Data Management Plan: National Estuarine Research Reserve (NERR) System-Wide Monitoring Program (SWMP)

1. General Description of Data to be Managed

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

National Estuarine Research Reserve (NERR) System-Wide Monitoring Program (SWMP)

1.2. Summary description of the data: Each reserve maintains at least one meteorological station to quantify atmospheric conditions at fifteen minute intervals. Core elements currently measured at all reserves include air temperature, relative humidity, barometric pressure, wind speed, wind direction, rainfall, and photosynthetically active radiation (PAR). Each reserve deploys at least four water quality sondes ("datasondes") for continuous monitoring of water quality parameters at fifteen minute intervals. Datasonde placement is designed to characterize gradients in environmental conditions. Core data include water temperature, specific conductivity, salinity, percent saturation of dissolved oxygen, concentration of dissolved oxygen, depth or level (vertical control), pressure, pH, and turbidity. Calculated values include pressure corrected water depth or level. SWMP also includes monthly analyses to quantify nutrient and pigment concentrations at the same water quality monitoring stations where datasondes are located, if possible. Discrete samples are collected once monthly at specified tidal conditions minimally at the four designated long-term water quality monitoring stations. More intensive diel (lunar day) sampling is conducted at one long-term monitoring station each month to better understand impacts of tide on nutrient cycling. Core elements currently measured at all reserves include nitrate, nitrite, ammonium, orthophosphate, and chlorophyll *a*.

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

1.4. Actual or planned temporal coverage of the data:

Continuous at 28 coastal and estuarine reserves

1.5. Actual or planned geographic coverage of the data:

Nominally 4 water quality stations and one meteorological station at each of 28 coastal and estuarine reserves

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

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.)*

Weather stations and datasondes moored or mounted a fixed distance from the bottom

1.8. If data are from a NOAA Observing System of Record,[15] indicate name of system: Yes. National Estuarine Research Reserve System-Wide Monitoring Program (see https://drive.google.com/a/noaa.gov/file/d/0B-a1g92HFlc0Q2tDb3A5b3ZPX0k/view)

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

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

2.1. Name: Anne Ball

2.2. Title: Data Manager

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

2.4. E-mail address: anne.ball@noaa.gov

2.5. Phone number: 843-740-1229

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: Marie Bundy

3.2. Position Title: Ecologist

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? Yes

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"): 1.8%

5. **Data Lineage and Quality**

NOAA has issued Information Quality Guidelines[16] 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)*: http://cdmo.baruch.sc.edu/data/policy.cfm and http://cdmo.baruch.sc.edu/data/qaqc.cfm

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: NA

5.2. Quality control procedures employed *(describe or provide URL of description)*: http://cdmo.baruch.sc.edu/data/qaqc.cfm

6. **Data Documentation**

The EDMC Data Documentation Procedural Directive[17] 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? Yes 6.1.1.

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

6.2. Name of organization or facility providing metadata hosting:
NERRS Centralized Data Management Office

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

6.3. URL of metadata folder or data catalog, if known: http://cdmo.baruch.sc.edu/get/landing.cfm

6.4. Process for producing and maintaining metadata *(describe or provide URL of description)*: http://cdmo.baruch.sc.edu/data/metadata.cfm

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[18] contains specific guidance, recommends the use of open-standard, interoperable, nonproprietary 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? yes

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? N/A

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

7.2. Name of organization of facility providing data access: NERRS Centralized Data Management Office

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

7.2.2. URL of data access service, if known: http://cdmo.baruch.sc.edu/

7.3. Data access methods or services offered:
Data export system: http://cdmo.baruch.sc.edu/get/export.cfm
Advanced query system: http://cdmo.baruch.sc.edu/aqs
Real time data application: http://cdmo.baruch.sc.edu/get/realTime.cfm
GIS application: http://cdmo.baruch.sc.edu/get/gis.cfm
Vegetation monitoring application: http://cdmo.baruch.sc.edu/get/vegetation_index.html Web services: http://cdmo.baruch.sc.edu/webservices.cfm

7.4. Approximate delay between data collection and dissemination: I month

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

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 NODC, NCDC, NGDC, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)*

In the past, data has been archived at NODC and NCDC. Archiving has not taken place in some time. CDMO and OCM will meet in December to address archiving and will contact NCEI at that time.

8.1.1. If World Data Center or Other, specify: NA

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

8.2. Data storage facility prior to being sent to an archive facility (if any): NERRS Centralized Data Management Office http://cdmo.baruch.sc.edu/

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

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:
Data are uploaded and 'ingested' into the core SQL database at every stage of data collection (including near real-time transmission) and QAQC. All flat files uploaded to the database are archived on the FTP site hosted by our primary web server, they represent one method for rebuilding the database and data archive if necessary. These two measures help to minimize risk of data deletion.

The process of data ingestion into the database includes a multitude of checks to include: sampling station verification, datetimestamp verification, missing data, corrupted data, inappropriate characters/content, incomplete file ingestion, and sensor range QAQC checks. In addition, any processing of the data during QAQC is performed within an Excel macro that facilitates formatting and protects data content. These measures help to minimize risk due to malicious or erroneous modification.

A secondary database is maintained on a separate server that serves as an additional local back up. All servers are backed up using Backup Assist software. The SQL database is also backed up using SQL backup

functions. Backup files are stored on a network drive in a different location and backups are tested on a regular basis.

9. **Additional Line Office or Staff Office Questions**

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

South Slough NERR operating procedures for calibrating, validating, operating, and maintaining equipment:

As a NANOOS Observing System provider, we follow industry best practices and manufacturer guidance where applicable, to calibrate, operate, and maintain the equipment used in this effort, and will provide documentation of this upon request.

Further, we maintain equipment inventories, shipping logs, and instrument maintenance history logs, as appropriate, that are available upon request.