

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: NOAA/NOS Center for Operational Oceanographic Products and Services (CO-OPS)

8.2 Publication Date: 20090306

8.4 Title: Crab Haul Creek Tide Gauge Data, North Inlet Estuary, Georgetown, South Carolina: 2001 – Feb2008.

8.6 Geospatial Data Presentation Form: text data in monthly files

8.7 Series Information

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

8.7.2 Issue Identification: June 1, 2001 – February 6, 2009

8.8 Publication Information:

8.8.1 Publication Place: Baruch Marine Field Laboratory, Georgetown, SC USA and CO-OPS's website

8.8.2 Publisher: USC Belle W. Baruch Marine Field Laboratory and NOAA/NOS CO-OPS

8.9 Other Citation Details: The 2001-2008 data were collected under the auspices and protocols of the NOAA's Center for Operational Oceanographic Products and Services. Baruch Institute's versions, created by Baruch's data manager, are derived from NOAA/NOS CO-OPS' database.

8.10 Online linkage: <http://tidesandcurrents.noaa.gov/>

1.2 Description

1.2.1 Abstract:

The Center for Operational Oceanographic Products and Services

The Center for Operational Oceanographic Products and Services (CO-OPS) collects, analyzes and distributes historical and real-time observations and predictions of water levels, coastal currents and other meteorological and oceanographic data. This is part of an integrated National Ocean Service program supporting safe maritime navigation, more productive water-borne commerce, and the needs of the [National Weather Service](#), coastal zone management, engineering and surveying communities. The Center manages the [National Water Level Observation Program](#) and the national network of [Physical Oceanographic Real-Time Systems](#) in major U.S. harbors. It conducts its programs through university, industry, Federal and State partnerships as appropriate. CO-OPS resides within [NOAA's National Ocean Service](#).

The National Water Level Program

The National Oceanic and Atmospheric Administration (NOAA)/National Ocean Service's (NOS) [Center for Operational Oceanographic Products and Services \(CO-OPS\)](#) manages the National Water Level Program (NWLP) to meet NOAA's mission and goal requirements for water-level information. The NWLP is the foundation for major observational programs within NOS and serves as a component of the Federal backbone for the Integrated Sustained Ocean Observing System (IOOS.) The NWLP consists of networks of long-term and short-term water-level stations and is an "end-to-end" system of data collection, quality control, data management and product delivery. The NWLP serves as a water level datum reference system for the Nation. The tide and water-level datums derived from the NWLP have traditionally been important primarily for navigation and shoreline boundary purposes. For example, the tidal datum of Mean Lower Low Water (MLLW) is used as the reference datum, or Chart Datum, for U.S. nautical chart products in tidal waters. Similarly, Mean High Water (MHW) is used as the reference datum for the National Shoreline.

The National Water Level Observation Network

The fundamental observational component of the NWLP is the National Water Level Observation Network (NWLON). The NWLON is a network of 175 long-term, continuously operating water-level stations throughout the USA, including its island possessions and territories and the Great Lakes. The NWLON has expanded over time in response to increasing national and local needs. NWLON stations are the foundation for reference stations for NOAA's tide prediction products, and serve as controls in determining tidal datums for all short-term water-level stations. Technological advancements in sensors, data collection and data communications have enabled routine real-time automated and event-driven data acquisition using the GOES satellite. NWLON data-collection platforms are now capable of measuring other oceanographic parameters in addition to water levels, including meteorological parameters. Because of these advancements, the application of NWLON data and products has broadened. For instance, the NWLON is a key part of the NOAA Tsunami Warning System and the NOAA Storm Surge Warning System. NWLON stations support [Physical Oceanographic Real-Time Systems \(PORTS\)](#) in major ports and harbors. NWLON stations have standard configurations of water level sensors (including backup sensors), backup and primary data-collection platforms, solar panel power, GOES satellite radios, and telephone modems. Sensors are calibrated and vertically referenced to nearby networks of benchmarks. The data continuity, the vertical stability and careful referencing of NWLON stations have enabled the data to be used to estimate relative [sea-level trends](#) for the Nation.

