

## Important!

This is the “Long-Term *Spartina alterniflora* biomass, productivity, porewater chemistry and marsh elevation in North Inlet Estuary, Georgetown, SC: 1984-2015” *original metadata*, created 3/17/2004 by Ginger Ogburn-Matthews. *Links and email addresses* in this document *have not been updated* as those locations and people may no longer be available. The data referred to have been updated through 2015.

The *condensed metadata* may be accessed at:

[http://links.baruch.sc.edu/data/accessfiles/condensed\\_metadata/Spartina\\_alterniflora\\_Biomass\\_productivity\\_porewater\\_chemistry\\_and\\_marsh\\_elevation.zip](http://links.baruch.sc.edu/data/accessfiles/condensed_metadata/Spartina_alterniflora_Biomass_productivity_porewater_chemistry_and_marsh_elevation.zip)

Because it is condensed, please consult this original metadata for additional information and more extensive description.

**Questions about the data should be addressed to the data manager identified on the *condensed metadata* form.**

## 1. Identification Information

### 1.1 Citation Information

**8.1 Originator:** Dr. James Morris

**8.1 Originator:** Betsy Haskin

**8.1 Originator:** Robin L. Krest

**8.1 Originator:** Warren Hankinson

**8.1 Originator:** Karen Sundberg

**8.1 Originator:** Diana Rodriguez

**8.2 Publication Date:** 20151231

**8.4 Title:** Long-Term *Spartina alterniflora* biomass, productivity, porewater chemistry and marsh elevation in North Inlet Estuary, Georgetown, SC: 1984-2015.

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

### 8.8 Publication Information:

**8.8.1 Publication Place:** Georgetown, South Carolina USA

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

**8.9 Other Citation Details:** Portions of these data are contributions to the Long-Term Ecological Research (LTER) program and the Long-Term Research in Environmental Biology (LTREB) program; see other North Inlet LTER and other LTREB datasets listed in Cross Reference. The 1984-1991 data were previously published and documented on the LTER web site (<http://www.lternet.edu>) as: NIN007 – *Spartina* Production.

**8.10 Online linkage:** <http://links.baruch.sc.edu/Data/NISpartina/index.html>

### 1.2 Description

**1.2.1 Abstract:** The salt marsh in the North Inlet estuary was sampled approximately monthly for estimates of biomass, productivity, porewater chemistry, and salt marsh elevation. Beginning in 2003, snail densities were also recorded. The sampling sites were dominated by *Spartina alterniflora*. Sampling plots were initially located in the low- and high-marsh at Oyster Landing (OL) and Goat Island (GI). Annual productivity is determined from non-destructive aboveground biomass measurements at five plot sites. Two plot sites are in the low marsh (one each at OL & GI); three sites are high marsh (one at OL & two at GI). The additional GI high marsh site is fertilized with nitrogen and phosphorus. Measurements for biomass and productivity began in May 1984 (GI) or July 1986 (OL). Beginning in 1993, nutrient (PO<sub>4</sub>, NH<sub>4</sub>, S<sub>2</sub>, Cl and Fe<sub>2</sub>) concentrations of porewater samples collected with permanent equilibrators were determined at the same five biomass and productivity sites; a sixth porewater site (DB) was located in a high-marsh dieback on Sixty Bass Creek beginning in 2006. Surface Elevation Tables (SET) were used to measure changes in the elevation of the marsh surface at Goat Island high- and low-marsh plots beginning in 1996.

**1.2.2 Purpose:** The purpose of this project is the long term study of *Spartina alterniflora* and nutrients in salt marsh ecosystems. Specifically, the measurement of biomass, production, and stem density in various marsh sites is used to understand long-term patterns of *Spartina* growth and to relate these patterns to other factors such as sea level, climate, pore water nutrients and marsh elevation.

