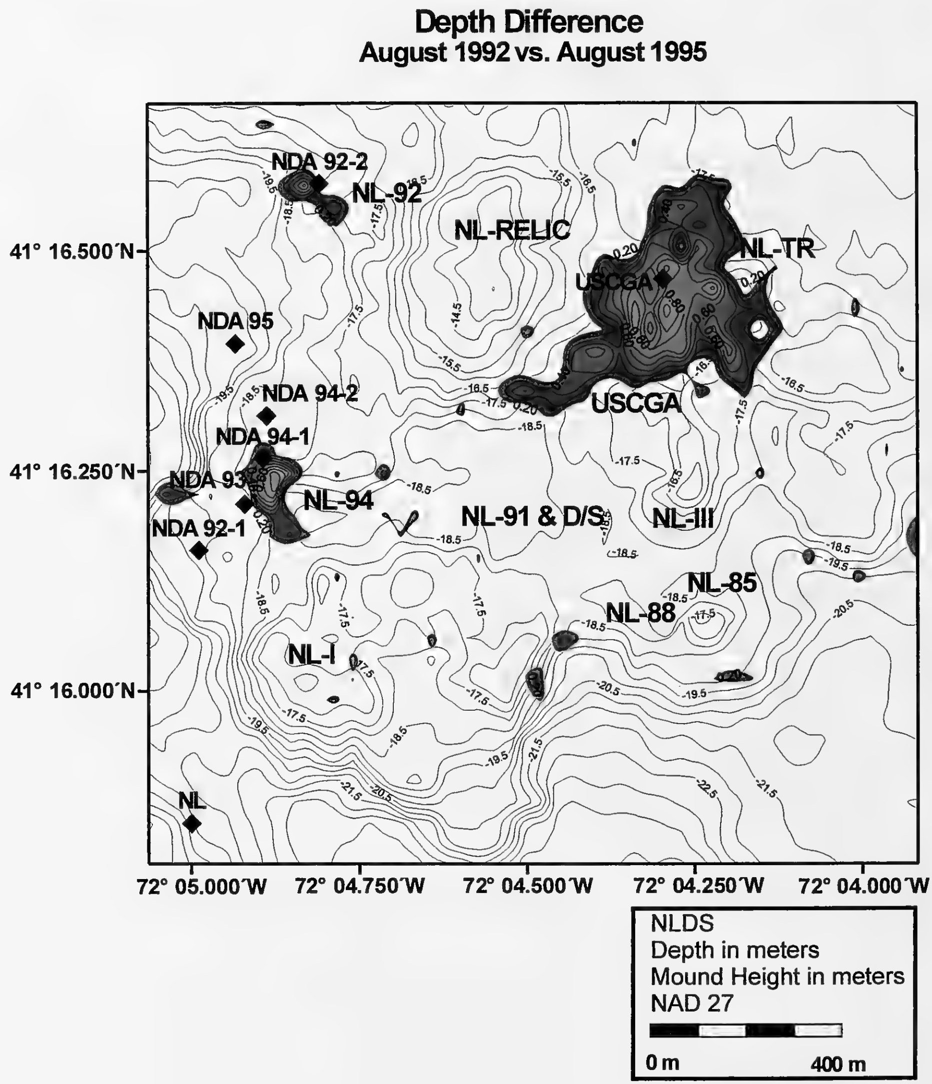

Figure 3-35. Depth difference plot displaying the location of the disposal mounds created since the August 1992 survey (USCGA, NL-94, and NL-92) relative to historic disposal mounds

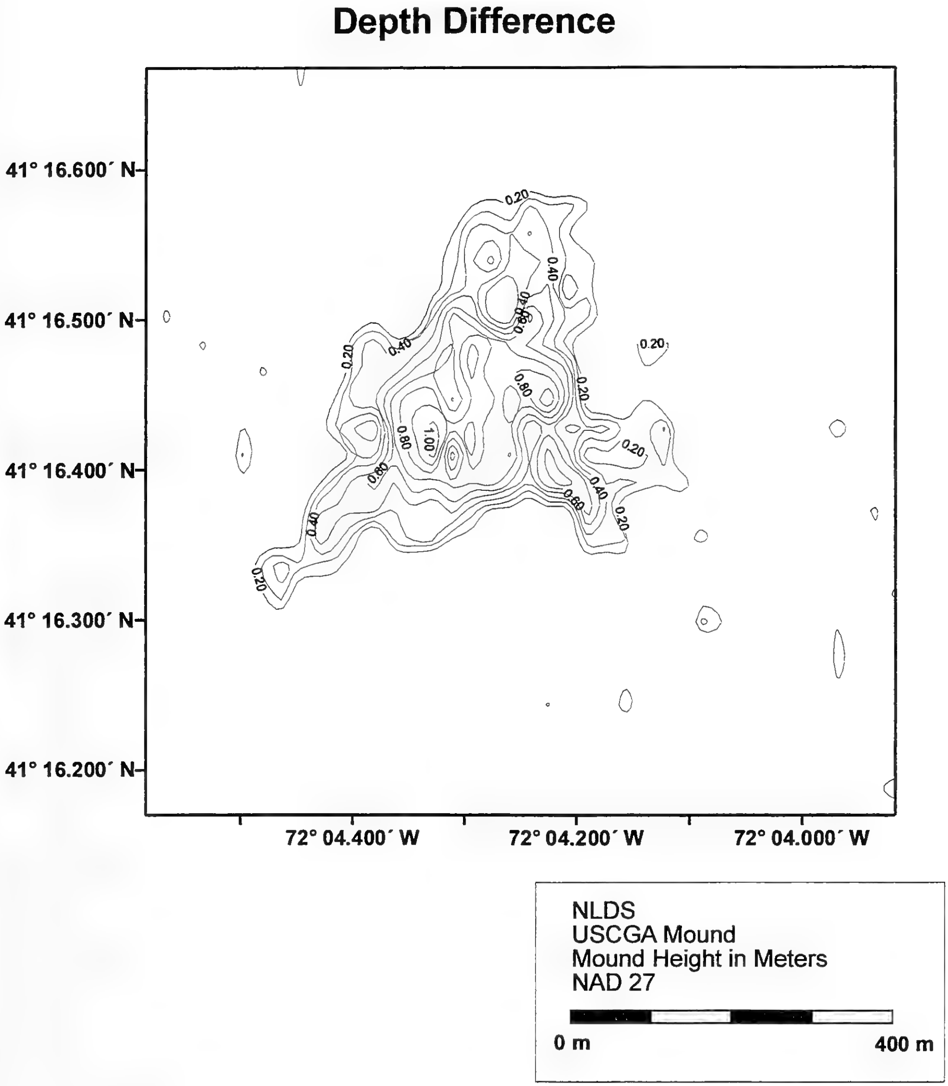

Figure 3-36. USCGA mound, depth difference from August 1992 to August 1995, 0.2 m contour interval

At ten out of thirteen REMOTS® stations, the dredged material thickness exceeded the camera prism penetration depth in all of the replicate photographs (Table 3-5). Along the southeast stations, dredged material thickness either exceeded prism penetration depth or reached a maximum of 13.24 cm (100SE) and 9.23 cm (50SE). At Station 150E, dredged material thickness was less than penetration depth and averaged 12.8 cm.

The mean prism penetration depths ranged from 12.2 cm to 15.9 cm and averaged 14.0 cm. These values are consistent with the presence of fine-grained material at most of the stations. Most REMOTS® photographs taken at the USCGA mound showed homogeneous silt-clay (>4 phi). Very fine sand (4 to 3 phi) was noted in two replicates at 100S, and at one replicate each at 100W, 50N, 50S, and CTR. Sand-over-mud layering was noted at all stations.

The boundary roughness values for the USCGA mound sediment-profile photographs were low (ranging from 0.6 to 1.6 cm with an average of 1.0 cm), indicating relatively little surface disturbance. Boundary roughness was due to biogenic activity in all but one photograph. In one of the replicate photographs at Station 100E, the boundary roughness was due to the presence of shell lag at the sediment surface.

Station-averaged apparent RPD depths ranged from 0.8 cm to 7.6 cm at the USCGA mound (Figure 3-37; Table 3-5). The average RPD value for the mound was 2.69 cm, with no geographic pattern to the distribution of values. The RPD values for two out of three replicate photographs taken at the center station (CTR) were unmeasurable due to camera artifacts. These two photographs were noted as being potentially hypoxic, along with one replicate image at Station 50S and one replicate at Station 100S.

A Stage II biological assemblage dominated the USCGA mound. The presence of Stage III organisms (primarily Stage II on III) was noted in three of the replicate images at Station 50W, two replicates at Stations 50E and 100E, and one replicate at Stations 100SE and 100W (Figure 3-38). Many of the photographs showed dense aggregations of amphipod tubes, or disturbed and decaying tube mats. Due to the presence of Stage II or Stage II on III communities, the USCGA mound at the time of the August 1995 survey appeared to be recovering more rapidly than predicted for recently deposited dredged material (Germano et al. 1994).

Median OSI values at USCGA mound REMOTS® stations ranged from +3 to +9, with an overall average of +6.4 (Table 3-5). The lowest OSI was at the CTR station (+3), primarily due to low dissolved oxygen conditions and lack of Stage III organisms, although only one CTR photograph had a measurable OSI due to camera artifacts on the

Table 3-5
USCGA REMOTS® Sediment-Profile Photography Results Summary for the 1995 Survey

Mound/ Ref Area	Location	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)	Number of Reps w/ Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
USCGA	100E	12.16	>11.99	3	1.90	II,III	ST_II_ON_III	>4	7.33	8	0.96
USCGA	100N	13.37	>13.3	3	4.97	II	ST_II	>4	7.67	9	1.12
USCGA	100S	12.22	>11.92	3	3.92	II	ST_II	4 to 3	7	8	0.65
USCGA	100SE	14.74	13.24	3	2.42	II,III	ST_II_ON_III	>4	7	6	0.78
USCGA	100W	14.86	>14.74	3	1.31	II,III	ST_II_ON_III	>4	6.5	6.5	0.81
USCGA	150E	14.31	12.81	3	2.69	II	ST_II	>4	6	5	1.18
USCGA	150S	13.32	>13.01	3	1.57	II	ST_II	>4	4	5	1.34
USCGA	50E	14.53	>14.59	3	0.82	II,III	ST_II_ON_III	>4	6	6	1.56
USCGA	50N	14.27	>14.12	3	7.64	II	ST_II	>4	9	9	0.83
USCGA	50S	15.90	>15.66	3	1.40	II	ST_II	>4	5.33	6	0.76
USCGA	50SE	13.74	9.23	3	2.04	II	ST_II	>4	6.33	5	0.97
USCGA	50W	15.46	>15.45	3	1.88	II,III	ST_II_ON_III	>4	7	7	1.45
USCGA	CTR	13.58	>13.59	3	2.48	II	ST_II	>4	3	3	1.16
AVG		14.03	13.36	3	2.69				6.32	6.42	1.04
MAX		15.90	>15.66	3	7.64				9	9	1.56
MIN		12.16	9.23	3	0.82				3	3	0.65

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

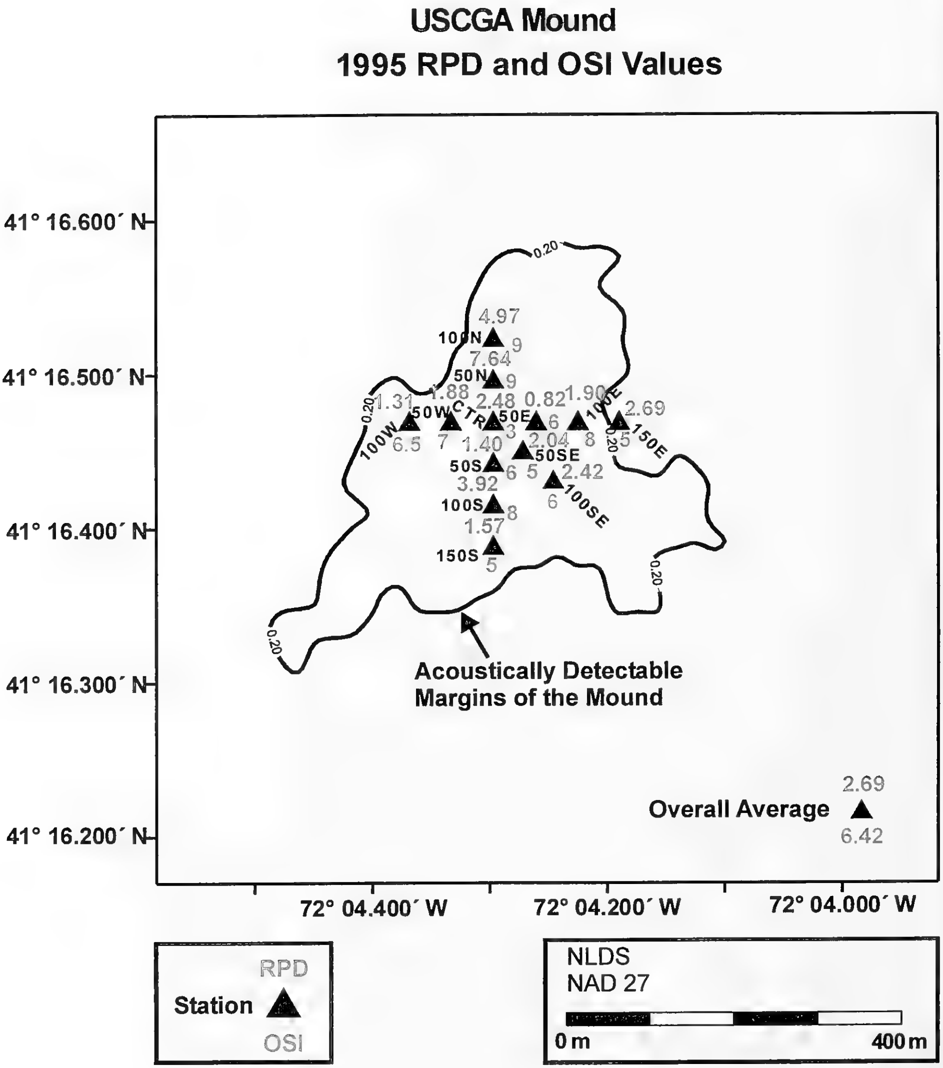

Figure 3-37. Distribution map of mean RPD and median OSI values calculated for the 1995 survey over the USCGA Mound

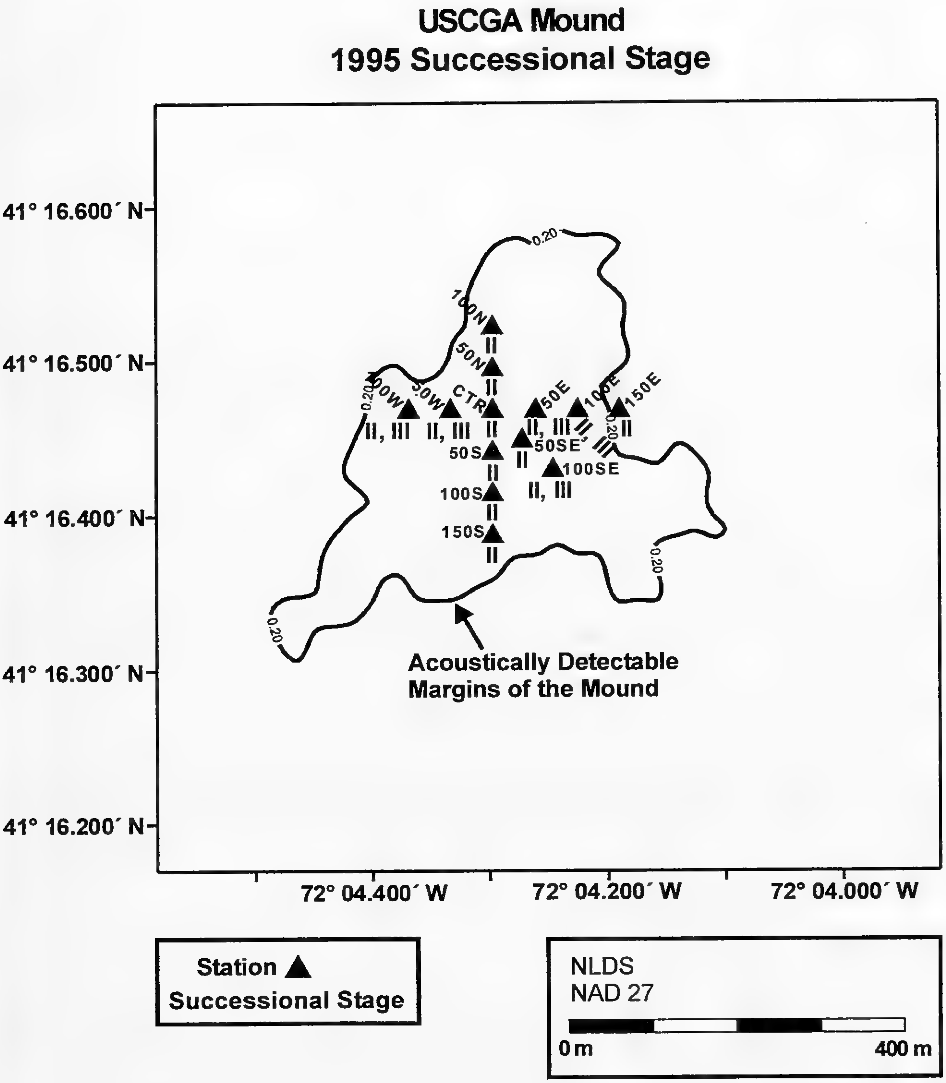

Figure 3-38. Distribution map of successional stage calculated for the 1995 survey over the USCGA Mound

other replicates. Two other USCGA stations (150S and 50S) also had evidence of low apparent dissolved oxygen and the absence of Stage III organisms, resulting in lower OSI values. A median value of +5 was derived for Station 150S and +6 was calculated for Station 50S. Sediment methane was noted at one replicate image at Station 50W; however, the presence of Stage III organisms buffered the effect on the OSI for that station.

3.3 NL-94 Disposal Mound

3.3.1 Bathymetry

The NL-94 mound was formed when 37,000 m^3 of material from the U.S. Navy Submarine Base was released at the NDA 94 buoy. The disposal activity was concentrated around the NDA-94-1 buoy position. As a result, the August 1995 precision bathymetric survey was successful in detecting this small deposit (Figure 3-35). A 0.48 km^2 area of detailed analysis was selected around the active disposal point to conduct precision depth difference calculations.

The deposition of material at the NDA-94-1 buoy resulted in the formation of a disposal mound approximately 125 m wide and 0.9 m high (Figure 3-39). A flat tongue of dredged material with a maximum height of 0.4 m extended 140 m southeast from the apex of the mound. This southeast tongue of the NL-94 mound abutted the historic NL-I mound (Figure 3-35).

3.3.2 REMOTS® Sediment-Profile Photography

A series of REMOTS® sediment-profile photographs were collected over the NL-94 mound in August 1995 and September 1997 to document the lateral extent of dredged material within close proximity to the NDA-94-1 disposal buoy position, as well as assess the benthic recolonization status of the surficial sediments. A complete set of REMOTS® image analysis results for the NL-94 mound are presented in Appendix B.

3.3.2.1 August 1995 Survey

The center station (CTR) and six surrounding stations (all within 50 m of the center) had dredged material, with the thickness of the dredged material layer at each station exceeding the penetration depth of the camera prism. Twelve of the fifteen REMOTS® stations had recently placed dredged material present, while three of the stations had either ambient sediment or historic dredged material. At Stations 150NW, 100SW, and 150SE, one or two of the replicate photographs displayed dredged material layer thickness greater than or equal to the penetration depth of the camera prism. At Stations 150NW and

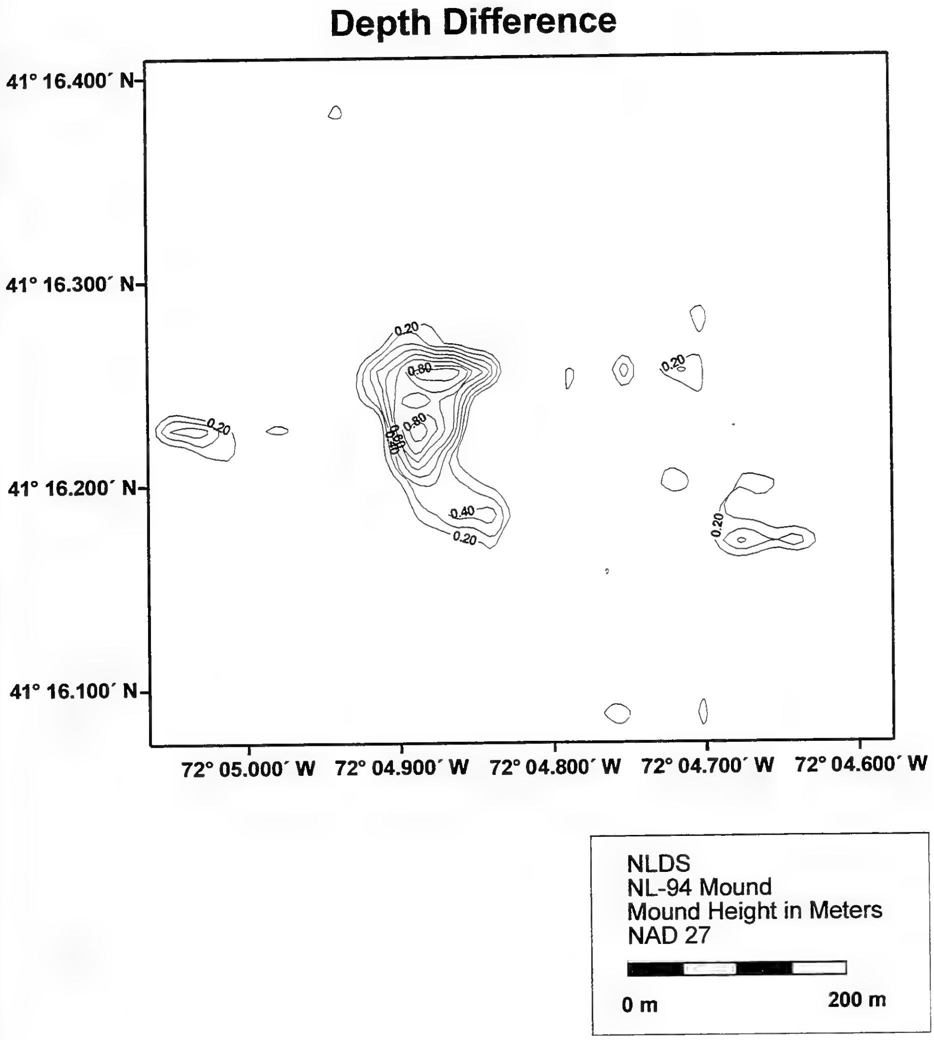

Figure 3-39. NL-94 mound, depth difference from August 1992 to August 1995, 0.2 m contour interval

100SW, the remaining replicates indicated ambient sediment, while historic dredged material from the NL-I mound was detected at 150SE (Figure 3-40A&B). This resulted in mean dredged material thickness of 2.9 to 5.5 cm for these stations. At 100E, all replicates had dredged material over ambient sediment, for an average thickness of 5.3 cm. Ambient sediment was found in all replicates at stations 100 m west, northwest, and northeast of the center.

The mean camera penetration depths for REMOTS® stations at the NL-94 mound ranged from 7.9 cm to 15.6 cm and averaged 11.85 cm. These values are consistent with the presence of fine-grained material at most of the stations (Figure 3-41).

The major modal grain size was consistently classified as fine-grained silt-clay (>4 phi) at the stations within 50 m of the center station and at Station 100SE. The remaining station replicates ranged from silt-clay (>4 phi) to very fine sand (3 to 4 phi; Table 3-6). Sand-over-mud layering was observed at the majority of the stations outside a 50 m radius from the center.

Average boundary roughness values ranged from 0.6 cm to 2.9 cm. The distribution of boundary roughness values showed no spatial pattern. With the exception of three stations, boundary roughness over the NL-94 mound was attributed to biogenic activity. One replicate from Station 100E exhibited evidence of a scour lag feature, one replicate from Station 50NE showed a possible erosional boundary, and one replicate at 50NW displayed a shell lag feature.

Average RPD values at NL-94 stations ranged from 0.7 cm to 5.1 cm, with an average RPD value of 2.02 cm over the entire mound (Table 3-6). There was no apparent geographic pattern to the distribution of deep and shallow RPD depths (Figure 3-42). The shallowest RPD was measured at 50S (0.7 cm), and the deepest RPD was measured at 50SE (5.2 cm).

Stage II and Stage II on III communities dominated the NL-94 mound. Stations 100NE and 50NW had Stage I present, as well as Stages II and III (Figure 3-43). Because these are advanced successional stages for an area recently impacted by dredged material, NL-94 appeared to have recovered rapidly relative to the normal progression of benthic recovery (Germano et al. 1994).

Median OSI values ranged from +6 to +11 over the NL-94 mound, with an overall average of +7.4 (Table 3-6). In general, an OSI of less than +6 indicates areas of benthic disturbance (Rhoads and Germano 1982). The highest OSI value of +11.0 was detected at Station 50SE, where there was Stage II on III and a mean RPD thickness of 5.1 cm

Table 3-6
NL-94 REMOTS® Sediment-Profile Photography Results Summary for the 1995 Survey

Mound/ Ref Area	Location	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)	Number of Reps w/ Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NL-94	100E	7.94	5.33	4	1.13	II,III	ST_II_ON_III	3 to 4	6	6	1.21
NL-94	100NE	11.27	0.00	0	2.69	I,II,III	ST_II_ON_III	3 to 4	7.33	8	2.01
NL-94	100NW	11.72	0.00	0	2.48	II,III	ST_II_ON_III	4 to 3	8	9	2.31
NL-94	100SE	15.25	3.91	1	1.23	II,III	ST_II_ON_III	>4	5.67	6	0.76
NL-94	100SW	9.36	5.50	2	1.61	II,III	ST_II_ON_III	>4	6.50	6.5	2.28
NL-94	100W	10.75	0.00	0	2.84	II,III	ST_II_ON_III	2 to 4	8.67	9	1.27
NL-94	150NW	10.08	2.89	1	1.79	II,III	ST_II_ON_III	4 to 3	6.75	7	1.52
NL-94	150SE	10.26	3.71	1	4.06	II,III	ST_II_ON_III	4 to 3	8.33	8	2.94
NL-94	50N	13.08	>12.95	3	1.25	II,III	ST_II_ON_III	>4	7.33	7	1.80
NL-94	50NE	15.60	>15.39	3	1.00	II,III	ST_II_ON_III	>4	5	7	0.91
NL-94	50NW	10.87	>10.86	3	2.13	I,II,III	ST_II_ON_III	>4	8	7	1.45
NL-94	50S	12.85	>12.78	3	0.74	II,III	ST_II_ON_III	>4	6.33	6	1.13
NL-94	50SE	13.00	>12.89	3	5.15	II,III	ST_II_ON_III	>4	11	11	1.15
NL-94	50SW	12.94	>12.95	3	1.09	II,III	ST_II_ON_III	>4	7	7	2.38
NL-94	CTR	12.77	>12.56	3	1.11	II,III	ST_II_ON_III	>4	6.33	7	0.56
AVG		11.85	9.31	2	2.02				7.22	7.43	1.58
MAX		15.60	>15.39	4	5.15				11	11	2.94
MIN		7.94	0.00	0	0.74				5	6	0.56

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

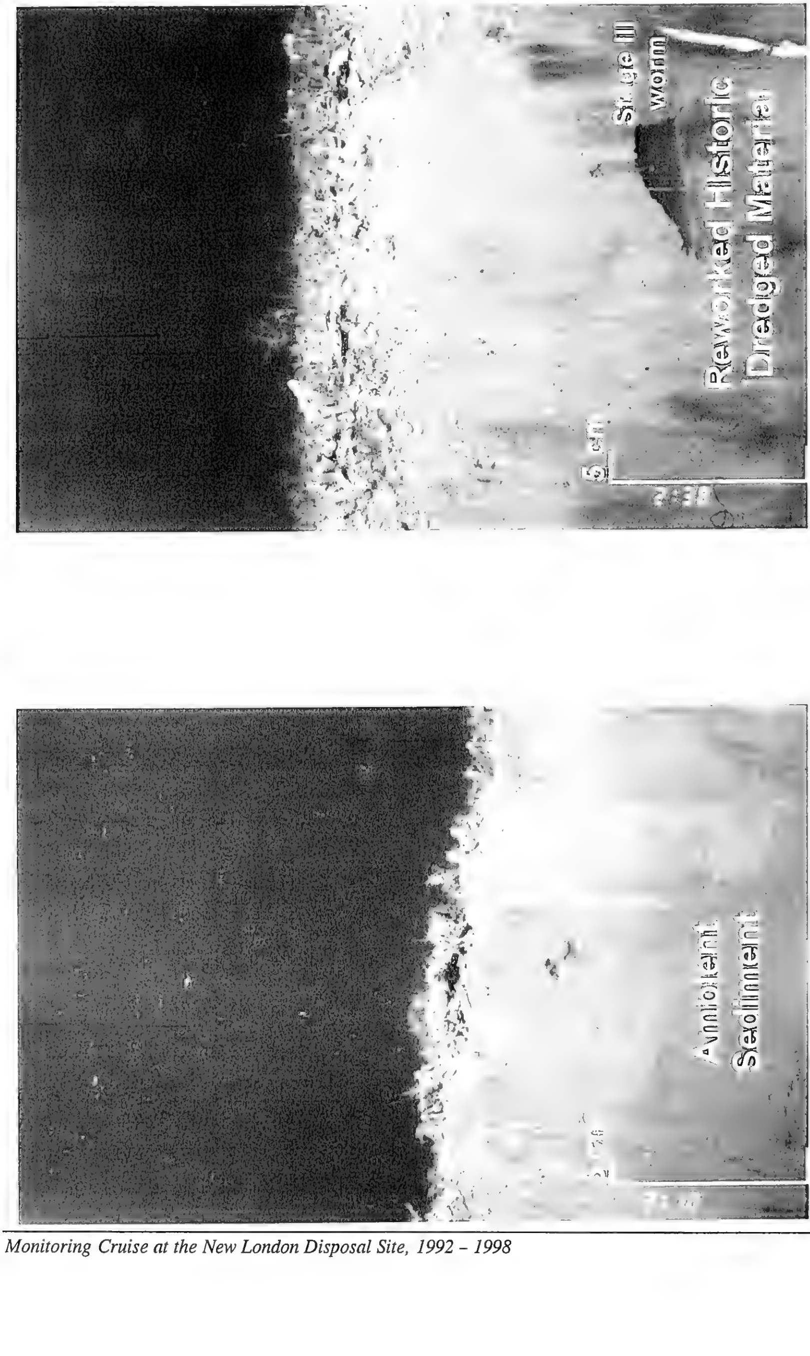

Figure 3-40. REMOTS® images obtained from NL-94 Station 150NW (A) and 150SE (B) depicting ambient sediment and reworked historic dredged material, respectively

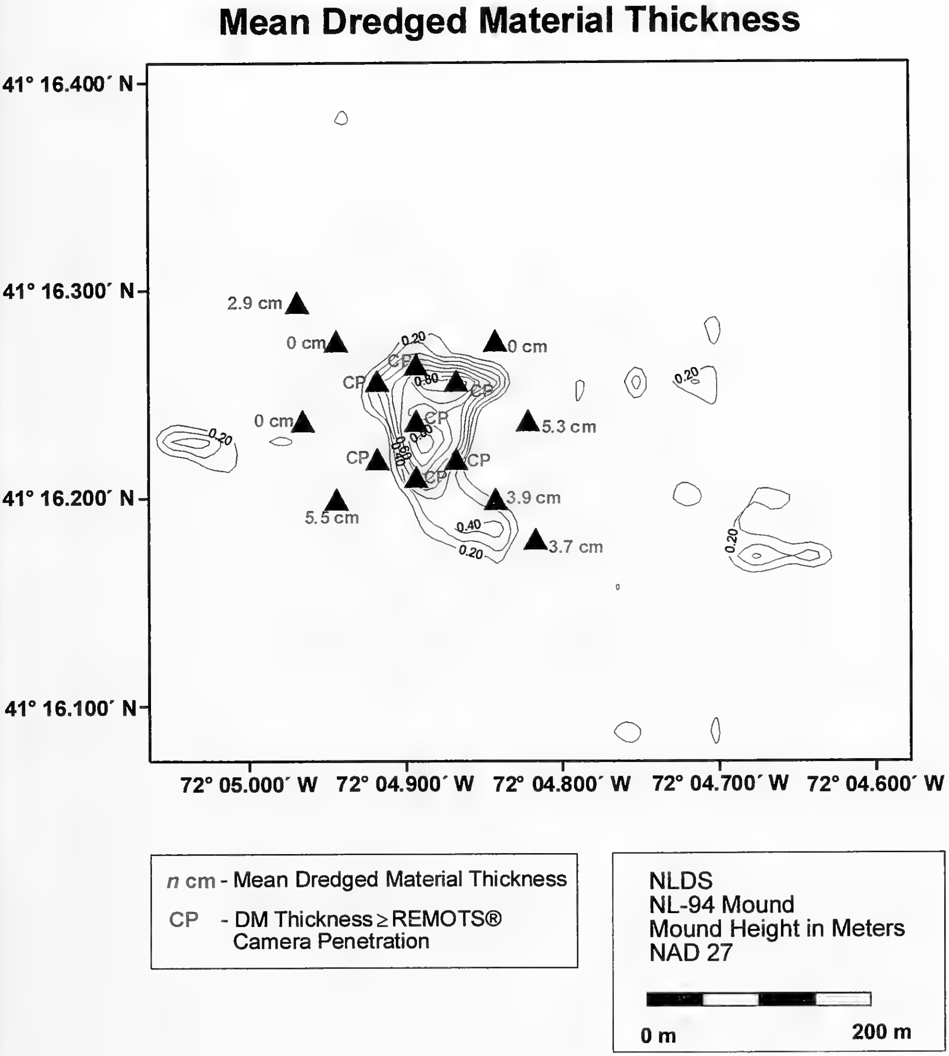

Figure 3-41. Mean dredged material thickness at the 1995 REMOTS® sediment-profile photography stations over the NL-94 mound

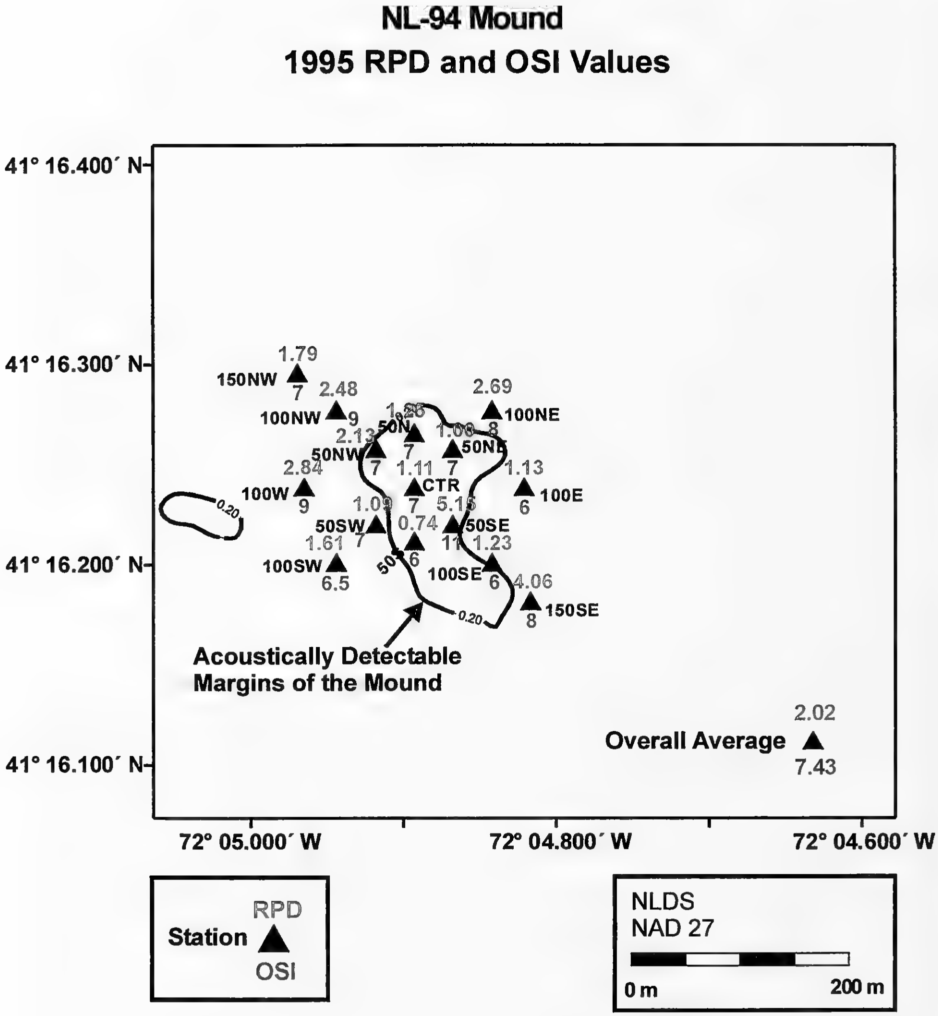

Figure 3-42. Distribution map of mean RPD and median OSI values calculated for the 1995 survey over the NL-94 Mound

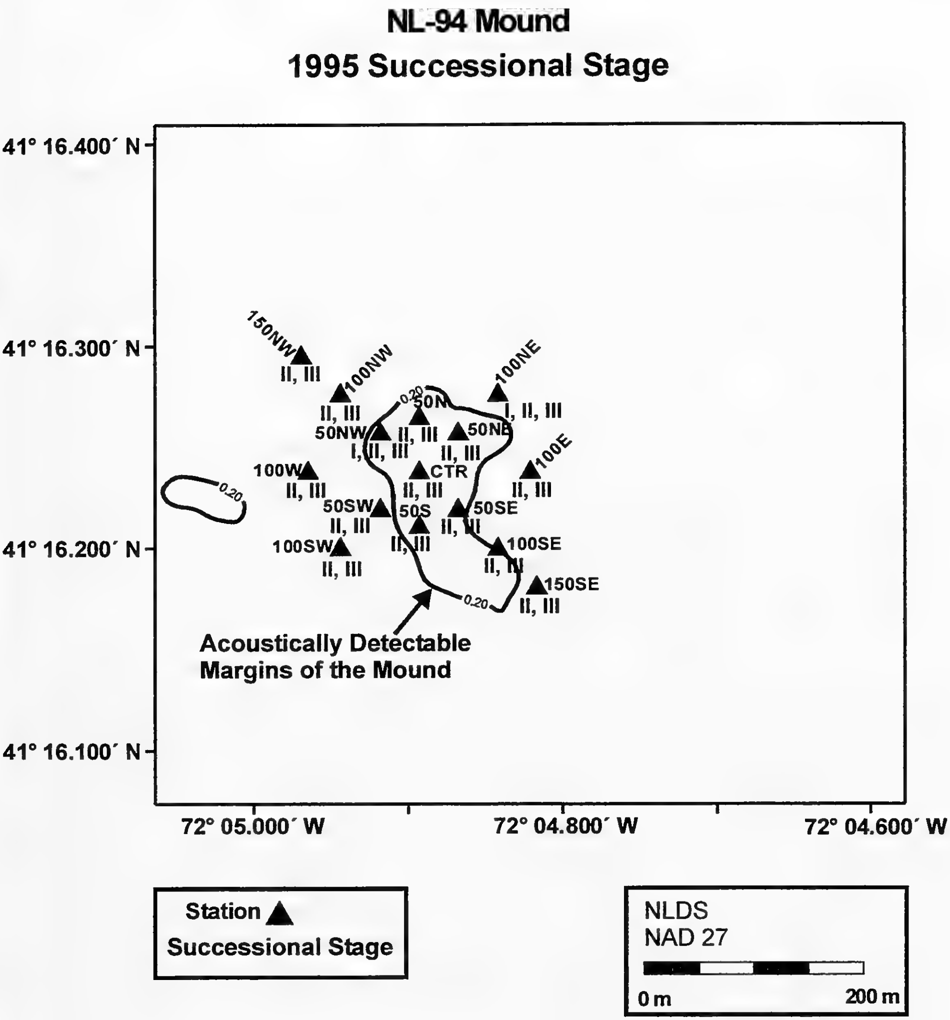

Figure 3-43. Distribution map of successional stage calculated for the 1995 survey over the NL-94 Mound

(Figure 3-42). One replicate at 50NE showed evidence of low apparent DO, but no methane was evident in any replicate.

3.3.2.2 September 1997 Survey

In September 1996, the NDA-96 buoy was deployed approximately 80 m west of the NL-94 mound. A total volume of 3,400 m^3 of supplemental cap material was placed over the mound at the buoy, adding to the pre-existing mound (Figures 1-3 and 3-44). In September 1997, 15 stations at the NL-94 mound were sampled with the REMOTS® sediment-profile camera, duplicating the survey conducted in 1995. Three or more replicate images were obtained at each station to document the placement of the new material and monitor benthic recovery.

Dredged material was detected in all replicates at all stations. The measured thickness of dredged material ranged from 6.0 to 16.2 cm (>13.5 cm average; Table 3-10). Dredged material layer thickness was equal to, or exceeded, the camera penetration in all replicates images collected in September 1997. In 1995, dredged material was not detected at stations 100NE, 100NW, and 100W. Thin layers of dredged material over ambient sediments were noted at Stations 100SE, 100SW, and 150NW. The presence of dredged material greater than camera penetration at these stations during the 1997 survey was consistent with the placement of material at the NDA 96 buoy (Figure 3-44).

The REMOTS® images characterized the sediment as a mix of fine to very fine sand (3 to 4 phi) with some variability (Table 3-7). As a result, the major modal grain size for the entire mound was 4 to 3 phi (very fine sand) at most stations. Stations 100NW, 100W, 50NW, and 50SE displayed a finer grain size, with a mix of silt-clay predominating (>4 phi). Coarser-grained sediment consisting of fine to medium sand (2 phi) occurred in at least one replicate at Stations CTR, 50SW, and 100E. Surface sand overlying fine-grained sediment (sand-over-mud stratigraphy) was noted in 28 of the 46 photographs collected.

The boundary roughness values for the NL-94 mound ranged from 0.6 to 4.2 cm, with an average of 1.4 cm (Table 3-7). Shell lag or disturbed amphipod tube mats were visible on the sediment surface within most replicate images. One replicate image at each of Stations 100NE, 50NE, and 100SW was identified as winnowed. Armoring of the sediment surface by shell lag (current scouring), visible in the images at Stations 150SE, 50NW, 50S, and 100E, may protect the mound from further current-induced winnowing (Figure 3-45). In contrast to the 1995 survey results, boundary roughness was primarily attributed to physical forces, although some surface disturbances were indeterminate or caused by biogenic activity.

Table 3-7
NL-94 Disposal Mound REMOTS® Sediment-Profile Photography Results Summary for the 1997 Survey

Mound/ Ref Area	Station	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)**	Number of Reps w/Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NL-94	100E	6.20	>6.04	4	1.77	I	ST_I	4 to 3	INDET	INDET	1.21
NL-94	100NE	8.74	>8.79	3	3.14	I,II	ST_II	4 to 3	7	7	0.86
NL-94	100NW	15.67	>15.78	3	6.15	I,III	ST_I_ON_III	>4	9	9	0.64
NL-94	100SE	13.35	>13.47	3	2.77	I,II,III	ST_II_ON_III	4 to 3	7.5	7.5	1.51
NL-94	100SW	12.11	>12.38	3	4.11	I,II,III	ST_II_TO_III	4 to 3	9	9	0.60
NL-94	100W	14.75	>14.68	3	5.45	I,II	ST_II	>4	7	7	0.78
NL-94	150NW	9.95	>9.85	3	4.43	I,II,III	ST_I_ON_III	4 to 3	7.33	9	3.14
NL-94	150SE	15.76	>15.95	3	6.04	I,II,III	ST_II_TO_III	4 to 3	9.33	10	1.68
NL-94	50N	15.54	>15.35	3	2.39	I,II,III	ST_II_ON_III	4 to 3	8.5	8.5	0.81
NL-94	50NE	16.32	>16.23	3	4.96	I,II	ST_II	4 to 3	8	8	0.99
NL-94	50NW	13.76	>13.38	3	4.17	I,II,III	ST_II_TO_III	>4	7	7	0.70
NL-94	50S	15.78	>16.06	3	INDET	I,III	ST_I_ON_III	4 to 3	INDET	INDET	1.28
NL-94	50SE	15.76	>15.71	3	4.57	I,II,III	ST_II_ON_III	>4	5	7	1.74
NL-94	50SW	15.39	>14.81	3	INDET	II,III	ST_II_TO_III	4 to 3	INDET	INDET	4.15
NL-94	CTR	14.27	>14.42	3	5.69	I,III	ST_I_ON_III	4 to 3	11	11	1.20
AVG		13.56	>13.53	3.07	4.28				7.97	8.33	1.42
MAX		16.32	>16.23	4	6.15				11	11	4.15
MIN		6.20	>6.04	3	1.77				5	7	0.60

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

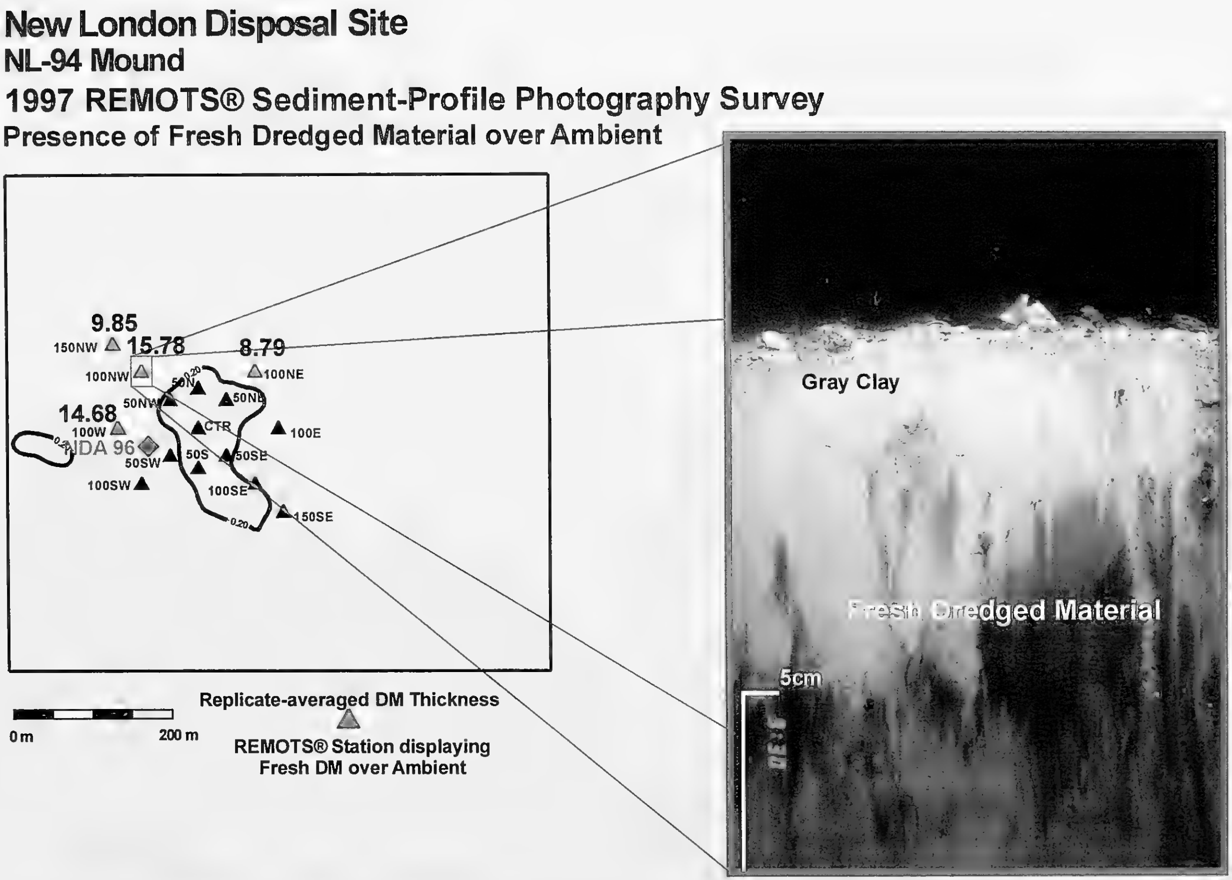

Figure 3-44. Interpretive map and example image (100NW) showing stations over the NL-94 mound displaying ambient sediments in 1995 which had received fresh dredged material during the 1996-97 disposal season

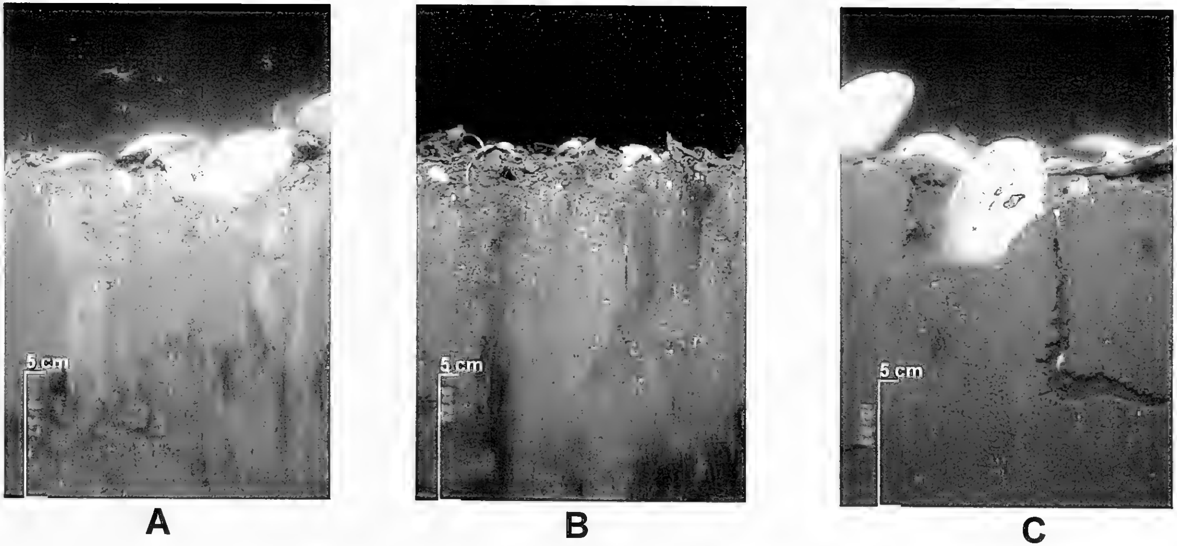

Figure 3-45. REMOTS® images obtained from NL-94 Station 150SE (A), 50NW (B), and 50S (C) depicting shell armoring

The replicate-averaged apparent RPD ranged from 1.8 to 6.2 cm (4.3 cm average), with no apparent spatial pattern (Figure 3-46; Table 3-7). Six stations had a visible redox rebound ranging from 4 to 9 cm, suggesting a recent reduction in RPD depth.

Similar to the 1995 data, the successional status was advanced, showing healthy Stage II or Stage II on III communities inhabiting the sediments of the NL-94 mound (Figure 3-47). Some of the photographs were identified as Stage I to II due to the presence of disturbed amphipod (*Ampelisca*) tube mats. Stage III organisms were present in half of the replicate images and 11 of the 15 stations.

The median OSI ranged from +7 to +11, with an overall average of +8.3 (Figure 3-46; Table 3-7). A replicate-averaged OSI of < +6 suggested a disturbed benthic habitat at Station 50SE. A number of replicates had indeterminant OSI values due to camera faceplate wiper smearing or artifacts on the sediment profile. The overall average OSI in 1997 was slightly higher than that observed during the survey conducted in 1995 (+7.4), indicating a slight improvement in benthic conditions.

3.4 Northern Region

3.4.1 1997 Master Bathymetric Survey

The 2100 × 2100 m precision bathymetric survey performed over the NLDS provided a new DGPS baseline to aid in the development of a Geographic Information System (GIS) database for the disposal site, as well as to facilitate comparisons with future project-specific surveys. This survey yielded a bathymetric chart of the 4.41 km^2 area with a minimum depth of 13.5 m over the NL-RELIC mound and a maximum depth of 24.75 m approximately 100 m south of the disposal site boundary (Figure 3-48). A total of 11 dredged material disposal mounds were apparent within the confines of the disposal site, although many of them overlapped to form one larger feature. A vertically exaggerated, three-dimensional view of the NLDS displays the various dredged material deposits in contrast to the natural topography, indicating the presence of a central "bowl" surrounded by dredged material mounds (Figure 3-49).

The overall topography of the NLDS slopes from a depth of less than 14 m in the Northern Region towards the south and southwest. A northwest–southeast oriented trough divides the area elevated by active dredged material disposal throughout the center of the site and the elevated area in the southwest corner (Figures 3-48 and 3-49). This ridge is in close proximity to the U.S. Coast Guard (USCG) special purposes buoy "NL." The data collected as part of the July 1986 master bathymetry survey covered an area of the seafloor

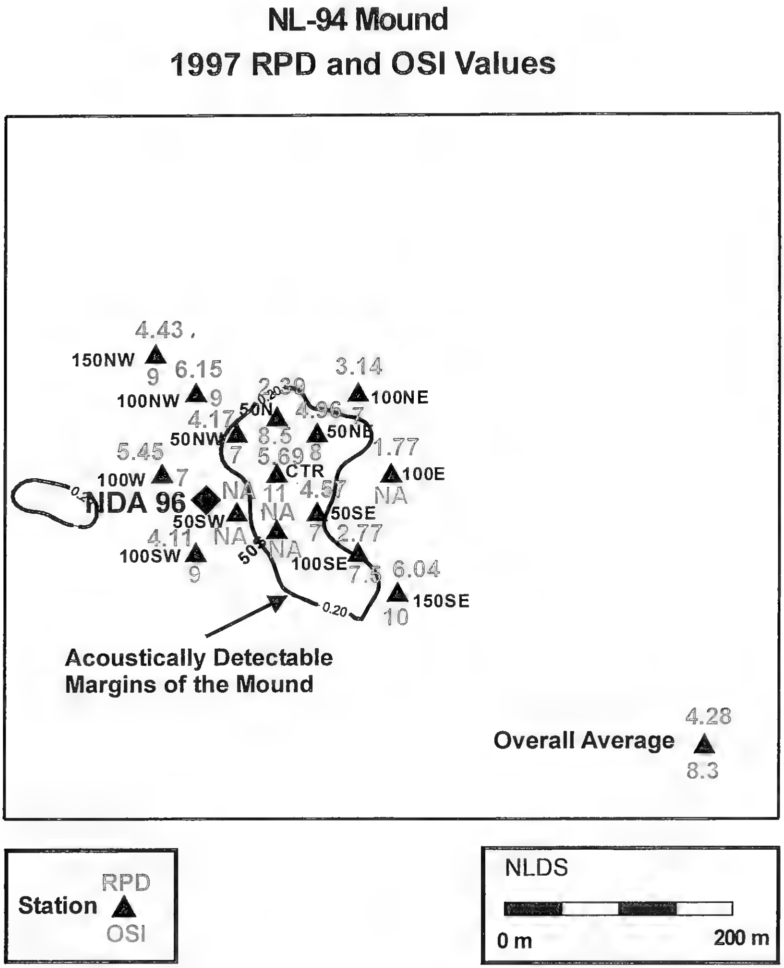

Figure 3-46. Distribution map of mean RPD and median OSI values calculated for the 1997 survey over the NL-94 Mound

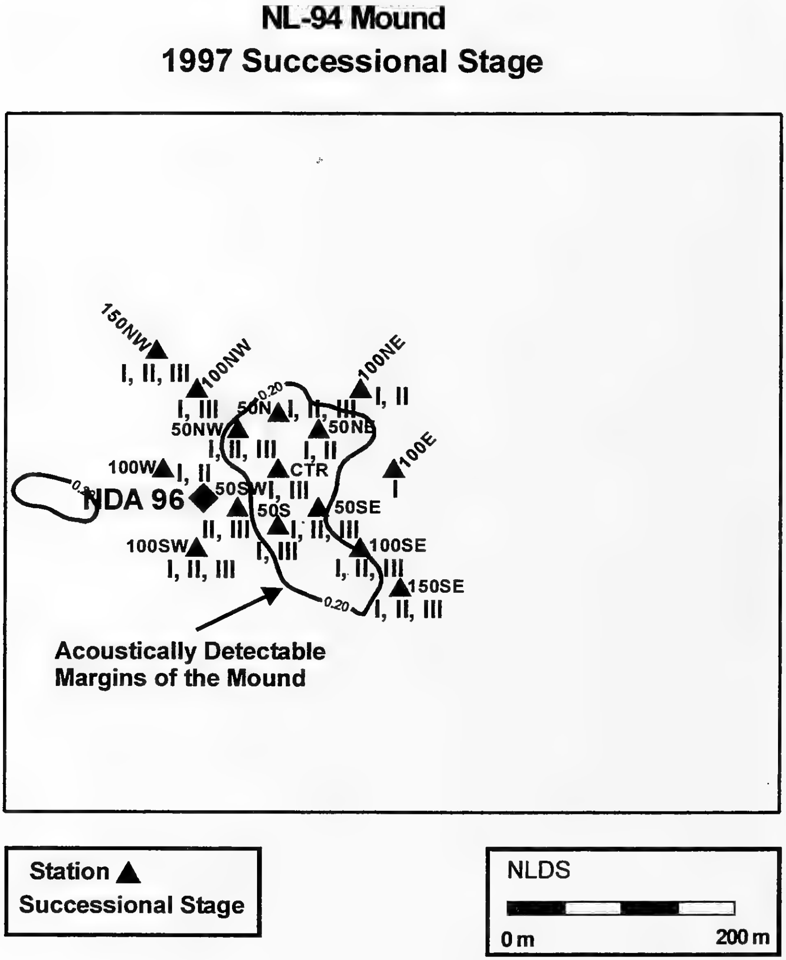

Figure 3-47. Distribution map of successional stage calculated for the 1997 survey over the NL-94 Mound

September 1997 Master Bathymetric Survey

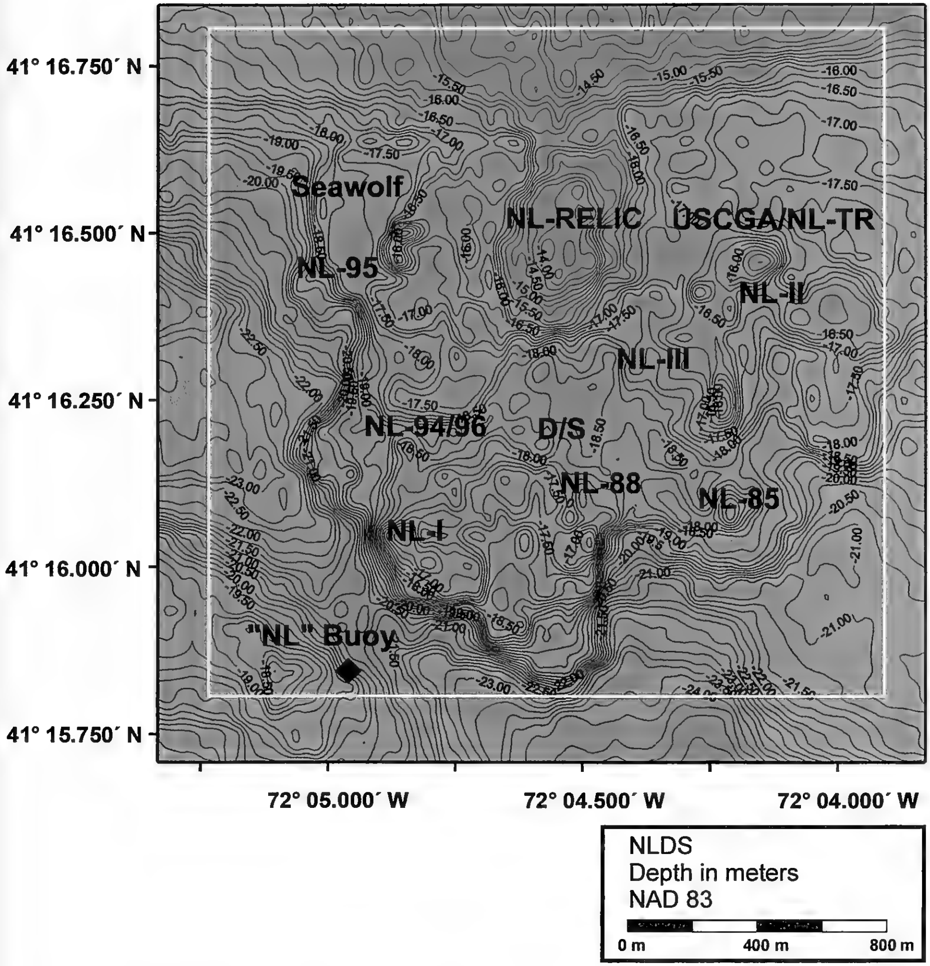

Figure 3-48. Bathymetric chart of New London Disposal Site (contour interval = 0.25 m)

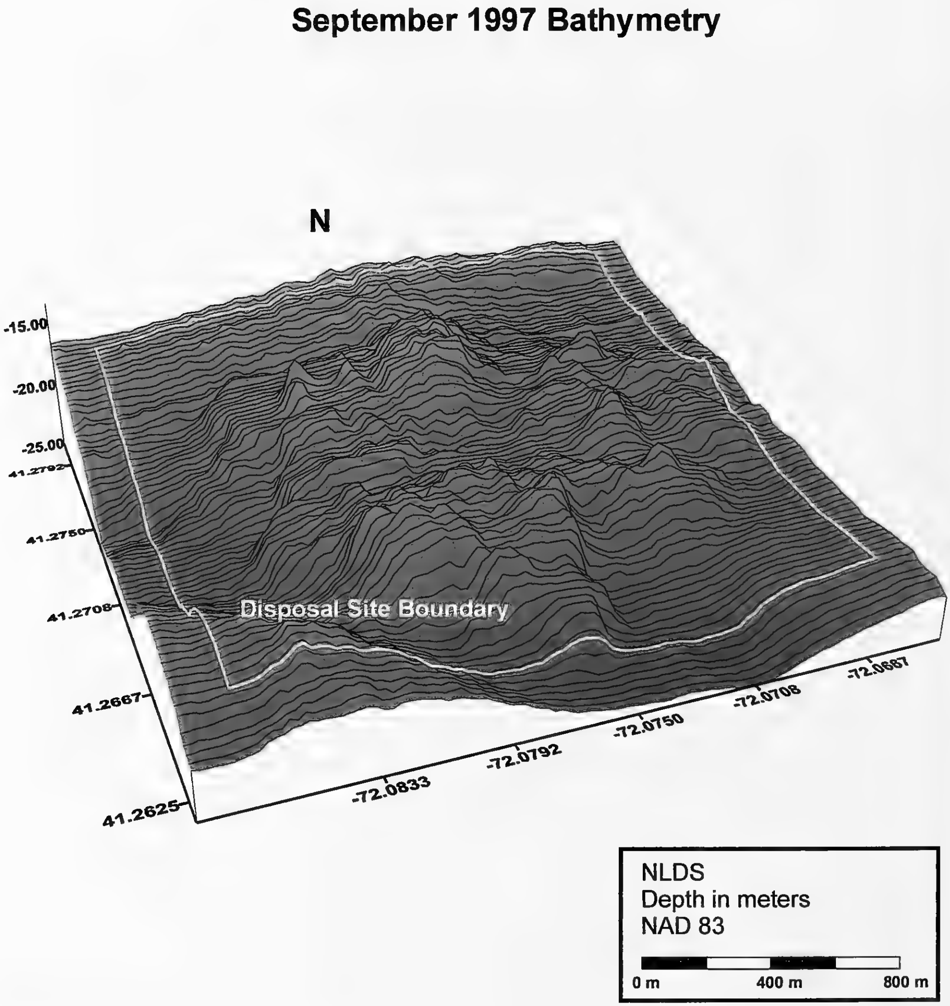

Figure 3-49. Three-dimensional view of the bathymetry of NLDS (vertical exaggeration 37.25)

approximately 1200 m to the southwest of the current disposal site boundaries (Figure 3-50).