Other NWLP Applications

In addition to their traditional applications, water-level data provide several other beneficial applications and services. CO-OPS recently created the [Coastal Oceanographic Applications and Services of Tides And Lakes\(COASTAL\)Program](#) to focus on non-navigational applications of the NWLP. The COASTAL Program works with internal and external partners to provide "value-added" products and services to local and regional coastal managers and users. Some of these applications include beneficial uses of dredged material, coastal planning, monitoring coastal wetland loss and marsh restoration, storm-surge monitoring, evacuation route planning, emergency preparedness, and HAZMAT response. The COASTAL Program fosters synergy between NOS's water-level and geodetic programs. The ability to use modern surveying techniques, such as GPS surveys, in conjunction with water-level information has resulted in improved baseline information for all of these applications.

1.2.2 Purpose:

The National Ocean Service (NOS) Center for Operational Oceanographic Products and Services (CO-OPS) collects and distributes observations and predictions of water levels and currents to ensure safe, efficient and environmentally sound maritime commerce. The Center provides the set of water level and coastal current products required to support NOS' Strategic Plan mission requirements, and to assist in providing operational oceanographic data/products required by NOAA's other Strategic Plan themes. For example, CO-OPS provides data and products required by the National Weather Service to meet its flood and tsunami warning responsibilities. The Center manages the National Water Level Observation Network (NWLON), and a national network of Physical Oceanographic Real-Time Systems (PORTS) in major U.S. harbors. The Center establishes standards for the collection and processing of water level and current data, collects and documents user requirements which serve as the foundation for all resulting program activities, designs new and/or improved oceanographic observing systems, designs software to improve CO-OPS' data processing capabilities, maintains and operates oceanographic observing systems, performs operational data analysis/quality control, and produces/disseminates oceanographic products.

The Field Operations Division (FOD) operates and maintains all oceanographic and Great Lakes observing systems required to meet CO-OPS' mission objectives. The Division ensures the continuous operations of navigation and other real-time observing systems needed to support the protection of life and property. FOD also operates the Ocean Systems Test and Evaluation Facility (OSTEF) in order to support Requirements and Development Division (RDD), and Information Systems Division (ISD) development efforts. FOD operates equipment to test and evaluate new observing systems and software modules developed to support NOS mission objectives. The Division: installs, documents, operates and maintains CO-OPS measurement systems (e.g., NWLON, PORTS); conducts field reconnaissance and geodetic operations to include the establishment, leveling, documentation, and inspection of NOS benchmarks; and provides training in the installation, operation and maintenance of CO-OPS observing equipment.

1.2.3. Supplemental Information: NOAA Tides and Currents website, managed by the Center for Operational Oceanographic Products and Services (CO-OPS), is the portal to the National Oceanic and Atmospheric Administration's vast collection of oceanographic and meteorological data (historical and real-time), predictions, and nowcasts and forecasts. CO-OPS provides the national infrastructure, science, and technical expertise to monitor, assess, and distribute tide, current, water level, and other coastal oceanographic products and services that support NOAA's mission of environmental stewardship and environmental assessment and prediction. CO-OPS provides operationally sound observations and monitoring capabilities coupled with operational Nowcast Forecast modeling.

1.3 Time Period of Content:

9.3 Range of Dates/Times

9.3.1 Beginning Date: 20010601

9.3.3 Ending Date: 200901319

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) Crab Haul Creek tide gauge monitoring site, located at -79.1928 W, 33.3494 N, is considered a fairly pristine and undisturbed area. The tide gauge station is located at the end of the OL pier. This is also the location of one of the NIW NERR water quality and nutrient stations and weather station. 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:** WATER LEVEL
- 1.6.1.2 Theme Keyword:** TIDE GAUGE
- 1.6.1.2 Theme Keyword:** MLLW
- 1.6.1.2 Theme Keyword:** COASTAL
- 1.6.1.2 Theme Keyword:** National Water Level Observation Network
- 1.6.1.2 Theme Keyword:** Center for Operational Oceanographic Products and Services
- 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:** MARSH
- 1.6.1.2 Theme Keyword:** SEA LEVEL
- 1.6.1.2 Theme Keyword:** SALT MARSH
- 1.6.1.2 Theme Keyword:** TIDAL

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:** 6-MINUTE
- 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:	2001
1.6.4.2 Temporal Keyword:	2002
1.6.4.2 Temporal Keyword:	2003
1.6.4.2 Temporal Keyword:	2004
1.6.4.2 Temporal Keyword:	2005
1.6.4.2 Temporal Keyword:	2006
1.6.4.2 Temporal Keyword:	2007

1.7 Access Constraints:

None; however, it is strongly recommended that these data be acquired directly from the National Ocean Service (NOS) Center for Operational Oceanographic Products and Services (CO-OPS) 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) 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 PIs and Grantor are not responsible for the use and/or misuse of data from this database.