### 1.2.3. Supplemental Information:

The original LTER data from 1984-1991 were published to the LTER web site in 1992, with the following file names:

LTER.NIN.SPARTINA.CENSUS92  
LTER.NIN.SPARTINA.COSM49  
LTER.NIN.SPARTINA.LTER66

This metadata file refers to the following datafiles available on the Baruch Data website:

North Inlet\_planthts\_1984-2015.csv  
North Inlet\_biomass\_1984-2015.csv  
North Inlet\_productivity\_1984-2015.csv  
North Inlet\_porewater\_1993-2015.csv  
North Inlet\_elevationchange\_1996-2015.csv  
North inlet\_snails\_2003-2015.xlsx

Additional data processing information (executable and source files) is archived internally at the Baruch Institute.

### **Publications:**

James T. Morris and Betsy Haskin. 1990. A 5-yr Record of Aerial Primary Production and Stand Characteristics of *Spartina alterniflora*. *Ecology*. Vol. 71(6): 2209-2217.

Morris, J.T., B. Kjerfve, J.M. Dean. 1990. Dependence of estuarine productivity on anomalies in mean sea level. *Limnol. Oceanogr.* 35: 926-930.

Morris, J.T. 2000. Effects of sea level anomalies on estuarine processes. Pp. 107-127. In: J. Hobbie (ed.), *Estuarine Science: A Synthetic Approach to Research and Practice*. Island Press. 539 pp.

James T. Morris, P.V. Sundareshwar, Christopher T. Nietch, Bjorn Kjerfve, D.R. Cahoon. 2002. Responses of Coastal Wetlands to Rising Sea Level. *Ecology*. Vol. 83(10): 2869-2877.

Morris, J. T. 2005. Effects of changes in sea level and productivity on the stability of intertidal marshes, p. 121-127. In [eds.], P. Lasserre, P. Viaroli, and P. Campostrini *Lagoons and coastal wetlands in the global change context: Impacts and management issues*, Proceedings of the International Conference. ICAM Dossier N°3, UNESCO.

Morris, J.T., D. Porter, M., Neet, P. A. Noble, L. Schmidt, L. A. Lapine, and J. Jensen. 2005. Integrating LIDAR, multispectral imagery and neural network modeling techniques for marsh classification. *Int. J. Remote Sensing* 26:5221-5234.

Morris, J.T. 2006. Competition among marsh macrophytes by means of geomorphological displacement in the intertidal zone. *Estuarine Coastal and Shelf Science* (3-4): 395-402.

Morris, J. T. 2007. Ecological engineering in intertidal saltmarshes. *Hydrobiologia*. 577: 161-168.

Morris, J. T. 2007. Estimating net primary production of salt-marsh macrophytes, p. 106-119. In [eds.], T. J. Fahey and A. K. Knapp *Principles and Standards for Measuring Primary Production*. Oxford University.

Bernot, MJ; Bernot, RJ; Morris, JT. 2009. Nutrient cycling relative to delta N-15 and delta C-13 natural abundance in a coastal wetland with long-term nutrient additions. *Aquatic Ecology*. 43(4):803-813.

Kiehn, WM; Morris, JT. 2009. Relationships between *Spartina alterniflora* and *Littoraria irrorata* in a South Carolina Salt Marsh. *Wetlands* 29(3): 818-825.

Kirwan, ML; Guntenspergen, GR; Morris, JT. 2009. Latitudinal trends in *Spartina alterniflora* productivity and the response of coastal marshes to global change. *Global Change Biology* 15(8): 1982-1989.

Mudd, SM; Howell, SM; Morris, JT. 2009. Impact of dynamic feedbacks between sedimentation, sea-level rise, and biomass production on near-surface marsh stratigraphy and carbon accumulation. *Estuarine Coastal and Shelf Science* 82(3): 377-389.

Kiehn, W.M. and J.T. Morris. 2010. Variability in Dimethylsulfoniopropionate (DMSP) in *Spartina alterniflora* and its effect on *Littoraria irrorata*. *Marine Ecology Progress Series* 406:47-55.

