1. Identification Information
1.1 Citation Information
8.1 Originator: Belle W. Baruch Institute for Marine and Coastal Sciences
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 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
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: 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

1.2 Description
1.2.1 Abstract:
Meteorological data were collected on a daily basis from December 1, 1986 through March 3, 1996 at the Oyster Landing Research site in the North Inlet Estuary, Georgetown County, SC. Data recorded include: maximum and minimum daily values for air temperature, relative humidity, and barometric pressure; current (instantaneous) air temperature; and daily rainfall totals. Protocols for data collection changed over the course of the database, see the Methodology section for more information. For the entire data set, relative humidity and barometric pressure data were recorded automatically on charts. Daily maximum and minimum values were interpreted from the charts based on the 24-hour period 0000 to 2400. For most of the data set, daily rainfall totals and all current (instantaneous), maximum, and minimum air temperature data were derived from visual inspection of the rain gauge or thermometers, recorded by hand, and based on a 1000 to 1000 daily time period. During the latter portion of the data set, maximum and minimum air temperature and rainfall values were interpreted from charts for the 0000 to 2400 24-hour time period. During this time, no "current" air temperature data were recorded. Readings were taken every day of the year, except when individual sensors were not functioning.

1.2.2 Purpose:
To monitor and archive weather data for the North Inlet Estuary LTER site in order to observe environmental variability, changes, or trends over time; for use in short and long-term studies at North Inlet and other nearby estuaries; and for comparisons to other LTER and NWS sites in the nation and world. The National Weather Service Station also served as a backup for the automated LTER Meteorological station, which was located nearby.

1.2.3. Supplemental Information:

Rain:
During the 2002-2003 Data Rescue Project, it was determined that the NWS daily rain data from 6/21/1993 through 3/3/1996 came from the R8 gauge located at Oyster Landing (RAINDAZE Database). These rain data were recorded by event, not for a specific time period (1000 to 1000 or 0000 to 2400). In order to make the RAINDAZE data compatible with the NWS database, these data were corrected to the appropriate time period by calculating a rate of rainfall

(total/number of hours in the event) and then multiplying by the number of hours it rained in the appropriate period. It is important to note that some rainfall "readings" may actually be calculated values and that the calculations are based on the assumption that the rate of rainfall remained constant throughout the event. See the Process Description section for a complete list of calculated rainfall readings.

Relative Humidity:
There were obvious calibration issues with the hygrothermograph throughout the database. As a result, maximum and minimum relative humidity data should be used with caution and only to indicate trends. See the Anomalous Data portion of this document for more information.

Raw Charts (additional, non-published raw data):
As part of the 2002-2003 Data Rescue Project, all raw data charts were scanned to a digital (.JPG) format and archived on the LTER NWS.RAW Archive CD. Raw charts containing data that were never interpreted or included in the final data set are available for the thermograph, hygrothermograph, and barograph. Solar radiation data were recorded on charts by a pyranograph for several years and never included in the data set at all. The 2002-2003 Data Rescue Project Data Manager felt that interpretation at this late date (and without any documentation for the solar radiation data) would introduce additional error without the original weather technicians' input. It was also unclear how well the sensors were maintained and if they were even still functioning properly during this period. As a result, the Data Rescue Project made no attempt to interpret these data and they are not included in the final data set. See the Completeness Report for detailed information on raw chart availability as well as data availability for the final data set.

Additional Meteorological Databases:
The LTER Meteorological Station was located at the end of the Oyster Landing Pier, approximately 1200 ft from the National Weather Service Station. The LTER MET station collected average meteorological values with water parameters on an hourly basis from June 3, 1982 through April 29, 1996. Average values for wind speed, wind direction, air temperature, barometric pressure, solar radiation, water temperature, and conductivity were generated from 3600 readings (sensors were scanned once per second) for each hour. Water level readings were recorded every six minutes; the hourly value reported is an instantaneous reading. For a short period of time (October 1989 to December 1990), relative humidity data were also collected. For more information, see the LTERMET data and metadata at http://links.baruch.sc.edu/data/.

The North Inlet – Winyah Bay National Estuarine Research Reserve (NIW NERR) site was established in June of 1993, and its environmental monitoring program began running under the auspice of the NERR program at that time. In 1995, the System-Wide Monitoring Program (SWMP) was created to set protocols for monitoring the estuarine environments of all NERR sites, however, weather data collection protocols were not developed until 1997. On July 2, 1997 the NIW NERR site's data collection procedures changed from the previous 15 years (LTER MET) to follow these new guidelines. Weather data were collected from the NERR Meteorological station at the end of Oyster Landing Pier on a 15-minute, hourly, and 24-hour basis for air temperature, relative humidity, photosynthetically active solar radiation (LiCor sensor), barometric pressure, wind speed, wind direction, solar radiation (Eppley sensor), and rain parameters. For more information on the NERRMET database, see the data and metadata for years 1997 through 1999 at http://links.baruch.sc.edu/data/ and years 2000 through 2002 (updated annually) at http://cdmo.baruch.sc.edu/.

The RAINDAZE database is a compilation of rain data from multiple sources for the period of April 1, 1978 through December 31, 2001. Rain gauges at Oyster Landing (including the NWS dip-stick gauge) provided the majority of data for this database. For more information on the RAINDAZE database, see the data and metadata at http://links.baruch.sc.edu/data/.

1.3 Time Period of Content:
9.3 Range of Dates/Times
9.3.1 Beginning Date: 19861201
9.3.2 Beginning Time: 1000
9.3.3 Ending Date: 19960303
9.3.4 Ending Time: 0000

1.3.1 Currentness Reference: Observed

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 Hobcaw Barony property is bordered to the north by the Debordieu Colony property, to the west by Highway 17, and is located in Georgetown County, South Carolina, USA. The North Inlet Estuary lies east of the uplands of Hobcaw Barony and contains Crab Haul Creek, where the Oyster Landing pier and research site are located. The North Inlet estuary, located approximately 10 km east of Georgetown, is a bar-built Class C type estuary (Pritchard, 1955) and is composed of numerous winding tidal creeks. North Inlet is considered a pristine tidal estuary due to minimal anthropogenic impacts. The watershed drains a 24.8 km^2 area of mostly pine forest and the moderately developed Debordieu Colony residential development to the north. The coordinates for the National Weather Service Station, and two sensors that were also located at Oyster Landing and used for brief periods during the database, are listed below in decimal degrees and utm zone 17 North:

NWS Weather Station at Oyster Landing:	-79.191 W, 33.350 N	3691621.92 N, 668308.05 E
LTER Rain Gauge 8:	-79.191 W, 33.350 N	3691595.60 N, 668314.63 E
LTER MET Station:	-79.189 W, 33.349 N	3691484.13 N, 668527.94 E

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

1.5.1.1 West Bounding Coordinate: -79.270
1.5.1.2 East Bounding Coordinate: -79.153
1.5.1.3 North Bounding Coordinate: 33.366
1.5.1.4 South Bounding Coordinate: 33.296