According to the National Ocean Service (NOS) Center for Operational Oceanographic Products and Services (CO-OPS): The information on government servers are in the public domain, unless specifically annotated otherwise, and may be used freely by the public. Before using information obtained from this server, special attention should be given to the date and time of the data and products being displayed. This information shall not be modified in content and then presented as official government material. The user assumes the entire risk related to its use of these data. NOS is providing these data "as is," and NOS disclaims any and all warranties, whether express or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose. In no event will NOS be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of this data. NOS requests that attribution be given whenever NOS material is reproduced and re-disseminated. Pursuant to 17 U.S.C. 403, third parties producing copyrighted (compilation) works consisting predominantly of material created by Federal Government employees are encouraged to provide notice with such work(s) identifying the U.S. Government material incorporated and stating that such material is not subject to copyright protection.

1.9 Point of Contact:

10.2 Contact Person Primary

10.2.2 Contact Person: Ginger Ogburn-Matthews
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 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 Monday - Friday

1.11 Data Set Credit:

Support to purchase the water level measurement system was provided by NSF Grant No. 9907650, overseen by the University of South Carolina's Belle W. Baruch Institute for Marine and Coastal Sciences. NOS/CO-OPS is in charge of gathering, managing, and distributing these data. South Carolina Geodetic Survey Office provided the initial benchmark information for the area surrounding the tide gauge before its deployment.

1.14 Native Data Set Environment

Data are in a data logger language that must be decoded by NOS/CO-OPS, using the site's datums and other water level configuration information.

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 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/>

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/>

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>

1.14 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 Keesee

8.1 Originator: Sarah Foose

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.

1.14 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>

1.14 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: 1994-2007.

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

1.14 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

The primary bench mark is a disk set near the Belle Baruch Institute lab boat landing on Crab Haul Creek, 8.11 m (26.6 ft) ENE of the north corner of a concrete boat landing, 4.45 m (14.6 ft) north of power pole No. 70915 with a security light, 0.52 m (1.7 ft) SSE of power pole No. 0656 with three transformers, and 0.46 m (1.5 ft) ESE of a witness post. The bench mark is set 10 cm (0.3 ft) below ground level, crimped to the top of a stainless steel rod driven 11.3 m (37 ft) to refusal, and encased in a PVC pipe and concrete kickblock.

BENCH MARK STAMPING: 2245 B 1982
DESIGNATION: 866 2245 B TIDAL

MONUMENTATION: Tidal Station disk VM#: 16409
AGENCY: National Ocean Survey (NOS) PID#: DD1344
SETTING CLASSIFICATION: Stainless steel rod

The bench mark is a disk set along the road leading to the lab boat ramp and pier, 45.35 m (148.8 ft) west of power pole No. 50908, 29.29 m (96.1 ft) SE of power pole No. 0657, 4.57 m (SSW of the center of the road, 0.24 m (0.8 ft) north of a metal witness post, and 0.76 m (2.5 ft) below the road. The bench mark is 18 cm (0.6 ft) below ground level, crimped to the top of a stainless steel rod driven 13.4 m (44 ft) to refusal, and encased in a PVC pipe and concrete kickblock.

BENCH MARK STAMPING: 2245 C 1982
DESIGNATION: 866 2245 C TIDAL

MONUMENTATION: Tidal Station disk VM#: 16410
AGENCY: National Ocean Survey (NOS) PID#: DD1343
SETTING CLASSIFICATION: Stainless steel rod

The bench mark is a disk set along the dirt road leading to the lab boat ramp and pier, 3.35 m (11.0 ft) NNE of the center of the road, 1.52 m (5.0 ft) east of a witness post, 0.94 m (3.1 ft) NW of a power pole with guy wire, and 0.15 m (0.5 ft) below the road. The bench mark is crimped to the top of a stainless steel rod driven 11.0 m (36 ft) to refusal, and encased in a PVC pipe and concrete kickblock.