Kirwan, M.I., G.R. Guntenspergen, A. D'Alpaos, J.T. Morris, S.M. Mudd and S. Temmerman 2010. Limits on the adaptability of coastal marshes to rising sea level. *Geophysical Research Letters* 37 (23) L23401.

Mudd, SM; A. D'Alpaos and J.T. Morris 2010. How does vegetation affect sedimentation on tidal marshes? Investigating particle capture and hydrodynamic controls on biologically mediated sedimentation. *Journal of Geophysical Research-Earth Surface* 115 (F3) F03029.

Davey, E., C. Wigand, R. Johnson, K.L. Sundberg, J.T. Morris and C.T. Roman 2011. Use of computed tomography imaging for quantifying coarse roots, rhizomes, peat, and particle densities in marsh soils. *Ecological Applications* 21(6):2156-2171.

Wilson, A.M. and J.T. Morris 2012. The influence of tidal forcing on groundwater flow and nutrient exchange in a salt marsh-dominated estuary. *Biogeochemistry* 108:27-38.

Morris, J.T., Edwards, J., Crooks, S., Reyes, E. 2012. Assessment of Carbon Sequestration Potential in Coastal Wetlands. Pp 517-532. In: *Recarbonization of the Biosphere: Ecosystem and Global Carbon Cycle*. R. Lal, K. Lorenz, R. Hüttel, B. U. Schneider, J. von Braun (eds). Springer.

Hughes, A.L.H., A.M. Wilson and J.T. Morris. 2012. Hydrologic variability in a salt marsh: Assessing the links between drought and acute marsh dieback. *Estuarine, Coastal and Shelf Science* 111:95-106.

Hagen, SC, JT Morris, P Bacopoulos, and JF. Weishampel. 2013 Sea-Level Rise Impact on a Salt Marsh System of the Lower St. Johns River. *J Waterway, Port and Ocean Engineering*, 139(2):118-125.

Ibanez, C. J.T. Morris, I.A. Mendelsohn, and J.W. Day, Jr. 2012. Coastal Marshes, pp. 129-163 in Day et al. (eds). *Estuarine Ecology*. Wiley-Blackwell.

Morris, J.T., Edwards, J., Crooks, S. and, Reyes, E 2012. Assessment of Carbon Sequestration Potential in Coastal Wetlands. In: *Recarbonization of the Biosphere: Ecosystem and Global Carbon Cycle*. R. Lal, K. Lorenz, R. Hüttel, B. U. Schneider, J. von Braun (eds). Springer.

Voss, C.M., R.R. Christian, J.T. Morris. 2013. Marsh macrophyte responses to inundation anticipate impacts of sea-level rise and indicate ongoing drowning of North Carolina marshes. *Mar. Biol.* 160:181-194.

Morris, J.T., G.P Shaffer and J.A. Nyman. 2013. Brinson Review: Perspectives on the influence of nutrients on the sustainability of coastal wetlands. *Wetlands* 33:975-988.

Morris, J.T., K.L. Sundberg and C.S. Hopkins. 2013. Salt marsh primary production and its responses to relative sea level and nutrients in estuaries at Plum Island, Massachusetts, and North Inlet, South Carolina, USA. *Oceanography* 26(3): 78-84.

Smith, M.D., K.J. La Pierre, S.L. Collins, A.K. Knapp, K.L. Gross, J.E. Barrett, S.D. Frey, L. Gough, R.J. Miller, J.T. Morris, L.E. Rustad and J. Yarie. 2015. Global environmental change and the nature of aboveground net primary productivity responses: insights from long-term experiments. *Oecologia* 177:935-947.

Wigand, C., E. Davey, R. Johnson, K. Sundberg, J. Morris, P. Kenny, E. Smith and M. Holt. 2015. Nutrient effects on belowground organic matter in a minerogenic salt marsh, North Inlet, SC. *Estuaries and Coasts* 38: 1838-1853.