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:	BAROGRAPH
1.6.1.2 Theme Keyword:	BAROMETER
1.6.1.2 Theme Keyword:	BAROMETRIC PRESSURE
1.6.1.2 Theme Keyword:	COASTAL
1.6.1.2 Theme Keyword:	ECOSYSTEMS
1.6.1.2 Theme Keyword:	ESTUARINE
1.6.1.2 Theme Keyword:	ESTUARY
1.6.1.2 Theme Keyword:	HUMIDITY
1.6.1.2 Theme Keyword:	HYGROTHERMOGRAPH
1.6.1.2 Theme Keyword:	INSTANTANEOUS
1.6.1.2 Theme Keyword:	LONG-TERM
1.6.1.2 Theme Keyword:	LONG-TERM ECOLOGICAL RESEARCH
1.6.1.2 Theme Keyword:	LTER
1.6.1.2 Theme Keyword:	MARSH
1.6.1.2 Theme Keyword:	MAXIMUM
1.6.1.2 Theme Keyword:	METEOROLOGICAL
1.6.1.2 Theme Keyword:	MICROBAROGRAPH
1.6.1.2 Theme Keyword:	MINIMUM
1.6.1.2 Theme Keyword:	NATIONAL WEATHER SERVICE
1.6.1.2 Theme Keyword:	RAIN
1.6.1.2 Theme Keyword:	RAINFALL
1.6.1.2 Theme Keyword:	RAIN GAUGE
1.6.1.2 Theme Keyword:	RELATIVE HUMIDITY
1.6.1.2 Theme Keyword:	PRECIPITATION
1.6.1.2 Theme Keyword:	PRECIPTATION GAUGE
1.6.1.2 Theme Keyword:	PRESSURE
1.6.1.2 Theme Keyword:	SALT MARSH
1.6.1.2 Theme Keyword:	SNOW
1.6.1.2 Theme Keyword:	TEMPERATURE

1.6.1.2 Theme Keyword: THERMOGRAPH
1.6.1.2 Theme Keyword: WEATHER
1.6.1.2 Theme Keyword: WEATHER STATION

1.6.2 Place

1.6.2.1 Place Keyword Thesaurus: None
1.6.2.2 Place Keyword: COASTAL
1.6.2.2 Place Keyword: CRAB HAUL CREEK
1.6.2.2 Place Keyword: EAST COAST
1.6.2.2 Place Keyword: GEORGETOWN COUNTY
1.6.2.2 Place Keyword: HOBCAW BARONY
1.6.2.2 Place Keyword: NORTH INLET
1.6.2.2 Place Keyword: NORTH INLET-WINYAH BAY NERR
1.6.2.2 Place Keyword: OYSTER LANDING
1.6.2.2 Place Keyword: SOUTH CAROLINA
1.6.2.2 Place Keyword: SOUTHEAST COAST
1.6.2.2 Place Keyword: USA

1.6.3 Stratum

1.6.3.1 Stratum Keyword Thesaurus: None
1.6.3.2 Stratum Keyword: SURFACE

1.6.4 Temporal

1.6.4.1 Temporal Keyword Thesaurus: None
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: 1986
1.6.4.2 Temporal Keyword: 1987
1.6.4.2 Temporal Keyword: 1988
1.6.4.2 Temporal Keyword: 1989
1.6.4.2 Temporal Keyword: 1990
1.6.4.2 Temporal Keyword: 1991
1.6.4.2 Temporal Keyword: 1993
1.6.4.2 Temporal Keyword: 1994
1.6.4.2 Temporal Keyword: 1995
1.6.4.2 Temporal Keyword: 1996
1.6.4.2 Temporal Keyword: 1986-1996
1.6.4.2 Temporal Keyword: 1980s
1.6.4.2 Temporal Keyword: 1990s

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:

Following academic courtesy standards, the PIs (originators), the University of South Carolina's Belle W. Baruch Institute for Marine and Coastal Sciences, and Grantor (see Data Set Credit section) should be fully acknowledged 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.

1.9 Point of Contact:

10.2 Contact Organization Primary

10.2.1 Contact Organization:	Univ. of South Carolina's Baruch Institute
10.2.2 Contact Person:	Ginger Ogburn-Matthews
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 Laboratory
10.4.2 Address:	P.O. 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
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 Mon.- Friday

1.11 Data Set Credit:
The National Science Foundation provided funding, under grants DEB 8012165 and BSR 8514326, to the North Inlet Long-Term Ecological Research (LTER) Program, Belle W. Baruch Institute, University of South Carolina, with Dr. F. J. Vernberg as project director. Numerous researchers, faculty, post-docs, technicians, students, and data managers have contributed to these data sets.

1.14 Native Data Set Environment
From 12/1/1986 through 6/20/1993, the raw air temperature and precipitation data were recorded onto a form by hand. Beginning on 6/21/1993, the air temperature and precipitation data were automatically recorded on seven-day charts. Relative humidity and barometric pressure data were automatically recorded on seven-day charts for the entire data set. Approximately once a week the Weather Technician brought the charts back to the Field Lab, interpreted them, and entered the data from the forms and charts into text files. The USC Baruch Data Manager imported these ascii files into Microsoft Excel and formatted them for the purposes of this database. The final data are in text (.csv) and .xls formats.

1.15 Cross Reference:
8. Citation Information:
8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research
8.1 Originator: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve
8.1 Originator: D. Allen
8.1 Originator: A. Lohrer
8.2 Publication Date: 200304
8.4 Title: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve Meteorological Data, North Inlet Estuary, Georgetown, South Carolina: 2002.
8.6 Geospatial Data Presentation Form: MS Access database and tab-delimited text (spreadsheet)
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
8.10 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: 2002
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: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina
8.8.2 Publisher: NERR Centralized Data Management Office

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

1.15 Cross Reference:
8. Citation Information:
8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research
8.1 Originator: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve
8.1 Originator: D. Allen
8.1 Originator: A. Lohrer
8.2 Publication Date: 20021111
8.4 Title: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve Meteorological Data, North Inlet Estuary, Georgetown, South Carolina: 2001.
8.6 Geospatial Data Presentation Form: MS Access database and tab-delimited text (spreadsheet)
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
8.10 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: 2002
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: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina
8.8.2 Publisher: NERR Centralized Data Management Office
8.10 Online Linkage: http://cdmo.baruch.sc.edu

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research
8.1 Originator: North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve
8.1 Originator: D. Allen
8.1 Originator: A. Lohrer
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: MS Access database and tab-delimited text (spreadsheet)
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: 2001
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: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina
8.8.2 Publisher: NERR Centralized Data Management Office URL: http://cdmo.baruch.sc.edu

1.14 Cross Reference:
8. Citation Information
8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research
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 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
8.10 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: 2002
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: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina
8.8.2 Publisher: NERR Centralized Data Management Office URL: http://cdmo.baruch.sc.edu