BENCH MARK STAMPING: 2245 D 1982
DESIGNATION: 866 2245 D TIDAL

MONUMENTATION: Tidal Station disk VM#: 16411
AGENCY: National Ocean Survey (NOS) PID#: DD4668
SETTING CLASSIFICATION: Concrete monument

The bench mark is a disk set in top of a concrete monument near the boat sheds along the road leading to the lab boat ramp and pier, 22.56 m (74.0 ft) north of the center of the road, 7.13 m (23.4 ft) NE of the SW corner of the maintenance shed, 0.58 m (1.9 ft) east of the east corner of the shed, 6 cm (0.2 ft) below ground level and about level with the road.

BENCH MARK STAMPING: 2245 E 1982
DESIGNATION: 866 2245 E TIDAL

MONUMENTATION: Tidal Station disk VM#: 16412
AGENCY: National Ocean Survey (NOS) PID#: DD4667
SETTING CLASSIFICATION: Concrete monument

The bench mark is a disk set in top of a concrete monument near the boat sheds along the road leading to the lab boat ramp and pier, 49.38 m (162.0 ft) WNW of the west corner of the maintenance shed, 0.82 m (2.7 ft) WNW of the southernmost pole of the boat shed (Bay 1), 0.18 m (0.6 ft) SE of a witness post, and at ground level.

Station ID: 8662245 PUBLICATION DATE: 04/29/2003
Name: OYSTER LANDING, CRAB HAUL CREEK SOUTH CAROLINA
NOAA Chart: 11532 Latitude: 33° 21.1' N
USGS Quad: PLANTERSVILLE Longitude: 79° 11.2' W

T I D A L D A T U M S

Tidal datums at OYSTER LANDING, CRAB HAUL CREEK based on:

LENGTH OF SERIES: 2 Years
TIME PERIOD: June 2001 - May 2002
TIDAL EPOCH: 1983-2001
CONTROL TIDE STATION: 8665530 CHARLESTON, COOPER RIVER ENTRANCE

Elevations of tidal datums referred to Mean Lower Low Water (MLLW), in METERS:

HIGHEST OBSERVED WATER LEVEL (07/22/2001)	=	2.228
MEAN HIGHER HIGH WATER (MHHW)	=	1.554
MEAN HIGH WATER (MHW)	=	1.446
MEAN SEA LEVEL (MSL)	=	0.815
MEAN TIDE LEVEL (MTL)	=	0.752
MEAN LOW WATER (MLW)	=	0.058
MEAN LOWER LOW WATER (MLLW)	=	0.000
LOWEST OBSERVED WATER LEVEL (02/27/2002)	=	-0.490

National Geodetic Vertical Datum (NGVD 29)

Bench Mark Elevation Information In METERS above:

Stamping or Designation	MLLW	MHW
2245 A 1982	1.770	0.324
2245 B 1982	2.352	0.906
2245 C 1982	2.577	1.131
2245 D 1982	1.930	0.484
2245 E 1982	2.257	0.811

2.1.2.2 Attribute Accuracy Explanation

Station ID: 8662245 PUBLICATION DATE: 04/29/2003
Name: OYSTER LANDING, CRAB HAUL CREEK SOUTH CAROLINA
NOAA Chart: 11532 Latitude: 33° 21.1' N
USGS Quad: PLANTERSVILLE Longitude: 79° 11.2' W

D E F I N I T I O N S

Mean Sea Level (MSL) is a tidal datum determined over a 19-year National Tidal Datum Epoch. It pertains to local mean sea level and should not be confused with the fixed datums of North American Vertical Datum of 1988 (NAVD 88).

NGVD 29 is a fixed datum adopted as a national standard geodetic reference for heights but is now considered superseded. NGVD 29 is sometimes referred to as Sea Level Datum of 1929 or as Mean Sea Level on some early issues of Geological Survey Topographic Quads. NGVD 29 was originally derived from a general adjustment of the first-order leveling networks of the U.S. and Canada after holding mean sea level observed at 26 long term tide stations as fixed. Numerous local and wide-spread adjustments have been made since establishment in 1929. Bench mark elevations relative to NGVD 29 are available from the National Geodetic Survey (NGS) data base via the World Wide Web at National Geodetic Survey.

NAVD 88 is a fixed datum derived from a simultaneous, least squares, minimum constraint adjustment of Canadian/Mexican/United States leveling observations. Local mean sea level observed at Father Point/Rimouski, Canada was held fixed as the single initial constraint. NAVD 88 replaces NGVD 29 as the national standard geodetic reference for heights. Bench mark elevations relative to NAVD 88 are available from NGS through the World Wide Web at National Geodetic Survey.

