

1. Identification Information

1.1 Citation Information

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: North Inlet – Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: Dennis Allen

8.1 Originator: Wendy Allen

8.1 Originator: Erik Smith

8.1 Originator: Andrew Lohrer

8.1 Originator: Chris Buzzelli

8.1 Originator: Amy Cook

8.1 Originator: Tracy Buck

8.1 Originator: Jennifer Keese

8.1 Originator: Jennifer Jarrell

8.2 Publication Date: 20060331

8.4 Title: North Inlet – Winyah Bay (NIW) National Estuarine Research Reserve Meteorological Data, North Inlet Estuary, Georgetown, South Carolina: 2000 – 2004.

8.5 Edition: Second Edition

8.6 Geospatial Data Presentation Form: comma delimited digital data and Microsoft Excel spreadsheet in yearly files

8.7 Series Information

8.7.1 Series Name: Baruch Institute's Meteorological Database for the North Inlet Estuary, South Carolina

8.7.2 Issue Identification: January 1, 2000 – December 31, 2004

8.8 Publication Information:

8.8.1 Publication Place: Baruch Marine Field Laboratory, Georgetown, SC USA

8.8.2 Publisher: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.9 Other Citation Details: The 2001-2004 data were collected under the auspices and protocols of the National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP) for the North Inlet – Winyah Bay (NIW) Reserve, which is hosted by the Baruch Marine Field Lab. The 2000 data were collected under NIW NERR auspices and protocols, but were not considered official SWMP data. This database and metadata document are Baruch Institute's versions, created by Baruch's data managers, and follow Baruch's quality control and assurance procedures in addition to NIW NERR and CDMO protocols. Both data and metadata vary from the NERR/CDMO versions.

8.10 Online linkage: <http://links.baruch.sc.edu/data/>

8.11 Larger Work Citation:

8. Citation Information:

8.1 Originator: National Oceanic and Atmospheric Administration (NOAA)

8.1 Originator: Office of Ocean and Coastal Resource Management (OCRM)

8.1 Originator: National Estuarine Research Reserve System (NERR)

8.2 Publication Date: 1995

8.4 Title: NERR System-Wide Monitoring Program (SWMP)

8.6 Geospatial Data Presentation Form: tab delimited text (spreadsheet)

8.8 Publication Information:

8.8.1 Publication Place: Georgetown, South Carolina

8.8.2 Publisher: NERR Centralized Data Management Office

8.10 Online Linkage: <http://nerrs.noaa.gov/Monitoring/> or <http://nerrs.noaa.gov/Monitoring/History.html>

1.2 Description

1.2.1 Abstract:

National Estuarine Research Reserve System

The National Estuarine Research Reserve System was established by the Coastal Zone Management Act of 1972 (as amended) and is a network of protected areas established for long-term research, education and stewardship. This partnership program between NOAA and the coastal states protects more than one million acres of estuarine land and water, which provides essential habitat for wildlife; offers educational opportunities for students, teachers and the public; and serves as living laboratories for scientists. NOAA provides funding, national guidance, and technical assistance. Each reserve is managed on a daily basis by a lead state agency or university, with input from local partners.

NERR System Wide Monitoring Project (SWMP)

The National Estuarine Research Reserve System-wide Monitoring Program tracks short-term variability and long-term changes in estuarine waters to understand how human activities and natural events can change ecosystems. It provides valuable long-term data on water quality, water nutrient levels, and weather at frequent time intervals. Coastal managers use this monitoring data to make informed decisions on local and regional issues, such as “no-discharge” zones for boats and measuring the success of restoration projects. The reserve system currently measures physical and chemical water quality indicators, nutrients and the impacts of weather on estuaries. As the program expands, plans include adding a biological monitoring component and tracking changes in land use through remote sensing.

North Inlet – Winyah Bay Reserve’s Weather Monitoring Program

The North Inlet Estuary and the adjacent lower northeastern section of Winyah Bay Estuary were designated as part of the National Estuarine Research Reserve System in 1992. The North Inlet - Winyah Bay (NIW) Reserve is managed/hosted by the University of South Carolina, Belle W. Baruch Institute for Marine and Coastal Sciences, at the Baruch Marine Field Laboratory. Its environmental monitoring program began running under the auspices of the NERR program in June 1993. In 1995, the NERR program began a System-Wide Monitoring Program that set protocols for monitoring the estuarine environment, starting with water quality. Collection protocols for weather data were being developed and implemented in 1997, at which time the NIW reserve’s data collection procedures changed to follow these new guidelines. Official SWMP weather protocols were implemented in 2001. Weather data collected under the NERR program are a continuation of the Baruch Institute’s long-term meteorological data set, which began in 1982, with rainfall data extending back into 1978.

The NIW NERR weather station is located at the end of the Oyster Landing pier. The station includes sensors for air temperature, relative humidity, photosynthetically active solar radiation (PAR, collected by a LiCor Quantum sensor), barometric pressure, wind speed, wind direction, solar radiation (Eppley black and white pyranometer, wavelengths between 280 and 2800 nm), and precipitation. All sensors are located on an aluminum tower at a height of approximately 3.5 meters (with the exception of the rain gauge, which is adjacent to the boardwalk) and are wired into a Campbell Scientific CR10X data logger. The data logger program, provided by the NERR Centralized Data Management Office (CDMO), determines and implements the data collection schedule. Readings are taken every 5 seconds continuously throughout the year and various average, instantaneous, and total data are reported for 15-minute, hourly, and 24-hour time intervals. Over the course of this database, there were protocol changes in data collection and reporting. See the Supplemental Information section (below) for some general information, the Completeness Report and the “NERRMET.MissingAnomalous.2000-2004” document for more detailed information, and the Field Methodology Description for a complete data collection schedule.

1.2.2 Purpose:

The principal objective of this dataset is to monitor and archive meteorological data for the North Inlet - Winyah Bay NERR in order to observe environmental variability, changes, or trends over time; for use in short and long-term studies at North Inlet; for comparisons to other NERR sites; and to compliment other biological, chemical, and physical research conducted throughout the reserve. As part of the NERR System-wide monitoring program, this information will also contribute to effective national, regional, and site specific coastal zone management.

1.2.3. Supplemental Information:

Data Collection and Reporting

This metadata document pertains to the NIW NERR Weather data for the years 2000-2004. However, this metadata document and the data it accompanies are Baruch’s version and may differ from the NIW NERR CDMO versions. Some important differences in the datasets are as follows:

1. Data and FGDC metadata for the year 2000 are reported in Baruch’s dataset or are available through the NIW NERR Weather Technician. They are not reported as part of the SWMP Weather Database by the CDMO.
2. Eppley Solar Radiation data from January 1, 2000 through October 21, 2003 are reported (as instantaneous readings) in Baruch’s dataset or are available through the NIW NERR Weather Technician, but are not reported as part of the SWMP Weather Database by the CDMO. On October 21, 2003 the CR10X version 4.0 program was implemented and the CDMO began reporting Eppley Solar Radiation data (total readings) as a non-required component of SWMP.

3. A major data collection protocol change was instituted on October 21, 2003. This change resulted in several differences in the values reported (instantaneous readings to averages or totals, etc) as well as the reporting format. Please see the various data collection schedules as reported in the methodology section of this document for more information.

Other NIW NERR SWMP Datasets:

NIW NERR Nutrient: Water samples were collected from four sites within the North Inlet and Winyah Bay Estuaries every 20 days, at 2 hour and 4 minute intervals, for 2 complete tidal cycles (26 hours). Samples were obtained with an ISCO automated water sampler at a depth of 0.5 meters below the water's surface. The samples were then analyzed in the lab for numerous parameters including: salinity, chlorophyll a, nitrogen (total whole and dissolved, ammonia, nitrite, nitrate-nitrite, and dissolved inorganic nitrogen), phosphorus (total and dissolved, ortho phosphate), dissolved organic carbon, suspended sediment (total suspended sediment, inorganic suspended sediment, organic suspended sediment), and suspended sediment color. Tide stage based on published NOAA tide charts is also available. Parameters changed throughout the database, limited parameters beginning in January of 2002 are available from the CDMO (<http://cdmo.baruch.sc.edu/>) and the complete database (called NERR Water Chemistry) is available through Baruch's Data Management Office (<http://links.baruch.sc.edu/Data/>) beginning in June of 1993. Baruch's LTER Water Chemistry (LTERDWS) database is a precursor to this database and reports some preliminary data from as early as 1978. Daily data from 3 sites, including most of the parameters listed above, were reported by 1981 and through June of 1993.

NIW NERR Water Quality: Water quality data are collected via an automated datalogger from four sites within the North Inlet and Winyah Bay Estuaries at 30 minute intervals. Parameters include: water temperature, specific conductivity, salinity, dissolved oxygen (percent saturation and milligrams/Liter), depth, pH, and turbidity. NIW NERR Water Quality data are available from the CDMO (<http://cdmo.baruch.sc.edu/>) beginning in January of 1995. Water Quality data were collected under the auspices of the NERR program beginning in October of 1993; these earlier data are available through Baruch's Data Management Office (<http://links.baruch.sc.edu/Data/>). In addition, water quality data are available beginning in 1982 in Baruch's LTER Meteorological database with water parameters (LTERMET).

1.3 Time Period of Content:

9.3 Range of Dates/Times

9.3.1 Beginning Date: 20000101

9.3.3 Ending Date: 20041231

1.3.1 Currentness Reference: Ground condition.

1.4 Status:

1.4.1 Progress: Complete

1.4.2 Maintenance and update frequency: As needed

99.1.5.1 Description of Geographic Extent:

The NIW NERR is located on the Southeastern Atlantic coast of the United States and includes two tidal estuaries, North Inlet and Winyah Bay, near Georgetown, South Carolina. The North Inlet estuary, located directly east of the uplands of Hobcaw Barony (also known as the Belle W. Baruch Property) and approximately 10 km east of Georgetown, is a bar-built Class C type estuary (Pritchard, 1955). It is composed of numerous winding tidal creeks and is considered a pristine tidal estuary due to minimal anthropogenic impacts. The watershed drains a 24.8 km² area of mostly pine forest, a golf course, and a moderately developed residential watershed to the north. The Winyah Bay estuary, classified as a Class B type estuary by Pritchard (1955) and composed of waters that originate in the Blue Ridge Mountains of North Carolina, is one of the largest river-estuary ecosystems on the Eastern Seaboard. It is located 14.4 km south of North Inlet. Winyah Bay drains the sub-basins of 6 major rivers, which are heavily impacted by agriculture, mining, and industry. The rivers drain approximately 46,736 km² of uplands and marshes.

The Oyster Landing (OL) meteorological monitoring site, located at -79.1928 W, 33.3494 N, is considered a fairly pristine and undisturbed area. The weather station is located on an aluminum tower, approximately 3.5 meters in height, at the end of the OL pier. This is also the location of one of the NIW NERR water quality and nutrient stations. The pier stretches into the upper reaches of Crabhaul Creek in the mid western portion of North Inlet. The sampling site is located approximately 2.8 km from the headwaters of Crabhaul Creek. The creek directly drains pine forested uplands and

wetlands. Salinity can range from 0 - 32 ppt. and average tidal range is approximately 1.4 meters. The creek has an average depth of approximately 2 meters Mean High Water (MHW) and average width of approximately 150 meters MHW. The bottom is comprised mostly of oyster shell hash with some fine sediment and detritus.

