SELECTION AND POPULATION OF THE DATABASE FOR THE DISPOSAL ANALYSIS NETWORK-NEW YORK SYSTEM

Prepared for:

U.S. Army Corps of Engineers
New York District, Operations Division
26 Federal Plaza
New York, NY 10278-0090

Prepared by:

Science Applications International Corporation
Admiral's Gate
221 Third Street
Newport, RI 02840

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ACKNOWLEDGMENT

This report describes the selection and population of datasets for the Disposal Analysis Network for the New York District (DAN-NY) which provides the U.S. Army Corps of Engineers-New York District (NYD) with the data management, analysis, and display capabilities to meet the needs identified in the Introduction. The DAN-NY Phase 3 program was conducted by Science Applications International Corporation (SAIC) of Newport, RI, under Delivery Order 23 of SAIC's Indefinite Delivery Contract No. DACW65-95-D-0063 with the U.S. Army Corps of Engineers - Norfolk District. Mr. Brian May was the NYD's manager of technical activities for this deliver order, and Dr. Scott McDowell was SAIC's program manager.

Mr. James Clausner of the U.S. Army Engineer Waterways Experiment Station and Mr. Brian May of the NYD both provided valuable insight for the selection of datasets for database population during the Needs Assessment task. We thank them for their efforts, support, and enthusiasm throughout the entire project.

Mr. Steve Pace was responsible for the day-to-day management of activities on the project with assistance from both Mr. Greg Tufts (technical) and Ms. Mary Magee (financial). Mssrs. Ed DeAngelo, Mike Cole, Chris McFarlane, and Jason Infantino prepared and converted the bathymetric datasets. Mr. Jason Infantino scanned all REMOTS® and planview photographs and was assisted by Mr. Greg Tufts during the QA/QC of REMOTS® analysis data. Mr. Chris McFarlane processed the sidescan data with assistance from Mr. Ed DeAngelo. Mr. Greg Tufts and Mr. Jim Singer developed the metadata information for all of the datasets, and Mr. Dave Inglin and Greg Tufts performed the final QA for the database. Mr. Steve Pace and Mr. Greg Tufts authored the report, Dr. Scott McDowell provided technical review, and Ms. Kate Spearman was responsible for report production.

1.0 INTRODUCTION

The U.S. Army Corps of Engineers New York District (NYD) Operations Division is responsible for administering the NYD's Dredged Material Management and Monitoring Program. A critical component of this program has been the implementation of a comprehensive management and monitoring effort for the regional dredged material ocean disposal site known as the Mud Dump Site (MDS). Comprising approximately 2.2 square nautical miles and located 6 nmi off the coast of New Jersey and 9 nmi from the coast of New York in the inner New York Bight Apex, its proximity to numerous, formerly active disposal sites, heavily trafficked shipping zones, and the approaches to New York Harbor create a unique set of circumstances in terms of disposal site management.

Close coordination with environmental regulatory (USEPA) and resource (NMFS and USFWS) agencies at the Federal level, as well as the State (NYSDEC, NYDEP, NJDEP) and local level is essential within the NYD's management and monitoring responsibilities. Information in the form of project-specific details, sediment testing and environmental monitoring data, have been collected for numerous dredged material projects over the past ten years. These datasets existed in non-electronic, report-style formats, which were difficult and expensive to access for NYD staff and managers. A system designed with the project manager in mind by incorporating elements of relational databases and geographic information systems would improve the efficiency of dredged material disposal site management.

This report describes the selection and population of the initial datasets for the Disposal Analysis Network for the New York District (DAN-NY) which provides the NYD with the data management, analysis, and display capabilities to meet the needs identified above (SAIC, 1996). The datasets selected under Phase 3 have been made available within DAN-NY to ensure that NYD management have direct access to the latest marine environmental information from the New York Bight.

The datasets selected for inclusion in the DAN-NY system consisted of disposal and monitoring data from several areas within the New York Bight region. The primary datasets were bathymetric and sidescan sonar survey data, REMOTS® sediment profile images and planview photographs of the seafloor, and results from grab samples (sediment and tissue chemistry, and sediment grain size data), as collected by SAIC over the past decade. In addition, disposal log and buoy location data obtained from the NYD were incorporated into the database. Supporting data from the MDS and surrounding area also were acquired from the following sources:

- Bathymetric data collected by the U.S. Geological Survey (USGS), as provided by the NYD Planning Division and the U.S. Army Engineer Waterways Experiment Station (WES),
- Bathymetric data collected by NYD Operations Division, Survey Branch,
- Sidescan sonar data collected by EPA Region II in the Northwest Regions presently included in the Historic Area Remediation Site (HARS),
- Sediment and tissue chemistry data provided by EPA Region II, and
- Sediment and tissue chemistry data (permitee data) from the MDS reference areas provided by the NYD Operations Division.