NGVD 29 and NAVD 88 are fixed geodetic datums whose elevation relationships to local MSL and other tidal datums may not be consistent from one location to another.

The Vertical Mark Number (VM#) and PID# shown on the bench mark sheet are unique identifiers for bench marks in the tidal and geodetic databases, respectively. Each bench mark in either database has a single, unique VM# and/or PID# assigned. Where both VM# and PID# are indicated, both tidal and geodetic elevations are available for the bench mark listed.

The NAVD 88 elevation is shown on the Elevations of Tidal Datums Table Referred to MLLW only when two or more of the bench marks listed have NAVD 88 elevations. The NAVD 88 elevation relationship shown in the table is derived from an average of several bench mark elevations relative to tide station datum. As a result of this averaging, NAVD 88 bench mark elevations computed indirectly from the tidal datums elevation table may differ slightly from NAVD 88 elevations listed for each bench mark in the NGS database.

Jun 5 2006 13:35

**ELEVATIONS ON STATION DATUM
National Ocean Service (NOAA)**

Station: 8662245
Name: OYSTER LANDING, CRAB HAUL CREEK, SC
Status: Accepted

T.M.: 0 W
Units: Meters
Epoch: 1983-2001

Datum	Value	Description
MHHW	2.746	Mean Higher-High Water
MHW	2.638	Mean High Water
DTL	1.969	Mean Diurnal Tide Level
MTL	1.944	Mean Tide Level
MSL	2.007	Mean Sea Level
MLW	1.250	Mean Low Water
MLLW	1.192	Mean Lower-Low Water
GT	1.554	Great Diurnal Range
MN	1.389	Mean Range of Tide
DHQ	0.108	Mean Diurnal High Water Inequality
DLQ	0.058	Mean Diurnal Low Water Inequality
HWI	1.02	Greenwich High Water Interval (in Hours)
LWI	7.01	Greenwich Low Water Interval (in Hours)
NAVD		North American Vertical Datum
Maximum	3.420	Highest Water Level on Station Datum
Max Date	20010722	Date Of Highest Water Level
Max Time	02:12	Time Of Highest Water Level
Minimum	0.702	Lowest Water Level on Station Datum
Min Date	20020227	Date Of Lowest Water Level
Min Time	20:42	Time Of Lowest Water Level

To refer Water Level Heights to a Tidal Datum, apply the desired Datum Value.

Click [HERE](#) for further station information including New Epoch products.

To refer Water Level Heights to either
NGVD (National Geodetic Vertical Datum of 1929) or
NAVD (North American Vertical Datum of 1988), apply the values located at:
[National Geodetic Survey](#)

Harmonic Constants (P2)

- # -- Order in which NOS lists the constituents.
- Name -- Common name used to refer to a particular constituent, subscript refers to the number of cycles per day.
[Click here for definitions.](#)
- Ampl -- One-half the range of a tidal constituent.
- Epoch -- The phase lag of the observed tidal constituent relative to the theoretical equilibrium tide.
- Speed -- The rate change in the phase of a constituent, expressed in degrees per hour. The speed is equal to 360 degrees divided by the constituent period expressed in hours.

Please refer to the [Tide and Current Glossary](#) for definitions of terms.

Amplitudes are in Meters

Phases are in degrees, referenced to [Local Standard Time \(LST\)](#)

Latitude: 33° 21.1' N Longitude: 79° 11.2' W

8662245 Oyster Landing (North Inlet Estuary), SC

#	Name	Ampl	Epoch	Speed
1	M2	0.630	244.1	28.9841042
2	S2	0.099	273.1	30.0000000
3	N2	0.144	238.4	28.4397295
4	K1	0.102	138.0	15.0410686
5	M4	0.048	285.3	57.9682084
6	O1	0.077	146.8	13.9430356
7	M6	0.029	357.1	86.9523127
8	MK3	0.021	162.7	44.0251729
9	S4	0.002	170.6	60.0000000
10	MN4	0.019	297.2	57.4238337
11	NU2	0.022	214.0	28.5125831
12	S6	0.001	356.0	90.0000000
13	MU2	0.024	311.6	27.9682084
14	2N2	0.022	259.3	27.8953548
15	OO1	0.006	157.7	16.1391017
16	LAM2	0.017	209.7	29.4556253
17	S1	0.015	76.8	15.0000000
18	M1	0.007	147.5	14.4966939
19	J1	0.008	162.1	15.5854433
20	MM	0.000	0.0	0.5443747
21	SSA	0.053	50.0	0.0821373
22	SA	0.078	176.0	0.0410686
23	MSF	0.000	0.0	1.0158958
24	MF	0.000	0.0	1.0980331
25	RHO	0.002	126.1	13.4715145
26	Q1	0.018	154.8	13.3986609
27	T2	0.007	258.1	29.9589333
28	R2	0.009	117.4	30.0410667
29	2Q1	0.004	101.1	12.8542862
30	P1	0.031	139.2	14.9589314
31	2SM2	0.003	304.1	31.0158958
32	M3	0.006	287.9	43.4761563
33	L2	0.064	237.7	29.5284789
34	2MK3	0.018	175.7	42.9271398
35	K2	0.027	271.3	30.0821373
36	M8	0.001	284.1	115.9364166
37	MS4	0.018	345.5	58.9841042

