Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

Delaware River and Upper Bay Sediment Data

1.2. Summary description of the data:

The area of coverage consists of 192 square miles of benthic habitat mapped from 2005 to 2007 in the Delaware River and Upper Delaware Bay. The bottom sediment map was constructed by the utilization of a Roxann Seabed Classification System and extensive sediment grab samples. Data was collected in a gridded trackline configuration, with tracklines spacing of 100 meters parallel to the shoreline and 200 meters perpendicular to the shoreline.This project is an extension of the work currently being performed in Delaware waters by DNREC's Delaware Coastal Program's Delaware Bay Benthic Mapping Project.The bottom sediment point data, which has

been classified according to the existing benthic mapping Roxann box plot, are converted from a number that categorizes the point according to its corresponding box (in the Roxann) into a number which reflects the sediment properties of each box in relation to one another. A ranking scale is used to allow a statistical griding scheme to interpolate between sediment data points, while minimizing erroneous sediment classifications and allowing gradational sediment deposits to be gridded. A ranking scale from 0 to 28 was used for this project, with 0 representing the finest grained classifications (fluidized clay) and 28 representing the coarsest grained

classifications (dense shell material). Table 1 illustrates the distribution of sediment classifications along the ranking scale, which takes into account the relation of sediment types and grain sizes to one another using both the Wentworth Scale and Shepard's classification system. Finer grains are more similar in their deposition environments, such as clay and silts, because they reflect similar current regimes, sorting, and reworking patterns (Poppe et al., 2003). While coarse sediments are much more dissimilar to finer grains, with respect to current velocities, sorting, and winnowing, the finer grains are much more closely related in their sediment diameters that the

coarser grains as you increase in Phi size and/or diameter. These account for the close clustering of coarse grained deposit descriptions at the upper end of the ranking scale, while the finer grained sediments show a gradation as you increase in the rating scale.

The bottom sediment data is gridded in Surfer 8, a surface and terrain modeling program, using block kriging and a nugget effect. This statistical griding technique estimates the average value of a variable within a prescribed local area (Isaaks and Srivastava, 1989). Block kriging utilizes the existing point data values, weights the values of the data depending

upon the proximity to the point being estimated, to discretize the local area into an array of estimated data value points and then averaging those individual point estimates together to get an average estimated value over the area of interest (Isaaks and Srivastava, 1989). A variogram is constructed for the data, and the resultant spatial model that is developed from the variogram is used in the block kriging surface model to more accurately interpolate the sediment data . The fitted model was a nugget effect (with an error variance of 21.8%) and a linear model (with a slope of 0.00286

and an anisotropy of 1, which represents a complete lack of spatial correlation).The accuracy of the estimation is dependent upon the grid size of the area of interpolation, the size of each cell within the grid, and the number of discretized data points that are necessary to estimate the cells within that grid spacing. The grid size that was used to interpolate the bottom sediment maps was 442 lines x 454 lines, with a cell size of 44.93 m2. The nugget effect is added to allow the griding to assume there is very little, if any, lateral correlation or trends within the bottom sediment (Isaaks and Srivastava, 1989). The nugget effect model entails a complete lack of spatial correlation; the point data values at any particular location bear no similarity even to adjacent data values (Isaaks and Srivastava, 1989). Without the nugget effect the griding would assume that you could only have a linear progression of sediment types and would insert all the sediment types along the scale between two sediment types (i.e. silty fine to medium sands and fine to medium sand with varying amounts of pebbles would be inserted between fine sand and coarse sand even though that is not what is occurring along the bottom. The sediment data is gridded with no drift for the data interpolation, also helping to minimize erroneous classifications. Sediment Classification Ranking Sediment Description 0-11-2 Clay, 2-33-44-55-66-7 Silt, 7-88-9 Sandy Silts, 9-1010-11 Fine Sand, 11-1212-13 Silty Fine to Medium Sands, 13-14 Silty Medium Sand, 14-1515-16 Fine to Medium Sand, 16-1717-18 Fine to Medium Sand with abundant shell material and/or pebbles, 18-1919-20 Coarse Sand with varying amounts of pebbles, 20-2121-2222-23 Moderate Shell Material/Sandy Pebbles, 23-2424-2525-26 Abundant Shell Material/ Gravel, 26-2727-28 Dense Oyster Shell

Original contact information:

Contact Name: Bartholomew Wilson

Contact Org: Delaware DNREC Coastal Programs

Phone: 302-739-9283

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:
2005 to 2007

1.5. Actual or planned geographic coverage of the data:
W: -75.613208, E: -75.209328, N: 39.833043, S: 39.15493

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Map (digital)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
NOAA Office for Coastal Management (NOAA/OCM)

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:
NOAA Office for Coastal Management (NOAA/OCM)