2.0 PROCESSES OF DATASET SELECTION AND POPULATION OF DATABASE

From the available datasets from the New York Bight, a subset was selected for population within the DAN-NY database. Upon commencement of the Phase 3 project, three discriminators were identified during the Needs Assessment meeting held between the NYD Technical Manager, the WES Dredged Material Disposal Engineer, and members of the SAIC Phase 3 DAN-NY team. The discriminators included spatial, temporal, and functional aspects of the datasets as relevant to the DAN-NY program.

2.1 Spatial Discriminators

The datasets describing the physical conditions of the seafloor covered many different geographical areas of the New York Bight. Since the DAN-NY program was limited to the disposal of dredged material at the MDS, some of the datasets were not selected for database population, because they did not lie within the designated site.

Those datasets which were selected for population of the database were grouped according to spatial coverage in a descending order of magnitude. The largest area of coverage included those datasets taken in the New York Bight at large, followed by the Expanded Mud Dump and the Northwest Region, the MDS, and finally, the Port Authority of New York and New Jersey (PANY-NY) 1993 Capping Project area (PANY-NJ) (Figure 1). Also shown in this figure is the recently designated Historic Area Remediation Site (HARS).

2.2 Temporal Discriminators

Those datasets selected by geographic coverage were further culled by the Needs Assessment team based on the time of each of the surveys. Datasets from a series of projects over a relatively short time span were examined for one or two representatives. For instance, during the PANY-NJ 1993 Capping Project only a few of the numerous REMOTS® surveys were selected. Likewise, not all of the quarterly MDS bathymetric datasets available from the NYD Survey Branch were selected. The Needs Assessment team was selective in choosing the initial datasets for population into the database.

2.3 Functional Discriminators

As a final discriminator after spatial and temporal considerations were made by the Needs Assessment team, the value of each dataset to the functions of the DAN-NY program was determined. The main functions of the program included: 1) viewing a time series of bathymetric changes and volumes at the MDS using several display techniques, 2) calculating volume differences in disposal mound construction using the MDFATE model, 3) compiling siting information about disposal buoy locations, and 4) accessing disposal position data. The functional discriminators also included dataset by type, and each met other needs within the DAN-NY program. The other display functions within DAN-NY besides that of bathymetry included; 1) accessing photographic survey data and display, 2) accessing sediment grab data and display, and 3) accessing sidescan sonar images. These three functional discriminators were applied before the spatial and temporal discriminators were applied to the process of dataset selection.