Pritchard, D.W. 1955. Estuarine circulation patterns. Proc. Am. Soc. Civ. Eng. 81(717):1-11.

Oyster Landing Bounding Coordinates:

1.5.1.1 West Bounding Coordinate: -79.192

1.5.1.2 East Bounding Coordinate: -79.167

1.5.1.3 North Bounding Coordinate: 33.350

1.5.1.4 South Bounding Coordinate: 33.327

1.6 Keywords

1.6.1 Theme

1.6.1.1 Theme Keyword Thesaurus:	None
1.6.1.2 Theme Keyword:	AIR TEMPERATURE
1.6.1.2 Theme Keyword:	BAROMETRIC PRESSURE
1.6.1.2 Theme Keyword:	CLIMATE
1.6.1.2 Theme Keyword:	COASTAL
1.6.1.2 Theme Keyword:	CREEK
1.6.1.2 Theme Keyword:	EPPLEY
1.6.1.2 Theme Keyword:	ESTUARINE
1.6.1.2 Theme Keyword:	ESTUARY
1.6.1.2 Theme Keyword:	TIDAL CREEK
1.6.1.2 Theme Keyword:	LICOR
1.6.1.2 Theme Keyword:	MARSH
1.6.1.2 Theme Keyword:	METEOROLOGICAL
1.6.1.2 Theme Keyword:	NERR
1.6.1.2 Theme Keyword:	PAR
1.6.1.2 Theme Keyword:	PHOTOSYNTHETICALLY ACTIVE RADIATION
1.6.1.2 Theme Keyword:	PRECIPITATION
1.6.1.2 Theme Keyword:	RELATIVE HUMIDITY
1.6.1.2 Theme Keyword:	SALT MARSH
1.6.1.2 Theme Keyword:	SOLAR RADIATION
1.6.1.2 Theme Keyword:	SWMP
1.6.1.2 Theme Keyword:	TIDAL
1.6.1.2 Theme Keyword:	PAR
1.6.1.2 Theme Keyword:	WEATHER
1.6.1.2 Theme Keyword:	WEATHER STATION
1.6.1.2 Theme Keyword:	WIND SPEED
1.6.1.2 Theme Keyword:	WIND VELOCITY

1.6.2 Place

1.6.2.1 Place Keyword Thesaurus:	None
1.6.2.2 Place Keyword:	OYSTER LANDING PIER
1.6.2.2 Place Keyword:	OYSTER LANDING
1.6.2.2 Place Keyword:	CRAB HAUL CREEK
1.6.2.2 Place Keyword:	NORTH INLET
1.6.2.2 Place Keyword:	NORTH INLET ESTUARY
1.6.2.2 Place Keyword:	GEORGETOWN COUNTY
1.6.2.2 Place Keyword:	SOUTH CAROLINA
1.6.2.2 Place Keyword:	SOUTH EAST COAST
1.6.2.2 Place Keyword:	EAST COAST
1.6.2.2 Place Keyword:	ATLANTIC COAST

1.6.4 Temporal

1.6.4.1 Temporal Keyword Thesaurus:	None
1.6.4.2 Temporal Keyword:	15-MINUTES
1.6.4.2 Temporal Keyword:	HOUR
1.6.4.2 Temporal Keyword:	DAY
1.6.4.2 Temporal Keyword:	WEEK
1.6.4.2 Temporal Keyword:	MONTH
1.6.4.2 Temporal Keyword:	YEAR
1.6.4.2 Temporal Keyword:	LONG-TERM
1.6.4.2 Temporal Keyword:	2000
1.6.4.2 Temporal Keyword:	2001
1.6.4.2 Temporal Keyword:	2002
1.6.4.2 Temporal Keyword:	2003
1.6.4.2 Temporal Keyword:	2004

1.7 Access Constraints:

None; however, it is strongly recommended that these data be acquired directly from the Belle W. Baruch Institute for Marine and Coastal Sciences and not indirectly through other sources which may have changed the data in some way.

1.8 Use Constraints:

According to the Belle W. Baruch Institute for Marine and Coastal Sciences:

Following academic courtesy standards, the PI (originators), the North Inlet – Winyah Bay NERR site, the University of South Carolina's Belle W. Baruch Institute for Marine Biology and Coastal Research, and Grantor (see Data Set Credit section) should be fully acknowledged and cited in any subsequent publications in which any part of these data are used. Use of the data without completely reading and understanding the metadata is not recommended. The Baruch Institute, Baruch Institute researchers, and Grantor are not responsible for the use and/or misuse of data from this database. See the section on Distribution Liability for more information. Following is the correct citation for this dataset:

Allen, Dennis M., Wendy Allen, Erik Smith, Andrew Lohrer, Chris Buzzelli, Amy Cook, Tracy Buck, Jennifer Keese, Jennifer Jarrell. 2006. North Inlet – Winyah Bay (NIW) National Estuarine Research Reserve Meteorological Data, North Inlet Estuary, Georgetown, South Carolina: 2000 – 2004. Second Edition. Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina, Data Archives Website: <http://links.baruch.sc.edu/Data/>.

According to the Ocean and Coastal Resource Management Data Dissemination Policy for the NERRS System-wide Monitoring Program:

NOAA/ERD retains the right to analyze, synthesize and publish summaries of the NERRS System-wide Monitoring Program data. The PI retains the right to be fully credited for having collected and processed the data. Following academic courtesy standards, the PI and NERR site where the data were collected will be contacted and fully acknowledged in any subsequent publications in which any part of the data are used. Manuscripts resulting from the NOAA/OCRM supported research that are produced for publication in open literature, including refereed scientific journals, will acknowledge that the research was conducted under an award from the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration.

1.9 Point of Contact:

10.2 Contact Person Primary

10.2.2 Contact Person:	Melissa Ide
10.3 Contact Position:	Research Data Rescue Manager & Analyst

10.4 Contact Address

10.4.1 Address Type:	Mailing Address
10.4.2 Address:	PO Box 1630
10.4.2 Address:	USC Baruch Marine Field Lab
10.4.3 City:	Georgetown
10.4.4 State or Province:	South Carolina
10.4.5 Postal Code:	29442

10.4.6 Country: USA
10.5 Contact Voice Telephone: (843) 546-6219 extension 243
10.7 Contact Facsimile Telephone: (843) 546-1632
10.8 Contact Electronic Mail Address: melissa@belle.baruch.sc.edu
10.9 Hours of Service: 8:30 am to 4:30 pm EST/EDT Monday - Friday

1.11 Data Set Credit:

Research was conducted under an award (initial award number NA270R0322-01 October 15, 1992) for the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration. The North Inlet – Winyah Bay National Estuarine Research Reserve, overseen by the University of South Carolina's Belle W. Baruch Institute for Marine and Coastal Sciences, is in charge of gathering, managing, and distributing these data, through the NERRS Centralized Data Management Office, for research, education, and coastal zone management purposes. Several researchers, technicians, and data managers contributed to this data set.

1.14 Native Data Set Environment

Data are in Microsoft Excel 2003 Professional and comma separated value (csv) formats. Metadata are in Microsoft (MS) Word 2003 Professional and plain text formats. Images, including graphics, are in JPEG (.JPG) format.

Related NIW NERR/Baruch Meteorological Databases:

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: Dennis Allen

8.1 Originator: Wendy Allen

8.1 Originator: Erik Smith

8.1 Originator: Andrew Lohrer

8.1 Originator: Chris Buzzelli

8.1 Originator: Amy Cook

8.1 Originator: Tracy Buck

8.1 Originator: Jennifer Keesee

8.2 Publication Date: 2005

8.4 Title: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve Meteorological Data, North Inlet Estuary, Georgetown, South Carolina: 2001-2004.

8.6 Geospatial Data Presentation Form: comma and tab delimited text (spreadsheet) in yearly files

8.8 Publication Information:

8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina

8.8.2 Publisher: NERR Centralized Data Management Office

8.9 Other Citation Details: These data were collected under the auspices and protocols of the National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP). This is the NERR/CDMO version of the database.

8.10 Online Linkage: <http://cdmo.baruch.sc.edu>

8.11 Larger Work Citation:

8. Citation Information:

8.1 Originator: National Oceanic and Atmospheric Administration (NOAA)

8.1 Originator: Office of Ocean and Coastal Resource Management (OCRM)

8.1 Originator: National Estuarine Research Reserve System (NERR)

8.2 Publication Date: 1995

8.4 Title: NERR System-Wide Monitoring Program (SWMP)

8.6 Geospatial Data Presentation Form: tab delimited text (spreadsheet)

8.8 Publication Information:

8.8.1 Publication Place: Georgetown, South Carolina

8.8.2 Publisher: NERR Centralized Data Management Office

8.10 Online Linkage: <http://nerrs.noaa.gov/Monitoring/> or <http://nerrs.noaa.gov/Monitoring/History.html>

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: Dennis Allen

8.1 Originator: Wendy Allen

8.1 Originator: Andrew Lohrer

8.1 Originator: Tracy Buck

8.1 Originator: Jennifer Keesee

8.1 Originator: Jennifer Jarrell

8.2 Publication Date: Unpublished material

8.4 Title: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve Meteorological Data, North Inlet Estuary, Georgetown, South Carolina: 2000.

8.6 Geospatial Data Presentation Form: comma and tab delimited text (spreadsheet) in a yearly file

8.9 Other Citation Details: These data were collected under the auspices and protocols of the NIW National Estuarine Research Reserve but are not considered official System-Wide Monitoring Program (SWMP) data. SWMP Weather was implemented in 2001. This is the NIW NERR version of the database.

1.15 Cross Reference:

8. Citation Information

8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina

8.1 Originator: North Inlet – Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: D. Allen

8.1 Originator: E. Chipouras

8.2 Publication Date: 20020701

8.4 Title: North Inlet – Winyah Bay (NIW) National Estuarine Research Reserve Meteorological Data, North Inlet Estuary, Georgetown, South Carolina: 1997 – 1999.

8.6 Geospatial Data Presentation Form: comma delimited text and MS Excel spreadsheet in yearly files

8.8 Publication Information:

8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA

8.8.2 Publisher: The Belle W. Baruch Institute for Marine Biology and Coastal Research, Baruch Marine Field Lab, University of South Carolina

8.9 Other Citation Details: These data were collected under the auspices and protocols of the NIW National Estuarine Research Reserve but are not considered official System-Wide Monitoring Program (SWMP) data. SWMP Weather was implemented in 2001. This database and the associated metadata are the Baruch Institute's versions, are independent of the NERR/CDMO versions, and follow Baruch's quality control and assurance procedures in addition to NIW NERR protocols.

8.10 Online Linkage: <http://links.baruch.sc.edu/data/>

1.15 Cross Reference:

8. Citation Information

8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina

8.1 Originator: F.J. Vernberg

8.1 Originator: B. Kjerfve

8.1 Originator: W.K. Michener

8.2 Publication Date: 20011219

8.4 Title: Long Term Ecological Research (LTER) Climate Data with Water Parameters from North Inlet Meteorological Station, North Inlet Estuary, Georgetown, South Carolina: 1982-1996.