Depth difference comparisons between the 1986 and 1997 surveys (corrected to MLLW and NAD 83) show sizable accumulations of dredged material corresponding to the formation of several mounds, including the Seawolf (1995) NL-TR/USCGA (1989–90), and NL-88 (1988) mounds. There were no corresponding changes in depth between 1986 and 1997 near the "NL" buoy (Figure 3-50). As a result, this ridge represents a natural geologic feature on the seafloor of eastern Long Island Sound. Survey artifacts were identified in the northern area of the disposal site along the east-west slope visible in Figure 3-50. The small patches of apparent accumulation in the southern portion of the disposal site also may be a result of "noise" from various bottom features.

3.4.2 NLDS Northern Region

The Northern Region of NLDS (Figure 2-7) was surveyed in September 1997 using precision bathymetry and REMOTS® photography to provide an adequate baseline for valid depth difference calculations and assessment of benthic conditions in future surveys.

3.4.2.1 Bathymetry

Depths in the Northern Region ranged from approximately 14 m near the northern end of the NL-RELIC mound to >23 m in the southwest corner (Figure 3-51). The deepest area of the Northern Region was consistent with the overall topography of the area.

3.4.2.2 REMOTS® Sediment-Profile Photography

The September 1997 REMOTS survey of the Northern Region consisted of sampling at eleven stations (Figure 2-7). Historic dredged material was detected at seven of the eleven stations distributed within the region. Dredged material was commonly characterized by a chaotic sediment fabric, gray clay, or disturbed surficial layers, and in most cases was easily distinguished from the brown, sandy ambient material. Dredged material was not detected in any replicate image obtained from Stations N1, N3, N5, and N10 (Table 3-8). However, some historical material placed over 20 years ago at the NL-Relic mound, near Station N5, may now appear similar to ambient material. Station N9, located at the northern edge of the Seawolf Mound may have been influenced by dredged material disposed during the 1995-96 disposal season.

Table 3-8
NLDS Northern Region REMOTS® Sediment-Profile Photography Results Summary for the 1997 Survey

Station	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)**	Number of Reps w/Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
North Region										
N1	9.50	0	0	4.35	II,III	ST_II_ON_III	4 to 3	9	9	0.98
N2	9.39	2.28	1 historical	1.83	I,II,III	ST_II_ON_III	4 to 3	6.67	7	0.52
N3	8.81	0	0	4.03	II,III	ST_II_TO_III	4 to 3	8	7	0.75
N4	10.58	2.86	1 historical	3.28	I,II,III	ST_II_ON_III	4 to 3	7.75	8	0.72
N5	8.51	0	0	2.96	II,III	ST_II_ON_III	4 to 3	9	9	0.65
N6	7.00	>6.45	2 historical	1.94	II,III	ST_II_TO_III	variable	7	7	1.54
N7	10.09	>6.48	1 historical, 1 Seawolf DM	3.60	II,III	ST_II_ON_III	4 to 3	8.3	9	1.11
N8	6.55	4.8	1 historical	6.19	I,II,III	ST_II_ON_III	4 to 3	11	11	0.84
N9	16.50	>16.50	3 Seawolf DM	0.00	I,II,III	ST_III	>4	1	1	0.70
N10	4.55	0	0	1.38	II	ST_II	3 to 2	5.5	5.5	0.84
N11	11.96	4.67	1 historical	3.10	II	ST_II	4 to 3	7.3	8	0.68
AVG	9.40	4.00		2.97				7.32	7.41	0.85
MAX	16.50	>16.5		6.19				11	11	1.54
MIN	4.55	0.00		0.00				1	1	0.52

** Values shown are means for n=3 replicate images obtained and analyzed at each station. If dredged material exceeded the prism penetration depth in at least two replicates, then the mean value shown is a minimum estimate of dredged material layer thickness (indicated by the >sign).

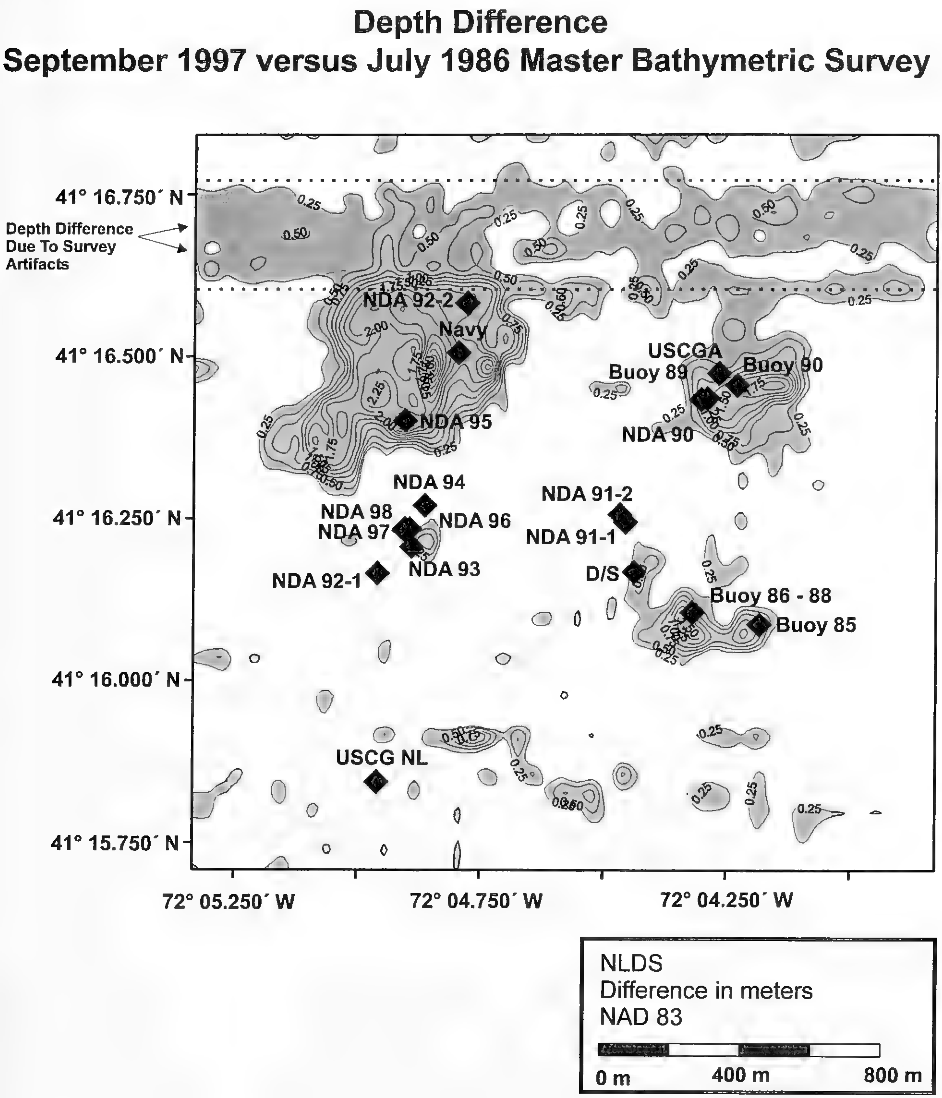

Figure 3-50. Depth difference between the 1986 and 1997 master bathymetric surveys

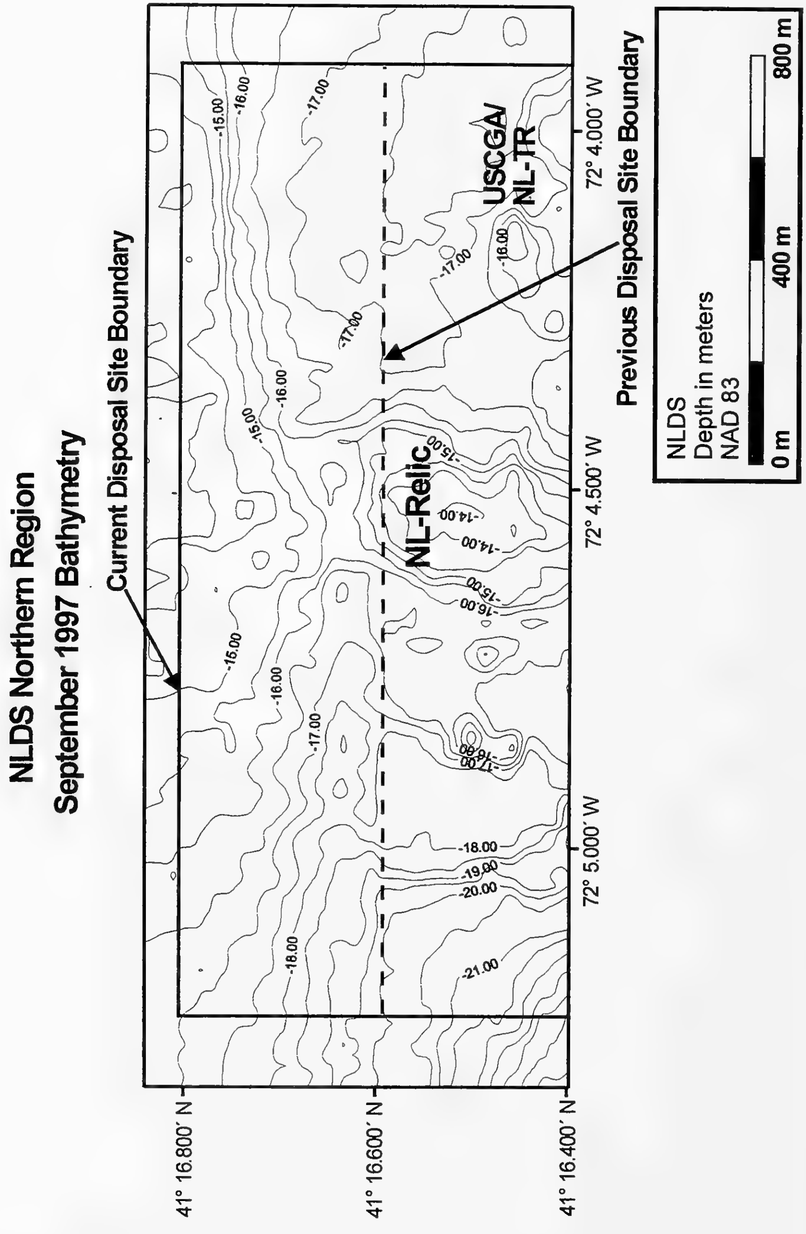

Figure 3-51. September 1997 bathymetry of the Northern Region

Fine to very fine sand characterized the sediment at most stations in the Northern Region, as the major modal grain size was 4 to 3 phi (very fine sand) in most photographs (Table 3-8). At Station N9 fine sediments, either gray clay or brown clayey silt (>4 phi), were predominant. In contrast, one replicate at Station N6 contained gravel with overlying shells. Station 10 had two photographs with a coarser grain size of fine sand (3 to 2 phi). Surface sand overlying fine-grained sediment (sand over mud stratigraphy) was noted in one-fourth of the photographs from the region.

Despite the occasional appearance of an overlying sand layer, all of the stations in the Northern Region had relatively low boundary roughness values, with a replicate-averaged mean of 0.9 cm. The coarse grain size in replicates at Station N6 and N10, in addition to the predominance of shell lag and disturbed tube mats on the sediment surface, indicated potential bottom current scouring. Although some stations were indeterminant or had biogenic activity, boundary roughness was primarily due to physical forces.

The replicate-averaged apparent RPD ranged from 0 to 6.2 cm (3.0 average; Figure 3-52; Table 3-8). At Station N9, two replicates had an indeterminate RPD and one replicate had no RPD visible due to the presence of gray clay. Seven replicate images collected throughout the region had a visible redox rebound ranging from 4 cm to 7 cm depth, suggesting a recent reduction in RPD depth.

The biological assemblage at the Northern Region stations showed a dominance of Stage II organisms (amphipods) with some Stage III organisms present (Table 3-8). The Stage II organisms settle and create dense tube mats on the sediment surface, filtering particles from currents they create at the top of the tubes. This high density of tubes and filtering activity may serve to exclude Stage I organisms. Only a few replicates were suspected of having retro-Stage II conditions. Stage III organisms, indicated by sub-surface feeding voids, were present in 13 replicates of the Northern Region stations (Figure 3-53).

Median OSI values ranged from +1 to +11 over the Northern Region, with an overall average of +7.4 (Table 3-8). The majority of the stations had OSI values > +6. The lowest OSI was detected at Station N9, where gray clay was present from the nearby Seawolf disposal mound. The highest possible OSI value, +11, was calculated for four replicate images and assigned to Station N8. Neither low dissolved oxygen conditions nor methane were observed in any of the photographs collected in September 1997.

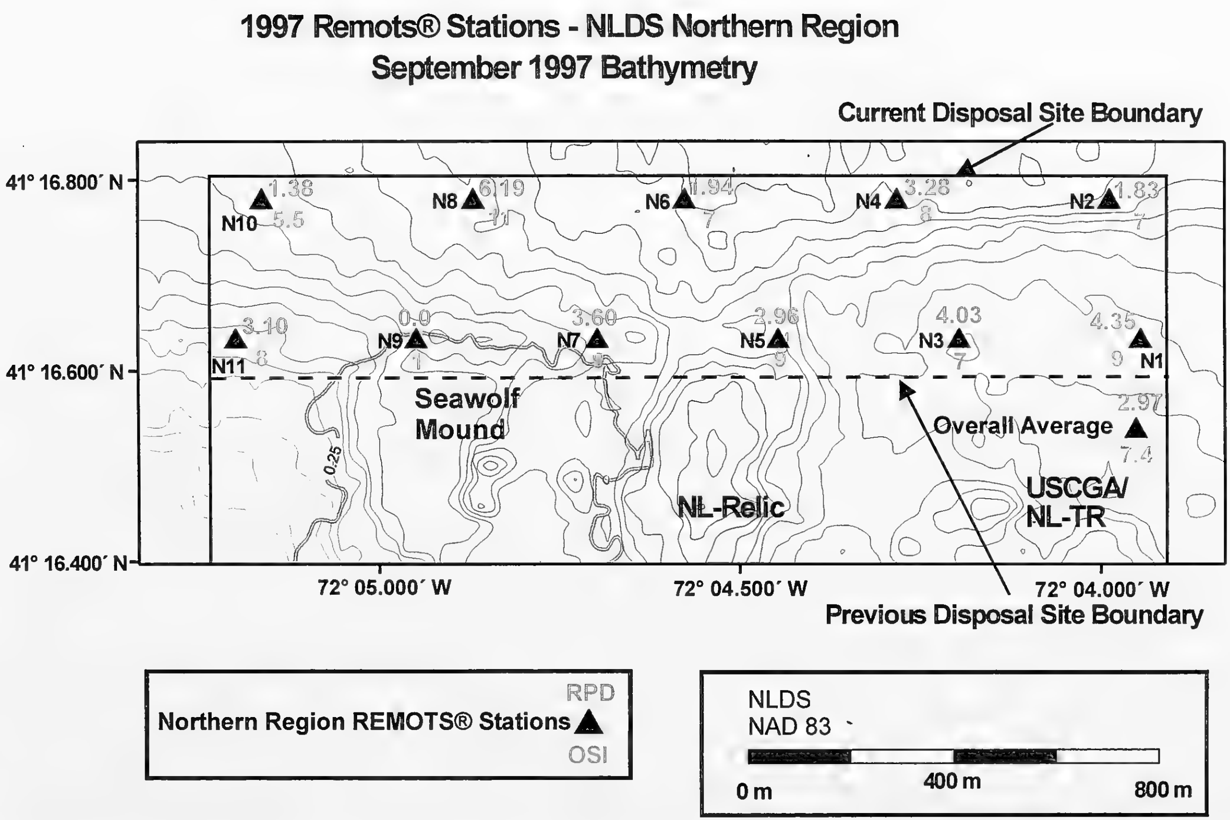

Figure 3-52. Distribution of RPD and OSI values over the Northern region of NLDS

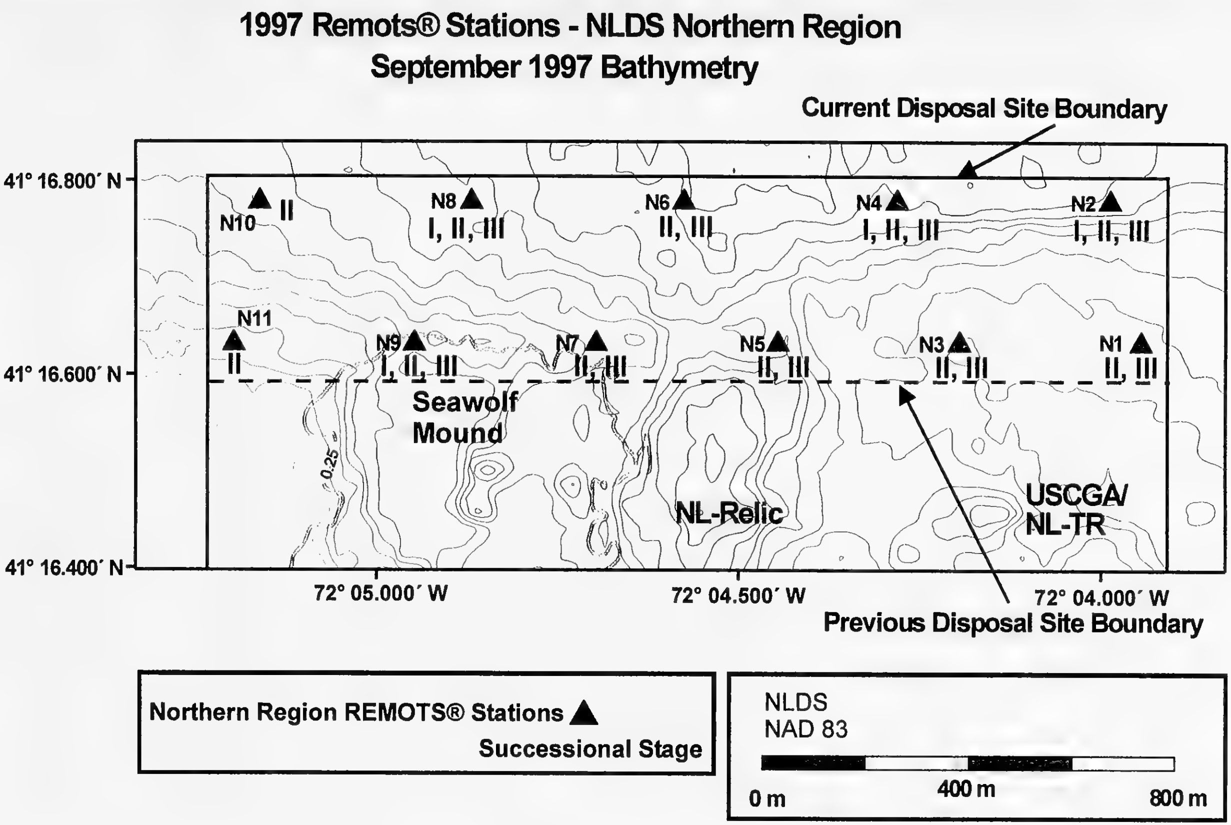

Figure 3-53. Distribution of successional stage assemblages over the Northern Region of NLDS

3.5 NL-92 Disposal Mound

The NL-92 mound is a small dredged material disposal mound formed by the disposal of approximately 18,000 m^3 of dredged material at the NDA 92-2 buoy. This small deposit was detected in the August 1995 bathymetric survey (Figure 3-35). A 0.56 km^2 area surrounding the NDA 92-2 buoy position was selected as the area of detailed analysis. The NL-92 mound was found to be 140 m wide, with a maximum height of 0.6 m (Figure 3-54). A REMOTS® sediment-profile photography survey was not conducted over the NL-92 mound, because this location was planned to be used for dredged material disposal relatively soon after the bathymetric survey.

3.6 NLDS Reference Areas

Three reference areas for NLDS (NLON REF, NE REF and WEST REF) were surveyed with the REMOTS® sediment-profile camera in August 1992, August 1995, September 1997 and July 1998. These reference areas provide a basis for comparison with the images collected over the NLDS project mounds and aid in determining the health of the benthic community within the disposal site. The condition at NLON REF, NE REF, and WEST REF is presumed to reflect seasonal and annual variations in environmental conditions. Three replicate photographs were collected at each reference area station and subjected to the identical series of measurements and criteria used to characterize benthic habitat within the disposal site. A complete set of REMOTS® image analysis results for each reference area and each survey are presented in Appendix B.

3.6.1 August 1992 Survey

A 13-station cross-shaped grid was established over each of the three NLDS reference areas in August 1992 (Figure 2-8). The results obtained from the reference areas were used in comparison to the data collected over the NL-91 and D/S mound complex.

Dredged material was not apparent at any of the reference stations. Sediment layering (sand-over-mud stratigraphy) was noted in multiple replicate photographs at NE REF and NLON REF. The surfaces at these stations were characterized by shell fragments and fine sands overlying silt and clay, with the formation of some bedforms (ripples).

The stations over NE REF and NLON REF displayed very similar sediment grain size distributions, relative to the disposal site, with a major mode of 3 to 4 phi (very fine sand; Table 3-9). The WEST REF was also characterized as predominantly sand, but sediment grain size major modes varied between 2 to 3 phi (medium to fine sand),

Table 3-9
NLDS Reference Area REMOTS® Sediment-Profile Photography Results Summary for the 1992 Survey

Mound/ Ref Area	Number	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)	Number of Reps w/Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NLON REF	100e	3.60	0.00	0	0.97	II	Stage II	3 to 4	5.0	5.0	0.84
NLON REF	100n	5.56	0.00	0	1.12	II	Stage II	3 to 4	5.0	5.0	1.34
NLON REF	100s	6.06	0.00	0	1.03	II	Stage II	3 to 4	5.0	5.0	0.89
NLON REF	100w	4.61	0.00	0	1.21	II	Stage II	3 to 4	5.3	5.0	2.17
NLON REF	200e	5.16	0.00	0	1.13	II,III	Stage II ON Stage III	3 to 4	5.7	5.0	0.85
NLON REF	200n	5.34	0.00	0	1.14	I,II	Stage II	3 to 4	3.7	3.0	0.61
NLON REF	200s	9.11	0.00	0	1.42	II	Stage II	3 to 4	5.3	5.0	0.61
NLON REF	200w	4.88	0.00	0	1.08	II	Stage II	3 to 4	5.0	5.0	0.76
NLON REF	300e	4.72	0.00	0	1.14	II	Stage II	3 to 4	5.0	5.0	0.76
NLON REF	300n	4.73	0.00	0	1.11	I	Stage I	3 to 4	2.0	2.0	0.78
NLON REF	300s	7.42	0.00	0	1.28	II,III	Stage II ON Stage III	3 to 4	6.7	7.0	0.56
NLON REF	300w	6.56	0.00	0	1.39	II	Stage II	3 to 4	5.3	5.0	0.63
NLON REF	ctr	3.38	0.00	0	1.07	II	Stage II	3 to 4	4.7	5.0	0.96
NE REF	100e	7.05	0.00	0	1.28	II	Stage II	3 to 4	5.3	5.0	0.45
NE REF	100n	9.48	0.00	0	1.47	II,III	Stage II ON Stage III	3 to 4	5.7	5.0	1.03
NE REF	100s	9.61	0.00	0	1.75	I,II	Stage II	3 to 4	5.0	6.0	0.69
NE REF	100w	7.59	0.00	0	1.22	II,III	Stage II ON Stage III	3 to 4	6.3	7.0	0.94
NE REF	200e	6.97	0.00	0	1.42	I,II,III	Stage II ON Stage III	3 to 4	6.0	7.0	1.12
NE REF	200n	8.46	0.00	0	2.28	II	Stage II	3 to 4	6.3	7.0	0.68
NE REF	200s	10.61	0.00	0	2.33	II,III	Stage II ON Stage III	3 to 4	7.7	7.0	0.79
NE REF	200w	8.24	0.00	0	1.19	II,III	Stage II ON Stage III	3 to 4	7.3	7.0	1.06
NE REF	300e	8.69	0.00	0	2.14	II,III	Stage II ON Stage III	3 to 4	7.0	7.0	1.08
NE REF	300n	8.69	0.00	0	1.66	II	Stage II	3 to 4	5.5	5.5	0.61
NE REF	300s	7.33	0.00	0	1.43	II,III	Stage II ON Stage III	3 to 4	6.7	7.0	0.87
NE REF	300w	7.58	0.00	0	1.91	II,III	Stage II ON Stage III	3 to 4	7.7	8.0	0.69
NE REF	ctr	8.00	0.00	0	0.94	II	Stage II	3 to 4	4.3	4.0	1.35
WEST REF	100e	5.04	0.00	0	2.24	INDET	INDET	2 to 3	INDET	INDET	1.04
WEST REF	100n	6.33	0.00	0	1.70	I	Stage I	3 to 4	4.0	4.0	0.57
WEST REF	100s	8.29	0.00	0	2.22	I	Stage I	3 to 4	4.3	5.0	0.49
WEST REF	100w	4.07	0.00	0	2.25	I	Stage I	2 to 3	3.5	3.5	0.40
WEST REF	200e	5.33	0.00	0	2.12	INDET	INDET	2 to 3	INDET	INDET	0.67
WEST REF	200n	1.47	0.00	0	0.45	I	Stage I	3 to 4	3.0	3.0	0.07
WEST REF	200s	7.26	0.00	0	1.69	I,III	Stage I ON Stage III	3 to 4	7.0	7.0	0.60
WEST REF	200w	7.00	0.00	0	1.73	I	Stage I	2 to 3	3.7	4.0	0.36
WEST REF	300e	5.76	0.00	0	1.73	III	Stage III	2 to 3	7.0	7.0	0.49
WEST REF	300n	0.00	0.00	0	0.00	INDET	INDET	INDET	INDET	INDET	0.00
WEST REF	300s	6.52	0.00	0	1.13	I,III	Stage I ON Stage III	3 to 4	4.7	4.0	0.61
WEST REF	300w	5.94	0.00	0	1.42	I,III	Stage I ON Stage III	3 to 4	4.7	4.0	0.78
WEST REF	ctr	7.42	0.00	0	1.24	I,III	Stage I ON Stage III	>4	5.7	7.0	0.47
AVG		6.41	0.00	0	1.44				5.33	5.36	0.76
MAX		10.61	0.00	0	2.33				7.67	8	2.17
MIN		0.00	0.00	0	0.00				2	2	0.00

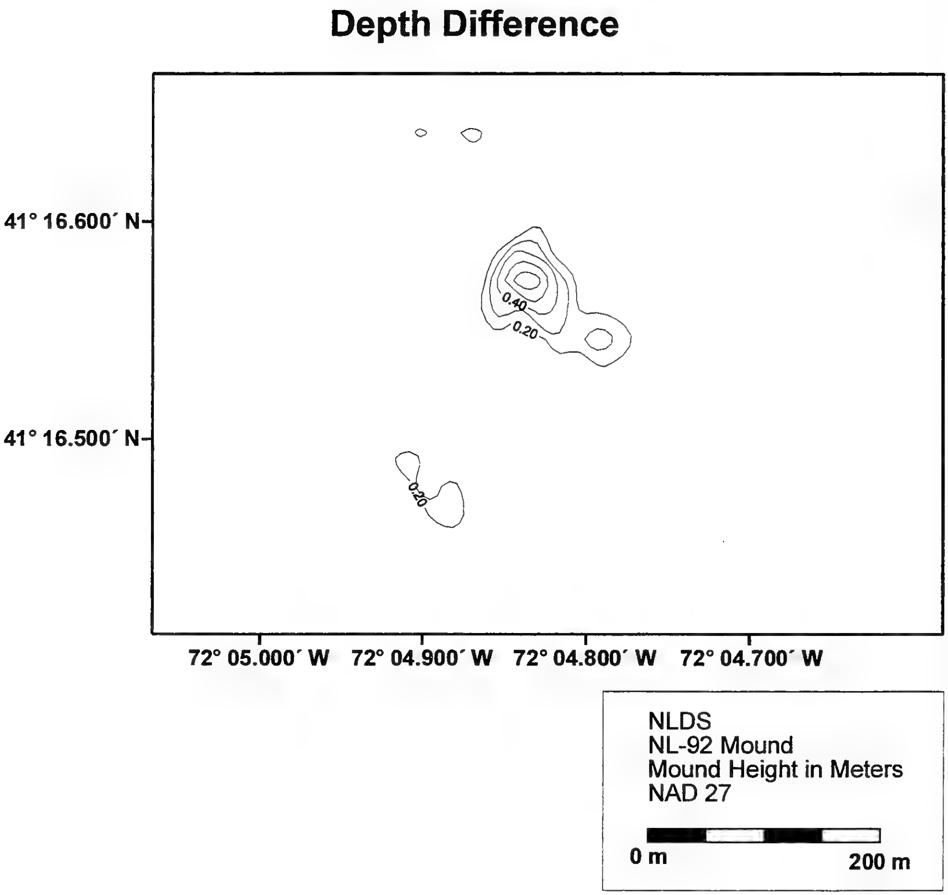

Figure 3-54. NL-92 mound, depth difference from August 1992 to August 1995, 0.2 m contour interval

3 to 4 phi (very fine sand) and >4 (silt). Shell fragments and shell lag deposits were also a major characteristic of the surface sediments at WEST REF.

Each of the three reference areas showed relatively low intra- and inter-station mean boundary roughness values, ranging from 0.0 cm to 2.2 cm across all three areas (Table 3-9). Boundary roughness determinations were classified as biogenic for the majority of the photographs collected in August 1992.

The replicate averaged RPD depths within the three areas ranged from 0.0 cm to 2.3 cm, the overall average RPD was 1.44 cm (Table 3-9). The WEST REF exhibited slightly deeper RPD layers than those at NE REF and NLON REF. No redox rebound layers were observed in any of the replicate images collected at the three reference areas.

The NE and NLON reference areas exhibited Stage II populations (amphipod tube mats) with several stations progressing to Stage III, while the reference area WEST REF showed signs of recent benthic disturbance. Five of the 13 stations sampled at WEST REF had exclusively Stage I populations (Table 3-9). Four stations had Stage I organisms colonizing the sediment surface over Stage III deposit feeders at depth. The eastern-most station displayed evidence of a healthy Stage III population. Stations 300 m north, 100 m east, and 200 m east had indeterminate successional stages due to low camera penetration.

The median OSI values at the reference areas in 1992 ranged from +2 to +8, with an overall average of +5.4. The majority of stations had index values of +5 and +7 (Table 3-9). There were five indeterminate stations at the disposal site and three at the WEST REF area, due to indeterminate RPD values or successional stages. Neither low DO conditions nor sediment methane were noted at any of the 39 reference stations in August 1992.

3.6.2 August 1995 Survey

The surficial sediments at the NLDS reference areas (NLON REF, NE REF, and WEST REF) were examined with REMOTS® sediment-profile photography as part of the August 1995 survey. These reference areas served as a baseline for determining the health of the benthic community at the NL-94 and USCGA mounds, as well as the NL-91 and D/S mound complex. In contrast to 1992, a total of 15 stations were surveyed in August 1995 (four at NLON REF, five at NE REF, and six at WEST REF). These stations were randomly distributed within a 300-m radius of the center of each reference area (Figure 2-8).

No dredged material was present in any replicate photograph obtained from the three reference areas. Camera penetration depth ranged from 3.0 cm to 9.6 cm, and was shallowest at WEST REF (Table 3-10). Despite the relatively low penetration, sand-over-mud layering was observed in all replicate photographs from NE REF and in two replicate photographs from NLON REF Station 2. No evidence of mud was seen at WEST REF.

All of the reference areas were predominantly characterized as fine to very fine sand (Table 3-10). At NE REF and NLON REF, the major modal grain size was 4 to 3 phi (very fine sand) in all but one photograph from NE REF. NE REF Station 4 had a major modal grain size of >4 phi (silt/clay). At WEST REF, the sediment was mostly 3 to 2 phi (fine sand). WEST REF Station 5 was dominated by 2 to 1 phi (medium sand).

All of the reference area REMOTS® photographs showed low boundary roughness. Averaged boundary roughness values for the stations ranged from 0.4 cm to 1.6 cm and were attributed to biogenic activity.

The apparent RPD depth ranged from 0.7 cm to 2.9 cm at the reference stations. The average RPD value was 1.76 cm at WEST REF, 1.04 cm at NE REF, and 1.51 cm at NLON REF (Table 3-10). Two REMOTS® photographs at WEST REF (Station 2/B and Station 6/B) showed no RPD and indications of low apparent DO conditions within the bottom waters. No redox rebound layers were detected in any of the 1995 reference area photographs.

In general, the reference areas displayed a solid Stage II benthic community with progression into Stage II on III at all but two stations (NE REF Station 2 and NLON REF Station 4; Table 3-10). Dense amphipod tube mats were present at all three reference areas. The replicate image obtained from WEST REF Station 6/B was classified as azoic, while the remaining two photographs (obtained within a 25 meter radius) displayed healthy Stage II and Stage III benthic communities. This suggests a very recent and highly localized benthic disturbance.

Median OSI values ranged from +4 to +8 at the reference stations during the 1995 survey, with an overall average of +5.9. This shows a slight improvement in overall benthic conditions, relative to the August 1992 survey despite one replicate photograph at NLON REF (Station 2/B) and two replicates at WEST REF (Station 2/B and Station 6/B) showing evidence of low DO conditions or enrichment. No methane gas was apparent in any replicate image.

Table 3-10
NLDS Reference Area REMOTS® Sediment-Profile Photography Results Summary for the 1995 Survey

Mound/ Ref Area	Location	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)	Number of Reps w/ Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NLON REF	STA1	5.52	0	0	0.84	II,III	ST_II_ON_III	4 to 3	5.33	5	0.68
NLON REF	STA2	9.56	0	0	1.12	II,III	ST_II_ON_III	4 to 3	5.00	5	1.05
NLON REF	STA3	7.23	0	0	1.76	II,III	ST_II_ON_III	4 to 3	7.00	7	0.96
NLON REF	STA4	4.42	0	0	2.31	II	ST_II	4 to 3	6.33	6	0.94
NE REF	STA1	6.55	0	0	1.79	II,III	ST_II_ON_III	4 to 3	7.33	8	1.36
NE REF	STA2	7.18	0	0	1.03	II	ST_II	4 to 3	5.00	5	1.55
NE REF	STA3	6.37	0	0	0.96	I,II,III	ST_II_ON_III	4 to 3	6.00	6	0.81
NE REF	STA4	7.56	0	0	0.65	II,III	ST_II_ON_III	4 to 3	5.67	6	0.43
NE REF	STA5	6.19	0	0	0.77	II,III	ST_II_ON_III	4 to 3	5.00	4	1.18
WEST REF	STA1	5.23	0	0	2.91	II,III	ST_II_ON_III	3 to 2	8.67	8	1.50
WEST REF	STA2	4.33	0	0	0.80	II,III	ST_II_ON_III	3 to 2	4.00	5	0.56
WEST REF	STA3	3.96	0	0	1.69	II	ST_II	3 to 2	6.33	6	1.29
WEST REF	STA4	6.85	0	0	1.21	II,III	ST_II_ON_III	3 to 2	6.33	6	0.75
WEST REF	STA5	3.03	0	0	2.93	INDET	INDET	2 to 1	INDET	INDET	0.89
WEST REF	STA6	7.34	0	0	0.99	II,III	ST_II_ON_III	3 to 2	1.67	6	1.44
AVG		6.09	0.00	0.00	1.45				5.69	5.93	1.03
MAX		9.56	0.00	0.00	2.93				8.67	8	1.55
MIN		3.03	0.00	0.00	0.65				1.67	4	0.43

3.6.3 September 1997 Survey

A total of 13 randomly selected stations were surveyed with the REMOTS® sediment-profile camera at NLON REF, NE REF and WEST REF reference areas as part of the September 1997 field effort. Four stations were surveyed in NLON REF, four at WEST REF, and five in the NE REF. These data were used as the basis for comparison in assessing benthic habitat quality over the NL-94 mound and the NL-91 and D/S mound complex.

No dredged material was present in any of the replicate photographs obtained from the three reference areas. Replicate averaged camera penetration depth ranged from 4.6 cm to 10.3 (Table 3-10). The shallow to moderate camera penetration documented limited sand-over-mud layering at several stations within each reference area. All of the reference areas showed some evidence of physical reworking or erosion of sediment as shown by the following characteristics: poor sediment sorting, shell layers near the surface (shell lag), hydroids, or ripped up amphipod tube mats. WEST REF showed the most widespread evidence of physical reworking, with shell lag at 4 out of 6 stations.

All of the reference areas were similar in sediment grain size distributions with a predominant major mode of 3 to 4 phi (very fine sand). Station 10 in the WEST REF was an exception to this and exhibited a predominant grain size major mode of 2 to 3 phi (medium to fine sand; Table 3-10).

Each of the three reference areas showed relatively low intra- and inter-station mean boundary roughness thickness values, ranging from 0.39 cm to 1.39 cm (Table 3-10). The overall average boundary roughness was 0.73 cm, with the majority of replicates displaying physical disturbances.

The replicate averaged RPD ranged from 1.75 cm to 3.48 cm, with an overall mean of 2.35 cm within the three areas (Table 3-10). Redox rebound layers approximately 5 cm deep were identified in two replicates obtained from NE REF.

The NE REF and WEST REF reference areas exhibited primarily Stage II populations, with several stations having Stage III present (Table 3-10). The reference area NLON REF showed primarily Stage II organisms progressing to Stage III (three of four stations) and one station in which Stage I organisms were present at the sediment surface over Stage III deposit feeders. The images from NLON REF and NE REF showed dense amphipod tube mats (Stage II). The mats at NE REF were in the process of being eroded during the survey, while those at NLON REF were largely intact.

Median OSI values for the reference area REMOTS® stations ranged from +5 to +10, with an overall average of +6.8 (Table 3-10). Once again, the reference areas in 1997 showed a small improvement in benthic habitat conditions relative to previous years (1995 and 1992). No low DO conditions or methane gas was detected in any replicate image.

3.6.4 July 1998 Survey

As part of the July 1998 survey over NLDS, 13 randomly selected stations were surveyed with the REMOTS® sediment-profile camera at NLON REF, NE REF and WEST REF reference areas. Four stations were surveyed in NLON REF, four at WEST REF, and five in the NE REF. These data were used as the basis for comparison in assessing benthic habitat quality over the NL-91 and D/S mound complex.

Camera penetration ranged from 5.6 cm to 11.7 cm, with an average of 7.8 cm, which was comparable with 1997 results (Table 3-11). No evidence of dredged material was apparent in any of the photographs. Sand or sandy silt over mud stratigraphy was observed in many of the photographs. Sediments at NE REF and NLON REF were moderately sorted, whereas WEST REF sediments were primarily poorly sorted. Organic detrius, surface scour, and/or shell fragments were present at the surface in many of the replicates.

Fine to very fine sands (3 to 4 phi) characterized most of the sediment at the reference areas (Table 3-11). Two stations within NE REF were composed primarily of fine-grained sediments (>4 phi) while WEST REF displayed several stations with a significant fine sand component (2 to 3 phi).

Boundary roughness values were generally low (<1 cm), except at WEST REF Station W13 (STA 08), which had a replicate average value of 1.7 cm. Disturbances within the surface sediments at the reference areas were primarily attributed to physical forces. However, evidence of biological activity causing the surface disturbance was present in approximately 33% of the reference area photographs.

The RPD depths ranged from 1.55 cm to 3.98 cm, with an overall average of 2.55 cm (Table 3-11). In general, the RPD depths at both NLON REF and WEST REF tended to be deeper relative to NE REF. Redox rebound layers were apparent roughly 4 cm below the sediment-water interface at two stations within NE REF (Stations 10 and 12).

Tube mats were common at the reference areas; some of these mats appeared to be disturbed at NE REF and WEST REF. Stage II was considered the dominant successional stage. Stage I was found at multiple stations in all three reference areas, but only seven replicates had active feeding voids at depth to indicate the presence of Stage III individuals.

The OSI median values ranged from +5 to +10, with an overall average of +6.7. These were very similar to values observed in 1997 (+6.8). No replicates had low dissolved oxygen conditions, although a few replicates from NE REF did portray dark, sulfidic sediments. No methane gas pockets were detected in the images obtained from the reference areas in July 1998.

Table 3-11
NLDS Reference Area REMOTS® Sediment-Profile Photography Results Summary for the 1997 Survey

Mound/ Ref Area	Station	Camera Penetration Mean (cm)	Dredged Material Thickness Mean (cm)**	Number of Reps w/Dredged Material	RPD Mean (cm)	Successional Stages Present	Highest Stage Present	Grain Size Major Mode (phi)	OSI Mean	OSI Median	Boundary Roughness Mean (cm)
NLON REF	STA1	5.04	0.00	0	2.27	I,II,III	ST_I_ON_III	4 to 3	5.0	5	0.45
NLON REF	STA2	9.90	0.00	0	2.55	I,II,III	ST_II_ON_III	4 to 3	7.7	9	0.77
NLON REF	STA3	4.64	0.00	0	2.48	II,III	ST_II_TO_III	4 to 3	7.5	7.5	0.57
NLON REF	STA4	7.43	0.00	0	1.81	I,II,III	ST_II_ON_III	4 to 3	6.0	5	0.52
NE REF	STA5	7.25	0.00	0	1.92	I,II,III	ST_II_ON_III	4 to 3	6.3	6	0.39
NE REF	STA6	7.11	0.00	0	2.43	II	ST_II	4 to 3	6.5	6.5	1.39
NE REF	STA7	8.52	0.00	0	2.59	I,II	ST_II	4 to 3	6.0	7	0.58
NE REF	STA8	8.25	0.00	0	2.65	I,II	ST_II	4 to 3	6.3	7	0.60
NE REF	STA9	8.01	0.00	0	2.07	I,II,III	ST_II_ON_III	4 to 3	8.3	8	0.54
WEST REF	STA10	6.98	0.00	0	2.42	I,II	ST_II	3 to 2	6.0	6	0.77
WEST REF	STA11	10.28	0.00	0	3.48	II,III	ST_II_ON_III	4 to 3	10.0	10	0.83
WEST REF	STA12	5.72	0.00	0	2.10	II	ST_II	4 to 3	6.0	6	1.19
WEST REF	STA13	6.16	0.00	0	1.75	I,II	ST_II	4 to 3	5.3	5	0.92
AVG		7.33	0.00	0.00	2.35				6.7	6.8	0.73
MAX		10.28	0.00	0.00	3.48				10	10	1.39
MIN		4.64	0.00	0.00	1.75				5	5	0.39

Table 3-12

NLDS Reference Area REMOTS® Sediment-Profile Photography Results Summary for 1997 and 1998 Surveys

Mound/ Ref Area	Reference Area Station (97)*	Camera Penetration Mean (cm)		Dredged Material Thickness Mean (cm)		Number of Reps w/Dredged Material		RPD Mean (cm)		Successional Stages Present		Highest Stage Present		Grain Size Major Mode (phi)		OSI Median		Boundary Roughness	
	Survey:	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
NLON REF	NL 1 (STA 01)	5.04	6.07	0.00	0.00	0	0	2.27	3.29	I,II,III	I,II	ST_I_ON_III	ST_II	4 to 3	4 to 3	5	6	0.5	0.4
NLON REF	NL 2 (STA 02)	9.90	9.10	0.00	0.00	0	0	2.55	2.56	I,II,III	II,III	ST_II_ON_III	ST_II_ON_III	4 to 3	4 to 3	9	8	0.8	1.0
NLON REF	NL 3 (STA 03)	4.64	5.55	0.00	0.00	0	0	2.48	2.52	II,III	I,III	ST_II_TO_III	ST_I_ON_III	4 to 3	4 to 3	7.5	5	0.6	1.1
NLON REF	NL 4 (STA 04)	7.43	6.95	0.00	0.00	0	0	1.81	2.50	I,II,III	I,II	ST_II_ON_III	ST_I_TO_II	4 to 3	4 to 3	5	7	0.5	0.5
NE REF	NE 5 (STA 09)	7.25	7.75	0.00	0.00	0	0	1.92	1.87	I,II,III	I,II	ST_II_ON_III	ST_II	4 to 3	4 to 3	6	5.5	0.4	0.6
NE REF	NE 6 (STA 10)	7.11	8.47	0.00	0.00	0	0	2.43	1.85	II, III	I,II	ST_II_TO_III	ST_II	4 to 3	>4	6.5	6	1.4	0.6
NE REF	NE 7 (STA 11)	8.52	8.56	0.00	0.00	0	0	2.59	2.01	I,II	I,II,III	ST_II	ST_I_ON_III	4 to 3	4 to 3	7	6	0.6	1.0
NE REF	NE 8 (STA 12)	8.25	7.36	0.00	0.00	0	0	2.65	1.55	I,II	I,II,III	ST_II	ST_II_ON_III	4 to 3	4 to 3	7	7	0.6	0.9
NE REF	NE 9 (STA 13)	8.01	7.21	0.00	0.00	0	0	2.07	1.71	I,II,III	I,II	ST_II_ON_III	ST_II	4 to 3	4 to 3	8	5	0.5	1.0
WEST REF	W 10 (STA 05)	6.98	11.66	0.00	0.00	0	0	2.42	3.68	I,II	I,II,III	ST_II	ST_I_ON_III	3 to 2	4 to 3	6	10	0.8	1.1
WEST REF	W 11 (STA 06)	10.28	8.10	0.00	0.00	0	0	3.48	2.90	II,III	I,II	ST_II_ON_III	ST_I_TO_II	4 to 3	4 to 3	10	7	0.8	1.2
WEST REF	W 12 (STA 07)	5.72	6.46	0.00	0.00	0	0	2.10	3.98	II	NA	ST_II	NA	4 to 3	3 to 2	6	NA	1.2	0.7
WEST REF	W 13 (STA 08)	6.16	8.52	0.00	0.00	0	0	1.75	2.74	I,II	II	ST_II	ST_II	4 to 3	4 to 3	5	8	0.9	1.7
AVG		7.33	7.83	0.00	0.00	0	0	2.35	2.55							6.8	6.7	0.7	0.9
MAX		10.28	11.66	0.00	0.00	0	0	3.48	3.98							10	10	1.4	1.7
MIN		4.64	5.55	0.00	0.00	0	0	1.75	1.55							5	5	0.4	0.4

* 1998 Station designations (STA xx) for correlation with names and locations listed in Table 2-8.

4.0 DISCUSSION

The New London Disposal Site (NLDS) was monitored over five time intervals during the period 1991-1998 and received dredged material from twelve distinct episodes of disposal (Figure 1-3). The patterns of disposal and monitoring provide an overview of the processes affecting the environment within the disposal site. This report includes specific details regarding individual disposal mounds, their history and monitoring results. This report is the first of two-volume report that covers D/S, NL-91, USCGA, NL-94, and the Northern Region. Volume 2 of this report covers the results of monitoring the U. S. Navy Seawolf mound in 1997 and 1998. Before discussing each mound complex and the baseline study of the northern region, it is helpful to review the evidence of physical and biological response to disposal activity at this site.

The master bathymetric survey conducted in 1997 over the revised DAMOS NLDS site boundaries provided data for an analysis of the topographic signature of the disposal site over a ten year period since the prior master survey in 1986 (Section 4.1). The REMOTS® sediment profile photography results from the disposal sites are compared in a general way with the results from the three surrounding reference areas (NLON-REF, NE-REF, and WEST-REF) in Section 4.2. The history and monitoring results of each disposal mound (D/S & NL-91, USCGA, NL-94) are then discussed (Sections 4.3, 4.4, 4.5). Finally, a discussion of the baseline characterization results for the Northern Region is provided in Section 4.6.

4.1 Topography and Evidence of Historical Disposal at the NLDS

The 1997 master bathymetric survey showed several key features important for the future management of the NLDS. First, the spatial distribution and topography of the dredged material mounds coincided well with the known buoy locations and mound growth over time as recorded in previous surveys (NUSC 1979, SAI 1980, Parker and Revelas 1989, SAIC 1990a, b, c; 1995a, b; Germano et al. 1995). Coherent disposal mounds can be seen associated with the historical placement of dredged material at the following locations: NL-I (1978), NL-II (1979-80), NL-III (1980-81), Seawolf, NL-85, NL-88, Dow/Stonington & NL-91, USCGA/NL-TR, NL-95, and NL-94/96 (Figure 1-2). Most significantly, the NL-RELIC Mound has been a prominent and unchanging feature at the site since DAMOS bathymetric surveys began in 1977 (NUSC 1979, SAI 1980). The presence of discrete disposal mounds with consistent heights and shapes provides evidence that dredged material placed on the seafloor at the NLDS has been stable for at least twenty years. The importance of these results should be emphasized. Despite clear evidence of surface washing of fine-grained material across the disposal site and a potential for active bedload transport (Knebel et al. 1999, Waddell et al. 1999), the consolidated mass of disposal mounds measured as volume in bathymetric depth-difference calculations has been stable over a period of at least twenty years.

A three-dimensional view of the master bathymetric survey showed lower topographic relief south of the NL-RELIC Mound, in a depression surrounded by historical dredged material disposal mounds (Figure 3-49). The practice of using the periodic disposal of dredged material to develop topographic barriers was first discussed in relation to NLDS (SAI 1980). This practice was a successful management method during the formation of the NHAV-93 mound at the Central Long Island Sound Disposal Site (Morris 1996). In that study, a topographic depression was used to site the disposal of a major dredging project (New Haven); the disposal of the dredged material in this "bowl" served to restrict its lateral spread. The depression located south of the NL-RELIC mound represents a potential area for similar future management of material at NLDS. However, the location of this bowl directly beneath the U.S. Navy Submarine corridor may place limits on the effective use of this area for dredged material disposal. Buoys located in this corridor are a hazard to submarine navigation and mound height would need to be limited, in order to ensure water depths greater than 14 m. Other topographic low areas are near the margins of the disposal site and include the trough in the southwestern quadrant of the site, which is associated with the natural ridge southwest of the site.

4.2 Biological Response to Disposal at the NLDS

The REMOTS® sediment profile data collected from reference areas and within the disposal site provide an opportunity to compare and contrast the biological response to disposal activity over a six year period (1992-1998). Throughout this period the fresh and recent (1-6 years old) dredged material showed a rapid recovery from a disturbed surface to a healthy benthic assemblage. Areas of historical dredged material (over 6 years old) were not specifically targeted for investigation, but were sampled around the margins of new disposal mounds. These areas all supported a healthy mature benthic community. Reference areas appeared to be recovering in 1992 from some patches of disturbance in 1991 but also recovered rapidly and returned to a more uniform mature benthic community in 1995. All reference areas experienced some limited patches of disturbance (presence of recolonizing Stage I organisms, eroded tube mats, shallow RPDs) at various times within the survey period. None of the individual reference stations exhibited consistent disturbance, that is, the patches were in different places each year. Overall, the reference areas supported a healthy benthic assemblage and displayed typical features of seasonal settlement and disturbance (see below).

Assessment of the health of the benthic community at NLDS requires the ability to separate site-specific characteristics from regional environmental characteristics. During this time, historical dredged material and reference areas experienced very limited direct physical disturbance, whereas areas that received fresh dredged material experienced a short period of physical disturbance followed by recovery. In some areas, dredged material was placed two or three times during the six years. All of the monitoring surveys were conducted in late summer (July 30-September 6), a period with elevated water temperatures and the potential for ecological stress or seasonal senescence of settling organisms (see below).

The most consistent biological characteristic observed over the monitoring period was the widespread presence of tube building amphipods in surface sediments. These organisms collect fine-grained sediments to construct their tubes, and the presence of the tubes enhances trapping and deposition of fine sediments (Mills 1967). The mats can become very dense and restrict bioturbation and circulation in sediments below the tubes (the result is a relatively thin redox potential discontinuity or RPD). In both disposal areas and reference areas, a mixed layer of fine sand and coarse shells was present beneath the tubes, but this layer is often difficult to see. Clumps of mussels also were seen and widely reported from the area within and around the disposal site. In areas with shells or pebbles on the surface, hydroids and mussels were seen attached to the hard substrate.

When the amphipod tubes are physically disturbed or abandoned (due to natural seasonal decline, senescence or environmental stress), they are easily eroded, and the sand or shell surface is again exposed to bottom currents. As a result, summer periods (when the tube mats are present and widespread in and around the NLDS) may represent active deposition of fine sediment, with subsequent die-off or thinning of the tubes and sediment reworking in the winter.

The surface sediment characteristics are a combination of the material deposited and processes of physical and biological reworking. The DAMOS monitoring results reported here serve to demonstrate that the surface sediment characteristics throughout the disposal site and reference areas became similar over time (with the exception of areas mantled with coarse sand or pebbles). The NLDS is subject to relatively strong tidal currents but is also sheltered from wave disturbance (Waddell et al. 1999). When tidal currents are sufficient to transport fine sand as bedload, some fine materials may be winnowed leaving a lag deposit of sands and shells too large for transport. Semi-diurnal tidal currents at the NLDS appear to be strong enough to rework unconsolidated surface sediments through this process until surface sediments have a lag deposit of sand or shells. However fine surface sediments are also bound by biological activity and may be remarkably resistant to erosion while the organisms are alive. Tidal currents are likely to be slightly weaker in the depression where the NL-91 and D/S mound complex is located compared to the tops of nearby, shallower mounds.

The result of the surface sediment winnowing process includes six characteristics in REMOTS® images: shell lag, winnowed surfaces, disturbed amphipod tube mats, physical boundary roughness, and sand-over-mud stratigraphy. There are three potential causes for surface disturbance of tube mats: 1) predator foraging; 2) microbial decomposition following the abandonment of the tubes; and 3) disturbance from either trawling or a temporary increase in near-bottom turbulence or current velocity. When tubes are abandoned they are much more susceptible to physical transport by currents.

Surface sediment reworking at NLDS appears to be limited to winnowing of fines accumulated during the summer in areas where shell lag armors the surface. The shell lag may form in the fall and winter during periodic storms, then again be covered with tube mats that bind finer sediments in the spring and summer. This seasonal response is observed to be consistent between reference areas and disposal areas, and results in a fluctuation between seafloor surfaces covered with muddy tubes to surfaces with clean shell and fine sand. This seasonal cycle may open opportunities for settlement of recolonizing benthic organisms and explain their patchy distribution at reference areas. Any deposition of fresh dredged material will begin to be exposed to this cycle and will eventually acquire tubes or attached organisms depending on grain size. In general, there is evidence of fall-winter winnowing in many areas of NLDS and spring-summer deposition of finer materials. As shown by the long-term stability of mounds at the site (see above), this cycle does not appear to result in any significant net loss or gain of sediment.

4.2.1 Evidence of Low Dissolved Oxygen

In some years (1995, 1997), NLDS appears to have experienced a seasonal or annual environmental stress or disturbance that has affected apparent reduction-oxidation conditions within the sediments across some of the disposal mounds and nearby reference areas. In other years (1992, 1998) there is no evidence of such disturbance. Dissolved oxygen concentrations measured in August 1992 approximately 1 m above the bottom at the disposal site and reference stations ranged from 7.3 $mg \cdot l^{-1}$ to 7.8 $mg \cdot l^{-1}$, while surface water oxygen concentrations ranged from 7.7 $mg \cdot l^{-1}$ to 8.1 $mg \cdot l^{-1}$. These results are comparable to results for August 5, 1992 (7.05 $mg \cdot l^{-1}$) from the Connecticut Department of Environmental Protection Hypoxia Monitoring Program (CT DEP) measured at Station M3 (Kaputa and Olsen 2000). Station M3 is located at the west end of Fisher's Island, 2 nmi SE of NLDS in greater than 35-m water depth (water depths at NLDS range from 14 m to 24 m).

The monitoring surveys conducted in early August 1992, late August 1995, early September 1997 and late July 1998 all revealed the presence of widespread tube-building ampeliscid amphipods at the surface sediments. At the time of the surveys, many of the tubes were empty and the mats were susceptible to disturbance. In the surveys conducted later in the summer (1995 and 1997) the sediments underneath the mats contained evidence of restricted circulation in the bottom waters or organic enrichment of the sediments (shallow RPD thicknesses, methane bubbles, senescent tube mats, e.g. at USCGA and NL-91). The presence of these indicators at the reference areas suggests that a regional environmental stress or disturbance may have affected the eastern LIS region in 1995 and 1997.

It is generally assumed that eastern LIS does not experience hypoxic conditions (defined by the EPA's Long Island Sound Study as 3.0 $mg \cdot l^{-1}$ or less). CT DEP data for this region show a seasonal decrease in DO values from May to December with a low period from late July to August or September (Kaputa and Olsen 2000). Stations further away from NLDS (K2, J2, and N3) also follow the same pattern of lower DO values in the surface and bottom waters from May to December. Dissolved oxygen levels normally decrease to 6 or 7 $mg \cdot l^{-1}$ for all of these stations. The lowest values recorded since 1991 for these stations approached 5.9 $mg \cdot l^{-1}$ in the summer of 1991. Based on the CT DEP time series data there is no evidence that 1995 or 1997 experienced conditions markedly different from 1992 or 1998. However the surveys in 1995 and 1997 were conducted later in the summer when environmental stress may have been sustained for a longer period.

While these measured values do not seem sufficient for true hypoxia, they may contribute to the conditions observed. The most likely explanation for the presence of patches of reduced sediments and methane is that seasonal senescence of dense mats of tube building amphipods may create temporary reducing conditions near the sediment surface. Once these mats are eroded, the reduced sediments will be exposed to overlying waters and rapidly oxidized through bioturbation and diffusion. Sediment profile surveys conducted during this period (late August – early September) might contain all three of these conditions (senescent tube mats and reduced sediments, reduced surface sediments, thin RPD at surface). DAMOS surveys in western and central Long Island Sound have noted that survey data during late summer may be complicated by the sediment disturbance induced by hypoxic conditions and have recommended that surveys should be conducted in early summer or early fall after recovery (Morris 1998, Murray and Saffert 1999). While the eastern Long Island Sound may not experience hypoxia, it seems clear that seasonal biological processes may affect survey results. Future surveys at NLDS could optimally be scheduled after recolonization has begun (early June) but before mid-August when tube mats appear to senesce.

4.3 Capping of the Dow/Stonington Disposal Mound

The NL-91 and D/S mound complex reflects a complicated history. The products of seven disposal sequences are reflected in the results of four separate monitoring surveys. These results show that a low mound complex was formed in 1991-1992 from mixed deposits rather than a distinct capped mound. This mound complex had a thin layer of sand covering the central region that was subsequently covered with additional cap material in 1997-1998 (Figure 3-30). While the intended capping process was not completed as originally planned in 1992, the presence of the sand layer and addition of subsequent cap material in 1997-1998 has provided sufficient interim isolation of the material intended for capping. Throughout the survey period this mound complex supported a healthy benthic community that progressed rapidly from early colonizers to a more mature state. There was no evidence of adverse environmental impact from the sediments and the surface of the mound responded physically and biologically the same as other mounds and the reference areas. Further, additional sediment was sent to this location from 1998-2000, and the results of follow-up surveys will be presented in a future report.

Dredged material disposal activities at NLDS were confined to the period between mid-October 1991 through mid-January 1992. Within those 90 days, the NDA buoy was moored at four different locations, the D/S buoy was removed from the site during capping operations and never recovered, and the U.S. Navy established a 300-m wide corridor for submarines transiting through NLDS. In the midst of an unusually active buoy management cycle, an apparent error in navigation information during disposal resulted in much of the CDM being placed somewhat to the east of the buoy, leading to the formation of the irregularly-shaped NL-91 and D/S mound complex (Figure 3-9).

The depth difference map generated using survey data collected before and after CDM disposal indicated that the bulk of the CDM was placed east of the NDA and D/S buoys (Figure 3-8). REMOTS® sediment-profile photographs were further assessed to determine if thickness of material <20 cm could be mapped to further delineate the distribution of dredged material (see Section 4.3.2 and Figure 3-11).

4.3.1 Benthic Recolonization

The area surrounding the NL-91 and D/S mound complex consistently showed evidence of rapid benthic recolonization (Stage I progressing to Stage II with Stage III) similar to results expected from sediments with a low potential for adverse biological effects (Figure 3-24). In 1992, after the initial placement of material, the mounds supported active benthic colonization and were more advanced than predicted. Median OSI values ranging from $+2.0$ to $+8.0$ (average $+4.9$) were comparable to those of the reference areas (Figure 3-27 and Tables 3-1 and 3-9). The recolonization status of the area around the NL-91 and D/S mound complex was characterized as supporting a solid Stage II population with some progression into Stage III assemblages. Apparent RPD values of the NL-91 and D/S mound complex tended to be slightly lower, but comparable to those of the two eastern reference areas (NE-REF and NLON-REF).