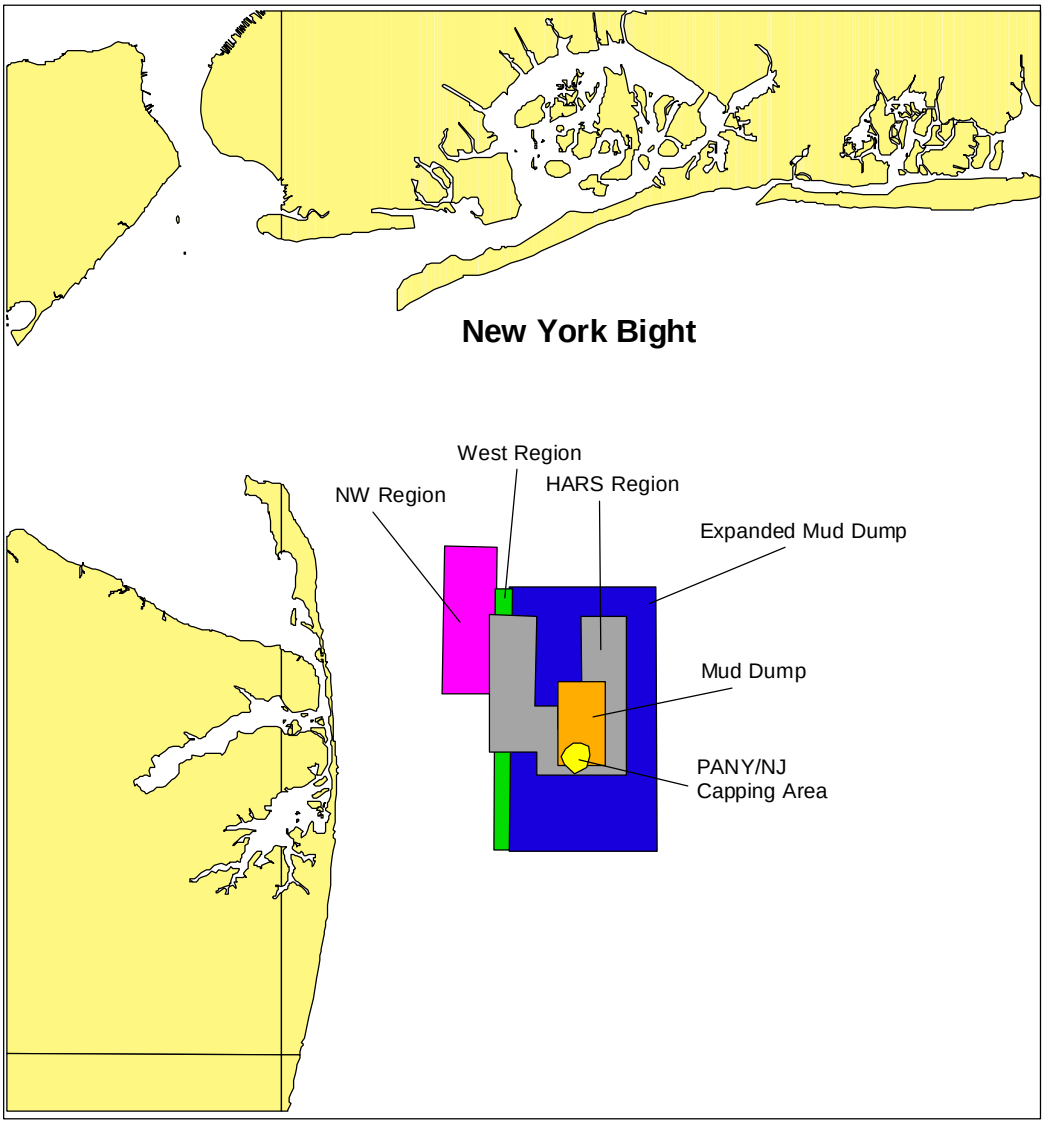

Figure 1. Previous surveys areas within the New York Bight from which datasets were selected for population of the DAN-NY database

3.0 BATHYMETRIC DATA

The datasets selected by the Needs Assessment team for bathymetric data are listed in Table 1.

3.1 Data Sources

Under DAN-NY Phase 3, electronic bathymetric data were supplied from several sources including SAIC, WES, NYD Survey Branch at Caven Point, and EPA Region II (NOAA data). The goal under Phase 3 was to reformat these data from their original state to one that could be imported in Arc-View™ (the GIS software used in DAN-NY) and used to produce a high resolution grid of evenly spaced depth measurements expressed in a uniform horizontal and vertical datum. This section documents the original format of each dataset and the steps required to convert them to a common grid within DAN-NY. The steps vary with the different types of datasets provided.

3.2 Database Maintenance

Future datasets from a variety of sources can be input to the DAN-NY database according to their individual format, and the maintenance of the bathymetric database may include several conversions. Bathymetric data from SAIC single-beam surveys since 1991 have been corrected to both horizontal and vertical datums as part of post-survey processing, and have not required further conversion. Earlier datasets prior to 1991 have been converted as part of the Phase 3 task. In either case, all previous datasets from SAIC have been converted to the NAD ’83 horizontal datum and Mean Lower Low Water (MLLW) datums. Continued input of SAIC-acquired bathymetric data from contemporary and future surveys will include only depth corrections of raw data to MLLW, since the GPS acquisition of navigation data presently occurs in NAD ’83 at the Mud Dump Site (MDS).

In previous surveys where navigation data were acquired on the NAD ’27 horizontal datum, they were converted to NAD ’83 using the Corpscon program, while gridding the data was accomplished with SAIC proprietary software, Hydrographic Data Analysis System (HDAS). The corrected and gridded data were stored in ASCII file format and were named according to region and date. The file was imported into ArcView™ and Surfer™ where it was re-interpolated into a grid format for the generation of data products in the DAN-NY system. The Surfer™ program was used to produce the 3-D wire mesh diagrams.

Bathymetric data from ten surveys of the MDS conducted by the NYD, Survey Branch were also input to the DAN-NY database. Unlike SAIC data, five of the datasets in electronic file format had not been previously gridded. Instead, they had been thinned, and presented in the NAD ’27 datum, State Plane feet (New York LI - Zone 3104). The depth soundings were referenced to Mean Low Water (MLW). Incorporating the NYD datasets into the DAN-NY database required Corpscon to convert the navigation data to NAD ’83 State Plane feet, New York Long Island. A correction was added to all soundings to convert depth values from MLW to MLLW. The remaining five bathymetric datasets were in smooth sheet format. To include the smooth sheet datasets into the database, individual soundings have been digitized point-by-point into ASCII file format. Each dataset was then gridded and plotted to check for spurious data points before importation into DAN-NY.

Table 1. Bathymetric Datasets Included in the 1997 DAN-NY Database.