2.2 Logical Consistency Report: not applicable

2.3 Completeness Report:

Month	Year	Dates of month with Data	Entire Month	Partial Month	NOS Web Final
May	2001	31st		X	Yes
Jun	2001	1st to 30th	X		Yes
July	2001	1st to 31st	X		Yes
Aug	2001	1st to 31st	X		Yes
Sep	2001	1st to 30th	X		Yes
Oct	2001	1st to 31st	X		Yes
Nov	2001	1st to 30th	X		Yes
Dec	2001	1st to 31st	X		Yes
Jan	2002	1st to 31st	X		Yes
Feb	2002	1st to 30th	X		Yes
Mar	2002	1st to 31st	X		Yes
Apr	2002	1st to 30th	X		Yes
May	2002	1st to 31st	X		Yes
Jun	2002	1st to 30th	X		Yes
July	2002	1st to 11th		X	Yes
Aug	2002	No Data			No Data
Sep	2002	No Data			No Data
Oct	2002	Bad Data			No Data
Nov	2002	Bad Data			No Data
Dec	2002	Bad Data			No Data
Jan	2003	No Data			No Data
Feb	2003	19th to 28th		X	Yes
Mar	2003	1st to 31st	X		Yes
Apr	2003	1st to 30th	X		Yes
May	2003	1st to 31st	X		Yes
Jun	2003	1st to 20th		X	Data On Preliminary Page
July	2003	Bad Data			No Data
Aug	2003	Bad Data			No Data
Sep	2003	Bad Data			No Data
Oct	2003	Bad Data			No Data
Nov	2003	Bad Data			No Data
Dec	2003	Bad Data			No Data
Jan	2004	Bad Data			No Data
Feb	2004	Bad Data			No Data
Mar	2004	Bad Data			No Data
Apr	2004	Bad Data			No Data
May	2004	Bad Data			No Data
Jun	2004	Bad Data			No Data
July	2004	20th-31st		X	Yes
Aug	2004	1st to 31st	X		Yes
Sep	2004	1st to 30th	X		Yes
Oct	2004	1st to 31st	X		Yes
Nov	2004	1st to 30th	X		Yes
Dec	2004	1st to 31st	X		Yes
Jan	2005	1st to 31st	X		Yes
Feb	2005	1st to 28th	X		Yes
Mar	2005	1st to 31st	X		Yes
Apr	2005	1st to 30th	X		Yes
May	2005	1st to 31st	X		Yes
Jun	2005	1st to 30th	X		Yes
July	2005	1-9; 24-30		X	Yes
Aug	2005	3-6; 21-23,31		X	Yes
Sep	2005	1st to 30th	X		Yes
Oct	2005	1-3; 24-31		X	Yes
Nov	2005	1st to 30th	X		Yes
Dec	2005	1st to 31st	X		Yes

Month	Year	Dates of month with Data	Entire Month	Partial Month	NOS	Web	Final
Jan	2006	1st to 31st	X				Yes
Feb	2006	1st to 28th	X				Yes
Mar	2006	1st to 31st	X				Yes
Apr	2006	1st to 30th	X				Yes
May	2006	1st to 31st	X				Yes
Jun	2006	1st to 30th	X				Yes
July	2006	1st to 31st	X				Yes
Aug	2006	1st to 31st	X				Yes
Sep	2006	1st to 30th	X				Yes
Oct	2006	1-9; 13-21; 31		X			Yes
Nov	2006	1st to 30th	X				Yes
Dec	2006	1st to 31st	X				Yes
Jan	2007	All months	Entire Year Complete				Yes
Jan	2008	All months	Entire Year Complete				Yes
Jan	2009	1st to 31st	X				Yes
Feb	2009	1st to 28th	X				No