2.4. E-mail address:
coastal.info@noaa.gov

2.5. Phone number:
(843) 740-1202

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

3.2. Title:
Data Steward

4. Resources

Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Process Steps:

- Data was collected in a gridded trackline configuration, with tracklines spacing of 100 meters parallel to the shoreline and 200 meters perpendicular to the shoreline. This project is an extension of the work currently being performed in Delaware waters by DNREC's Delaware Coastal Program's Delaware Bay Benthic Mapping Project. The bottom sediment point data, which has been classified according to the existing benthic mapping Roxann box plot, are converted from a number that categorizes the point according to its corresponding box (in the Roxann) into a number which reflects the sediment properties of each box in relation to one another. A ranking scale is used to allow a statistical griding scheme to interpolate between sediment data points, while minimizing erroneous sediment classifications and allowing gradational sediment deposits to be gridded. A ranking scale from 0 to 28 was used for this project, with 0 representing the finest grained classifications (fluidized clay) and 28 representing the coarsest grained classifications (dense shell material). Table 1 illustrates the distribution of sediment classifications along the ranking scale, which takes into account the relation of sediment types and grain sizes to one another using both the Wentworth Scale and Shepard's classification system. Finer grains are more similar in their deposition environments, such as clay and silts, because they reflect similar current regimes, sorting, and reworking patterns (Poppe et al., 2003). While coarse sediments are much more dissimilar to finer grains, with respect to current velocities, sorting, and winnowing, the finer grains are much more closely related in their sediment diameters that the coarser grains as you increase in Phi size and/or diameter. These account for the close clustering of coarse grained deposit descriptions at the upper end of the ranking scale, while the finer grained sediments show a gradation as you increase in the rating scale.
- The bottom sediment data is gridded in Surfer 8, a surface and terrain modeling program, using block kriging and a nugget effect. This statistical griding technique estimates the average value of a variable within a prescribed local area (Isaaks and Srivastava, 1989). Block kriging utilizes the existing point data values, weights the

values of the data depending upon the proximity to the point being estimated, to discretize the local area into an array of estimated data value points and then averaging those individual point estimates together to get an average estimated value over the area of interest (Isaaks and Srivastava, 1989). A variogram is constructed for the data, and the resultant spatial model that is developed from the variogram is used in the block kriging surface model to more accurately interpolate the sediment data. The fitted model was a nugget effect (with an error variance of 21.8%) and a linear model (with a slope of 0.00286 and an anisotropy of 1, which represents a complete lack of spatial correlation). The accuracy of the estimation is dependent upon the grid size of the area of interpolation, the size of each cell within the grid, and the number of discretized data points that are necessary to estimate the cells within that grid spacing. The grid size that was used to interpolate the bottom sediment maps was 442 lines x 454 lines, with a cell size of 44.93 m2. The nugget effect is added to allow the griding to assume there is very little, if any, lateral correlation or trends within the bottom sediment (Isaaks and Srivastava, 1989). The nugget effect model entails a complete lack of spatial correlation; the point data values at any particular location bear no similarity even to adjacent data values (Isaaks and Srivastava, 1989). Without the nugget effect the griding would assume that you could only have a linear progression of sediment types and would insert all the sediment types along the scale between two sediment types (i.e. silty fine to medium sands and fine to medium sand with varying amounts of pebbles would be inserted between fine sand and coarse sand even though that is not what is occurring along the bottom. The sediment data is gridded with no drift for the data interpolation, also helping to minimize erroneous classifications. Sediment Classification Ranking Sediment Description 0-11-2 Clay, 2-33-44-55-66-7 Silt, 7-88-9 Sandy Silts, 9-1010-11 Fine Sand, 11-1212-13 Silty Fine to Medium Sands, 13-14 Silty Medium Sand, 14-1515-16 Fine to Medium Sand,16-1717-18 Fine to Medium Sand with abundant shell material and/or pebbles, 18-1919-20 Coarse Sand with varying amounts of pebbles, 20-2121-2222-23 Moderate Shell Material/Sandy Pebbles, 23-2424-2525-26 Abundant Shell Material/Gravel, 26-2727-28 Dense Oyster Shell.

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:
- 1.7. Data collection method(s)
- 3.1. Responsible Party for Data Management
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.3. Data access methods or services offered
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

https://www.fisheries.noaa.gov/inport/item/47943

6.4. Process for producing and maintaining metadata
(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:
NOAA Office for Coastal Management (NOAA/OCM)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:
ftp://ftp.coast.noaa.gov/pub/benthic/Benthic_Cover_Data/DE_DelawareBay.zip

7.3. Data access methods or services offered:

7.4. Approximate delay between data collection and dissemination:

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
Office for Coastal Management - Charleston, SC

8.3. Approximate delay between data collection and submission to an archive facility:

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage

relevant to the data collection

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.