Identifier	Survey Name	Region	Start	End	Collector
93C1192B	BATHY Nov 92 93C-(Baseline)	1993 PANY/NJ Capping Project	11/06/92	11/07/92	SAIC
93C0193B	BATHY Jan 93 93C-(Poststorm)	1993 PANY/NJ Capping Project	01/06/93	01/06/93	SAIC
93C0293B	BATHY Feb 93 93C	1993 PANY/NJ Capping Project	02/09/93	02/11/93	SAIC
93C0693B	BATHY Jun 93 93C	1993 PANY/NJ Capping Project	06/24/93	06/24/93	SAIC
93C0793B	BATHY Jul 93 93C	1993 PANY/NJ Capping Project	07/20/93	07/22/93	SAIC
93C0394B	BATHY Mar 94 93C-(Postcap)	1993 PANY/NJ Capping Project	03/18/94	03/21/94	SAIC
XMD0673B	BATHY Jun 73 XMD	Expanded Mud Dump Area	06/01/73	*	SAIC
XMD0878B	BATHY 1978 XMD	Expanded Mud Dump Area	08/01/78	*	NYD
XMD0280B	BATHY Feb 80 XMD	Expanded Mud Dump Area	02/01/80	*	NYD
XMD0895B	BATHY Aug 95 XMD	Expanded Mud Dump Area	08/12/95	09/01/95	SAIC
MDS0881B	BATHY Aug 81 MDS	Mud Dump Site	08/01/81	*	NYD
MDS1186B	BATHY Nov 86 MDS	Mud Dump Site	11/04/86	11/16/86	SAIC
MDS0288B	BATHY Feb 88 MDS	Mud Dump Site	02/01/88	*	SAIC
MDS0988B	BATHY Sep 88 MDS	Mud Dump Site	09/01/88	*	SAIC
MDS0689B	BATHY Jun 89 MDS	Mud Dump Site	06/01/89	*	NYD
MDS1090B	BATHY Oct 90 MDS	Mud Dump Site	10/02/90	10/04/90	SAIC
MDS0991B	BATHY Sep 91 MDS	Mud Dump Site	09/13/91	09/16/91	SAIC
MDS0194B	BATHY Jan 94 MDS	Mud Dump Site	12/28/93	01/21/94	SAIC
MDS0794B	BATHY Jul 94 MDS	Mud Dump Site	07/01/94	*	NYD
MDS1094B	BATHY Oct 94 MDS	Mud Dump Site	10/01/94	*	NYD
MDS0495B	BATHY April 95 MDS	Mud Dump Site	04/01/95	*	NYD
MDS0995B	BATHY Sep 95 MDS	Mud Dump Site	09/06/95	09/13/95	SAIC
MDS1095B	BATHY Oct 95 MDS	Mud Dump Site	10/01/95	02/01/96	NYD
MDS0896B	BATHY Aug 96 MDS	Mud Dump Site	08/01/96	*	NYD
MDS0396MB	BATHY 1997 Multibeam Survey	Mud Dump Site	03/10/97	03/14/97	SAIC
NYB1936B	BATHY 1936 NYB	New York Bight	01/01/36	*	NOAA
NYB1995B	BATHY 1995 NYB	New York Bight	01/01/95	*	WES
NWR0596B	BATHY May 96 NWR	Northwest Regions	05/05/96	05/07/96	SAIC
* No known end date for survey				Number of Surveys	28

Other datasets such as the 1995 New York Bight Apex bathymetry maintained by the National Oceanic and Atmospheric Administration, National Ocean Service, Coast and Geodetic Survey were previously processed at WES using Intergraph™ MSM (terrain modeling) capabilities. The horizontal coordinates were expressed as meters in UTM Zone 18, while soundings were recorded in feet relative to MLW. To import the datasets into the DAN-NY database, the data were converted to ARCInfo™ format, and re-projected to NAD '83 State Plane feet with a conversion of soundings to the MLLW reference. The grid was then exported to a format that could be directly imported into ArcView™ and the DAN-NY database.

The NOAA/NOS bathymetric data from 1936 required a selection process to reduce the amount of information used within DAN-NY. Only those soundings within a rectangular region surrounding the MDS were selected for interpolation of a gridded dataset in the DAN-NY database.

Within the DAN-NY system valid comparisons between datasets required several processing techniques to standardize the wide variety of bathymetric datasets to the datum selected for use in the DAN-NY database. Maintenance of the database required a knowledge of the techniques as well as the limitations of the data.

3.3 Quality Control Procedures

The QA/QC procedures to ensure the accuracy and compatibility of the data included plotting gridded data sets in ArcView™ to identify any anomalous data points and eliminate offsets between parallel survey lanes. The conversion of NAD '27 referenced data to the NAD '83 datum was checked by plotting the surveys within ArcView™ to identify outlying data points, and visually evaluate the plotted data in relation to known points, such as well-known bottom features.