In 1995, three years after the NL-91 and D/S mound complex was placed, the benthic communities at the most recent disposal mounds were even more advanced than in 1992 and comparable to the reference area benthic community (which had improved). All stations contained Stage II on III successional stages and RPDs had deepened (Table 3-2). OSI values had improved from an average of +4.9 to +8.0. In 1997, the NL-91 and D/S mound complex continued to support a healthy benthic community. The dominant successional stages were Stage II or Stage II on III (Table 3-3). The median OSI values ranged from +2.0 to +11, with an overall average of +8.6, slightly higher than measured in 1995. After placement of additional cap material in 1998, the NL-91 and D/S mound complex again supported a healthy benthic community. The dominant successional stages were Stage II or Stage II on III communities (Table 3-4).

Recolonization of the new dredged material was rapid and many of the replicate photographs from these regions showed Stage III feeding voids. The station median OSI values ranged from +3.0 to +11.0, with an overall average of +7.5, which was only slightly lower than prior to the placement of new material (1997).

4.3.2 Sediment Distribution and Characterization

The evidence from sediment profile photography of the distribution of dredged material released during the 1991-1992 disposal season is consistent with the placement of a mixed deposit of Dow UDM and Stonington UDM and Port Niantic material near the D/S buoy, and east of the D/S buoy a deposit of Dow CDM (compare Figures 3-8 and 3-11). REMOTS® photographs collected in 1992 were able to provide a clear delineation of the distribution of fresh dredged material, but it was difficult to clearly separate the source of fresh materials. The UDM and CDM from Dow facilities were quite similar in sediment texture (black silt). However the REMOTS® photographs revealed the presence of a layer of sand over much of the surface of the NL-91 and D/S mound complex.

This distinctive sand layer (1.27 cm to 7.03 cm thick) was mixed with dredged shells and small pebbles. The layer is similar in texture to the Port Niantic material targeted for the NDA buoy on 11 and 12 December 1991 at the end of the disposal period (Figure 3-12). REMOTS® photographs collected in the vicinity of the bulk of the CDM deposit detected a thin layer of biologically re-worked dredged material over fresh dredged material (Figure 3-10) whereas surrounding the new mounds, the surface sediments were reworked older dredged material (lighter in color).

The surface of these deposits converged over time with the development of a reworked shelly sand surface seasonally occupied with amphipod tubes. The lateral edges of the original deposit were clear in 1992, but became less clear as subsequent deposition and reworking caused the surface sediments to converge in appearance. This similarity in appearance indicates a continual effect of biological and physical reworking as amphipods trap mud and tidal currents transport fine sand and shell fragments. In 1997 the pattern of distribution was quite uniform with fine to very fine sand over the entire survey area including the NL-91 and D/S mound complex, and similar to the reference areas.

After deposition of new material in 1997-1998, a fresh layer was found over the center of the Dow/Stonington UDM (Figure 3-29). The 1997–1998 disposal logs indicated that 6,850 m^3 of sediments were placed over the northern area of the D/S mound as supplemental cap (Figure 3-30). This material was seen as distinctive layers of fresh dredged material in stations over the older D/S Mound sediments and to the north (Figure 3-33). In some stations to the east, the new material was not sufficiently distinct to measure thickness but was darker and showed fewer signs of biological reworking.

One location beyond the southern margin of the NL-91 and D/S mound complex (1992 Station 400 S) had a distinctive layer of pebbles, shells and sand on the surface (Figure 3-15). This station is located on the top of a slope at the very edge of older dredged material accumulation. It is likely to represent a lag deposit formed from older dredged material. It also provides a useful reference mark because this coarse material was detected in each subsequent survey (400S 1992 became Stations 200S in 1995, 1997, 1998; Figures 3-21,3-26,3-31). The consistency of results from this station located just beyond the margin of the disposal mound complex over a period of six years combined with no net topographic change is clear evidence of the physical stability (armoring) of this area.

The NL-91 and D/S mound complex is located in a depression surrounded by disposal mounds which provide protection from tidal currents and waves. This mound complex has remained physically stable from 1992 through 1998. During this time the mound and surrounding areas have supported a stable, healthy benthic community. Any significant physical erosion (more than about a centimeter) or impact from biologically unsuitable sediments would have been evident in the REMOTS® sediment profile photographs collected during this period.

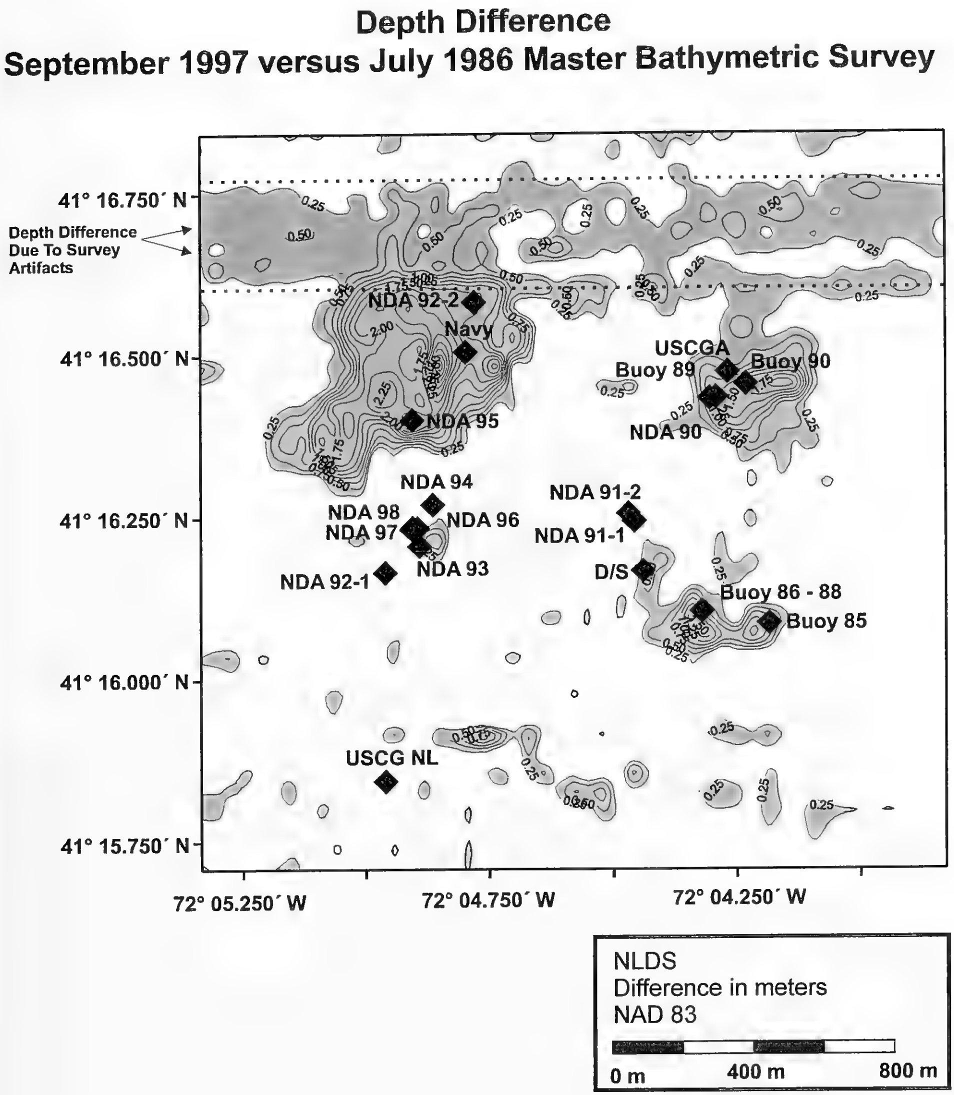

Figure 3-50. Depth difference between the 1986 and 1997 master bathymetric surveys

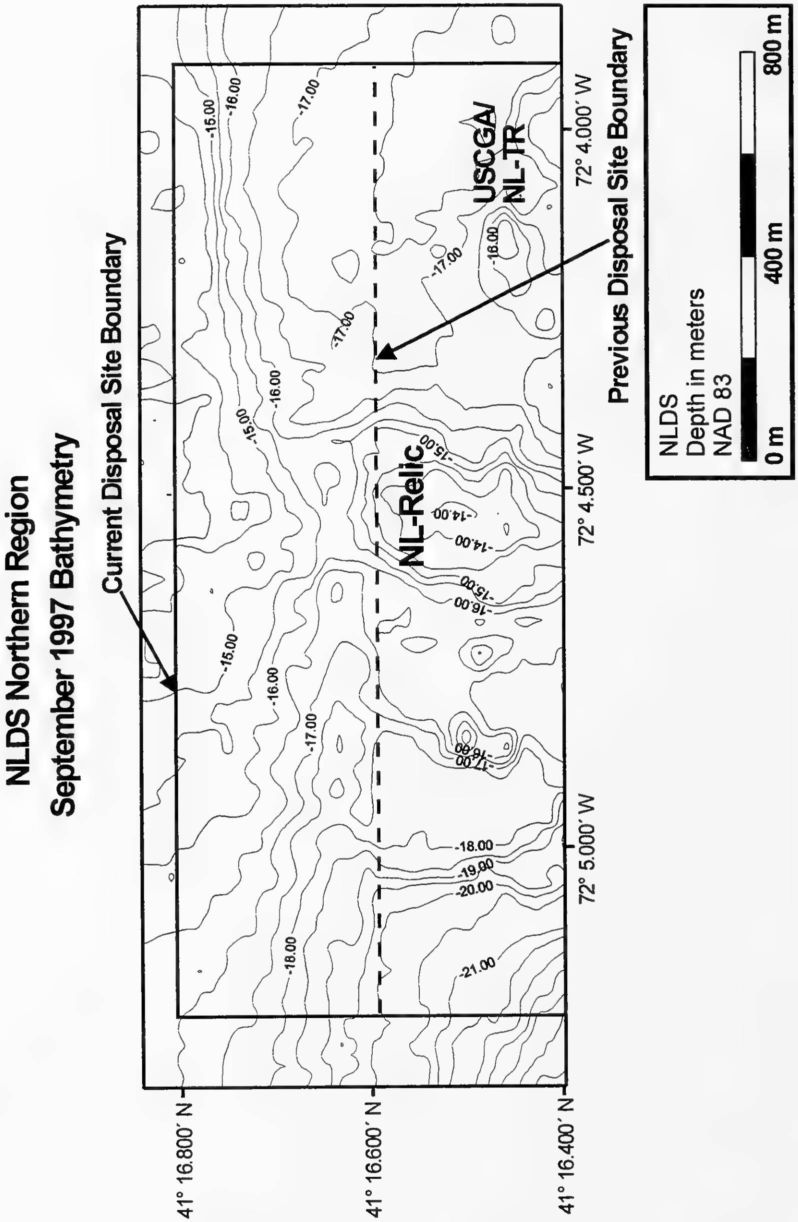

Figure 3-51. September 1997 bathymetry of the Northern Region

Fine to very fine sand characterized the sediment at most stations in the Northern Region, as the major modal grain size was 4 to 3 phi (very fine sand) in most photographs (Table 3-8). At Station N9 fine sediments, either gray clay or brown clayey silt (>4 phi), were predominant. In contrast, one replicate at Station N6 contained gravel with overlying shells. Station 10 had two photographs with a coarser grain size of fine sand (3 to 2 phi). Surface sand overlying fine-grained sediment (sand over mud stratigraphy) was noted in one-fourth of the photographs from the region.

Despite the occasional appearance of an overlying sand layer, all of the stations in the Northern Region had relatively low boundary roughness values, with a replicate-averaged mean of 0.9 cm. The coarse grain size in replicates at Station N6 and N10, in addition to the predominance of shell lag and disturbed tube mats on the sediment surface, indicated potential bottom current scouring. Although some stations were indeterminant or had biogenic activity, boundary roughness was primarily due to physical forces.

The replicate-averaged apparent RPD ranged from 0 to 6.2 cm (3.0 average; Figure 3-52; Table 3-8). At Station N9, two replicates had an indeterminate RPD and one replicate had no RPD visible due to the presence of gray clay. Seven replicate images collected throughout the region had a visible redox rebound ranging from 4 cm to 7 cm depth, suggesting a recent reduction in RPD depth.

The biological assemblage at the Northern Region stations showed a dominance of Stage II organisms (amphipods) with some Stage III organisms present (Table 3-8). The Stage II organisms settle and create dense tube mats on the sediment surface, filtering particles from currents they create at the top of the tubes. This high density of tubes and filtering activity may serve to exclude Stage I organisms. Only a few replicates were suspected of having retro-Stage II conditions. Stage III organisms, indicated by sub-surface feeding voids, were present in 13 replicates of the Northern Region stations (Figure 3-53).

Median OSI values ranged from +1 to +11 over the Northern Region, with an overall average of +7.4 (Table 3-8). The majority of the stations had OSI values > +6. The lowest OSI was detected at Station N9, where gray clay was present from the nearby Seawolf disposal mound. The highest possible OSI value, +11, was calculated for four replicate images and assigned to Station N8. Neither low dissolved oxygen conditions nor methane were observed in any of the photographs collected in September 1997.

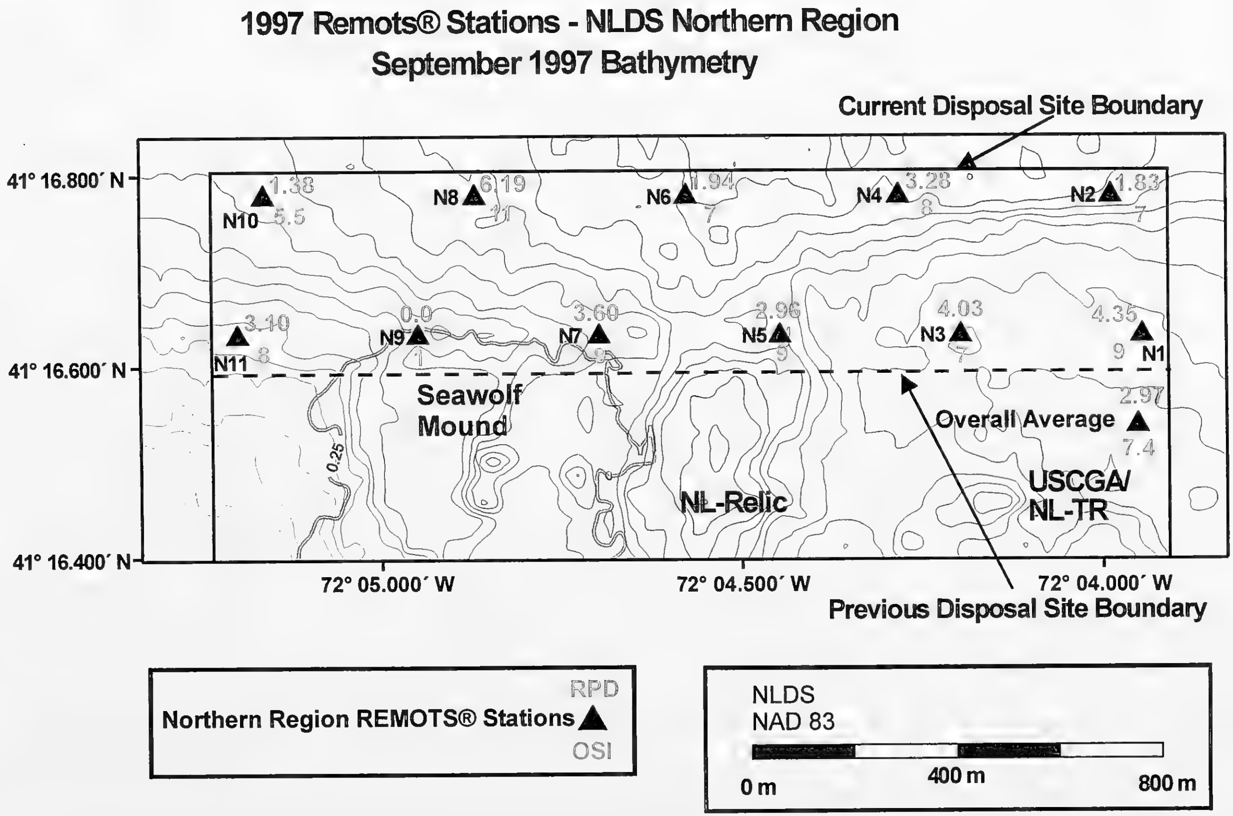

Figure 3-52. Distribution of RPD and OSI values over the Northern region of NLDS

The Northern Region of the NLDS is an area that is relatively flat and uniform supporting a stable, mature benthic community. The depths in the northern half of the region are too shallow to accommodate placement of mounds, but the slope may provide some containment for projects placed in the southern half. Historical dredged material was observed with REMOTS® sediment profile photographs and in each case found to be supporting a healthy benthic community.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The New London Disposal Site (NLDS) monitoring results from 1992-1998 form a time-series of observations of individual mounds and the site as a whole including reference areas. This time-series provides insights into physical and biological processes and any potential environmental impacts from the disposal of dredged material at the site. This section provides conclusions for the site and each individual mound or region surveyed (and recommendations for site management).

5.1 Overview of Monitoring

- A dredged material management strategy has been successfully developed for NLDS that takes into account regional influences over the site as well as site-specific constraints on dredged material disposal. This strategy has incorporated the use of off-site reference areas to determine regional effects on the site. It also uses preexisting disposal mounds, and a planned placement of mounds to form a "ring of mounds," that will both contain the spread of dredged material on the seafloor and allow unacceptably contaminated dredged material (UDM) to be capped with a minimum amount of capping dredged material (CDM).

- The configuration of disposal mounds at the NLDS has remained stable over at least the last twenty years between master surveys, indicating stability of the mass of material at the disposal site, despite sorting and winnowing of surficial fine-grained material. There is strong evidence of stability of deposits placed at NLDS as much as twenty to thirty years ago (NL-RELIC, NL-I, -II, -III and -TR).

- All areas surveyed during this period showed evidence of healthy, stable benthic communities and rapid recolonization of dredged material following disposal activities.

- Biological activity had a strong seasonal impact on surface sediments. Widespread settlement and growth of tube-building organisms promoted deposition of fine-grained sediment on the surface of NLDS. Senescence or migration of these organisms caused decomposition of tubes and removal of fines and tubes leaving coarser sediment on the surface.

- Physical and biological monitoring data from the NLDS were consistent with a model of seasonal winnowing of surficial fine-grained material. This process serves to armor the disposal mounds with a surficial scour lag deposit providing a mechanism for long-term stabilization of the mounds.

- Reference areas reflected conditions throughout NLDS including: seasonal responses to biological and physical processes and apparent impacts of low dissolved oxygen or organic enrichment. All reference areas supported stable, healthy benthic communities. In 1992 reference area conditions based on the Organism-Sediment Index (OSI) improved over results from 1991, improved again in 1995 and 1997 and remained stable in 1998. An increased presence of Stage II and Stage III organisms at NLON-REF and NE-REF has resulted in higher OSI values and increased RPD depths. Conditions at WEST-REF exhibited signs of a recent benthic disturbance in 1992 and 1995. Low OSI values relative to NE-REF and NLON-REF, and a Stage I or Stage I over Stage III population suggests the area was in recovery from a localized disturbance.

5.2 Dow/Stonington and NL-91 Mound

- The NL-91 and D/S mound complex is located in a flat "bowl" formed by surrounding disposal mounds that provides protection from storms and tidal currents. This mound complex was stable throughout the survey period and supported development of a healthy benthic community.

- Sediment deposition during disposal and capping operations during the 1991-92 disposal season yielded a maximum mound height of 0.7 m at the D/S buoy location and 0.5 m at the NDA buoy location. Disposal operations resulted in the development of overlapping areas of deposition: a low mound at the NDA buoy, an elongated low mound extending eastward from the D/S buoy and a layer of sand mixed with shells and pebbles over a portion of both of these mounds.

- Inconsistencies in navigation and disposal barge positioning during CDM deposition caused the cap material to be placed somewhat to the east of the main disposal mound. During capping operations, the coordinates for capping points were apparently misinterpreted causing an offset (250 m to 400 m) to the southeast.

- The material deposited at the CDM points was composed mainly of black silt covered by a layer of biologically-reworked dredged material and fine sand. This bottom feature supported a stable Stage II benthic infaunal assemblage.

- The material deposited at the D/S buoy was composed of black silt covered with a sand layer 2-7 cm thick. The sand layer was consistent with material from the Port Niantic project disposed at the nearby NDA-91 buoy. This area supported a stable Stage II benthic infaunal assemblage.

- Monitoring activity over the NL-91 and D/S mound complex in 1995 and 1997 continued to show mature and healthy benthic infaunal populations and sand-over-mud layering over the mound.

- The recolonization of the area by a diverse benthic community (Stages II and III), representing a broad range of sensitivities, indicates that sediment toxicity and chronic impacts are non-existent or unlikely. The response of the benthic community is a direct indicator of potential for adverse effects and supports a conclusion that either the UDM material was isolated by the surface sediments or the sediments were conservatively classified during the regulatory process. Nonetheless, as a prudent management measure, additional sediments were directed to this location in 1997-1998 to thicken the cap, accompanied by periodic monitoring to assess any changes.

- Additional cap material was placed over the central area in 1997-1998 as a conservative management response to the relatively thinner cap coverage attained during the project. A layer of new CDM (2–10 cm) was detected over the central region of the mound using REMOTS® sediment-profile photography.

- Normal rates of biological recolonization of the mound were observed in 1998. Areas of new CDM had a combination of initial and advanced successional stages showing the standard progression of recovery of the benthic community.

5.3 USCGA Mound

- The USCGA Mound was formed in 1994-1995 from 124,000 m^3 of material from the U.S. Coast Guard Academy. Approximately 80,500 m^3 of CDM was placed over 43,500 m^3 of UDM creating a mound 420 m wide and 1 m high at the apex. The mound overlapped and merged with the historical NL-TR Mound in the northeast quadrant of the NLDS.

- REMOTS® sediment profile results in 1995 indicated that the capped mound was supporting a healthy benthic community. Some stations showed evidence of impact from low dissolved oxygen or organic enrichment, but this was also seen at the reference areas and is attributed to regional conditions of stress.

5.4 NL-94 Mound

- The NL-94 Mound was formed in 1994-1995 from 37,000 m^3 of material from the U.S. Navy Submarine Base. Approximately 28,200 m^3 of CDM was placed over 8,700 m^3 of UDM creating a mound 125 m wide and 0.9 m high. A tongue of dredged material 20-40 cm thick extended 140 m southeast from the mound apex.

- REMOTS® sediment profile results in 1995 indicated that the capped mound was supporting a healthy benthic community. This represented faster recovery than expected. Some stations showed evidence of impact from low dissolved oxygen or organic enrichment, but this was also seen at the reference areas and is attributed to regional conditions of stress.

- Additional suitable material was placed in 1996-1997 to the west of the NL-94 Mound at the NDA-96 buoy. The NL-94/96 Mound complex forms a flat ridge in the western center of the NLDS between the southern edge of the Seawolf Mound and the northern edge of NL-I.

- REMOTS® sediment profile results in 1997 indicated that the new dredged material was supporting a healthy benthic community and recovered more quickly than expected.

5.5 Northern Region

- The master bathymetric survey conducted in 1997 extended into an area termed the Northern Region to provide baseline characterization. The plateau and apron of the Seawolf Mound extended into this region, indicated by both bathymetric and REMOTS® data. Historical dredged material was detected in the Northern Region and can be related to pre-DAMOS disposal in the vicinity of the NL-RELIC Mound. The older age of this disposal activity is reflected in a higher successional status compared to the reference areas, for both ambient sediments and historical dredged material.

5.6 Recommendations

- The capped mound formed at Dow/Stonington should receive additional material to ensure sufficient cap distribution (50 cm) over all UDM placed at these sites. Following placement of additional CDM, monitoring of the mounds should include assessment of benthic recolonization and dredged material thickness across the mounds[2].

- Future surveys at NLDS could optimally be scheduled after recolonization has begun (early June) but before mid-August when tube mats appear to senesce.

[2] During the 1998-2000 disposal seasons, over 20,000 m^3 of CDM from a number of projects was placed at the D/S mound to augment the cap. Monitoring of the D/S mound was conducted during the summer of 2000, including bathymetric and REMOTS® surveys. The results of these surveys will be published in a subsequent report.

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Appendix A
Disposal Logs

A1
1991-92 Disposal Season

Dredged Material Targeted for the NDA Buoy

permittee	project	disparea	dispdate	wtd	xtd	ytd	ztd	latdeg	latmin	longdeg	longmin	frbuoy	dir	cyvol
NDA #1 Buoy														
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	14-Oct-91	0	26134	43976.5	0	41	16.365	72	4.387	10'	SOU	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	15-Oct-91	0	26133.4	43976.8	0	41	16.422	72	4.303	10'	S-E	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	16-Oct-91	0	26134.5	43976.5	0	41	16.352	72	4.446	10'	SOU	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	17-Oct-91	0	26134.5	43976.5	0	41	16.352	72	4.446	10'	SOU	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	19-Oct-91	0	26134.1	43976.5	0	41	16.362	72	4.398	5'	S-E	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	19-Oct-91	0	26134.5	43976.5	0	41	16.352	72	4.446	10'	SOU	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	21-Oct-91	0	26134.1	43976.4	0	41	16.348	72	4.402	10'	S-E	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	23-Oct-91	0	26134.2	43976.5	0	41	16.36	72	4.41	10'	EAS	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	23-Oct-91	0	26134.2	43976.5	0	41	16.36	72	4.41	10'	EAS	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	24-Oct-91	0	26133.4	43976.4	0	41	16.366	72	4.319	15'	S-E	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	25-Oct-91	0	26134.2	43976.5	0	41	16.36	72	4.41	10'	EAS	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	06-Nov-91	0	26133.8	43976.5	0	41	16.37	72	4.363	10'	EAS	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	08-Nov-91	0	26134.2	43976.5	0	41	16.36	72	4.41	10'	EAS	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	12-Nov-91	0	26134.1	43976.4	0	41	16.348	72	4.402	10'	S-E	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	15-Nov-91	0	26134.1	43976.9	0	41	16.419	72	4.383	15'	S-E	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	15-Nov-91	0	26134.1	43976.4	0	41	16.348	72	4.402	10'	S-E	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	18-Nov-91	0	26133.8	43976.9	0	41	16.426	72	4.347		Off-Station	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	19-Nov-91	0	26133.9	43976.6	0	41	16.382	72	4.371		Off-Station	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	20-Nov-91	0	26133.8	43976.8	0	41	16.412	72	4.351		Off-Station	150
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	26-Nov-91	0	26133.6	43976.7	0	41	16.403	72	4.331		Off-Station	75
								Total Gwen Mor Marina Material at NDA #1 Yd^3						**2925**
								Total Gwen Mor Marina Material at NDA #1 m^3						**2236.455**
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	19-Nov-91	0	0	0	0	41	16.2	72	5	18'	Off-Station	775
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	20-Nov-91	0	0	0	0	41	16.22	72	4	100'	Off-Station	600
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	21-Nov-91	0	0	0	0	41	16.2	72	4	100'	Off-Station	800
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	22-Nov-91	0	0	0	0	41	16.22	72	4	100'	Off-Station	700
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	23-Nov-91	0	0	43975.5	0	41	16.188	72	4.595	100'	Off-Station	600
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	25-Nov-91	0	0	43975.6	0	41	16.222	72	4.501	100'	Off-Station	575
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	26-Nov-91	0	0	43975.1	0	41	16.156	72	4.501	100'	Off-Station	450
								Total Port Niantic Material at NDA #1 Yd^3						**4500**
								Total Port Niantic Material at NDA #1 m^3						**3440.7**
NDA #2 Buoy														
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	27-Nov-91	0	0	43975.5	0	41	16 207	72	4.509	10'	SWE	75
GWEN MOR MARINA	GWEN MOR MARINA	NLDS	06-Dec-91	0	26134.6	43975.5	0	41	16.209	72	4.497	10'	SWE	75
								Total Gwen Mor Marina Material at NDA #2 Yd^3						**150**
								Total Gwen Mor Marina Material at NDA #2 m^3						**114.69**
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	27-Nov-91	0	0	43975.5	0	41	16.198	72	4.552	100'	S-W	400
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	02-Dec-91	0	0	43975.3	0	41	16.18	72	4.512	80'	S-W	350
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	06-Dec-91	0	0	43975.4	0	41	16.192	72	4.518	20'	SOU	700
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	07-Dec-91	0	0	43975.5	0	41	16.207	72	4.509	25'	S-E	600
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	09-Dec-91	0	0	43975.5	0	41	16.207	72	4.509	26'		550
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	10-Dec-91	0	0	43975.5	0	41	16.204	72	4.523	30'	EAS	600
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	11-Dec-91	0	0	43975.6	0	41	16.216	72	4.529	20'	SOU	375
PORT NIANTIC, INC.	PORT NIANTIC	NLDS	12-Dec-91	0	0	43975.5	0	41	16.204	72	4.523	25'	EAS	375
								Total Port Niantic Material at NDA #2 Yd^3						**3950**
								Total Port Niantic Material at NDA #2 m^3						**3020.17**
						Total Volume of Material Deposited at the NDA Buoys Yd^3								**11525**
						Total Volume of Material Deposited at the NDA Buoys m^3								**8812.015**

Dredged Material Targeted for the D/S Buoy

permittee	project	disparea	dispdate	wtd	xtd	ytd	ztd	latdeg	latmin	longdeg	longmin	frbuoy	dir	cyvol
D/S Mound UDM														
DOW CHEMICAL	THAMES RIVER	NLDS	02-Dec-91	0	0	0	0	41	16.16	72	4	6'		6300
DOW CHEMICAL	THAMES RIVER	NLDS	03-Dec-91	0	0	43975.1	0	41	16.165	72	4.458	30'	EAS	6300
DOW CHEMICAL	THAMES RIVER	NLDS	04-Dec-91	0	0	0	0	41	16.16	72	4	2'		6300
DOW CHEMICAL	THAMES RIVER	NLDS	05-Dec-91	0	26134.2	43975.1	0	41	16.163	72	4.465	30'	EAS	6300
DOW CHEMICAL	THAMES RIVER	NLDS	06-Dec-91	0	0	43975.2	0	41	16.177	72	4.464	30'	S-W	6240
												Total UDM Yd³		**31440**
												Total UDM m³		**24039**
D/S Mound UDM														
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	06-Dec-91	0	26134.4	43975.1	0	41	16.158	72	4.489	5'	WES	2500
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	07-Dec-91	0	26134.1	43975	0	41	16.152	72	4.457	15'	WES	375
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	07-Dec-91	0	26134.3	43975.2	0	41	16.175	72	4.473	30'	S-W	1700
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	08-Dec-91	0	26134.3	43975.1	0	41	16.161	72	4.477	5'	N-E	375
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	08-Dec-91	0	26134.4	43975.2	0	41	16.172	72	4.485	1'		1300
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	09-Dec-91	0	26134.6	43973.4	0	41	15.915	72	4.579	5'	EAS	2555
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	09-Dec-91	0	26134.2	43975	0	41	16.149	72	4.469	60'	N-E	175
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	10-Dec-91	0	26134.5	43975.5	0	41	16.212	72	4.485	20'	N-E	1900
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	11-Dec-91	0	26134.5	43975.5	0	41	16.212	72	4.485	20'	N-E	2700
TOWN OF STONINGTON	STONINGTON HARBOR	NLDS	12-Dec-91	0	26134.6	43975.5	0	41	16.209	72	4.497	30'	NOR	2200
												Total UDM Yd³		**15780**
												Total UDM m³		**12065.4**
D/S Mound CDM														
DOW CHEMICAL	THAMES RIVER	NLDS	03-Jan-92	0	0	0	0	41	16.14	72	4	40'	EAS	6500
DOW CHEMICAL	THAMES RIVER	NLDS	04-Jan-92	0	0	0	0	41	16.11	72	4	45'	EAS	6500
DOW CHEMICAL	THAMES RIVER	NLDS	05-Jan-92	0	0	0	0	41	16.11	72	4	45'	EAS	6500
DOW CHEMICAL	THAMES RIVER	NLDS	06-Jan-92	0	0	0	0	41	16.167	72	4.467	150'	E	6300
DOW CHEMICAL	THAMES RIVER	NLDS	07-Jan-92	0	0	0	0	41	16.1	72	4	400'	S-E	6500
DOW CHEMICAL	THAMES RIVER	NLDS	08-Jan-92	0	0	0	0	41	16.167	72	4.467	150'	E	6500
DOW CHEMICAL	THAMES RIVER	NLDS	09-Jan-92	0	0	0	0	41	16.08	72	4	500'	S-E	6000
DOW CHEMICAL	THAMES RIVER	NLDS	10-Jan-92	0	0	0	0	41	16.08	72	4	500'	S-E	6000
DOW CHEMICAL	THAMES RIVER	NLDS	11-Jan-92	0	0	0	0	41	16.08	72	4	450'	S-E	6350
DOW CHEMICAL	THAMES RIVER	NLDS	12-Jan-92	0	0	0	0	41	16.08	72	4	450'	S-E	6025
DOW CHEMICAL	THAMES RIVER	NLDS	13-Jan-92	14712.4	0	43974.3	0	41	16.069	72	4.413	500'	SE	6300
DOW CHEMICAL	THAMES RIVER	NLDS	14-Jan-92	0	0	0	0	41	16.083	72	4.45	500'	SE	4500
DOW CHEMICAL	THAMES RIVER	NLDS	15-Jan-92	14712.5	0	43925	0	41	10.167	72	1.657	2000'	SE	3570
												Total CDM Yd³		**77545**
												Total CDM m³		**59290.9**

Total Volume of D/S Material Yd³	**124765**
Total Volume of D/S Material m³	**95395.3**

A2
1992-93 Disposal Season

ProjName	Permitnum	Permittee	Dispsite	DisDate	Lat	Lon	DisBuoy	DirBuoy	CYVol
MUMFORD COVE	199200625	MUMFORD COVE ASSOCIATION	NLDS	10/12/92	41.26986522	-72.07420283	.5mi	N-E	150
MUMFORD COVE	199200625	MUMFORD COVE ASSOCIATION	NLDS	10/14/92	41.26968188	-72.07406949	.5MI	N-E	275
MUMFORD COVE	199200625	MUMFORD COVE ASSOCIATION	NLDS	10/15/92	41.26963188	-72.07426949	.5MI	N-E	275
MUMFORD COVE	199200625	MUMFORD COVE ASSOCIATION	NLDS	10/15/92	41.27014855	-72.07393616	.5MI	N-E	250
MUMFORD COVE	199200625	MUMFORD COVE ASSOCIATION	NLDS	10/15/92	41.26944855	-72.07413616	5MI	N-E	275
MUMFORD COVE	199200625	MUMFORD COVE ASSOCIATION	NLDS	10/16/92	41.26944855	-72.07413616	5MI	N-E	300
MUMFORD COVE	199200625	MUMFORD COVE ASSOCIATION	NLDS	10/20/92	41.26939855	-72.07433616	5MI	N-E	250
				Total Mumford Cove Material deposited at NL-92 mound yd^3					1775
				Total Mumford Cove Material deposited at NL-92 mound m^3					1357.17

ProjName	Permitnum	Permittee	Dispsite	DisDate	Lat	Lon	DisBuoy	DirBuoy	CYVol
NAVAL SUBBASE, NLON	199001203	US NAVY, NORTH. DIV., NAVAL FA	NLDS	2/6/93	41.27631517	-72.08005302	0.31	NOR	450
NAVAL SUBBASE, NLON	199001203	US NAVY, NORTH. DIV., NAVAL FA	NLDS	2/10/93	41.27631517	-72.08005302	1/4 MI	NOR	450
NAVAL SUBBASE, NLON	199001203	US NAVY, NORTH. DIV., NAVAL FA	NLDS	2/11/93	41.27613183	-72.07991969	20.00	S-W	800
NAVAL SUBBASE, NLON	199001203	US NAVY, NORTH. DIV., NAVAL FA	NLDS	2/17/93	41.27636517	-72.07986969	20.00	NOR	700
NAVAL SUBBASE, NLON	199001203	US NAVY, NORTH. DIV., NAVAL FA	NLDS	2/19/93	41.27628183	-72.08025303	40.00	N-W	30
				Total US Navy material deposited at the NL-92 mound yd^3					2430
				Total US Navy material deposited at the NL-92 mound m^3					1857.98

ProjName	Permitnum	Permittee	Dispsite	DisDate	Lat	Lon	DisBuoy	DirBuoy	CYVol
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	2/21/93	41.27628183	-72.08025303	40.00	WES	700
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	2/23/93	41.27623183	-72.08045303	50.00	WES	600
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	2/25/93	41.27628183	-72.08025303	40.00	WES	700
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	2/25/93	41.2760485	-72.0803197	40.00	WES	650
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	2/26/93	41.2759985	-72.0805197	50.00	WES	650
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	2/27/93	41.2760485	-72.0803197	40,00	WSW	600
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	3/1/93	41.2759985	-72.0805197	50.00	WES	650
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	3/2/93	41.2760485	-72.0803197	40.00	WES	650
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	3/3/93	41.27631517	-72.08005302	30.00	WES	500
PATCHOGUE RIVER	199202960	TOWN OF WESTBROOK	NLDS	4/3/93	41.27628183	-72.08025303	40 YDS	300	500
				Total Patchogue Riv. material deposited at the NL-92 mound yd^3					6200
				Total Patchogue Riv. material deposited at the NL-92 mound m^3					4740.52

ProjName	Permitnum	Permittee	Dispsite	DisDate	Lat	Lon	DisBuoy	DirBuoy	CYVol
PILOT'S POINT MARINA	198801650	PILOTS POINT MARINA INC	NLDS	3/7/93	41.27593183	-72.07978635	20 YDS	WES	850
PILOT'S POINT MARINA	198801650	PILOTS POINT MARINA INC	NLDS	3/8/93	41.27631517	-72.08005302	30 YDS	320	850
PILOT'S POINT MARINA	198801650	PILOTS POINT MARINA INC	NLDS	3/9/93	41.27631517	-72.08005302	30 YDS	310	800
PILOT'S POINT MARINA	198801650	PILOTS POINT MARINA INC	NLDS	3/10/93	41.27631517	-72.08005302	10 YDS	310	700
PILOT'S POINT MARINA	198801650	PILOTS POINT MARINA INC	NLDS	3/10/93	41.27631517	-72.08005302	15 YDS	310	700
PILOT'S POINT MARINA	198801650	PILOTS POINT MARINA INC	NLDS	3/12/93	41.27631517	-72.08005302	15 YDS	310	800
PILOT'S POINT MARINA	198801650	PILOTS POINT MARINA INC	NLDS	3/13/93	41.27628183	-72.08025303	5 YDS	270	850
				Total Pilot's Point material deposited at the NL-92 mound yd³					5550
				Total Pilot's Point material deposited at the NL-92 mound m³					4243.53

ProjName	Permitnum	Permittee	Dispsite	DisDate	Lat	Lon	DisBuoy	DirBuoy	CYVol
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/22/93	41.27631517	-72.08005302	15YDS	280	650
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/23/93	41.27628183	-72.08025303	25 YDS	300	800
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/24/93	41.27608183	-72.08011969	30 YDS	280	900
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/25/93	41.27631517	-72.08005302	30 YDS	300	950
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/26/93	41.27636517	-72.07986969	25 YDS	300	900
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/27/93	41.276082	-72.08012	30 YDS	300	900
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/29/93	41.2760485	-72.0803197	30 YDS	310	900
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	3/30/93	41.27608183	-72.08011969	20 YDS	300	800
DEEP RIVER	199010208	DEEP RIVER MARINA INC	NLDS	4/2/93	41.27608183	-72.08011969	10 YDS	280	950
				Total Deep River material deposited at the NL-92 mound yd³					7750
				Total Deep River material deposited at the NL-92 mound m³					5925.65

Total Reported Volume Deposited at the NL-92 mound yd³	23705
Total Reported Volume Deposited at the NL-92 mound m³	18124.8

A3
1993-94 Disposal Season
(No Disposal Reported)

A4
1994-95 Disposal Season

Dredged Material Targeted for the NDA 94 Buoy

Permittee	Project	Disparea	Dispdate	Lat deg	Lat min	Long Deg	Long Min	DisBuoy	DirBuoy	CYVol
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	26-Dec-94					30'	W	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	27-Dec-94					30'	W	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	27-Dec-94					75'	S	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	28-Dec-94					30'	W	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	28-Dec-94					30'	W	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	29-Dec-94					75'	S	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	30-Dec-94					75'	S	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	30-Dec-94					75'	S	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	31-Dec-94					40'	S	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	2-Jan-95					75'	S	750
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	3-Jan-95					50'	SE	700
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	4-Jan-95					80'	S	700
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	5-Jan-95					65'	S	850
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	5-Jan-95					65'	S	700
						Total Pier 17 UDM at the NDA 94 Buoy yd³				11350
						Total Pier 17 UDM at the NDA 94 Buoy m³				8678.21

Permittee	Project	Disparea	Dispdate	Lat deg	Lat min	Long Deg	Long Min	DisBuoy	DirBuoy	CYVol
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	17-Jan-95					40'	E	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	17-Jan-95					50'	SW	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	18-Jan-95					30'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	18-Jan-95					20'	SE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	19-Jan-95					30'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	19-Jan-95					20'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	20-Jan-95					50'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	20-Jan-95					50'	SE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	21-Jan-95					90'	SE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	23-Jan-95					50'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	24-Jan-95					50'	SSE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	24-Jan-95					40'	SW	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	24-Jan-95					40'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	25-Jan-95					50'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	25-Jan-95					30'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	26-Jan-95					60'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	26-Jan-95					50'	SE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	27-Jan-95					70'	SSW	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	27-Jan-95					50'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	27-Jan-95					90'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	28-Jan-95					90'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	30-Jan-95					70'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	31-Jan-95					50'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	31-Jan-95					60'	SE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	1-Feb-95					50'	SE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	2-Feb-95					75'	SW	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	2-Feb-95					100'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	3-Feb-95					100'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	3-Feb-95					100'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	4-Feb-95					100'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	7-Feb-95					300'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	8-Feb-95					300'	SSE	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	8-Feb-95					300'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	8-Feb-95					300'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	9-Feb-95					300'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	9-Feb-95					200'	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	11-Feb-95					100	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	13-Feb-95					75	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	13-Feb-95					75	S	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	14-Feb-95					300'	SSW	900
DEPT/NAVY - PIER 17	THAMES RIVER	NLDS	14-Feb-95					300'	S	900
						Total Pier 17 CDM at the NDA 94 Buoy yd³				68278.2
						Total Pier 17 CDM at the NDA 94 Buoy m³				52205.5
					Total Volume of Material deposited at the NDA 94 Buoy m³					79628.2
					Total Volume of Material deposited at the NDA 94 Buoy yd³					60883.7

Dredged Material Targeted for the USCG Buoy

Permittee	Project	Disparea	Dispdate	Lat deg	Lat min	Long Deg	Long Min	DisBuoy	DirBuoy	CYVol
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	10-Jan-95					25'	E	3000
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	10-Jan-95					5'	W	2800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	10-Jan-95					25'	E	2750
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	10-Jan-95					25'	NE	2800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	11-Jan-95					25'	W	2000
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	11-Jan-95					10'	W	2600
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	11-Jan-95					20'	W	2600
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	11-Jan-95					15'	SW	2000
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	12-Jan-95					5'	E	2500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	12-Jan-95					15'	N	2300
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	12-Jan-95					2'		2550
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	13-Jan-95					15'	W	2500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	13-Jan-95					0'		2850
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	13-Jan-95					50'	E	2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	14-Jan-95					20'	E	2850
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	14-Jan-95					20'	SE	2800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	14-Jan-95					10'	E	2800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	15-Jan-95					45'	E	2200
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	15-Jan-95					10'	SE	2400
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	18-Jan-95					0		2300
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	18-Jan-95					0		2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	18-Jan-95					0		2700

Total Eagle Pier UDM at the USCG Buoy yd³	56700
Total Eagle Pier UDM at the USCG Buoy m³	43352.8

Permittee	Project	Disparea	Dispdate	Lat deg	Lat min	Long Deg	Long Min	DisBuoy	DirBuoy	CYVol
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	18-Jan-95					0		2950
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	18-Jan-95					0		2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	19-Jan-95					100'	SW	2950
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	19-Jan-95					150'	W	2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	19-Jan-95					100'	NW	2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	19-Jan-95							2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	19-Jan-95					125'	SW	2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	20-Jan-95					200'	W	2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	20-Jan-95					125'	NW	2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	20-Jan-95					10'	S	2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	21-Jan-95							2800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	21-Jan-95							2750
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	21-Jan-95							2650
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	21-Jan-95							2650
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	22-Jan-95							2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	22-Jan-95							2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	22-Jan-95							2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	22-Jan-95							2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	23-Jan-95							2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	23-Jan-95							2700
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	23-Jan-95							2400
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	23-Jan-95							2500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	24-Jan-95							2800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	24-Jan-95							2350
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	24-Jan-95							2900
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	24-Jan-95							3000
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	24-Jan-95							3000
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	25-Jan-95							3000
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	25-Jan-95							2800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	25-Jan-95							1500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	25-Jan-95							2000
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	26-Jan-95							2500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	26-Jan-95							2900
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	26-Jan-95							2400
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	26-Jan-95							1800
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	27-Jan-95							2400
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	27-Jan-95							1500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	27-Jan-95							1500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	28-Jan-95							2100
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	28-Jan-95							1600
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	28-Jan-95							2500
US COAST GUARD ACADEMY	EAGLE PIER	NLDS	28-Jan-95							1500

Total Eagle Pier CDM at the USCG Buoy yd³	262253
Total Eagle Pier CDM at the USCG Buoy m³	200519
Total Volume of Material Deposited at the USCG Buoy yd³	318953
Total Volume of Material Deposited at the USCG Buoy m³	243871

A5
1995-96 Disposal Season

BUOY	SAMP_ID	PERMIT_NUM	PERMITTEE	PROJECT	DISPDATE	DEPTIME	DISPTIME	RETTIME	DIST	LATDEG	LATMIN	LONGDEG	LONGMIN	FRBUOY	DIR	CYVOL	DRAFT	INSP	CERTNUM
NDA-95	12826	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	11/25/95	1015	1200	130	10	41	16.338	72	4.943	5'		300	8.5	WJF	91-10-039
NDA-95	12827	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	11/27/95	1200	141	305	10	41	16.338	72	4.943	20'		300	8.5	WJF	91-10-039
NDA-95	12028	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	11/30/95	1730	1938	2100	10	41	16.333	72	4.943	10'		250	8.5	WJF	91-10-039
NDA-95	12829	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	12/03/95	830	1020	1210	10	41	16.355	72	4.927	15'	S	300	8	TCL	94-01-009
NDA-95	12830	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/04/95	1830	1930	2030	8	41	16.352	72	4.939	50'	SW	300	8.5	TCL	94-01-009
NDA-95	12831	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/05/95	730	825	915	8	41	16.355	72	4.927	40'	S	275	8	TCL	94-01-009
NDA-95	12832	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/05/95	1915	2015	2100	8	41	16.352	72	4.939	50'	S	350	9.5	TCL	94-01-009
NDA-95	12834	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/06/95	1950	2100	2155	8	41	16.355	72	4.927	75'	S	325	9	TCL	94-01-009
NDA-95	12833	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/06/95	730	835	935	8	41	16.352	72	4.939	50'	S	300	8.5	TCL	94-01-009
NDA-95	12836	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/07/95	2040	2145	2245	8	41	16.369	72	4.923	50'	S	350	9.5	TCL	94-01-009
NDA-95	12835	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/07/95	840	945	1045	8	41	16.366	72	4.935	50'	S	325	9	TCL	94-01-009
NDA-95	12837	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/08/95	930	1030	1145	8	41	16.369	72	4.923	50'	SW	325	9	TCL	94-01-009
NDA-95	12838	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/08/95	2010	2120	2305	10	41	16.366	72	4.935	30'	S	300	8.5	TCL	94-01-009
NDA-95	13175	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/13/95	1200	1250	1400	7	41	16.366	72	4.935	15'	NE	325	9.0	W[illegible]	91-10-039
NDA-95	13174	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/13/95	20	120	220	7	41	16.338	72	4.943	10'	NE	300	8.5	WJF	91-10-039
NDA-95	13167	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/14/95	145	245	345	7	41	16.369	72	4.923	50'	S	300	8.5	TCL	94-01-009
NDA-95	13176	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/14/95	1500	1550	1635	7	41	16.352	72	4.939	15'		150	7.0	WJF	91-10-039
NDA-95	13168	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/15/95	1545	1640	1740	7	41	16.366	72	4.935	50'	S	275	8.0	TCL	94-01-009
NDA-95	13169	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/16/95	420	540	630	7	41	16.383	72	4.919	50'	NE	300	8.5	TCL	94-01-009
NDA-95	13170	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/16/95	1705	1810	1905	7	41	16.383	72	4.919	50'	NE	275	8.0	TCL	94-01-009
NDA-95	13171	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/17/95	550	655	755	7	41	16.383	72	4.919	50'	NE	300	8.5	TCL	94-01-009
NDA-95	13172	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/17/95	1740	1845	1940	7	41	16.383	72	4.919	50'	NE	275	8.0	TCL	94-01-009
NDA-95	13173	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/18/95	625	755	840	7	41	16.38	72	4.931	50'	NE	250	7.5	TCL	94-01-009
NDA-95	13177	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/18/95	1815	1938	2055	7	41	16.366	72	4.935	10'		300	8.0	WJF	91-10-039
NDA-95	13178	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/19/95	620	725	820	7	41	16.338	72	4.943	1'		350	9.0	WJF	91-10-039
NDA-95	13179	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/22/95	2100	2215	0	7	41	16.352	72	4.939	10'		350	9.0	WJF	91-10-039
NDA-95	13180	199500138	GROTON LONG POINT ASSOC	VENETIAN HARBOR	12/23/95	1000	1105	1200	7	41	16.352	72	4.939	5'		350	9.0	WJF	91-10-039
NDA-95	13644	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	12/28/95	1530	1725	1847	10	41	16.366	72	4.935	10'		400	9'	WJF	91-10-039
NDA-95	13645	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	12/30/95	1630	1830	1945	10	41	16.38	72	4.931	15'		400	9'	WJF	91-10-039
NDA-95	13609	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/04/96	2030	2110	2240	10	41	19.206	72	4.126	5'		350	8.5'	WJF	91-10-039
NDA-95	13608	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/06/96	1830	2030	2210	10	41	16.366	72	4.935	5'		300	8'	WJF	91-10-039
NDA-95	13607	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/09/96	1900	2100	2230	10	41	16.366	72	4.935	5'		350	8.5'	WJF	91-10-039
NDA-95	13677	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/10/96	1400	1615	1740	10	41	16.383	72	4.919	50'	S	350	8.5'	TCL	94-01-009
NDA-95	13606	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/11/96	1430	1645	1807	10	41	16.383	72	4.919	10'		300	8'	WJF	91-10-039
NDA-95	13605	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/12/96	1415	1615	1745	10	41	16.352	72	4.939	10'		250	8'	WJF	91-10-039
NDA-95	13604	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/14/96	1315	1510	1638	10	41	16.369	72	4.923	10'		300	8.5'	WJF	91-10-039
NDA-95	13603	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/15/96	1430	1610	1740	10	41	16.366	72	4.935	10'		250	8'	WJF	91-10-039
NDA-95	13602	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/16/96	1430	1625	0	10	41	16.366	72	4.935	10'		300	8.5'	WJF	91-10-039
NDA-95	13601	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/19/96	830	1000	1130	10	41	16.38	72	4.931	20'		300	8.5'	WJF	91-10-039
NDA-95	13600	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/22/96	1320	1520	1620	10	41	16.38	72	4.931	10'		250	8'	WJF	91-10-039
NDA-95	13599	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/23/96	1430	1645	1800	10	41	16.366	72	4.935	5'		300	9'	WJF	91-10-039
NDA-95	13598	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/26/96	1415	1610	1730	10	41	16.38	72	4.931	5'		350	9'	WJF	91-10-039
NDA-95	13597	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/29/96	1545	1735	1900	10	41	16.338	72	4.943	100'		300	9'	WJF	91-10-039
NDA-95	13596	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/30/96	1615	1800	1930	10	41	16.38	72	4.931	15'		300	8.5'	WJF	91-10-039
NDA-95	13595	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	01/31/96	1600	1810	1945	10	41	16.338	72	4.943	50'		350	9'	WJF	91-10-039
NDA-95	13690	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/01/96	1600	1750	1920	10	41	16.38	72	4.931	20'		300	9'	WJF	91-10-039
NDA-95	13691	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/02/96	1515	1705	1835	10	41	16.366	72	4.935	50'		250	8.5'	WJF	91-10-039
NDA-95	13692	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/06/96	1500	1700	1830	10	41	16.38	72	4.931	10'		250	8.5'	WJF	91-10-039
NDA-95	13693	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/07/96	1130	1335	1500	10	41	16.394	72	4.927	15'		250	8.5'	WJF	91-10-039
NDA-95	13694	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/08/96	1230	1430	1600	10	41	16.394	72	4.927	10'		300	9.5'	WJF	91-10-039
NDA-95	13695	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/09/96	1600	615	1930	10	41	16.355	72	4.927	100'		250	8'	WJF	91-10-039
NDA-95	13697	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/13/96	845	1045	1215	10	41	16.366	72	4.935	25'		350	10'	WJF	91-10-039
NDA-95	13698	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/14/96	1500	1700	1830	10	41	16.366	72	4.935	25'		300	8.5'	WJF	91-10-039
NDA-95	13699	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/15/96	1500	1700	1830	10	41	16.38	72	4.931	15'		300	8.5'	WJF	91-10-039
NDA-95	13700	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/19/96	805	1000	1130	10	41	16.38	72	4.931	5'		300	9'	WJF	91-10-039
NDA-95	13701	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/20/96	830	1030	1200	10	41	16.394	72	4.927	20'		300	9'	WJF	91-10-039
NDA-95	13702	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/21/96	1030	1210	1330	10	41	16.352	72	4.939	25'		300	8.5'	WJF	91-10-039
NDA-95	13703	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/22/96	1145	1330	1500	10	41	16.338	72	4.943	20'		350	9'	WJF	91-10-039
NDA-95	13704	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/23/96	1230	1430	1545	10	41	16.366	72	4.935	20'		200	8'	WJF	91-10-039
NDA-95	13705	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/24/96	1215	1350	1530	10	41	16.394	72	4.927	8'		150	8'	WJF	91-10-039
NDA-95	13706	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/26/96	1600	1800	1930	10	41	16.338	72	4.943	75'		200	8'	WJF	91-10-039
NDA-95	13707	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/27/96	1500	1710	1845	10	41	16.338	72	4.943	100'		200	8'	WJF	91-10-039
NDA-95	13709	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/28/96	1730	1915	2045	10	41	16.352	72	4.939	100'		200	8'	WJF	91-10-039
NDA-95	13708	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/28/96	430	630	800	10	41	16.338	72	4.943	125'		200	8'	WJF	91-10-039
NDA-95	13710	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	02/29/96	1745	1945	2100	10	41	16.352	72	4.939	100'		200	8'	WJF	91-10-039
NDA-95	13792	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/01/96	620	800	930	10	41	16.352	72	4.939	125'		150	8'	WJF	91-10-039
NDA-95	13790	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/04/96	2100	2300	30	10	41	16.38	72	4.931	75'		150	7.5'	WJF	91-10-039
NDA-95	13791	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/04/96	800	1000	1130	10	41	16.366	72	4.935	75'		175	8'	WJF	91-10-039
NDA-95	13789	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/05/96	900	1055	1230	10	41	16.338	72	4.943	250'		150	7.5'	WJF	91-10-039
NDA-95	13788	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/06/96	1010	1210	1330	10	41	16.352	72	4.939	200'		150	7.5'	WJF	91-10-039
NDA-95	13787	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/06/96	1100	100	230	10	41	16.338	72	4.943	225'		150	7.5'	WJF	91-10-039
NDA-95	13786	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/07/96	1130	1320	1500	10	41	16.366	72	4.935	150'		175	7.5'	WJF	91-10-039
NDA-95	13785	199500590	BREWER'S YACHT YARD AT MYSTIC	MYSTIC RIVER, MYSTIC CT	03/11/96	830	1030	1200	10	41	16.366	72	4.935	150'		200	8.5'	WJF	91-10-039

Total Volume Deposited at the NDA-95 Buoy yd³	20250
Total Volume Deposited at the NDA-95 Buoy m³	15483.2