1.14 Cross Reference:
8. Citation Information
8.1 Originator: Belle W. Baruch Institute of Coastal Ecology and Forest Science
8.1 Originator: National Weather Service
8.1 Originator: T. Williams
8.1 Originator: M. Gibson
8.2 Publication Date: Unpublished material
8.4 Title: National Weather Service Data for Hobcaw Barony
8.6 Geospatial Data Presentation Form: hardcopy handwritten data sheets

1.14 Cross Reference:
8. Citation Information
8.1 Originator: W.K. Michener
8.1 Originator: D.M. Allen
8.1 Originator: E.R. Blood
8.1 Originator: T.A. Hiltz
8.1 Originator: B. Kjerfve
8.1 Originator: F.H. Sklar
8.2 Publication Date: 1990
8.4 Title: Climatic Variability and Salt Marsh Ecosystem Response: Relationship to Scale. *In*: D. Greenland and W. Lloyd, Jr. (eds.): Climate Variability and Ecosystem Response: Proceedings of a long-term ecological research workshop; Boulder, CO. Gen. Tech. Rep. SE-65
8.6 Geospatial Data Presentation Form: scientific publication
8.8 Publication Information:
8.8.1 Publication Place: Asheville, NC
8.8.2 Publisher: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station
8.9 Other Citation Details: 90pp.

1.14 Cross Reference:
8. Citation Information
8.1 Originator: W.K. Michener
8.1 Originator: B. Kjerfve
8.1 Originator: D. Greenland (editor)
8.2 Publication Date: 1987
8.4 Title: North Inlet, SC. P.56-60 In: D. Greenland (ed.): The Climate of the Long-Term Ecological Research Sites.
8.6 Geospatial Data Presentation Form: scientific publication

1.14 Cross Reference:
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

The following databases (with the exception of the merged data set denoted by **) are all part of the larger Michener, Miller, and Nottrott (1990) work listed above:

1.14 Cross Reference:
8. Citation Information
8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research
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 spreadsheet
8.8 Publication Information:
8.8.1 Publication Place: Belle W. Baruch Marine Field Laboratory, Georgetown, South Carolina, USA
8.8.2Publisher: The Belle W. Baruch Institute for Marine Biology and Coastal Research, Baruch Marine Field Lab, University of South Carolina
8.9 Other Citation Details: Data Set Code: NIN001
8.10 Online Linkage: http://links.baruch.sc.edu/data/

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Elizabeth R. Blood
8.2 Publication Date: 1990
8.4 Title: Estuarine Surface Water Nutrient Chemistry and Water Quality Data for Clambank and Oyster Landing*
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN003

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Richard G. Zingmark
8.2 Publication Date: 1990
8.4 Title: Long-Term Variations in Phytoplankton Biomass in North Inlet Estuary*
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN004

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Leonard R. Gardner
8.2 Publication Date: 1990
8.4 Title: Suspended Sediment*
8.6 Geospatial Data Presentation Form: digital text

8.9 Other Citation Details: Data Set Code: NIN005

The three databases above were merged into the following data set:

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Elizabeth Blood (Daily Estuarine Surface Water Nutrient Chemistry and Water Quality Data)
8.1 Originator: Leonard Robert Gardener (Suspended Sediments)
8.1 Originator: Richard Zingmark (Phytoplankton Biomass - Chlorophyll a and Phaeophytin)
8.1 Originator: Belle W. Baruch Institute for Marine Biology and Coastal Research
8.2 Publication Date: 19981120
8.4 Title: Long Term Ecological Research (LTER) Daily Estuarine Surface Water Nutrient and Water Quality, Suspended Sediment, and Chlorophyll a Data for the North Inlet Estuary, Georgetown, SC: 1978-1993**
8.6 Geospatial Data Presentation Form: comma delimited digital data and spreadsheet
8.5 Edition: First Edition
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: September 1, 1978 - June 30, 1993
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 Biology and Coastal Research, University of South Carolina
8.10 Online Linkage: http://links.baruch.sc.edu/data/

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Elizabeth R. Blood
8.2 Publication Date: 1990
8.4 Title: Precipitation Chemistry
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN006

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. James T. Morris
8.2 Publication Date: 1990
8.4 Title: Spartina Production
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN007

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Dennis M. Allen
8.2 Publication Date: 1990
8.4 Title: Motile Epibenthos, Macrozooplankton
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN008

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Stephen E. Stancyk
8.2 Publication Date: 1990
8.4 Title: Zooplankton (153 µm)
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN009

1.14 Cross Reference:

8. Citation Information:
8.1 Originator: Dr. Dennis M. Allen
8.2 Publication Date: 1990
8.4 Title: Fishes, Shrimps and Crabs: Oyster Landing Basin
8.6 Geospatial Data Presentation Form: digital text and spreadsheet
8.9 Other Citation Details: Data Set Code: NIN010

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Keith L. Bildstein
8.2 Publication Date: 1990
8.4 Title: Size of the Feeding Population of White Ibises (Eudocimus albus), an Avian Secondary Consumer
8.6 Geospatial Data Presentation Form: unknown
8.9 Other Citation Details: Data Set Code: NIN011

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Keith L. Bildstein
8.2 Publication Date: 1990
8.4 Title: Size of the Nesting Population of White Ibises (Eudocimus albus), an Avian Secondary Consumer
8.6 Geospatial Data Presentation Form: unknown
8.9 Other Citation Details: Data Set Code: NIN012

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Robert J. Feller
8.2 Publication Date: 1990
8.4 Title: North Inlet Subtidal Macrobenthos
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN013

1.14 Cross Reference:
8. Citation Information:
8.1 Originator: Dr. Bruce C. Coull
8.2 Publication Date: 1990
8.4 Title: Meiobenthos Abundance, Copepod Species Data
8.6 Geospatial Data Presentation Form: digital text
8.9 Other Citation Details: Data Set Code: NIN014

2. Data Quality Information
2.1 Attribute Accuracy
2.1.1 Attribute Accuracy Report:
All original components of the NWS Station were manufactured by Qualimetrics, however, no original instrument manuals were archived for sensor accuracy documentation. As part of the 2002-2003 Data Rescue Project, the Data Manager contacted All Weather Inc. (Qualimetrics is a subsidiary of All Weather Inc.) to obtain any documentation available for the sensors. All Weather Inc. provided the accuracy information reported below and stated that, to the best of their knowledge, the information reported applies to the sensors that were in use for the NWS database. The Data Manager also obtained 2003 versions of the manuals for the "same" sensor models. It is unclear whether the documentation in the manuals is identical to the documentation that accompanied the original sensors, or if the models produced in 2003 have specifications identical to those used for the NWS database. The attribute accuracy report below also contains information on sensors used to supplement the NWS weather station when necessary: the LTER R8 Rain Gauge and the LTER MET Station air temperature sensor. For additional documentation on the dates that sensors were in use, see the Field Methodology Description section.