8.5 Edition: Second Edition

8.6 Geospatial Data Presentation Form: comma delimited digital data and MS Excel spreadsheet

8.8 Publication Information:

8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA

8.8.2 Publisher: The Belle W. Baruch Institute for Marine Biology and Coastal Research, Baruch Marine Field Lab, University of South Carolina

8.9 Other Citation Details: LTER Data Set Code: NIN001

8.10 Online Linkage: <http://links.baruch.sc.edu/data/>

8.11 Larger Work Citation:

8. Citation Information:

8.1 Originator: W.K. Michener (Editor)
8.1 Originator: A.B. Miller (Editor)
8.1 Originator: R. Nottrott (Editor)
8.2 Publication Date: 1990
8.4 Title: Long-Term Ecological Research Network Core Data Set Catalog
8.6 Geospatial Data Presentation Form: catalog in book and on-line form
8.8 Publication Information:
8.8.1 Publication Place: Columbia, South Carolina USA
8.8.2 Publisher: Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina
8.9 Other Citation Details: Published for the Long-Term Ecological Research Network

1.15 Cross Reference:

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina
8.1 Originator: W. K. Michener
8.1 Originator: D. Taylor
8.2 Publication Date: 20030627
8.4 Title: Long-Term Ecological Research (LTER) National Weather Service Station Data for the North Inlet Estuary, Georgetown, South Carolina: 1986 – 1996
8.5 Edition: Second Edition
8.6 Geospatial Data Presentation Form: comma delimited digital data and MS Excel spreadsheet
8.8 Publication Information:
8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA
8.8.2 Publisher: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina
8.9 Other Citation Details: LTER Data Set Code NIN002
8.10 Online linkage: <http://links.baruch.sc.edu/data/>
8.11 Larger Work Citation:
8. Citation Information
8.1 Originator: W.K. Michener (Editor)
8.1 Originator: A.B. Miller (Editor)
8.1 Originator: R. Nottrott (Editor)
8.2 Publication Date: 1990
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8.6 Geospatial Data Presentation Form: catalog in book and on-line form
8.8 Publication Information:
8.8.1 Publication Place: Columbia, South Carolina, USA
8.8.2 Publisher: The Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina
8.9 Other Citation Details: Published for the Long-Term Ecological Research Network

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina
8.1 Originator: North Inlet – Winyah Bay National Estuarine Research Reserve (NIW NERR)
8.1 Originator: Belle W. Baruch Institute of Coastal Ecology and Forest Science
8.2 Publication Date: 200301
8.4 Title: Long-Term Rainfall Monitoring Database (RAINDAZE) for Hobcaw Barony and the North Inlet Estuary, Georgetown, South Carolina: 1978 – 2001.
8.5 Edition: First Edition
8.6 Geospatial Data Presentation Form: comma delimited digital data and MS Excel spreadsheet
8.7 Series Information
8.7.1 Series Name: Baruch Institute's Meteorological Database for the North Inlet Estuary, South Carolina
8.7.2 Issue Identification: April 1, 1978 – December 31, 2001
8.8 Publication Information:
8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA
8.8.2 Publisher: The Belle W. Baruch Institute for Marine Biology and Coastal Research, Baruch Marine Field Lab, University of South Carolina

8.9 Other Citation Details: The 1997 through 2001 data were collected under the auspices and protocols of the NIW National Estuarine Research Reserve as part of the NERRMET databases.

8.10 Online linkage: <http://links.baruch.sc.edu/data/>

Other NIW NERR/Baruch Databases:

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: North Inlet-Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: Dennis Allen

8.1 Originator: Andrew Lohrer

8.1 Originator: Evan Chipouras

8.1 Originator: Nicole Rutherford

8.1 Originator: Chris Spruck

8.1 Originator: Chris Aadland

8.1 Originator: Jennifer Jarrell

8.2 Publication Date: 20031121

8.4 Title: North Inlet-Winyah Bay National Estuarine Research Reserve's (NERR) Estuarine Water Quality Data for the North Inlet and Winyah Bay Estuaries, Georgetown, South Carolina: 1993-2002

8.5 Edition: First Edition

8.6 Geospatial Data Presentation Form: comma delimited digital data and MS Excel spreadsheet in yearly files

8.7 Series Information

8.7.1 Series Name: Baruch Institute's Water Quality Long-Term Monitoring Database for the North Inlet and Winyah Bay Estuaries, South Carolina

8.7.2 Issue Identification: October 25, 1993 - December 31, 2002

8.8 Publication Information:

8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA

8.8.2 Publisher: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.9 Other Citation Details: These data were collected under the auspices and protocols of the North Inlet-Winyah Bay NERR. The National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP) protocols took effect in 1995. This database and the associated metadata are the Baruch Institute's versions, are independent of the NERR/CDMO versions, and follow Baruch's quality control and assurance procedures in addition to NERR SWMP protocols.

8.10 Online linkage: <http://links.baruch.sc.edu/data/>

8.11 Larger Work Citation:

8. Citation Information:

8.1 Originator: National Oceanic and Atmospheric Administration (NOAA)

8.1 Originator: Office of Ocean and Coastal Resource Management (OCRM)

8.1 Originator: National Estuarine Research Reserve System (NERR)

8.2 Publication Date: 1995

8.4 Title: NERR System-Wide Monitoring Program (SWMP)

8.6 Geospatial Data Presentation Form: tab delimited text (spreadsheet)

8.8 Publication Information:

8.8.1 Publication Place: Georgetown, South Carolina

8.8.2 Publisher: NERR Centralized Data Management Office

8.10 Online Linkage: <http://neris.noaa.gov/Monitoring/> or <http://neris.noaa.gov/Monitoring/History.html>

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: North Inlet-Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: Dennis Allen

8.1 Originator: Wendy Allen

8.1 Originator: Chris Spruck

8.1 Originator: Chris Aadland

8.1 Originator: Jennifer Jarrell

8.1 Originator: Andrew Lohrer

8.1 Originator: Evan Chipouras

8.1 Originator: Tracy Buck

8.1 Originator: Chris Buzzelli

8.2 Publication Date: 2005

8.4 Title: North Inlet-Winyah Bay National Estuarine Research Reserve's (NERR) Estuarine Water Quality Data for the North Inlet and Winyah Bay Estuaries, Georgetown, South Carolina: 1995-2004

8.6 Geospatial Data Presentation Form: comma and tab delimited text (spreadsheet) in yearly files

8.8 Publication Information:

8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA

8.8.2 Publisher: NERR Centralized Data Management Office

8.9 Other Citation Details: These data were collected under the auspices and protocols of the North Inlet-Winyah Bay NERR. The National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP) protocols took effect in 1995. This is the NERR/CDMO version of the database.

8.10 Online linkage: <http://cdmo.baruch.sc.edu>

8.11 Larger Work Citation:

8. Citation Information:

8.1 Originator: National Oceanic and Atmospheric Administration (NOAA)

8.1 Originator: Office of Ocean and Coastal Resource Management (OCRM)

8.1 Originator: National Estuarine Research Reserve System (NERR)

8.2 Publication Date: 1995

8.4 Title: NERR System-Wide Monitoring Program (SWMP)

8.6 Geospatial Data Presentation Form: tab delimited text (spreadsheet)

8.8 Publication Information:

8.8.1 Publication Place: Georgetown, South Carolina

8.8.2 Publisher: NERR Centralized Data Management Office

8.10 Online Linkage: <http://nerrs.noaa.gov/Monitoring/> or <http://nerrs.noaa.gov/Monitoring/History.html>

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina

8.1 Originator: North Inlet-Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: Bill Johnson

8.1 Originator: Alan Lewitus

8.1 Originator: Drew Lohrer

8.1 Originator: Dennis Allen

8.1 Originator: Danny Taylor

8.1 Originator: Tonia Robinson

8.1 Originator: Virginia Ogburn-Matthews

8.2 Publication Date: 20030328

8.4 Title: North Inlet-Winyah Bay National Estuarine Research Reserve's (NERR) Estuarine Surface Water Nutrient, Suspended Sediment, and Chlorophyll a Data for the North Inlet and Winyah Bay Estuaries, Georgetown, South Carolina: 1993-2001

8.6 Geospatial Data Presentation Form: comma delimited digital data and MS Excel spreadsheet

8.7 Series Information

8.7.1 Series Name: Baruch Institute's Water Chemistry, Chlorophyll a, and Suspended Sediment Long-Term Monitoring Database for the North Inlet Estuary, South Carolina

8.7.2 Issue Identification: June 1, 1993 - December 31, 2001

8.8 Publication Information:

8.8.1 Publication Place: Georgetown, South Carolina, USA

8.8.2 Publisher: Belle W. Baruch Institute for Marine Biology and Coastal Research, University of South Carolina

8.9 Other Citation Details: These data were collected under the auspices and protocols of the North Inlet-Winyah Bay NERR. The National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP) instated their protocols in the year 2002. This database and the associated metadata are the Baruch Institute's versions, are independent of the NERR/CDMO versions, and follow Baruch's quality control and assurance procedures in addition to NIW NERR protocols.

8.10 Online linkage: <http://links.baruch.sc.edu/data/>

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences

8.1 Originator: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve

8.1 Originator: Wendy Allen

8.1 Originator: Chris Buzzelli

8.1 Originator: Tracy Buck

8.1 Originator: Bill Johnson

8.1 Originator: Jennifer Keese

8.1 Originator: Sarah Foote

8.2 Publication Date: 2005

8.4 Title: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve (NERR) Estuarine Surface Water Nutrient and Chlorophyll a Data for the North Inlet and Winyah Bay Estuaries, Georgetown, South Carolina: 2002-2004

8.6 Geospatial Data Presentation Form: comma and tab delimited text (spreadsheet) in yearly files

8.8 Publication Information:

8.8.1 Publication Place: Georgetown, South Carolina

8.8.2 Publisher: NERR Centralized Data Management Office

8.10 Online Linkage: <http://cdmo.baruch.sc.edu>

8.9 Other Citation Details: These data were collected under the auspices and protocols of the North Inlet-Winyah Bay NERR. The National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP) protocols took effect in 2002. This is the NERR/CDMO version of the database.

8.11 Larger Work Citation:

8. Citation Information:

8.1 Originator: National Oceanic and Atmospheric Administration (NOAA)

8.1 Originator: Office of Ocean and Coastal Resource Management (OCRM)

8.1 Originator: National Estuarine Research Reserve System (NERR)

8.2 Publication Date: 1995

8.4 Title: NERR System-Wide Monitoring Program (SWMP)

8.6 Geospatial Data Presentation Form: tab delimited text (spreadsheet)

8.8 Publication Information:

8.8.1 Publication Place: Georgetown, South Carolina

8.8.2 Publisher: NERR Centralized Data Management Office

8.10 Online Linkage: <http://nerrs.noaa.gov/Monitoring/> or <http://nerrs.noaa.gov/Monitoring/History.html>

1.15 Cross Reference:

8. Citation Information

8.1 Originator: Dr. Dennis Allen

8.1 Originator: Ginger Ogburn-Matthews

8.1 Originator: Paul Kenny

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: North Inlet – Winyah Bay National Estuarine Research Reserve (NIW NERR)

8.2 Publication Date: 20040930

8.4 Title: Long-Term Low Tide Monitoring Data for Fishes, Shrimps, & Crabs in Oyster Landing Creek, North Inlet Estuary, Georgetown, South Carolina: 1983-2003.