BUOY	SAMP_ID	PERMIT_NUM	PERMITTEE	PROJECT	DISPDATE	DEPTIME	DISPTIME	RETTIME	DIST	LATDEG	LATMIN	LONGDEG	LONGMIN	FRBUOY	DIR	CYVOL	DRAFT	INSP	CERTNUM
U S NAVY	12822	199500787	MYSTIC SEAPORT MUSEUM	MYSTIC RIVER	10/31/95	1645	1855	2030	10	41	16.497	72	4.82	20'		300	9	WJF	91-10-039
U S NAVY	12823	199500787	MYSTIC SEAPORT MUSEUM	MYSTIC RIVER	11/01/95	1615	1812	2015	10	41	16.497	72	4.82	5'		250	9	WJF	91-10-039
U S NAVY	12824	199500787	MYSTIC SEAPORT MUSEUM	MYSTIC RIVER	11/02/95	1615	1820	2100	10	41	16.497	72	4.82	15'		250	9	WJF	91-10-039
U S NAVY	12825	199500787	MYSTIC SEAPORT MUSEUM	MYSTIC RIVER	11/06/95	500	750	900	10	41	16.497	72	4.82	25'		250	9	WJF	91-10-039
U S NAVY	12936	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/21/95	320	550	730	15	41	16.485	72	4.824	75'	W	1950	13	RHS	91-10-061
U S NAVY	12937	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/21/95	800	1020	1230	15	41	16.501	72	4.824	50'	W	1950	12.3	RHS	91-10-061
U S NAVY	12939	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/21/95	1745	1910	2110	15	41	16.502	72	4.82	100'	W	1900	12.6	RHS	91-10-061
U S NAVY	12938	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/21/95	1240	1450	1715	15	41	16.503	72	4.827	80'	W	1900	12.3	RHS	91-10-061
U S NAVY	12942	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/22/95	1145	1340	1545	15	41	16.48	72	4.825	75'	E	1950	13	RHS	91-10-061
U S NAVY	12940	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/22/95	300	530	740	15	41	16.485	72	4.827	30	N	1950	13.6	RHS	91-10-061
U S NAVY	12943	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/22/95	1640	1825	2020	15	41	16.485	72	4.82	90'	E	1875	12.9	RHS	91-10-061
U S NAVY	12941	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/22/95	750	940	1130	15	41	16.5	72	4.827	10	N	1950	13.6	RHS	91-10-061
U S NAVY	12944	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/22/95	2035	2215	15	15	41	16.5	72	4.82	5'	W	1850	13	RHS	91-10-061
U S NAVY	12945	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/23/95	30	245	440	15	41	16.5	72	4.824	0'		1550	11.3	RHS	91-10-061
U S NAVY	12946	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/23/95	845	1120	1330	15	41	16.501	72	4.827	10'	W	1400	9	RHS	91-10-061
U S NAVY	12950	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/23/95	1830	2005	2215	15	41	16.501	72	4.826	0'		1700	12.0	RHS	91-10-061
U S NAVY	12948	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/23/95	500	640	830	15	41	16.501	72	4.825	0'		1750	11.3	RHS	91-10-061
U S NAVY	12951	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/23/95	2230	2355	200	15	41	16.501	72	4.824	0'		1750	12.0	RHS	91-10-061
U S NAVY	12947	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/23/95	845	1115	1330	15	41	16.502	72	4.825	20'	E	1700	12.3	RHS	91-10-061
U S NAVY	12949	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/23/95	1404	1635	1815	15	41	16.502	72	4.822	20'	E	1500	12.0	RHS	91-10-061
U S NAVY	12952	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/24/95	215	410	600	15	41	16.503	72	4.827	0'		1700	12.0	RHS	91-10-061
U S NAVY	12953	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/24/95	615	745	900	15	41	16.503	72	4.827	0'		1800	12.3	RHS	91-10-061
U S NAVY	12955	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/24/95	2130	2345	140	15	41	16.504	72	4.82	0'		1800	12.4	RHS	91-10-061
U.S. NAVY	12954	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/24/95	915	1050	1225	15	41	16.505	72	4.818	0'		1700	12.3	RHS	91-10-061
U S NAVY	12896	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	10/24/95	1700	1850	2015	16	41	16.494	72	4.832	100	N	800	10	DCC	94-01-016
U S NAVY	12958	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/25/95	1840	2015	2210	13	41	16.48	72	4.85	0'		1750	11.3	RHS	91-10-061
U S NAVY	12957	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/25/95	615	810	945	15	41	16.5	72	4.824	0'		1750	12.0	RHS	91-10-061
U S NAVY	12956	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/25/95	150	410	600	15	41	16.508	72	4.827	50'	N	1600	12.3	RHS	91-10-061
U S NAVY	12897	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	10/25/95	1345	1540	1718	16	41	16.483	72	4.824	100	N	900	10	DCC	94-01-016
U S NAVY	12964	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/26/95	1835	2005	2400	15	41	16.48	72	4.821	35'	S	1650	10.0	RHS	91-10-061
U S NAVY	12963	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/26/95	1540	1705	1825	15	41	16.493	72	4.831	25'	N	1850	11.0	RHS	91-10-061
U S NAVY	12960	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/26/95	130	340	605	12	41	16.501	72	4.825	5'	S	1100	10.0	RHS	91-10-061
U S NAVY	12962	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/26/95	945	1120	1205	12	41	16.501	72	4.824	5'	S	1700	11.0	RHS	91-10-061
U S NAVY	12959	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/26/95	130	315	605	12	41	16.502	72	4.824	5'	S	1850	11.3	RHS	91-10-061
U S NAVY	12961	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/26/95	640	740	945	12	41	16.503	72	4.823	0'		1850	12.0	RHS	91-10-061
U S NAVY	12898	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	10/26/95	1345	1535	1800	16	41	16.494	72	4.832	100	N	800	11	DCC	94-01-016
U S NAVY	12966	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/27/95	410	515	615	8	41	16.49	72	4.821	10'	E	1800	12.0	RHS	91-10-061
U S NAVY	12967	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/27/95	805	945	1040	12	41	16.501	72	4.854	30'	N	1400	10.0	RHS	91-10-061
U S NAVY	12968	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/27/95	1340	1510	1600	12	41	16.501	72	4.82	20'	E	1850	12.0	RHS	91-10-061
U S NAVY	12965	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/27/95	5	215	350	12	41	16.503	72	4.827	20'	W	1600	11.3	RHS	91-10-061
U S NAVY	12899	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	10/27/95	1400	1548	1710	16	41	16.494	72	4.832	100	N	800	10	DCC	94-01-016
U S NAVY	12970	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/28/95	1500	1610	1715	8	41	16.493	72	4.826	10'	S	1700	12.0	RHS	91-10-061
U S NAVY	12969	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/28/95	1220	1335	1450	8	41	16.5	72	4.82	10'	E	1850	11.6	RHS	91-10-061
U S NAVY	12974	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/29/95	1730	1930	2100	12	41	16.495	72	4.827	25'	S	1750	12.0	RHS	91-10-061
U S NAVY	12973	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/29/95	1330	1445	1715	12	41	16.496	72	4.827	20'	S	1800	12.0	RHS	91-10-061
U S NAVY	12972	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/29/95	705	820	1100	12	41	16.5	72	4.821	30'	N	1500	10.3	RHS	91-10-061
U S NAVY	12971	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/29/95	2340	215	330	15	41	16.503	72	4.827	40'	N	1900	12.3	RHS	91-10-061
U S NAVY	12977	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/30/95	625	800	1035	15	41	16.496	72	4.825	75'	S	1850	12.3	RHS	91-10-061
U S NAVY	12981	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/30/95	1900	2040	2135	8	41	16.498	72	4.826	30'	S	1700	11.0	RHS	91-10-061
U S NAVY	12976	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/30/95	220	420	610	15	41	16.5	72	4.827	0'		1800	12.3	RHS	91-10-061
U S NAVY	12980	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/30/95	1750	2020	2230	15	41	16.501	72	4.828	20'	N	1800	11.6	RHS	91-10-061
U S NAVY	12975	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/30/95	2230	15	220	15	41	16.502	72	4.827	20'	W	1850	12.3	RHS	91-10-061
U S NAVY	12978	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/30/95	1120	1230	1420	12	41	16.504	72	4.827	40'	N	1850	12.3	RHS	91-10-061
U S NAVY	12979	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/30/95	1440	1555	1740	15	41	16.504	72	4.827	50'	N	1850	12.3	RHS	91-10-061
U S NAVY	12900	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	10/30/95	1445	1615	1745	16	41	16.494	72	4.832	100	N	800	10	DCC	94-01-016
U S NAVY	12982	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/31/95	2240	5	150	15	41	16.5	72	4.827	0'		1900	12.6	RHS	91-10-061
U.S. NAVY	12983	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/31/95	205	330	515	15	41	16.5	72	4.825	0'		1850	12.3	RHS	91-10-061
U S NAVY	12984	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/31/95	525	645	900	15	41	16.501	72	4.827	10'	N	1850	12.3	RHS	91-10-061
U S NAVY	12985	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/31/95	915	1025	1125	12	41	16.501	72	4.825	10'	W	1850	12.3	RHS	91-10-061
U S NAVY	12987	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/31/95	1625	1740	1835	12	41	16.501	72	4.825			1700		RHS	91-10-061
U S NAVY	12988	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/31/95	2115	2235	10	15	41	16.501	72	4.821	10'	E	1850	12.3	RHS	91-10-061
U S NAVY	12986	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	10/31/95	1245	1425	1600	15	41	16.503	72	4.823			1750		RHS	91-10-061
U S NAVY	12991	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/01/95	945	1050	1130	10	41	16.463	72	4.801	15'	S	1700	12.0	JAA	91-10-045
U S NAVY	12992	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/01/95	1500	1700	1750	12	41	16.47	72	4.802	10'	SSE	1800	11.6	JAA	91-10-045
U.S. NAVY	12994	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/01/95	2145	2300	30	15	41	16.491	72	4.802	12'	NNE	1950	12.6	JAA	91-10-045
U S NAVY	12993	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/01/95	1820	1945	2035	12	41	16.499	72	4.805	8'	NNE	1800	12.6	JAA	91-10-045
U S NAVY	12989	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/01/95	30	200	400	15	41	16.502	72	4.827	10'	S	1750	12.3	RHS	91-10-061
U.S. NAVY	12990	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/01/95	410	545	635	12	41	16.503	72	4.828	20'	N	1850	12.3	RHS	91-10-061
U.S. NAVY	12995	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/02/95	40	245	340	12	41	16.472	72	4.832	30'	SW	1850	12.3	JAA	91-10-045
U S NAVY	12996	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/02/95	1005	1135	1225	12	41	16.494	72	4.818	20'	N	1900	12.3	JAA	91-10-045
U S NAVY	12997	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/02/95	1530	1800	1915	12	41	16.495	72	4.852	25'	W	1050	10.6	JAA	91-10-045
U.S. NAVY	12998	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/03/95	830	1005	1105	10	41	16.477	72	4.818	5'	SSW	1750	12.0	JAA	91-10-045
U S NAVY	12999	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/03/95	1340	1520	1730	15	41	16.48	72	4.832	10'	SW	1650	11.3	JAA	91-10-045
U S NAVY	13000	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/03/95	1930	2100	2240	15	41	16.494	72	4.805	12'	N	1850	11.6	JAA	91-10-045
U S NAVY	13004	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/04/95	1140	1320	1510	14	41	16.468	72	4.843	50'	WSW	1900	12.3	JAA	91-10-045
U S NAVY	13001	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/04/95	2250	20	220	14	41	16.471	72	4.834	30'	S	1950	12.3	JAA	91-10-045

U.S. NAVY	13002	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/04/95	240	435	630	14	41	16 475	72	4 839	40'	S	1900	12 3	JAA	91-10-045
U S NAVY	13005	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/04/95	1530	1705	1800	11	41	16 477	72	4 823	20'	S	1950	12 6	JAA	91-10-045
U S NAVY	13003	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/04/95	640	820	925	12	41	16 495	72	4 812	50'	N	1700	11 6	JAA	91-10-045
U S NAVY	13006	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/04/95	2135	2310	110	14	41	16 504	72	4 809	15'	N	1900	12 0	JAA	91-10-045
U S NAVY	13009	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/05/95	905	1100	1155	12	41	16 464	72	4 829	35'	S	1900	12 3	JAA	91-10-045
U S NAVY	13010	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/05/95	1555	1800	2020	15	41	16 472	72	4 843	45'	SW	1850	12 0	JAA	91-10-045
U S NAVY	13008	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/05/95	520	655	850	15	41	16 492	72	4 8	40'	NE	2100	13 3	JAA	91-10-045
U S NAVY	13007	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/05/95	125	310	500	14	41	16 493	72	4.812	70'	N	2000	13 0	JAA	91-10-045
U S NAVY	13011	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/05/95	2035	2210	2400	14	41	16 505	72	4 815	60'	N	1750	11 6	JAA	91-10-045
U S NAVY	13012	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/06/95	15	235	425	15	41	16 465	72	4 819	40'	S	1800	12 0	JAA	91-10-045
U S NAVY	13013	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/06/95	440	620	730	11	41	16 479	72	4 834	30'	WSW	1900	12 6	JAA	91-10-045
U S NAVY	13015	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/06/95	1820	1940	2030	11	41	16 482	72	4 85	0'		1450	11 3	JAA	91-10-045
U S NAVY	13014	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/06/95	1055	1245	1345	11	41	16 5	72	4.805	50'	N	1200	10 9	JAA	91-10-045
U S NAVY	12901	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/06/95	1130	1315	1440	16	41	16.494	72	4 832	90	N	800	10	DCC	94-01-016
U S NAVY	12902	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/06/95	2145	2340	40	16	41	16 497	72	4 82	50'	N	800	10	DCC	94-01-016
U S NAVY	13020	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/07/95	2215	2335	210	14	41	16 461	72	4 807	75'	S	1750	11 9	JAA	91-10-045
U S NAVY	13017	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/07/95	445	640	805	12	41	16 476	72	4 848	45'	WSW	1650	12 3	JAA	91-10-045
U S NAVY	13018	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/07/95	1030	1145	1245	11	41	16 5	72	4 814	30'	N	1400	10 3	JAA	91-10-045
U S NAVY	13016	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/07/95	145	305	440	14	41	16 506	72	4 812	60'	N	1750	11 9	JAA	91-10-045
U S NAVY	13019	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/07/95	1715	1905	2010	11	41	16 507	72	4 815	75'	N	1700	11 9	JAA	91-10-045
U S NAVY	12903	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/07/95	1030	1214	1320	16	41	16 497	72	4 82	50'	N	800	10	DCC	94-01-016
U S NAVY	13021	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/08/95	225	425	600	14	41	16 45	72	4 83	100'	S	1600	11 9	JAA	91-10-045
U S NAVY	13024	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/08/95	1620	1755	1840	11	41	16 456	72	4 811	90'	S	1950	12 6	JAA	91-10-045
U S NAVY	13023	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/08/95	1225	1340	1525	12	41	16 458	72	4 833	100'	SW	1650	12 0	JAA	91-10-045
U S NAVY	13022	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/08/95	635	755	850	11	41	16 459	72	4 816	100'	S	1700	11 6	JAA	91-10-045
U S NAVY	12904	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/08/95	300	426	542	16	41	16 497	72	4 82	50'	N	800	10	DCC	94-01-016
U S NAVY	12905	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/08/95	1215	1406	1545	16	41	16 511	72	4.816	75'	N	800	10	DCC	94-01-016
U S. NAVY	13027	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/09/95	950	1120	1225	11	41	16 447	72	4 89	90'	SSW	1800	12 9	JAA	91-10-045
U S NAVY	13028	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/09/95	1820	1930	2025	11	41	16 449	72	4 814	60'	N	1600	11 3	JAA	91-10-045
U S NAVY	13026	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/09/95	250	430	550	11	41	16 475	72	4 834	100'	SW	1850	12 0	JAA	91-10-045
U S. NAVY	13025	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/09/95	2210	15	230	14	41	16 5	72	4 826			1900	13 0	JAA	91-10-045
U S NAVY	12906	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/09/95	200	330	500	16	41	16 494	72	4 832	85'	N	800	10	DCC	94-01-016
U S NAVY	12907	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/09/95	1230	1408	1537	16	41	16 494	72	4 832	80'	N	800	10	DCC	94-01-016
U S NAVY	12908	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/09/95	2330	100	215	16	41	16 497	72	4 82	40'	N	800	10	DCC	94-01-016
U S NAVY	13032	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/10/95	1350	1455	1615	11	41	16 464	72	4 805	70'	SSE	1850	12 3	JAA	91-10-045
U S NAVY	13030	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/10/95	410	510	630	11	41	16 469	72	4 757	70'	E	1900	12 6	JAA	91-10-045
U S NAVY	13029	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/10/95	2305	35	135	11	41	16 479	72	4 796	60'	SE	1850	13 3	JAA	91-10-045
U S NAVY	13033	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/10/95	1750	1840	2035	11	41	16 494	72	4 856	100'	NW	1800	12 9	JAA	91-10-045
U S NAVY	13034	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/10/95	2150	2300	130	13	41	16 496	72	4 842	60'	NW	2000	13 3	JAA	91-10-045
U S NAVY	13031	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/10/95	640	830	920	12	41	16 505	72	4 853	100'	NNW	1700	12 3	JAA	91-10-045
U S NAVY	12909	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/10/95	930	1103	1208	16	41	16 483	72	4 824	50'	E	800	10	DCC	94-01-016
U S. NAVY	12910	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/10/95	1930	2108	2220	16	41	16 488	72	4 861	60'	N	800	10	DCC	94-01-016
U S NAVY	13036	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/11/95	535	700	840	15	41	16 475	72	4 761	90'	SE	1950	13 0	JAA	91-10-045
U S. NAVY	13037	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/11/95	850	1040	1220	14	41	16 49	72	4 844	50'	WNW	1950	13 0	JAA	91-10-045
U S NAVY	13039	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/11/95	2012	2122	2315	12	41	16 5	72	4 87	75'	N	2100	12 6	JAA	91-10-045
U S NAVY	13038	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/11/95	1230	1430	1535	11	41	16 509	72	4 835	120'	WNW	1950	13 0	JAA	91-10-045
U S NAVY	13035	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/11/95	140	335	520	15	41	16 511	72	4 833	130'	NNW	1800	12 9	JAA	91-10-045
U S NAVY	12911	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/11/95	945	1124	1240	16	41	16 483	72	4 824	50'	E	800	10	DCC	94-01-016
U S NAVY	13040	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/13/95	2330	119	300	12	41	16 435	72	4 86	60'	ESE	2200	13 0	JAA	91-10-045
U S NAVY	13046	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/13/95	2050	2210	2310	12	41	16 465	72	4.951	75'	S	2150	13 0	LW	91-10-063
U S NAVY	13042	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/13/95	835	958	1100	12	41	16 48	72	4 843	50'	W	2200	13 0	LW	91-10-063
U S NAVY	13041	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/13/95	310	615	815	12	41	16 486	72	4 779	10'	NE	2100	13 0	JAA	91-10-045
U S NAVY	13045	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/13/95	1630	1745	1955	12	41	16 51	72	4 76	50'	N	2100	13 0	LW	91-10-063
U S NAVY	13043	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/13/95	1205	1434	1610	12	41	16 522	72	4.804	50'	N	2200	13 0	LW	91-10-063
U S NAVY	13044	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/13/95	1325	1434	1530	12	41	16 522	72	4 804	50'	N	1950	12 6	LW	91-10-063
U S NAVY	12912	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/13/95	1655	1825	1947	16	41	16 494	72	4 832	80'	N	800	10	DCC	94 01-016
U S NAVY	13050	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/14/95	1200	1335	1540	12	41	16 434	72	4 833	80'	W	2100	13 0	LW	91-10-063
U S NAVY	13047	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/14/95	105	208	415	12	41	16 445	72	4 861	60'	N	2100	13 0	LW	91-10-063
U S NAVY	13049	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/14/95	925	1020	1145	12	41	16 449	72	4 818	100'	NW	2000	12 6	LW	91-10-063
U S NAVY	13051	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/14/95	1550	1720	1850	12	41	16 46	72	4 859	75'	W	2100	[illegible]	LW	91-10-063
U S NAVY	13048	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/14/95	430	558	800	12	41	16 469	72	4 906	50'	NW	2050	13 0	LW	91-10-063
U S NAVY	13052	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/15/95	655	815	1010	12	41	16 48	72	4 861	75'	W	2100	13 0	LW	91-10-063
U S NAVY	13058	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/16/95	2030	2220	2359	12	41	16 431	72	4 859	90'	SW	2100	13 0	LW	91-10-063
U S NAVY	13055	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/16/95	925	1111	1300	12	41	16 442	72	4 884	80'	SW	2000	12 6	LW	91-10-063
U S NAVY	13057	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/16/95	1700	1836	2020	12	41	16 449	72	4 859	80'	SW	2050	13 0	LW	91-10-063
U S NAVY	13054	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/16/95	550	703	905	12	41	16 478	72	4 882	75'	SW	2050	13 0	LW	91-10-063
U S NAVY	13053	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/16/95	200	325	510	12	41	16 479	72	4 884	75'	S	2050	13 0	LW	91-10-063
U S NAVY	13056	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/16/95	1300	1500	1610	12	41	16 51	72	4 859	75'	SSW	2100	13 0	LW	91-10-063
U S NAVY	12913	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/16/95	150	330	450	16	41	16 47	72	4 884	75'	W	800	10	DCC	94-01-016
U S NAVY	12914	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/16/95	2045	2210	2330	16	41	16 47	72	4 884	75'	W	800	10	DCC	94-01-016
U S NAVY	13062	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/17/95	1125	1235	1340	12	41	16.428	72	4 81	75'	W	1950	13 6	LW	91-10-063
U S NAVY	13063	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/17/95	1400	1500	1600	12	41	16 44	72	4 884	80'	SW	2200	13 6	LW	91-10-063
U S NAVY	13064	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/17/95	1600	1955	2055	12	41	16 446	72	4.88	90'	SW	2200	13 6	LW	91-10-063
U S NAVY	13061	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/17/95	840	955	1120	12	41	16 454	72	4.904	90'	SW	2100	13 0	LW	91-10-063
U S NAVY	13059	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/17/95	0	137	305	12	41	16 474	72	4 893	75'	W	2100	13 0	LW	91-10-063
U S NAVY	13060	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/17/95	310	500	605	12	41	16 49	72	4.89	20'	E	2000	12 6	LW	91-10-063
U S NAVY	12915	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/17/95	1215	1340	1455	16	41	16 377	72	4 887	75'	SW	800	10	DCC	94-01-016

U S NAVY	13065	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/18/95	2250	18	150	12	41	16 444	72	4 868	75'	SW	2100	13 0	LW	91-10-063
U S NAVY	13069	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/18/95	2230	2345	110	12	41	16 475	72	4 842	75'	WSW	2100	13 0	LW	91-10-063
U S NAVY	13068	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/18/95	1700	1838	1930	12	41	16 49	72	4 875	80'	WSW	2000	12 6	LW	91-10-063
U S NAVY	13066	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/18/95	200	325	440	12	41	16 495	72	4 893	8'	W	2000	12 6	LW	91-10-063
U S. NAVY	13067	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/18/95	1000	1118	1210	12	41	16 5	72	4 835	75'	SW	2200	13 0	LW	91-10-063
U S NAVY	12917	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/18/95	1555	1740	1900	16	41	16 456	72	4 888	90'	W	800	10	DCC	94-01-016
U S NAVY	12916	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/18/95	215	340	455	16	41	16 47	72	4 884	75'	W	800	10	DCC	94-01-016
U S NAVY	13074	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/19/95	1810	1940	2035	12	41	16 445	72	4 841	90'	SSW	1750	11 9	JAA	91-10-045
U S NAVY	13075	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/19/95	2150	2320	100	15	41	16 453	72	4 852	100'	SW	1950	,2 3	JAA	91-10-045
U S NAVY	13073	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/19/95	1525	1635	1800	14	41	16 465	72	4 872	75'	SW	1900	12 6	JAA	91-10-045
U S NAVY	13070	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/19/95	120	255	420	12	41	16 467	72	4 905	100'	W	2100	13 0	LW	91-10-063
U S NAVY	13072	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/19/95	950	1110	1200	12	41	16 482	72	4 85	100'	WSW	1750	11 9	JAA	91-10-045
U S. NAVY	13071	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/19/95	430	602	710	14	41	16 49	72	4 895	80'	W	2400	13 0	JAA	91-10-045
U S NAVY	12918	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/19/95	1010	1136	1310	16	41	16 47	72	4 884	75'	W	800	10	DCC	94-01-016
U S NAVY	12919	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/19/95	1940	2050	2230	16	41	16 472	72	4 872	90'	SW	800	10	DCC	94-01-016
U S. NAVY	13078	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/20/95	915	1045	1150	12	41	16 461	72	4 863	125'	SW	2050	13 6	JAA	91-10-045
U S NAVY	13079	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/20/95	1510	1645	1730	12	41	16 466	72	4 907	135'	WSW	1900	12 9	JAA	91-10-045
U S NAVY	13080	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/20/95	2100	2245	2330	12	41	16 466	72	4 831	60'	SSW	1850	12 0	JAA	91-10-045
U S NAVY	13077	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/20/95	420	550	645	12	41	16 471	72	4 829	75'	SSW	1950	12 6	JAA	91-10-045
U S NAVY	13076	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/20/95	110	220	315	12	41	16 49	72	4 899	110'	WSW	1850	12 0	JAA	91-10-045
U S. NAVY	12921	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/20/95	2030	2209	2325	16	41	16 461	72	4 864	90'	SW	800	10	DCC	94-01-016
U S NAVY	12920	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/20/95	1115	1250	1428	16	41	16 47	72	4 884	80'	W	800	10	DCC	94-01-016
U S NAVY	13082	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/21/95	620	756	855	12	41	16 457	72	4 855	80'	SW	1950	13 0	JAA	91-10-045
U S NAVY	13085	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/21/95	2130	2255	2345	11	41	16 462	72	4 897	70'	SW	1800	12 0	JAA	91-10-045
U S NAVY	13083	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/21/95	1345	1500	1555	11	41	16 485	72	4 86	90'	SW	1900	12 6	JAA	91-10-045
U S NAVY	13084	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/21/95	1835	1955	2115	14	41	16 499	72	4 867	100'	WSW	1725	11 9	JAA	91-10-045
U S NAVY	13081	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/21/95	250	428	600	15	41	16 499	72	4 865	100'	WSW	1850	12 0	JAA	91-10-045
U S NAVY	12922	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/21/95	1145	1349	1500	16	41	16 458	72	4 876	100'	SW	800	10	DCC	94-01-016
U S NAVY	13088	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/22/95	730	950	1050	12	41	16 445	72	4 857	90'	SW	1775	11 9	JAA	91-10-045
U S NAVY	13089	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/22/95	1300	1440	1535	12	41	16 452	72	4 867	100'	SW	1900	12 0	JAA	91-10-045
U S NAVY	13086	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/22/95	40	215	320	15	41	16 468	72	4 83	70'	SSW	1900	12 6	JAA	91-10-045
U S NAVY	13087	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/22/95	330	520	645	14	41	16 475	72	4 872	110'	SW	1825	12 0	JAA	91-10-045
U S NAVY	13091	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/22/95	2135	2315	15	12	41	16 491	72	4 796	125'	NE	1975	12 9	JAA	91-10-045
U S. NAVY	13090	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/22/95	1700	1906	2120	15	41	16 511	72	4 837	110'	N	1950	13 0	JAA	91-10-045
U S NAVY	12924	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/22/95	1800	1925	2055	16	41	16 458	72	4 876	90'	SW	800	10	DCC	94-01-016
U S NAVY	12923	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/22/95	815	1005	1133	16	41	16 47	72	4 884	80'	W	800	10	DCC	94-01-016
U S. NAVY	13092	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/23/95	120	300	500	15	41	16 455	72	4 787	140'	SE	1775	11 9	JAA	91-10-045
U S NAVY	13094	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/23/95	1005	1155	1345	15	41	16 503	72	4 825	100'	N	1800	12 4	JHA	91-10-045
U S NAVY	13093	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/23/95	510	657	755	12	41	16 515	72	4 865	125'	N	1900	13 0	JHA	91-10-045
U S NAVY	13095	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/23/95	1900	2005	2110	9	41	16 515	72	4 837	125'	N	1850	12 3	JHA	91-10-045
U S. NAVY	13096	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/24/95	120	230	415	13	41	16 443	72	4 736	150'	SSE	1875	12 6	JHA	91-10-045
U S. NAVY	13099	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/24/95	2200	2316	50	14	41	16 49	72	4 791	90'	E	1950	13 0	JHA	91-10-045
U S NAVY	13098	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/24/95	1740	1905	2055	11	41	16 499	72	4 878	100'	NW	1825	12 0	JHA	91-10-045
U S NAVY	13181	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/24/95	955	1100	1155	10	41	16 499	72	4 815	75'	NE	1825	12 3	JAA	91-10-045
U S NAVY	13097	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/24/95	430	550	640	10	41	16 508	72	4 798	100'	NNE	1850	12 0	JHA	91-10-045
U S. NAVY	13182	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/24/95	1440	1520	1615	8	41	16 511	72	4 76	150'	NE	1850	12 6	JAA	91-10-045
U S NAVY	12925	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/24/95	1940	2107	2230	16	41	16 458	72	4 876	90'	SW	800	10	DCC	94-01-016
U S NAVY	13100	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/25/95	100	230	330	12	41	16 418	72	4 778	160'	SSE	1925	12 9	JHA	91-10-045
U S. NAVY	13103	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/25/95	1340	1450	1600	14	41	16 46	72	4 783	110'	SE	1850	12 0	JHA	91-10-045
U S NAVY	13102	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/25/95	1010	1106	1200	10	41	16 485	72	4 783	110'	E	1825	12 0	JHA	91-10-045
U S NAVY	13105	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/25/95	2155	2300	2400	11	41	16 497	72	4 817	65'	ENE	1900	12 9	JHA	91-10-045
U.S. NAVY	13101	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/25/95	630	740	825	11	41	16 499	72	4 838	90'	NNE	1975	13 3	JHA	91-10-045
U S NAVY	13104	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/25/95	1700	1840	1925	11	41	16 509	72	4 804	120'	ENE	1775	11 6	JHA	91-10-045
U S NAVY	12927	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/25/95	1945	2108	2230	16	41	16 458	72	4 876	95'	SW	800	10	DCC	94-01-016
U S NAVY	12926	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/25/95	745	918	1036	16	41	16 47	72	4 884	85'	W	800	10	DCC	94-01-016
U S. NAVY	13108	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/26/95	1300	1430	1530	12	41	16 44	72	4 808	100'	ESE	2050	12 6	LW	91-10-063
U S NAVY	13109	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/26/95	1650	1833	1933	12	41	16 45	72	4 788	100'	ESE	2100	13 0	LW	91-10-063
U S NAVY	13107	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/26/95	840	1125	1300	12	41	16 47	72	4 875	110'	ESE	2000	12 6	LW	91-10-063
U.S. NAVY	13106	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/26/95	120	250	400	11	41	16 506	72	4 837	110'	N	1850	12 0	JHA	91-10-045
U S. NAVY	12928	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/26/95	815	843	1118	16	41	16 456	72	4 888	90'	W	800	10	DCC	94-01-016
U S NAVY	12929	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/26/95	2000	2137	2255	16	41	16 47	72	4 884	80'	W	800	10	DCC	94-01-016
U S. NAVY	13111	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/27/95	1800	1911	2020	12	41	16 45	72	4 77	100'	ESE	2100	13 0	LW	91-10-063
U S. NAVY	13112	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/27/95	2130	2300	0	12	41	16.488	72	4.784	150'	E	2100	13 0	LW	91-10-063
U S. NAVY	13110	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/27/95	0	123	220	12	41	16 492	72	4 762	110'	ENE	2100	13 0	LW	91-10-063
U S NAVY	12930	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/27/95	800	937	1102	16	41	16 458	72	4 876	80'	SW	800	10	DCC	94-01-016
U.S. NAVY	12931	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/27/95	2040	2237	10	16	41	16 458	72	4 876	90'	SW	800	10	DCC	94-01-016
U S NAVY	13113	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/28/95	1835	2000	2115	12	41	16 435	72	4 795	120'	ESE	2100	13 0	LW	91-10-063
U S NAVY	12932	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/28/95	1020	1200	1325	16	41	16 458	72	4 876	95'	SW	800	10	DCC	94-01-016
U S NAVY	12933	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/28/95	2330	120	250	16	41	16 47	72	4 884	80'	W	800	10	DCC	94-01-016
U.S. NAVY	13114	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	11/29/95	0	120	250	12	41	16 443	72	4 808	125'	S	2100	13 0	LW	91-10-063
U S NAVY	12934	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/29/95	1055	1230	1420	16	41	16 456	72	4 888	95'	W	800	10	DCC	94-01-016
U S NAVY	12935	199401959	DEPT/NAVY - PIER 17	THAMES RIVER, GROTON, CT	11/30/95	130	248	415	16	41	16 458	72	4.888	100'	W	800	10	DCC	94-01-016
U S. NAVY	13115	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/02/95	30	225	300	12	41	16 414	72	4 86	100'	S	2200	13 0	LW	91-10-063
U S NAVY	13118	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/02/95	1820	2000	2120	12	41	16 42	72	4 875	100'	NE	2150	13 0	LW	91-10-063
U S NAVY	13116	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/02/95	505	655	800	12	41	16 477	72	4 773	150'	E	2100	13 0	LW	91-10-063
U S. NAVY	13117	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/02/95	955	1152	1320	12	41	16 479	72	4 77	150'	E	2150	13 0	LW	91-10-063
U S. NAVY	13119	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/03/95	0	110	230	12	41	16 459	72	4.792	110'	SE	2100	13 0	LW	91-10-063

U S NAVY	13120	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/03/95	400	540	640	12	41	16.49	72	4.835	150'	N	2150	13.0	LW	91-10-063
U S NAVY	13122	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/03/95	2050	2153	2300	10	41	16.504	72	4.824	110'	N	1975	12.9	JAA	91-10-045
U S NAVY	13121	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/03/95	1520	1710	1830	13	41	16.517	72	4.862	125'	NNW	2100	13.0	JAA	91-10-045
U S NAVY	13123	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT 1	12/04/95	1830	1955	2055	11	41	16.501	72	4.828	125'	N	2050	13.6	JAA	91-10-045
U S NAVY	13185	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/05/95	1830	2020	2115	11	41	16.466	72	4.758	80'	SSE	1850	12.9	JAA	91-10-045
U S NAVY	13184	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/05/95	1325	1445	1550	10	41	16.484	72	4.821	60'	NNW	1950	14.3	JAA	91-10-045
U S NAVY	13183	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/05/95	450	645	750	12	41	16.525	72	4.852	140'	NNW	1825	12.3	JAA	91-10-045
U S NAVY	13186	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/06/95	140	335	450	12	41	16.511	72	4.894	80'	NNW	1800	12.3	JAA	91-10-045
U S NAVY	13187	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/06/95	1420	1515	1620	8	41	16.514	72	4.868	90'	NNW	1850	12.9	JAA	91-10-045
U S NAVY	13188	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/07/95	310	510	615	12	41	16.507	72	4.842	100'	NW	1975	13.6	JAA	91-10-045
U S NAVY	13189	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/07/95	1110	1305	1510	14	41	16.524	72	4.811	120'	NNW	1300	9.6	JAA	91-10-045
U S NAVY	13191	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/08/95	2220	2340	120	9	41	16.489	72	4.834	60'	WSW	1900	12.9	JAA	91-10-045
U S NAVY	13190	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/08/95	2220	2340	120	12	41	16.53	72	4.802	120'	NNW	1850	12.6	JAA	91-10-045
U S NAVY	13197	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/09/95	1925	2120	2330	14	41	16.467	72	4.77	200'	ESE	1850	12.6	JAA	91-10-045
U S NAVY	13196	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/09/95	1515	1700	1915	14	41	16.489	72	4.777	180'	ENE	1825	12.3	JAA	91-10-045
U S NAVY	13193	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/09/95	500	637	800	14	41	16.503	72	4.815	80'	N	1850	12.6	JAA	91-10-045
U S NAVY	13192	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/09/95	145	300	450	12	41	16.516	72	4.863	60'	NW	1925	12.9	JAA	91-10-045
U S NAVY	13195	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/09/95	1155	1325	1505	15	41	16.517	72	4.788	150'	NNE	1825	12.3	JAA	91-10-045
U S NAVY	13194	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/09/95	830	955	1150	15	41	16.518	72	4.843	100'	N	1800	12.0	JAA	91-10-045
U S NAVY	13199	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/10/95	400	555	745	14	41	16.437	72	4.828	200'	S	1700	11.6	JAA	91-10-045
U S. NAVY	13198	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/10/95	2340	200	315	12	41	16.444	72	4.789	200'	SSE	1750	12.0	JAA	91-10-045
U S NAVY	13200	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/10/95	800	950	1150	14	41	16.466	72	4.841	50'	SW	1650	12.0	JAA	91-10-045
U S NAVY	13201	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/10/95	1200	1330	1505	14	41	16.493	72	4.873	200'	W	1700	11.6	JAA	91-10-045
U.S NAVY	13202	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/10/95	1515	1650	1945	14	41	16.496	72	4.862	240'	WNW	1750	12.0	JAA	91-10-045
U S NAVY	13203	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/10/95	1950	2205	2350	14	41	16.508	72	4.848	190'	NNW	1825	12.3	JAA	91-10-045
U S NAVY	13207	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/11/95	2030	2215	0	12	41	16.456	72	4.765	0		2100	13.0	LW	91-10-063
U S NAVY	13205	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/11/95	720	825	1015	12	41	16.475	72	4.87	0		2100	13.0	LW	91-10-063
U S NAVY	13206	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/11/95	1710	1815	2000	12	41	16.51	72	4.778	0		2000	12.6	LW	91-10-063
U.S NAVY	13204	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/11/95	20	235	440	14	41	16.549	72	4.817	230'	N	1775	12.9	JAA	91-10-045
U S NAVY	13209	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/12/95	420	630	800	12	41	16.447	72	4.828	0		2100	13.0	LW	91-10-063
U S NAVY	13211	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/12/95	2155	2330	120	12	41	16.479	72	4.868	0		2050	13.0	LW	91-10-063
U S. NAVY	13210	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/12/95	810	945	1140	12	41	16.5	72	4.824	0		2100	13.0	LW	91-10-063
U S NAVY	13208	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/12/95	15	225	420	12	41	16.53	72	4.794	0		2100	13.0	LW	91-10-063
U S NAVY	13212	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/13/95	130	255	345	12	41	16.435	72	4.834	0		2200	13.0	LW	91-10-063
U S NAVY	13217	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/13/95	2015	2130	2305	12	41	16.473	72	4.79	0		2150	13.0	LW	91-10-063
U S NAVY	13213	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/13/95	500	640	825	12	41	16.511	72	4.847	0		2000	12.6	LW	91-10-063
U S NAVY	13215	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/13/95	1200	1330	1505	12	41	16.514	72	4.824	0		2050	13.0	LW	91-10-063
U S NAVY	13216	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/13/95	1535	1645	2010	12	41	16.52	72	4.777	0		2000	12.6	LW	91-10-063
U S NAVY	13214	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/13/95	855	945	1200	12	41	16.541	72	4.824	0		2050	13.0	LW	91-10-063
U S NAVY	13218	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/14/95	0	45	200	10	41	16.446	72	4.788	0		2150	13.0	LW	91-10-063
U S NAVY	13219	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/14/95	200	340	500	12	41	16.46	72	4.845	0		2100	13.0	LW	91-10-063
U.S NAVY	13220	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/14/95	510	640	710	12	41	16.476	72	4.776	0		2150	13.0	LW	91-10-063
U S NAVY	13221	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/14/95	1215	1425	1555	12	41	16.517	72	4.828	0		2100	13.0	LW	91-10-063
U S NAVY	13222	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/15/95	120	320	420	12	41	16.467	72	4.822	0		2150	13.0	LW	91-10-063
U S NAVY	13228	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/15/95	2200	2315	0	10	41	16.467	72	4.81	0		2150	13.0	LW	91-10-063
U S NAVY	13223	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/15/95	705	820	905	12	41	16.506	72	4.88	0		2000	13.0	LW	91-10-063
U S. NAVY	13226	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/15/95	1525	1700	1800	12	41	16.522	72	4.78	0		2200	13.6	LW	91-10-063
U S NAVY	13227	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/15/95	1815	1935	2145	12	41	16.526	72	4.76	0		2000	13.0	LW	91-10-063
U S NAVY	13224	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/15/95	1010	1130	1240	12	41	16.528	72	4.85	0		2150	13.0	LW	91-10-063
U S NAVY	13225	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/15/95	1240	1415	1525	12	41	16.534	72	4.844	0		2200	13.3	LW	91-10-063
U S NAVY	13229	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	25	210	320	12	41	16.455	72	4.805	0		2150	13.0	LW	91-10-063
U S NAVY	13230	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	320	510	635	12	41	16.508	72	4.862	0		2050	13.0	LW	91-10-063
U S NAVY	13231	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	700	800	850	12	41	16.508	72	4.862	0		2050	13.0	LW	91-10-063
U S NAVY	13233	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	1145	1330	1445	12	41	16.51	72	4.865	0		2100	12.9	LW	91-10-063
U S NAVY	13232	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	900	1005	1055	10	41	16.512	72	4.861	0		1800	12.6	LW	91-10-063
U.S NAVY	13236	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	2205	2305	0	12	41	16.518	72	4.78	0		2150	13.0	LW	91-10-063
U S NAVY	13235	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	1800	1900	2000	12	41	16.52	72	4.808	0		2200	13.0	LW	91-10-063
U S NAVY	13234	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/16/95	1450	1608	1728	12	41	16.543	72	4.803	0		2200	13.0	LW	91-10-063
U S NAVY	13239	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	805	915	1030	14	41	16.442	72	4.817	250'	S	1825	12.6	JAA	91-10-045
U S NAVY	13238	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	515	645	0	12	41	16.45	72	4.777	0		2150	13.0	LW	91-10-063
U S NAVY	13237	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	240	350	500	12	41	16.46	72	4.777	0		2200	13.0	LW	91-10-063
U S NAVY	13240	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	1040	1145	1300	14	41	16.469	72	4.841	50'	SSW	1775	12.6	JAA	91-10-045
U S NAVY	13241	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	1320	1435	1555	14	41	16.484	72	4.875	200'	W	1875	12.9	JAA	91-10-045
U S NAVY	13242	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	1600	1740	1835	14	41	16.497	72	4.865	190'	WNW	1800	12.6	JAA	91-10-045
U S NAVY	13243	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	1925	2045	2215	14	41	16.527	72	4.842	250'	NNW	1950	13.0	JAA	91-10-045
U S NAVY	13244	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/17/95	2225	2350	115	14	41	16.528	72	4.806	225'	N	1750	12.0	JAA	91-10-045
U S NAVY	13249	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/18/95	1415	1550	1730	14	41	16.443	72	4.823	240'	S	1925	13.0	JAA	91-10-045
U S NAVY	13248	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/18/95	1135	1300	1410	14	41	16.457	72	4.781	225'	SSE	1875	12.9	JAA	91-10-045
U S NAVY	13247	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/18/95	830	1000	1110	14	41	16.463	72	4.771	250'	ESE	1750	12.3	JAA	91-10-045
U S NAVY	13251	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/18/95	2050	2227	2320	11	41	16.487	72	4.882	250'	W	1825	12.8	JAA	91-10-045
U S NAVY	13250	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/18/95	1810	1925	2040	13	41	16.505	72	4.8	100'	NW	1850	12.9	JAA	91-10-045
U S NAVY	13245	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/18/95	125	310	440	14	41	16.518	72	4.792	250'	NNE	1825	12.6	JAA	91-10-045
U S NAVY	13246	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/18/95	450	625	825	14	41	16.521	72	4.775	225'	ENE	1875	12.9	JAA	91-10-045
U.S. NAVY	13258	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/19/95	2005	2133	20	14	41	16.46	72	4.775	250'	ESE	1700	12.0	JAA	91-10-045
U S. NAVY	13257	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/19/95	1630	1805	1955	14	41	16.514	72	4.774	250'	ENE	1850	12.9	JAA	91-10-045
U S NAVY	13252	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/19/95	35	215	335	14	41	16.517	72	4.868	250'	WNW	2000	13.3	JAA	91-10-045
U S NAVY	13255	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/19/95	1005	1115	1315	14	41	16.518	72	4.812	60'	NNW	1775	12.6	JAA	91-10-045

U S NAVY	13256	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/19/95	1330	1450	1620	14	41	16 521	72	4 789	250'	NNE	1925	13 0	JAA	91-10-045
U S NAVY	13253	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/19/95	345	520	645	14	41	16 526	72	4 841	250'	NNW	1875	12 9	JAA	91-10-045
U S NAVY	13254	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/19/95	655	820	955	14	41	16 533	72	4 816	250'	N	1900	13 0	JAA	91-10-045
U S NAVY	13260	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/20/95	1145	1245	1340	11	41	16 444	72	4 816	250'	S	1950	13 3	JAA	91-10-045
U S NAVY	13259	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/20/95	815	932	1040	12	41	16 453	72	4 79	250'	SSE	1300	10 9	JAA	91-10-045
U.S NAVY	13261	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/20/95	2135	2249	2400	0	41	16 494	72	4 88	250'	W	1625	13 3	JAA	91-10-045
U S NAVY	13262	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/21/95	315	505	645	14	41	16 508	72	.4 876	270'	WNW	1500	11 9	JAA	91-10-045
U S NAVY	13263	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/21/95	700	850	1025	12	41	16 521	72	4 836	250'	NNW	1300	10 9	JAA	91-10-045
U S NAVY	13264	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/23/95	510	641	730	12	41	16 462	72	4 659	100'	W	1950	13 3	JAA	91-10-045
U S NAVY	13265	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/24/95	135	305	415	14	41	16 508	72	4 889	150'	W	1825	13 0	JAA	91-10-045
U S NAVY	13271	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/24/95	2000	2130	2300	12	41	16 513	72	4 748	0		2000	13 0	LW	91-10-063
U S NAVY	13266	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/24/95	420	530	620	11	41	16 52	72	4 905	175'	W	1750	12 6	JAA	91-10-045
U S NAVY	13267	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/24/95	755	915	1035	12	41	16 533	72	4 888	0		2050	13 0	LW	91-10-063
U S NAVY	13270	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/24/95	1635	1740	1950	12	41	16 536	72	4 776	0		2150	13 1	LW	91-10-063
U S NAVY	13269	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/24/95	1400	1505	1630	12	41	16 544	72	4 841	0		1950	12 6	LW	91-10-063
U S NAVY	13268	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/24/95	1040	1220	1350	12	41	16 546	72	4 857	0		2000	12 6	LW	91-10-063
U S NAVY	13275	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/25/95	1145	1305	1405	12	41	16 421	72	4 859	0		1950	12 6	LW	91-10-063
U S NAVY	13277	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/25/95	2145	2305	30	12	41	16 424	72	4 907	0		2050	12 6	LW	91-10-063
U S NAVY	13276	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/25/95	1530	1725	1820	12	41	16 429	72	4 894	0		2000	12 6	LW	91-10-063
U S NAVY	13274	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/25/95	625	820	910	12	41	16 429	72	4 8	0		2000	12 6	LW	91-10-063
U S NAVY	13273	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/25/95	330	500	635	12	41	16 446	72	4 756	0		2000	12 6	LW	91-10-063
U S NAVY	13272	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/25/95	2305	30	200	12	41	16 472	72	4 741	0		2050	13 0	LW	91-10-063
U S NAVY	13278	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/26/95	40	205	340	12	41	16 447	72	4 899	0		1950	12 6	LW	91-10-063
U S NAVY	13280	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/26/95	800	940	1245	17	41	16 436	72	4 863			2000	12'6"	LW	91-10-063
U S NAVY	13282	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/26/95	1645	1810	1955	12	41	16 5	72	4 905	145'		1950	13'	LW	91-10-063
U S NAVY	13281	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/26/95	1255	1435	1615	12	41	16 5	72	4 903	145'		2200	13'6"	LW	91-10-063
U S NAVY	13283	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/26/95	2008	2130	2320	12	41	16 508	72	4 902	145'		1300	12'	LW	91-10-063
U S NAVY	13284	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/26/95	2330	115	300	12	41	16 518	72	4 856	145'		1250	12'	LW	91-10-063
U S NAVY	13288	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/27/95	1915	2030	2130	12	41	16 488	72	4 733			2000	13'	LW	91-10-063
U.S. NAVY	13287	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/27/95	1620	1730	1900	12	41	16 501	72	4 759	145'		2000	13'	LW	91-10-063
U S NAVY	13285	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/27/95	315	500	630	12	41	16 507	72	4 823	145'		1200	12'	LW	91-10-063
U S NAVY	13286	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/27/95	1000	1100	1230	12	41	16 528	72	4 741	145'		1800	12'6"	LW	91-10-063
U S NAVY	13295	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/28/95	2105	2240	2345	12	41	16 387	72	4 903			2200	13'	LW	91-10-063
U S NAVY	13289	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/28/95	2250	20	130	12	41	16 428	72	4 788			1800	12'	LW	91-10-063
U S NAVY	13292	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/28/95	930	1040	1230	12	41	16.43	72	4 877			1950	13'	LW	91-10-063
U S NAVY	13290	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/28/95	140	315	450	12	41	16 43	72	4.793			1800	12'	LW	91-10-063
U S NAVY	13293	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/28/95	1230	1345	1500	12	41	16 45	72	4 896			2200	13'	LW	91-10-063
U S NAVY	13294	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/28/95	1540	1705	1755	12	41	16 476	72	4.896			1800	12'	LW	91-10-063
U S NAVY	13297	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/29/95	340	530	740	12	41	16 303	72	4 899			2100	13'	LW	91-10-063
U S NAVY	13296	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/29/95	100	205	340	12	41	16 454	72	4 854	145'		1950	13'	LW	91-10-063
U S NAVY	13298	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/29/95	800	935	1125	12	41	16 513	72	4 913			2200	13'	LW	91-10-063
U S NAVY	13300	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/29/95	1530	1715	1900	12	41	16 529	72	4.861	145'		2000	13'	LW	91-10-063
U S. NAVY	13299	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/29/95	1130	1333	1530	12	41	16 537	72	4 898			2200	13'	LW	91-10-063
U S NAVY	13301	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/29/95	1910	2100	2200	12	41	16 546	72	4 831			2000	13'	LW	91-10-063
U.S NAVY	13305	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/30/95	2055	2215	2305	12	41	16 462	72	4.753			2050	13'	LW	91-10-063
U S NAVY	13304	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/30/95	915	1030	1135	12	41	16 498	72	4.739			1700	12'	LW	91-10-063
U S NAVY	13306	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/31/95	45	150	310	12	41	16 419	72	4 808			2000	13'	LW	91-10-063
U S NAVY	13307	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/31/95	310	435	555	12	41	16 424	72	4 854			2200	13'	LW	91-10-063
U S NAVY	13308	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/31/95	655	810	930	12	41	16 438	72	4 89			2200	13'	LW	91-10-063
U S NAVY	13309	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/31/95	955	1120	1310	13	41	16 46	72	4 899			1825	12'6"	JAA	91-10-045
U S NAVY	13310	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/31/95	1320	1440	1520	12	41	16 476	72	4 908			1700	11'6"	JAA	91-10-045
U S NAVY	13303	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/31/95	520	645	740	12	41	16 514	72	4 76			1800	12'6"	LW	91-10-063
U S NAVY	13302	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/31/95	45	210	300	12	41	16 534	72	4.778			2200	13'	LW	91-10-063
U S NAVY	13311	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/01/96	2100	2230	40	14	41	16 408	72	4 879			1800	12'6"	JAA	91-10-045
U.S. NAVY	13312	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/01/96	45	205	250	12	41	16 454	72	4 848			1850	12'9"	JAA	91-10-045
U.S NAVY	13313	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/01/96	445	620	705	12	41	16 504	72	4 92			1900	13'	JAA	91-10-045
U.S. NAVY	13314	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/01/96	855	1010	1055	12	41	16 518	72	4.91			1750	12'3"	JAA	91-10-045
U.S NAVY	13315	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/01/96	1615	1740	1830	12	41	16 541	72	4 884			1950	13'3"	JAA	91-10-045
U S NAVY	13316	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/01/96	2030	2150	2235	13	41	16 55	72	4 862			1875	13'	JAA	91-10-045
U S NAVY	13588	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/02/96	1950	2133	2245	13	41	16 451	72	4 762			1950	13'	JAA	91-10-045
U S NAVY	13591	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/02/96	1640	1753	1835	12	41	16 479	72	4 738			1825	12'6"	JAA	91-10-045
U.S NAVY	13590	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/02/96	1105	1243	1330	13	41	16 517	72	4 744			1550	11'3"	JAA	91-10-045
U.S. NAVY	13318	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/02/96	520	640	725	13	41	16 54	72	4 782			1800	12'9"	JAA	91-10-045
U S NAVY	13317	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON, CT	01/02/96	25	205	250	13	41	16 548	72	4 819			1825	12'9"	JAA	91-10-045
U S NAVY	13582	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	1400	1527	1700	13	41	16 408	72	4 902			1700	11'6"	JAA	91-10-045
U S NAVY	13586	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	145	303	445	13	41	16.42	72	4 849			1900	13'	JAA	91-10-045
U S NAVY	13589	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	2250	2400	140	13	41	16.428	72	4 802			1825	12'6"	JAA	91-10-045
U.S. NAVY	13587	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	445	615	745	13	41	16 431	72	4 889			1825	12'6"	JAA	91-10-045
U.S. NAVY	13584	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	800	940	1110	13	41	16 449	72	4 898			1800	12'6"	JAA	91-10-045
U S NAVY	13583	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	1705	1827	1935	12	41	16 461	72	4 862			1800	12'6"	JAA	91-10-045
U S NAVY	13585	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	1130	1243	1355	13	41	16 476	72	4 898			1775	12'6"	JAA	91-10-045
U S NAVY	13581	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/03/96	2215	2323	2400	12	41	16 504	72	4 908			1800	13'	JAA	91-10-045
U S. NAVY	13579	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/04/96	115	230	355	13	41	16 521	72	4 898			1550	11'9"	JAA	91-10-045
U S NAVY	13580	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/04/96	400	521	610	12	41	16 54	72	4 895			1850	12'6"	JAA	91-10-045
U S NAVY	13578	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/04/96	1320	1435	1530	12	41	16 543	72	4 814			2050	13'6"	JAA	91-10-045
U S. NAVY	13577	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/04/96	925	1043	1215	12	41	16 546	72	4 863			1650	12'	JAA	91-10-045
U S NAVY	13573	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/05/96	1410	1553	1710	12	41	16 447	72	4 76			1800	12'6"	JAA	91-10-045

U.S. NAVY	13575	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/05/96	535	715	810	12	41	16 481	72	4 735		1750	13'	JAA	91-10-045
U S NAVY	13574	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/05/96	220	400	530	13	41	16 512	72	4 75		1900	13'	JAA	91-10-045
U S NAVY	13576	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER AT GROTON & NEW LONDON CT	01/05/96	2150	50	210	13	41	16 542	72	4 774		1850	13'6"	JAA	91-10-045
U S NAVY	13476	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/06/96	825	945	1105	12	41	16 42	72	4 856		1800	1"3"	JAA	91-10-045
U S NAVY	13475	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/06/96	440	638	810	13	41	16 427	72	4 802		1825	12'6"	JAA	91-10-045
U S NAVY	13571	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/06/96	1320	1438	1600	12	41	16 432	72	4 891		1900	13'	JAA	91-10-045
U S NAVY	13572	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/06/96	1720	1904	2050	13	41	16 452	72	4 904		1700	12'	JAA	91-10-045
U S NAVY	13570	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/06/96	2055	2215	2320	12	41	16 477	72	4 899		1850	12'6"	JAA	91-10-045
U S NAVY	13568	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/07/96	45	202	340	13	41	16 403	72	4.9		1750	12'3"	JAA	91-10-045
U S NAVY	13567	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/07/96	1305	1430	1545	12	41	16 513	72	4.892	145'	1850	12'6"	LW	91-10-063
U S NAVY	13566	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/07/96	756	906	1006	12	41	16 519	72	4 886	145'	1950	12'6"	LW	91-10-063
U S NAVY	13564	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/08/96	2125	2255	40	12	41	16 525	72	4 861	145'	1850	12'6"	LW	91-10-063
U S NAVY	13558	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/09/96	2235	2340	50	12	41	16 405	72	4 859	145'	1950	13'	LW	91-10-063
U S NAVY	13561	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/09/96	1925	2045	2215	12	41	16 41	72	4 805	145'	2050	12'6"	LW	91-10-063
U S NAVY	13560	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/09/96	1610	1800	1915	12	41	16 43	72	4 757	145'	1900	12'6"	LW	91-10-063
U S NAVY	13563	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/09/96	1255	1415	1515	12	41	16 497	72	4 748	145'	1650	12'6"	LW	91-10-063
U S NAVY	13565	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/09/96	50	220	325	12	41	16 529	72	4 82	145'	2000	12'6"	LW	91-10-063
U S NAVY	13562	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/09/96	500	630	730	12	41	16 546	72	4 777	145'	1800	12'6"	LW	91-10-063
U S NAVY	13559	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/10/96	855	1005	1050	12	41	16 432	72	4 895		2000	12'6"	LW	91-10-063
U S NAVY	13556	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/11/96	655	755	840	12	41	16 401	72	4 896		1500	12'6"	LW	91-10-063
U S NAVY	13557	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/11/96	1445	1555	1705	12	41	16 496	72	4 894		2150	13'	LW	91-10-063
U S NAVY	13554	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/11/96	2315	30	120	12	41	16 52	72	4 902		1600	13'	LW	91-10-063
U S NAVY	13548	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/12/96	1530	1645	1815	12	41	16 504	72	4 778	145'	1500	12'6"	LW	91-10-063
U S NAVY	13550	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/12/96	1355	1513	1615	10	41	16 518	72	4 906		1900	13'	JAA	91-10-045
U S NAVY	13555	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/12/96	415	575	615	12	41	16 532	72	4 889		1900	13'	LW	91-10-063
U S NAVY	13553	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/12/96	1220	1340	1510	12	41	16 543	72	4 82		1950	13'	LW	91-10-063
U S NAVY	13552	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/12/96	845	1005	1210	12	41	16 547	72	4 857		1200	11'	LW	91-10-063
U S NAVY	13543	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	1420	1600	1720	12	41	16 419	72	4 905	145'	2000	12'6"	LW	91-10-063
U S NAVY	13542	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	1150	1315	1415	12	41	16 42	72	4 857		2000	12'6"	LW	91-10-063
U S NAVY	13547	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	845	1005	1105	12	41	16 423	72	4 8		1900	12'6"	LW	91-10-063
U S NAVY	13546	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	300	410	510	12	41	16 43	72	4.757		1750	12'6"	LW	91-10-063
U S NAVY	13538	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	1735	1855	2015	12	41	16 435	72	4 907	145'	1900	12'6"	LW	91-10-063
U S NAVY	13539	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	2020	2145	2255	12	41	16 456	72	4 903	145'	2100	13'	LW	91-10-063
U S NAVY	13549	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	2330	36	210	12	41	16 498	72	4 753	145'	1700	14'	LW	91-10-063
U S NAVY	13551	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	1815	111	320	13	41	16 502	72	4 909		1900	13'	JAA	91-10-045
U S NAVY	13534	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	2330	128	300	13	41	16 513	72	4 75		2100	13'3"	JAA	91-10-045
U S NAVY	13544	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	330	451	555	10	41	16 538	72	4 881		1700	12'9"	JAA	91-10-045
U S NAVY	13541	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	1900	2119	2315	12	41	16 543	72	4 775		1750	12'9"	JAA	91-10-045
U S NAVY	13540	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	1315	1445	1540	10	41	16 547	72	4 828		1800	13'9"	JAA	91-10-045
U S NAVY	13545	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	645	808	915	11	41	16 549	72	4 86		1400	12'3"	JAA	91-10-045
U S NAVY	13536	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	5	130	230	12	41	16 369	72	4 899	145'	1600	11'	LW	91-10-063
U S NAVY	13529	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	1450	1647	1805	12	41	16 424	72	4 859		1650	12'9"	JAA	91-10-045
U S NAVY	13528	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	1020	1147	1240	11	41	16 429	72	4 812		2050	13'3"	JAA	91-10-045
U S NAVY	13526	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	1810	2022	2130	10	41	16 434	72	4 897		1950	13'2"	JAA	91-10-045
U.S. NAVY	13535	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	310	505	610	11	41	16 444	72	4 76		1850	13'6"	JAA	91-10-045
U S NAVY	13537	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	430	550	700	12	41	16 488	72	4 906	145'	1950	12'6"	LW	91-10-063
U S NAVY	13532	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	800	855	955	12	41	16 498	72	6 902		2000	12'6"	LW	91-10-063
U S NAVY	13524	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	2130	2320	45	12	41	16 521	72	4 774		1500	12'6"	LW	91-10-063
U S NAVY	13533	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	1005	1115	1220	12	41	16 533	72	4 899		1500	11'	LW	91-10-063
U S NAVY	13530	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	1230	1350	1500	12	41	16 534	72	4 858	145'	1900	13'	LW	91-10-063
U S NAVY	13531	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	1810	1945	2100	12	41	16 537	72	4 827		1950	13'	LW	91-10-063
U S NAVY	13522	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	720	901	955	10	41	16 398	72	4 898		1400	11'	JAA	91-10-045
U S NAVY	13516	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	1745	1840	2045	12	41	16 411	72	4 803	145'	1950	13'	LW	91-10-063
U S NAVY	13517	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	2000	2145	2245	12	41	16 423	72	4 855		1200	11'	LW	91-10-063
U.S. NAVY	13527	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	2310	57	215	11	41	16 456	72	4 905		1675	12'9"	JAA	91-10-045
U S NAVY	13520	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	835	1025	1205	12	41	16 457	72	4 896	80'	2000	13'6"	LW	91-10-063
U S NAVY	13521	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	330	502	555	10	41	16 473	72	4 908		1825	12'6"	JAA	91-10-045
U S NAVY	13525	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	55	225	345	12	41	16 498	72	4 746	145'	2100	12'6"	LW	91-10-063
U S NAVY	13518	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	1150	1324	1450	13	41	16 508	72	4 908		1600	12'3"	JAA	91-10-045
U S NAVY	13519	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	1455	1623	1825	13	41	16 516	72	4 909		1900	13'	JAA	91-10-045
U S NAVY	13514	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	1830	2009	2110	11	41	16 534	72	4 898		1850	13'9"	JAA	91-10-045
U S NAVY	13508	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	1115	1225	1320	12	41	16 39	72	4 89		2100	13'	LW	91-10-063
U S NAVY	13509	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	1450	1630	1720	12	41	16 4	72	4 89		1200	11'	LW	91-10-063
U S NAVY	13502	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	2215	19	130	12	41	16 43	72	4.808		1800	13'3"	JAA	91-10-045
U S NAVY	13512	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	55	210	325	12	41	16 439	72	4 91		1900	12'6"	LW	91-10-063
U S NAVY	13505	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	1755	1915	2000	12	41	16 447	72	4.763		1825	12'6"	JAA	91-10-045
U.S. NAVY	13513	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	330	440	535	12	41	16 45	72	4 902		900	10'	LW	91-10-063
U S NAVY	13504	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	800	958	1150	12	41	16 503	72	4 752		1700	13'3"	JAA	91-10-045
U S NAVY	13500	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	2255	2380	45	12	41	16.52	72	4 89		2000	12'6"	LW	91-10-063
U S NAVY	13511	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	500	619	750	12	41	16 539	72	4 764		1800	13'	JAA	91-10-045
U S NAVY	13510	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	155	335	450	12	41	16 543	72	4 614		1800	13'3"	JAA	91-10-045
U S NAVY	13515	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	2300	19	145	12	41	16 548	72	4 662		1800	13'	JAA	91-10-045
U.S. NAVY	13503	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	315	445	600	12	41	16 414	72	4 845		1875	14'	JAA	91-10-045
U S NAVY	13493	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	1600	1940	2030	12	41	16 42	72	4.85		2200	13'	LW	91-10-063
U S NAVY	13492	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	1350	1510	1600	12	41	16 42	72	4 8		2150	13'	LW	91-10-063
U S NAVY	13489	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	2230	2330	145	12	41	16 43	72	4 89		1000	13'	LW	91-10-063
U S NAVY	13496	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	620	742	910	12	41	16 435	72	4 9		1250	10'6"	JAA	91-10-045