Sensor: 6310-A Standard (Dip-stick, non-recording) Rain Gauge (NWS)
Manufacturer: Qualimetrics
Capacity: 20 inches of rainfall
Graduations: 0.01 inches or 0.2 mm

***Sensor*:** 4421 Min/Max Thermometer Set (NWS)
Manufacturer: Qualimetrics
Range of Measurement*:*
Min Thermometer: -45 degrees C to +50 degrees C
Max Thermometer: -30 degrees C to +55 degrees C
Graduations: 0.5 degrees C
Accuracy: plus or minus 0.2 degrees C above 0 degrees C

Sensor: 5020 Hygrothermograph (NWS)
Manufacturer: Qualimetrics
Sensing elements:
Temperature: Aged Bimetal Strip
Humidity: Hair Bundle
Graduations:
Temperature: 1 degree C
Humidity: 1 percent
Accuracy:
Temperature: plus or minus 1 percent
Humidity: plus or minus 1 percent midscale, plus or minus 3 percent at extremes (that's us)

Sensor: 7010-A Microbarograph (NWS)
Manufacturer: Qualimetrics
Sensing Element: 14 cell, 2.5 inch diameter aneroid bellows
Range of Measurement: 945 to 1045 millibars
Graduations: 0.5 millibars
Resolution: 0.25 millibars
Accuracy: plus or minus 0.15 millibars

Sensor: 4110-A Thermograph (NWS)
Manufacturer: Qualimetrics
Sensing element: Aged Bimetal Strip
Graduations: 1 degree C
Accuracy: plus or minus 0.5 degrees C

Sensor: Universal Recording Rain Gauge: 5-780 Series (LTER Gauge R8)
Manufacturer: Belfort Instrument Company
Sensitivity: 0.01 inches
Accuracy: 0.3 percent of full scale

Sensor: YSI 703: Dual Element Air Temperature Thermistor w/ Naturally Aspirated Temperature Shield (LTER MET)
Manufacturer: Climatronics Corporation
Accuracy: plus or minus 0.4 degrees C

2.1.2 Quantitative Attribute Accuracy Assessment
2.1.2 .1 Attribute Accuracy Value

Parameter	Number of Decimal Places
Air Temp Minimum	0
Air Temp Current	0
Air Temp Maximum	0
Rain	1
Relative Humidity Minimum	0
Relative Humidity Maximum	0
Barometric Pressure Minimum	0
Barometric Pressure Maximum	0

2.1.2.2 **Attribute Accuracy Explanation:**

Date: The date 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 Temp Minimum and Maximum: As a result of the variation in the accuracy of the sensors in use (plus or minus 1%, 0.5ºC, 0.2ºC, and 0.4ºC) and the inconsistencies in the resolution of the values reported by the weather technician, it was determined that rounding to the nearest whole number would be most practical and beneficial. Data were reported to varying levels of resolution throughout the database and are often available to the nearest ½ of a whole number in the raw data.

Air Temp Current: Due to inconsistencies in the resolution of the values recorded by the weather technician, the accuracy of the thermometer (0.2ºC), and in order to be consistent with the maximum and minimum air temp data, the current air temp values are reported to the nearest whole number.

Rain: Based on the accuracy and resolution of the two sensors used for rainfall data, it was determined that data could be reported to the nearest tenth of a millimeter with reasonable confidence.

Relative Humidity Minimum and Maximum: Based on the accuracy of the hygrothermograph (plus or minus 1 percent midscale, 3 percent at extremes) and the fact that relative humidity values are often in the extreme upper end of the spectrum at this location, values were rounded to the nearest whole number.

Barometric Pressure Minimum and Maximum: Due to inconsistencies in the resolution of the values reported by the weather technician, which ranged from rounding to the nearest whole number to the nearest 10^{th} of a whole number, it was determined that it would be most beneficial and practical to report values to the nearest whole number.

2.2 Logical Consistency Report:

Not applicable

2.3 Completeness Report:

The MS Excel final data file is verified for typographical errors by the Data Manager. The following schedules give availability information for the final data set and raw charts. There may be missing data within these availability periods. The missing and anomalous data sections below pertain only to the final rescued/published 2003 data set.

Data Availability:

Final 2003 Published Data Set:
Max and Min Air Temperature: 12/1/1986 – 2/4/1996
Current Air Temperature: 12/1/1986 – 6/20/1993
Rain: 12/1/1986 – 3/3/1996
Max and Min Relative Humidity: 12/29/1986 – 3/3/1996
Max and Min Barometric Pressure: 10/10/1989 – 3/3/1996

Raw Pen Recording Charts:
Thermograph (Air Temperature) Charts: 2/20/1990 – 10/26/1996
Hygrothermograph (Relative Humidity) Charts: 9/10/1986 – 12/4/1996, 3/14/1997 – 4/11/1997
Hygrothermograph (Air Temperature) Charts: 5/1/1995 – 12/4/1996, 3/14/1997 – 4/11/1997
Barograph (Barometric Pressure) Charts: 10/9/1989 – 12/4/1996, 3/14/1997 – 4/11/1997
Pyranograph (Solar Radiation) Charts: 10/23/1989 – 12/4/1996

Missing Data:

Missing data occur on the following dates for the parameters specified. All occurrences of missing data were marked with a period in the published 2003 data set.

1986

12/01/1986 – 12/31/1986	BP Max, BP Min
12/01/1986 – 12/28/1986	RH Max, RH Min
12/25/1986	All parameters

1987

01/01/1987 – 12/31/1987	BP Max, BP Min
01/01/1987	AT Max, AT Min, AT Current, Time, Rain
01/02/1987	AT Min
02/08/1987	Time
02/22/1987	Time
03/09/1987	AT Max
03/17/1987 – 03/26/1987	RH Max, RH Min
04/08/1987	RH Max, RH Min
05/04/1987 – 05/10/1987	RH Max, RH Min
05/06/1987	AT Max, AT Min, AT Current, Time
05/30/1987	AT Max, AT Min, AT Current, Time, Rain
06/15/1987	RH Min
06/16/1987 – 06/21/1987	RH Max, RH Min
07/04/1987	AT Max, AT Min, AT Current, Time, Rain
07/18/1987	AT Max
07/21/1987	RH Max, RH Min
07/22/1987	AT Max, AT Min, AT Current, Time, RH Max, RH Min
07/23/1987	AT Max, AT Min, AT Current, Time
08/15/1987	AT Max
08/25/1987 – 08/30/1987	RH Max, RH Min
09/19/1987	AT Max, AT Min, AT Current, Time, Rain
09/20/1987	AT Max, AT Min, AT Current,
09/27/1987	AT Max
10/15/1987 – 10/18/1987	RH Max, RH Min
11/09/1987 – 11/10/1987	RH Max, RH Min
11/21/1987 – 11/22/1987	RH Max, RH Min
11/27/1987 – 11/29/1987	RH Max, RH Min
12/01/1987 – 12/11/1987	RH Max, RH Min
12/25/1987	AT Max, AT Min, AT Current, Time, Rain