2.5.1 Methodology

2.5.1.1 Methodology Type: Field Collection Procedures and Protocols

2.5.1.3 Methodology Description: Tide Gauge Data Field Collection Protocol

The tide gauge measures water level in reference to MLLW in Crabhaul Creek (Oyster Landing Pier) every six minutes. The data are transmitted to NOAA via NOAA's Geostationary Operational Environmental Satellites (GOES), making the data available on-line in near real-time (one hour delay). Data are available to the public, and are useful in showing tidal anomalies, observing sea level rise, and modeling local phenomenon in North Inlet Estuary. This state-of-the art tide gauge is accurate to ± 3 mm with a resolution of ± 1 mm. The gauge is part of the NOS's (National Ocean Service) National Water Level Observation Network (NWLON); NOS oversees all data management. The National Tidal Datum Epoch has been updated to the 1983-01 epoch on April 21, 2003.

The initial Vitel water level gauge was installed on May 31st, 2001 and was sending data to the GOES every 3 hours. This gauge had been hit twice by lightning and never worked with stability after those hits. A new Sutron 9210 "hydro" system was installed on October 5, 2005 and its system was scheduled to send data to the GOES every hour.

2.5.2.1 Process Description: 2009 Data Rescue Process

All final monthly data graphics and documentation files (including this document) were archived in the NIWaterLevel.2001-2008.FINAL Directory on CD, Baruch's Server, and Baruch's website as part of the final, published database.

2.5.2.3 Process Date: 20090306

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:

This information is available on each NOAA/NOS/CO-OPS data table.

5.2.2 Entity and Attribute Detail Citation:

Definitions were developed and maintained by NOAA/NOS/CO-OPS. However, many of the entity type definitions are standard for the field of oceanography.

6. Distribution Information

6.1 Distributor:

10.2 Contact Organization Primary

10.1.2 Contact Organization: NOAA/NOS/CO-OPS

10.1.1 Contact Person: Stephen Lyles

10.3 Contact Position: Data Manager

10.4 Contact Address

10.4.1 Address Type: Mailing Address

10.4.2 Address: Center for Operational Oceanographic Products and Services

10.4.2 Address: 1305 East-West Highway

10.4.3 City: Silver Spring

10.4.4 State or Province: Maryland

10.4.5 Postal Code: 20910-3281

10.4.6 Country: USA

10.5 Contact Voice Telephone: (301) 713-2877

10.7 Contact Facsimile Telephone: (301) 713-4436

6.2 Resource Description:

Dataset Identification

Oyster Landing tide gauge

Crab Haul Creek water level

Tide Gauge Station 8662245 database

North Inlet Estuary tide level Database

NWLON Station 8662245

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. Careful attention should be paid to the contents of the metadata file associated with these data.

According to the National Ocean Service (NOS) Center for Operational Oceanographic Products and Services (CO-OPS): The information on government servers are in the public domain, unless specifically annotated otherwise, and may be used freely by the public. Before using information obtained from this server, special attention should be given to the date and time of the data and products being displayed. This information shall not be modified in content and then presented as official government material. The user assumes the entire risk related to its use of these data. NOS is providing these data "as is," and NOS disclaims any and all warranties, whether express or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose. In no event will NOS be liable to you or to any third party for any direct, indirect, incidental, consequential, special or exemplary damages or lost profit resulting from any use or misuse of this data. NOS requests that attribution be given whenever NOS material is reproduced and re-disseminated. Pursuant to 17 U.S.C. 403, third parties producing copyrighted (compilation) works consisting predominantly of material created by Federal Government employees are encouraged to provide notice with such work(s) identifying the U.S. Government material incorporated and stating that such material is not subject to copyright protection.

6.4 Standard Order Process

6.4.2. Digital Form

6.4.2.1 Digital Transfer Information

6.4.2.1.1 Format Name: .TXT (text only), html, and jpg.

6.4.2.1.2 Format Version Number: unknown

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://tidesandcurrents.noaa.gov/>

6.4.3 Fees: None

7. Metadata Reference Information

7.1 Metadata Date: 20060605

7.2 Metadata Review Date: 20060612

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

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

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