8.5 Edition: Second

8.6 Geospatial Data Presentation Form: comma delimited digital text data and Microsoft Excel spreadsheets. Documentation is in Microsoft Word and text formats.

8.8 Publication Information:

8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA

8.8.2 Publisher: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.9 Other Citation Details: The 1983 through June 1993 data were collected under the auspices and protocols of the Long-Term Ecological Research (LTER) Program. This database called, NIN10 - LTER Oyster Landing Biweekly Fish Sampling, was originally published on the LTER Program's website from 1993 to 1996. Data collected from June 1993 through 2003 was collected under the auspices of the North Inlet - Winyah Bay National Estuarine Research Reserve's monitoring program.

8.10 Online linkage: <http://links.baruch.sc.edu/data>

1.15 Cross Reference:

8. Citation Information

8.1 Originator: Dr. Dennis Allen

8.1 Originator: Virginia Ogburn-Matthews

8.1 Originator: Paul Kenny

8.1 Originator: Tracy Buck

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: North Inlet – Winyah Bay National Estuarine Research Reserve (NIW NERR)

8.2 Publication Date: unpublished material

8.4 Title: Long-Term High Tide Marsh Enclosure Data for Fishes, Shrimps, & Crabs in Oyster Landing Basin, North Inlet Estuary, Georgetown, South Carolina: 1994-2004.

8.6 Geospatial Data Presentation Form: comma delimited digital text data and Microsoft Excel spreadsheets. Documentation is in Microsoft Word and text formats.

1.15 Cross Reference:

8. Citation Information:

8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.1 Originator: Dr. Dennis Allen

8.1 Originator: Lynn Barker

8.1 Originator: Ginger Ogburn-Matthews

8.1 Originator: Paul Kenny

8.1 Originator: Tracy Buck

8.2 Publication Date: 2006

8.4 Title: Long-Term Motile Epibenthic Macrozooplankton Data for the North Inlet Estuary, Georgetown, South Carolina: 1981-2003

8.5 Edition: Second

8.6 Geospatial Data Presentation Form: comma delimited text and MS Excel spreadsheet

8.7 Series Information

8.7.1 Series Name: Baruch Institute's Epibenthic Macrozooplankton Long-Term Monitoring Database for the North Inlet Estuary, South Carolina.

8.7.2 Issue Identification: January 20, 1981 – December 22, 2003

8.8 Publication Information:

8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA

8.8.2 Publisher: Belle W. Baruch Institute for Marine and Coastal Sciences, University of South Carolina

8.9 Other Citation Details: Funded by the National Science Foundation's (NSF) Long Term Ecological Research (LTER) Program (LTER Data Set Code NIN008) and by the National Oceanic and Atmospheric Administration's (NOAA) National Estuarine Research Reserve (NERR) Program.

8.10 Online linkage: <http://links.baruch.sc.edu/data/>

2. Data Quality Information

2.1 Attribute Accuracy

2.1.1 Attribute Accuracy Report:

All sensors are maintained and calibrated to the manufacturers specifications. Information on the accuracy of these sensors was taken from the relevant Campbell Scientific Instruction manual or sensor manufacturer's (if not Campbell) instruction manual. These manuals are stored on site at the Baruch Marine Field Lab and maintained by the NIW NERR Weather Research Technician and stored on site at the Baruch Marine Field Lab along with each sensor's calibration documentation. Excerpts containing pertinent information have been archived in the NERRMET.2000-2004 Notebook. Wherever possible, PDF versions of each sensor's manual were archived on the NERRMET.2000-2004 CDs. Both CDs and Notebook are maintained by Baruch's Data Manager onsite at the Baruch Marine Field Lab.

Temperature and Relative Humidity

Model #: HMP45C; SN U2520001

Temperature Measurement Range: -40-+60°C

Temperature Accuracy: $\pm 0.2^{\circ}\text{C}$ at 20°C

Relative Humidity Measurement Range: 0-100% non-condensing

RH Accuracy at 20°C: $\pm 2\%$ RH (0-90%) and $\pm 3\%$ (90-100%)

Temperature Dependence of RH Measurement: $\pm 0.05\%$ RH/ $^{\circ}\text{C}$

Typical Long Term Stability of RH sensor: better than 1% RH per year

Uncertainty of calibration: $\pm 1.2\%$ RH

Dates in Use: 08/11/1999 - 5/17/2001, 09/18/2001 - 5/13/2003, 02/18/2004 - 07/12/2004, 08/06/2004 - 09/02/2004

Model #: HMP35C; SN R2620008

Operating Temperature: -35-+60°C

Temperature Measurement Range: -35-+60°C

Temperature Accuracy: $\pm 0.4^\circ\text{C}$ for all errors (worst case) at a range of -24°C to 48°C.

Relative Humidity Measurement Range: 0-100% non-condensing

RH Accuracy at 20°C: $\pm 2\%$ RH (0-90%) and $\pm 3\%$ (90-100%)

Temperature Dependence of RH Measurement: $\pm 0.04\%$ RH/°C

Typical Long Term Stability of RH sensor: better than 1% RH per year

Uncertainty of calibration: $\pm 1.2\%$ RH

Dates in Use: 07/1997- 08/11/1999, 05/17/2001- 09/18/2001, 5/13/2003 - 02/18/2004, 9/2/2004 - 12/31/2004

Barometric Pressure

Model # CS-105; SN W1530030

Operating Range: Pressure – 600-1060 mb

Temperature: -40-+60C

Humidity: non-condensing

Accuracy: $\pm 0.5\text{mb}$ @ 20°C

$\pm 2\text{ mb}$ between 0°C and +40°C

$\pm 4\text{ mb}$ between -20°C and +45°C

$\pm 6\text{ mb}$ between -40°C and +60°C

Stability: $\pm 0.1\text{ mb}$ per year

Dates in Use: 05/17/2001 - 5/13/2003

Model # CS-105; SN U1120009

Same specifications as above

Dates in Use: 08/11/1999 - 05/17/2001, 5/13/2003 - 12/31/2004

Wind Speed and Direction

Met One Wind Sensor, Model # 034A-L; SN X3121

Wind Speed:

Range: 0-49 m/s

Threshold: 0.4 m/s

Accuracy: $\pm 0.12\text{ m/s}$ for wind speeds less than 10.1 m/s

$\pm 1.1\%$ of reading for wind speeds greater than 10.1 m/s

Wind Direction:

Range: 0 to 360°, shorting to ground between 356° and 360°

Threshold: 0.4 m/s

Accuracy: $\pm 4^\circ$

Resolution: 0.5°

Dates in Use: 05/17/2001 - 5/13/2003

Wind Sentry, Model # 03001-5; SN 8702

Wind Speed:

Range: 0-50 m/s, gust survival at 60m/s

Threshold: 0.5 m/s

Accuracy: to within 2% if calibrated properly

Wind Direction:

Range: 360° mechanical, 355° electrical (5° open)

Threshold: 0.8 m/s at 10° displacement, 1.8 m/s at 5° displacement

Accuracy: $\pm 5^\circ$ or better if calibrated properly

Dates in Use: 07/1997 - 05/17/2001, 5/13/2003 - 12/31/2004

Rain Gauge

Tipping Bucket Rain Gauge, Model #: TE525; SN 27988-1200 (new March 2001)

Range: 0.1 mm

Accuracy: $\pm 1.0\%$ at up to 1 inch/hour
+0, -3% from 1 to 2 inches/hour
+0, -5% from 2 to 3 inches/hour

Dates in Use: 05/17/2001-12/31/2004

Tipping Bucket Rain Gauge, Model #: Sierra-Misco Environment Ltd. 2500; SN 1425C

Range: 0.1 mm

Accuracy: $\pm 1.0\%$ at 2 inches/hr

Dates in Use: 07/1997 - 05/17/2001 (retired)

Photosynthetically Active Radiation

LiCor Quantum Sensor, Model # LI190SZ; SN Q18206

Stability: $<\pm 2\%$ change over 1 yr

Operating Temperature: -40 to 65°C

Sensitivity: typically 5 microAmpere (uA) per 1000 micromoles $s^{-1} m^{-2}$

Linearity: Maximum deviation of 1% up to 10,000 micromoles $s^{-1} m^{-2}$.

Temperature Dependence: $\pm 0.15\%$ per °C maximum

Light spectrum wavelength: 400 to 700 nanometers

Dates in Use: 06/26/2001 - 6/19/2003

LiCor Quantum Sensor, Model # LI190SB; SN Q26604

Same specifications as above

Dates in Use: 07/1997 - 04/1999, 04/1999 - 04/19/2000, 03/2001 - 06/26/2001, 6/19/2003 - 12/31/2004

Solar Radiation

Eppley Black and White Pyranometer, Model # 8-48; SN 28070

Range: measures wavelengths between 280 and 2800 nm, does not subtract reflection from the ground

Resistance: 353 ohms at 23°C

Temperature Compensation Range: -20 to +40°C

Sensitivity: 10.35×10^{-6} volts/watts meter⁻²
7.22 millivolts/cal cm⁻² min⁻¹

Linearity: $\pm 1\%$ from 0 to 1400 watts meter⁻² (or 2.008 Langleys/min)

Calibration: to within $\pm 1\%$

Range: 0-2

Dates in Use: 05/17/2001 - 5/13/2003

Eppley Black and White Pyranometer, Model # 8-48; SN 28078

Same specifications as above

Dates in Use: 8/11/1999 - 5/17/2001, 5/13/03 - 12/31/2004

2.1.2 Quantitative Attribute Accuracy Assessment

2.1.2.1 Attribute Accuracy Value

<u>Parameter</u>	<u>Column Heading</u>	<u>Number of Decimal Places</u>
Air Temperature	AirTemp	1
Max and Min Air Temperature	Max AT, Min AT	1
Relative Humidity	RelHumid	0
Max and Min Relative Humidity	Max RH, Min RH	0
Barometric Pressure	BarPress	0
Max and Min Barometric Pressure	Max BP, Min BP	0
Wind Speed	WindSpd	1
Wind Direction	WindDir	0
Standard Deviation of Wind Direction	StandDev	0
Max and Min Wind Speed	Max WS, Min WS	1

Total Precipitation	TotPrecp	1
Total Photosynthetically Active Radiation	TotPAR	1
Average Voltage	AvgVolt	1
Solar Radiation (01/01/00 – 10/21/03)	SolRad	3
Total Solar Radiation (10/21/03 – 12/31/04)	TotSolRad	1

2.1.2.2 Attribute Accuracy Explanation

Reporting accuracy was determined by the NERR CDMO and Baruch's Data Managers in an attempt to best reflect the observed and documented accuracy, resolution, and range of measurement information available for each sensor. The number of decimal places published in the final database is meant to best represent the precision and accuracy of the data. Raw data are archived on CD and Baruch's Server as part of the complete NERRMET database archival, but are not recommended for use. Please contact the NIW NERR Weather Technician or Baruch's Data Manager (contact info at the end of this document) for more information on reporting accuracy or to obtain these data in their raw format.