1988

01/01/1988 – 12/31/1988	BP Max, BP Min
01/01/1988	AT Min
01/09/1988	Rain
01/10/1988	AT Min
01/15/1988 – 01/16/1988	Rain
01/30/1988	AT Max
02/21/1988	AT Max
03/12/1988	AT Max
03/21/1988	AT Max, AT Min, AT Current, Time, Rain
03/25/1988	AT Max
03/27/1988	AT Max
04/04/1988 – 04/10/1988	RH Max, RH Min
04/11/1988	RH Min
05/01/1988	AT Min
05/11/1988	AT Max
07/04/1988	AT Max, AT Min, AT Current, Time
07/05/1988	AT Min, AT Max

10/01/1988	Time, AT Min, AT Current, AT Max, Rain
11/15/1988	RH Max, RH Min
12/25/1988	Time, AT Min, AT Current, AT Max, Rain

1989

01/01/1989 - 10/09/1989	BP Max, BP Min
01/30/1989	AT Max, AT Min, AT Current,
06/06/1989 – 06/11/1989	RH Max, RH Min
07/04/1989	AT Max, AT Min, AT Current, Time
09/19/1989 – 09/21/1989	RH Max, RH Min
09/22/1989 – 10/09/1989	All Parameters
10/16/1989	RH Max, RH Min
10/18/1989	AT Max, AT Min, AT Current, Time, Rain
11/30/1989	AT Min, AT Current
12/24/1989 – 12/27/1989	AT Max, AT Min, AT Current, Time, Rain

1990

01/13/1990 – 01/14/1990	AT Min, AT Current
01/15/1990	AT Max, AT Min
02/18/1990	AT Min, AT Current
02/19/1990	AT Min
04/07/1990 – 04/10/1990	AT Min, AT Current
05/18/1990	AT Min, AT Current
05/25/1990	AT Min, AT Current
05/30/1990	AT Min, AT Current
06/12/1990	AT Min, AT Current
06/23/1990	AT Min, AT Current
07/02/1990	AT Min
07/04/1990	Time, AT Min, AT Current, AT Max, Rain
08/10/1990	AT Min, AT Current
10/01/1990	AT Min
11/12/1990	AT Min
12/25/1990	AT Max, AT Min, AT Current, Time

1991

02/23/1991	AT Min, AT Current
02/24/1991 – 02/25/1991	AT Min
04/29/1991	AT Min, AT Current
04/30/1991	AT Min
07/04/1991	AT Max, AT Min, AT Current, Time, Rain
08/22/1991	AT Min, AT Current
09/03/1991	AT Max, AT Min, AT Current, Time, Rain
09/17/1991	AT Min, AT Current
12/25/1991	AT Max, AT Min, AT Current, Time, Rain

1992

01/18/1992	Time
02/06/1992	AT Min
02/10/1992	AT Min
02/16/1992	AT Min, AT Current
03/20/1992	AT Min, AT Current
03/31/1992	AT Min, AT Current
04/26/1992	AT Min
05/16/1992	AT Min
05/17/1992 – 05/18/1992	AT Min, AT Current
05/20/1992	AT Min, AT Current
07/04/1992	AT Max, AT Min, AT Current, Time, Rain

08/23/1992	AT Max, AT Min, AT Current, Time, Rain
08/25/1992	AT Max, AT Min, AT Current, Time, Rain
12/25/1992	AT Max, AT Min, AT Current, Time, Rain

1993

01/16/1993	AT Max, AT Min, AT Current, Time, Rain
02/09/1993 – 02/14/1993	RH Max, RH Min
02/23/1993 – 02/24/1993	BP Max, BP Min
03/14/1993	AT Min
04/11/1993	AT Max, AT Min, AT Current, Time
04/27/1993	AT Max, AT Min, AT Current, Time
04/29/1993	AT Max
05/08/1993	AT Max, AT Min, AT Current, Time
06/21/1993 – 12/31/1993	AT Current, Time
12/28/1993 – 12/31/1993	BP Max, BP Min

1994

01/01/1994 – 01/02/1994	BP Max, BP Min
01/01/1994 – 12/31/1994	AT Current, Time

1995

01/01/1995 – 12/31/1995	AT Current, Time
03/28/1995	AT Max, AT Min
04/18/1995 – 04/30/1995	AT Max, AT Min
12/18/1995 – 01/08/1996	AT Max, AT Min
12/28/1995 – 12/30/1995	BP Max, BP Min

1996

01/01/1996 – 03/03/1996	AT Current, Time
02/05/1996 – 03/03/1996	AT Max, AT Min

Anomalous Data:

This section identifies data that have been determined to be inaccurate and removed from the final data set by the 2002-2003 Data Rescue Project Data Manager, provides justification for the removal of the inaccurate data, and identifies "questionable" data. Questionable or suspect data are data that the Data Manager believes may be compromised in quality but remain in the data set. Wherever possible, both questionable and inaccurate data are correlated with information from relevant documentation that may help to explain any problems with the data. Data that have been removed from the final data set are still present in unedited and/or raw data files.

Air Temperature:

10/24/1995 - 11/05/1995: the maximum and minimum air temperature readings recorded by the NWS weather station appear to be extraordinarily high for the time of year. The 2003 Rescue Project Data Manager compared the values to readings taken at the LTER MET weather station, which were significantly lower. The data were determined to anomalous and possibly erroneous, but were retained in the data set.

Rain:

It is important to note that if the Weather Technician did not visit the weather station to collect the current air temperature and rainfall amount, any rain that fell would remain in the rain gauge and be recorded on the following day's visit. In addition, the extended length of time that any rainfall remained in the gauge might affect the accuracy of the measurement due to evaporation losses. If data were missing as a result of a problem with the gauge (for example when the gauge was inoperative after Hurricane Hugo), this would not apply and no rain would be carried over during the period of missing data.

Large rainfall events were confirmed with another source at Oyster Landing whenever possible. The following large events were verified with the LTER R8 rain gauge used in the RAINDAZE database and confirmed as accurate.

10/11/1990 171.5 mm
10/13/1994 167.6 mm

On 1/1/1987 a rainfall event occurred but was not recorded because the rain gauge was full of seawater. The date is noted in the Missing Data portion of this document.

On 6/15/1987 the Weather Technician recorded a rainfall amount of 86 mm. The Data Manager attempted to verify this value with the RAINDAZE database, but the LTER R8 gauge in use at the time did not register a similar amount. Based on the amounts recorded by the R8 gauge, the reading should probably have been 8.6 mm. However, the raw data form clearly shows 86 mm. As a result, the Data Manager decided to leave the reading in the database unaltered, but mark it as possibly erroneous. Use this value with caution.

On 12/23/1989 the value of 38.1 mm recorded for that date refers to snowfall.

Relative Humidity:
There were obvious calibration issues with the hygrothermograph throughout the database. As a result, maximum and minimum relative humidity data should be used with caution and only to indicate trends. The relative humidity hair bundle has a tendency to corrode in the salt marsh environment of this location, and as a result, must be cleaned periodically and calibrated weekly with a psychrometer (which results in some down time). It is unclear whether the calibration discrepancies displayed in the data result from inadequate weekly calibration, corrosion, or sensor inaccuracies. In general, maximum relative humidity values at this location are at or near 100. Max readings that remain above or below that range for a majority of the time are probably a result of calibration error. This error also affects the minimum readings, we assume proportionately, but is less visible because minimum readings are rarely near the lower limit.