U.S NAVY	13495	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	1145	1235	1325	12	41	16.44	72	4.74		800	13'	LW	91-10-063
U.S NAVY	13497	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	1040	1311	1400	12	41	16.457	72	4.904		1700	13'6"	JAA	91-10-045
U.S NAVY	13494	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	840	1000	1055	12	41	16.5	72	4.75		1900	13'	LW	91-10-063
U.S NAVY	13491	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	1825	2129	2240	10	41	16.506	72	4.934		1550	11'9"	JAA	91-10-045
U.S NAVY	13498	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	400	500	550	12	41	16.53	72	4.81		2100	13'	LW	91-10-063
U.S NAVY	13488	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	610	715	815	12	41	16.4	72	4.89		1400	11'	LW	91-10-063
U.S NAVY	13487	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	400	440	550	8	41	16.47	72	4.9		1200	11'	LW	91-10-063
U.S NAVY	13483	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	840	945	1050	12	41	16.52	72	4.93		1400	11'6"	LW	91-10-063
U.S NAVY	13484	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	1130	1235	1325	12	41	16.53	72	4.93		1600	11'6"	LW	91-10-063
U.S NAVY	13485	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	445	647	830	12	41	16.534	72	4.94		1925	13'6"	JAA	91-10-045
U.S NAVY	13479	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	1435	1550	1645	12	41	16.54	72	4.91		2100	12'6"	LW	91-10-063
U.S NAVY	13486	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	1020	1216	1325	12	41	16.549	72	4.918		1800	12'3"	JAA	91-10-045
U.S NAVY	13480	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	1650	1822	1915	12	41	16.56	72	4.88		2200	13'	LW	91-10-063
U.S NAVY	13477	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	2015	2125	2210	12	41	16.56	72	4.84		2100	12'6"	LW	91-10-063
U.S NAVY	13481	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	1330	1519	1620	11	41	16.565	72	4.888		1525	11'6"	JAA	91-10-045
U.S NAVY	13472	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	525	640	735	12	41	16.43	72	4.74		2100	12'6"	LW	91-10-063
U.S NAVY	13469	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	1025	1217	1330	10	41	16.439	72	4.745		1500	11'	JAA	91-10-045
U.S NAVY	13474	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	450	657	800	10	41	16.457	72	4.717		1750	13'	JAA	91-10-045
U.S NAVY	13460	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	415	510	550	8	41	16.46	72	4.88	300'	1200	10'	LW	91-10-063
U.S NAVY	13468	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	1140	1300	1425	12	41	16.47	72	4.8	300'	2050	13'	LW	91-10-063
U.S NAVY	13467	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	845	1005	1130	12	41	16.47	72	4.79	300'	2050	12'6"	LW	91-10-063
U.S NAVY	13471	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	225	335	420	12	41	16.47	72	4.72		2100	13'	LW	91-10-063
U.S NAVY	13482	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	2120	2348	40	11	41	16.569	72	4.832		1725	13'	JAA	91-10-045
U.S NAVY	13473	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	140	248	345	10	41	16.569	72	4.818		2100	10'9"	'AA	91-10-045
U.S NAVY	13478	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	2315	15	100	12	41	16.57	72	4.81		2000	12'6"	LW	91-10-063
U.S NAVY	13464	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	1100	1152	1245	12	41	16.35	72	4.92	300'	2000	:3'	LW	91-10-063
U.S NAVY	13466	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	315	455	645	12	41	16.392	72	4.814		1850	12'6"	JAA	91-10-045
U.S NAVY	13470	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	2250	50	300	12	41	16.408	72	4.788		1825	12'6"	JAA	91-10-045
U.S NAVY	13462	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	1120	1233	1335	10	41	16.411	72	4.896		1550	11'3"	JAA	91-10-045
U.S NAVY	13458	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	2335	45	145	12	41	16.46	72	4.95		1500	12'6"	LW	91-10-063
U.S NAVY	13461	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	720	814	925	10	41	16.46	72	4.89	300'	2000	12'6"	LW	91-10-063
U.S NAVY	13463	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	1540	1803	1900	11	41	16.521	72	4.903		1450	12'	JAA	91-10-045
U.S NAVY	13457	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	2055	2149	2240	10	41	16.542	72	4.892		1500	11'	JAA	91-10-045
U.S NAVY	13454	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	1210	1315	1415	10	41	16.384	72	4.928		1525	11'6"	JAA	91-10-045
U.S NAVY	13453	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	645	751	840	10	41	16.386	72	4.869		1350	10'9"	JAA	91-10-045
U.S NAVY	13455	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	0	117	215	10	41	16.393	72	4.884		1400	11'3"	JAA	91-10-045
U.S NAVY	13450	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	2110	2207	2345	10	41	16.442	72	4.947		1200	10'	JAA	91-10-045
U.S NAVY	13459	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	345	450	530	10	41	16.46	72	4.95		1700	12'6"	LW	91-10-063
U.S NAVY	13451	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	825	920	1010	12	41	16.49	72	4.95		1800	13'	LW	91-10-063
U.S NAVY	13452	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	1400	1515	1600	12	41	16.5	72	4.94		1800	11'	LW	91-10-063
U.S NAVY	13448	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	2040	2200	2300	12	41	16.5	72	4.91	300'	2100	13'	LW	91-10-063
U.S NAVY	13456	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	330	429	520	10	41	16.515	72	4.904		1500	11'	JAA	91-10-045
U.S NAVY	13447	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	1735	1855	1955	12	41	16.52	72	4.93		2100	13'	LW	91-10-063
U.S NAVY	13440	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	2055	2215	2310	12	41	16.4	72	4.81		2100	12'6"	LW	91-10-063
U.S NAVY	13439	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	1625	1745	1815	12	41	16.41	72	4.78		1500	12'6"	LW	91-10-063
U.S NAVY	13442	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	1050	1150	1230	10	41	16.43	72	4.74		2000	13'	LW	91-10-063
U.S NAVY	13445	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	1	132	325	12	41	16.462	72	4.944		1450	11'3"	JAA	91-10-045
U.S NAVY	13446	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	330	453	620	13	41	16.503	72	4.948		1850	12'6"	JAA	91-10-045
U.S NAVY	13437	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	1545	1655	1805	10	41	16.537	72	4.933		1950	13'3"	JAA	91-10-045
U.S NAVY	13438	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	2110	2225	2350	11	41	16.548	72	4.916		1575	10'6"	JAA	91-10-045
U.S. NAVY	13441	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/22/96	700	755	845	8	41	16.57	72	4.81		1200	12'6"	LW	91-10-063
U.S. NAVY	13435	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	0	50	935	10	41	16.39	72	4.86		2200	13'	LW	91-10-063
U.S. NAVY	13421	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	520	629	735	10	41	16.393	72	4.874		1600	12'	JAA	91-10-045
U.S. NAVY	13420	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	205	323	415	10	41	16.409	72	4.818		1650	12'6"	JAA	91-10-045
U.S. NAVY	13430	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	1030	1140	1330	10	41	16.44	72	4.94		2050	13'	LW	91-10-063
U.S. NAVY	13425	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	1830	2019	2110	10	41	16.44	72	4.745		1700	13'	JAA	91-10-045
U.S. NAVY	13424	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	2130	2235	2320	12	41	16.45	72	4.79		2150	13'	LW	91-10-063
U.S. NAVY	13432	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	1230	1404	1500	10	41	16.454	72	4.731		1600	11'9"	JAA	91-10-045
U.S. NAVY	13427	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	1330	1450	1510	10	41	16.46	72	4.95		2150	13'	LW	91-10-063
U.S. NAVY	13433	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	5	117	240	12	41	16.505	72	4.887		1475	11'3"	JAA	91-10-045
U.S. NAVY	13431	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	530	655	805	12	41	16.584	72	4.799		1425	11'3"	JAA	91-10-045
U.S NAVY	13419	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	950	1125	1225	10	41	16.3	72	4.91	300'	2200	13'	LW	91-10-063
U.S NAVY	13416	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	1145	1409	1530	11	41	16.384	72	4.911		1725	12'9"	JAA	91-10-045
U.S NAVY	13426	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	2245	12	155	12	41	16.414	72	4.79		1550	11'9"	JAA	91-10-045
U.S NAVY	13414	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	1450	1640	1805	12	41	16.44	72	4.94	300'	2200	13'	LW	91-10-063
U.S NAVY	13422	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	0	100	300	12	41	16.44	72	4.82		2200	13'6"	LW	91-10-063
U.S NAVY	13415	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	1820	1937	2040	12	41	16.49	72	4.83	300'	1500	12'6"	LW	91-10-063
U.S NAVY	13413	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	2145	2235	2355	12	41	16.49	72	4.81	300'	2100	12'6"	LW	91-10-063
U.S. NAVY	13423	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	305	405	445	10	41	16.52	72	4.9		2200	13'	LW	91-10-063
U.S NAVY	13418	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/24/96	610	705	800	12	41	16.54	72	4.89		2200	13'	LW	91-10-063
U.S NAVY	13399	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	2325	30	130	10	41	16.38	72	4.86		2200	13'	LW	91-10-063
U.S NAVY	13408	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	1245	1345	1450	10	41	16.38	72	4.74	300'	1300	10'	LW	91-10-063
U.S. NAVY	13404	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	2050	2150	2245	12	41	16.41	72	4.81		2150	13'	LW	91-10-063
U.S. NAVY	13403	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	1740	1855	2000	12	41	16.41	72	4.78	300'	2050	13'	LW	91-10-063
U.S. NAVY	13409	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	205	405	540	11	41	16.433	72	4.948		1525	11'3"	JAA	91-10-045
U.S. NAVY	13410	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	600	717	840	10	41	16.453	72	4.939		1350	10'6"	JAA	91-10-045
U.S NAVY	13406	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	2020	2157	2330	11	41	16.477	72	4.961		1600	11'6"	JAA	91-10-045

U S NAVY	13405	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	1220	1403	1530	10	41	16 484	72	4 957			1725	12'3"	JAA	91-10-045
U S NAVY	13443	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	52	200	330	12	41	16 5	72	4 88	300'		2000	13'	LW	91-10-063
U S NAVY	13412	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	320	420	545	12	41	16 5	72	4 84	300'		2100	12'6"	LW	91-10-063
U S NAVY	13407	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	640	725	820	10	41	16 5	72	4 81	300'		2150	13'	LW	91-10-063
U S NAVY	13411	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	20	125	235	12	41	16 5	72	4 8	300'		2000	12'6"	LW	91-10-063
U S NAVY	13444	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	430	525	615	10	41	16 57	72	4 84			1000	8'	LW	91-10-063
U S NAVY	13396	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	1000	1105	1150	10	41	16 44	72	4 94			2200	13'	LW	91-10-063
U S NAVY	13389	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	2115	2220	2310	12	41	16 45	72	4 79			1800	12'	LW	91-10-063
U S NAVY	13393	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	1500	1600	1700	12	41	16 46	72	4 95			2200	13'	LW	91-10-063
U S NAVY	13394	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	1800	1850	1950	12	41	16 49	72	4 95			2150	13'	LW	91-10-063
U S NAVY	13401	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	2350	120	300	11	41	16 498	72	4 936			1750	12'6"	JAA	91-10-045
U S NAVY	13402	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	315	430	600	11	41	16 53	72	4 929			1675	12'	JAA	91-10-045
U S NAVY	13397	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	610	725	830	10	41	16 55	72	4 899			1725	12'3"	JAA	91-10-045
U S NAVY	13391	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	1640	1758	1900	10	41	16 57	72	4 834			1750	12'6"	JAA	91-10-045
U S NAVY	13398	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	1215	1340	1425	11	41	16 575	72	4 884			1650	12'	JAA	91-10-045
U S NAVY	13392	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	2030	2146	2245	10	41	16 581	72	4 799			1500	11'6"	JAA	91-10-045
U S NAVY	13384	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	1515	1727	1815	10	41	16 392	72	4 824			1875	13'	JAA	91-10-045
U S NAVY	13383	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	915	1123	1225	10	41	16 406	72	4 782			1750	13'	JAA	91-10-045
U S NAVY	13388	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	410	637	750	10	41	16 418	72	4 733			1475	11'3"	JAA	91-10-045
U S NAVY	13390	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	2310	80	140	12	41	16 44	72	4 82			2150	13'	LW	91-10-063
U S NAVY	13385	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	235	347	455	12	41	16 45	72	4 94	300'		2200	13'	LW	91-10-063
U S NAVY	13387	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	45	232	405	11	41	16 453	72	4.731			1450	10'6"	JAA	91-10-045
U S NAVY	13386	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	645	749	840	10	41	16 49	72	4 93	300'		2000	13'	LW	91-10-063
U S NAVY	13379	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	1945	2125	2245	12	41	16 49	72	4 84	300'		2150	13'	LW	91-10-063
U S NAVY	13381	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	1315	1420	1550	12	41	16 5	72	4 91	300'		2150	13'	LW	91-10-063
U S NAVY	13382	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	1600	1720	1830	12	41	16 52	72	4 88	300'		2000	12'6"	LW	91-10-063
U S NAVY	13370	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	2000	2125	2230	12	41	16 4	72	4 95	300'		2000	13'	LW	91-10-063
U S NAVY	13369	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	1640	1813	1925	12	41	16 44	72	4 92	300'		1200	10'6"	LW	91-10-063
U S NAVY	13371	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	1550	1715	1840	10	41	16 473	72	4 94			1775	12'6"	JAA	91-10-045
U S NAVY	13372	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	2140	2303	2355	10	41	16 476	72	4 962			1350	11'6"	JAA	91-10-045
U S NAVY	13367	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	2325	20	200	12	41	16 49	72	4 95			1400	11'	LW	91-10-063
U S NAVY	13375	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	350	520	630	12	41	16 49	72	4 74	300'		1700	12'6"	LW	91-10-063
U S NAVY	13380	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	2310	100	180	10	41	16 52	72	4 81	300'		2200	13'	LW	91-10-063
U.S NAVY	13745	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	1620	1730	1840	12	41	16 392	72	4 857	100'	SE	750	10'	DLC	91-10-031
U S NAVY	13746	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	1305	1430	1545	11	41	16 405	72	4 813	120'	SE	925	10'	DLC	91-10-031
U S NAVY	13360	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	1915	2020	2130	12	41	16 42	72	4 81	300'		2150	12'6"	LW	91-10-063
U.S. NAVY	13363	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	535	630	720	12	41	16 44	72	4 82			1700		LW	91-10-063
U S NAVY	13368	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	225	325	420	12	41	16 45	72	4 79			2150	13'	LW	91-10-063
U S NAVY	13357	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	2155	2300	80	12	41	16 48	72	4 81			1600	12'6"	LW	91-10-063
U S NAVY	13359	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	1630	1735	1830	12	41	16 48	72	4 81			1600	12'6"	LW	91-10-063
U S NAVY	13361	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	1140	1235	1325	12	41	16 48	72	4 81			1800	12'	LW	91-10-063
U S NAVY	13362	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	1415	1510	1615	12	41	16 48	72	4 81			2200	13'	LW	91-10 063
U S NAVY	13365	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	245	407	510	10	41	16 497	72	4 944			1600	11'9"	JAA	91-10-045
U S NAVY	13364	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	910	1005	1100	12	41	16 5	72	4 94			2200		LW	91-10-063
U S NAVY	13366	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	945	1059	1200	10	41	16 529	72	4 932			1750	13'	JAA	91-10-045
U S. NAVY	13355	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/29/96	2205	2357	100	10	41	16 554	72	4 915			1800	13'	JAA	91-10-045
U S NAVY	13743	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	230	350	500	12	41	16.386	72	4 919	100'	SSW	800	10'	DLC	91-10-031
U S NAVY	13348	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	2200	2300	2400	12	41	16 43	72	4 74			2000	12'	LW	91-10-063
U S NAVY	13741	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	0	135	245	12	41	16 435	72	4 946	50'	NW	800	10'	DLC	91-10-031
U S NAVY	13358	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	100	210	310	12	41	16 44	72	4 81	300'		2150	12'6"	LW	91-10-063
U S NAVY	13353	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	335	435	535	12	41	16 49	72	4 93			1300	10'6"	LW	91-10-063
U S. NAVY	13352	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	1800	1600	1650	12	41	16 5	72	4 84			2200	13'6"	LW	)1-10-063
U S NAVY	13354	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	740	840	930	12	41	16 55	72	4 91			1600	12'6"	LW	91-10-063
U S NAVY	13351	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	1140	1230	1315	10	41	16 58	72	4 88			1700	12'	LW	91-10-063
U S. NAVY	13356	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	245	414	510	10	41	16 562	72	4 89			1900	13'3"	JAA	91-10-045
U S NAVY	13350	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	1720	1846	2000	10	41	16 566	72	4 814			1750	12'9"	JAA	91-10-045
U S NAVY	13349	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	950	1103	1215	11	41	16.569	72	4 849			1800	13'	JAA	91-10-045
U S. NAVY	13347	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	1745	1845	1935	10	41	16 57	72	4 81			1600	12'	LW	91-10-063
U S NAVY	13342	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	1510	1610	1715	12	41	16 39	72	4 92			2000	12'6"	LW	91-10-063
U S NAVY	13341	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	1235	1315	1415	12	41	16 39	72	4 86			1800	12'6"	LW	91-10-063
U S NAVY	13346	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	1005	1105	1215	12	41	16 4	72	4 81			1800	12'6"	LW	91-10-063
U S. NAVY	13345	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	25	120	215	10	41	16 41	72	4 78			1800	12'	LW	91-10-063
U S NAVY	13344	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	545	723	835	10	41	16 435	72	4 728			1800	12'9"	JAA	91-10-045
U S NAVY	13343	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	50	229	345	10	41	16 449	72	4.731			1975	13'9"	JAA	91-10-045
U S NAVY	13339	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	1745	1905	2000	10	41	16 46	72	4 95			1800	12'6"	LW	91-10-063
U S. NAVY	13340	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	1815	1905	2000	12	41	16 46	72	4 95			600	10'	LW	91-10-063
U S NAVY	13742	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	940	1125	1330	13	41	16 46	72	4 946		N	800	11'	DLC	91-10-031
U S NAVY	13338	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/31/96	2200	2300	0	0	41	16 49	72	4 95			2100	13'	LW	91-10-063
U S NAVY*	13336	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/09/96	2000	2143	2250	15	41	16 27	72	4 51			800	10'	DCC	94-01-016
U S NAVY*	13334	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/10/96	845	1100	1235	15	41	16 3	72	4 54			800	10'	DCC	94-01-016
U S NAVY*	13332	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/10/96	1925	2050	2210	15	41	16 31	72	4 54			800	10'	DCC	94-01-016
U S NAVY*	13330	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	230	340	500	15	41	16 32	72	4 53			800	10'	DCC	94-01-016
U S NAVY*	13328	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	1215	1328	1500	15	41	16 33	72	4 51			800	10'	DCC	94-01-016
U S NAVY*	13326	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/13/96	2015	2135	2310	15	41	16 32	72	4 49			800	10'	DCC	94-01-016
U S NAVY*	13323	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	845	1000	1105	15	41	16 32	72	4 46			800	10'	DCC	94-01-016
U S NAVY*	13324	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/14/96	1620	1742	1850	15	41	16 3	72	4 44			800	10'	DCC	94-01-016
U S NAVY*	13337	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	1805	1930	2050	15	41	16 27	72	4 45			900	10'	DCC	94-01-016

U S. NAVY*	13321	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	410	530	640	15	41	16 29	72	4 43			800	10'	DCC	94-01-016
U S NAVY*	13320	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	1940	2107	2310	15	41	16 26	72	4 53			800	10'	DCC	94-01-016
U S NAVY*	13333	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	1530	1720	1830	15	41	16 25	72	4 51			900	10'	DCC	94-01-016
U S NAVY*	13335	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	540	705	845	15	41	16 26	72	4 48			900	10'	DCC	94-01-016
U S NAVY*	13331	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	1200	1322	1430	15	41	16 27	72	4 54			900	10'	DCC	94-01-016
U S NAVY*	13329	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	2120	2300	35	15	41	16 24	72	4 52			900	10'	DCC	94-01-016
U S NAVY*	13327	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	830	1050	1210	15	41	16 3	72	4 56			700	9'	DCC	94-01-016
U S NAVY*	13325	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	2330	50	200	15	41	16 32	72	4 55			900	10'	DCC	94-01-016
U S NAVY*	13322	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/19/96	1040	1240	1410	15	41	16 33	72	4 55			850	9 5'	DCC	94-01-016
U S NAVY*	13465	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	1430	1540	1640	12	41	16 26	72	4 95	200'		1000	10'	LW	91-10-063
U S NAVY*	13319	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/20/96	2145	2250	10	15	41	16 33	72	4 53			650	9'	DCC	94-01-016
U S NAVY*	13449	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/21/96	1650	1825	1940	10	41	16 25	72	4 95			1400	11'3"	JAA	91-10-045
U S NAVY*	13429	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	610	712	755	10	41	16 26	72	4 95			2000	13'	LW	91-10-063
U S NAVY*	13434	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	245	355	525	12	41	16 569	72	4 488			1600	11'	JAA	91-10-045
U S NAVY*	13417	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	2305	15	200	12	41	16 232	72	4 841			1850	12'3"	JAA	91-10-045
U S NAVY*	13751	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/25/96	1820	1935	2045	15	41	16 34	72	4 5			925	10'	DCC	94-01-016
U S NAVY*	13400	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	200	350	445	12	41	16 39	72	4 92			2000	13'	LW	91-10-063
U S NAVY*	13395	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	605	700	800	0	41	16 24	72	4 95			2150	13'	LW	91-10-063
U S NAVY*	13750	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	600	723	835	15	41	16 34	72	4 48			900	10'	DCC	94-01-016
U S NAVY*	13749	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/26/96	1520	1645	1750	15	41	16 27	72	4 43			925	10'	DCC	94-01-016
U S NAVY*	13748	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/27/96	110	315	435	15	41	16 25	72	4 44			900	10'	DCC	94-01-016
U S NAVY*	13374	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	1320	1430	1530	12	41	16 33	72	4 86	300'		2100	12'6"	LW	91-10-063
U S NAVY*	13373	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	1000	1050	1200	10	41	16 36	72	4 81	300'		1600	11'6"	LW	91-10-063
U S NAVY*	13378	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	415	540	700	10	41	16 379	72	4 928			1575	11'6"	JAA	91-10-045
U S NAVY*	13376	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	650	755	900	10	41	16 38	72	4 78	300'		2000	12'6"	LW	91-10-063
U S. NAVY*	13377	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	15	140	405	11	41	16 382	72	4 874			1500	11'3"	JAA	91-10-045
U S. NAVY*	13747	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/28/96	2320	50	200	12	41	16 24	72	4 46			800	10'	DLC	91-10-031
U S NAVY*	13744	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/30/96	1430	1550	1700	12	41	16 237	72	4 949		SSW	800	10'	DLC	91-10-031
U S. NAVY**	13279	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, GROTON & NEW LONDON, CT	12/26/95	350	535	645	12	41	16	72	4	0		2050	12 6	LW	91-10-063
U S NAVY**	13291	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER, NEW LONDON & GROTON CT	12/28/95	500	630	720	12	41	16	72	4			1850	12'	LW	91-10-063
U S NAVY**	13569	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/07/96	345	510	615	12	41	16	72	4			1700	12'	JAA	91-10-045
U S NAVY**	13523	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/15/96	400	510	610	12	41	16	72	4			1500	12'6"	LW	91-10-063
U S NAVY**	13506	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	1735	1825	1925	12	41	16	72	4			2100	13'	LW	91-10-063
U S NAVY**	13507	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/16/96	1935	2040	2125	12	41	16	72	4			1850	13'	LW	91-10-063
U S NAVY**	13499	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	620	715	815	12	41	16	72	4			1400	11'	LW	91-10-063
U S NAVY**	13501	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/17/96	50	200	345	12	41	16	72	4			1400	11'	LW	91-10-063
U S NAVY**	13490	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/18/96	145	245	345	12	41	16	72	4			2100	13'	LW	91-10-063
U S NAVY**	13428	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	1740	1845	1930	10	41	16	72	4			2050	13'	LW	91-10-063
U S NAVY**	13436	199200083	DEPT/NAVY - SEAWOLF	THAMES RIVER	01/23/96	315	415	500	12	41	16	72	4			2000	13'	LW	91-10-063

Total Volume depositved at the US Navy Buoy yd³	1129375
Total Volume depositved at the US Navy Buoy m³	863520

A6
1996-97 Disposal Season

BUOY	SAMP_ID	PERMIT_NUM	PERMITTEE	PROJECT	DISPDATE	DEPTIME	DISPTIME	RETTIME	DIST	LATDEG	LATMIN	LONGDEG	LONGMIN	FRBUOY	DIR	CYVOL	DRAFT	INSP	CERTNUM
NDA-96	14737	199602837	NIANTIC DOCKOMINIUM	NIANTIC DOCKOMINIUM	01/02/1997	1600	1800	2000	14	41	16.255	72	4.899	100		300	9	TEW	96-03-015
NDA-96	14738	199602837	NIANTIC DOCKOMINIUM	NIANTIC DOCKOMINIUM	01/02/1997	2130	2330	100	14	41	16.197	72	4.926	100		75	6	TEW	96-03-015
NDA-96	14937	199602834	GALES FERRY MARINA	GALES FERRY MARINA ENTRANCE	05/21/1997	2200	4	210	22	41	16.18	72	4.942	30'	SSE	700	10	RDB	91-10-015
NDA-96	14938	199602834	GALES FERRY MARINA	GALES FERRY MARINA ENTRANCE	05/21/1997	1015	1215	1440	22	41	16.178	72	4.954	35'	S	700	10	RDB	91-10-015
NDA-96	14939	199602834	GALES FERRY MARINA	GALES FERRY MARINA ENTRANCE	05/21/1997	940	1146	1355	22	41	16.198	72	4.982	80'	W	700	10	RDB	91-10-015
NDA-96	14936	199602834	GALES FERRY MARINA	GALES FERRY MARINA ENTRANCE	05/22/1997	1155	1350	1555	22	41	16.188	72	4.906	10'	S	650	10	RDB	91-10-015
NDA-96	14935	199602834	GALES FERRY MARINA	GALES FERRY MARINA ENTRANCE	05/22/1997	2255	113	315	22	41	16.197	72	4.926	10'	SW	700	10	RDB	91-10-015
NDA-96	14934	199602834	GALES FERRY MARINA	GALES FERRY MARINA ENTRANCE	05/23/1997	2310	107	240	19	41	16.185	72	4.918	20'	SE	650	10	RDB	91-10-015

Total Volume Disposed at the NDA-96 buoy yd^3	4475
Total Volume Disposed at the NDA-96 buoy m^3	3421.59

A7
1997-98 Disposal Season

ID	Permit#	Permittee	Project Name	Site	Date		Time of Disposal				Loran	Loran		Lat Deg	Lat Min	Lon Deg	Lon Min	Vol(C^3)	Vol(M^3)	Draft	Insp Initial	Insp #
15001	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19970910	320	411	500	7	0	0	0	0	41	16.23	72	4.51	300	229.5	8	RBD	91-10-015
15000	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971010	425	515	605	7	0	0	0	0	41	16.24	72	4.4	300	229.5	8	RBD	91-10-015
15005	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971010	1701	1754	1846	6	0	26134.7	43975.7	0	41	16.235	72	4.501	400	306	9	RPC	91-10-009
15004	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971011	530	620	710	6	0	26134.8	43975.7	0	41	16.232	72	4.513	400	306	9	RPC	91-10-009
15006	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971011	530	620	710	6	0	26134.8	43975.7	0	41	16.232	72	4.513	400	306	9	RPC	91-10-009
15007	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971011	1800	1840	1935	6	0	26134.8	43975.7	0	41	16 232	72	4.513	400	306	9	RPC	91-10-009
15008	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971012	600	650	740	6	0	26134.7,	43975.7	0	41	16 235	72	4.501	200	153	7.5	RPC	91-10-009
15010	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971013	702	752	845	6	0	26134.7	43975.6	0	41	16.221	72	4.505	200	153	8	RPC	91-10-009
15009	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971013	1945	2030	2115	6	0	26134.7	43975.7	0	41	16.235	72	4.501	250	191.25	8	RPC	91-10-009
15011	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971013	1945	2032	2125	6	0	26134.7	43975.6	0	41	16.221	72	4.505	300	229.5	9	RPC	91-10-009
15013	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971014	810	901	955	6	0	26134.7	43975.7	0	41	16.235	72	4.501	350	267.75	9	RPC	91-10-009
15014	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19971014	2150	2238	10	4	0	26134.7	43975.6	0	41	16.221	72	4.505	100	76.5	7	RDB	91-10-015
15621	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19980404	1605	1657	1745	7	0	26134.9	43975.7	0	41	16.23	72	4.525	200	153	8	RDB	91-10-015
15622	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19980405	1745	1832	1920	7	0	26134.8	43975.7	0	41	16.232	72	4.513	300	229.5	9	RDB	91-10-015
15623	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19980406	1910	1957	2040	7	0	26234.6	43975.6	0	41	13.697	72	16.417	100	76.5	7	RDB	91-10-015
15624	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19980407	735	825	915	7	0	26134.8	43975.7	0	41	16.232	72	4.513	200	153	8	RDB	91-10-015
15625	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19980408	610	656	1140	17	0	26134.7	43975.7	0	41	16 235	72	4.501	150	114.75	7	RDB	91-10-015
15626	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19980408	2040	2130	2215	7	0	26134.7	43975.6	0	41	16 221	72	4.505	150	114.75	7	RDB	91-10-015
15627	199000882	SHENNECOSSETT YACHT CL	PINE ISLAND BAY	NLDS	19980409	2040	2130	2230	7	0	26134.8	43975.7	0	41	16.232	72	4.513	200	153	8	RDB	91-10-015
																Project Total		4900	3748.5			
15019	199602834	GALES FERRY MARINA	G. F. MARINA ENTRANCE	NLDS	19971015	2145	19	340	22	0	26134.7	43975.7	0	41	16 235	72	4.501	700	535.5	10	RDB	91-10--015
15020	199602834	GALES FERRY MARINA	G. F. MARINA ENTRANCE	NLDS	19971016	1055	1302	1540	22	0	26134.7	43975.7	0	41	16 235	72	4.501	800	612	10	RDB	91-10--015
15021	199602834	GALES FERRY MARINA	G. F. MARINA ENTRANCE	NLDS	19971017	2330	148	440	22	0	26134.8	43975.7	0	41	16.232	72	4.513	700	535.5	10	RDB	91-10--015
15022	199602834	GALES FERRY MARINA	G. F. MARINA ENTRANCE	NLDS	19971017	1145	1354	1555	22	0	26134.8	43975.8	0	41	16.246	72	4.509	650	497.25	9.5	RDB	91-10--015
15023	199602834	GALES FERRY MARINA	G. F. MARINA ENTRANCE	NLDS	19971018	5	229	440	22	0	26134.6	43975.7	0	41	16.237	72	4.469	600	459	9.5	RDB	91-10--015
15024	199602834	GALES FERRY MARINA	G. F. MARINA ENTRANCE	NLDS	19971018	1235	1440	1610	19	0	26134.6	43975.7	0	41	16.237	72	4.469	600	459	9.5	RDB	91-10--015
																Project Total		4050	3098 25			
																Season Total			6846.75			

Appendix B
REMOTS® Results

B1a

NL-91 and D/S Mound Complex 1992

Mound/ Ref. Area	Station	Rep.	Date	Time	Analyst	Latitude	Longitude	Successional Stage	Grain Size (phi)		Major Mode	Mudclasts		Camera Penetration				Dredged Material Thickness	Redox Rebound	
									Minimum	Maximum		Count	Diameter	Minimum	Maximum	Range	Mean		Min.	Max.
NL-91	100e	a	80892	124	jbc			Stage I	> 4	1	1 to 2	0	0	3.22	4.36	1.14	3.79	4.32	0	0
NL-91	100e	c	80892	125	jbc			Stage I	3	1	1 to 2	0	0	2.5	2.75	0.25	2.62	2.75	0	0
NL-91	100e	d	80992	1122	jbc			Stage I	> 4	1	2 to 3	0	0	4.52	5.21	0.69	4.86	5.21	0	0
NL-91	100e	e	80992	1122	jbc			Stage I	> 4	1	2 to 3	0	0	3.06	4.3	1.24	3.68	4.3	0	0
NL-91	100e	f	80992	1123	jbc			Stage I	> 4	1	2 to 3	0	0	5.68	6.24	0.56	5.96	6.24	0	0
NL-91	100n	a	80892	218	jbc			Stage I	>4	0	3 to 4	0	0	4.66	5.76	1.1	5.21	5.76	0	0
NL-91	100n	b	80892	219	jbc			x	> 4	2	3 to 4	0	0	1.1	2.37	1.27	1.74	2.37	0	0
NL-91	100n	c	80892	220	jbc			Stage I	>4	0	3 to 4	0	0	4.11	4.87	0.76	4.49	4.87	0	0
NL-91	100ne	a	80892	358	jbc			Stage II	> 4	2	3 to 4	0	0	9.74	10.12	0.38	9.93	9.99	0	0
NL-91	100ne	b	80892	359	jbc			Stage I ON Stage III	>4	0	3 to 4	0	0	5.33	7.7	2.37	6.52	7.5	0	0
NL-91	100ne	c	80892	359	jbc			Stage I	4	2	2 to 3	0	0	3.79	5.54	1.75	4.66	5.5	0	0
NL-91	100nw	a	80892	251	jbc			Stage II	4	1	2 to 3	0	0	7.79	11.7	3.91	9.74	0	0	0
NL-91	100nw	b	80892	254	jbc			Stage I	> 4	1	3 to 4	0	0	5.75	7	1.25	6.37	6.54	0	0
NL-91	100nw	c	80892	255	jbc			Stage I ON Stage III	> 4	1	2 to 3	0	0	6	8.74	2.74	7.37	8.79	0	0
NL-91	100s	a	80892	213	jbc			Stage I	> 4	1	1 to 2	0	0	2.03	2.71	0.68	2.37	2.71	0	0
NL-91	100s	b	80892	214	jbc			Stage I	>4	0	3 to 4	0	0	9.91	10.58	0.67	10.24	10.58	0	0
NL-91	100s	c	80892	214	jbc			Stage I ON Stage III	>4	0	2 to 3	0	0	7.32	9.19	1.87	8.25	9.19	0	0
NL-91	100se	a	80892	301	jbc			Stage I	> 4	1	2 to 3	0	0	7.62	8.83	1.21	8.22	8.62	0	0
NL-91	100se	b	80892	301	jbc			Stage I	4	1	2 to 3	0	0	5	8.24	3.24	6.62	8.08	0	0
NL-91	100se	c	80892	302	jbc			Stage I	> 4	1	3 to 4	0	0	3.37	8.29	4.92	5.83	7.95	0	0
NL-91	100sw	a	80892	351	jbc			x	x	x	x	0	0	0	0	0	0	0	0	0
NL-91	100sw	b	80892	352	jbc			x	x	x	x	0	0	0	0	0	0	0	0	0
NL-91	100sw	c	80892	352	jbc			Stage I	4	2	3 to 4	0	0	5.25	7.7	2.45	6.48	0	0	0
NL-91	100w	a	80892	132	jbc			Stage II	> 4	1	3 to 4	0	0	11.85	13.04	1.19	12.45	13.08	0	0
NL-91	100w	c	80892	134	jbc			Stage I	> 4	1	3 to 4	0	0	6.05	6.56	0.51	6.31	6.56	0	0
NL-91	200e	a	80892	120	jbc			Stage II ON Stage III	> 4	1	3 to 4	0	0	8.34	8.85	0.51	8.59	8.85	0	0
NL-91	200e	b	80892	120	jbc			Stage II	> 4	1	3 to 4	0	0	9.35	12.23	2.88	10.79	12.23	0	0
NL-91	200e	c	80892	121	jbc			Stage I	> 4	1	3 to 4	0	0	10.24	10.84	0.6	10.54	10.84	0	0
NL-91	200n	a	80892	223	jbc			Stage III	> 4	1	3 to 4	0	0	5.84	7.49	1.65	6.67	7.49	0	0
NL-91	200n	b	80892	223	jbc			x	4	1	3 to 4	0	0	0.89	1.78	0.89	1.33	1.78	0	0
NL-91	200n	c	80892	224	jbc			Stage I	>4	0	3 to 4	0	0	4.91	5.25	0.34	5.08	5.25	0	0
NL-91	200ne	a	80892	404	jbc			Stage I ON Stage III	> 4	1	3 to 4	0	0	10.45	10.91	0.46	10.68	10.83	0	0
NL-91	200ne	b	80892	405	jbc			Stage I ON Stage III	> 4	2	> 4	0	0	8.49	9.62	1.13	9.06	9.79	0	0
NL-91	200ne	c	80892	405	jbc			Stage I	4	1	2 to 3	0	0	7.87	8.95	1.08	8.41	8.83	0	0
NL-91	200nw	a	80892	242	jbc			Stage II	4	1	2 to 3	0	0	10.7	11.87	1.17	11.28	0	0	0
NL-91	200nw	b	80892	245	jbc			INDET	4	1	3 to 4	0	0	6.04	8.49	2.45	7.27	8.49	0	0
NL-91	200nw	c	80892	246	jbc			Stage I	> 4	1	3 to 4	0	0	10.91	11.66	0.75	11.28	11.83	0	0
NL-91	200s	a	80892	208	jbc			Stage II	> 4	1	3 to 4	0	0	11.85	12.66	0.81	12.25	12.66	0	0
NL-91	200s	b	80892	209	jbc			Stage II	> 4	1	3 to 4	0	0	12.36	13.38	1.02	12.87	13.38	0	0
NL-91	200s	c	80892	210	jbc			Stage II	> 4	2	3 to 4	2	0.34	12.66	13.33	0.67	13	13.33	0	0
NL-91	200se	a	80892	305	jbc			x	x	x	x	0	0	0	0	0	0	0	0	0
NL-91	200se	c	80892	306	jbc			Stage II	4	2	3 to 4	0	0	15.49	16.7	1.21	16.09	16.61	0	0
NL-91	200sw	a	80892	342	jbc			Stage I	> 4	2	3 to 4	0	0	3.12	6.2	3.08	4.66	6.45	0	0
NL-91	200sw	b	80892	342	jbc			Stage II	> 4	1	3 to 4	0	0	9.33	11.41	2.08	10.37	11.08	0	0
NL-91	200sw	c	80892	345	jbc			x	x	x	x	0	0	0	0	0	0	0	0	0
NL-91	200w	a	80892	136	jbc			Stage I	> 4	1	> 4	0	0	6.35	6.9	0.55	6.62	6.9	0	0
NL-91	200w	b	80892	137	jbc			Stage I	> 4	1	3 to 4	0	0	6.77	7.7	0.93	7.24	7.7	0	0
NL-91	200w	c	80892	138	jbc			Stage I	> 4	1	3 to 4	0	0	6.73	7.2	0.47	6.96	7.2	0	0
NL-91	300e	a	80892	111	jbc			x	> 4	1	2 to 3	0	0	0	0	0	0	0	0	0
NL-91	300e	b	80892	111	jbc			Stage I	> 4	1	3 to 4	0	0	8.59	9.82	1.23	9.21	9.82	0	0
NL-91	300e	c	80892	112	jbc			Stage I	> 4	1	3 to 4	0	0	8.09	8.85	0.76	8.47	8.85	0	0
NL-91	300ene	a	80992	1057	jbc			Stage I	4	0	3 to 4	0	0	1.52	2.46	0.94	1.99	2.46	0	0
NL-91	300ene	b	80992	1058	jbc			x	3	0	2 to 3	0	0	4.06	4.66	0.6	4.36	0	0	0
NL-91	300ene	c	80992	1058	jbc			Stage I ON Stage III	> 4	1	3 to 4	0	0	5.08	7.15	2.07	6.12	0	0	0
NL-91	300n	a	80892	227	jbc			Stage I	>4	0	2 to 3	0	0	7.45	7.92	0.47	7.68	7.92	0	0
NL-91	300n	b	80892	230	jbc			Stage I ON Stage III	>4	0	2 to 3	0	0	4.44	5.25	0.81	4.85	5.25	0	0
NL-91	300n	c	80892	231	jbc			x	x	x		0	0	0	0	0	0	0	0	0
NL-91	300s	a	80892	203	jbc			Stage I	-> 4	-1	1 to 2	0	0	9.57	10.2	0.63	9.88	10.2	0	0
NL-91	300s	b	80892	205	jbc			Stage I	-> 4	-1	1 to 2	0	0	9.4	9.82	0.42	9.61	9.82	0	0
NL-91	300s	c	80892	206	jbc			Stage I	>4	0	1 to 2	1	0.51	10.37	11.05	0.68	10.71	11.05	0	0
NL-91	300se	a	80992	1224	jbc			Stage II	> 4	1	3 to 4	2	0.43	16.45	17.56	1.11	17	17.56	0	0

Mound/ Ref. Area	Station	Rep	Apparent RPD Thickness Area	Minimum	Maximum	Mean	Mound/ Ref. Area	Station	Rep.	OSI	Methane Count	Surface Disturbance	Low DO	Comments
NL-91	100e	a	20.51	0.68	2.29	1.485	NL-91	100e	a	3	0	Biological	NO	some slope sa cap over dm
NL-91	100e	c	34.33	2.24	2.79	2.515	NL-91	100e	c	5	0	Physical	NO	sand cap material
NL-91	100e	d	22.19	1.08	2.07	1.575	NL-91	100e	d	4	0	Biological	NO	cap material? rpd hard to see
NL-91	100e	e	11.67	0.6	1.08	0.84	NL-91	100e	e	3	0	Biological	NO	possibly cap? some slope
NL-91	100e	f	28.66	1.51	2.54	2.025	NL-91	100e	f	4	0	Biological	NO	some shells plant debris on surface cap over dm?
NL-91	100n	a	99	99	99	99	NL-91	100n	a	99	0	Biological	NO	surface debris cap? sa with shell fragments
NL-91	100n	b	99	99	99	99	NL-91	100n	b	99	0	Physical	NO	hard ground hydroids rocks some shells
NL-91	100n	c	99	99	99	99	NL-91	100n	c	99	0	Biological	NO	fine sand with shell fragments cap?
NL-91	100ne	a	31.18	1.75	2.75	2.25	NL-91	100ne	a	6	0	Biological	NO	x
NL-91	100ne	b	19.92	1	1.87	1.435	NL-91	100ne	b	7	0	Indeterminate	NO	thin sand venear
NL-91	100ne	c	26.16	1.71	2.12	1.915	NL-91	100ne	c	4	0	Physical	NO	relic dm?
NL-91	100nw	a	28.04	1.67	2.42	2.045	NL-91	100nw	a	6	0	Physical	NO	relic dm?
NL-91	100nw	b	43.02	1.92	4.29	3.105	NL-91	100nw	b	6	0	Physical	NO	relic dm?
NL-91	100nw	c	36.73	1.92	3.41	2.665	NL-91	100nw	c	9	0	Physical	NO	x
NL-91	100s	a	35.7	2.24	2.96	2.6	NL-91	100s	a	5	0	Biological	NO	hydroids tape grass blade some shells cap piece wood in bckgrd
NL-91	100s	b	99	99	99	99	NL-91	100s	b	99	0	Biological	NO	beige clay thin layer cap
NL-91	100s	c	99	99	99	99	NL-91	100s	c	99	0	Biological	NO	some shell fragments sand cap
NL-91	100se	a	23.39	1.42	2	1.71	NL-91	100se	a	4	0	Physical	NO	light colored sand over dark dredged material
NL-91	100se	b	21.96	1.04	2.17	1.605	NL-91	100se	b	4	0	Physical	NO	x
NL-91	100se	c	10.94	0.58	1	0.79	NL-91	100se	c	3	0	Physical	NO	
NL-91	100sw	a	0	0	0	0	NL-91	100sw	a	99	0	x	NO	
NL-91	100sw	b	99	99	99	99	NL-91	100sw	b	99	0	x	NO	
NL-91	100sw	c	32.9	1.29	3.5	2.395	NL-91	100sw	c	5	0	Biological	NO	
NL-91	100w	a	99	99	99	99	NL-91	100w	a	99	0	Biological	NO	
NL-91	100w	c	99	99	99	99	NL-91	100w	c	99	0	Biological	NO	
NL-91	200e	a	7.5	0.34	0.76	0.55	NL-91	200e	a	6	0	Biological	NO	
NL-91	200e	b	11.89	0.51	1.27	0.89	NL-91	200e	b	5	0	Physical	NO	
NL-91	200e	c	21.04	1.14	2.07	1.605	NL-91	200e	c	4	0	Biological	NO	
NL-91	200n	a	99	99	99	99	NL-91	200n	a	99	0	Biological	NO	
NL-91	200n	b	9.09	0.3	1.06	0.68	NL-91	200n	b	99	0	Biological	NO	
NL-91	200n	c	25.8	1.61	2.2	1.905	NL-91	200n	c	4	0	Biological	NO	
NL-91	200ne	a	35.01	2.21	2.87	2.54	NL-91	200ne	a	9	0	Biological	NO	
NL-91	200ne	b	25.54	1.12	2.58	1.85	NL-91	200ne	b	8	0	Biological	NO	
NL-91	200ne	c	23.39	0.5	2.91	1.705	NL-91	200ne	c	4	0	Physical	NO	
NL-91	200nw	a	61.22	3.58	5.33	4.455	NL-91	200nw	a	9	0	Biological	NO	
NL-91	200nw	b	47.06	2.17	4.62	3.395	NL-91	200nw	b	99	0	Biological	NO	
NL-91	200nw	c	44.63	2.33	4.16	3.245	NL-91	200nw	c	6	0	Biological	NO	
NL-91	200s	a	25.52	1.61	2.16	1.885	NL-91	200s	a	6	0	Biological	NO	
NL-91	200s	b	19.94	0.89	2.07	1.48	NL-91	200s	b	5	0	Biological	NO	
NL-91	200s	c	5.13	0.17	0.59	0.38	NL-91	200s	c	4	0	Biological	NO	
NL-91	200se	a	0	0	0	0	NL-91	200se	a	99	0	x	NO	
NL-91	200se	c	30.8	1.33	3.16	2.245	NL-91	200se	c	6	0	Biological	NO	
NL-91	200sw	a	21.3	0.83	2.25	1.54	NL-91	200sw	a	4	0	Biological	NO	
NL-91	200sw	b	29.38	1	3.29	2.145	NL-91	200sw	b	6	0	Physical	NO	
NL-91	200sw	c	0	0	0	0	NL-91	200sw	c	99	0	x	NO	
NL-91	200w	a	16	0.42	1.95	1.185	NL-91	200w	a	3	0	Biological	NO	
NL-91	200w	b	33.63	1.78	3.22	2.5	NL-91	200w	b	5	0	Biological	NO	
NL-91	200w	c	9.97	0.38	1.1	0.74	NL-91	200w	c	2	0	Biological	NO	
NL-91	300e	a	0	0	0	0	NL-91	300e	a	99	0	Biological	NO	
NL-91	300e	b	23.65	1.06	2.46	1.76	NL-91	300e	b	4	0	Biological	NO	
NL-91	300e	c	41.99	2.92	3.26	3.09	NL-91	300e	c	6	0	Biological	NO	
NL-91	300ene	a	11.2	0.55	1.06	0.805	NL-91	300ene	a	3	0	Biological	NO	
NL-91	300ene	b	99	99	99	99	NL-91	300ene	b	99	0	Indeterminate	NO	
NL-91	300ene	c	9.11	0.42	0.89	0.655	NL-91	300ene	c	6	0	Physical	NO	
NL-91	300n	a	23.37	1.1	2.33	1.715	NL-91	300n	a	4	0	Biological	NO	
NL-91	300n	b	13.23	0.51	1.44	0.975	NL-91	300n	b	7	0	Physical	NO	
NL-91	300n	c	0	0	0	0	NL-91	300n	c	99	0	x	NO	
NL-91	300s	a	99	99	99	99	NL-91	300s	a	99	0	Physical	NO	
NL-91	300s	b	99	99	99	99	NL-91	300s	b	99	0	Physical	NO	
NL-91	300s	c	99	99	99	99	NL-91	300s	c	99	0	Biological	NO	
NL-91	300se	a	3.31	0	0.47	0.235	NL-91	300se	a	4	0	Biological	NO	

Mound/ Ref. Area	Station	Rep.	Date	Time	Analyst	Latitude	Longitude	Successional Stage	Grain Size (phi) Minimum	Grain Size (phi) Maximum	Major Mode	Mudclasts Count	Mudclasts Diameter	Camera Penetration Minimum	Camera Penetration Maximum	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness	Redox Rebound Min	Redox Rebound Max.
NL-91	300se	b	80992	1226	jbc			Stage II	>4	0	3 to 4	0	0	12.48	16.92	4.44	14.7	16.92	0	0
NL-91	300se	c	80992	1227	jbc			Stage II	> 4	1	3 to 4	2	0.6	18.9	19.98	1.08	19.44	19.98	0	0
NL-91	300sse	a	80992	1248	jbc			Stage II	> 4	1	3 to 4	0	0	17.13	17.44	0.31	17.28	17.44	0	0
NL-91	300sse	b	80992	1249	jbc			x	> 4	1	3 to 4	6	0.35	14.66	15.2	0.54	14.93	15.2	0	0
NL-91	300sse	c	80992	1250	jbc			Stage I	4	1	2 to 3	0	0	2.45	3.01	0.56	2.73	0	0	0
NL-91	300w	a	80892	141	jbc			x	> 4	1	3 to 4	0	0	1.14	3.73	2.59	2.43	3.73	0	0
NL-91	300w	b	80892	142	jbc			x	> 4	1	3 to 4	0	0	0	0	0	0	0	0	0
NL-91	300w	c	80892	142	jbc			x	> 4	1	> 4	0	0	1.86	3.85	1.99	2.86	3.85	0	0
NL-91	400e	a	80892	106	jbc			Stage II ON Stage III	> 4	1	3 to 4	0	0	8.85	9.44	0.59	9.14	9.44	0	0
NL-91	400e	b	80892	107	jbc			Stage I ON Stage III	-> 4	-1	3 to 4	0	0	7.49	8.38	0.89	7.94	8.38	0	0
NL-91	400e	c	80892	108	jbc			Stage II ON Stage III	>4	0	3 to 4	0	0	11.18	11.56	0.38	11.37	11.56	0	0
NL-91	400ene	a	80992	1103	jbc			Stage I	>4	0	3 to 4	0	0	8.13	9.86	1.73	9	0	0	0
NL-91	400ene	b	80992	1104	jbc			Stage I	> 4	1	3 to 4	0	0	10.2	11.26	1.06	10.73	0	0	0
NL-91	400ene	c	80992	1105	jbc			x	4	0	2 to 3	0	0	2.12	3.56	1.44	2.84	3.56	0	0
NL-91	400n	a	80892	234	jbc			x	> 4	1	2 to 3	0	0	3.98	4.4	0.42	4.19	4.4	0	0
NL-91	400n	b	80892	236	jbc			Stage I ON Stage III	>4	0	3 to 4	0	0	4.83	6.22	1.39	5.52	6.22	0	0
NL-91	400n	c	80892	237	jbc			x	4	1	3 to 4	0	0	0.59	1.78	1.19	1.19	1.78	0	0
NL-91	400s	a	80892	159	jbc			Stage I	> 4	1	3 to 4	0	0	6.18	7.28	1.1	6.73	7.28	0	0
NL-91	400s	b	80892	200	jbc			x	-> 4	-1	-1 to 0	0	0	1.99	2.29	0.3	2.14	0	0	0
NL-91	400s	c	80892	201	jbc			x	> 4	1	3 to 4	0	0	3.13	4.23	1.1	3.68	0	0	0
NL-91	400se	a	80992	1216	jbc			Stage II	> 4	1	2 to 3	0	0	14.87	15.29	0.42	15.08	15.29	0	0
NL-91	400se	b	80992	1216	jbc			Stage II	> 4	1	3 to 4	0	0	13.17	14.34	1.17	13.75	14.34	0	0
NL-91	400se	c	80992	1217	jbc			Stage II	> 4	1	3 to 4	1	0.29	8.61	10.25	1.64	9.43	10.25	0	0
NL-91	400se	d	80992	1219	jbc			Stage II	> 4	1	3 to 4	0	0	13.78	15.16	1.38	14.47	15.16	0	0
NL-91	400see	a	80992	1153	jbc			Stage I -> II	> 4	1	3 to 4	5	0.42	16.55	17.64	1.09	17.09	17.64	0	0
NL-91	400see	b	80992	1154	jbc			Stage I	> 4	1	3 to 4	1	0.57	18.96	19.31	0.35	19.14	19.31	0	0
NL-91	400see	c	80992	1154	jbc			Stage I	> 4	1	> 4	1	0.39	14.42	15.54	1.12	14.98	15.54	0	0
NL-91	400sse	a	80992	1242	jbc			Stage I -> II	> 4	1	2 to 3	0	0	8.82	10.5	1.68	9.66	0	0	0
NL-91	400sse	b	80992	1243	jbc			Stage II ON Stage III	>4	0	2 to 3	0	0	10.29	10.96	0.67	10.63	0	0	0
NL-91	400sse	c	80992	1243	jbc			Stage II	>4	0	2 to 3	0	0	8.44	8.86	0.42	8.65	0	0	0
NL-91	400w	a	80892	145	jbc			x	> 4	1	3 to 4	0	0	1.19	1.78	0.59	1.48	1.78	0	0
NL-91	400w	b	80892	146	jbc			x	>4	0	3 to 4	0	0	2.07	3.05	0.98	2.56	3.05	0	0
NL-91	400w	c	80892	146	jbc			Stage I	> 4	1	2 to 3	0	0	6.18	6.94	0.76	6.56	6.94	0	0
NL-91	500e	a	80992	1115	jbc			Stage II	>4	0	3 to 4	0	0	9.23	9.82	0.59	9.52	9.82	0	0
NL-91	500e	b	80992	1116	jbc			Stage I ON Stage III	>4	0	2 to 3	0	0	6.56	7.2	0.64	6.88	0	0	0
NL-91	500e	c	80992	1116	jbc			Stage II ON Stage III	>4	0	3 to 4	0	0	8.97	10.75	1.78	9.86	10.75	0	0
NL-91	500s	a	80992	1257	jbc			Stage II ON Stage III	>4	0	3 to 4	0	0	11.17	12.01	0.84	11.59	0	0	0
NL-91	500s	b	80992	1257	jbc			x	> 4	1	3 to 4	0	0	5.04	6.67	1.63	5.85	0	0	0
NL-91	500s	c	80992	1258	jbc			x	4	1	3 to 4	0	0	3.01	4.52	1.51	3.77	0	0	0
NL-91	500se	a	80992	1207	jbc			Stage I	> 4	1	3 to 4	0	0	16.45	17.51	1.06	16.98	17.51	0	0
NL-91	500se	b	80992	1211	jbc			x	> 4	1	3 to 4	3	0.39	15.58	17.89	2.31	16.74	17.89	0	0
NL-91	500see	a	80992	1148	jbc			Stage II	> 4	2	> 4	0	0	0	0	0	0	0	0	0
NL-91	500see	b	80992	1149	jbc			Stage I -> II	> 4	1	3 to 4	0	0	14.41	17.7	3.29	16.05	17.7	0	0
NL-91	500see	c	80992	1150	jbc			Stage II	-> 4	-1	3 to 4	2	0.67	18.16	19.11	0.95	18.63	19.11	0	0
NL-91	500sse	a	80992	1236	jbc			Stage II ON Stage III	> 4	1	3 to 4	0	0	8.32	9.53	1.21	8.93	0	0	0
NL-91	500sse	b	80992	1237	jbc			Stage II ON Stage III	> 4	1	3 to 4	0	0	9.2	9.95	0.75	9.58	0	0	0
NL-91	500sse	c	80992	1237	jbc			Stage II	> 4	1	3 to 4	0	0	12.35	12.52	0.17	12.43	0	0	0
NL-91	600e	a	80992	1111	jbc			Stage II ON Stage III	> 4	1	3 to 4	1	0.43	10.79	11.6	0.81	11.2	11.6	0	0
NL-91	600e	b	80992	1112	jbc			Stage II ON Stage III	> 4	1	3 to 4	2	0.43	9.82	11.01	1.19	10.41	11.01	0	0
NL-91	600e	c	80992	1112	jbc			Stage I ON Stage III	> 4	1	3 to 4	0	0	9.95	10.62	0.67	10.29	10.62	0	0
NL-91	600s	a	80992	1045	jbc			Stage I ON Stage III	>4	0	3 to 4	0	0	11.28	12.27	0.99	11.77	0	0	0
NL-91	600s	b	80992	1049	jbc			Stage I ON Stage III	>4	0	3 to 4	0	0	9.64	10.16	0.52	9.9	0	0	0
NL-91	600s	c	80992	1050	jbc			Stage III	>4	0	3 to 4	0	0	10.15	12.86	2.71	11.51	0	0	0
NL-91	600se	a	80992	1200	jbc			Stage I	>4	0	2 to 3	0	0	8.02	9.2	1.18	8.61	0	0	0
NL-91	600se	b	80992	1201	jbc			Stage II	> 4	1	3 to 4	1	0.76	10	11.17	1.17	10.58	0	0	0
NL-91	600se	c	80992	1202	jbc			Stage II	> 4	1	3 to 4	0	0	10.71	13.52	2.81	12.12	13.52	0	0
NL-91	600see	a	80992	1143	jbc			Stage I -> II	> 4	1	3 to 4	0	0	11.16	11.87	0.71	11.51	11.87	0	0
NL-91	600see	b	80992	1144	jbc			Stage II	-> 4	-1	3 to 4	1	0.62	12.45	13.78	1.33	13.12	13.78	0	0
NL-91	600see	c	80992	1145	jbc			Stage II	> 4	1	3 to 4	5	0.42	10.7	11.24	0.54	10.97	11.24	0	0
NL-91	ctr	a	80892	128	jbc			Stage I ON Stage III	>4	0	2 to 3	0	0	6.18	6.73	0.55	6.46	6.65	0	0
NL-91	ctr	b	80892	129	jbc			Stage I	>4	0	1 to 2	0	0	8.04	8.42	0.38	8.23	8.42	0	0
NL-91	ctr	c	80892	130	jbc			Stage I	>4	0	1 to 2	0	0	7.75	8.34	0.59	8.04	0	0	0

Mound/ Ref. Area	Station	Rep.	Apparent RPD Thickness Area	Minimum	Maximum	Mean	Mound/ Ref. Area	Station	Rep	OSI	Methane Count	Surface Disturbance	Low DO	Comments
NL-91	300se	b	10.84	0	1.55	0.775	NL-91	300se	b	5	0	Physical	NO	
NL-91	300se	c	3.59	0	0.52	0.26	NL-91	300se	c	4	0	Physical	NO	
NL-91	300sse	a	8.9	0.34	0.95	0.645	NL-91	300sse	a	4	0	Biological	NO	
NL-91	300sse	b	9.87	0.34	1.09	0.715	NL-91	300sse	b	99	0	Physical	NO	
NL-91	300sse	c	13.94	0.56	1.42	0.99	NL-91	300sse	c	3	0	Physical	NO	
NL-91	300w	a	16.39	0.34	2.07	1.205	NL-91	300w	a	99	0	Biological	NO	
NL-91	300w	b	99	99	99	99	NL-91	300w	b	99	0	Biological	NO	
NL-91	300w	c	5.4	0.17	0.63	0.4	NL-91	300w	c	99	0	Biological	NO	
NL-91	400e	a	16.24	0.38	2.03	1.205	NL-91	400e	a	7	0	Biological	NO	
NL-91	400e	b	12.9	0.85	1.06	0.955	NL-91	400e	b	7	0	Biological	NO	
NL-91	400e	c	99	99	99	99	NL-91	400e	c	99	0	Biological	NO	
NL-91	400ene	a	23.07	0.8	2.54	1.67	NL-91	400ene	a	4	0	Physical	NO	
NL-91	400ene	b	4.72	0.13	0.55	0.34	NL-91	400ene	b	2	0	Biological	NO	
NL-91	400ene	c	99	99	99	99	NL-91	400ene	c	99	0	Physical	NO	
NL-91	400n	a	99	99	99	99	NL-91	400n	a	99	0	Biological	NO	
NL-91	400n	b	99	99	99	99	NL-91	400n	b	99	0	Biological	NO	
NL-91	400n	c	99	99	99	99	NL-91	400n	c	99	0	Physical	NO	
NL-91	400s	a	17.07	0.76	1.74	1.25	NL-91	400s	a	3	0	Biological	NO	
NL-91	400s	b	99	99	99	99	NL-91	400s	b	99	0	Physical	NO	
NL-91	400s	c	12.37	0.47	1.35	0.91	NL-91	400s	c	99	0	Physical	NO	
NL-91	400se	a	2.31	0	0.34	0.17	NL-91	400se	a	0	0	Biological	YES	
NL-91	400se	b	3.59	0	0.52	0.26	NL-91	400se	b	4	0	Biological	NO	
NL-91	400se	c	8.05	0.13	1.05	0.59	NL-91	400se	c	4	0	Physical	NO	
NL-91	400se	d	5.14	0.29	0.46	0.375	NL-91	400se	d	4	0	Biological	NO	
NL-91	400see	a	5.43	0.25	0.55	0.4	NL-91	400see	a	3	0	Biological	NO	
NL-91	400see	b	7.51	0	1.08	0.54	NL-91	400see	b	2	0	Physical	NO	
NL-91	400see	c	5.74	0.22	0.6	0.41	NL-91	400see	c	2	0	Physical	NO	
NL-91	400sse	a	12.29	0.29	1.51	0.9	NL-91	400sse	a	4	0	Biological	NO	
NL-91	400sse	b	28.15	1.34	2.73	2.035	NL-91	400sse	b	8	0	Physical	NO	
NL-91	400sse	c	9.09	0.42	0.92	0.67	NL-91	400sse	c	4	0	Biological	NO	
NL-91	400w	a	10.35	0.59	0.93	0.76	NL-91	400w	a	99	0	Physical	NO	
NL-91	400w	b	8.65	0.3	0.97	0.635	NL-91	400w	b	99	0	Biological	NO	
NL-91	400w	c	12.61	0.42	1.44	0.93	NL-91	400w	c	3	0	Biological	NO	
NL-91	500e	a	17.94	0.59	2.03	1.31	NL-91	500e	a	5	0	Biological	NO	
NL-91	500e	b	33.96	1.48	3.47	2.475	NL-91	500e	b	9	0	Biological	NO	
NL-91	500e	c	19.74	0.93	1.95	1.44	NL-91	500e	c	7	0	Physical	NO	
NL-91	500s	a	25.28	1.6	2.14	1.87	NL-91	500s	a	8	0	Biological	NO	
NL-91	500s	b	15.66	0.52	1.72	1.12	NL-91	500s	b	99	0	Physical	NO	
NL-91	500s	c	17.32	0.47	1.98	1.225	NL-91	500s	c	99	0	Indeterminate	NO	
NL-91	500se	a	6.09	0.3	0.59	0.445	NL-91	500se	a	2	0	Biological	NO	
NL-91	500se	b	3.44	0	0.5	0.25	NL-91	500se	b	99	0	Physical	NO	
NL-91	500see	a	99	99	99	99	NL-91	500see	a	99	0	x	NO	
NL-91	500see	b	7.33	0	1.08	0.54	NL-91	500see	b	3	0	Physical	NO	
NL-91	500see	c	12.76	0.46	1.42	0.94	NL-91	500see	c	5	0	Biological	NO	
NL-91	500sse	a	12.33	0.34	1.47	0.905	NL-91	500sse	a	7	0	Physical	NO	
NL-91	500sse	b	31.63	1.68	2.9	2.29	NL-91	500sse	b	9	0	Biological	NO	
NL-91	500sse	c	20.95	1.09	2.02	1.555	NL-91	500sse	c	6	0	Biological	NO	
NL-91	600e	a	5.52	0.17	0.63	0.4	NL-91	600e	a	6	0	Biological	NO	
NL-91	600e	b	9.96	0.34	1.1	0.72	NL-91	600e	b	6	0	Biological	NO	
NL-91	600e	c	13.1	0.47	1.44	0.955	NL-91	600e	c	7	0	Biological	NO	
NL-91	600s	a	18.18	1.08	1.51	1.295	NL-91	600s	a	7	0	Biological	NO	
NL-91	600s	b	13.64	0.69	1.25	0.97	NL-91	600s	b	7	0	Biological	NO	
NL-91	600s	c	12.9	0.89	2.54	1.715	NL-91	600s	c	8	0	Biological	NO	
NL-91	600se	a	11.47	0.59	1.09	0.84	NL-91	600se	a	3	0	Biological	NO	
NL-91	600se	b	11.09	0.55	1.05	0.8	NL-91	600se	b	5	0	Biological	NO	
NL-91	600se	c	99	99	99	99	NL-91	600se	c	99	0	Physical	NO	
NL-91	600see	a	5.08	0.12	0.62	0.37	NL-91	600see	a	3	0	Biological	NO	
NL-91	600see	b	3.1	0.12	0.33	0.225	NL-91	600see	b	4	0	Biological	NO	
NL-91	600see	c	2.54	0	0.37	0.185	NL-91	600see	c	4	0	Biological	NO	
NL-91	ctr	a	23.8	0.93	2.58	1.755	NL-91	ctr	a	8	0	Biological	NO	
NL-91	ctr	b	33.65	2.12	2.84	2.48	NL-91	ctr	b	5	0	Biological	NO	
NL-91	ctr	c	22.43	0.97	2.33	1.65	NL-91	ctr	c	4	0	Biological	NO	