Date: The date values are integers and have no decimal places assigned to them, they are accurate to the whole number.

Julian Day: The Julian Day values are integers and have no decimal places assigned to them, they are accurate to the whole number.

Time: The time values are integers and have no decimal places assigned to them. Time is generally considered to be accurate to within 5 minutes.

Air Temperature (all parameters): Based on the accuracy of both sensors used ($\pm 0.2^{\circ}\text{C}$ and $\pm 0.4^{\circ}\text{C}$), it was determined that a number in the hundredths place would not be appropriate. Values were rounded to the nearest 10^{th} (1 decimal place).

Relative Humidity (all parameters): Based on the accuracy of both sensors used ($\pm 3\%$ RH at 90-100% RH) and the uncertainty of calibration ($\pm 1.2\%$ RH), it was determined that a number in the tenths place would not be appropriate. Values were rounded to the nearest whole number.

Barometric Pressure (all parameters): Based on the accuracy of the sensor ($\pm 2\text{mb}$ between 0°C and 40°C , higher at more extreme temperatures), it was determined that a number in the tenths place would not be appropriate. Values were rounded to the nearest whole number.

Wind Speed (all parameters): Based on the thresholds (0.4 and 0.5 m/s) and accuracies ($\pm 2\%$ and $\pm 1.1\%$ of readings) of the sensors used, it was determined that a number in the hundredths place would not be appropriate. Values were rounded to the nearest 10^{th} (1 decimal place).

Wind Direction: Based on the accuracies ($\pm 5^{\circ}$ and $\pm 4^{\circ}$) of the sensors used, it was determined that a number in the tenths place would not be appropriate. Values were rounded to the nearest whole number.

Rain: Based on the accuracies ($\pm 1.0\%$ at 2inches/hr and $\pm 1.0\%$ at up to 1 inch/hr) and the minimum amount of rain recorded by the sensor (0.25mm), it was determined that a number in the hundredths place would not be appropriate. Values were rounded to the nearest 10^{th} (1 decimal place).

Total Photosynthetically Active Radiation (PAR): Based on the uncertainty of calibration (to within 5% of full range) and the range of measurement (0-2000) of the LiCor Quantum Sensor, an error of 100 millimoles/ M^2 is possible in the calibration process. An expert in the field of solar radiation (Jim Morris, Univ. of South Carolina) recommended that reporting values with one decimal place would be more than sufficient for research use. Values were rounded to the nearest 10^{th} (1 decimal place).

Voltage: voltage is reported as a tool to gauge battery power to the weather station only. It is reported in volts with one decimal place.

Solar Radiation (Instantaneous): Based on the uncertainty of calibration (to within $\pm 1\%$), the linearity ($\pm 1\%$ from 0 to 2.008 Langleys/min), and the range of measurement (0-2) of the Eppley Pyranometer, it was determined that a number in the thousandths place could still be valuable. An expert in the field of solar radiation (Jim Morris, Univ. of South Carolina), recommended that three decimal places be maintained in the final data set. Values were rounded to the nearest 1000^{th} (3 decimal places).

Total Solar Radiation: Based on the uncertainty of calibration (to within $\pm 1\%$) and the linearity ($\pm 1\%$ from 0 to 2.008 Langleys/min) of the Eppley Pyranometer, as well as the range of measurement for a 15-minute versus 24-hour period (measurements range from 0 to 8,000+), it was determined that retaining 1 decimal place was most appropriate for the final dataset. This reporting accuracy was recommended/approved by Robert W. Scarborough, SWMP Oversight Committee Chair and Delaware NERR Research Coordinator. The National Climatic Data Center reports hourly totals for solar radiation in Langleys with one decimal place as well. (Some users may be interested in retaining 2 decimal places for the 15-minute data – these data are available through the NIW NERR Weather Technician or Baruch's Data Manager)

2.2 Logical Consistency Report: not applicable

2.3 Completeness Report:

The NIW NERR Weather Technician, CDMO Weather Data Analyst, and 2006 Data Rescue Manager verified the data files. Specific data availability information may be found in the “NERRMET.MissingAnomalous.2000-2004” document, a separate file archived along with this Metadata document, as part of the final dataset documentation. The “NERRMET.MissingAnomalous.2000-2004” document identifies data that are missing from the dataset, erroneous data that were deleted by the NIW NERR Weather Technician or 2006 Data Rescue Manager, and data that were designated as questionable or anomalous. This documentation pertains only to Baruch’s final published dataset, and may differ from NIW NERR/CDMO versions of the database. All occurrences of missing or deleted data were marked with a period (.) in the final dataset. Data that have been removed or edited in the final dataset are still present in unedited and/or raw data files. The “NERRMET.MissingAnomalous.2000-2004” document is archived along with the final data, graphics, and documentation on CD and Baruch’s Server. It is also published online at <http://links.baruch.sc.edu/data/> and in the NERRMET 2000-2004 Project Notebook located onsite at the Baruch Marine Lab. Excerpts from the Missing/Anomalous Document containing important general information are included below:

All Parameters

Users should be aware that data values may not have been collected over the entire relevant time period or be based on all the expected 5-second data. Problems with the weather station data collection, maintenance, or power outages may result in missing data; but, for example, an hourly average isn’t necessarily deleted from the database simply because a few 5-second data are missing. Also, precipitation, PAR (LiCor), and later Solar Radiation parameters are total values (rather than averages) and are often left in the dataset despite not being based on the entire relevant time period (totals may be incomplete). If a “significant” portion of the data comprising a time interval was missing, protocol called for the time interval’s calculated value to be deleted as well. In general, decisions to leave data in the dataset were made at the NERR Technician’s discretion; the 2006 Data Rescue Manager did not attempt to determine the validity of these values, as the NERR Technician had a much better grasp of the situation at the time that the decision was made. It is the user’s responsibility to examine the missing, deleted, and anomalous data reports to ensure that average and total data were collected/calculated to their standards.

Relative Humidity

For relative humidity data from 01/01/2000 through 05/15/2003, all measured values greater than 100% were altered by the CR10X datalogger program to read 100% in the raw data. Readings greater than 100% could indicate a sensor malfunction, calibration problems that should be addressed, normal measurement error, or super saturated air. Because these values were manipulated in the raw data, it was impossible for the NERR Tech or Data Managers to determine whether they were valid data points. On 4/17/2002, Baruch’s data managers met with representatives from the Southeastern Regional Climate Center of the South Carolina DNR, representatives from the CDMO, and two NERR technicians to discuss this and other matters. As a result of this meeting, a formal recommendation was made to the CDMO to cease the manipulation of these values at the data collection level (raw data) and to instead handle the matter at the data management editing level where informed decisions can be made and documented. The CDMO and the Data Management Committee reviewed the recommendation, agreed with it, and began implementing it in May of 2003.

In addition, the sensor that was in use from 08/11/1999 through 05/16/01 seemed to have slightly lower readings than would be expected, and they should be considered questionable as a result. When it was installed, there was a marked difference in the readings from the previous sensor. Maximum readings were around 97 or 98% as opposed to 100%, which was standard for the previous sensor and the climate in this area. When the sensor was replaced on 05/16/01, the readings returned to the previous and expected range.

Wind Speed

From 01/01/2000 through 05/16/2001, the wind speed sensor offset number (0.2) for the sensor in use (03001-5 Wind Sentry) showed up as a reading whenever there was no wind, and potentially, when the sensor was malfunctioning. There are no reported zero wind speed readings for this time period; the lowest reported value is 0.2. The offset number is the threshold from which the sensor can first recognize wind and, when it appears erroneously (through CR10X programming or sensor error) in the data, it represents a zero. Values of 0.2 in the data should be treated with caution as they may actually result from a measurement taken when there was either no wind or too little for the sensor to measure. The NIW NERR and 2006 Data Rescue Manager did not find any specific instances during this time where the offset value was

present as a reading when the sensor was malfunctioning. The sensor measured in increments of 0.15, and only one decimal place was retained, so after the offset number, readings appear in the data as 0.3 (0.30), 0.5 (0.45), 0.6 (0.60), 0.8 (0.75), 0.9 (0.90).

Starting on 05/17/2001, when the new Met One sensor was installed, the CR10X datalogger program was altered to record a wind speed of zero (instead of the offset number) if there was no wind. However, since the lowest recorded reading is the offset number, and this number was changed to zero by the datalogger program, the next lowest reading that is present in the data is equal to the offset number (0.2811) plus 0.16, the increment that the sensor measures in. Therefore, the measurements begin at zero, jump to 0.4 (0.44), and then continue on as 0.6 (0.60), 0.8 (0.76), 0.9 (0.92), etc. If the sensor changes and the offset number and/or increment of measurement change, the recorded measurements would change accordingly.

On 10/21/2003 the datalogger program for wind speed changed yet again. Beginning on 10/21/2003 and through 12/31/2004, zero wind speed readings were no longer recorded. The 03001-5 Wind Sentry sensor was in use and the offset number (0.2) was once again recorded when there was no wind or when the wind speed was less than the sensor's threshold. Values of 0.2 in the data should be treated with caution (see above). It is unclear what the increment of measurement was for this period, but with one decimal place retained, readings progress normally.

Wind Direction

Wind directions were recorded whether or not there was a measurable wind speed. As mentioned above, from 01/01/2000 – 03/16/2001 and from 10/21/2003 – 12/31/2004, there were no zero wind speed readings and the wind speed offset number was reported as a reading instead. Users should be cautious of both 15-minute instantaneous wind direction readings taken when the wind speed was recorded as zero and when the offset number was recorded as a wind speed. These may not be true direction readings as there was no measurable wind speed at the time. Average wind directions may also include direction readings taken when there was no measurable wind speed.

PAR (LiCor)

The LiCor PAR sensor has been in use throughout the NIW NERR MET data sets, which began in 1997. However, PAR data were not reported in the final dataset until 06/26/2001 as a result of various problems with the data. For documentation on earlier PAR data, please see the NERR MET 1997-1999 database documentation. For the purposes of this database, an explanation of PAR data problems is as follows.

On 04/19/2000 a new LiCor sensor was installed in a new location on the weather station. The sensor was moved, from a location next to the tipping bucket rain gauge to the top of the storage box on the pier, because it was possible that it was being shaded for a portion of the day (per conversation with Baruch Data Manager, Ginger Ogburn-Matthews, no written documentation). After this move, there was a large increase in the PAR recorded. Because of this large discrepancy in the readings, it was determined that the sensor probably was being shaded, that the effect on the readings was both evident and substantial, and that there was no way to rescue the data. The readings during this time period were also extremely erratic and often out of the expected range for a 15-minute total. There appeared to be changes made to the program, in an attempt to correct these readings, which affected the data and were not documented. In addition, the old sensor had a cracked/corroded cable that may have been causing problems. As a result, these data were designated as completely unreliable and all PAR data were deleted from 01/01/2000 to 04/19/2000. (It should be noted that the sensor location was changed yet again on 12/14/2000. It was moved off of the top of the storage cabinet (on the platform) to the southeast corner piling of the floating dock (off of the platform)).