A noticeable change in relative humidity readings occurred in October of 1989, when a new hygrothermograph was installed to replace the old one destroyed in Hurricane Hugo. This discrepancy indicates that a calibration issue existed with one or both of the hygrothermographs. The maximum values obtained from the old hygrothermograph tended to hover around and above 100. Max values from the new hygrothermograph exhibited a marked drop and hovered around the lower 90's, until 1992, when they climbed to the upper 90's and 100. From late 1992, through mid-1995, the RH charts appear to match the expected values. However, in mid-1995, the max values dropped back down to the lower 90's and remained there through the end of the database.

Relative humidity readings over 100 on the charts occurred often throughout the database and were always recorded as 100 in the digital data. In most cases, these readings appear to be a result of calibration issues, but occasionally legitimate values over 100 may indicate super-saturation of the air.

Digital images of the raw charts are available on the LTER NWS.RAW Archive CD and could be helpful in determining whether the hygrothermograph was calibrated properly or if specific readings were corrected down to 100.

Barometric Pressure:
On 03/13/1993 a minimum barometric pressure of 975 was recorded by the NWS weather station. The Data Manager verified that the LTER MET station (located at Oyster Landing) recorded a similarly low barometric pressure.

2.5 Lineage

2.5.1 Methodology

2.5.1.1 Methodology Type: Field Collection Procedures and Protocols
2.5.1.3 Methodology Description: Overall Field Collection Protocol

The NWS weather station consisted of the following NWS approved components:

1. Instrument Shelter
2. Qualimetrics 6310-A Standard (Dip-stick, non-recording) Rain Gauge
3. Qualimetrics 4421 Min/Max Thermometer Set
4. Qualimetrics 5020 Hygrothermograph
5. Qualimetrics 4110-A Thermograph
6. Qualimetrics 7010-A Microbarograph

The NWS instrument shelter was mounted to a concrete platform and located at the Oyster Landing Research Site on Crab Haul Creek. The shelter contained the thermometers, thermograph, and hygrothermograph. The rain gauge was located approximately 25 feet from the instrument shelter in a grass clearing and the microbarograph was maintained in the Data Management Office inside the field lab. The system measured daily maximum and minimum values for air temperature, relative humidity, and barometric pressure, as well as instantaneous air temperature and total rainfall values.

From 12/1/1986 through 6/20/1993, a weather technician visited the weather station every day at approximately 1000 to collect data for the previous 24-hour period. The technician recorded readings for maximum, minimum, and instantaneous air temperature from the min/max thermometers and the total rainfall from the rain gauge. Once a week (when available) the charts from the hygrothermograph, thermograph, and microbarograph were collected and interpreted for the 0000-2400 time period. Beginning on 6/21/1993, daily visits to the weather station were discontinued. As a result, there are no more instantaneous air temperatures after this date. Maximum and minimum air temperatures were obtained from either the thermograph or hygrothermograph and rainfall amounts were provided by the LTER R8 rain gauge, which was also located at the Oyster Landing Research Site. Data from the temperature sensor on the LTER MET Station (located on the Oyster Landing Pier) was utilized for a brief period in 1995 when the NWS hygrothermograph wasn't functioning properly. See the Data Collection Schedule (below) for specific information on the time periods that each sensor was utilized for the final data set and the 24-hour period that the data apply to. The Completeness Report details data availability in both the final data set and raw chart availability for each of the sensors.

Data Collection Schedule for the Final Data Set:

Parameter	Dates	Sensor/Gauge	24-Hour Period
Max/Min Air Temperature			
	12/1/1986 – 6/20/1993	4421 Min/Max Thermometer Set	1000-1000
	6/21/1993 – 5/28/1995	4110-A Thermograph	0000-2400
	5/29/1995 – 11/6/1995	5020 Hygrothermograph	0000-2400
	11/6/1995 – 12/17/1995	YSI 703 – Dual Element Thermistor	0000-2400
	12/18/1995 – 2/4/1996	5020 Hygrothermograph	0000-2400
Current Air Temperature			
	12/1/1986 – 6/20/1993	4421 Min/Max Thermometer Set	NA
Rain			
	12/1/1986 – 6/20/1993	6310-A Standard Rain Gauge	1000-1000
	6/21/1993 – 9/17/1993	Belfort Universal Recording Rain Gauge	1000-1000
	9/1/1993 – 3/3/1996	Belfort Universal Recording Rain Gauge	0000-2400
Max/Min Relative Humidity			
	12/29/1986 – 3/3/1996	5020 Hygrothermograph	0000-2400
Max/Min Barometric Pressure			
	10/10/1989 – 3/3/1996	7010-A Microbarograph	0000-2400

2.5.1.4 Methodology Citation:

8. Citation Information

8.1 Originator: D. Greenland (ed.)
8.2 Publication Date: 198606
8.4 Title: Standardized meteorological measurements for Long-Term Ecological Research sites
8.6 Geospatial Data Presentation Form: Published Manuscript
8.8 Publication Information:
8.8.1 Publication Place: University of Colorado
8.8.2 Publisher: Bulletin of the Ecological Society of America
8.9 Other Citation Details: Volume 67(4), Pages 275-277

2.5.1.4 Methodology Citation:

8. Citation Information

8.1 Originator: Belfort Instrument Company
8.2 Publication Date: 1986
8.4 Title: Instruction Manual, Catalog Number 5-780 Series, Universal Recording Rain Gauge
8.6 Geospatial Data Presentation Form: Manual
8.8 Publication Information:
8.8.1 Publication Place: Baltimore, Maryland
8.8.2 Publisher: Belfort Instrument Company
8.9 Other Citation Details: Publication date for original instruction manuals is unknown

2.5.1.4 Methodology Citation:

8. Citation Information:

8.1 Originator: U.S. Department of Commerce, Environmental Science Services Administration, Weather Bureau
8.2 Publication Date: 1970
8.1 Title: Weather Bureau Observing Handbook No. 2; Substation Observations
8.6 Geospatial Data Presentation Form: Published Manuscript
8.8 Publication Information:
8.8.1 Publication Place: Silverspring, MD
8.8.2 Publisher: U.S. Government Printing Office
8.9 Other Citation Details: 77 pages

2.5.1.4 Methodology Citation:

8. Citation Information:

8.1 Originator: Qualimetrics Inc.
8.2 Publication Date: Unknown
8.4 Title: Instruction Manuals
8.6 Geospatial Data Presentation Form: Manual
8.8 Publication Information:
8.8.1 Publication Place: Princeton, New Jersey
8.8.2 Publisher: Qualimetrics Inc.
8.9 Other Citation Details: The archived manuals for these sensors were obtained in 2003 and were published by All Weather Inc. in Sacramento, California.