3.4 Metadata Procedures

Individual bathymetric surveys were documented by metadata files which conformed to the standards prescribed in the March 24, 1995 Federal Geographic Data Committee's (FDGC) (NSDI, 1995). These files were created using the National Biological Surveys (NBS) MetaMaker metadata creation software. This program was a user-friendly Windows 95 application which allowed the user to produce metadata documents conforming to the standards and formatting requirements of the FDGC. The metadata files were included as electronic text files for each survey dataset and can be accessed in the GIS options menu within DAN-NY.

Since DAN-NY was delivered to the NYD in June of 1997, it did not contain metadata in the Corpsmet format, which became available later in August 1997. Future metadata submissions will be in the Corpsmet format.

The metadata files were comprised of seven individual sections, each composed of numerous sub-sections. Throughout all survey types (i.e., Bathymetry, REMOTS® , etc.), Sections 1, 2, 3, 4, 6 & 7 were similar. Section 5, the Entity and Attribute Information section, detailed the specific

survey parameters (attributes) that were contained in the individual DAN-NY datasets including any needed definitions, clarification and limitations of values. For the bathymetric data sets, Section 5 was of particular value in that it identified those which could not be used for depth differencing due to the lack of data resolution, the age of the dataset, or the method of collection.

4.0 REMOTSâ AND PLANVIEW DATA

The Remote Environmental Monitoring System (REMOTS®) is a sediment profile technique used to quantify both physical and biological parameters from photographs taken of the seafloor. This formal analysis technique results in tabular data which can be quantitatively compared for temporal and spacial differences. Both the tabular data and scanned photographs are presented in DAN-NY.

The planview datasets are also composed of tabular data analyzed from seafloor photographs. The orientation of the images is in the planview aspect which allows close inspection of the sediment surface. Both the tabular data and scanned photographs are presented in DAN-NY. The REMOTS® and planview datasets selected by the Needs Assessment team are listed in Table 2.

4.1 Data Sources

The REMOTS® and planview datasets included in the DAN-NY database were acquired by SAIC, and contain both scanned images and results of image analyses. Scanning and storage of images occurred independently from both the formal REMOTS® and qualitative planview analyses, and took place after film development. In the laboratory a suite of physical and biological parameters were measured directly from the film negatives using a video digitizer and computer image analysis system once the images were scanned. Analysis of the planview images did not require scanning the images; all images were archieved on CD-ROM and imported to DAN-NY.

A spreadsheet for each of the survey datasets was generated from the analysis of REMOTS® and planview images. The images were scanned and corrected for lighting and color before they were archived as .tif files on CD-ROMs, and converted to .jpg image files for importation into the DAN-NY database. After the REMOTS® and planview images were scanned and archived, data from the analyses of the images were entered into spreadsheet format and stored with the corresponding image file. Comprehensive spreadsheets for all of the REMOTS® surveys and planview surveys were generated. The comprehensive spreadsheet for the REMOTS® surveys consisted of station identifier, station location, OSI, RPD, stage, grain size major mode, dredge material, sand over mud, methane gas and low dissolved oxygen. The fields imported into the database for planview included station identifier, location, presence of boulders, cobbles, sand and fines, kinetic energy input, sand ripple measurements, dredge material, epifauna, infauna and shell material.

4.2 Database Maintenance

The REMOTS® and planview section of the DAN-NY database should be maintained by continued scanning of new images acquired during field surveys, and by the re-generation of the comprehensive spreadsheet created during Phase 3. Data from the individual image analyses will also be imported into the database to support the display of images in the ArcView™ presentation.