Unfortunately, the multiplier (specific to sensor/calibration) was never changed in the CR10X datalogger program when the new sensor was installed on 04/19/2000. There was a multiplier change and sensor test on 4/24/2000 (noted in the NERR Tech's "Other remarks" section of the NERR metadata), but it appears that it was still incorrect and the change was not specified or documented in the CR10X program. The sensor was recalibrated in March of 2001 (no documentation for exact date), but again the multiplier wasn't corrected. The error was discovered and the multiplier was finally corrected for the sensor in use on 04/03/2002. The NERR Data Technician was able to go back and correct data beginning on 06/26/2001 (through 04/03/2002) for the multiplier that should have been used at that time. Data recorded prior to June 26 couldn't be corrected because of incomplete documentation. While the incorrect multiplier may have accounted for some of the large discrepancy noticed after the sensor location was moved, it is unlikely that all of the issues described above were a result; pre-4/19/2000 data are still believed to be unreliable.

In addition, for PAR data from 01/01/2000 through 10/21/2003 all measured values less than zero were altered by the CR10X datalogger program to read zero in the raw data. Values less than zero could indicate a sensor malfunction,

calibration problems that should be addressed, normal measurement error, or an incorrect multiplier. Because these values were manipulated in the raw data, it was impossible for the NERR Tech or Data Managers to determine whether they were valid data points. On 04/17/2002, Baruch's data managers met with representatives from the Southeastern Regional Climate Center of the South Carolina DNR, representatives from the CDMO, and two NERR technicians to discuss this and other matters. As a result of this meeting, a formal recommendation was made to the CDMO to cease the manipulation of these values at the data collection level (raw data) and to instead handle the matter at the data management editing level where informed decisions can be made and documented. The CDMO and the Data Management Committee reviewed the recommendation, agreed with it, and began implementing it in October of 2003.

Finally, users should be aware that because this is a total parameter, small negative values recorded in the 5-second data that are within the expected error range of the sensor are summed to attain 15-minute, hourly, and 24-hour totals. 15-minute and hourly totals may show larger than expected negative values as a result.

Solar Radiation (Eppley)

From 01/01/2000 through 10/21/2003, solar radiation data are available as 15-minute instantaneous readings reported in Langley's/minute. These data were not reported in the NIW NERR/CDMO version of the dataset. The 2006 Data Rescue Manager merged the archived NIW NERR solar radiation data with the rest of the dataset for the purposes of this data publication. Beginning on 10/21/2003, this parameter was changed to Total Solar Radiation and included in the NIW NERR/CDMO version of the dataset.

Total Solar Radiation (Eppley)

Total Solar Radiation, reported in Langley's, was reported for 15-minute, hourly, and 24-hour time intervals beginning on 10/21/2003. Users should be aware that because this is a total parameter, small negative values recorded in the 5-second data that are within the expected error range of the sensor are summed to attain 15-minute, hourly, and 24-hour totals. 15-minute and hourly totals may show larger than expected negative values as a result.

2.5.1 Methodology

2.5.1.1 Methodology Type: Field Collection Procedures and Protocols

2.5.1.3 Methodology Description: Meteorological Data Field Collection Protocol

The Oyster Landing weather station is located at the end of an 800-foot pier ending in Crab Haul Creek. Sensors are located on and around a 3.5 meter high weather tower and wired to a Campbell Scientific CR10X datalogger according to CDMO and manufacturer's protocols. The CR10X controls the sensors via a datalogger program supplied by the CDMO and samples every 5-seconds throughout the year. Data collection schedules over the course of this database are as follows:

Data Collection Schedules:

December 01, 2000 – October 21, 2003:

15-minute Data (arrays 150, 151, 112):

- Instantaneous Readings: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction, Solar Radiation
- Totals: Precipitation, PAR

Hourly Data (arrays 101, 102, 103, 104, 105):

- Averages from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction
- Totals: Precipitation, PAR

24-Hour Data (arrays 241, 242, 243, 244, 245, 246):

- Averages from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction
- Maximum, Minimum, and their times from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed
- Wind Direction Standard Deviation from 5-second data
- Totals: Precipitation, PAR

October 21, 2003 – 12/31/2004:

15-minute Data (array 15):

- Averages from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction, Battery Voltage
- Maximum, Minimum, and their times from 5-second data: Air Temperature, Relative Humidity, Barometric

Pressure, Wind Speed

- Wind Direction Standard Deviation from 5-second data
- Totals: Precipitation, Solar Radiation, PAR

Hourly Data (array 60):

- Averages from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction, Battery Voltage
- Maximum, Minimum, and their times from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed
- Wind Direction Standard Deviation from 5-second data
- Totals: Precipitation, Solar Radiation, PAR

24-Hour Data (array 144):

- Averages from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed, Wind Direction, Battery Voltage
- Maximum, Minimum, and their times from 5-second data: Air Temperature, Relative Humidity, Barometric Pressure, Wind Speed
- Wind Direction Standard Deviation from 5-second data
- Totals: Precipitation, Solar Radiation, PAR

The CR10X datalogger converts 5-second data into the appropriate output (15-minute instantaneous reading or average, hourly average, maximum, etc.). 5-second data are retained until available memory on the CR10X is full and then overwritten (ring-memory) and discarded. PC208W software, located on the NERR Weather Computer in the System Wide Monitoring Lab at the NIW NERR Building, interfaces with the CR10X to upload data via short haul modem approximately every 15 minutes. This data is archived in monthly raw comma delimited (.DAT) data files on the NERR Weather Computer and the BMFL Server.

Both the sensors comprising the weather station and the datalogger program controlling them have changed multiple times over the course of the database. Sensors are changed out for recalibration or repair and sensor-specific multipliers are changed within the datalogger program as a result. The sensors and their dates of use are detailed in the Data Quality/Accuracy section of this metadata document. Calibration information, multipliers, and offset values are carefully documented by the NERR Weather Technician and documentation is maintained onsite at the NIW NERR Building. Data collection protocol changes have also resulted in program and data reporting changes. The Supplemental Information portion of this metadata document and the Missing and Anomalous Data Document (separate file) detail any changes that may have affected the dataset.

2.5.1.4 Methodology Citation:

8. Citation Information

8.1 Originator: National Estuarine Research Reserve System, Centralized Data Management Office

8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research

8.1 Originator: Tamara D. Small

8.1 Originator: Ashly D. Norman

8.1 Originator: Danna D. Swain

8.1 Originator: Jesse Friedmann

8.1 Originator: Dwayne E. Porter

8.2 Publication Date: 200312

8.4 Title: CDMO Operations Manual, Version 5.0

8.6 Geospatial Data Presentation Form: Published Manual

8.8 Publication Information

8.8.1 Publication Place: Belle W. Baruch Marine Laboratory, Georgetown, SC

8.8.2 Publisher: National Estuarine Research Reserve System, Centralized Data Management Office

2.5.1.4 Methodology Citation:

8. Citation Information

8.1 Originator: National Estuarine Research Reserve System, Centralized Data Management Office

8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research

8.1 Originator: V. Ogburn-Matthews

8.1 Originator: M.E. Crane

8.1 Originator: W. Jefferson

8.1 Originator: T.D. Small

8.1 Originator: D. Porter
8.2 Publication Date: 20000207
8.4 Title: CDMO Operations Manual, Version 4.0
8.6 Geospatial Data Presentation Form: Published Manual
8.8 Publication Information
8.8.1 Publication Place: Belle W. Baruch Marine Laboratory, Georgetown, SC
8.8.2 Publisher: National Estuarine Research Reserve System, Centralized Data Management Office

2.5.1.4 Methodology Citation:

8. Citation Information
8.1 Originator: Campbell Scientific Corporation
8.2 Publication Date: Unknown
8.4 Title: Sensor operation manuals
8.6 Geospatial Data Presentation Form: Manual
8.8 Publication Information
8.8.1 Publication Place: Logan, UT
8.8.2 Publisher: Campbell Scientific Corporation

2.5.1.4 Methodology Citation:

8. Citation Information
8.1 Originator: W.E. Thompson
8.1 Originator: S. Ross
8.2 Publication Date: 19970115
8.4 Title: North Carolina National Estuarine Research Reserve Meteorological Monitoring Program – Standard Operating Procedure for Collection of Data and Maintenance of Equipment
8.6 Geospatial Data Presentation Form: Published Manual
8.8 Publication Information
8.8.1 Publication Place: Wilmington, NC
8.8.2 Publisher: North Carolina NERR

2.5.1.4 Methodology Citation:

8. Citation Information
8.1 Originator: National Weather Service
8.2 Publication Date: 19960700
8.4 Title: Automated Surface Observing System Manual
8.6 Geospatial Data Presentation Form: Manual

2.5.1.4 Methodology Citation:

8. Citation Information
8.1 Originator: Environmental Protection Agency
8.2 Publication Date: 1995
8.4 Title: EPA Quality Assurance Handbook for Air Pollution Measurements Systems
8.6 Geospatial Data Presentation Form: Manual
8.9 Other Citation Details: Volume IV: Meteorological Measurements

2.5.1.4 Methodology Citation:

8. Citation Information
8.1 Originator: LTER Climate Committee
8.2 Publication Date: 19860600
8.4 Title: Standardized Meteorological Measurements for LTER Sites
8.6 Geospatial Data Presentation Form: Published Manuscript

2.5.1.4 Methodology Citation:

8. Citation Information
8.1 Originator: The American Association of State Climatologists
8.2 Publication Date: 19851000
8.4 Title: Heights and Exposure Standards for Sensors on Automated Weather Stations
8.6 Geospatial Data Presentation Form: Published Manuscript

8.8 Publication Information

8.8.1 Publication Place: The State Climatologist, Publication of the American Association of State Climatologists

8.8.2 Publisher: The American Association of State Climatologists

2.5.3.1 Process Description:

Monthly raw data files were QA/QC'd through the Weather Data Management Program (WDMP) (01/01/2000 – 10/21/2003) or GemTeck's environmental database application, EQWin Data Manager (10/21/2003 – 12/31/2004). The WDMP was developed in Visual Basic to interface with the NERRS data collection schedule. It automatically input and converted the monthly raw data files into an Access database. Then the WDMP checked the data against a predetermined set of error criteria (detailed below) and produced error and summary reports. Any anomalous or erroneous data flagged by the WDMP were then investigated by the NERR Technician and the determination (reasonable/suspect) or action taken (correction/deletion) was documented. 11111, 55555, and 99999 codes were used to designate (as placeholders) missing, erroneous, and deleted data.