2.5.3.1 Process Description:

The Weather Technician either recorded data onto a form onsite at the NWS field station or interpreted weekly charts back at the field lab. These data were then entered into a digital text file, checked for typographical errors, and sent to mass storage on the University of South Carolina's mainframe in Columbia. Data were probably compiled in monthly files, then merged into yearly files, and ultimately merged into a Microsoft Excel file that compiled all the data available at the time.

2002-2003 Data Rescue Project:

The Rescue Project Data Manager used the most recently compiled file, "NWSDaily86-95.xls", to build the final data set. Additional data, for the period of 7/1/1995 – 12/31/1995, were discovered in digital format in the former Data Manager's files. These data were perused for any anomalies or difficulties that would explain their absence from the "NWSDaily86-95" file, and when none were found, they were appended to the data set.

Additional Raw Chart Data Rescue:

Additional data had been interpreted on the raw charts (handwritten notes) by the Weather Technician, but were never entered into a digital file. The Rescue Data Manager entered these data, for the following dates, so that all interpreted data were included in the digital data set:

MIN BP: 12/18/1995 - 3/3/1996*
MAX BP: 12/4/1995 – 3/3/1996*
MIN RH: 12/19/1995 – 3/3/1996
MAX RH: 12/18/1995 – 3/3/1996
MIN AT: 1/8/1996 – 2/4/1996

MAX AT: 1/8/1996 – 2/4/1996

* The Rescue Project Data Manager interpreted a Max Barometric Pressure value on 2/29/1996 (was not interpreted initially by Weather Technician), corrected the Min interpreted value on 3/1/1996, and wrote in dates for 3/2/1996, 3/3/1996, and 3/4/1996. All changes or additions were initialed on the original chart.

Raw charts with additional weather data are available after the end of the digital data set, but were never interpreted. These raw charts, along with the others, were scanned into digital format and archived on the LTER NWS.RAW Archive CD.

Rain Data Rescue:
Rain data from Baruch's LTER RAINDAZE data set were used to complete the data set through 3/3/1996. These data often had to be converted to report the specific 24-hour period of time desired, instead of the entire rain event (RAINDAZE data were collected by event). Data were converted by calculating the rate of rainfall (amount of rain/number of hours) and then multiplying by the number of hours that the event occurred during the appropriate 24-hour period. This method introduces error and users should be aware that some "readings" are actually calculated values. Calculations to correct for time period were made for the following rain events:

8/4/1993-8/5/1993 (made by previous Data Manager prior to the 2002-2003 Data Rescue Project)
10/7/1993-10/8/1993
10/25/1993-10/26/1993
11/9/1993-11/10/1993
12/22/1993-12/23/1993
1/13/1994-1/14/1994
1/29/1994-1/31/1994
2/23/1994-2/24/1994
3/1/1994-3/2/1994
6/10/1994-6/11/1994
6/27/1994-6/29/1994
7/19/1994-7/20/1994
7/28/1994-7/29/1994
9/2/1994-9/3/1994
11/15/1994-11/16/1994
12/16/1994-12/17/1994
1/28/1995-1/29/1995
2/3/1995-2/4/1995
2/28/1994-3/1/1995
4/5/1995-4/6/1995
8/25/1995-8/27/1995
3/1/1996-3/2/1996

Data Set Formatting:
After compiling all the data available for the digital data set, the Rescue Project Data Manager replaced all missing data markers (such as: -99.9, -9999, and -999) with a period (.). In addition, current temperature spreadsheet cells that were filled with 0 after they stopped recording current temperatures, and cells that were left blank, were also filled with a period (.). All instances of missing data were recorded in the Missing Data portion of the Completeness Report in this document. The Rescue Project Data Manager then formatted the data set for consistency, accuracy, and ease of use. The date column was formatted as "mm/dd/yyyy" and the time column was left in "hmm" format. Each parameter column was formatted to report the appropriate number of decimal places (see the attribute accuracy section).

Data Verification and Quality Control:
The data set was then reviewed for errors and inconsistencies. The rain data in particular were problematic; some of the data were reported in inches and some in millimeters. In order to verify the rain data and convert to the correct units where necessary, they were compared to the raw NWS rain charts or the RAINDAZE database. There are some discrepancies between the databases, as would be expected to some extent, but unless the readings were significantly different (in the Rescue Data Manager's opinion) they were left unaltered. There were a few instances that the Rescue Project Data Manager determined corrections needed to be made; they are as follows:

12/11/1993: Corrected to match RAINDAZE rainfall
1/27/1994: Corrected to match raw NWS charts and RAINDAZE rainfall

5/1/1994: Corrected to match RAINDAZE, was reported on the wrong date (5/2/1994) in NWS data file
5/30/1994-5/31/1994: Corrected to match RAINDAZE, rain event was missing from NWS data file
9/2-3/1994: Corrected to match RAINDAZE and for the appropriate time period
3/5/1995: Corrected to match RAINDAZE, was reported on the wrong date (3/6/1995) in NWS data file
4/22/1995: Corrected to match RAINDAZE, rain event was missing from NWS data file
4/24/1995: Corrected to match RAINDAZE, rain event was missing from NWS data file

An additional quality check was performed when the data were graphed using SigmaPlot (version 8.0). Graphs were perused for data that appeared to be anomalous and all questionable data were explored to determine whether they resulted from a data entry error, a documented weather event (hurricane, etc.), or if they should be considered erroneous. Data entry errors were corrected for minimum relative humidity on 9/27/1994 and 10/20/1993, and for maximum relative humidity on 5/5/1990. All erroneous/anomalous data are reported in the Anomalous Data portion of the Completeness Report.

Data Set Archival:
The final, rescued data set was archived in both .xls and .csv formats, along with graphics and metadata, on the LTER NWS.PUBLISH CD, in the LTER NWS notebook, and on-line at http://links.baruch.sc.edu/data/. All "process" files used or created throughout the rescue and archival of this database were also included on the LTER NWS.PUBLISH CD. All raw hardcopies were scanned into digital format and archived on the LTER NWS.RAW Archive CD.

2.5.2.3 Process Date: 20030601

3 Spatial Data Organization Information:
3.1 Indirect Spatial Reference:
Hobcaw Barony and the North Inlet Estuary are 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 date on which the readings were recorded in mm/dd/yyyy format.

Time: The Eastern Standard Time that the current air temperature, 24-hour rainfall total, and the max and min air temperature readings (for the previous approximately 24-hour period) were recorded. Time is reported in hmm format and should be approximately 1000 every day that it is present.

Air Temp Minimum or Maximum: Minimum or maximum air temperature as recorded in degrees Celsius by either the Minimum Thermometer, Thermograph, Hygrothermograph, or Thermistor. When taken by the thermometer, applies to the (approximately 24-hour period prior to the recorded time (12/1/1986 – 6/20/1993). When taken with the thermograph, hygrothermograph, or thermistor, applies to the period of 0000-2400 on the date indicated (6/21/1993 – 3/3/1996).