Table 2. Photographic Datasets Included in the 1997 DAN-NY Database

Identifier	Survey Name	Region	Start	End	Collector	Images
XMD1095P	PLANVIEW Oct 95 XMD	Expanded Mud Dump Area	10/08/95	10/19/95	SAIC	118
EMD0991P	PLANVIEW Sep 91 EMD & MDS	Experimental Mud Dump	09/17/91	11/07/91	SAIC	92
MDS1090P	PLANVIEW Oct 90 MDS	Mud Dump Site	10/05/90	10/08/90	SAIC	90
MDS1096P	PLANVIEW Oct 96 MDS	Mud Dump Site	10/13/96	10/16/96	SAIC	125
NWR0596P	PLANVIEW May 96 NWR	Northwest Regions	05/08/96	05/09/96	SAIC	62
93C0193R	REMOTS® Jan 93 93C	1993 PANY/NJ Capping Project	01/07/93	01/08/93	SAIC	92
93C0793R	REMOTS® Jul 93 93C	1993 PANY/NJ Capping Project	07/08/93	07/09/93	SAIC	93
93C0494R	REMOTS® Apr 94 93C	1993 PANY/NJ Capping Project	04/08/94	04/23/94	SAIC	90
93C1096R	REMOTS® Oct 96 93C	1993 PANY/NJ Capping Project	10/11/96	10/13/96	SAIC	98
XMD1095R	REMOTS® Oct 95 XMD	Expanded Mud Dump Area	10/08/95	10/19/95	SAIC	148
EMD1186R	REMOTS® Nov 86 EMD	Experimental Mud Dump	11/04/86	11/16/86	SAIC	282
EMD0991R	REMOTS® Sep 91 EMD	Experimental Mud Dump	09/17/91	11/07/91	SAIC	174
93C1192R	REMOTS® Nov 92 93C	Experimental Mud Dump	11/08/92	11/10/92	SAIC	92
MDS1090R	REMOTS® Oct 90 MDS	Mud Dump Site	10/05/90	10/08/90	SAIC	159
MDS1096R	REMOTS® Oct 96 MDS	Mud Dump Site	10/13/96	10/16/96	SAIC	98
NWR0596R	REMOTS® May 96 NWR	Northwest Regions	05/08/96	05/09/96	SAIC	62
				PLANVIEW Total		487
				REMOTS® Total		1388

4.3 Quality Control Procedures

The selection of the photos for scanning into images and inclusion into the DAN-NY database was based on the judgment of the scientist performing the REMOTS® analysis. One of three replicates was selectively chosen for each station that best represented the benthic conditions of the station. The choice was then confirmed by a second member of the SAIC scientific staff. Once the slides were scanned and saved as .tif files, each was archived to two sets of CD-ROMs and stored at separate locations. The .tif files were subsequently saved as .jpg files and used within the DAN-NY application. Since many of the accompanying station summary and data sheets from the REMOTS® analysis existed as electronic text files, QA/QC procedures were used to ensure that a common station file name existed for each scanned REMOTS® image, its data analysis sheet, and the appropriate station summary information. The correct station name was critical, because it was the field identifier within DAN-NY used to query the data.

Since some of the data existed only on hard-copy form, they were transcribed during the Phase 3 project into electronic format. As technicians entered the data into Microsoft Excel™ spreadsheet format, the recorded values were compared with those in the original hard-copy. REMOTS® image and data sheet station identifiers also were checked. Station identifiers from the analysis files were compared to the station summary sheets to ensure information existed for all stations.

All station locations were also plotted in ArcView™ to detect possible errors by comparing their plots against station patterns from the previously submitted hard-copy data reports.

4.4 Metadata Procedures

As previously described in the Bathymetry section, individual REMOTS® survey data files were documented by metadata files that conformed to the standards prescribed in the 1995 FDGC (NSDI, 1995), using the NBS MetaMaker metadata creation software. And as previously stated, all of the subsections were similar for each survey except Section 5, which detailed the specific survey parameters. The Corpsmet program became available in August 1997, three months after DAN-NY was delivered. Accordingly, future metadata submissions to the NYD will be in the Corpsmet format.

5.0 SEDIMENT/TISSUE DATA

The Sediment/Tissue datasets selected by the Needs Assessment team are listed in Table 3.

5.1 Data Sources

A total of seven individual chemistry survey data files comprised the chemistry section of the DAN-NY Phase 3 database. The database contains sediment and/or tissue chemical data at 285 individual stations located throughout the Expanded Mud Dump, Mud Dump Site, and the New York Bight Areas. Of the total 285 stations sampled, 47 were analyzed from four surveys for dioxin/furan tissue concentration. All surveys were conducted between 1990 and 1995. Five of the seven datasets were collected by SAIC, and the remaining two were collected by Battelle for the USACE and the EPA, Region II. Table 4 lists the seven surveys and the chemical parameters that are included within the respective data files of the DAN-NY database.

5.2 Database Maintenance

The survey data files were created by transcribing archived electronic data spreadsheets and data tables into Excel™ spreadsheet format. The station locations for each of the 1990-1994 surveys were converted from NAD ‘27 to NAD ‘83 referenced latitudes and longitudes as batch files utilizing Corpscon datum conversion software. The Excel™ spreadsheets were subsequently converted to a dBase data file format native to ArcView™. The data file was accompanied by a reference query table, which provided the interface between the database and the specific chemical parameter of interest. Detailed descriptions of the chemical parameters can be found in individual metadata text files that accompany the data sets and can be accessed as a function of the GIS application.

5.3 Quality Control Procedures

The sediment and tissue chemistry data sets were created by importing existing electronic data as well as creating spreadsheets in Excel™. The QA/QC of the chemistry datasets was accomplished by comparing the spreadsheet values with those reported in previously submitted SAIC survey reports and the deliverables from laboratories subcontracted to perform the chemical analyses.