Error/Anomalous Data Criteria 01/01/2000 – 10/21/2003:

Air Temp:

- 15 min sample not greater than *max* for the day
- 15 min sample not less than the *min* for the day
- 15 min sample not greater than 3.0 (C) from the previous 15 minutes
- Maximum and minimum values recorded for the day
- 1 hour average not greater than 10% above the greatest 15 min sample recorded in the hour

Relative Humidity:

- Not changed by more than 25% from the previous 15 minutes
- Maximum and minimum values recorded for the day
- 1-hour average not greater than 10% above the greatest 15 min sample recorded in the hour

Precipitation:

- Precipitation not greater than 5 mm in 15 min
- No precipitation for the month

Wind Speed:

- Wind speed greater than 30 m/s
- Wind speed less than 0.5 m/s

Wind Direction:

- Wind direction not greater than 360 degrees
- Wind direction not less than 0

Pressure:

- Pressure greater than 1040 mb or less than 980 mb
- Pressure changes greater than 5 mb per hour
- Maximum and minimum values recorded for the day
- 1-hour average not greater than 10% above the greatest 15 min sample recorded in the hour

Time:

- 15-minute interval
- 60-minute interval
- 1440-minute interval

Date:

- Year
- Julian Date

For all data:

- Duplicate interval data

Beginning October 21, 2003, comma-delimited monthly files were opened in Microsoft Excel and pre-processed using the EQWin format Macro provided by the CDMO. This Macro reformats header columns, inserts stations codes and a date column, corrects the time column format, and formats the data to the appropriate number of decimal places. The pre-processed file is then ready to be copied into the EQWin weather.eqi file where the data are QA/QC'd (criteria detailed below) and archived. EQWin queries, reports and graphs are used to discover dataset outliers and large changes in the data.

EQWin is also used to generate statistics, view graphs; create customized queries and reports; cross query the water, weather, and nutrient data; and finally export the data to the CDMO.

Error/Anomalous Data Criteria 10/21/2003 – 12/31/2004:

Air Temp:

- 15 min sample not greater than *max* for the day
- 15 min sample not less than the *min* for the day
- 15 min sample not greater than 3.0 (°C) from the previous 15 minutes
- Maximum and minimum values recorded for the day
- 1 hour average not greater than 10% above the greatest 15 min sample recorded in the hour

Relative Humidity:

- Not changed by more than 25% from the previous 15 minutes
- Maximum and minimum values recorded for the day
- 1-hour average not greater than 10% above the greatest 15 min sample recorded in the hour

Rainfall:

- Precipitation not greater than 5 mm in 15 min
- No precipitation for the month

Wind Speed:

- Wind speed greater than 65 m/s
- Wind speed less than .5 m/s

Wind Direction:

- Wind direction not greater than 360 degrees
- Wind direction not less than 0 degrees

Pressure:

- Pressure greater than 1040 mb or less than 980 mb
- Pressure changes greater than 5 mb per hour
- Maximum and minimum values recorded for the day
- 1-hour average not greater than 10% above the greatest 15 min sample recorded in the hour

Time:

- 15-minute interval
- 60-minute interval
- 1440-minute interval

Date:

- Year
- Julian Date

For all data:

- Duplicate interval data

In order to maintain the continuity of the database after the new data collection procedures instituted on October 21, 2003, all weather data collected with earlier versions of the CR10X program (12 array output) were reformatted by the CDMO for compatibility (new 3 array output). As part of this process, all 11111, 55555, and 99999 coded placeholders were deleted from the spreadsheets and the cells were left blank. Data for years 2000 through 2003 were then run through the EQWin program. The 2000 data were not run through EQWin or made available online through the CDMO website.

2006 Data Rescue Process Description

The 2006 Data Rescue Manager obtained all posted final data and metadata files from the CDMO and the NIW NERR Weather Technician, and all raw and process data files from the NIW NERR Technician. Yearly data files were imported into Microsoft Excel (from tab delimited text files). Each yearly file was sorted by array number and separate worksheets were created within a yearly workbook for 15-minute, hourly, and 24-Hour data. Missing data denoted by an empty cell in the spreadsheet were marked with a period "." as placeholder. All 55555, 11111, and 99999 codes that were mistakenly left in the dataset were removed and replaced with missing data markers. For data prior to 10/21/2003, an additional column for solar radiation (Eppley) was added to the database, and 15-minute Eppley data obtained from the NIW NERR Technician were inserted. For data beginning on 10/21/2003, the 2006 Data Rescue Manager determined that date/time rows did not appear throughout the database whenever the CR10X was powered off. All of these instances were found and rows inserted with missing data markers for the missing data, so that the database would be complete.

There were numerous incidences throughout the database, where missing 15-minute data for a “total” parameter (LiCor, Precip) resulted in zero values recorded in the hourly and 24-hour data (the program was totaling nothing to reach a value). These zero values were found and replaced with missing data markers. During a portion of the database (11/2002 – 10/21/2003) only rain events were recorded (nothing was entered when there was no rain) so a period with no rainfall was indistinguishable from missing data (both were represented by a blank cell in the spreadsheet). The 2006 Data Rescue Manager filled in zeros for date/times with no documented missing precipitation data to complete the dataset.

All data were QA/QC’d again by the 2006 Data Rescue Manager and verified using all forms of data documentation from the NIW NERR Technician and the CDMO. In addition, graphics were created using hourly data and used to QA/QC the data for visible trends that might indicate sensor malfunctions or other problems with the data. Missing, anomalous, and erroneous data documentation; changes made to the data; and relevant additional notations detailed in the CDMO metadata were combined with additional documentation made by the 2006 Data Rescue Manager and consolidated into one cohesive document. All changes made to the NIW NERR CDMO version of the data by the 2006 Data Rescue Manager are detailed in this document. It was titled “NERRMET.MissingAnomalous.2000-2004”, and the file was archived in .doc and .txt versions along with the rest of the final database.

For 2000-2002, columns were added to the spreadsheets, and filled with missing data markers, to account for all parameters present after the October 21, 2003 data collection schedule change. Column headings were revised and standardized, and each column was formatted for consistency and accuracy throughout the database.

All final data and documentation files (including this document) were archived in the NERRMET.2000-2004.FINAL Directory on CD, Baruch’s Server, and Baruch’s website as part of the final, published database. Hardcopies of both the metadata documents and final spreadsheets were printed for archival in the NERRMET 2000-2004 Notebook, which is maintained by Baruch’s Data Manager onsite at the Field Lab. All raw and process data and documentation files were archived in the NERRMET.2000-2004 Raw and Process Directories on CD and Baruch’s Server.

2.5.2.3 Process Date: 20060331

3 Spatial Data Organization Information:

3.1 Indirect Spatial Reference:

North Inlet Estuary, which is part of Hobcaw Barony, is located in Georgetown County, South Carolina, USA.

3.2 Direct Spatial Reference Method: Point

5. Entity and Attribute Information:

5.2 Overview Description:

5.2.1 Entity and Attribute Overview:

Date = the month day and year that the reading was taken.

Julian Day = day from the Julian calendar (1-365 or 366) that the reading was taken.

Time = the Eastern Standard Time that the reading was taken.

AirTemp = the average (15-minute data are instantaneous readings 01/01/2000 – 10/21/2003) air temperature from 5-second instantaneous readings sent to the datalogger from the temperature and humidity sensor, for the designated time interval.

RelHumid = the average (15-minute data are instantaneous readings 01/01/2000 – 10/21/2003) relative humidity from 5-second instantaneous readings sent to the datalogger from the temperature and humidity sensor, for the designated time interval.

BarPress = the average (15-minute data are instantaneous readings 01/01/2000 – 10/21/2003) barometric pressure from 5-second instantaneous readings sent to the datalogger from the pressure sensor, for the designated time interval.

WindSpd = the average (15-minute data are instantaneous readings 01/01/2000 – 10/21/2003) wind speed from 5-second instantaneous readings sent to the datalogger from the wind sensor, for the designated time interval.

WindDir = the (15-minute data are instantaneous readings 01/01/2000 – 10/21/2003) wind direction from 5-second instantaneous readings sent to the datalogger from the wind sensor, for the designated time interval.

StandDev WD = the standard deviation of the 5-second wind direction readings sent to the datalogger from the temperature and humidity sensor, for the designated time interval.

TotPrecp = the total precipitation recorded by the tipping bucket rain gauge for the designated time interval.

TotPAR = the total photosynthetically active radiation recorded by the LiCor Quantum Sensor for the designated time interval.

AvgVolt = the average battery voltage from 5-second instantaneous readings recorded by the datalogger for the designated time interval.

SolRad = the instantaneous solar radiation (wavelengths between 280 and 2800 nm) reading recorded by the Eppley pyranometer at 15 minute intervals (01/01/2000 – 10/21/2003). Note: the sensor does NOT subtract reflection from the ground.

TotSolRad = the total solar radiation (wavelengths between 280 and 2800 nm) recorded by the Eppley black and white pyranometer for the designated interval. Note: the sensor does NOT subtract reflection from the ground.

Max XX: the maximum 5-second instantaneous reading recorded by the datalogger over the designated time interval, for the designated parameter (where XX: AirTemp = AT, RelHumid = RH, BarPress = BP, or WindSpd = WS).

Min XX: the minimum 5-second instantaneous reading recorded by the datalogger over the designated time interval, for the designated parameter (where XX: AirTemp = AT, RelHumid = RH, BarPress = BP, or WindSpd = WS).

Max XX Time: the time that the maximum 5-second instantaneous reading was recorded by the datalogger over the designated time interval, for the designated parameter (where XX: AirTemp = AT, RelHumid = RH, BarPress = BP, or WindSpd = WS).

Min XX Time: the time that the maximum 5-second instantaneous reading was recorded by the datalogger over the designated time interval, for the designated parameter (where XX: AirTemp = AT, RelHumid = RH, BarPress = BP, or WindSpd = WS).

The following table describes the variable names, value type and size (in total number of digits.number of decimal places format), and the value measurement range (maximum and minimum recorded values, may include anomalous data) with its unit of measurement.

<u>Variable</u>	<u>Type and Total Size of Value.Number of Decimal Places</u>	<u>Range of Measurement and Units</u>
Date (mm/dd/yyyy)	Integer	1-12, 1-31, 2000-2004
J Day	Integer	1-366
Time (hh:mm)	Integer	00:15 – 24:00
AirTemp, Max AT, Min AT	Real 4.1	-8.9 – 35.6 degrees Celsius
RelHumid, Max RH, Min RH	Real 3.0	12 – 103 percent saturation
BarPress, Max BP, Min BP	Real 4.0	994 – 1046 millibars
WindSpd, Max WS, Min WS	Real	0.0 – 31.7 meters/second
WindDir	Real 3.0	0 – 360 degrees
StandDev WD	Real 3.0	10 – 102
TotPrp	Real 5.1	0.0 – 155.2 millimeters
TotPAR	Real 7.1	-1.9 – 59220.7
AvgVolt	Real 4.1	6.0 – 13.8
SolRad	Real 5.3	-0.005 – 1.890
TotSolRad	Real 6.1	-1.4 – 8036.1
Max XX Time (all parameters, hhmm)	Integer	0000 – 2359
Min XX Time (all parameters, hhmm)	Integer	0000 – 2359

5.2.2 Entity and Attribute Detail Citation:

Definitions were developed by the NERRS CDMO and Baruch Institute's researchers, data managers, and technicians; no published standards for entity definitions were used to define the entities used in this dataset. However, some of the entity type definitions are standard for the field of climatology and meteorology.