Air Temp Current: Current air temperature as recorded in degrees Celsius by the Weather Technician, from the Max/Min Thermometer Set, at the time indicated.

Rain: Total rainfall recorded in millimeters for the (approximately) 24-hour period ending on the date and time indicated (12/1/1986 – 6/20/1993) or for the period of 0000-2400 on the date indicated (6/21/1993 – 3/3/1996).

Relative Humidity Minimum or Maximum: Minimum or maximum relative humidity reading as recorded in percent saturation by the Hygrothermograph. Applies to the period of 0000-2400 on the date indicated.

Barometric Pressure Minimum or Maximum: Minimum or maximum barometric pressure reading as recorded in millibars by the Microbarograph. Applies to the period of 0000-2400 on the date indicated.

Variable	Type (total size of value.number of decimal places)	Range of Measurement (min-max)

Date (mm/dd/yyyy)	Integer	1 – 12, 1 – 31, 1986 – 1996
Time (hmm)	Integer	726 – 1515
Air Temp Minimum	Real 3.0	-14 – 28
Air Temp Current	Real 2.0	-8 – 35
Air Temp Maximum	Real 2.0	-2 – 42
Rain	Real 5.1	0.0 – 171.5
Relative Humidity Minimum	Real 3.0	15 – 100
Relative Humidity Maximum	Real 3.0	40 – 100
Barometric Pressure Minimum	Real 4.0	975 – 1038
Barometric Pressure Maximum	Real 4.0	998 – 1043

*Range of measurement values are actual highest and lowest values collected during the database timeframe. They may include values that are considered anomalous.

5.2.2 Entity and Attribute Detail Citation:
Definitions were developed by Baruch Institute's researchers, data managers, and technicians; no published standards for entity definitions were used to define the entities used in this data set. However, the general use of these entity type definitions are understood by the meteorological and ecological communities at large.

6. Distribution Information

6.1 Distributor:

10.2 Contact Organization Primary

10.1.2 Contact Organization:	Univ. of South Carolina's Baruch Institute
10.1.1 Contact Person:	Ginger Ogburn-Matthews
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
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:

Data Set Identification names:

National Weather Service Station Data
NWS Database
LTER NWS Database
LTER Data Set Code: NIN002

Identification of Directories and Files:

The LTER NWS.PUBLISH CD contains the complete Final 1986-1996 Database, graphics, and metadata, as well as all process files used or created throughout the rescue and archival of this database. The PUBLISH CD contains the following files in the following directories:

NWS.FINAL (Directory Size: 24.3 MB, 5 folders, 60 files)
FINAL.DOCUMENTATION (Directory Size: 2.10 MB, 10 files)
NWS.1986-1996.FGDC.METADATA.doc
NWS.1986-1996.FGDC.METADATA.txt
NWS.SENSORS.DOQQ.jpg
NWS.SENSORS.DOQQ.pdf

NWS.Station.DiffLocation.jpg*
NWS.RGauge.East.jpg
NWS.RGauge.North.jpg
NWS.RGauge.OLPier.jpg
NWS.RGauge.Original.jpg**
NWS.RGauge.South.jpg

*Photo was not taken at Oyster Landing location, weather station was at a different location for display purposes when this picture was taken in 2003.

**The "original" photo was taken on an unknown date, probably during data collection in the late 1980's.

FINAL.DATA (Directory Size: 516 KB, 2 files)
NWS.1986-1996.FINAL.xls
NWS.1986-1996.FINAL.csv

FINAL.GRAPHICS (Directory Size: 21.8 MB, 2 folders, 47 files)

Summary (Directory Size: 4.41 MB, 6 files)
NWS.1986-1996.AT.MAX.jpg
NWS.1986-1996.AT.MIN.jpg
NWS.1986-1996.RH.MAX.jpg
NWS.1986-1996.RH.MIN.jpg
NWS.1989-1996.BP.MAX.jpg
NWS.1989-1996.BP.MIN.jpg

Annual (Directory Size: 17.3 MB, 41 files)
NWS.1986.AT.jpg
NWS.1986.RAIN.jpg
NWS.1986.RH.jpg
NWS.1987.AT.jpg
NWS.1987.RAIN.jpg
NWS.1987.RH.jpg
NWS.1988.AT.jpg
NWS.1988.RAIN.jpg
NWS.1988.RH.jpg
NWS.1989.AT.jpg
NWS.1989.RAIN.jpg
NWS.1989.RH.jpg
NWS.1989.BP.jpg
NWS.1990.AT.jpg
NWS.1990.RAIN.jpg
NWS.1990.RH.jpg
NWS.1990.BP.jpg
NWS.1991.AT.jpg
NWS.1991.RAIN.jpg
NWS.1991.RH.jpg
NWS.1991.BP.jpg
NWS.1992.AT.jpg
NWS.1992.RAIN.jpg
NWS.1992.RH.jpg
NWS.1992.BP.jpg
NWS.1993.AT.jpg
NWS.1993.RAIN.jpg
NWS.1993.RH.jpg
NWS.1993.BP.jpg
NWS.1994.AT.jpg
NWS.1994.RAIN.jpg
NWS.1994.RH.jpg
NWS.1994.BP.jpg
NWS.1995.AT.jpg

NWS.1995.RAIN.jpg
NWS.1995.RH.jpg
NWS.1995.BP.jpg
NWS.1996.AT.jpg
NWS.1996.RAIN.jpg
NWS.1996.RH.jpg
NWS.1996.BP.jpg

NWS.PROCESS (Directory Size: 6.92 MB, 17 folders, 104 files)

Process.Data	(Directory Size: 1.65 MB, 5 folders, 39 files)
Process.Documentation	(Directory Size: 284 KB, 1 folder, 7 files)
Process.Graphics	(Directory Size: 4.04 MB, 1 file)
SAS.Programs	(Directory Size: 68 KB, 16 files)
nws.raindaze	(Directory Size: 772 KB, 1 folder, 12 files)
NWS.MonthlyBulletins	(Directory Size: 128 KB, 4 folders, 29 files)

The LTER NWS.RAW Archive CD contains scanned digital versions of the raw charts and data entry forms, and a directory of the CD contents.

6.3 Distribution Liability:

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

> The data sets 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 required 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. It is strongly recommended that careful attention be paid to the contents of the metadata file associated with these data. Neither the Belle W. Baruch Institute for Marine and Coastal Sciences, nor the National Science Foundation shall be held liable for unprofessional use of the data described and/or contained herein.

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) or WORD (.DOC) format as well as .CSV or .TXT (text only) format.

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

6.4.2.2.1.1 Computer Contact Information

6.4.2.2.1.1.1 Network Address

6.4.2.2.1.1.1.1 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: 20030601

7.2 Metadata Review Date: 20030625

7.4 Metadata Contact:

10.2 Contact Organization Primary

10.1.2 Contact Organization:	Univ. of South Carolina's Baruch Institute
10.1.1 Contact Person:	Ginger Ogburn-Matthews
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
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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
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

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