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NL-91 and D/S Mound Complex 1995

Station	Rep	Date	Successional Stage	Grain Size (phi) Min.	Grain Size (phi) Max.	Major Mode	Mud Clasts No.	Mud Clasts Dia.	Camera Penetration Min.	Camera Penetration Max.	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness Area	Dredged Material Thickness Min.	Dredged Material Thickness Max.	Dredged Material Thickness Mean	Redox Rebound Min.	Redox Rebound Max.	Redox Rebound Mean	Apparent RPD Thickness Area	Apparent RPD Thickness Min.	Apparent RPD Thickness Max.	Apparent RPD Thickness Mean	Methane Bubbles/Diameter No.	Methane Bubbles/Diameter Area	Methane Bubbles/Diameter Min.	Methane Bubbles/Diameter Max.	Methane Bubbles/Diameter Mean	OSI	Surface Disturbance	Low DO	Comments
100E	A	08/25/9	ST_I_ON_III	1	>4	>4	0	0	10.63	12.77	2.14	11.7	157.54	10.44	12.82	11.43	0.97	10.97	5.97	17.264	0.58	2.28	1.24	0	0	0	0	0	7	BIOGENIC	NO	S/M, DM > or = to pen ; Chaetopterus, amphipods
100E	B	08/25/9	ST_II_ON_III	2	>4	>4	0	0	17.09	17.77	0.68	17.43	238.67	12.96	17.96	17.51	0.83	7.58	4.2	17.264	0.58	2.28	1.24	0	0	0	0	0	7	BIOGENIC	NO	S/M, DM > or = to pen ; tubes and hydroids on surf
100E	C	08/25/9	ST_II_ON_III	2	>4	>4	0	0	14.81	16.02	1.21	15.41	206.99	14.71	15.87	15.27	0.05	8.3	4.18	21.421	0.1	4.56	1.53	0	0	0	0	0	8	BIOGENIC	NO	DM > or = to pen ; tube mat; Zostera
100N	A	08/25/9	ST_II_TO_III	2	>4	4 to 3	0	0	11.65	12.48	0.82	12.07	0	0	0	0	0	0	0	47.785	0.29	6.94	3.71	0	0	0	0	0	9	BIOGENIC	NO	Ambient ?, disturbed tube mat
100N	B	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	13.64	14.18	0.53	13.91	189.65	13.83	14.56	14.08	0	0	0	48.979	1.99	4.56	3.61	0	0	0	0	0	10	BIOGENIC	NO	Ambient?
100N	D	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	8.93	11.65	2.72	10.29	0	0	0	0	0	0	0	33.831	0.83	4.81	2.51	0	0	0	0	0	9	BIOGENIC	NO	Ambient, decaying amph. tubes, burrow; large feeding void
100S	A	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	10.1	13.11	3.01	11.6	158.77	10.24	13.11	11.84	0.83	8.74	4.7[illegible]	14.775	0.1	1.75	1.06	0	0	0	0	0	7	BIOGENIC	NO	S/M, DM > or = to pen.; ripped-up tube mat, cracks and voids
100S	B	08/25/9	ST_II_ON_III	2	>4	>4	5	0.42	12.77	14.18	1.41	13.47	184.42	6.84	14.56	13.6	0	0	0	16.199	0.19	3.74	1.22	3	0.366	0.25	0.74	0.49	5	BIOGENIC	NO	DM > or = to pen ; reduced clasts on surf over lg crack
100S	C	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	13.98	14.27	0.29	14.13	186.75	13.2	14.42	13.75	0.54	10.58	5.56	29.335	0.1	6.21	2.16	0	0	0	0	0	8	BIOGENIC	NO	S/M, DM > or = to pen ; tube mat
100W	A	08/25/9	ST_I_ON_III	0	>4	4 to 3	2	0.61	8.01	11.12	3.11	9.56	0	0	0	0	0	0	0	48.985	1.65	5.83	3.62	0	0	0	0	0	10	BIOGENIC	NO	Ambient; ripped-up tube mat
100W	B	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	7.23	8.98	1.75	8.11	0	0	0	0	0	0	0	38.391	0.05	5.29	2.78	0	0	0	0	0	9	BIOGENIC	NO	Ambient, ripped-up tube mat, hydroids and tubes; many sm. burrows
100W	C	08/25/9	ST_II_ON_III	2	>4	4 to 3	1	0.49	7.43	9.18	1.75	8.3	0	0	0	0	0	0	0	34.139	0.05	7.09	2.54	0	0	0	0	0	9	BIOGENIC	NO	Ambient; decaying tube mat
200E	A	08/25/9	ST_II_ON_III	2	>4	4 to 3	0	0	15.68	16.41	0.73	16.04	215.63	15.49	16.26	15.62	3.3	10.29	[illegible]	56.784	0.05	8.01	4.37	0	0	0	0	0	11	BIOGENIC	NO	DM > or = to pen ; crustacean burrows and sm. voids, amphipod tubes
200E	B	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	13.01	13.88	0.87	13.45	179.31	10.24	13.74	13.26	0	0	0	34.884	0.05	5.19	2.73	0	0	0	0	0	9	BIOGENIC	NO	S/M, DM > or = to pen ; amphi. tubes, sm voids, lg. crack or void, worm
200E	C	08/25/9	ST_II_ON_III	1	>4	>4	0	0	15.68	16.21	0.54	15.95	217.18	15.53	16.55	15.87	0	0	0	43.039	0.34	8.25	3.3	0	0	0	0	0	10	BIOGENIC	NO	S/M, DM > or = pen ; sm voids, cracks?, amphi. tubes; st. I's on tubes
200N	B	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	7.33	8.06	0.73	7.69	0	0	0	0	0	0	0	16.184	0.05	4.27	1.23	0	0	0	0	0	7	BIOGENIC	NO	RPD patchy; ambient, some wiper smear
200N	C	08/25/9	ST_II_ON_III	0	>4	3 to 2	0	0	10.78	12.19	1.41	11.48	0	0	0	0	0	0	0	25.616	0.53	4.9	1.88	0	0	0	0	0	8	BIOGENIC	NO	Ambient, tiny void on left
200N	D	08/26/9	ST_II_ON_III	1	>4	4 to 3	0	0	10.49	10.83	0.34	10.66	0	0	0	0	0	0	0	26.464	0.05	4.42	1.94	0	0	0	0	0	8	BIOGENIC	NO	Ambient, tube mat
200S	E	08/26/9	ST_II_ON_III	-1	>4	2 to 1	0	0	5.29	7.34	2.05	6.32	0	0	0	0	0	0	0	10.603	0.05	1.89	0.77	0	0	0	0	0	7	PHYSICAL	NO	Poorly sorted, S/M, some voids
200S	F	08/26/9	ST_I_ON_III	-1	>4	3 to 2	0	0	0.19	8.06	7.88	4.13	0	0	0	0	0	0	0	15.708	0.1	3.06	1.18	0	0	0	0	0	7	BIOGENIC	NO	S/M, granules and sand over mud, large burrow
200S	G	08/26/9	INDET	-1	>4	<-1	0	0	0.78	5.15	4.37	2.96	0	0	0	0	0	0	0	NA	NA	NA	NA	0	0	0	0	0	IND	PHYSICAL	NO	Underpenetrated, pebbles and shell has over mud
200W	D	08/26/9	ST_II_ON_III	-1	>4	3 to 2	0	0	6.6	8.74	2.14	7.67	99.08	6.65	8.5	7.27	0	0	0	35.175	0.34	5.29	2.57	0	0	0	0	0	9	BIOGENIC	NO	DM > or = to pen, S/M
200W	E	08/26/9	ST_II_ON_III	-1	>4	4 to 3	0	0	13.64	14.76	1.12	14.2	84.74	5.58	6.94	6.24	0	0	0	21.053	0.05	2.57	1.53	0	0	0	0	0	8	BIOGENIC	NO	DM over ambient
200W	F	08/26/9	ST_II_ON_III	1	>4	3 to 2	0	0	5.78	7.18	1.41	6.48	83.73	1.75	6.46	6.05	0	0	0	24.116	0.05	4.81	1.78	0	0	0	0	0	8	BIOGENIC	NO	DM > or = to pen , tube mat
300E	A	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	15.24	15.92	0.68	15.58	210.04	15.19	16.02	15.53	3.35	13.16	8.26	31.25	0.68	4.61	2.29	0	0	0	0	0	9	BIOGENIC	NO	S/M, DM > or = to pen ; amphipod tube mat
300E	B	08/25/9	ST_II_ON_III	0	>4	4 to 3	0	0	11.73	12.43	0.69	12.08	161.96	10.1	12.48	11.62	0.2	6.39	3.29	17.366	0.1	5.3	1.27	0	0	0	0	0	7	BIOGENIC	NO	S/M, amphipod tube; inc. podoconds, some clay lumps at depth
300E	C	08/25/9	ST_II	2	>4	>4	0	0	14.31	16.53	2.23	15.42	216.32	14.06	16.88	15.55	0.64	8.02	4.33	27.126	0.15	4.76	2.04	0	0	0	0	0	6	BIOGENIC	NO	S/M, DM > or = to pen ; lg. burrow in center, amphipod tube mat inc. podocerids
300N	A	08/25/9	ST_II	-1	>4	4 to 3	0	0	14.11	14.9	0.79	14.5	0	0	0	0	0	0	0	53.993	0.35	14.85	4.35	0	0	0	0	0	9	BIOGENIC	NO	Ambient, amphipod tube mat, deep burrow; some shell lag
300N	B	08/25/9	ST_II	-1	>4	>4	0	0	12.97	14.41	1.43	13.69	0	0	0	0	0	0	0	33.515	0.15	6.29	2.51	0	0	0	0	0	7	BIOGENIC	NO	Ambient, amphipod tube mat, tiny relict? void, shell lag
300N	C	08/25/9	ST_II_ON_III	-1	>4	>4	0	0	15.59	16.68	1.09	16.14	0	0	0	0	0	0	0	44.367	1.04	15.25	3.59	0	0	0	0	0	10	BIOGENIC	NO	Ambient, amphipod tubes; burrows to depth
400E	A	08/25/9	ST_II	-1	>4	>4	0	0	9.85	11.63	1.78	10.74	142.62	9.95	11.48	10.28	0	0	0	5.994	0.15	0.69	0.39	0	0	0	0	0	4	BIOGENIC	NO	v. reduced DM > or = pen ; RPD v. thin, raw amphi. tubes; 1 mussel sh
400E	B	08/25/9	ST_II	0	>4	>4	3	0.58	17.92	20.2	2.28	19.06	259.89	17.87	19.85	18.83	0	0	0	20.585	0.35	4.31	1.51	0	0	0	0	0	6	BIOGENIC	NO	DM > or = pen ; S/M, decaying amphipod tubes; lg. burrow
400E	D	08/26/9	ST_II_ON_III	2	>4	>4	0	0	13.17	13.42	0.25	13.29	175.72	12.72	13.42	12.99	1.29	7.48	4.38	26.533	1.29	4.75	1.92	0	0	0	0	0	8	BIOGENIC	NO	S/M, DM > or = pen ; dense amphipod tube mat
500E	A	08/25/9	ST_II_ON_III	2	>4	4 to 3	0	0	13.22	15.1	1.88	14.16	187.92	12.82	14.85	13.65	2.87	9.36	6.11	23.308	0.05	9.21	1.88	0	0	0	0	0	8	BIOGENIC	NO	DM > or = to pen ; S/M, amphipod tube mat
500E	B	08/25/9	ST_II_ON_III	0	>4	4 to 3	0	0	11.83	13.27	1.44	12.55	172.05	11.88	13.37	12.4	0.54	7.72	4.13	16.773	0.05	3.07	1.19	0	0	0	0	0	7	BIOGENIC	NO	S/M, DM > or = to pen ; amphipod tube mat, relict III?
500E	C	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	11.83	13.27	1.44	12.55	0	0	0	0	0	0	0	33.533	0.54	7.43	2.5	0	0	0	0	0	9	BIOGENIC	NO	Ambient; lg. void at depth, amphipod tubes, wiper artifacts
CTR	A	08/25/9	ST_II_ON_III	2	>4	4 to 3	0	0	12.33	15	2.67	13.67	191.45	13.69	14.95	14.02	1.27	14.17	7.72	60.991	0.97	6.17	3.78	0	0	0	0	0	11	BIOGENIC	NO	S/M, DM > or = to pen ; dense faunal assemblage on surf ; cracks and voids
CTR	B	08/25/9	ST_II_ON_III	1	>4	4 to 3	0	0	12.04	12.86	0.83	12.45	169.1	11.89	12.96	12.4	1.7	11.94	6.82	33.522	0.87	6.65	2.43	0	0	0	0	0	9	BIOGENIC	NO	S/M, DM > or = to pen ; tube mat
CTR	D	08/26/9	ST_II_ON_III	2	>4	4 to 3	0	0	13.01	14.71	1.7	13.86	189.84	5.49	14.66	13.74	0.54	10.4	5.47	36.517	0.24	6.8	2.78	0	0	0	0	0	9	BIOGENIC	NO	S/M, DM > or = to pen ; tube mat

IND = Indeterminate

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NL-91 and D/S Mound Complex 1997

Mound/ Ref. Area	Station	Rep.	Date	TIME	ANALYST	LATITUDE	LONGITUDE	Successional Stage	Grain Size (phi)		Major	Mudclasts		Camera Penetration				Dredged Material Thickness			
									Minimum	Maximum	Mode	Count	Diameter	Minimum	Maximum	Range	Mean	Area	Minimum	Maximum	Mean
D/S	100e	a	09/06/97	10:59	HLS	41 16.17127	072 04.358W	ST_I_ON_III	>4	3	>4	0	0.00	17.39	18.62	1.23	18.00	247.15	17.34	19.70	17.73
D/S	100e	b	09/06/97	10:59	HLS	41 16.17193	072 04.363W	ST_II_TO_III	>4	3	4 to 3	0	0.00	16.68	19.46	2.77	18.07	250.86	16.93	19.50	17.84
D/S	100e	c	09/06/97	11:00	HLS	41 16.16787	072 04.372W	ST_II_TO_III	>4	3	4 to 3	0	0.00	18.86	19.51	0.64	19.18	265.57	18.71	19.60	19.13
D/S	100n	a	09/06/97	11:31	HLS	41 16.21417	072 04.430W	INDET	>4	3	4 to 3	0	0.00	0.12	2.52	2.40	1.32	NA	NA	NA	NA
D/S	100n	b	09/06/97	11:32	HLS	41 16.21827	072 04.428W	ST_II_ON_III	>4	3	4 to 3	0	0.00	13.25	13.98	0.73	13.62	190.01	13.30	14.08	13.58
D/S	100n	c	09/06/97	11:32	HLS	41 16.22117	072 04.427W	ST_II_ON_III	>4	3	4 to 3	0	0.00	14.32	16.02	1.70	15.17	214.38	14.56	16.31	15.27
D/S	100n	d	09/10/97	6:54	HLS	41 16.21038	072 04.423W	ST_II_TO_III	>4	2	4 to 3	0	0.00	14.75	16.98	2.23	15.87	219.73	14.75	16.78	15.61
D/S	100s	a	09/06/97	11:27	HLS	41 16.11422	072 04.448W	ST_III	>4	3	4 to 3	0	0.00	15.44	16.46	1.02	15.95	216.83	15.24	16.31	15.64
D/S	100s	b	09/06/97	11:28	HLS	41 16.11498	072 04.451W	ST_II_ON_III	>4	3	4 to 3	0	0.00	14.08	14.95	0.87	14.51	197.63	13.88	14.61	14.19
D/S	100s	c	09/06/97	11:28	HLS	41 16.11487	072 04.455W	ST_II	>4	3	4 to 3	0	0.00	11.65	13.35	1.70	12.50	177.22	11.26	13.59	12.72
D/S	100w	a	09/06/97	11:15	HLS	41 16.17008	072 04.505W	ST_I_ON_III	>4	3	4 to 3	0	0.00	10.50	12.28	1.78	11.39	160.83	10.40	12.43	11.57
D/S	100w	b	09/06/97	11:16	HLS	41 16.17018	072 04.506W	ST_II	>4	3	4 to 3	0	0.00	8.01	8.93	0.92	8.47	119.45	8.11	9.32	8.56
D/S	100w	c	09/06/97	11:16	HLS	41 16.17153	072 04.508W	ST_II_ON_III	>4	3	4 to 3	0	0.00	11.36	14.13	2.77	12.74	176.49	11.50	14.27	12.79
D/S	200e	a	09/06/97	10:55	HLS	41 16.16697	072 04.306W	ST_II	>4	3	4 to 3	0	0.00	15.02	16.21	1.18	15.62	218.75	15.27	16.35	15.75
D/S	200e	b	09/06/97	10:56	HLS	41 16.16987	072 04.313W	ST_II	>4	3	4 to 3	0	0.00	18.52	19.61	1.08	19.06	269.17	18.52	19.80	19.15
D/S	200e	c	09/06/97	10:56	HLS	41 16.16897	072 04.315W	ST_II	>4	3	4 to 3	0	0.00	16.06	17.44	1.38	16.75	235.18	16.40	17.59	16.87
D/S	200n	a	09/06/97	11:40	HLS	41 16.27478	072 04.422W	ST_I	>4	3	>4	0	0.00	14.13	14.90	0.78	14.51	201.95	14.37	14.85	14.50
D/S	200n	b	09/06/97	11:43	HLS	41 16.27492	072 04.430W	ST_II	>4	3	4 to 3	0	0.00	12.23	16.65	4.42	14.44	214.65	12.57	16.50	15.41
D/S	200n	c	09/06/97	11:43	HLS	41 16.27688	072 04.435W	ST_II_ON_III	>4	3	4 to 3	0	0.00	15.39	17.33	1.94	16.36	230.92	15.49	17.28	16.45
D/S	200s	a	09/06/97	11:20	HLS	41 16.06492	072 04.421W	ST_I	>4	3	4 to 3	0	0.00	6.55	7.82	1.26	7.18	109.09	7.14	8.35	7.85
D/S	200s	c	09/06/97	11:23	HLS	41 16.05947	072 04.444W	ST_II_ON_III	>4	3	4 to 3	0	0.00	8.59	9.76	1.16	9.17	128.68	8.74	9.81	9.18
D/S	200s	d	09/10/97	6:49	HLS	41 16.06035	072 04.438W	INDET	>4	3	4 to 3	0	0.00	3.12	4.36	1.24	3.74	48.22	2.33	4.65	3.42
D/S	200w	a	09/06/97	10:25	HLS	41 16.16328	072 04.588W	ST_II	>4	3	4 to 3	0	0.00	6.31	8.52	2.22	7.41	96.13	6.11	8.57	6.89
D/S	200w	b	09/06/97	10:26	HLS	41 16.16617	072 04.598W	ST_I_ON_III	3	3	4 to 3	0	0.00	9.41	9.90	0.49	9.66	140.18	9.85	10.44	10.08
D/S	200w	d	09/10/97	6:45	HLS	41 16.16715	072 04.582W	ST_II	>4	2	3 to 2	0	0.00	NA	3.00	4.50	3.75	NA	3.00	4.50	3.75
D/S	300e	a	09/06/97	10:51	HLS	41 16.17177	072 04.226W	ST_I_TO_II	>4	2	4 to 3	0	0.00	18.03	19.75	1.72	18.89	267.32	17.98	19.85	18.97
D/S	300e	b	09/06/97	10:52	HLS	41 16.17312	072 04.228W	ST_II	>4	3	4 to 3	0	0.00	12.51	13.65	1.13	13.08	182.31	12.66	13.74	13.13
D/S	300e	c	09/06/97	10:53	HLS	41 16.16878	072 04.230W	ST_I_ON_III	>4	3	4 to 3	0	0.00	14.29	14.73	0.44	14.51	201.89	14.14	14.93	14.48
D/S	300n	a	09/06/97	11:49	HLS	41 16.32717	072 04.425W	ST_II	>4	4	>4	0	0.00	13.88	14.56	0.68	14.22	199.81	13.98	14.66	14.35
D/S	300n	b	09/06/97	11:49	HLS	41 16.32298	072 04.429W	ST_I	>4	4	>4	0	0.00	13.20	14.76	1.55	13.98	191.92	13.06	14.90	13.78
D/S	300n	c	09/06/97	11:50	HLS	41 16.32497	072 04.429W	ST_II	>4	3	4 to 3	0	0.00	13.74	15.05	1.31	14.39	198.49	13.93	14.95	14.19
D/S	400e	a	09/06/97	10:45	HLS	41 16.167	072 04.147W	ST_II_ON_III	>4	3	4 to 3	0	0.00	13.55	14.38	0.84	13.97	190.70	13.40	14.24	13.79
D/S	400e	b	09/06/97	10:45	HLS	41 16.166	072 04.147W	INDET	>4	3	>4	0	0.00	19.61	19.75	0.15	19.68	271.00	19.56	19.90	19.62
D/S	400e	c	09/06/97	10:46	HLS	41 16.165	072 04.148W	ST_III	>4	3	4 to 3	0	0.00	20.25	20.64	0.39	20.44	282.80	20.20	20.54	20.21
D/S	400e	d	09/10/97	6:58	MSC	41 16.173	072 04.162W	INDET	>4	3	>4	1	5.75	15.20	15.84	0.64	15.52	214.61	14.95	15.94	15.38
D/S	400e	e	09/10/97	6:59	MSC	41 16.162	072 04.160W	ST_I_ON_III	>4	3	>4	0	0.00	18.22	19.55	1.34	18.89	263.72	18.12	19.50	18.82
D/S	500e	a	09/06/97	10:41	HLS	41 16.16693	072 04.045W	ST_III	>4	3	>4	0	0.00	20.00	20.00	0.00	20.00	280.61	20.00	20.00	20.00
D/S	500e	b	09/06/97	10:41	HLS	41 16.17	072 04.073W	ST_II_ON_III	>4	3	>4	0	0.00	12.02	13.50	1.48	12.76	172.16	11.72	13.40	12.39
D/S	500e	c	09/06/97	10:42	HLS	41 16.16775	072 04.077W	ST_II_ON_III	>4	3	4 to 3	2	1.72	15.96	17.24	1.28	16.60	226.41	15.96	17.54	16.31
D/S	500e	d	09/10/97	7:02	MSC	41 16.1686	072 04.088W	ST_II	>4	3	4 to 3	0	0.00	12.33	13.12	0.79	12.72	177.35	12.38	13.32	12.70
D/S	ctr	a	09/06/97	11:11	HLS	41 16.17037	072 04.434W	ST_II_ON_III	>4	3	4 to 3	0	0.00	16.93	18.42	1.49	17.67	245.42	16.98	18.02	17.44
D/S	ctr	b	09/06/97	11:12	HLS	41 16.17492	072 04.433W	ST_II	>4	3	4 to 3	0	0.00	16.68	17.97	1.29	17.33	242.17	16.39	19.11	17.22
D/S	ctr	c	09/06/97	11:12	HLS	41 16.17713	072 04.441W	ST_II	>4	3	4 to 3	0	0.00	15.30	16.34	1.04	15.82	219.29	15.45	16.19	15.79

Mound/ Ref. Area	Station	Rep.	Redox Rebound Min.	Redox Rebound Max.	Redox Rebound Mean	Apparent RPD Thickness Area	Apparent RPD Thickness Minimum	Apparent RPD Thickness Maximum	Apparent RPD Thickness Mean	OSI	Methane Count	Surface Disturbance	Low DO	Comments
D/S	100e	a	0	0	0	47.47	0.10	5.52	3.55	10	0	BIOGENIC	NO	dm>pen; surf tubes; sm shell; feeding voids
D/S	100e	b	0	0	0	NA	NA	NA	NA	NA	0	INDET	YES	dm>pen; S/M; wiper artifacts
D/S	100e	c	0	0	0	NA	6.00	10.00	7.50	10	0	BIOGENIC	NO	dm>pen; S/M; wiper artifact; Amphipod tube mat; feeding void
D/S	100n	a	0	0	0	NA	NA	NA	NA	NA	0	INDET	NO	underpen; hardground
D/S	100n	b	0	0	0	143.22	9.56	11.99	10.49	11	0	BIOGENIC	NO	dm>pen; ripped-up tube mats; lg feeding void at depth
D/S	100n	c	0	0	0	71.07	0.63	10.24	5.46	11	0	PHYSICAL	NO	dm>pen; S/M; ripped-up tube mat; feeding voids
D/S	100n	d	0	0	0	60.02	2.52	5.74	4.28	10	0	INDET	NO	dm>pen; S/M; shell lag; Ampelisca tubemats; feeding voids
D/S	100s	a	0	0	0	23.99	0.63	2.38	1.69	8	0	PHYSICAL	NO	dm>pen; S/M(bk clay); scour lag; lg feeding void?
D/S	100s	b	0	0	0	37.96	0.63	3.45	2.69	9	0	PHYSICAL	NO	dm>pen; S/M; wiper clast artifact; feeding voids
D/S	100s	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; S/M; wiper artifact; scour lag deposit; ripped-up t.mat
D/S	100w	a	0	0	0	109.96	4.26	10.40	8.10	11	0	BIOGENIC	NO	dm>pen; S/M; worm 7.75-10 cm; surf tube mat
D/S	100w	b	0	0	0	NA	4.00	7.00	5.00	9	0	PHYSICAL	NO	dm>pen; S/M; wiper artifacts;patchy RPD; ripped up tube mat
D/S	100w	c	0	0	0	72.72	2.86	6.84	5.24	11	0	PHYSICAL	NO	dm>pen; S/M; ripped-up Ampelisca tube mat; feeding void?
D/S	200e	a	4.98	6.65	5.81	37.77	0.44	4.53	2.84	7	0	BIOGENIC	NO	dm>pen; S/M; ripped-up amphipod tube mat
D/S	200e	b	8.37	11.43	9.9	98.45	0.49	10.25	7.97	9	0	BIOGENIC	NO	dm>pen; S/M; wiper artifact?; tube mat
D/S	200e	c	0	0	0	40.78	0.15	5.71	3.95	9	0	PHYSICAL	NO	dm>pen;S/M;wiper smear;ripped-up amphipod tubemat;thin worm 9cm
D/S	200n	a	0	0	0	14.24	0.44	1.65	0.98	3	0	PHYSICAL	NO	dm>pen; S/M; thin;blurred RPD; amphipod or poly. tubes?; surf scour; erosional
D/S	200n	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen;S/M;2 worms at depth; ripped-up tube mat; patchy/faint RPD
D/S	200n	c	0	0	0	73.38	1.89	7.18	5.50	11	0	PHYSICAL	NO	dm>pen; ripped-uptube mat;3 feeding voids at depth
D/S	200s	a	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; wiper smaering?; ripped-up Ampelisca tube
D/S	200s	c	0	0	0	NA	1.49	7.10	3.79	11	0	PHYSICAL	NO	dm>pen; S/M; shell lag; polyc.&amphipod tube mats; feeding voids
D/S	200s	d	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	shallow pen; dm>pen; RPD>pen; brick/gravel/&debris on surf; surf tubes; feeding void
D/S	200w	a	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; thin and patchy RPD; ripped-up tube mat; Retro II
D/S	200w	b	0	0	0	29.83	1.23	2.91	2.13	8	0	PHYSICAL	NO	dm>pen; S/M; shell lag; ripped-up tube mat; feeding voids or fracture? at depth
D/S	200w	d	0	0	0	NA	6.00	9.00	7.00	9	0	INDET	NO	dm>pen; RPD>pen?; rocks; shell lag; ripped-up Ampelisca tubemat
D/S	300e	a	0	0	0	66.91	1.97	7.68	5.29	8	0	PHYSICAL	NO	dm>pen; S/M (bk clay); shell lag in S; infilled burrow
D/S	300e	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	YES	dm>pen; wiper streaking?; feeding void? 10cm; Retro II?
D/S	300e	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	YES	dm>pen; S/M; wiper streaking; 2rocks on surf; inf.feeding void
D/S	300n	a	0	0	0	15.29	0.10	2.57	1.05	5	0	BIOGENIC	NO	dm>pen; S/M; thin RPD; ripped-up Ampelisca tube mat;drag-down?
D/S	300n	b	0	0	0	NA	0.40	2.00	1.00	-1	0	PHYSICAL	YES	dm>pen; thin S/M; worms 4-5 cm depth;sm. void?; CH4?; erosional
D/S	300n	c	8.74	10.92	9.83	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; S/M; ripped-up tube mat; feeding voids at depth?; erosional
D/S	400e	a	3.35	6.21	4.78	7.83	0.05	2.12	1.09	7	0	PHYSICAL	NO	dm>pen; shell; ripped-up Amphipod tube mat; lg feeding voids at 10;13cm depth
D/S	400e	b	8.42	10.3	9.36	97.19	2.96	10.74	7.27	NA	0	INDET	NO	dm>pen; S/M; wiper streaks; burrow; overpen
D/S	400e	c	0	0	0	NA	NA	NA	NA	NA	0	INDET	NO	overpen; dm>pen; S/M;lg feeding voids at depth
D/S	400e	d	0	0	0	NA	NA	NA	NA	NA	0	INDET	NO	dm>pen;S/M;wiper mudclast over thin br sand;very lg relict feeding voids or pull-apart
D/S	400e	e	0	0	0	60.33	2.08	5.54	4.32	11	0	BIOGENIC	NO	dm>pen; S/M; wiper smearing; methane?
D/S	500e	a	0	0	0	NA	NA	NA	NA	NA	0	INDET	NO	overpen; dm>pen; S/M; feeding voids
D/S	500e	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen;S/M; bk wiper artifacts;surf tubes; feeding voids at depth
D/S	500e	c	0	0	0	NA	NA	NA	NA	NA	0	INDET	NO	dm>pen; S/M; feeding voids at depth; RPD smeared by wiper
D/S	500e	d	0	0	0	60.33	2.08	5.54	4.32	9	0	BIOGENIC	NO	dm>pen;S/M; ripped-up Ampelisca tube mat;relict feeding voids at depth?
D/S	ctr	a	0	0	0	79.79	4.21	7.08	5.84	11	0	BIOGENIC	NO	dm>pen; S/M
D/S	ctr	b	0	0	0	NA	NA	NA	NA	NA	0	BIOGENIC	NO	dm>pen; S/M; v.lg burrow infilled w/dk;fluidized particulates to 5cm
D/S	ctr	c	0	0	0	79.79	0.35	10.99	6.49	9	0	PHYSICAL	NO	dm>pen; S/M; wiper smear; ripped-up tube mat; void?

B1d
NL-91 and D/S Mound Complex 1998

Mound/ Ref. Area	Station	Rep.	Date	TIME	ANALYST	LATITUDE	LONGITUDE	Successional Stage	Grain Size (phi) Minimum	Grain Size (phi) Maximum	Major Mode	Mudclasts Count	Mudclasts Diameter	Camera Penetration Minimum	Camera Penetration Maximum	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness Area	Dredged Material Thickness Minimum	Dredged Material Thickness Maximum	Dredged Material Thickness Mean
D/S	DSCNTR	A	07/30/98	13:22	MCS	41 16.167N	072 04.444W	ST_I_TO_II	>4	2	4 to 3	0	0	14.18	15.47	1.29	14.83	211.21	14.08	15.57	15.06
D/S	DSCNTR	B	07/30/98	13:22	MCS	41 16.167N	072 04.447W	ST_II	>4	2	4 to 3	0	0	11.39	12.59	1.19	11.99	166.37	11.64	12.69	11.83
D/S	DSCNTR	C	07/30/98	13:23	MCS	41 16.164N	072 04.449W	ST_I_TO_II	>4	2	4 to 3	0	0	14.38	14.93	0.55	14.65	206.77	7.46	15.02	14.73
D/S	DS100E	A	07/30/98	13:18	MCS	41 16.170N	072 04.377W	ST_II	>4	2	4 to 3	0	0	15.67	16.47	0.8	16.07	222.59	11.74	16.37	16.01
D/S	DS100E	B	07/30/98	13:19	MCS	41 16.166N	072 04.381W	ST_II_ON_III	>4	2	4 to 3	0	0	11.59	13.28	1.69	12.44	178.81	11.49	13.38	12.83
D/S	DS100E	C	07/30/98	13:19	MCS	41 16.166N	072 04.387W	ST_I_TO_II	>4	2	4 to 3	0	0	12.79	14.03	1.24	13.41	184.57	10.3	13.98	13.2
D/S	DS100N	A	07/30/98	13:54	MCS	41 16.231N	072 04.447W	ST_I	>4	2	4 to 3	0	0	13.03	16.92	3.88	14.98	221.49	12.99	16.87	15.92
D/S	DS100N	C	07/30/98	13:57	MCS	41 16.217N	072 04.440W	ST_I_TO_II	>4	-1	3 to 2	0	0	13.08	14.98	1.89	14.03	200.88	1.09	15.02	14.15
D/S	DS100N	D	08/01/98	9:05	HLS	41 16.227N	072 04.431W	ST_II	>4	2	4 to 3	0	0	7.69	11.38	3.69	9.54	138.04	0.05	11.38	9.95
D/S	DS100S	A	07/30/98	14:04	MCS	41 16.120N	072 04.439W	ST_II	>4	2	>4	0	0	13.33	13.98	0.65	13.66	186.53	13.18	13.78	13.33
D/S	DS100S	B	07/30/98	14:04	MCS	41 16.120N	072 04.438W	ST_II	>4	3	4 to 3	0	0	14.58	16.32	1.74	15.45	211.48	14.58	16.32	15.15
D/S	DS100S	C	07/30/98	14:05	MCS	41 16.119N	072 04.438W	ST_II	>4	3	>4	0	0	13.63	16.07	2.44	14.85	210.9	12.09	16.02	15.23
D/S	DS100W	A	07/30/98	13:30	MCS	41 16.173N	072 04.527W	ST_II_ON_III	>4	2	4 to 3	0	0	8.81	9.35	0.55	9.08	126	8.66	9.3	9.07
D/S	DS100W	C	07/30/98	13:33	MCS	41 16.165N	072 04.515W	ST_II_ON_III	>4	2	4 to 3	0	0	10.65	12.59	1.94	11.62	168.24	10.75	12.59	12.1
D/S	DS100W	E	08/01/98	8:59	HLS	41 16.177N	072 04.482W	ST_II_ON_III	>4	3	4 to 3	0	0	13.23	13.79	0.56	13.51	192.36	13.28	13.95	13.6
D/S	DS200E	A	07/30/98	13:13	MCS	41 16.171N	072 04.298W	ST_II_ON_III	>4	3	4 to 3	0	0	14.28	15.03	0.75	14.65	200.71	7.06	14.78	14.37
D/S	DS200E	B	07/30/98	13:14	MCS	41 16.167N	072 04.294W	ST_II_ON_III	>4	3	4 to 3	0	0	14.83	15.77	0.95	15.3	212.07	14.43	15.72	15.16
D/S	DS200E	C	07/30/98	13:14	MCS	41 16.168N	072 04.299W	ST_I_ON_III	>4	3	4 to 3	0	0	11	12.84	1.84	11.92	170.86	10.9	12.99	12.24
D/S	DS200N	A	07/30/98	13:48	MCS	41 16.279N	072 04.440W	ST_II_ON_III	>4	2	>4	0	0	9.3	9.75	0.45	9.53	131.92	9.15	9.75	9.43
D/S	DS200N	B	07/30/98	13:49	MCS	41 16.281N	072 04.442W	ST_II	>4	2	4 to 3	0	0	11.84	13.03	1.19	12.44	172.9	11.89	12.99	12.38
D/S	DS200N	C	07/30/98	13:50	MCS	41 16.284N	072 04.448W	ST_I	>4	2	4 to 3	0	0	6.57	8.31	1.74	7.44	102.05	6.32	8.31	7.31
D/S	DS200S	C	07/30/98	14:10	MCS	41 16.061N	072 04.449W	ST_I_ON_III	>4	-1	3 to 2	0	0	4.73	5.77	1.04	5.25	71.39	4.43	6.27	5.09
D/S	DS200S	D	08/01/98	8:42	HLS	41 16.057N	072 04.433W	ST_II	>4	3	>4	2	1.06	4.9	7.42	2.53	6.16	84.85	4.95	7.53	6.12
D/S	DS200S	E	08/01/98	8:43	HLS	41 16.047N	072 04.424W	ST_II_ON_III	>4	3	4 to 3	0	0	7.63	8.59	0.96	8.11	112.09	7.32	8.59	8.03
D/S	DS200W	B	07/30/98	13:37	MCS	41 16.170N	072 04.596W	ST_II_ON_III	>4	2	4 to 3	0	0	13.58	14.08	0.5	13.83	192.02	13.33	13.98	13.66
D/S	DS200W	C	07/30/98	13:37	MCS	41 16.162N	072 04.597W	ST_I_ON_III	>4	3	4 to 3	0	0	2.29	4.38	2.09	3.33	45.84	2.34	4.53	3.26
D/S	DS200W	D	08/01/98	8:45	HLS	41 16.165N	072 04 579W	ST_II	>4	3	4 to 3	0	0	6.97	9.25	2.92	8.44	114.82	6 82	9.23	8.21
D/S	DS300E	A	07/30/98	13:07	MCS	41 16.161N	072 04.230W	ST_I	>4	3	>4	0	0	12.24	12.84	0.6	12.54	171.3	11.99	12.69	12.23
D/S	DS300E	B	07/30/98	13:08	MCS	41 16.165N	072 04.228W	ST_I	>4	3	>4	0	0	13.28	15.42	2.14	14.35	192.27	13.13	15.07	13.73
D/S	DS300E	C	07/30/98	13:09	MCS	41 16.169N	072 04.228W	ST_I	>4	3	>4	0	0	14.18	15.27	1.09	14.73	204.43	10.7	15.07	14.56
D/S	DS300N	A	07/30/98	13:43	MCS	41 16.332N	072 04.451W	ST_II_ON_III	>4	2	>4	0	0	12.64	14.43	1.79	13.53	188.13	12.69	14.43	13.5
D/S	DS300N	B	07/30/98	13:44	MCS	41 16.329N	072 04.448W	ST_I	>4	2	4 to 3	0	0	9.55	12.54	2.99	11.04	156.68	9.6	12.59	11.18
D/S	DS300N	C	07/30/98	13:45	MCS	41 16.328N	072 04.449W	ST_II_ON_III	>4	2	4 to 3	0	0	9.35	10	0.65	9.68	132.33	9.15	10	9.5
D/S	DS400E	A	07/30/98	12:45	MCS	41 16.165N	072 04.160W	ST_I	>4	4	>4	0	0	13.93	14.43	0.5	14.18	194.4	0.05	14.23	13.48
D/S	DS400E	B	07/30/98	12:46	MCS	41 16.160N	072 04.165W	ST_II	>4	3	>4	0	0	16.22	17.91	1.69	17.06	238.14	8.01	17.91	17.06
D/S	DS400E	C	07/30/98	12:47	MCS	41 16.170N	072 04.179W	ST_I	>4	3	>4	1	1.38	11.29	13.58	2.29	12.44	175.3	11.39	13.63	12.52
D/S	DS500E	A	07/30/98	12:41	MCS	41 16.164N	072 04.094W	ST_II	>4	3	>4	0	0	15.72	19.4	3.68	17.56	243.04	15.57	19.2	17.08
D/S	DS500E	C	07/30/98	12:42	MCS	41 16.158N	072 04.084W	ST_II	>4	3	4 to 3	0	0	11.59	12.19	0.6	11.89	162.24	11.14	12.09	11.59
D/S	DS500E	E	08/01/98	8:33	HLS	41 16.150N	072 04.069W	ST_II_ON_III	>4	3	>4	0	0	17.73	18.33	0.61	18.03	0	0	0	0

Mound/ Ref. Area	Station	Rep.	Redox Rebound Min.	Max.	Mean	Apparent RPD Thickness Area	Minimum	Maximum	Mean	OSI	Methane Count	Surface Disturbance	Additional Measurements	(cm)	Low DO	Comments
D/S	DSCNTR	A	0	0	0	108 69	5 67	10.1	7.9	8	0	BIOGENIC	MAX THICKNESS OF NEW DM	8.46	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, RIPPED-UP TUBEMAT, HYDROIDS,
D/S	DSCNTR	B	0	0	0	17.162	0 25	6 62	3.76	9	0	BIOGENIC	MAX THICKNESS OF NEW DM	7.16	NO	DM>P, DM/OLD DM, S/MUD, WIPER SMEAR, POORLY SORTED, VOIDS?, HYDROIDS, RPD EXTRAP,
D/S	DSCNTR	C	0	0	0	27.254	0.3	6 87	3.75	7	0	PHYSICAL	MAX THICKNESS OF NEW DM	5 67	NO	DM>P, DM/OLD DM, S/MUD, WIPER SMEAR, POORLY SORTED, ORG DETRITUS, SHELL FRAGS, SCOURED?,
D/S	DS100E	A	0	0	0	63 501	1.89	7.06	4 87	9	0	BIOGENIC	THICKNESS OF NEW DM	8 11	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, BURROWS,
D/S	DS100E	B	0	0	0	94 292	4 28	10 85	7	11	0	BIOGENIC	MAX THICKNESS OF NEW DM	10 25	NO	DM>P, DM/OLD DM, S/MUD, WIPER CLAST, POORLY SORTED, VOID, WORM,
D/S	DS100E	C	0	0	0	81.527	2 14	10	6 34	8	0	BIOGENIC	MAX THICKNESS OF NEW DM	12 14	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, BURROWS?, HYDROIDS,
D/S	DS100N	A	0	0	0	32 837	0.05	5 27	2 69	5	0	PHYSICAL	MAX THICKNESS OF NEW DM	8 06	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, SHELL FRAGS,
D/S	DS100N	C	0	0	0	198.16	1.09	14 83	13.96	8	0	PHYSICAL	MAX THICKNESS OF NEW DM	9 35	NO	DM(S)>P, DM/OLD DM, S/MUD, POORLY SORTED,
D/S	DS100N	D	0	0	0	22.373	0 31	2 56	1 57	6	0	BIOGENIC	NOADDM	0	NO	DM>PEN, S/MUD, AMPELISCA TUBES, VOIDS?, BURROW,
D/S	DS100S	A	0	0	0	49 295	1 84	6 32	3.71	8	0	PHYSICAL	MAX THICKNESS OF NEW DM	2 89	NO	DM>P, DM/OLD DM, S/M, MOD SORTED, AMPELISCA, RIPPED-UP TUBE MAT, BURROWS,
D/S	DS100S	B	0	0	0	NA	0 5	6	1 8	6	0	BIOGENIC	MAX THICKNESS OF NEW DM	3 73	NO	DM>P, DM/OLD DM,WIPER CLAST, MOD SORTED,AMPHIPOD TUBE MATS, BURROWS,WORM,FRACTURE
D/S	DS100S	C	0	0	0	NA	0 4	4 7	2 5	7	0	PHYSICAL	MAX THICKNESS OF NEW DM	2 34	NO	DM>P, DM/OLD DM, WIPER CLASTS, MOD SORTED, SM AMPHIPODS, BURROWS,
D/S	DS100W	A	0	0	0	NA	0 5	4	2 5	9	0	PHYSICAL	MAX THICKNESS OF NEW DM	3 83	NO	DM>P, DM LAYERING?, POORLY SORTED, BURROWS, ORG DETRITUS, SHELL FRAGS,
D/S	DS100W	C	0	0	0	76.184	3.18	9	5 67	11	0	BIOGENIC	MAX THICKNESS OF NEW DM	9 2	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, TUBEMAT, HYDROID,
D/S	DS100W	E	0	0	0	21.982	0 46	2 87	1.52	8	0	BIOGENIC	NOADDM	0	NO	DM>PEN, S/MUD, RIPPED UP TUBEMAT, VOIDS?, HYDROIDS,
D/S	DS200E	A	0	0	0	50 034	1.69	5.17	3 67	10	0	PHYSICAL	NOADDM	0	NO	DM>P, S/MUD, MOD SORTED, RIPPED-UP TUBEMAT, VOIDS, WORM, SHELL FRAGS,
D/S	DS200E	B	0	0	0	22.324	0.1	6 27	3.64	10	0	BIOGENIC	NOADDM	0	NO	DM>P, S/MUD, MOD SORTED, VOID, BURROW, HYDROIDS, SHELL FRAGS,
D/S	DS200E	C	0	0	0	NA	0.5	6	3.3	10	0	PHYSICAL	NOADDM	0	NO	DM>P, DM LAYERING?, S/MUD, MOD SORTED, VOID, SHELLS @ Z, SCOURLAG, SHELLS @ SURF
D/S	DS200N	A	0	0	0	24 991	0 2	5 22	2 41	9	0	BIOGENIC	MAX THICKNESS OF NEW DM	3.08	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, AMPHIPOD STALKS, BURROW,
D/S	DS200N	B	0	0	0	NA	2	4.5	3 5	8	0	BIOGENIC	MAX THICKNESS OF NEW DM	6.17	NO	DM>P, DM/OLD DM, POORLY SORTED, HYDROIDS,
D/S	DS200N	C	0	0	0	37.392	0 2	6.12	2.79	5	0	PHYSICAL	MAX THICKNESS OF NEW DM	6.27	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, RETROGRADE?, BURROWS, SHELL LAG,
D/S	DS200S	C	0	0	0	68.943	4 18	5.87	4 95	11	0	PHYSICAL	NOADDM	0	NO	DM>P, DM/OLD DM, POORLY SORTED, VOIDS, HYDROIDS, SCOURED, PEBBLES,
D/S	DS200S	D	0	0	0	19 633	0.51	3.18	1.37	5	0	INDET	NOADDM	0	NO	DM>PEN, SULFIDIC SED, S/MUD, TUBEMAT,
D/S	DS200S	E	0	0	0	20.76	0.91	2 58	1.44	7	0	INDET	NOADDM	0	NO	DM>PEN, TUBEMATS, RELICT? VOIDS, BURROW OR DRAG-DOWN,SHELL LAG,2 LIVE URCHINS,
D/S	DS200W	B	0	0	0	66.159	2.14	6.82	4 86	11	0	BIOGENIC	MAX THICKNESS OF NEW DM	5 67	NO	DM>P, DM/OLD DM, S/MUD, POORLY SORTED, VOIDS, HYDROIDS, SHELL FRAGS,
D/S	DS200W	C	0	0	0	34 549	0.45	3.78	2.62	9	0	PHYSICAL	NOADDM	0	NO	DM>P, POORLY SORTED, RIPPED-UP TUBEMATS, VOID?, SHELLS, SCOURED, BRICK,
D/S	DS200W	D	0	0	0	58 387	2 67	6.1	4 21	9	0	BIOGENIC	NOADDM	0	NO	DM>PEN, S/MUD, MOD SORTED, AMPELISCA TUBES, HYRDOIDS,
D/S	DS300E	A	0	0	0	11.245	0 05	1.64	0 86	3	0	PHYSICAL	NOADDM	0	NO	DM>P, DM LAYERING, S/MUD, MOD SORTED, RIPPED-UP TUBEMAT, BURROW, SCOURLAG,
D/S	DS300E	B	0	0	0	5 151	0 2	1.29	0.78	3	0	PHYSICAL	NOADDM	0	NO	DM>P, S/MUD, MOD SORTED, BURROW OPENING, SHELL FRAGS, SCOURLAG,
D/S	DS300E	C	0	0	0	7.225	0.05	3.03	1.88	4	0	PHYSICAL	NOADDM	0	NO	DM>P, S/MUD, WIPER CLAST, MOD SORTED, RELICT VOID?, BURROW,
D/S	DS300N	A	0	0	0	89.24	4.43	7.41	6.53	11	0	BIOGENIC	NOADDM	0	NO	DM>P OR AMB?, S/MUD, POORLY SORTED,TUBES, SHELL FRAGS,
D/S	DS300N	B	0	0	0	84.857	2.94	10.15	6.55	7	0	PHYSICAL	MAX THICKNESS OF NEW DM	6.47	NO	DM>P, DM/OLD DM, S/MUD,WIPER CLAST, POORLY SORTED, BURROW, SHELL HASH @ DEPTH, PARTING @ S/MUD BOUNDARY
D/S	DS300N	C	0	0	0	62 2	1.89	8.01	4.83	11	0	PHYSICAL	MAX THICKNESS OF NEW DM	7.81	NO	DM>P, DM/OLD DM, S/MUD, WIPER CLAST, POORLY SORTED, BURROWS?, SCOURED?,
D/S	DS400E	A	0	0	0	NA	0 2	2.1	0.8	3	0	PHYSICAL	NOADDM	0	NO	DM>P, WELL SORTED, SCOURED?,
D/S	DS400E	B	0	0	0	7.095	0.55	2.74	1.58	6	0	PHYSICAL	NOADDM	0	NO	DM>P, WIPER SMEAR, WELL SORTED, RIPPED-UP TUBEMAT, VOID?, BURROW, CHAETOPTERUS,
D/S	DS400E	C	0	0	0	5 43	0.45	1.99	1.18	3	0	PHYSICAL	NOADDM	0	NO	DM>P, WIPER SMEAR, MOD SORTED, RIPPED-UP TUBEMAT, WORM @ Z,
D/S	DS500E	A	0	0	0	13.821	0.1	6 42	2.33	7	0	PHYSICAL	NOADDM	0	NO	DM>P, S/MUD, MOD SORTED, RIPPED-UP TUBEMAT, VOIDS?, BURROWS, SHELL FRAG,
D/S	DS500E	C	0	0	0	18.167	0.5	6.02	2.84	7	0	BIOGENIC	NOADDM	0	NO	DM>P, MOD SORTED, PODOCERID AMPHIPOD STALKS, VOIDS?, BURROWS,
D/S	DS500E	E	5 45	9.14	7.3	37.989	1.97	3.48	2 67	9	0	BIOGENIC	NOADDM	0	NO	AMB, SULFIDIC SED, S/BK MUD, RIPPED-UP TUBE MAT, FEEDING VOIDS, WORM,

B2
USCGA Mound 1995

Station	Rep	Date	Successional Stage	Grain Size (phi) Min.	Grain Size (phi) Max.	Major Mode	Mud Clasts No.	Mud Clasts Dia.	Camera Penetration Min.	Camera Penetration Max.	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness Area	Dredged Material Thickness Min.	Dredged Material Thickness Max.	Dredged Material Thickness Mean	Apparent RPD Thickness Area	Apparent RPD Thickness Min.	Apparent RPD Thickness Max.	Apparent RPD Thickness Mean	Methane Bubbles/Diameter NO.	Methane Bubbles/Diameter Area	Methane Bubbles/Diameter Min.	Methane Bubbles/Diameter Max.	Methane Bubbles/Diameter Mean	OSI	Surface Disturbance	Low DO	Comments
100E	A	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	10.43	11.63	1.2	11.03	147.61	10.48	11.63	10.67	26.498	0.1	2.92	1.92	0	0	0	0	0	8	PHYSICAL	NO	DM > or = to pen.; RPD to depth?; shell lag; wiper artifacts
100E	B	08/25/95	ST_II	0	>4	>4	0	0	11	11.49	0.48	11.25	153.6	8.71	11.67	11.12	8.177	0.05	2 2	0.56	0	0	0	0	0	4	BIOGENIC	NO	S/M; DM > or = to pen. depth
100E	C	08/25/95	ST_II_ON_III	1	>4	>4	0	0	13 59	14.79	1.2	14.19	195.49	13.68	14.98	14.18	33.769	0 53	13.01	3.21	0	0	0	0	0	10	BIOGENIC	NO	S/M; DM > or = to pen. depth; ripped-up tube mat
100N	A	08/25/95	ST_II	-1	>4	>4	0	0	11.84	12.62	0.78	12.23	170.74	12.09	12.77	12.28	13.495	0.05	2 88	0.94	0	0	0	0	0	5	BIOGENIC	NO	S/M; DM > or = to pen.; 2 DM layers?; ripped-up tube mat; some shell lag
100N	B	08/25/95	ST_II	1	>4	>4	0	0	13.4	15.49	2.09	14.44	197.38	10.05	15.53	14.28	102.92	1.55	10.78	7.5	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM > or = to pen.; several DM events?
100N	C	08/25/95	ST_II	-1	>4	>4	0	0	13.2	13.69	0 49	13 45	181.38	13.11	13 54	13 34	87.346	3 01	7.52	6 46	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM > or = to pen ; ripped-up amphipod tube mat; some shell lag
100S	A	08/25/95	ST_II	-1	>4	>4	0	0	9.71	10.58	0.87	10.15	135.59	9.27	10.97	9.83	8.9	0.05	1.84	0.83	0	0	0	0	0	4	BIOGENIC	NO	S/M; DM > or = to pen.; ripped-up amphipod tube mat; hypoxia?
100S	B	08/25/95	ST_II	-1	>4	4 to 3	0	0	13.54	13.98	0.44	13.76	185.1	13.35	13.88	13.46	102.55	1.55	10.1	7.45	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM > or = to pen.; ripped-up tube mat; burrows; shell lay
100S	C	08/25/95	ST_II	1	>4	4 to 3	0	0	12 43	13 06	0.63	12.74	172.63	12.14	12.96	12 47	45.552	0.1	6.7	3 67	0	0	0	0	0	8	BIOGENIC	NO	S/M; DM > or = to pen.; ripped-up tube mat; mottled sed.
100SE	A	08/25/95	ST_II	0	>4	>4	0	0	15.79	16 94	1.15	16.36	226.4	15.6	16.84	16.12	24.686	0.1	6.89	1.78	0	0	0	0	0	6	BIOGENIC	NO	S/M; DM > or = to pen.; amphipod tubes; no voids
100SE	B	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	14.4	15.22	0.81	14.81	202.53	14.55	15.02	14.57	63.823	0.05	9.04	4.79	0	0	0	0	0	11	BIOGENIC	NO	S/M; DM > or = to pen.; wiper artifacts
100SE	C	08/25/95	ST_II	-1	>4	>4	0	0	12.87	13 25	0.38	13 06	127.32	8.08	12.3	9 03	10.129	0 05	1.67	0 69	0	0	0	0	0	4	BIOGENIC	NO	S/M; 2 DM events?; DM to bottom of mid=blue layer?; burrow to depth but no voids
100W	A	08/25/95	ST_II_ON_III	-1	>4	>4	1	0.58	14.42	15	0.58	14.71	196.68	13.79	14.61	14.34	12.092	0.1	1.65	0.68	0	0	0	0	0	7	BIOGENIC	NO	S/M; DM > or = to pen.; ripped-apart tube mat
100W	B	08/25/95	ST_II	-1	>4	>4	0	0	14 52	15	0.49	14.76	201.2	11.12	15.1	14.69	24.413	0.05	4.51	1.76	0	0	0	0	0	6	BIOGENIC	NO	S/M; DM > or = to pen.; shell lag
100W	C	08/25/95	ST_II	-1	>4	4 to 3	0	0	14 42	15 78	1 36	15.1	209 41	14.32	15.73	15.16	NA	NA	NA	NA	0	0	0	0	0	IND	BIOGENIC	NO	S/M; DM > or = to pen.; buried tube mat; shell lag
150E	A	08/25/95	ST_II	-1	>4	>4	0	0	14.93	16 03	1.1	15.48	159.72	9.36	14.07	11.48	87.749	1.63	9.95	6.33	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM to base of dark blue layer?; ripped-up amphipod tube mat
150E	B	08/25/95	ST_II	-1	>4	>4	0	0	11.96	13.54	1.58	12.75	167.69	11.96	13.21	12.19	13.496	0.05	2.82	1	0	0	0	0	0	5	BIOGENIC	NO	S/M; DM to depth; ripped-up tube mat; shell lag
150E	C	08/25/95	ST_II	-1	>4	>4	0	0	14 26	15.12	0 86	14 69	204 62	7.08	15 31	14.77	10.418	0 05	1 29	0 74	0	0	0	0	0	4	BIOGENIC	NO	DM to depth?; S/M; burrow; ripped-up tube mat; wiper cl. and smear
150S	A	08/26/95	ST_II	1	>4	>4	0	0	11.26	12.62	1.36	11.94	181.37	11.12	12 62	11.55	0	0	0	0	0	0	0	0	0	-1	BIOGENIC	YES	DM > or = to pen.; decaying tube mat; a few healthy ind. on elevation on rt.
150S	B	08/26/95	ST_II	1	>4	>4	0	0	12 91	14.03	1.12	13.47	182.37	10	13.93	13.25	43.972	0.1	9.32	3.29	0	0	0	0	0	8	BIOGENIC	NO	S/M; DM > or = to pen.; elpped-up amphipod tube mat
150S	C	08/26/95	ST_II	0	>4	>4	0	0	13.79	15.34	1.55	14 56	195.98	13.64	15 29	14.23	19 538	0.1	4 81	1 42	0	0	0	0	0	5	BIOGENIC	NO	S/M; DM > or = to pen ; decaying amphipod tube mat
50E	A	08/25/95	ST_II	-1	>4	>4	0	0	13.68	15.45	1.77	14.57	203.72	7.85	15.69	14.7	13.468	0.05	2.11	0.98	0	0	0	0	0	5	BIOGENIC	NO	S/M; DM > or = to pen.; tube mat; shell lag; relic deep burr.; no voids
50E	B	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	14.26	15.74	1.48	15	209.38	14.5	15.69	15.22	7.6	0.05	2.58	0.54	0	0	0	0	0	6	BIOGENIC	NO	S/M; DM > or = to pen.; RPD only in sm. area on left; tubes; tiny voids
50E	C	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	13 3	14 74	1.44	14 02	191.51	13.35	14 55	13.88	12 43	0.05	2.92	0 94	0	0	0	0	0	7	BIOGENIC	NO	S/M; DM > or = to pen.; decaying tube mat; shell lag; eelgrass; sm. void
50N	A	08/25/95	ST_II	0	>4	>4	0	0	13.3	14.08	0.78	13.69	186.5	13.16	13.83	13.6	56.078	0.19	7.62	4.06	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM > or = to pen.; amphipod tube mat; drag-down
50N	B	08/25/95	ST_II	1	>4	4 to 3	0	0	14.27	14.9	0.63	14.59	200.47	14.08	15.1	14.46	90.824	2.43	12.77	6.83	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM > or = to pen; amphipod tube mat
50N	C	08/25/95	ST_II	-1	>4	>4	0	0	13.98	15.05	1.07	14.52	199.06	13.74	15	14 31	163.25	0.39	15.1	12.04	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM > or = to pen.; RPD > pen. in part; amphipod tube mat
50S	A	08/25/95	ST_II	1	>4	>4	0	0	10.63	11.26	0.63	10.95	151.96	10.44	11.5	10.9	7.095	0.05	2.58	0.48	0	0	0	0	0	4	BIOGENIC	NO	DM > or = to pen.; ripped-up tube mat; hypoxia?; hermit crabs on surf.
50S	B	08/25/95	ST_II	-1	>4	>4	0	0	19.66	20.73	1.07	20.19	277.75	15 29	20.78	19.66	27.358	0.05	8.2	2	0	0	0	0	0	6	BIOGENIC	NO	S/M; DM > or = to pen.; 2 DM layers
50S	C	08/25/95	ST_II	-1	>4	4 to 3	3	0 49	16 26	16 84	0.58	16 55	223 28	15.78	16 69	16 22	23 272	0 05	4.9	1.72	0	0	0	0	0	6	BIOGENIC	NO	S/M; DM > or = to pen.; ripped-up tube mat
50SE	A	08/25/95	ST_II	1	>4	>4	0	0	12.68	13.78	1.1	13.23	153.94	6.51	13.06	11.01	11.596	0.05	3.78	0.88	0	0	0	0	0	5	BIOGENIC	NO	S/M; lower left ambient?; decaying tube mat
50SE	B	08/25/95	ST_II	-1	>4	>4	0	0	13.83	14.74	0.91	14.28	139.37	4.5	12.3	10.05	50.19	0.1	12.01	4.34	0	0	0	0	0	9	BIOGENIC	NO	S/M; DM < pen.; ripped-up tube mat
50SE	C	08/25/95	ST_II	-1	>4	>4	0	0	13 25	14.16	0 91	13.71	89 6	4.49	10	6 64	12.916	0.05	2.73	0.91	0	0	0	0	0	5	BIOGENIC	NO	S/M; DM > or = to pen.; ripped-up amphipod tubes
50W	A	08/25/95	ST_II_ON_III	0	>4	>4	0	0	15.58	16.85	1.26	16.21	226 91	15.49	16.99	16.31	46.585	0.1	4.95	3.53	0	0	0	0	0	10	BIOGENIC	NO	S/M; DM > or = to pen.; amphipod tubes
50W	B	08/25/95	ST_II_ON_III	1	>4	>4	0	0	14.17	15.83	1.65	15	206 69	10.73	15.68	14.97	18.62	0.05	2.82	1.4	0	0	0	0	0	7	BIOGENIC	NO	S/M; DM > or = to pen.; amphipod tube mat
50W	C	08/25/95	ST_II_ON_III	2	>4	>4	0	0	14.47	15.88	1.41	15.17	207.34	10.73	15.78	15 08	10.235	0 05	1.36	0.71	14	0.4	5 25	9.9	7.58	4	BIOGENIC	NO	DM > or = to pen.; sed. patchy clay and black DM; PRINT for report; CH4!
CTR	A	08/25/95	ST_II	-1	>4	4 to 3	0	0	14.35	15.31	0.96	14.83	203.28	14.26	15.26	14.78	32.849	0.1	6.7	2.48	0	0	0	0	0	3	BIOGENIC	YES	S/M; DM > or = to pen.; amphipod tubes; thin deep oxy. burr.
CTR	B	08/25/95	ST_II	0	>4	>4	0	0	11.63	13.01	1.39	12.32	173.88	12.06	12.87	12.5	NA	NA	NA	NA	0	0	0	0	0	IND	BIOGENIC	NO	DM > or = to pen. depth; ripped-up tube mat; hypoxic?; wiper clasts
CTR	C	08/25/95	ST_II	-1	>4	>4	0	0	13 01	14.16	1.15	13 59	187.44	12 73	14 02	13 48	NA	NA	NA	NA	0	0	0	0	0	IND	BIOGENIC	NO	S/M; DM > or = to pen.; wiper smear; tube mat; hypoxic?