6. Distribution Information

6.1 Distributor:

10.2 Contact Organization Primary

10.1.2 Contact Organization:

10.1.1 Contact Person:

10.3 Contact Position:

Univ. of South Carolina's Baruch Institute
Ginger Ogburn-Matthews
Research Data Manager & Analyst

10.4 Contact Address

10.4.1 Address Type:	Mailing Address
10.4.2 Address:	USC Baruch Marine Field Lab
10.4.2 Address:	PO Box 1630
10.4.3 City:	Georgetown
10.4.4 State or Province:	South Carolina
10.4.5 Postal Code:	29442
10.4.6 Country:	USA
10.5 Contact Voice Telephone:	(843) 546-6219 extension 225
10.7 Contact Facsimile Telephone:	(843) 546-1632
10.8 Contact Electronic Mail Address:	ginger@belle.baruch.sc.edu
10.9 Hours of Service:	8:30 am to 4:30 pm EST/EDT Mon.- Friday

6.2 Resource Description:

Dataset Identification names:

NERRMET00-04
NERR Meteorological Database
NERR Weather Database
NIW NERR Weather
NIW NERR Meteorological Database

Final Rescued and Archived Database Directory and File Names

NERRMET.2000-2004.FINAL (Directory Size: 118 MB, 11 folders, 74 files)

FINAL.DATA (Directory Size: 84.4 MB, 5 files)

NERRMET.2000.FINAL.xls
NERRMET.2001.FINAL.xls
NERRMET.2002.FINAL.xls
NERRMET.2003.FINAL.xls
NERRMET.2004.FINAL.xls

CSV Versions (Directory Size: 22.3 MB, 15 files)

NERRMET.2000.15-Minute.FINAL.csv
NERRMET.2000.Hourly.FINAL.csv
NERRMET.2000.24-Hour.FINAL.csv

NERRMET.2001.15-Minute.FINAL.csv
NERRMET.2001.Hourly.FINAL.csv
NERRMET.2001.24-Hour.FINAL.csv

NERRMET.2002.15-Minute.FINAL.csv
NERRMET.2002.Hourly.FINAL.csv
NERRMET.2002.24-Hour.FINAL.csv

NERRMET.2003.15-Minute.FINAL.csv
NERRMET.2003.Hourly.FINAL.csv
NERRMET.2003.24-Hour.FINAL.csv

NERRMET.2004.15-Minute.FINAL.csv
NERRMET.2004.Hourly.FINAL.csv
NERRMET.2004.24-Hour.FINAL.csv

FINAL.DOCUMENTATION (Directory Size: 4.71 MB, 2 folders, 19 files)

NERRMET.2000-2004.METADATA.doc
NERRMET.2000-2004.METADATA.txt
NERRMET.2000-2004.METADATA.pdf

NERRMET.MissingAnomalous.2000-2004.doc
NERRMET.MissingAnomalous.2000-2004.txt
NERRMET.MissingAnomalous.2000-2004.pdf

SENSORS

(Directory Size: 2.34 MB, 7 files)

MetOne.034a-lc.pdf
03001-5.WindSentry.pdf
cs105.BarPres.pdf
hmp35c.TempRelHum.pdf
hmp45c.TempRelHum.pdf
LiCor190.pdf
TE525_Man.Rain.pdf

PHOTOS

(Directory Size: 417 KB, 5 files)

MetStation.jpg
MetStation2.jpg
MetStationCloseUp.jpg
OLPierMetStation.jpg
OysterLandingBasin.jpg

FINAL.GRAPHICS

(Directory Size: 6.76 MB, 5 folders, 35 files)

2000

(Directory Size: 1.15 MB, 6 files)

2000.Hourly.AvgAirTemp.jpg
2000.Hourly.AvgRelHum.jpg
2000.Hourly.AvgBarPres.jpg
2000.Hourly.AvgWindSpdDir.jpg
2000.Hourly.Rain.jpg
2000.15min.InstSolRad.jpg

2001

(Directory Size: 1.25 MB, 7 files)

2001.Hourly.AvgAirTemp.jpg
2001.Hourly.AvgRelHum.jpg
2001.Hourly.AvgBarPres.jpg
2001.Hourly.AvgWindSpdDir.jpg
2001.Hourly.Rain.jpg
2001.Hourly.TotPAR.jpg
2001.15min.InstSolRad.jpg

2002

(Directory Size: 1.40 MB, 7 files)

2002.Hourly.AvgAirTemp.jpg
2002.Hourly.AvgRelHum.jpg
2002.Hourly.AvgBarPres.jpg
2002.Hourly.AvgWindSpdDir.jpg
2002.Hourly.Rain.jpg
2002.Hourly.TotPAR.jpg
2002.15min.InstSolRad.jpg

2003

(Directory Size: 1.54 MB, 8 files)

2003.Hourly.AvgAirTemp.jpg
2003.Hourly.AvgRelHum.jpg
2003.Hourly.AvgBarPres.jpg
2003.Hourly.AvgWindSpdDir.jpg
2003.Hourly.Rain.jpg
2003.Hourly.TotPAR.jpg
2003.15min.InstSolRad.jpg
2003.15min.TotSolRad.jpg

2004

(Directory Size: 1.41 MB, 7 files)

2004.Hourly.AvgAirTemp.jpg
2004.Hourly.AvgRelHum.jpg
2004.Hourly.AvgBarPres.jpg
2004.Hourly.AvgWindSpdDir.jpg
2004.Hourly.Rain.jpg
2004.Hourly.TotPAR.jpg
2004.Hourly.TotSolRad.jpg

NERRMET.2000-2004.RescueProcess

(Directory Size: 184 MB, 18 folders, 76 files)

Posted.NIWNERR.CDMO.DataMetadata

(Directory Size: 58.0 MB, 3 folders, 18 files)

These are the data and metadata versions that were posted online by the CDMO for the NIW NERR as of 5/2006.

niwmet01.metadata.txt
niwmet02.metadata.txt
niwmet03.metadata.txt
niwmet04.metadata.doc
niwolmet01.data.txt
niwolmet02.data.txt
niwolmet03.data.txt
niwolmet04.data.txt

CDMO.Manual.v5.1

(Directory Size: 5.95 MB, 1 file)

CDMOManualv5.1_120604.pdf

CDMO.Manual.v4.0

(Directory Size: 2.42 MB, 5 files)

Cdmomanual4.0.pdf
Appendix G.doc
Appendix H.doc
MAINTENANCE PROCEDURES_4-3-02.doc
MAINTENANCE SHEET_4-3-02.doc

DataImportedToExcel

(Directory Size: 31.2 MB, 4 files)

The text versions of the CDMO posted data above imported into Excel.

niwolmet01.xls
niwolmet02.xls
niwolmet03.xls
niwolmet04.xls

NIWNERR.2000.DataMetadata

(Directory Size: 23.2 MB, 2 files)

No data or metadata files were posted by the CDMO for 2000. These metadata and data files were provided by the NIW NERR.

NIWNERR.2000.Metadata.doc
niwolmet00.xls

Graphics

(Directory Size: 46.0 MB, 5 files)

2000.NIWMet.Graphics.FINAL.jnb
2001.NIWMet.Graphics.FINAL.jnb
2002.NIWMet.Graphics.FINAL.jnb
2003.NIWMet.Graphics.FINAL.jnb
2004.NIWMet.Graphics.FINAL.jnb

Process.DataMetadataGraphics

(Directory Size: 56.4 MB, 10 folders, 46 files)

Subdirectories by year containing any old process data, metadata, or graphics.

Correspondence

(Directory Size: 25.5 KB, 3 files)

Contains copies of correspondence between the 2006 Data Rescue Manager and experts regarding documentation of the dataset.

Contains yearly directories with all available raw .dat, pre-processed, and EQWin files for archival purposes only.

6.3 Distribution Liability:

According to the Belle W. Baruch Institute for Marine and Coastal Sciences:

The datasets are only as good as the quality assurance and quality control procedures outlined in the Metadata. The user bears all responsibility for its subsequent use in any further analyses or comparisons. No warranty expressed or implied is made regarding the accuracy or utility of any data collected, managed, or disseminated for general or scientific purposes by the Belle W. Baruch Institute for Marine and Coastal Sciences. This disclaimer applies both to individual use of the data and aggregate use with other data. It is strongly recommended that these data be directly acquired from the Belle W. Baruch Institute for Marine and Coastal Sciences and not indirectly through other sources which may have changed the data in some way. Careful attention should be paid to the contents of the metadata file associated with these data. The Belle W. Baruch Institute for Marine and Coastal Sciences, the U.S. Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the National Aeronautics and Space Administration shall not be held liable for the use and/or misuse of the data described and/or contained herein.

According to the Ocean and Coastal Resource Management Policy for the NERRS National Monitoring Program:

The dataset enclosed within this package/transmission are only as good as the quality assurance and quality control procedures outlined by the enclosed metadata reporting statement. The user bears all responsibility for its subsequent use/misuse in any further analyses or comparisons. The Federal Government does not assume liability to the Recipient or third persons, nor will the Federal Government indemnify the Recipient for its liability due to any losses resulting in any way from the use of this dataset.

6.4 Standard Order Process

6.4.2. Digital Form

6.4.2.1 Digital Transfer Information

6.4.2.1.1 Format Name: EXCEL (.XLS), WORD (.DOC), .CSV, .TXT (text only), and jpg.

6.4.2.1.2 Format Version Number: Microsoft Office Professional 2000

6.4.2.1.6 File Decompression Technique: No compression applied

6.4.2.2 Digital Transfer Option

6.4.2.2.1 Computer Contact Information

6.4.2.2.1.1 Network Address

6.4.2.2.1.1.1 Network Resource Name: <http://links.baruch.sc.edu/data/>

6.4.3 Fees: None

6.5 Custom Order Process:

If requesting Non-digital (Paper (hard copy) printout), a fee of \$50 per hour (with a one-hour minimum) plus the cost of supplies will be imposed. As an offline option, CD-ROMs are available at the cost of \$5.00 each. This fee pays for the CD, the creation of the CD, and mailing charges.

7. Metadata Reference Information

7.1 Metadata Date: 20060331

7.2 Metadata Review Date: 20060522

7.4 Metadata Contact:

10.2 Contact Organization Primary

10.1.2 Contact Organization:

10.1.1 Contact Person:

Univ. of South Carolina's Baruch Institute

Melissa Ide

10.3 Contact Position:

Research Data Manager & Analyst

10.4 Contact Address

10.4.1 Address Type:

Mailing Address

10.4.2 Address:

USC Baruch Marine Field Lab

10.4.2 Address: PO Box 1630
10.4.3 City: Georgetown
10.4.4 State or Province: South Carolina
10.4.5 Postal Code: 29442
10.4.6 Country: USA
10.5 Contact Voice Telephone: (843) 546-6219 extension 243
10.7 Contact Facsimile Telephone: (843) 546-1632
10.8 Contact Electronic Mail Address: melissa@belle.baruch.sc.edu
10.9 Hours of Service: 8:30 am to 4:30 pm EST/EDT Mon. - Friday

7.5 Metadata Standard Name:

Content Standard for Digital Geospatial Metadata, Part 1: Biological Data Profile

7.6 Metadata Standard Version: FGDC-STD_001.1-1999