Geographic station positions were converted from NAD ‘27 referenced positions to NAD ‘83 datum utilizing Corpscon. The QA/QC of the individual station positions was performed by plotting station locations in ArcView™ to identify erroneous data. The plots are printed and compared to archived NAD ‘27 plots to ensure that the NAD ‘83 station locations exhibited the identical survey pattern.

Table 3. Sediment Grab Datasets Included in the 1997 DAN-NY Database

Identifier	Survey Name	Region	Start	End	Collector	Sediment/Tissue Stations
93C1192G	GRAB Nov 92 93C	1993 PANY/NJ Capping Project	11/11/92	11/16/92	SAIC	30/9
93C0193G	GRAB Jan 93 93C	1993 PANY/NJ Capping Project	01/17/93	01/17/93	SAIC	30/0
93C0494G	GRAB Apr 94 93C	1993 PANY/NJ Capping Project	04/14/94	04/18/94	SAIC	30/7
XMD1094G	GRAB Experimental Mud Dump	Expanded Mud Dump Area	10/01/94	10/01/94	EPA	46/24
XMD1095G	GRAB Oct 95 XMD	Expanded Mud Dump Area	10/08/95	10/19/95	SAIC	50/0
MDS1090G	GRAB Oct 90 MDS	Mud Dump Site	10/16/90	10/23/90	SAIC	39/7
REF1995G	GRAB 1995 NYD Reference Data	New York Bight	09/08/93	06/09/94	NYD	60/0
					Sediment Total	285
					Tissue Total	47

Table 4. Chemical Parameters Analyzed from Sediment/Tissue Samples within the New York MDS Region

Survey	Stations	Grainsize	TOC	Solids	Lipids	Dioxin	Furan	Metals	PAHs	PCBs /Pest
	Sediment/Tissue									
Apr 94 PANY/NJ Capping	30 / 7	*	*	*	*	*	*			
Jan 93 PANY/NJ Capping	30 / 0	*	*	*		*	*			
Nov 92 PANY/NJ Capping	30 / 9	*	*	*	*	*	*			
Oct 90 Mud Dump Site	39 / 7	*		*		*		*	*	*
Oct 95 Expanded MDS	50 / 0	*								
Oct 94 Expanded MDS SEIS	46 / 24	*	*	*	*	*	*	*	*	*
1995 NYB Reference Data	60 / 0	*	*	*				*	*	*

5.4 Metadata Procedures

Individual survey data were documented by a metadata file that conforms to the standards prescribed in the Federal Geographic Data (NSDI, 1995). The metadata files are included as an electronic text file for each survey data set and are accessed by selections in the options menu. The metadata files specify a complete detailed description of the chemical data sets accessed and displayed by the GIS database interface (i.e., number and types of dioxin congeners that comprise the dioxin value). The Corpsmet program became available in August 1997, three months after DAN-NY was delivered. Accordingly, future metadata submissions to the NYD will be in the Corpsmet format.

6.0 DISPOSAL LOG AND BUOY DATA

Of the available disposal logs and buoy data from the NYD records, a subset was selected for inclusion into the DAN-NY database by the Needs Assessment team.

6.1 Data Sources

The disposal logs from February 1993 through July 1997 were included, excluding the capping logs from the 1993 PANY-NJ Capping Project. The capping logs were not included, because of the shear volume of the material. Disposal logs of partially contaminated Category II material from the project were included. The buoy data from June 1988 through July 1997 were included in DAN-NY.

Disposal logs and buoy data were entered into the DAN-NY database utilizing a data entry screen. A total of 1,785 disposal logs and 635 buoy logs comprise the initial DAN-NY database. To accomplish the data base population, data entry technicians transcribed disposal and buoy log information from original log entries to the respective fields of the electronic data entry screen. When the information required on the data entry screen was completed and the log entry saved, the data were automatically transferred to a dBase data file for application within the Arcview™ system.

6.2 Database Maintenance

Additional disposal log and buoy data can be added to the DAN-NY database by entering the data through the Visual Basic™ application program written for the purpose of entry and error checking. Latter phases of DAN-NY will include the provision for entering both types of datasets. At the end of each dredging project, the disposal logs are being added to the DAN-NY database as part of Phase 4 activities. NYD personnel may need to enter the buoy data themselves to affect a rapid turnaround and manage on-going disposal operations at the HARS. Regardless of data type, the error checking written into the entry program takes place as described in the following Quality Control Procedures subsection.