IND = Indeterminate

B3a
NL-94 Mound 1995

Station	Rep	Date	Successional Stage	Grain Size (phi) Min.	Grain Size (phi) Max.	Mud Clasts Major Mode	Mud Clasts No.	Mud Clasts Dia.	Camera Penetration Min.	Camera Penetration Max.	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness Area	Dredged Material Thickness Min.	Dredged Material Thickness Max.	Dredged Material Thickness Mean	Apparent RPD Thickness Area	Apparent RPD Thickness Min.	Apparent RPD Thickness Max.	Apparent RPD Thickness Mean	OSI	Surface Disturbance	Low DO	Comments
100E	A	08/25/95	ST_II_ON_III	-1	>4	>4	6	0.5	6.6	7.13	0.53	6.87	75.4	4.21	6.27	5.46	8.872	0.05	1.15	0.6	6	BIOGENIC	NO	S/M; mud is DM
100E	B	08/25/95	ST_II	0	>4	4 to 3	0	0	6.51	8.42	1.91	7.46	63.3	3.01	5.45	4.56	17.909	0.05	4.98	1.31	5	BIOGENIC	NO	S/M; mud is DM; decaying tube mat
100E	C	08/25/95	ST_I_ON_III	-1	>4	3 to 2	0	0	5.55	7.18	1.63	6.36	46.2	0.96	4.64	3.37	18.264	0.29	2.87	1.31	7	PHYSICAL	NO	S/M; mud is DM; surface scour lag
100E	E	08/26/95	INDET	-1	>4	>4	0	0	10.7	11.44	0.77	11.05	111	5.89	9.09	7.91	18.412	0.24	2.2	1.29	IND	BIOGENIC	NO	S/M; mud is DM; shell lag
100NE	A	08/25/95	ST_II	1	>4	3 to 2	0	0	10.6	12.62	1.98	11.63	0	0	0	0	62.501	2.48	11.98	4.85	9	BIOGENIC	NO	Ambient; amphipods inc. podocerids; lg. void may be artifact
100NE	B	08/25/95	ST_II	-1	>4	4 to 3	0	0	7.82	9.8	1.98	8.81	0	0	0	0	18.731	0.05	3.32	1.34	5	BIOGENIC	NO	S/M; decaying amphipod tube mat
100NE	C	08/25/95	ST_II_ON_III	0	>4	>4	0	0	12.3	14.41	2.08	13.37	0	0	0	0	26.142	0.81	2.53	1.88	8	BIOGENIC	NO	Ambient; decaying amphipod tubes; pull-away
100NW	A	08/25/95	ST_II_ON_III	0	>4	4 to 3	0	0	12.7	13.91	1.19	13.32	0	0	0	0	48.467	0.4	9.8	3.72	10	BIOGENIC	NO	S/M; mud is ambient; dense amphipod tube mat
100NW	B	08/25/95	ST_II_ON_III	0	>4	4 to 3	0	0	12.3	13.91	1.58	13.12	0	0	0	0	38.634	1.04	7.87	2.81	9	BIOGENIC	NO	S/M; mud is ambient; dense amphipod tube mat; PRINT for report (ambient)
100NW	D	08/26/95	ST_II	-1	>4	>4	0	0	6.63	10.79	4.16	8.71	0	0	0	0	12.612	0.15	3.12	0.9	5	BIOGENIC	NO	S/M; mud is ambient; ripped-up amphipod tube mat; lg. shell
100SE	A	08/25/95	ST_II	-1	>4	>4	0	0	15.7	16.46	0.81	16.05	0	0	0	0	25.958	0.43	4.88	1.91	6	BIOGENIC	NO	Ambient?; feeding voids shallow; dense amphipod tube mat
100SE	B	08/25/95	ST_II	-1	>4	>4	1	0.9	15.6	16.51	0.96	16.03	0	0	0	0	6.325	0.1	0.81	0.43	4	BIOGENIC	NO	DM?; amphipod tube mat; shelter fabric below tube mat; RPD in tube mat
100SE	C	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	13.4	13.92	0.53	13.66	162	9.28	13.3	11.72	18.467	0.2	3.64	1.34	7	BIOGENIC	NO	DM surf. to bottom dark band; wiper cl.; PRINT for report (base of DM)
100SW	A	08/25/95	ST_II	-1	>4	3 to 2	0	0	3.59	6.51	2.92	5.05	0	0	0	0	19.164	0.05	5.07	1.49	5	BIOGENIC	NO	S/M; amphipod tube mat; shelter fabric below tube mat
100SW	B	08/25/95	ST_II_ON_III	0	>4	>4	0	0	11.2	11.68	0.43	11.46	158	5.71	11.77	11.42	27.813	0.05	4.5	2.03	8	BIOGENIC	NO	S/M; DM > or = to pen. depth; amphipod tube mat
100SW	C	08/25/95	ST_II_ON_III	0	>4	>4	0	0	9.28	12.15	2.87	10.72	147	3.28	11.82	10.59	8.063	0.05	1.29	0.56	6	BIOGENIC	NO	S/M; DM > or = to pen.; ripped-up amphipod tube mat
100SW	D	08/26/95	ST_II	-1	>4	4 to 3	0	0	8.76	11.63	2.87	10.19	0	0	0	0	32.375	0.24	4.59	2.36	7	BIOGENIC	NO	Ambient?; decaying tube mat; RPD artifact of pull-away?
100W	A	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	10.3	11.24	0.96	10.77	0	0	0	0	32.132	0.48	5.5	2.29	8	BIOGENIC	NO	Ambient? S/M; burrows
100W	B	08/25/95	ST_II	-1	>4	3 to 2	0	0	7.66	9.47	1.82	8.56	0	0	0	0	43.15	0.05	7.51	3.37	8	BIOGENIC	NO	Ambient; S/M; shelter fabric under mat
100W	C	08/25/95	ST_II_ON_III	0	>4	4 to 3	0	0	12.4	13.45	1.05	12.92	0	0	0	0	38.062	0.53	6.27	2.86	9	BIOGENIC	NO	Ambient?; S/M; decaying tube mat; poor sorting
150NW	C	08/25/95	ST_II	-1	>4	4 to 3	0	0	9.6	10.69	1.09	10.15	0	0	0	0	39.732	0.54	9.9	2.9	7	BIOGENIC	NO	S/M; mud is ambient; decaying amphipod tubes
150NW	D	08/25/95	ST_II_ON_III	0	>4	4 to 3	0	0	8.37	9.65	1.29	9.01	0	0	0	0	8.371	0.05	4.46	0.63	6	BIOGENIC	NO	S/M; mud is ambient; amphipod tube mat decaying
150NW	F	08/26/95	ST_II_ON_III	1	>4	3 to 2	0	0	11	12.48	1.49	11.73	158	11.01	12.07	11.57	36.437	0.45	6.04	2.67	9	BIOGENIC	NO	S/M; DM > or = to pen.; decaying amphipod tube mat
150NW	G	08/26/95	ST_II	0	>4	4 to 3	0	0	8.32	10.54	2.23	9.43	0	0	0	0	11.296	0.1	5.89	0.96	5	BIOGENIC	NO	S/M; mud is ambient; decaying amphipod tube mat
150SE	B	08/25/95	ST_II_ON_III	0	>4	4 to 3	0	0	11.1	11.97	0.91	11.51	0	0	0	0	114.94	4.14	11.46	8.44	11	BIOGENIC	NO	S/M; dense tube mat; PRINT for report (classic void; lg. worm; well-dev. II)
150SE	C	08/25/95	ST_II	0	>4	4 to 3	0	0	6.94	9.57	2.63	8.25	0	0	0	0	22.017	0.14	4.98	1.63	6	BIOGENIC	NO	Ripped-up amphipod tube mat
150SE	E	08/26/95	ST_II_ON_III	0	>4	>4	0	0	8.37	13.64	5.26	11.01	152	6.57	13.28	11.13	29.139	1.29	3.16	2.1	8	BIOGENIC	NO	S/M; DM > or = to penetration depth
50N	A	08/25/95	ST_II_ON_III	0	>4	>4	0	0	11.6	12.53	0.94	12.05	165	9.34	12.53	12.02	12.762	0.15	2.38	0.89	7	BIOGENIC	NO	DM > or = to pen. depth; amphipod tube mat
50N	B	08/25/95	ST_II_ON_III	1	>4	>4	0	0	13.3	14.11	0.79	13.71	188	13.18	13.94	13.71	11.571	0.1	1.83	0.82	7	BIOGENIC	NO	DM > or = to pen.; amphipod tube mat; lg. voids at depth (III?)
50N	C	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	11.6	15.3	3.66	13.47	180	6.57	14.85	13.12	28.65	0.1	4.26	2.04	8	BIOGENIC	NO	DM > or = to penetration depth
50NE	A	08/26/95	ST_II_ON_III	0	>4	>4	0	0	13.7	14.36	0.69	14.01	188	12.38	14.26	13.66	24.134	0.1	4.95	1.77	8	BIOGENIC	NO	DM > or = to pen.; amphipod tube mat; mottled gray clay + reduced mud
50NE	B	08/25/95	ST_II_ON_III	-1	>4	>4	1	2	17	18.17	1.19	17.57	240	8.56	18.46	17.41	12.324	0.1	3.81	0.87	7	PHYSICAL	NO	DM > or = to pen.; mottled; decaying amphipod tubes; low D.O.?
50NE	C	08/25/95	ST_II	-1	>4	>4	0	0	14.8	15.64	0.84	15.22	206	14.46	15.64	15.09	5.645	0.05	0.84	0.37	0	BIOGENIC	YES	DM > or = to pen.; RPD v. thin; 0 cm on much of surf.; decaying amphipod tubes
50NW	A	08/25/95	ST_II_ON_III	0	>4	>4	0	0	10.7	12.08	1.34	11.41	158	10.51	12.12	11.52	41.421	0.1	6.53	3.05	10	BIOGENIC	NO	DM > or = to pen.; RPd patchy; amphipod tube mat
50NW	B	08/25/95	ST_I_ON_III	-1	>4	>4	0	0	7.57	9.5	1.93	8.54	119	7.27	9.7	8.68	10.455	0.05	4.5	0.78	7	PHYSICAL	NO	DM > or = to pen.; RPD pathcy; shell lag
50NW	C	08/25/95	ST_II	-1	>4	>4	0	0	12.1	13.22	1.09	12.67	168	11.72	12.88	12.38	34.344	0.1	7.23	2.55	7	BIOGENIC	NO	DM > or = to pen.; amphipod tube mat; some shell lag
50S	A	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	12.2	13.16	0.96	12.68	172	12.22	13.23	12.46	5.176	0.05	0.62	0.34	6	BIOGENIC	NO	DM > or = to pen.; amphipod tube mat; some shell lag; many feeding voids
50S	B	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	13.9	15.31	1.44	14.59	201	7.27	15.25	14.72	19.679	0.05	3.4	1.39	7	BIOGENIC	NO	DM > or = to pen. depth; ripped-up amphipod tube mat
50S	C	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	10.8	11.77	1	11.27	152	10.71	11.67	11.16	7.306	0.05	1.24	0.49	6	BIOGENIC	NO	DM > or = to pen.; v. thin RPD; lg. void at depth
50SE	A	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	11.6	12.68	1.05	12.15	165	11.57	12.93	12.13	73.867	1.24	7.7	5.43	11	BIOGENIC	NO	S/M; DM > or = to pen.; dense amphipod tube mat
50SE	B	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	13.1	14.74	1.67	13.9	187	12.58	15.15	13.66	82.959	0.38	9.71	6.23	11	BIOGENIC	NO	DM > or = to pen.; some shell lag
50SE	C	08/25/95	ST_II_ON_III	-1	>4	>4	2	0.5	12.6	13.3	0.71	12.95	175	12.53	13.43	12.89	51.63	0.67	7.46	3.78	11	BIOGENIC	NO	S/M; DM > or = to pen.; dense amphipod tube mat
50SW	A	08/25/95	ST_II_ON_III	0	>4	>4	0	0	12.5	13.97	1.48	13.23	186	13.25	13.73	13.39	15.423	0.38	2.25	1.09	7	BIOGENIC	NO	S/M; mud is DM; DM> or = pen.; dense amphipod tube mat
50SW	B	08/25/95	ST_II_ON_III	-1	>4	>4	5	0.5	8.37	10.05	1.67	9.21	127	8.13	10.24	9.24	NA	NA	NA	NA	IND	BIOGENIC	NO	DM > or = to pen.; tube mat; no sand cap; wiper smear artifact
50SW	C	08/25/95	ST_II	0	>4	>4	5	0.5	14.4	18.37	3.97	16.39	221	13.69	18.28	16.21	NA	NA	NA	NA	IND	BIOGENIC	NO	DM > or = to pen.; RPD patchy; disturbed surface
CTR	A	08/25/95	ST_II_ON_III	0	>4	>4	2	0.5	13.1	13.52	0.4	13.32	177	12.53	13.69	13.03	20.817	0.05	5.74	1.52	8	BIOGENIC	NO	DM > or = to pen.; amphipod tube mat; voids small
CTR	B	08/25/95	ST_II_ON_III	-1	>4	>4	0	0	13	13.81	0.79	13.42	179	10.1	13.54	13.12	18.272	0.05	7.48	1.47	7	BIOGENIC	NO	DM > or = to pen.; amphipod tube mat; some shell lag
CTR	C	08/25/95	ST_II	-1	>4	>4	0	0	11.3	11.83	0.5	11.58	159	11.26	12.17	11.54	5.411	0.05	0.86	0.35	4	BIOGENIC	NO	DM > or = to pen.; old DM layers; decaying amphipod tubes; wiper artifact

IND = Indeterminate

B3b

NL-94 Mound 1997

Mound/ Ref. Area	Station	Rep.	Date	TIME	ANALYST	LATITUDE	LONGITUDE	Successional Stage	Grain Size (phi) Minimum	Grain Size (phi) Maximum	Major Mode	Mudclasts Count	Mudclasts Diameter	Camera Penetration Minimum	Camera Penetration Maximum	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness Area	Dredged Material Thickness Minimum	Dredged Material Thickness Maximum	Dredged Material Thickness Mean
NL-94	100e	a	09/06/97	10:14	HLS	41 16.24482	072 04.775W	INDET	4	2	3 to 2	0	0.00	2.66	3.69	1.03	3.18	44.28	2.61	4.38	3.13
NL-94	100e	b	09/06/97	10:15	HLS	41 16.24083	072 04.780W	INDET	>4	3	4 to 3	0	0.00	7.21	9.55	2.34	8.38	138.08	6.80	12.36	9.87
NL-94	100e	c	09/06/97	10:15	HLS	41 16.24093	072 04.787W	INDET	>4	3	4 to 3	0	0.00	9.95	10.34	0.39	10.15	110.58	6.65	9.26	7.94
NL-94	100e	d	09/10/97	6:41	HLS	41 16.24883	072 04.792W	ST_I	>4	2	3 to 2	0	0.00	2.52	3.61	1.09	3.07	45.50	2.57	3.91	3.21
NL-94	100ne	a	09/06/97	9:00	HLS	41 16.2832	072 04.809W	ST_I_TO_II	>4	3	4 to 3	0	0.00	8.52	9.41	0.89	8.97	127.45	8.47	9.51	9.08
NL-94	100ne	b	09/06/97	9:01	HLS	41 16.28485	072 04.808W	ST_I_TO_II	>4	3	4 to 3	0	0.00	9.31	10.00	0.69	9.66	130.97	9.04	10.58	9.71
NL-94	100ne	c	09/06/97	9:01	HLS	41 16.28788	072 04.810W	ST_II	>4	3	4 to 3	0	0.00	7.09	8.08	0.99	7.59	105.73	7.19	7.98	7.59
NL-94	100nw	a	09/06/97	9:29	HLS	41 16.246	072 04.919W	ST_III	>4	4	>4	0	0.00	15.30	15.79	0.50	15.54	214.35	15.20	15.94	15.36
NL-94	100nw	b	09/06/97	9:30	HLS	41 16.24698	072 04.956W	INDET	>4	3	>4	0	0.00	16.50	17.09	0.58	16.80	236.05	16.[illegible]6	17.14	16.81
NL-94	100nw	c	09/06/97	9:30	HLS	41 16.21995	072 04.945W	ST_I_ON_III	>4	4	>4	0	0.00	14.27	15.10	0.83	14.68	210.22	14.56	15.49	15.16
NL-94	100SE	a	09/06/97	9:52	HLS	41 16.21092	072 04.815W	ST_I	>4	3	4 to 3	0	0.00	11.84	14.51	2.67	13.18	178.90	12.09	14.61	12.78
NL-94	100SE	b	09/06/97	9:53	HLS	41 16.20785	072 04.821W	ST_II_ON_III	>4	3	4 to 3	0	0.00	14.47	15.05	0.58	14.76	208.58	14.37	16.[illegible]7	15.06
NL-94	100SE	c	09/06/97	9:53	HLS	41 16.2069	072 04.827W	INDET	>4	3	4 to 3	0	0.00	11.48	12.76	1.28	12.12	175.21	11.92	13.10	12.56
NL-94	100sw	a	09/06/97	9:17	HLS	41 16.20518	072 04.908W	ST_II_TO_III	>4	3	4 to 3	0	0.00	12.71	13.40	0.69	13.05	188.33	13.11	14.21	13.66
NL-94	100sw	b	09/06/97	9:18	HLS	41 16.20615	072 04.913W	ST_II_TO_III	>4	4	4 to 3	0	0.00	12.49	12.86	0.37	12.67	177.55	12.33	13.02	12.69
NL-94	100sw	c	09/06/97	9:19	HLS	41 16.209	072 04.915W	ST_I	>4	3	4 to 3	0	0.00	10.25	10.99	0.74	10.62	149.63	10.32	11.38	10.78
NL-94	100w	b	09/06/97	9:22	HLS	41 16.24808	072 04.926W	ST_I_TO_II	>4	4	>4	0	0.00	15.45	16.46	1.01	15.95	223.89	15.50	16.72	15.74
NL-94	100w	c	09/06/97	9:22	HLS	41 16.24988	072 04.931W	ST_I	>4	3	>4	0	0.00	14.07	14.87	0.79	14.47	204.67	14.34	14.97	14.63
NL-94	100w	d	09/10/97	6:38	HLS	41 16.2308	072 04.950W	ST_II	>4	2	4 to 3	0	0.00	13.56	14.11	0.54	13.84	190.96	13.22	14.16	13.68
NL-94	150nw	a	09/06/97	9:25	HLS	41 16.3038	072 04.996W	ST_II_TO_III	>4	3	4 to 3	0	0.00	7.67	12.43	4.76	10.05	145.50	8.01	12.62	10.47
NL-94	150nw	b	09/06/97	9:26	HLS	41 16.3098	072 04.957W	ST_I_ON_III	>4	3	4 to 3	0	0.00	13.40	14.37	0.97	13.88	194.13	13.59	14.42	13.88
NL-94	150nw	c	09/06/97	9:27	HLS	41 16.30392	072 04.945W	ST_I_TO_II	>4	3	4 to 3	0	0.00	4.08	7.77	3.69	5.92	71.83	4.08	7.67	5.21
NL-94	150se	a	09/06/97	9:56	HLS	41 16.18598	072 04.798W	ST_II_TO_III	>4	3	4 to 3	0	0.00	15.57	17.44	1.87	16.50	227.80	15.81	17.24	16.45
NL-94	150se	b	09/06/97	9:57	HLS	41 16.1889	072 04.803W	ST_II_TO_III	>4	3	4 to 3	0	0.00	13.10	15.42	2.32	14.26	202.35	13.89	15.57	14.71
NL-94	150se	c	09/06/97	9:57	HLS	41 16.19092	072 04.809W	ST_I_TO_II	>4	3	4 to 3	0	0.00	16.11	16.95	0.84	16.53	231.79	16.16	17.24	16.70
NL-94	50n	a	09/06/97	10:09	HLS	41 16.2741	072 04.873W	ST_II_ON_III	>4	3	4 to 3	0	0.00	17.91	18.91	1.00	18.41	257.48	17.91	18.81	18.38
NL-94	50n	b	09/06/97	10:09	HLS	41 16.26785	072 04.867W	INDET	>4	3	4 to 3	0	0.00	13.25	13.84	0.59	13.55	184.82	12.81	14.14	13.32
NL-94	50n	c	09/06/97	10:10	HLS	41 16.26772	072 04.873W	ST_I_ON_III	>4	4	>4	0	0.00	14.24	15.07	0.84	14.66	199.06	14.19	14.88	14.34
NL-94	50ne	a	09/06/97	9:05	HLS	41 16.26815	072 04.836W	ST_I_TO_II	>4	2	4 to 3	0	0.00	15.57	16.95	1.38	16.26	223.61	15.52	16.80	16.06
NL-94	50ne	b	09/06/97	9:05	HLS	41 16.26905	072 04.830W	ST_II	>4	3	4 to 3	0	0.00	14.78	15.62	0.84	15.20	211.37	14.63	15.67	15.02
NL-94	50ne	c	09/06/97	9:06	HLS	41 16.26115	072 04.821W	INDET	>4	4	>4	0	0.00	17.14	17.88	0.74	17.51	246.63	17.24	18.13	17.61
NL-94	50nw	a	09/06/97	9:33	HLS	41 16.2639	072 04.884W	ST_I	>4	3	>4	0	0.00	15.82	16.52	0.70	16.17	223.51	15.92	16.50	16.17
NL-94	50nw	b	09/06/97	9:33	HLS	41 16.26097	072 04.884W	ST_II_TO_III	>4	3	4 to 3	0	0.00	14.51	14.85	0.34	14.68	196.20	13.73	14.63	14.11
NL-94	50nw	c	09/06/97	9:34	HLS	41 16.26097	072 04.891W	ST_I_TO_II	>4	3	>4	0	0.00	9.90	10.97	1.07	10.44	137.35	9.45	10.70	9.85
NL-94	50s	a	09/06/97	10:02	HLS	41 16.22268	072 04.868W	ST_I_ON_III	>4	3	4 to 3	0	0.00	17.54	18.82	1.28	18.18	253.75	17.78	18.82	18.13
NL-94	50s	b	09/06/97	10:03	HLS	41 16.21988	072 04.881W	ST_III	>4	3	4 to 3	0	0.00	13.05	14.24	1.18	13.65	197.12	13.65	14.83	14.07
NL-94	50s	c	09/06/97	10:05	HLS	41 16.21685	072 04.873W	ST_I_ON_III	3	3	4 to 3	0	0.00	14.83	16.21	1.38	15.52	221.86	15.52	16.40	15.98
NL-94	50se	a	09/06/97	9:38	HLS	41 16.22288	072 04.843W	ST_II_ON_III	>4	4	>4	0	0.00	16.70	17.67	0.97	17.18	237.37	5.39	17.62	17.02
NL-94	50se	b	09/06/97	9:38	HLS	41 16.22493	072 04.851W	ST_I	>4	4	>4	0	0.00	10.97	14.47	3.50	12.72	175.86	11.36	14.81	12.61
NL-94	50se	c	09/06/97	9:39	HLS	41 16.22397	072 04.851W	ST_I	>4	3	>4	0	0.00	17.01	17.76	0.75	17.39	243.01	17.16	17.81	17.49
NL-94	50SW	a	09/06/97	9:14	HLS	41 16.21995	072 04.887W	ST_II	>4	3	3 to 2	0	0.00	9.21	17.58	8.37	13.39	156.34	8.05	17.53	11.42
NL-94	50SW	b	09/06/97	9:15	HLS	41 16.2221	072 04.894W	ST_II_TO_III	>4	4	4 to 3	0	0.00	15.42	16.11	0.68	15.76	220.28	15.58	16.74	15.91
NL-94	50SW	c	09/06/97	9:15	HLS	41 16.22398	072 04.898W	ST_II	>4	3	4 to 3	0	0.00	15.32	18.72	3.40	17.02	239.01	15.68	18.53	17.11
NL-94	CTR	a	09/06/97	9:11	HLS	41 16.24497	072 04.865W	ST_I_ON_III	>4	3	4 to 3	0	0.00	12.50	13.88	1.38	13.19	189.07	12.87	13.72	13.25
NL-94	CTR	b	09/06/97	9:11	HLS	41 16.246	072 04.866W	INDET	>4	2	3 to 2	0	0.00	13.10	14.63	1.53	13.87	196.40	13.50	14.58	14.08
NL-94	CTR	c	09/06/97	9:12	HLS	41 16.24698	072 04.867W	INDET	>4	2	4 to 3	0	0.00	15.42	16.11	0.68	15.76	220.88	15.58	16.63	15.92

Mound/ Ref. Area	Station	Rep.	Redox Rebound Min.	Redox Rebound Max.	Redox Rebound Mean	Apparent RPD Thickness Area	Apparent RPD Thickness Minimum	Apparent RPD Thickness Maximum	Apparent RPD Thickness Mean	OSI	Methane Count	Surface Disturbance	Low DO	Comments
NL-94	100e	a	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; underpen; shell lag; patchy bk/br sed
NL-94	100e	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm/pen; S/M; mottled dm; shells&shell lag-armoring; ripped-up amphipods tube mat
NL-94	100e	c	0	0	0	25.18	1.03	2.76	1.77	NA	0	PHYSICAL	NO	dm>pen; mytilus shell lag; ripped-up amphipod tube mat
NL-94	100e	d	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	rocks&barnacle conglomerates on surf
NL-94	100ne	a	2.21	5.3	3.76	35.01	1.06	4.38	2.67	6	0	PHYSICAL	NO	dm>pen; S/M; shell frags; polyc.&juv. amphipod(?) tubes; surf scour; worm at depth
NL-94	100ne	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; S/M; wiper smearing; erosional
NL-94	100ne	c	0	0	0	50.57	1.53	6.80	3.61	8	0	PHYSICAL	NO	dm>pen; S/M; wiper artifacts; ripped up Ampelisca tubes; surf scour
NL-94	100nw	a	0	0	0	15.29	0.54	1.44	1.04	7	0	INDET	NO	dm>pen; S/M; minor shell lag; feeding voids 2-8cm depth; RPD faint
NL-94	100nw	b	0	0	0	134.18	4.95	11.60	10.23	NA	0	INDET	NO	dm>pen; shell lag; possible feeding voids
NL-94	100nw	c	0	0	0	99.58	3.40	10.20	7.19	11	0	PHYSICAL	NO	dm>pen; shell lag; sm surf tubes; feeding void
NL-94	100SE	a	0	0	0	22.31	0.73	4.17	1.58	4	0	INDET	NO	dm>pen; shell lag; lg subsurface void(stage III?) on rt; young lobster on surf.
NL-94	100SE	b	0	0	0	55.15	1.04	5.27	3.96	11	0	PHYSICAL	NO	dm>pen; S/M; tubes and hydroid?; Retro II?
NL-94	100SE	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; wiper smearing;shells&shell lag; RPD patchy; feeding void?
NL-94	100sw	a	0	0	0	74.71	4.32	6.47	5.41	10	0	PHYSICAL	NO	dm>pen; S/M; shell lag; deep burrow and voids near pen limit;erosional
NL-94	100sw	b	0	0	0	38.15	1.06	4.44	2.81	8	0	INDET	NO	dm>pen; wiper mud clast; thin S/M; deep burrow; feeding void
NL-94	100sw	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; S/M;wiper smears;shell lag; 2 fractures near pen limit; burrow ctr
NL-94	100w	b	0	0	0	NA	NA	NA	NA	NA	0	BIOGENIC	NO	dm>pen; lg burrow system
NL-94	100w	c	0	0	0	117.74	7.04	9.58	8.45	7	0	PHYSICAL	NO	dm>pen; wiper artifacts?; shell lag; juv. amphipods
NL-94	100w	d	0	0	0	34.47	0.30	4.80	2.45	7	0	PHYSICAL	NO	dm>pen;S/M;shell frag;burrow,feeding void/shelter fabric/burrow/or drag-down
NL-94	150nw	a	0	0	0	49.45	0.39	6.40	3.54	9	0	PHYSICAL	NO	dm>pen; S/M; surface eroded?; shell lag; ripped-up tube matsm feeding voids
NL-94	150nw	b	0	0	0	71.97	2.96	7.14	5.31	11	0	PHYSICAL	NO	dm>pen;S/M; shell lag;Amphipods?;feeding voids sown to 6 cm depth
NL-94	150nw	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; S/M; underpen; cohesive mudclast w/ fractures; some smearing of RPD
NL-94	150se	a	0	0	0	79.52	4.04	7.59	5.72	10	0	PHYSICAL	NO	dm>pen; S/M; shell lag; ripped-up tube mat;lg. feeding void
NL-94	150se	b	0	0	0	104.70	5.22	9.56	7.69	10	0	PHYSICAL	NO	dm>pen; shells and shell lag-armoring; feeding voids 12-14cm
NL-94	150se	c	0	0	0	66.01	2.59	7.66	4.70	8	0	PHYSICAL	NO	dm>pen; S/M; shell lag; burrow on lt; fine; thin worms 8 cm
NL-94	50n	a	0	0	0	39.53	1.79	3.93	2.83	9	0	BIOGENIC	NO	dm>pen; S/M; shell lag; amphipod tubes on surf; void 9 cm
NL-94	50n	b	4.14	5.18	4.66	39.34	2.07	4.04	2.82	NA	0	PHYSICAL	NO	dm>pen; S/M;shell lag; chaotic fabric
NL-94	50n	c	3.1	4.43	3.77	21.28	0.69	2.86	1.51	8	0	PHYSICAL	NO	dm>pen; shell lag; feeding void 2-4 cm depth; thin sand rpd over clay
NL-94	50ne	a	6.9	10	8.45	48.71	2.17	4.53	3.48	7	0	BIOGENIC	NO	dm>pen;S/M;shell frag in sand;ripped-up tube mat;chaotic fabric at depth;erosion
NL-94	50ne	b	7.34	10.84	9.09	89.16	5.32	7.73	6.43	9	0	PHYSICAL	NO	dm>pen; S/M; shell lag; ripped-up tube mat; chaotic fabric at depth
NL-94	50ne	c	0	0	0	NA	NA	NA	NA	NA	0	INDET	NO	dm>pen;wiper artifact;shell lag;RPD thin&patchy; mottled fabric(chaotic); feeding void
NL-94	50nw	a	0	0	0	92.39	5.87	8.01	6.68	7	0	PHYSICAL	NO	dm>pen; S/M; shell lag; patchy RPD; methane?; relict feeding void?
NL-94	50nw	b	0	0	0	23.19	0.65	2.79	1.65	7	0	PHYSICAL	NO	dm>pen; S/M; shell lag in sand; wiper artifacts; Ampelisca tubes; feeding voids
NL-94	50nw	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; S/M; shell lag-armoring; minor wiper artifacts; smeared RPD
NL-94	50s	a	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; shell lag; surf tubes&amphipods; lg feeing void or fracture 4-7cm depth
NL-94	50s	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; mya shells on/in surf-armoring in question; burrow/feeding void 9cm
NL-94	50s	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; shell lag armoring; ripped-up Ampelisca tube mat; deep burrow
NL-94	50se	a	0	0	0	103.45	5.83	9.76	7.55	11	0	INDET	NO	dm>pen; S/M; layered dm; Chaetopterus; sm feeding voids 10&15cm
NL-94	50se	b	0	0	0	0.00	0.00	0.00	0.00	-3	0	BIOGENIC	YES	dm>pen; br-bk clay; lg oyster? shells at surf;few sm tubes; RPD thin&patchy
NL-94	50se	c	0	0	0	86.31	4.83	7.56	6.17	7	0	INDET	NO	dm>pen; S/M; tube at surf; wiper smearing&artifact
NL-94	50SW	a	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen;surf.dist.by camera;lg shell lag; amphipod mat; steel bl clay w/dk br dm
NL-94	50SW	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; lg oyster shells;shell lag; deep burrow
NL-94	50SW	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; br silt; lg shells in lag; Ampelisca tubes on surf; lg voids on rt?
NL-94	CTR	a	0	0	0	77.84	2.96	7.09	5.57	11	0	PHYSICAL	NO	dm>pen; S/M;wiper smear;shell lag; a few Ampelisca tubes; surf scour; feeding void
NL-94	CTR	b	0	0	0	82.38	4.88	7.98	5.92	NA	0	INDET	NO	dm>pen; S/M; shell lag; sm. voids at 3cm depth; pockets of smeared clay
NL-94	CTR	c	0	0	0	77.67	3.88	6.52	5.59	NA	0	PHYSICAL	NO	dm>pen;S/M;wiper artifacts; shell lag;Chaetopterus surf tube; burrow to pen limit

B4
Northern Region 1997

Mound/ Ref. Area	Station	Rep.	Date	TIME	ANALYST	LATITUDE	LONGITUDE	Successional Stage	Grain Size (phi)		Major	Mudclasts		Camera Penetration				Dredged Material Thickness			
									Minimum	Maximum	Mode	Count	Diameter	Minimum	Maximum	Range	Mean	Area	Minimum	Maximum	Mean
North Reg	n1	a	09/06/97	2:02	HLS	41 16.62872	072 03.967W	ST_II_ON_III	>4	3	4 to 3	0	0.00	9.61	10.97	1.35	10.29	0.00	0.00	0.00	0.00
North Reg	n1	b	09/06/97	2:06	HLS	41 16.62468	072 03.942W	INDET	>4	3	4 to 3	0	0.00	11.55	12.37	0.82	11.96	0.00	0.00	0.00	0.00
North Reg	n1	c	09/06/97	2:06	HLS	41 16.623	072 03.929W	ST_II	>4	3	4 to 3	0	0.00	5.87	6.65	0.78	6.26	0.00	0.00	0.00	0.00
North Reg	n2	a	09/06/97	2:11	HLS	41 16.77808	072 04.002W	ST_II	>4	3	4 to 3	0	0.00	6.80	7.67	0.87	7.23	0.00	0.00	0.00	0.00
North Reg	n2	b	09/06/97	2:12	HLS	41 16.7805	072 03.999W	ST_II	>4	3	4 to 3	0	0.00	6.31	6.80	0.49	6.55	0.00	0.00	0.00	0.00
North Reg	n2	c	09/06/97	2:13	HLS	41 16.78005	072 03.995W	ST_I_TO_II	>4	3	4 to 3	0	0.00	6.65	6.94	0.29	6.80	0.00	0.00	0.00	0.00
North Reg	n2	d	09/10/97	7:32	HLS	41 16.78042	072 03.970W	ST_II_TO_III	>4	3	4 to 3	0	0.00	10.05	10.71	0.66	10.38	0.00	0.00	0.00	0.00
North Reg	n2	e	09/10/97	7:33	HLS	41 16.76902	072 03.936W	ST_II_ON_III	>4	3	4 to 3	0	0.00	11.31	11.72	0.40	11.52	0.00	0.00	0.00	0.00
North Reg	n2	f	09/06/97	2:23	HLS	41 16.77208	072 03.967W	ST_II_ON_III	>4	3	4 to 3	0	0.00	13.63	14.03	0.40	13.83	191.02	13.54	14.03	13.69
North Reg	n3	b	09/06/97	2:19	HLS	41 16.63412	072 04.205W	ST_II_TO_III	>4	3	4 to 3	0	0.00	10.58	11.31	0.73	10.95	0.00	0.00	0.00	0.00
North Reg	n3	c	09/06/97	2:20	HLS	41 16.62968	072 04.210W	ST_II	>4	3	4 to 3	0	0.00	7.33	8.45	1.12	7.89	0.00	0.00	0.00	0.00
North Reg	n3	d	09/10/97	7:38	HLS	41 16.63822	072 04.179W	ST_II	>4	3	4 to 3	0	0.00	7.37	7.78	0.40	7.58	0.00	0.00	0.00	0.00
North Reg	n4	b	09/06/97	2:23	HLS	41 16.77202	072 04.281W	ST_II	3	3	4 to 3	0	0.00	10.78	11.84	1.07	11.31	159.86	10.73	11.99	11.42
North Reg	n4	c	09/06/97	2:24	HLS	41 16.77202	072 04.277W	ST_II	>4	3	4 to 3	0	0.00	8.59	8.98	0.39	8.79	0.00	0.00	0.00	0.00
North Reg	n4	d	09/10/97	7:27	HLS	41 16.78043	072 04.258W	ST_II_ON_III	>4	3	4 to 3	0	0.00	11.16	12.07	0.91	11.62	0.00	0.00	0.00	0.00
North Reg	n4	e	09/10/97	7:28	HLS	41 16.786	072 04.251W	ST_I_TO_II	>4	3	4 to 3	0	0.00	10.35	10.86	0.51	10.61	0.00	0.00	0.00	0.00
North Reg	n5	a	09/06/97	2:29	HLS	41 16.62737	072 04.439W	ST_II_TO_III	>4	3	4 to 3	0	0.00	6.17	6.31	0.15	6.24	0.00	0.00	0.00	0.00
North Reg	n5	b	09/06/97	2:29	HLS	41 16.62705	072 04.440W	ST_II_ON_III	>4	3	4 to 3	0	0.00	8.98	9.51	0.53	9.25	0.00	0.00	0.00	0.00
North Reg	n5	c	09/06/97	2:30	HLS	41 16.62698	072 04.438W	ST_II_ON_III	>4	3	4 to 3	0	0.00	9.42	10.68	1.26	10.05	0.00	0.00	0.00	0.00
North Reg	n6	a	09/06/97	2:34	HLS	41 16.77912	072 04.566W	ST_II_TO_III	>4	3	4 to 3	0	0.00	11.84	12.71	0.87	12.28	168.14	11.68	12.52	12.04
North Reg	n6	c	09/06/97	2:35	HLS	41 16.78305	072 04.557W	ST_I_TO_II	>4	3	4 to 3	0	0.00	6.75	7.86	1.12	7.31	102.76	6.97	7.83	7.32
North Reg	n6	d	09/10/97	7:22	HLS	41 16.76977	072 04.567W	INDET	>4	<-1	<-1	0	0.00	0.10	2.73	2.63	1.41	0.00	0.00	0.00	0.00
North Reg	n7	a	09/06/97	2:47	HLS	41 16.63577	072 04.682W	ST_II	>4	3	4 to 3	0	0.00	8.16	10.24	2.09	9.20	121.40	6.39	10.00	8.64
North Reg	n7	b	09/06/97	2:48	HLS	41 16.64002	072 04.557W	ST_II	>4	3	4 to 3	0	0.00	10.51	11.06	0.56	10.78	151.27	10.61	11.11	10.81
North Reg	n7	c	09/06/97	2:49	HLS	41 16.6442	072 04.690W	ST_II_ON_III	>4	3	4 to 3	0	0.00	9.95	10.63	0.68	10.29	0.00	0.00	0.00	0.00
North Reg	n8	b	09/06/97	2:53	HLS	41 16.77403	072 04.858W	ST_I_TO_II	>4	3	4 to 3	0	0.00	3.20	3.79	0.58	3.50	0.00	0.00	0.00	0.00
North Reg	n8	c	09/06/97	2:54	HLS	41 16.77202	072 04.849W	ST_II_ON_III	>4	3	4 to 3	0	0.00	9.06	10.15	1.09	9.60	134.81	9.01	10.15	9.60
North Reg	n9	b	09/06/97	2:59	HLS	41 16.62185	072 04.945W	ST_I	>4	4	>4	0	0.00	16.70	17.38	0.68	17.04	233.59	16.65	17.48	17.01
North Reg	n9	c	09/06/97	3:02	HLS	41 16.6363	072 04.946W	ST_III	>4	4	>4	0	0.00	16.21	16.55	0.34	16.38	226.31	16.07	16.84	16.43
North Reg	n9	d	09/10/97	7:17	HLS	41 16.6301	072 04.940W	INDET	>4	4	>4	1	1.05	15.54	16.63	1.09	16.09	222.01	15.40	17.03	16.07
North Reg	n10	a	09/06/97	3:08	HLS	41 16.7732	072 05.921W	ST_II	>4	3	3 to 2	0	0.00	3.06	3.30	0.24	3.18	0.00	0.00	0.00	0.00
North Reg	n10	b	09/06/97	3:08	HLS	41 16.7771	072 05.913W	INDET	>4	2	3 to 2	0	0.00	2.23	3.45	1.21	2.84	0.00	0.00	0.00	0.00
North Reg	n10	c	09/06/97	3:09	HLS	41 16.78317	072 05.927W	ST_II	>4	3	4 to 3	0	0.00	7.09	8.16	1.07	7.62	0.00	0.00	0.00	0.00
North Reg	n11	a	09/06/97	3:14	HLS	41 16.62588	072 05.189W	ST_II	>4	3	4 to 3	0	0.00	13.93	14.17	0.24	14.05	198.50	13.59	14.55	14.00
North Reg	n11	b	09/06/97	3:15	HLS	41 16.6302	072 05.192W	ST_II	>4	3	4 to 3	0	0.00	11.07	11.99	0.92	11.53	0.00	0.00	0.00	0.00
North Reg	n11	c	09/06/97	3:16	HLS	41 16.63502	072 05.187W	ST_II	>4	4	>4	0	0.00	9.85	10.73	0.87	10.29	0.00	0.00	0.00	0.00

Mound/ Ref. Area	Station	Rep.	Redox Rebound			Apparent RPD Thickness				OSI	Methane Count	Surface Disturbance	Low DO	Comments
			Min.	Max.	Mean	Area	Minimum	Maximum	Mean					
North Reg	n1	a	2.51	4.64	3.57	56.88	3.43	5.12	4.04	11	0	BIOGENIC	NO	ambient; hydroids; feeding void(?); sm&lg ampelisca tubes
North Reg	n1	b	0	0	0	89.73	5.77	7.41	6.43	NA	0	INDET	NO	ambient; feeding void?; bk smeared wiper artifact?;amphipods?
North Reg	n1	c	0	0	0	35.18	1.57	5.44	2.57	7	0	PHYSICAL	NO	ambient; Ampelisca tubes; RPD faint;Retro II?
North Reg	n2	a	0	0	0	24.74	0.40	5.71	1.73	6	0	PHYSICAL	NO	ambient; RPD faint/blurred; ripped-up amphipod tubemat
North Reg	n2	b	4.32	5.68	5	10.99	0.39	1.07	0.75	4	0	BIOGENIC	NO	ambient; burrow down to pen; RPD faint/blurry
North Reg	n2	c	0	0	0	26.73	0.81	2.58	1.87	5	0	INDET	NO	ambient; wiper artifacts; surf tubes
North Reg	n2	d	5.51	6.26	5.88	31.68	0.66	5.45	2.26	8	0	PHYSICAL	NO	ambient; br sand; ripped-up surf tubemats; feeding voids? near pen limit
North Reg	n2	e	5.15	6.77	5.96	36.35	1.46	4.85	2.61	9	0	BIOGENIC	NO	ambient; br sand/M; sm surf tubes; feeding void or drag-down lower rt
North Reg	n2	f	0	0	0	24.83	0.35	4.68	1.75	8	0	BIOGENIC	NO	dm>pen?; RPD patchy; feeding void and bioturbation at depth
North Reg	n3	b	0	0	0	96.86	4.17	8.83	7.20	10	0	INDET	NO	ambient; sm tubes; feeding void and bioturb. at depth
North Reg	n3	c	0	0	0	33.00	1.26	3.23	2.33	7	0	PHYSICAL	NO	ambient; hydroids and sm. amphipod tubes on surf; RPD patchy; erosional
North Reg	n3	d	0	0	0	36.44	1.62	3.69	2.57	7	0	PHYSICAL	NO	ambient; br sand; surf scour and sm. tubemats
North Reg	n4	b	0	0	0	9.32	0.39	1.17	0.63	4	0	PHYSICAL	NO	dm?;S/M; shell lag;mud fractures at depth; amphipods?; two vert. burrows
North Reg	n4	c	4.17	6.89	5.53	63.92	3.98	5.10	4.56	9	0	PHYSICAL	NO	ambient; wiper artifacts; ripped-up Ampelisca tubemat
North Reg	n4	d	0	0	0	58.90	2.37	6.21	4.21	11	0	BIOGENIC	NO	ambient; shell lag; Ampelisca tubemats; lg feeding void
North Reg	n4	e	0	0	0	52.49	2.53	6.62	3.71	7	0	INDET	NO	ambient; br sand/bk; surf tubemats
North Reg	n5	a	0	0	0	63.92	3.98	5.10	4.56	10	0	PHYSICAL	NO	ambient; feeding void; surf scour; worm 5-6cm; RPD patchy
North Reg	n5	b	0	0	0	34.92	1.52	4.55	2.46	9	0	PHYSICAL	NO	ambient; Ampelisca tube mat; feeding void
North Reg	n5	c	0	0	0	26.55	1.06	3.59	1.87	8	0	PHYSICAL	NO	ambient; Ampelisca tube mat?; feeding voids;scour lag
North Reg	n6	a	6.02	8.79	7.4	26.48	1.36	2.57	1.87	7	0	PHYSICAL	NO	dm>pen?; S/M?; shell lag; surf tube mat; inf. feeding void; hydroid
North Reg	n6	c	0	0	0	NA	0.00	4.00	2.00	5	0	PHYSICAL	NO	dm>pen; shell; poor sorting; thin and patchy RPD
North Reg	n6	d	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	shallow pen; shells and shell frags on surf; ripped-up tube mats
North Reg	n7	a	0	0	0	14.57	0.44	1.75	1.44	5	0	PHYSICAL	NO	dm>pen?;S/M; amphipod tube mat; shell lag; patchy RPD
North Reg	n7	b	0	0	0	73.77	4.55	5.91	5.26	9	0	PHYSICAL	NO	dm>pen?;S/M; wiper artifacts; surf scour; fractures near pen limit
North Reg	n7	c	0	0	0	57.60	3.20	5.29	4.10	11	0	BIOGENIC	NO	ambient; ripped-up tube mat; feeding voids/or fracture? at depth
North Reg	n8	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	ambient; shell lag; shelter fabric under mat
North Reg	n8	c	0	0	0	82.14	4.61	7.91	6.19	11	0	BIOGENIC	NO	dm>pen?; S/M;surf tubes; feeding void?
North Reg	n9	b	0	0	0	0.00	0.00	0.00	0.00	1	0	PHYSICAL	NO	dm>pen;S/M;gr clay w/2 dm layers;wiper smear;relict feeding void 3.5cm thick
North Reg	n9	c	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	dm>pen; gr clay; wiper artifact;feeding voids
North Reg	n9	d	0	0	0	NA	NA	NA	NA	NA	0	INDET	NO	dm>pen; gr clay;wiper artifacts; poss. burrow and feeding voids?; sm surf tubes
North Reg	n10	a	0	0	0	24.45	1.07	2.18	1.73	6	0	PHYSICAL	NO	ambient;shallow pen; rock;;hydroids; scour lag
North Reg	n10	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	ambient; shallow pen; shells on surf; scour lag; wiper artifacts?
North Reg	n10	c	0	0	0	15.00	0.39	2.09	1.03	5	0	PHYSICAL	NO	ambient; ripped-up Ampelisca tube mat; Retro II
North Reg	n11	a	0	0	0	48.73	2.67	4.22	3.48	8	0	INDET	NO	dm>pen; chaotic fabric; poor sorting; Ampelisca tubes
North Reg	n11	b	3.64	7.62	5.63	19.38	0.83	1.84	1.35	5	0	PHYSICAL	NO	ambient;S/M;Ampelisca tubes; ripped-up tube mat; Retro II?
North Reg	n11	c	0	0	0	63.11	2.22	6.26	4.48	9	0	PHYSICAL	NO	ambient?; RPD patchy-wiper artifacts?; ripped-up Ampelisca tubes; Retro II

B5a

Reference Areas 1992

Mound/ Ref. Area	Station	Rep.	Date	Time	Analyst	Latitude	Longitude	Successional Stage	Grain Size (phi)		Major Mode	Mudclasts		Camera Penetration				Dredged Material Thicknes
									Minimum	Maximum		Count	Diameter	Minimum	Maximum	Range	Mean	
NL-Ref	100e	a	80992	829	jbc			Stage II	> 4	2	3 to 4	0	0	2.71	4.06	1.35	3.38	0
NL-Ref	100e	b	80992	830	jbc			Stage II	> 4	2	3 to 4	0	0	3.3	3.93	0.63	3.62	0
NL-Ref	100e	c	80992	830	jbc			Stage II	> 4	2	3 to 4	0	0	3.51	4.06	0.55	3.79	0
NL-Ref	100n	a	80992	956	jbc			Stage II	> 4	1	3 to 4	0	0	4.4	5.16	0.76	4.78	0
NL-Ref	100n	b	80992	957	jbc			x	>4	0	3 to 4	0	0	4.61	6.39	1.78	5.5	0
NL-Ref	100n	c	80992	958	jbc			Stage II	> 4	1	3 to 4	0	0	5.67	7.15	1.48	6.41	0
NL-Ref	100s	a	80992	1001	jbc			Stage II	> 4	2	3 to 4	0	0	6.56	7.11	0.55	6.83	0
NL-Ref	100s	b	80992	1002	jbc			Stage II	> 4	1	3 to 4	0	0	4.53	6.47	1.94	5.5	0
NL-Ref	100s	c	80992	1002	jbc			Stage II	> 4	2	3 to 4	0	0	5.75	5.92	0.17	5.84	0
NL-Ref	100w	a	80992	820	jbc			Stage II	> 4	1	3 to 4	0	0	2.54	4.95	2.41	3.74	0
NL-Ref	100w	b	80992	820	jbc			Stage II	> 4	1	3 to 4	0	0	4.57	5.71	1.14	5.14	0
NL-Ref	100w	c	80992	821	jbc			Stage II	> 4	1	3 to 4	0	0	3.47	6.43	2.96	4.95	0
NL-Ref	200e	a	80992	833	jbc			Stage II	> 4	1	3 to 4	0	0	5.54	6.09	0.55	5.82	0
NL-Ref	200e	b	80992	834	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	5.08	6.3	1.22	5.69	0
NL-Ref	200e	c	80992	834	jbc			Stage II	> 4	2	3 to 4	0	0	3.6	4.36	0.76	3.98	0
NL-Ref	200n	a	80992	952	jbc			Stage I	> 4	1	3 to 4	0	0	5.92	6.43	0.51	6.18	0
NL-Ref	200n	b	80992	953	jbc			Stage II	> 4	1	3 to 4	0	0	5.37	5.84	0.47	5.6	0
NL-Ref	200n	c	80992	953	jbc			Stage I	>4	0	3 to 4	0	0	3.81	4.65	0.84	4.23	0
NL-Ref	200s	a	80992	1005	jbc			Stage II	> 4	2	3 to 4	0	0	10.49	10.66	0.17	10.57	0
NL-Ref	200s	b	80992	1006	jbc			Stage II	> 4	1	3 to 4	0	0	7.78	8.88	1.1	8.33	0
NL-Ref	200s	c	80992	1007	jbc			Stage II	> 4	2	3 to 4	0	0	8.16	8.71	0.55	8.44	0
NL-Ref	200w	a	80992	816	jbc			Stage II	> 4	1	3 to 4	0	0	3.51	4.1	0.59	3.81	0
NL-Ref	200w	b	80992	816	jbc			Stage II	>4	0	3 to 4	0	0	4.82	5.88	1.06	5.35	0
NL-Ref	200w	c	80992	817	jbc			Stage II	> 4	1	3 to 4	0	0	5.16	5.8	0.64	5.48	0
NL-Ref	300e	a	80992	837	jbc			Stage II	> 4	2	3 to 4	0	0	5.12	5.29	0.17	5.2	0
NL-Ref	300e	b	80992	838	jbc			Stage II	> 4	2	3 to 4	0	0	3.55	4.91	1.36	4.23	0
NL-Ref	300n	a	80992	947	jbc			Stage I	> 4	1	3 to 4	0	0	5.2	5.96	0.76	5.58	0
NL-Ref	300n	b	80992	948	jbc			x	> 4	1	3 to 4	0	0	4.57	5.12	0.55	4.84	0
NL-Ref	300n	c	80992	949	jbc			x	> 4	1	3 to 4	0	0	3.26	4.27	1.01	3.76	0
NL-Ref	300s	a	80992	1007	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	8.12	8.76	0.64	8.44	0
NL-Ref	300s	b	80992	1010	jbc			Stage II	> 4	2	3 to 4	0	0	6.26	6.81	0.55	6.54	0
NL-Ref	300s	c	80992	1011	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	7.02	7.53	0.51	7.28	0
NL-Ref	300w	a	80992	812	jbc			Stage II	> 4	1	3 to 4	0	0	5.37	5.71	0.34	5.54	0
NL-Ref	300w	b	80992	812	jbc			Stage II	> 4	1	3 to 4	0	0	6.73	7.32	0.59	7.02	0
NL-Ref	300w	c	80992	813	jbc			Stage II	>4	0	3 to 4	0	0	6.64	7.61	0.97	7.13	0
NL-Ref	ctr	a	80992	824	jbc			Stage II	> 4	2	3 to 4	0	0	2.79	3.38	0.59	3.09	0
NL-Ref	ctr	b	80992	826	jbc			Stage II	> 4	1	3 to 4	0	0	3.43	3.93	0.5	3.68	0
NL-Ref	ctr	c	80992	826	jbc			Stage II	> 4	3	3 to 4	0	0	2.5	4.27	1.77	3.38	0

Mound/ Ref. Area	Station	Rep.	Redox Rebound		Apparent RPD Thickness				OSI	Methane Count	Surface Disturbance	Low DO	Comments
			Min.	Max.	Area	Minimum	Maximum	Mean					
NL-Ref	100e	a	0	0	12.66	0.55	1.27	0.91	5	0	Biological	NO	
NL-Ref	100e	b	0	0	13.58	0.51	1.44	0.975	5	0	Biological	NO	
NL-Ref	100e	c	0	0	14.04	0.59	1.44	1.015	5	0	Biological	NO	
NL-Ref	100n	a	0	0	13.75	0.42	1.57	0.995	5	0	Biological	NO	
NL-Ref	100n	b	0	0	16.28	0.59	1.78	1.185	99	0	Biological	NO	
NL-Ref	100n	c	0	0	16.33	0.8	1.57	1.185	5	0	Biological	NO	
NL-Ref	100s	a	0	0	16.18	0.63	1.73	1.18	5	0	Biological	NO	
NL-Ref	100s	b	0	0	13.79	0.51	1.48	0.995	5	0	Biological	NO	
NL-Ref	100s	c	0	0	12.5	0.59	1.23	0.91	5	0	Biological	NO	
NL-Ref	100w	a	0	0	15.65	0.55	1.69	1.12	5	0	Physical	NO	
NL-Ref	100w	b	0	0	13.88	0.51	1.48	0.995	5	0	Biological	NO	
NL-Ref	100w	c	0	0	21.06	0.68	2.37	1.525	6	0	Physical	NO	
NL-Ref	200e	a	0	0	16.92	1.02	1.44	1.23	5	0	Biological	NO	
NL-Ref	200e	b	0	0	13.58	0.59	1.4	0.995	7	0	Biological	NO	
NL-Ref	200e	c	0	0	16.19	0.89	1.44	1.165	5	0	Biological	NO	
NL-Ref	200n	a	0	0	14	0.51	1.52	1.015	3	0	Biological	NO	
NL-Ref	200n	b	0	0	15.26	0.72	1.48	1.1	5	0	Biological	NO	
NL-Ref	200n	c	0	0	18.01	0.76	1.82	1.29	3	0	Biological	NO	
NL-Ref	200s	a	0	0	21.32	1.02	2.12	1.57	6	0	Biological	NO	
NL-Ref	200s	b	0	0	19.63	0.8	2.12	1.46	5	0	Biological	NO	
NL-Ref	200s	c	0	0	16.6	0.63	1.82	1.225	5	0	Biological	NO	
NL-Ref	200w	a	0	0	15.06	0.89	1.27	1.08	5	0	Biological	NO	
NL-Ref	200w	b	0	0	16.43	0.63	1.73	1.18	5	0	Biological	NO	
NL-Ref	200w	c	0	0	13.67	0.76	1.23	0.995	5	0	Biological	NO	
NL-Ref	300e	a	0	0	13.79	0.42	1.57	0.995	5	0	Biological	NO	
NL-Ref	300e	b	0	0	17.85	0.8	1.78	1.29	5	0	Biological	NO	
NL-Ref	300n	a	0	0	10.15	0.3	1.18	0.74	2	0	Biological	NO	
NL-Ref	300n	b	0	0	18.37	0.68	1.99	1.335	99	0	Biological	NO	
NL-Ref	300n	c	0	0	17.26	0.76	1.73	1.245	99	0	Biological	NO	
NL-Ref	300s	a	0	0	20.77	0.85	2.24	1.545	8	0	Biological	NO	
NL-Ref	300s	b	0	0	14.89	0.76	1.44	1.1	5	0	Biological	NO	
NL-Ref	300s	c	0	0	16.37	0.97	1.44	1.205	7	0	Biological	NO	
NL-Ref	300w	a	0	0	19.01	0.97	1.73	1.35	5	0	Biological	NO	
NL-Ref	300w	b	0	0	13.75	0.63	1.35	0.99	5	0	Biological	NO	
NL-Ref	300w	c	0	0	25.61	1.1	2.58	1.84	6	0	Biological	NO	
NL-Ref	ctr	a	0	0	14.47	0.63	1.44	1.035	5	0	Biological	NO	
NL-Ref	ctr	b	0	0	20.37	1.35	1.57	1.46	5	0	Biological	NO	
NL-Ref	ctr	c	0	0	10.01	0.34	1.1	0.72	4	0	Physical	NO	

Mound/ Ref. Area	Station	Rep.	Date	Time	Analyst	Latitude	Longitude	Successional Stage	Grain Size (phi)		Major Mode	Mudclasts		Camera Penetration				Dredged Material Thicknes
									Minimum	Maximum		Count	Diameter	Minimum	Maximum	Range	Mean	
NE-Ref	100e	a	80892	439	jbc			Stage II	> 4	x	3 to 4	0	0	7.91	8.08	0.17	7.99	0
NE-Ref	100e	b	80892	440	jbc			Stage II	> 4	2	3 to 4	0	0	7.2	7.66	0.46	7.43	0
NE-Ref	100e	c	80892	441	jbc			Stage II	> 4	2	3 to 4	0	0	5.37	6.08	0.71	5.72	0
NE-Ref	100n	a	80892	535	jbc			Stage II	> 4	2	3 to 4	0	0	8.37	9.33	0.96	8.85	0
NE-Ref	100n	b	80892	539	jbc			Stage II	> 4	2	3 to 4	0	0	9.45	10.78	1.33	10.12	0
NE-Ref	100n	c	80892	540	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	9.08	9.87	0.79	9.47	0
NE-Ref	100s	a	80892	529	jbc			Stage II	> 4	2	3 to 4	0	0	11.57	12.11	0.54	11.84	0
NE-Ref	100s	b	80892	530	jbc			Stage II	> 4	2	3 to 4	0	0	8.78	9.2	0.42	8.99	0
NE-Ref	100s	c	80892	530	jbc			Stage I	> 4	2	3 to 4	2	0.96	7.45	8.58	1.13	8.01	0
NE-Ref	100w	a	80892	434	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	5.74	6.16	0.42	5.95	0
NE-Ref	100w	b	80892	435	jbc			Stage II ON Stage III	> 4	1	3 to 4	0	0	9.45	10.57	1.12	10.01	0
NE-Ref	100w	c	80892	436	jbc			Stage II	> 4	2	3 to 4	0	0	6.16	7.45	1.29	6.81	0
NE-Ref	200e	a	80892	444	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	8.58	8.78	0.2	8.68	0
NE-Ref	200e	b	80892	445	jbc			Stage I	> 4	2	3 to 4	0	0	3.21	5.74	2.53	4.48	0
NE-Ref	200e	c	80892	445	jbc			Stage II ON Stage III	> 4	1	3 to 4	0	0	7.45	8.08	0.63	7.76	0
NE-Ref	200n	a	80892	543	jbc			Stage II	> 4	2	3 to 4	0	0	9.74	10.7	0.96	10.22	0
NE-Ref	200n	b	80892	544	jbc			Stage II	> 4	2	> 4	0	0	6.49	6.79	0.3	6.64	0
NE-Ref	200n	c	80892	547	jbc			Stage II	> 4	2	3 to 4	0	0	8.12	8.91	0.79	8.51	0
NE-Ref	200s	a	80892	524	jbc			Stage II	> 4	2	3 to 4	0	0	8.53	9.62	1.09	9.08	0
NE-Ref	200s	b	80892	524	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	12.53	12.91	0.38	12.72	0
NE-Ref	200s	c	80892	525	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	9.57	10.49	0.92	10.03	0
NE-Ref	200w	a	80892	429	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	7.87	8.91	1.04	8.39	0
NE-Ref	200w	b	80892	430	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	7.7	8.62	0.92	8.16	0
NE-Ref	200w	c	80892	431	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	7.58	8.78	1.2	8.18	0
NE-Ref	300e	a	80892	450	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	5.99	6.29	0.3	6.14	0
NE-Ref	300e	b	80892	451	jbc			Stage II	> 4	2	3 to 4	0	0	8.83	10.03	1.2	9.43	0
NE-Ref	300e	c	80892	451	jbc			Stage II	> 4	2	> 4	0	0	9.62	11.36	1.74	10.49	0
NE-Ref	300n	a	80892	551	jbc			Stage II	> 4	2	3 to 4	0	0	7.24	7.91	0.67	7.58	0
NE-Ref	300n	c	80892	553	jbc			Stage II	> 4	2	3 to 4	0	0	9.53	10.07	0.54	9.8	0
NE-Ref	300s	a	80892	518	jbc			Stage II	> 4	2	3 to 4	0	0	7.87	8.49	0.62	8.18	0
NE-Ref	300s	b	80892	520	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	5.12	6.12	1	5.62	0
NE-Ref	300s	c	80892	520	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	7.7	8.7	1	8.2	0
NE-Ref	300w	a	80892	423	jbc			Stage II ON Stage III	> 4	1	3 to 4	0	0	6.62	7.24	0.62	6.93	0
NE-Ref	300w	b	80892	424	jbc			Stage II	> 4	2	3 to 4	0	0	8.08	8.45	0.37	8.26	0
NE-Ref	300w	c	80892	425	jbc			Stage II ON Stage III	> 4	2	3 to 4	0	0	6.99	8.08	1.09	7.54	0
NE-Ref	ctr	a	80892	415	jbc			Stage II	> 4	1	3 to 4	0	0	7.58	8.34	0.76	7.96	0
NE-Ref	ctr	b	80892	417	jbc			Stage II	> 4	1	3 to 4	0	0	7.7	8.3	0.6	8	0
NE-Ref	ctr	c	80892	417	jbc			Stage II	> 4	1	> 4	0	0	6.69	9.4	2.71	8.04	0

Mound/ Ref. Area	Station	Rep.	Redox Rebound		Apparent RPD Thickness				OSI	Methane Count	Surface Disturbance	Low DO	Comments
			Min.	Max.	Area	Minimum	Maximum	Mean					
NE-Ref	100e	a	0	0	16.72	0.83	1.62	1.225	5	0	Biological	NO	tube mat on surface hydroid
NE-Ref	100e	b	0	0	23.94	1.58	1.96	1.77	6	0	Biological	NO	surface amphipod mat
NE-Ref	100e	c	0	0	11.3	0.37	1.29	0.83	5	0	Biological	NO	dense tube mat on surface
NE-Ref	100n	a	0	0	20.18	1.08	1.87	1.475	5	0	Biological	NO	x
NE-Ref	100n	b	0	0	20	0.83	2.12	1.475	5	0	Biological	NO	tube mat and hydroids
NE-Ref	100n	c	0	0	19.43	0.67	2.21	1.44	7	0	Biological	NO	hydroids surface tubes
NE-Ref	100s	a	0	0	29.38	1.33	3	2.165	6	0	Biological	NO	tube mat
NE-Ref	100s	b	0	0	26.8	1.21	2.71	1.96	6	0	Biological	NO	tube mat on surface
NE-Ref	100s	c	0	0	15.39	0.67	1.58	1.125	3	0	Biological	NO	surface debris rx hydroids
NE-Ref	100w	a	0	0	11.37	0.33	1.33	0.83	7	0	Biological	NO	surface tube mat
NE-Ref	100w	b	0	0	18.98	0.67	2.12	1.395	7	0	Biological	NO	some slope
NE-Ref	100w	c	0	0	19.49	1.12	1.75	1.435	5	0	Biological	NO	tube mat on surface
NE-Ref	200e	a	0	0	26.84	1.5	2.46	1.98	8	0	Biological	NO	dense tube mat on surface
NE-Ref	200e	b	0	0	13.24	0.29	1.67	0.98	3	0	Physical	NO	rippled some shells scattered on surface
NE-Ref	200e	c	0	0	17.51	0.62	1.96	1.29	7	0	Biological	NO	amphipod mat Stg III tube?
NE-Ref	200n	a	0	0	38.46	2.75	2.96	2.855	7	0	Biological	NO	dense surface tube mat
NE-Ref	200n	b	0	0	8.24	0.25	0.96	0.605	4	0	Biological	NO	dense tube mat
NE-Ref	200n	c	0	0	46.33	2.79	4	3.395	8	0	Biological	NO	surface tube mat
NE-Ref	200s	a	0	0	28.53	1.62	2.58	2.1	6	0	Biological	NO	hydroids and tubes on surface some slope
NE-Ref	200s	b	0	0	46.61	2.87	4	3.435	10	0	Biological	NO	dense tube mat and hydroids
NE-Ref	200s	c	0	0	19.9	0.83	2.08	1.455	7	0	Biological	NO	dense tube mat on surface
NE-Ref	200w	a	0	0	15.35	0.54	1.71	1.125	7	0	Biological	NO	surface tube mat
NE-Ref	200w	b	0	0	20.68	0.62	2.41	1.515	8	0	Biological	NO	surface tube mat
NE-Ref	200w	c	0	0	12.47	0.37	1.46	0.915	7	0	Biological	NO	surface tube mat
NE-Ref	300e	a	0	0	18.81	0.87	1.91	1.39	7	0	Biological	NO	hydroids surface tube mat
NE-Ref	300e	b	0	0	43.24	2.83	3.58	3.205	8	0	Biological	NO	surface tube mat
NE-Ref	300e	c	0	0	24.71	1.42	2.25	1.835	6	0	Biological	NO	xdense tube mat some slope
NE-Ref	300n	a	0	0	15.06	0.42	1.79	1.105	5	0	Biological	NO	tube mat
NE-Ref	300n	c	0	0	29.76	1.5	2.91	2.205	6	0	Biological	NO	surface tube mat
NE-Ref	300s	a	0	0	20.18	1.08	1.87	1.475	5	0	Biological	NO	surface tube mat hydroids
NE-Ref	300s	b	0	0	13.6	0.42	1.58	1	7	0	Biological	NO	surface tube mat some slope amphipods and Stg III worms
NE-Ref	300s	c	0	0	24.58	1.29	2.33	1.81	8	0	Biological	NO	dense tube mat on surface
NE-Ref	300w	a	0	0	24.09	1.21	2.33	1.77	8	0	Biological	NO	tube mat on surface
NE-Ref	300w	b	0	0	30.79	1.83	2.71	2.27	7	0	Biological	NO	tube mat on surface Ampelisca sp
NE-Ref	300w	c	0	0	23.02	1.25	2.12	1.685	8	0	Biological	NO	surface tube mat
NE-Ref	ctr	a	0	0	10.16	0.55	0.93	0.74	4	0	Physical	NO	some slope
NE-Ref	ctr	b	0	0	18.69	1.06	1.65	1.355	5	0	Biological	NO	x
NE-Ref	ctr	c	0	0	9.99	0.34	1.1	0.72	4	0	Physical	NO	some slope surface tube mat

Mound/ Ref. Area	Station	Rep.	Date	Time	Analyst	Latitude	Longitude	Successional Stage	Grain Size (phi)		Major Mode	Mudclasts		Camera Penetration				Dredged Material Thicknes
									Minimum	Maximum		Count	Diameter	Minimum	Maximum	Range	Mean	
West-Ref	100e	a	80892	1125	jbc			x	> 4	1	2 to 3	0	0	3.77	4.22	0.45	3.99	0
West-Ref	100e	b	80892	1126	jbc			x	> 4	1	2 to 3	0	0	6.1	7.09	0.99	6.59	0
West-Ref	100e	c	80892	1127	jbc			x	> 4	1	2 to 3	0	0	3.69	5.37	1.68	4.53	0
West-Ref	100n	a	80892	1208	jbc			Stage I	> 4	1	3 to 4	0	0	5.28	5.37	0.09	5.32	0
West-Ref	100n	b	80892	1209	jbc			Stage I	>4	0	3 to 4	0	0	6.87	6.95	0.08	6.91	0
West-Ref	100n	c	80892	1210	jbc			Stage I	> 4	1	2 to 3	0	0	5.99	7.54	1.55	6.76	0
West-Ref	100s	a	80892	1203	jbc			Stage I	-> 4	-1	2 to 3	0	0	7.62	8.07	0.45	7 84	0
West-Ref	100s	b	80892	1203	jbc			Stage I	> 4	1	3 to 4	0	0	7.25	7.37	0.12	7.31	0
West-Ref	100s	c	80892	1204	jbc			Stage I	>4	0	3 to 4	0	0	9.26	10.16	0.9	9.71	0
West-Ref	100w	a	80892	1136	jbc			Stage I	> 4	1	2 to 3	0	0	3.52	4.3	0.73	3.91	0
West-Ref	100w	b	80892	1137	jbc			Stage I	> 4	1	2 to 3	0	0	4.42	4.46	0.04	4.44	0
West-Ref	100w	c	80892	1137	jbc			x	> 4	1	2 to 3	0	0	3.69	4.06	0.37	3 87	0
West-Ref	200e	a	80892	1120	jbc			INDET	>4	0	2 to 3	0	0	4.42	5.04	0.62	4.73	0
West-Ref	200e	b	80892	1121	jbc			x	>4	0	2 to 3	0	0	4.14	4.96	0.82	4.55	0
West-Ref	200e	c	80892	1122	jbc			INDET	>4	0	2 to 3	2	0.9	6.43	7	0.57	6.72	0
West-Ref	200n	a	80892	1239	jbc			x	x	x	x	0	0	0	0	0	0	0
West-Ref	200n	b	80892	1240	jbc			x	x	x	x	0	0	0	0	0	0	0
West-Ref	200n	c	80892	1240	jbc			Stage I	>4	0	3 to 4	0	0	4.3	4.51	0.21	4.4	0
West-Ref	200s	a	80892	1157	jbc			x	>4	0	2 to 3	0	0	6.47	6.84	0.37	6.66	0
West-Ref	200s	b	80892	1157	jbc			Stage I ON Stage III	> 4	1	3 to 4	0	0	7	7.78	0.78	7.39	0
West-Ref	200s	c	80892	1158	jbc			x	>4	0	3 to 4	0	0	7.41	8.07	0.66	7.74	0
West-Ref	200w	a	80892	1140	jbc			Stage I	> 4	1	3 to 4	0	0	6.43	6.72	0.29	6.57	0
West-Ref	200w	b	80892	1141	jbc			Stage I	> 4	1	2 to 3	0	0	6.51	6.88	0.37	6.7	0
West-Ref	200w	c	80892	1141	jbc			Stage I	> 4	1	2 to 3	0	0	7.54	7.95	0.41	7.74	0
West-Ref	300e	a	80892	1119	jbc			Stage III	>4	0	2 to 3	0	0	5.08	5.65	0.57	5.37	0
West-Ref	300e	b	80892	1116	jbc			x	>4	0	2 to 3	1	0.86	6.8	7.05	0.25	6.92	0
West-Ref	300e	c	80892	1117	jbc			x	>4	0	2 to 3	1	1.31	4.67	5.32	0.65	5	0
West-Ref	300n	b	80892	1245	jbc			x	x	x	x	0	0	0	0	0	0	0
West-Ref	300n	c	80892	1246	jbc			x	x	x	x	0	0	0	0	0	0	0
West-Ref	300s	a	80892	1152	jbc			Stage I	>4	0	3 to 4	0	0	5.73	5.86	0.13	5.8	0
West-Ref	300s	b	80892	1153	jbc			Stage I ON Stage III	> 4	1	3 to 4	0	0	6.39	7.33	0.94	6.86	0
West-Ref	300s	c	80892	1153	jbc			Stage I	>4	0	3 to 4	0	0	6.51	7.29	0.78	6.9	0
West-Ref	300w	a	80892	1144	jbc			Stage I	> 4	1	2 to 3	0	0	5.5	5.91	0.41	5.7	0
West-Ref	300w	b	80892	1145	jbc			Stage I	>4	0	3 to 4	0	0	6.1	7.29	1 19	6.7	0
West-Ref	300w	c	80892	1146	jbc			Stage I ON Stage III	> 4	1	3 to 4	0	0	5.04	5.78	0.74	5.41	0
West-Ref	ctr	a	80892	1131	jbc			Stage I ON Stage III	> 4	1	> 4	0	0	6.39	6.76	0.37	6.57	0
West-Ref	ctr	b	80892	1132	jbc			Stage I	> 4	1	3 to 4	0	0	6.64	7.41	0.77	7.02	0
West-Ref	ctr	c	80892	1133	jbc			Stage I ON Stage III	>4	0	> 4	0	0	8.56	8.81	0.25	8.68	0

Mound/ Ref. Area	Station	Rep.	Redox Rebound		Apparent RPD Thickness				OSI	Methane Count	Surface Disturbance	Low DO	Comments
			Min.	Max.	Area	Minimum	Maximum	Mean					
West-Ref	100e	a	0	0	29.44	2.05	2.33	2.19	99	0	Biological	NO	
West-Ref	100e	b	0	0	29.05	1.76	2.5	2.13	99	0	Biological	NO	
West-Ref	100e	c	0	0	32.58	1.23	3.56	2.395	99	0	Biological	NO	
West-Ref	100n	a	0	0	17.72	1.19	1.43	1.31	3	0	Biological	NO	
West-Ref	100n	b	0	0	20.68	0.96	2.08	1.52	4	0	Biological	NO	
West-Ref	100n	c	0	0	31.17	2	2.54	2.27	5	0	Biological	NO	
West-Ref	100s	a	0	0	37.14	1.97	3.56	2.765	5	0	Biological	NO	
West-Ref	100s	b	0	0	15.86	0.57	1.8	1.185	3	0	Biological	NO	
West-Ref	100s	c	0	0	36.26	1.88	3.56	2.72	5	0	Biological	NO	
West-Ref	100w	a	0	0	23.25	1.27	2.17	1.72	4	0	Biological	NO	
West-Ref	100w	b	0	0	11.83	0.53	1.23	0.88	3	0	Biological	NO	
West-Ref	100w	c	0	0	56.2	3.65	4.67	4.16	99	0	Biological	NO	
West-Ref	200e	a	0	0	16.89	0.86	1.64	1.25	99	0	Biological	NO	
West-Ref	200e	b	0	0	34.99	2.09	3.07	2.58	99	0	Biological	NO	
West-Ref	200e	c	0	0	33.95	2.13	2.91	2.52	99	0	Biological	NO	
West-Ref	200n	a	0	0	0	0	0	0	99	0	x	NO	
West-Ref	200n	b	0	0	0	0	0	0	99	0	x	NO	
West-Ref	200n	c	0	0	18.22	1.02	1.68	1.35	3	0	Biological	NO	
West-Ref	200s	a	0	0	30.08	1.47	2.99	2.23	99	0	Biological	NO	
West-Ref	200s	b	0	0	17.5	0.49	2.13	1.31	7	0	Biological	NO	
West-Ref	200s	c	0	0	20.36	0.66	2.38	1.52	99	0	Biological	NO	
West-Ref	200w	a	0	0	20.85	0.98	2.13	1.555	4	0	Biological	NO	
West-Ref	200w	b	0	0	19.26	0.9	1.97	1.435	3	0	Biological	NO	
West-Ref	200w	c	0	0	29.17	1.56	2.83	2.195	4	0	Biological	NO	
West-Ref	300e	a	0	0	19.77	1.11	1.8	1.455	7	0	Biological	NO	
West-Ref	300e	b	0	0	33.29	1.8	3.15	2.475	99	0	Biological	NO	
West-Ref	300e	c	0	0	17.32	1.15	1.39	1.27	99	0	Biological	NO	
West-Ref	300n	b	0	0	0	0	0	0	99	0	x	NO	
West-Ref	300n	c	0	0	0	0	0	0	99	0	x	NO	
West-Ref	300s	a	0	0	12.62	0.53	1.35	0.94	3	0	Biological	NO	
West-Ref	300s	b	0	0	10.76	0.37	1.23	0.8	7	0	Biological	NO	
West-Ref	300s	c	0	0	22.35	0.78	2.54	1.66	4	0	Biological	NO	
West-Ref	300w	a	0	0	23.88	1.04	2.41	1.725	4	0	Biological	NO	
West-Ref	300w	b	0	0	18.66	1.06	1.68	1.37	3	0	Biological	NO	
West-Ref	300w	c	0	0	15.31	0.82	1.47	1.145	7	0	Biological	NO	
West-Ref	ctr	a	0	0	18.33	1.06	1.64	1.35	7	0	Biological	NO	
West-Ref	ctr	b	0	0	12.89	0.7	1.23	0.965	3	0	Biological	NO	
West-Ref	ctr	c	0	0	18.81	0.57	2.25	1.41	7	0	Biological	NO	

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Reference Area	Station	Rep	Date	Successional Stage	Grain Size (phi) Min.	Grain Size (phi) Max.	Mud Clasts Major Mode	Mud Clasts No.	Mud Clasts Dia.	Camera Penetration Min.	Camera Penetration Max.	Camera Penetration Range	Camera Penetration Mean	Apparent RPD Thickness Area	Apparent RPD Thickness Min.	Apparent RPD Thickness Max.	Apparent RPD Thickness Mean	OSI	Surface Disturbance	Low DO	Comments
WEST REF	STA1	A	08/26/95	ST_II_ON_III	-1	>4	3 to 2	0	0	3.3	4.88	1.58	4.09	52.202	2.49	4.83	3.78	11	BIOGENIC	NO	Underpenetrated; RPD > than measured; shell lag; poor sorting
WEST REF	STA1	B	08/26/95	ST_II	-1	>4	3 to 2	0	0	4.07	5.98	1.91	5.02	38.56	0.98	5.69	2.76	7	BIOGENIC	NO	Underpenetrated; RPD > than measured; shell lag; poor sorting
WEST REF	STA1	D	08/26/95	ST_II_ON_III	-1	>4	3 to 2	0	0	6.08	7.08	1	6.58	28.851	0.14	6.65	2.2	8	BIOGENIC	NO	Lg. burrow; poor sorting
WEST REF	STA2	A	08/26/95	ST_II_ON_III	0	>4	3 to 2	0	0	4.59	4.93	0.34	4.76	21.153	0.1	4.31	1.53	8	BIOGENIC	NO	RPD patchy; ripped-up tube mat; mod. to poor sorting
WEST REF	STA2	B	08/26/95	ST_II	-1	>4	3 to 2	0	0	2.78	3.5	0.72	3.14	0	0	0	0	-1	BIOGENIC	YES	Underpenetrated; ripped-up mat; mod. to poor sorting; hypoxic?
WEST REF	STA2	C	08/26/95	ST_II	1	>4	3 to 2	6	0.43	4.79	5.41	0.62	5.1	11.601	0.05	2.3	0.88	5	BIOGENIC	NO	Low penetration; RPD mostly on rt.; ripped-up amphipod tube mat; mod. to poor so
WEST REF	STA3	A	08/26/95	ST_III	-1	>4	3 to 2	0	0	5.22	6.12	0.91	5.67	33.781	0.72	5.31	2.48	9	BIOGENIC	NO	Ripped-up amphipod tube mat; some shell lag; sm. voids; poor sorting
WEST REF	STA3	B	08/26/95	ST_II	-1	>4	3 to 2	0	0	3.16	3.92	0.77	3.54	7.383	0.05	1.96	0.52	4	BIOGENIC	NO	Underpen.; ripped-up mat; poor sorting; shell lag; RPD patchy 0 cm in spots
WEST REF	STA3	C	08/26/95	ST_II	-1	>4	3 to 2	0	0	1.58	3.78	2.21	2.68	25.772	0.19	3.4	2.07	6	BIOGENIC	NO	Underpen.; ripped-up amphipod tube mat; poor sorting; wiper artifacts; shell lag
WEST REF	STA4	A	08/26/95	ST_II_ON_III	-1	>4	3 to 2	0	0	7.27	8.04	0.77	7.66	26.776	0.19	7.46	2.05	8	BIOGENIC	NO	Amphipod tube mat; podocerids; lg. burrow to depth; poor sorting
WEST REF	STA4	B	08/26/95	ST_II	-1	>4	4 to 3	0	0	7.27	8.04	0.77	7.66	13.839	0.05	2.54	1	5	BIOGENIC	NO	Ripped-up amphipod tube mat; wiper artifact; poor sorting
WEST REF	STA4	C	08/26/95	ST_II_ON_III	-1	>4	3 to 2	0	0	4.88	5.6	0.72	5.24	8.386	0.05	3.11	0.57	6	BIOGENIC	NO	Few amphipod tubes; sm. voids
WEST REF	STA5	A	08/26/95	INDET	-1	>4	2 to 1	0	0	3.64	3.88	0.24	3.76	50.496	2.49	4.5	3.61	IND	BIOGENIC	NO	RPD > penetration?; sm. voids
WEST REF	STA5	C	08/26/95	INDET	-1	>4	2 to 1	0	0	1.53	3.06	1.53	2.3	32.132	1.15	2.97	2.24	IND	INDET	NO	Underpenetrated; RPD > pen.; shelly; rippled; hypoxic?
WEST REF	STA6	A	08/26/95	ST_II_ON_III	1	>4	4 to 3	0	0	7.51	8.95	1.44	8.23	12.765	0.05	2.63	0.93	7	BIOGENIC	NO	Amphipod tube mat
WEST REF	STA6	B	08/26/95	AZOIC	-1	>4	3 to 2	0	0	5.65	8.13	2.49	6.89	0	0	0	0	-8	BIOGENIC	YES	Decaying tube mat; some shell lag; some RPD on right?
WEST REF	STA6	C	08/26/95	ST_II	-1	>4	3 to 2	0	0	6.46	7.32	0.86	6.89	26.172	0.05	5.31	2.04	6	BIOGENIC	NO	Amphipod tube mat; mod. to poor sorting
NE REF	STA1	A	08/26/95	ST_II_ON_III	1	>4	4 to 3	0	0	5.89	7.66	1.77	6.77	23.623	0.19	6.79	1.87	8	BIOGENIC	NO	S/M; ripped-up amphipod tubes
NE REF	STA1	B	08/26/95	ST_II_ON_III	-1	>4	4 to 3	0	0	5.55	7.32	1.77	6.44	21.882	0.05	6.32	1.62	8	BIOGENIC	NO	S/M; ripped-up tube mat
NE REF	STA1	C	08/26/95	ST_II	-1	>4	4 to 3	0	0	6.17	6.7	0.53	6.44	25.556	0.3	2.42	1.87	6	BIOGENIC	NO	S/M; no voids seen
NE REF	STA2	A	08/26/95	ST_II	2	>4	4 to 3	0	0	5.49	6.7	1.21	6.09	13.795	0.15	3.4	0.95	5	BIOGENIC	NO	S/M; ripped-up tube mat
NE REF	STA2	B	08/26/95	ST_II	3	>4	4 to 3	0	0	7.96	9.01	1.94	8.93	15.078	0.05	2.86	1.05	5	INDET	NO	S/M; ripped-up amphipod tube mat
NE REF	STA2	C	08/26/95	ST_II	1	>4	4 to 3	0	0	5.78	7.28	1.5	6.53	15.363	0.05	3.69	1.08	5	BIOGENIC	NO	S/M; ripped-up tube mat
NE REF	STA3	A	08/26/95	ST_II	0	>4	4 to 3	0	0	7.04	7.18	0.15	7.11	7.673	0.05	1.5	0.51	4	BIOGENIC	NO	S/M; ripped-up tube mat
NE REF	STA3	B	08/26/95	ST_I_ON_III	2	>4	4 to 3	0	0	4.85	5.88	1.02	5.36	7.129	0.05	1.5	0.48	6	INDET	NO	S/M; rippled?
NE REF	STA3	C	08/26/95	ST_II_ON_III	2	>4	4 to 3	0	0	6.02	7.28	1.26	6.65	26.617	1.01	2.32	1.9	8	BIOGENIC	NO	S/M; wiper artifacts
NE REF	STA4	A	08/26/95	ST_II_ON_III	-1	>4	4 to 3	0	0	8.45	9.08	0.63	8.76	11.439	0.1	3.11	0.85	7	BIOGENIC	NO	S/M; ripped-up tube mat
NE REF	STA4	B	08/26/95	ST_II_ON_III	1	>4	4 to 3	0	0	7.77	8.25	0.48	8.01	9.532	0.1	2.38	0.65	6	BIOGENIC	NO	S/M; ripped-up tube mat
NE REF	STA4	D	08/26/95	ST_II	1	>4	>4	0	0	5.83	6.02	0.19	5.92	6.652	0.05	0.73	0.44	4	INDET	NO	S/M; ripped-up tube mat?
NE REF	STA5	A	08/26/95	ST_II_ON_III	2	>4	4 to 3	0	0	6.5	7.28	0.78	6.89	17.67	0.05	6.41	1.34	7	INDET	NO	S/M; ripped-up amphipod tubes
NE REF	STA5	B	08/26/95	ST_II	2	>4	4 to 3	0	0	4.85	6.89	2.04	5.87	6.661	0.05	0.68	0.44	4	INDET	NO	S/M; ripped-up tube mat
NE REF	STA5	C	08/26/95	ST_II	-1	>4	4 to 3	0	0	5.44	6.17	0.73	5.8	7.608	0.05	1.17	0.53	4	INDET	NO	S/M; ripped-up tube mat
NLON REF	STA1	A	08/26/95	ST_II_ON_III	-1	>4	4 to 3	0	0	5.97	6.6	0.63	6.29	11.733	0.05	2.77	0.81	7	BIOGENIC	NO	Dense amphipod tube mat
NLON REF	STA1	B	08/26/95	ST_II	2	>4	4 to 3	0	0	5.34	6.17	0.83	5.75	15.64	0.05	3.4	1.1	5	BIOGENIC	NO	Dense amphipod tube mat; many small crustacean burrows in upper 2 cm
NLON REF	STA1	C	08/26/95	ST_II	-1	>4	4 to 3	0	0	4.22	4.81	0.58	4.52	8.767	0.05	2.04	0.6	4	BIOGENIC	NO	Dense amphipod tube mat
NLON REF	STA2	A	08/26/95	ST_II_ON_III	2	>4	4 to 3	0	0	8.74	10.05	1.31	9.39	20.968	0.44	6.75	1.62	8	BIOGENIC	NO	S/M; dense amphipod tube mat; PRINT for report; classic St. II; wiper artifact
NLON REF	STA2	B	08/26/95	ST_II_ON_III	2	>4	4 to 3	0	0	10	10.78	0.78	10.39	8.6	0.05	4.37	0.62	2	BIOGENIC	YES	S/M; dense amphipod tube mat; RPD 0 on most surf.; burrows in top 3 cm
NLON REF	STA2	C	08/26/95	ST_II	2	>4	4 to 3	10	1.01	8.79	9.03	0.24	8.91	NA	NA	NA	NA	IND	BIOGENIC	NO	Amphipod tubes; ripped-up mat; wiper artifacts
NLON REF	STA3	A	08/26/95	ST_II_ON_III	1	>4	4 to 3	0	0	5.97	7.09	1.12	6.53	12.63	0.05	3.35	0.88	7	BIOGENIC	NO	Ripped-up amphipod tube mat; RPD 0 over 1/2 surf.; sm. burrows
NLON REF	STA3	B	08/26/95	ST_II	2	>4	4 to 3	0	0	6.6	7.46	0.87	7.04	10.391	0.05	1.8	0.73	4	BIOGENIC	NO	Dense amphipod tube mat; many sm. crustacean burrows
NLON REF	STA3	C	08/26/95	ST_II_ON_III	-1	>4	4 to 3	0	0	7.67	8.54	0.87	8.11	46.099	1.17	5.63	3.68	10	BIOGENIC	NO	Amphipod tube mat; plant detritus; burrow at 6 cm depth
NLON REF	STA4	A	08/26/95	ST_II	1	>4	4 to 3	0	0	4.95	5.39	0.44	5.17	60.897	3.25	5.19	4.37	9	BIOGENIC	NO	Amphipod mat
NLON REF	STA4	B	08/26/95	ST_II	-1	>4	4 to 3	0	0	2.67	4.03	1.36	3.35	7.476	0.15	0.83	0.52	4	BIOGENIC	NO	Amphipod mat; eel grass detritus
NLON REF	STA4	C	08/26/95	ST_II	2	>4	4 to 3	0	0	4.23	5.25	1.02	4.74	28.829	0.05	3.01	2.04	6	BIOGENIC	NO	Ripped-up amphipod tube mat

IND = Indeterminate

B5c
Reference Areas 1997

Mound/ Ref. Area	Station	Rep.	Date	TIME	ANALYST	LATITUDE	LONGITUDE	Successional Stage	Grain Size (phi) Minimum	Grain Size (phi) Maximum	Major Mode	Mudclasts Count	Mudclasts Diameter	Camera Penetration Minimum	Camera Penetration Maximum	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness Area	Dredged Material Thickness Minimum	Dredged Material Thickness Maximum	Dredged Material Thickness Mean
NLON Ref	sta1	a	09/06/97	12:10	HLS	41 16.70907	072 01.973W	ST_I_ON_III	>4	3	4 to 3	0	0.00	7.04	7.86	0.82	7.45	0.00	0.00	0.00	0.00
NLON Ref	sta1	b	09/06/97	12:11	HLS	41 16.704	072 01.971W	ST_II	>4	3	4 to 3	0	0.00	4.61	4.90	0.29	4.76	0.00	0.00	0.00	0.00
NLON Ref	sta1	c	09/06/97	12:12	HLS	41 16.70102	072 01.891W	ST_II	>4	3	4 to 3	0	0.00	3.83	4.13	0.29	3.98	0.00	0.00	0.00	0.00
NLON Ref	sta1	d	09/10/97	8:04	HLS	41 16.70335	072 01.959W	INDET	>4	3	4 to 3	0	0.00	4.65	5.05	0.40	4.85	0.00	0.00	0.00	0.00
NLON Ref	sta1	e	09/10/97	8:05	HLS	41 16.7084	072 01.952W	INDET	>4	3	4 to 3	0	0.00	3.94	4.39	0.45	4.17	0.00	0.00	0.00	0.00
NLON Ref	sta2	a	09/06/97	12:28	HLS	41 16.56542	072 02.051W	ST_II_ON_III	>4	4	>4	0	0.00	8.45	9.32	0.87	8.89	0.00	0.00	0.00	0.00
NLON Ref	sta2	b	09/06/97	12:29	HLS	41 16.55987	072 02.051W	ST_I_TO_II	>4	4	>4	0	0.00	8.84	10.05	1.21	9.44	0.00	0.00	0.00	0.00
NLON Ref	sta2	c	09/06/97	12:30	HLS	41 16.55702	072 02.052W	ST_II_ON_III	>4	3	4 to 3	0	0.00	11.26	11.50	0.24	11.38	0.00	0.00	0.00	0.00
NLON Ref	sta3	a	09/06/97	12:15	HLS	41 16.69302	072 01.891W	ST_II	>4	3	4 to 3	0	0.00	3.79	4.71	0.92	4.25	0.00	0.00	0.00	0.00
NLON Ref	sta3	b	09/06/97	12:15	HLS	41 16.692	072 01.891W	INDET	>4	3	4 to 3	0	0.00	2.44	2.74	0.30	2.59	0.00	0.00	0.00	0.00
NLON Ref	sta3	c	09/06/97	12:16	HLS	41 16.6911	072 01.889W	ST_II	>4	3	4 to 3	0	0.00	4.73	5.41	0.68	5.07	0.00	0.00	0.00	0.00
NLON Ref	sta3	d	09/10/97	8:09	HLS	41 16.69963	072 01.880W	ST_II	>4	3	4 to 3	0	0.00	5.40	5.91	0.51	5.66	0.00	0.00	0.00	0.00
NLON Ref	sta3	e	09/10/97	8:09	HLS	41 16.7014	072 01.877W	ST_II_TO_III	>4	3	4 to 3	0	0.00	5.40	5.86	0.45	5.63	0.00	0.00	0.00	0.00
NLON Ref	sta4	a	09/06/97	12:21	HLS	41 16.57097	072 01.818W	ST_II_ON_III	>4	3	4 to 3	0	0.00	9.08	9.37	0.29	9.23	0.00	0.00	0.00	0.00
NLON Ref	sta4	b	09/06/97	12:24	HLS	41 16.56073	072 01.833W	ST_I_TO_II	>4	4	>4	0	0.00	5.80	6.47	0.68	6.14	0.00	0.00	0.00	0.00
NLON Ref	sta4	c	09/06/97	12:24	HLS	41 16.55602	072 01.838W	ST_I_TO_II	>4	3	4 to 3	0	0.00	6.62	7.20	0.58	6.91	0.00	0.00	0.00	0.00
NE-Ref	sta5	a	09/06/97	1:25	HLS	41 16.66	072 03.303W	ST_I_TO_II	>4	3	4 to 3	0	0.00	6.28	6.67	0.39	6.47	0.00	0.00	0.00	0.00
NE-Ref	sta5	c	09/06/97	1:27	HLS	41 16.65988	072 03.316W	ST_II	>4	3	4 to 3	0	0.00	6.04	6.43	0.39	6.23	0.00	0.00	0.00	0.00
NE-Ref	sta5	d	09/10/97	7:54	HLS	41 16.6683	072 03.313W	ST_II_ON_III	>4	3	4 to 3	0	0.00	8.84	9.24	0.40	9.04	0.00	0.00	0.00	0.00
NE-Ref	sta6	a	09/06/97	1:30	HLS	41 16.67802	072 03.377W	ST_II	>4	3	4 to 3	0	0.00	7.92	8.55	0.63	8.24	0.00	0.00	0.00	0.00
NE-Ref	sta6	b	09/06/97	1:30	HLS	41 16.67283	072 03.371W	ST_II_TO_III	>4	3	4 to 3	0	0.00	4.20	6.47	2.27	5.34	0.00	0.00	0.00	0.00
NE-Ref	sta6	d	09/10/97	7:52	HLS	41 16.6823	072 03.380W	ST_II	>4	3	4 to 3	0	0.00	7.12	8.38	1.26	7.75	0.00	0.00	0.00	0.00
NE-Ref	sta7	a	09/06/97	1:34	HLS	41 16.76303	072 03.359W	ST_II	>4	3	4 to 3	0	0.00	8.89	9.71	0.82	9.30	0.00	0.00	0.00	0.00
NE-Ref	sta7	b	09/06/97	1:35	HLS	41 16.762	072 03.360W	ST_I	>4	3	4 to 3	0	0.00	8.12	8.50	0.39	8.31	0.00	0.00	0.00	0.00
NE-Ref	sta7	c	09/06/97	1:36	HLS	41 16.76005	072 03.361W	ST_I_TO_II	>4	3	4 to 3	0	0.00	7.68	8.21	0.53	7.95	0.00	0.00	0.00	0.00
NE-Ref	sta8	b	09/06/97	1:42	HLS	41 16.68898	072 03.551W	ST_I_TO_II	>4	3	4 to 3	0	0.00	8.74	9.18	0.43	8.96	0.00	0.00	0.00	0.00
NE-Ref	sta8	c	09/06/97	1:42	HLS	41 16.69	072 03.553W	ST_I_TO_II	>4	3	4 to 3	0	0.00	6.52	7.44	0.92	6.98	0.00	0.00	0.00	0.00
NE-Ref	sta8	d	09/10/97	7:48	HLS	41 16780	072 03.535W	ST_II	>4	3	4 to 3	0	0.00	8.59	9.04	0.45	8.81	0.00	0.00	0.00	0.00
NE-Ref	sta9	a	09/06/97	1:47	HLS	41 16.6762	072 03.271W	ST_II_ON_III	>4	3	4 to 3	0	0.00	9.08	9.47	0.39	9.28	0.00	0.00	0.00	0.00
NE-Ref	sta9	b	09/06/97	1:48	HLS	41 16.67035	072 03.271W	ST_III	>4	3	4 to 3	1	2.04	7.57	8.22	0.64	7.90	0.00	0.00	0.00	0.00
NE-Ref	sta9	c	09/06/97	1:49	HLS	41 16.66298	072 03.261W	ST_I_ON_III	>4	3	4 to 3	0	0.00	6.57	7.15	0.58	6.86	0.00	0.00	0.00	0.00
West-Ref	w10	a	09/06/97	3:29	HLS	41 16.19803	072 05.921W	ST_II	>4	2	4 to 3	0	0.00	8.01	8.59	0.58	8.30	0.00	0.00	0.00	0.00
West-Ref	w10	c	09/06/97	3:34	HLS	41 16.20593	072 05.927W	ST_II	>4	2	3 to 2	0	0.00	7.72	8.54	0.83	8.13	0.00	0.00	0.00	0.00
West-Ref	w10	d	09/10/97	6:28	HLS	41 16.2048	072 05.913W	ST_I	>4	3	4 to 3	0	0.00	4.06	4.95	0.89	4.50	0.00	0.00	0.00	0.00
West-Ref	w11	a	09/06/97	3:24	HLS	41 16.32692	072 05.848W	ST_II_TO_III	>4	3	4 to 3	0	0.00	9.81	10.44	0.63	10.12	0.00	0.00	0.00	0.00
West-Ref	w11	b	09/06/97	3:24	HLS	41 16.32608	072 05.842W	ST_II_ON_III	>4	3	4 to 3	0	0.00	11.26	12.09	0.83	11.67	0.00	0.00	0.00	0.00
West-Ref	w11	c	09/06/97	3:25	HLS	41 16.32615	072 05.835W	INDET	>4	3	4 to 3	0	0.00	8.54	9.56	1.02	9.05	0.00	0.00	0.00	0.00
West-Ref	w12	b	09/06/97	3:40	HLS	41 16.19737	072 05.967W	ST_II	>4	3	4 to 3	0	0.00	4.56	5.83	1.26	5.19	0.00	0.00	0.00	0.00
West-Ref	w12	c	09/06/97	3:40	HLS	41 16.20333	072 05.948W	ST_II	>4	3	4 to 3	0	0.00	6.70	7.43	0.73	7.06	0.00	0.00	0.00	0.00
West-Ref	w12	d	09/10/97	6:31	HLS	41 16.19585	072 05.970W	ST_II	>4	3	4 to 3	0	0.00	4.11	5.69	1.58	4.90	0.00	0.00	0.00	0.00
West-Ref	w13	a	09/06/97	3:44	HLS	41 16.16782	072 05.842W	ST_II	>4	3	4 to 3	0	0.00	6.26	7.38	1.12	6.82	0.00	0.00	0.00	0.00
West-Ref	w13	b	09/06/97	3:44	HLS	41 16.16378	072 05.841W	ST_II	>4	3	4 to 3	0	0.00	6.07	7.14	1.07	6.60	0.00	0.00	0.00	0.00
West-Ref	w13	c	09/06/97	3:45	HLS	41 16.15167	072 05.846W	ST_I_TO_II	>4	3	4 to 3	0	0.00	4.76	5.34	0.58	5.05	0.00	0.00	0.00	0.00

Mound/ Ref. Area	Station	Rep.	Redox Rebound Min.	Redox Rebound Max.	Redox Rebound Mean	Apparent RPD Thickness Area	Apparent RPD Thickness Minimum	Apparent RPD Thickness Maximum	Apparent RPD Thickness Mean	OSI	Methane Count	Surface Disturbance	Low DO	Comments
NLON Ref	sta1	a	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	ambient; minor shell lag; Chaetopterus tube; 2 blades of dead eelgrass
NLON Ref	sta1	b	0	0	0	NA	0.50	4.00	1.50	5	0	INDET	NO	ambient; shallow pen; RPD very faint; Retro II?
NLON Ref	sta1	c	0	0	0	14.98	0.58	1.60	1.04	5	0	PHYSICAL	NO	ambient; shallow pen; dead eel grass blade; RetroII?
NLON Ref	sta1	d	0	0	0	29.25	1.57	2.47	2.05	NA	0	PHYSICAL	NO	ambient; br sand; shell lag
NLON Ref	sta1	e	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	ambient; br sand; RPD>pen; dead eel grass blades in sed
NLON Ref	sta2	a	0	0	0	39.59	1.50	4.01	2.97	9	0	PHYSICAL	NO	ambient;S/M;surf scour&sm tubes;Chaetopterus far-field;worm;feeding void
NLON Ref	sta2	b	0	0	0	0.00	0.00	7.00	2.10	5	0	PHYSICAL	NO	ambient; Crepidula shell; ripped-up tube mat; burrow/drag-down?; wiper artifact
NLON Ref	sta2	c	0	0	0	26.77	0.10	4.69	2.57	9	0	BIOGENIC	NO	ambient; S/M;wiper artifact;juv.Amphipod tubemat; thin worm below RPD bound.
NLON Ref	sta3	a	0	0	0	43.53	1.02	4.90	3.21	8	0	INDET	NO	ambient; shallow pen; Retro II?
NLON Ref	sta3	b	0	0	0	21.95	1.19	1.89	1.54	NA	0	PHYSICAL	NO	ambient; underpen; shell lag; sm surf tube
NLON Ref	sta3	c	0	0	0	NA	0.68	4.00	2.70	7	0	PHYSICAL	NO	ambient; dead eel grass blade; Retro II?
NLON Ref	sta3	d	0	0	0	28.42	1.06	3.28	2.03	6	0	PHYSICAL	NO	ambient; br sand; eel grass on surf; Retro II; ripped-up Ampelisca tubemat
NLON Ref	sta3	e	0	0	0	33.60	1.21	4.04	2.53	8	0	PHYSICAL	NO	ambient; br sand; Ampelisca? tubemat; sm feeding voids;rippled?
NLON Ref	sta4	a	0	0	0	0.00	0.68	9.54	2.50	9	0	BIOGENIC	NO	ambient; sm.tube mat of juvenil amphipods
NLON Ref	sta4	b	0	0	0	14.91	0.68	1.40	1.04	4	0	PHYSICAL	NO	ambient;S/M; sm tubes on surf(juv. amphipods?)
NLON Ref	sta4	c	0	0	0	NA	0.34	4.00	1.90	5	0	PHYSICAL	NO	ambient; S/M; Chaetoterus; erosional?
NE-Ref	sta5	a	0	0	0	39.94	0.69	5.35	2.86	6	0	INDET	NO	ambient; mottled RPD-wiper artifacts?;sm surf tubes(amphipods?);worm 7 cm depth
NE-Ref	sta5	c	0	0	0	13.72	0.48	1.69	0.95	5	0	PHYSICAL	NO	ambient; ripped-up amphipod tube mats on surf; Retro II?
NE-Ref	sta5	d	0	0	0	28.20	0.86	2.98	1.96	8	0	BIOGENIC	NO	ambient; br sand; feeding void w/worm; Amphipod tubes on surf
NE-Ref	sta6	a	0	0	0	38.25	1.26	5.12	2.90	7	0	PHYSICAL	NO	ambient;S/M; lg worm(6cm- >pen.limit); RetroII?
NE-Ref	sta6	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	ambient; surf scour; ripped-up Ampelisca tube mat; Retro II
NE-Ref	sta6	d	3.13	7.22	5.18	27.80	1.41	2.58	1.95	6	0	INDET	NO	ambient; br sand/bkM; drag-down; amphipod tubes on; minor shell lag
NE-Ref	sta7	a	0	0	0	34.74	1.24	4.03	2.46	7	0	PHYSICAL	NO	ambient;S/M; Chaetopterus tube&ripped-up amphipod tube mat
NE-Ref	sta7	b	0	0	0	NA	1.50	5.50	2.00	4	0	PHYSICAL	NO	ambient; wiper artifacts; Amphipods present?; borrow
NE-Ref	sta7	c	0	0	0	46.49	1.59	4.83	3.32	7	0	PHYSICAL	NO	ambient; RPD patchy; surf scour; Retro II?
NE-Ref	sta8	b	0	0	0	47.67	2.17	4.54	3.54	7	0	PHYSICAL	NO	ambient;S/M;sm surf tubes(juv amphipods?); minor surf scour
NE-Ref	sta8	c	0	0	0	44.76	2.04	5.37	3.18	7	0	PHYSICAL	NO	ambient; wiper artifacts; Ampelisaca tubes;RetroII?
NE-Ref	sta8	d	3.48	6.62	5.05	17.54	0.86	1.77	1.22	5	0	INDET	NO	ambient; br sand/bkM; amphipod tubemats; worm at 8cm
NE-Ref	sta9	a	0	0	0	34.63	0.75	4.13	2.46	9	0	PHYSICAL	NO	ambient;S/M;minor shell lag; surf scour;feeding void
NE-Ref	sta9	b	0	0	0	29.60	0.74	4.11	2.08	8	0	PHYSICAL	NO	ambient; S/M; mudclast on surf
NE-Ref	sta9	c	0	0	0	23.98	0.60	3.03	1.68	8	0	PHYSICAL	NO	ambient; burrow/feeding deposit; feeding voids?
West-Ref	w10	a	0	0	0	44.62	2.28	4.08	3.20	8	0	PHYSICAL	NO	ambient; shell lag and frg at surf;ripped-up Ampelisca tube mat
West-Ref	w10	c	0	0	0	30.60	1.65	2.91	2.16	6	0	PHYSICAL	NO	ambient; shell-rich sand; tube mat
West-Ref	w10	d	0	0	0	27.14	1.34	2.67	1.90	4	0	PHYSICAL	NO	shallow pen; ambient;S/M; shell lag; sm surf tubes
West-Ref	w11	a	0	0	0	65.45	3.09	7.21	4.70	10	0	PHYSICAL	NO	ambient?; wiper artifacts; feeding void at depth; ripped-up tube mat
West-Ref	w11	b	0	0	0	43.96	1.41	7.62	3.13	10	0	PHYSICAL	NO	ambient; ripped-up Ampelisca tube mat; feeding voids
West-Ref	w11	c	0	0	0	36.63	1.62	3.97	2.61	NA	0	PHYSICAL	NO	ambient; wiper smearing?; Ampelisca tube mat?
West-Ref	w12	b	0	0	0	NA	NA	NA	NA	NA	0	PHYSICAL	NO	ambient; shell lag; shell-rich sand w/scourlag; RPD faint
West-Ref	w12	c	0	0	0	30.93	1.65	2.62	2.18	6	0	PHYSICAL	NO	ambient; shell lag; ripped-up Ampelisca tube mat
West-Ref	w12	d	0	0	0	28.32	0.84	3.12	2.01	6	0	PHYSICAL	NO	ambient; S; shell lag; ripped-up tube mats; Retro II?
West-Ref	w13	a	0	0	0	NA	0.00	4.00	1.50	5	0	PHYSICAL	NO	ambient; shell-rich sand;surf scour; sparse Ampelisca
West-Ref	w13	b	0	0	0	34.04	0.78	5.83	2.43	7	0	PHYSICAL	NO	ambient;shell lag; ripped-up Amp.tubemat; RPD faint/patchy
West-Ref	w13	c	0	0	0	13.66	0.05	2.50	1.31	4	0	PHYSICAL	NO	ambient; partially low oxygen; patchy RPD; shell lag&sm.tube; retro II?

B5d
Reference Areas 1998

Mound/ Ref. Area	Station	Rep.	Date	TIME	ANALYST	LATITUDE	LONGITUDE	Successional Stage	Grain Size (phi) Minimum	Grain Size (phi) Maximum	Major Mode	Mudclasts Count	Mudclasts Diameter	Camera Penetration Minimum	Camera Penetration Maximum	Camera Penetration Range	Camera Penetration Mean	Dredged Material Thickness Area	Dredged Material Thickness Minimum	Dredged Material Thickness Maximum	Dredged Material Thickness Mean
NE-Ref	NERF09	A	07/30/98	11:46	MCS	41 16.661N	072 03.331W	INDET	>4	2	4 to 3	0	0	6.42	7.11	0.7	6.77	0	0	0	0
NE-Ref	NERF09	B	07/30/98	11:47	MCS	41 16.658N	072 03.323W	ST_II	>4	2	4 to 3	0	0	8.21	8.51	0.3	8.36	0	0	0	0
NE-Ref	NERF09	C	07/30/98	11:47	MCS	41 16.654N	072 03.321W	ST_I_TO_II	>4	2	4 to 3	0	0	7.76	8.51	0.75	8.13	0	0	0	0
NE-Ref	NERF10	A	07/30/98	11:34	MCS	41 16.715N	072 03.325W	ST_II	>4	3	>4	0	0	8.16	8.71	0.55	8.43	0	0	0	0
NE-Ref	NERF10	D	08/01/98	8:14	MCS	41 16.719N	072 03.325W	ST_II	>4	3	>4	0	0	7.73	8.48	0.76	8.11	0	0	0	0
NE-Ref	NERF10	E	08/01/98	8:15	HLS	41 16.714N	072 03.316W	ST_II	>4	3	>4	0	0	8.64	9.09	0.45	8.86	0	0	0	0
NE-Ref	NERF11	A	07/30/98	12:07	MCS	41 16.744N	072 03.557W	ST_I_TO_II	>4	2	4 to 3	0	0	7.06	8.16	1.09	7.61	0	0	0	0
NE-Ref	NERF11	B	07/30/98	12:08	MCS	41 16.741N	072 03.565W	ST_I_ON_III	>4	3	4 to 3	0	0	6.37	7.11	0.75	6.74	0	0	0	0
NE-Ref	NERF11	C	07/30/98	12:09	MCS	41 16.740N	072 03.571W	ST_I	>4	3	4 to 3	0	0	10.7	11.94	1.24	11.32	0	0	0	0
NE-Ref	NERF12	C	07/30/98	12:00	MCS	41 16.673N	072 03.390W	ST_II	>4	2	>4	0	0	6.47	8.21	1.74	7.34	0	0	0	0
NE-Ref	NERF12	D	08/01/98	8:18	HLS	41 16.681N	072 03.380W	ST_I_ON_III	>4	3	>4	0	0	7.27	7.42	0.15	7.35	0	0	0	0
NE-Ref	NERF12	E	08/01/98	8:19	HLS	41 16.676N	072 03.374W	ST_II_ON_III	>4	4	>4	0	0	6.97	7.83	0.86	7.4	0	0	0	0
NE-Ref	NERF13	A	07/30/98	11:39	MCS	41 16.679N	072 03.335W	ST_I	>4	3	4 to 3	0	0	5.37	6.52	1.14	5.95	0	0	0	0
NE-Ref	NERF13	B	07/30/98	11:39	MCS	41 16.678N	072 03.346W	INDET	>4	2	4 to 3	0	0	7.16	7.66	0.5	7.41	0	0	0	0
NE-Ref	NERF13	C	07/30/98	11:40	MCS	41 16.684N	072 03.344W	ST_II	>4	2	4 to 3	0	0	7.66	8.91	1.24	8.28	0	0	0	0
NLON Ref	NLRF01	A	07/30/98	11:03	MCS	41 16.658N	072 01.951W	ST_I	>4	3	4 to 3	0	0	5.73	6.08	0.35	5.9	0	0	0	0
NLON Ref	NLRF01	B	07/30/98	11:04	MCS	41 16.658N	072 01.951W	ST_I	>4	3	4 to 3	0	0	6.33	6.68	0.35	6.51	0	0	0	0
NLON Ref	NLRF01	C	07/30/98	11:04	MCS	41 16.658N	072 01.951W	ST_II	>4	3	4 to 3	0	0	5.53	6.08	0.55	5.8	0	0	0	0
NLON Ref	NLRF02	A	07/30/98	11:11	MCS	41 16.658N	072 01.951W	ST_II_ON_III	>4	3	4 to 3	0	0	7.39	8.49	1.11	7.94	0	0	0	0
NLON Ref	NLRF02	B	07/30/98	11:12	MCS	41 16.658N	072 01.951W	INDET	>4	3	>4	0	0	10.95	11.81	0.85	11.38	0	0	0	0
NLON Ref	NLRF02	C	07/30/98	11:13	MCS	41 16.658N	072 01.951W	ST_II	>4	3	4 to 3	0	0	7.49	8.49	1.01	7.99	0	0	0	0
NLON Ref	NLRF03	A	07/30/98	11:22	MCS	41 16.663N	072 02.091W	ST_I_ON_III	>4	3	4 to 3	0	0	6.27	7.31	1.04	6.79	0	0	0	0
NLON Ref	NLRF03	B	07/30/98	11:23	MCS	41 16.657N	072 02.092W	ST_I	>4	3	4 to 3	0	0	3.28	4.73	1.44	4	0	0	0	0
NLON Ref	NLRF03	C	07/30/98	11:24	MCS	41 16.656N	072 02.096W	ST_I	>4	3	4 to 3	0	0	5.47	6.27	0.8	5.87	0	0	0	0
NLON Ref	NLRF04	A	07/30/98	11:17	MCS	41 16.658N	072 01.951W	ST_II	>4	3	4 to 3	0	0	5.88	6.23	0.35	6.06	0	0	0	0
NLON Ref	NLRF04	B	07/30/98	11:17	MCS	41 16.653N	072 01.947W	ST_I_TO_II	>4	3	4 to 3	0	0	7.06	7.61	0.55	7.34	0	0	0	0
NLON Ref	NLRF04	C	07/30/98	11:18	MCS	41 16.654N	072 01.946W	ST_II	>4	3	4 to 3	0	0	7.11	7.81	0.7	7.46	0	0	0	0
West-Ref	WREF05	B	07/30/98	14:42	MCS	41 16.249N	072 06.022W	ST_II_TO_III	>4	3	4 to 3	0	0	11.33	13.23	1.9	12.28	0	0	0	0
West-Ref	WREF05	C	07/30/98	14:43	MCS	41 16.253N	072 06.023W	ST_I_ON_III	>4	3	4 to 3	0	0	12.82	13.38	0.56	13.1	0	0	0	0
West-Ref	WREF05	E	08/01/98	9:27	HLS	41 16.240N	072 06.020W	ST_II	>4	3	4 to 3	0	0	9.18	10	0.82	9.59	0	0	0	0
West-Ref	WREF06	D	08/01/98	9:18	HLS	41 16.074N	072 05.890W	ST_II	>4	3	4 to 3	0	0	7.69	9.23	1.54	8.46	0	0	0	0
West-Ref	WREF06	E	08/01/98	9:20	HLS	41 16.067N	072 05.884W	ST_I_TO_II	>4	3	4 to 3	0	0	7.18	8.26	1.08	7.72	0	0	0	0
West-Ref	WREF06	F	08/01/98	9:20	HLS	41 16.065N	072 05.897W	ST_II	>4	3	4 to 3	0	0	7.69	8.56	0.87	8.13	0	0	0	0
West-Ref	WREF07	A	07/30/98	14:34	MCS	41 16.210N	072 06.046W	INDET	>4	2	3 to 2	0	0	5.18	6	0.82	5.59	0	0	0	0
West-Ref	WREF07	B	07/30/98	14:35	MCS	41 16.209N	072 06.052W	INDET	>4	2	3 to 2	0	0	6.77	7.18	0.41	6.97	0	0	0	0
West-Ref	WREF07	C	07/30/98	14:38	MCS	41 16.207N	072 06.039W	INDET	>4	2	3 to 2	0	0	6.36	7.28	0.92	6.82	0	0	0	0
West-Ref	WREF08	B	07/30/98	14:50	MCS	41 16.270N	072 06.112W	ST_II	>4	2	3 to 2	0	0	8.87	10.31	1.44	9.59	0	0	0	0

Mound/ Ref. Area	Station	Rep.	Redox Rebound			Apparent RPD Thickness				OSI	Methane	Surface	Additional Measurements	(cm)	Low	Comments
			Min.	Max.	Mean	Area	Minimum	Maximum	Mean		Count	Disturbance			DO	
NE-Ref	NERF09	A	0	0	0	24.048	0.65	3.73	1.82	NA	0	PHYSICAL	NOADDM	0	NO	,S/MUD, WIPER CLASTS, MOD SORTED, HYDROIDS, SHELL FRAGS, RIPPLED?,
NE-Ref	NERF09	B	0	0	0	22.271	0.35	2.84	1.9	6	0	PHYSICAL	NOADDM	0	NO	,S/MUD, WIPER CLAST, MOD SORTED, RIPPED-UP TUBE MAT,
NE-Ref	NERF09	C	0	0	0	23.999	0.25	2.69	1.9	5	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, RIPPED-UP TUBE MAT,
NE-Ref	NERF10	A	0	0	0	20.599	0.9	2.29	1.52	6	0	BIOGENIC	NOADDM	0	NO	,S/MUD, MOD SORTED, AMPHIPOD TUBE MAT,
NE-Ref	NERF10	D	1.5	5.5	4.5	27.231	1.06	2.42	1.93	6	0	PHYSICAL	NOADDM	0	NO	AMB,BR S/BK MUD,SM AMPELISCA TUBES,SURF SCOUR,PODOCERID "STALKS",
NE-Ref	NERF10	E	0	0	0	NA	0.71	3	2.1	6	0	PHYSICAL	NOADDM	0	NO	AMB, BR SILT/BK MUD, RETRO II, SURF SCOUR,
NE-Ref	NERF11	A	0	0	0	37.324	0.8	4.33	2.79	6	0	INDET	NOADDM	0	NO	,S/MUD, MOD SORTED, AMPHIPOD STALKS?, ORG DETRITUS, SCOURED?,
NE-Ref	NERF11	B	0	0	0	20.946	0.1	2.59	1.57	8	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, AMPHIPOD STALKS?, VOIDS, HYDROIDS,
NE-Ref	NERF11	C	0	0	0	22.262	0.85	2.34	1.68	4	0	BIOGENIC	NOADDM	0	NO	,S/MUD, MOD SORTED, HYDROIDS ON CHAETOPTERUS, FRACTURES AT DEPTH,
NE-Ref	NERF12	C	0	0	0	20.992	0.55	2.79	1.54	6	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, RIPPED-UP TUBEMAT, HYDROIDS, ORG FLOC,
NE-Ref	NERF12	D	2.5	4.75	3.5	23.433	0.97	2.21	1.64	8	0	INDET	NOADDM	0	NO	AMB, SULFIDIC SED, BR/BK MUD, SURF TUBES?,
NE-Ref	NERF12	E	0	0	0	21.168	1.01	2.27	1.48	7	0	PHYSICAL	NOADDM	0	NO	AMB, SULFIDIC SED, BR/BK MUD, WELL-SORTED, RIPPED-UP TUBEMAT, FEEDING VOIDS, HYDROIDS,
NE-Ref	NERF13	A	0	0	0	24.725	1.09	2.59	1.81	4	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, POSS BURROW, SHELL FRAG @ SURF, SCOURED,
NE-Ref	NERF13	B	0	0	0	22.503	0.3	2.44	1.65	NA	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, ORG DETRITUS, HYDROIDS, RIPPLED?,
NE-Ref	NERF13	C	0	0	0	22.491	0.65	3.68	1.68	6	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, RIPPLED, ORG DETRITUS, HYDROID, PODOCERID,
NLON Ref	NLRF01	A	0	0	0	47.548	1.81	4.67	3.56	6	0	PHYSICAL	NOADDM	0	NO	,S>P, MOD SORTED, ORG DETRITUS @ SURF, SHELL, SCOURED?,
NLON Ref	NLRF01	B	0	0	0	38.349	0.85	3.92	2.82	5	0	BIOGENIC	NOADDM	0	NO	,S>P, MOD SORTED, TUBE MATS, ORG DETRITUS @ SURF,
NLON Ref	NLRF01	C	0	0	0	46.984	2.06	5.83	3.5	8	0	BIOGENIC	NOADDM	0	NO	,S/MUD, MOD SORTED, TUBE MATS, ORG DETRITUS @ SURF,
NLON Ref	NLRF02	A	0	0	0	31.615	0.85	3.52	2.31	9	0	BIOGENIC	NOADDM	0	NO	,S/MUD, MOD SORTED, TUBE MAT, POSS VOID, SHELL FRAG,
NLON Ref	NLRF02	B	0	0	0	NA	NA	NA	NA	NA	0	INDET	NOADDM	0	NO	,S/MUD, RECENTLY DISTURBED DM?, MOD SORTED,
NLON Ref	NLRF02	C	0	0	0	38.948	1.76	4.32	2.81	7	0	BIOGENIC	NOADDM	0	NO	,S/MUD, MOD SORTED, AMPHIPOD MATS, ORG DETRITUS @ SURF,
NLON Ref	NLRF03	A	0	0	0	34.713	1.24	3.63	2.57	9	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, SCOURED, VOID, SHELL FRAGS @ DEPTH, BRICK?,
NLON Ref	NLRF03	B	0	0	0	27.284	0.6	3.43	2.18	4	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, BURROW OPENING, POSS VOID, SHELL FRAG @ SURF, SCOURED, RIPPLED,
NLON Ref	NLRF03	C	0	0	0	37.126	1.49	4.83	2.81	5	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, SHELL @ SURF, SHELL FRAGS @ Z, SCOURED?,
NLON Ref	NLRF04	A	0	0	0	33.172	1.46	4.52	2.42	7	0	PHYSICAL	NOADDM	0	NO	,S/MUD, MOD SORTED, RIPPED-UP TUBE MATS,
NLON Ref	NLRF04	B	0	0	0	12.026	0.4	3.68	2.46	6	0	BIOGENIC	NOADDM	0	NO	,S/MUD, WIPER CLAST, MOD SORTED, SCOURED?,
NLON Ref	NLRF04	C	0	0	0	33.628	0.15	4.18	2.61	7	0	BIOGENIC	NOADDM	0	NO	,S/MUD, MOD SORTED, DEAD EEL GRASS BLADE,
West-Ref	WREF05	B	0	0	0	49.923	1.69	5.85	3.73	10	0	BIOGENIC	NOADDM	0	NO	,S/MUD, POOR SORTED, VOID, ORG DETRIUS, HYDROID, SCOUR?, SHELL HASH @ Z
West-Ref	WREF05	C	0	0	0	55.945	2	7.64	4.52	11	0	PHYSICAL	NOADDM	0	NO	,S/MUD, WIPER CLASTS, POOR SORTED, ORG DETRITUS, SCOUR?, SHELL HASH @ Z
West-Ref	WREF05	E	0	0	0	39.725	1.95	3.74	2.8	7	0	BIOGENIC	NOADDM	0	NO	AMB, MOD SORTED, RIPPED-UP TUBEMAT, VOID, CERIANTURES@DEPTH, SHELL HASH THROUGHOUT
West-Ref	WREF06	D	0	0	0	39.213	1.54	4.1	2.8	7	0	PHYSICAL	NOADDM	0	NO	AMB, WELL SORTED, DENSE RIPPED-UP TUBEMAT, SCOURED, SHELL HASH THROUGHOUT
West-Ref	WREF06	E	0	0	0	NA	0.56	5	3	6	0	PHYSICAL	NOADDM	0	NO	AMB, MOD-SORTED, SURF SCOUR, DEAD EEL GRASSBLADES, SHELL HADH THROUGHOUT
West-Ref	WREF06	F	0	0	0	40.904	2	4.05	2.9	7	0	PHYSICAL	NOADDM	0	NO	AMB, MOD SORTED, RIPPED-UP TUBEMAT, HYDROIDS, SHELL HASH THROUGHOUT
West-Ref	WREF07	A	0	0	0	45.93	2.21	5.44	3.38	NA	0	PHYSICAL	NOADDM	0	NO	,S/MUD, POORLY SORTED, ORG DETRIUS, SHELL FRAGS, SCOURLAG, SHELL HASH @ Z
West-Ref	WREF07	B	0	0	0	70.355	3.28	6.51	5.2	NA	0	PHYSICAL	NOADDM	0	NO	,S/MUD, POORLY SORTED, RIPPED-UP TUBEMAT, SHELL FRAGS, SHELL HASH @ Z
West-Ref	WREF07	C	0	0	0	43.035	1.74	4.77	3.36	NA	0	PHYSICAL	NOADDM	0	NO	,S/MUD, POOR SORTED, SHELL FRAGS @ SURF, SHELL HASH @ Z
West-Ref	WREF08	B	0	0	0	40.342	0.05	5.85	3.14	8	0	INDET	NOADDM	0	NO	,S/MUD, POOR SORTED, AMPHIPOD MAT?, ORG DETRITUS, HYDROIDS, SCOUR?, SHELL HASH @ Z