6.3 Quality Control Procedures

The disposal and buoy log database population phase required the entry of over 80,000 individual datum entered by technicians. To ensure the quality of the data, a system was developed that compared the double entry of each data point. The program identified differences between double entries, and allowed the correct value to be entered. All corrections to the dataset were made and re-checked by the task manager. The corrected, verified, second-entry data file was then saved as the final d-base file for application to the DAN-NY program.

All geographic positioning information was entered as Loran time delays (TDs) and subsequently converted to latitudes and longitudes referenced to NAD ‘83. This method was more efficient in terms of entry time and accuracy, because it was common to all hard copy disposal logs. Many of the latitudes and longitudes provided on the hard copy log sheets were not clearly noted as GPS,

DGPS, or to which datum (NAD ‘27 or NAD ‘83) they referenced. Accordingly, the positioning data was entered as Loran TDs and then converted to NAD ‘83 referenced latitudes and longitudes. The Loran TDs were converted to NAD ‘27 latitudes and longitudes utilizing a conversion program. The NAD ‘27 latitudes and longitudes were subsequently converted to positions referenced to the NAD ‘83 utilizing the Corpscon conversion software. Positions were converted as complete batch files to ensure data integrity. All converted positions were then plotted in ArcView™ within the pre-defined NAD ‘83 Mud Dump Site boundaries to determine whether any positions lay outside. Any discrepancies were investigated by comparing the hard-copy Loran TD to the value in the d-base data file.

6.4 Metadata Procedures

Metadata was not recorded for either the Disposal Log or Buoy datasets.

7.0 SIDESCAN SONAR DATA

The two sidescan sonar datasets selected for inclusion into the DAN-NY database are listed in Table 5 as a single entry, because they have been combined in the display of their features within DAN-NY.

7.1 Data Sources

Two sidescan datasets were imported into the DAN-NY database to display seafloor features at what is now known as the Historic Area Remediation Site (HARS) and formerly identified as the Expanded Mud Dump Area (XMD) and Northwest Regions (NWR). The survey of the XMD area was completed during March 1995, and the NWR area was surveyed during January 1996. Both datasets were previously converted to GRASS raster grid files and combined into a mosaic of the seafloor during the analyses of the results. To prepare the data for display within DAN-NY, the raster grid files were converted into ArcInfo™ grid files and alternately combined to provide a picture of the seafloor topography within DAN-NY.

In addition to the mosaics created, several select images of seafloor features were scanned and provided for DAN-NY. The features were grouped into the following categories: wrecks, lobster traps, trawl scow marks, and dredged material disposal events.

7.2 Maintenance Procedures

Additional sidescan images and mosaics from future sidescan surveys could be entered into the DAN-NY database to enhance the understanding of seafloor roughness at the HARS and environs depending on data storage format. Sidescan data in electronic format, which includes navigation information as part of the data string would be converted to GRASS raster images and layered into a representation of the area using ArcInfo™. The selection of datasets is also limited by size, since the conversion of large electronic datasets are limited by the availability of the processing computer memory since unprocessed sidescan data requires a large memory capacity to convert the products stored within the DAN-NY system. The memory size limitation is a function of data processing during the population task and not a limitation of display within DAN-NY. Once the processing of raw sidescan data is completed on an appropriate machine, subsets of large datasets might be included in a future population task for the DAN-NY program.

7.3 Quality Control Procedures

The 128 shades of gray used to create the sidescan mosaic were adjusted during the creation of the GRASS raster files, so that little adjustment was required to convert the data into the format used in DAN-NY. Only minor changes were made during the creation of the ArcInfo™ files: the overlaying of alternate files created a truer image of the seafloor with little image distortion from averaging between files.

7.4 Metadata Procedures

As previously described in the Bathymetry section, sidescan survey data files were documented by metadata files that conformed to the standards prescribed in the FDGC (NSDI, 1995), using the NBS MetaMaker metadata creation software. And as previously stated all of the subsections were similar for both surveys except Section 5, which detailed the specific survey parameters contained in the sidescan sonar dataset including any needed definitions, clarification and limitations of values pertaining to the sidescan images. The Corpsmet program became available in August 1997, three months after DAN-NY was delivered. Accordingly, future metadata submissions to the NYD will be in the Corpsmet format.

Table 5. Sidescan Sonar Datasets Included in the 1997 DAN-NY Database

Identifier	Survey Name	Region
XMD1995S	1995 Sidescan of XMD & NWR	Expanded Mud Dump Area & NWR

Identifier	Start	End	Collector
XMD1995S	3/95	1/96	EPA

8.0 References

SAIC. 1996. Design of the Disposal Analysis Network for the New York District (DAN-NY). SAIC Report No. 366. Report #33 of the New York Mud Dump Site Studies.

NSDI. 1995. Content Standards for Digital Geospatial Metadata Workbook. Federal Geographic Data Committee. Workbook Version 1.0.