### 1.3 Time Period of Content:

#### 9.3 Range of Dates/Times

9.3.1 Beginning Date: 19840501

9.3.3 Ending Date: 20151231

#### 1.3.1 Currentness Reference:

In the 1980's there was up to a six months lag time from the time that the samples were collected and analyzed to the time that the final yearly data were published. Raw numbers from data books were entered into mainframe accounts. The numbers were verified, edited, finalized, and then run through Statistical Analysis System (SAS) programs to obtain final values. As of the mid-1990s, the databases are all cumulative and are updated once annually, usually in the winter. Study and data collection are ongoing as of Jan 2016.

### 1.4 Status:

1.4.1 Progress: In Work

1.4.2 Maintenance and update frequency: Annually

### 1.5 Spatial Domain:

**99.1.5.1 Description of Geographic Extent:** The North Inlet Estuary is located on the southeastern coast of the United States, approximately 10 kilometers east of Georgetown, South Carolina. The North Inlet Estuary lies east of the uplands of Hobcaw Barony (also known as the Belle W. Baruch Property). To the north of the Estuary is the Debordieu Colony Property. North Inlet Estuary is a bar-built Class C type estuary (Pritchard, 1955) and is a relatively small tidal estuary (area = 2630 hectares). It is composed of numerous winding tidal creeks dominated by *Spartina alterniflora* and is considered a pristine tidal estuary due to minimal anthropogenic impacts. The watershed drains a 24.8 square kilometer area of mostly pine forest and a moderately developed residential watershed to the north.

**Individual Sampling Site Information:** Sampling for the LTREB *Spartina* project takes place at three locations: Goat Island, Oyster Landing, and Sixty Bass Creek (site of a marsh dieback). The Goat Island sites (33° 19.88'N, 79° 11.87'W) are accessible from Clambank Rd. about 1/2 mile south of Clambank Landing. A board walk connects the high marsh site and the low marsh site. Oyster Landing is accessible from the Baruch Marine Field Laboratory. The high marsh site (33° 21.08'N, 79° 11.52'W) is located on the north side of the causeway which leads to the landing. The low marsh site (33° 20.88'N, 79° 11.36'W) is just south of the pier. The dieback site (33° 19.33'N, 79° 11.39'W) at Sixty Bass Creek is accessible by boat from Clambank Landing.

#### 1.5.1 Bounding Coordinates:

1.5.1.1 West Bounding Coordinate: -79.20

1.5.1.2 East Bounding Coordinate: -79.18

1.5.1.3 North Bounding Coordinate: 33.35

1.5.1.4 South Bounding Coordinate: 33.32

### 1.6 Keywords

#### 1.6.1 Theme

1.6.1.1 Theme Keyword Thesaurus: None

1.6.1.2 Theme Keyword: estuary

1.6.1.2 Theme Keyword: salt marsh

1.6.1.2 Theme Keyword: above ground biomass

1.6.1.2 Theme Keyword: primary production

1.6.1.2 Theme Keyword: annual productivity

1.6.1.2 Theme Keyword: LTER

1.6.1.2 Theme Keyword: LONG-TERM ECOLOGICAL RESEARCH

1.6.1.2 Theme Keyword: long term

1.6.1.2 Theme Keyword: marsh

1.6.1.2 Theme Keyword: pore water chemistry

1.6.1.2 Theme Keyword: nutrients

1.6.1.2 Theme Keyword: marsh elevation

1.6.1.2 Theme Keyword: sedimentation erosion table (SET)

1.6.1.2 Theme Keyword: surface elevation table (SET)

1.6.1.2 Theme Keyword: LTREB

**1.6.1.2 Theme Keyword:** LONG-TERM RESEARCH IN ENVIRONMENTAL BIOLOGY

**1.6.2 Place**

- 1.6.2.1 Place Keyword Thesaurus:** None
- 1.6.2.2 Place Keyword:** North Inlet Estuary
- 1.6.2.2 Place Keyword:** South Carolina
- 1.6.2.2 Place Keyword:** Georgetown
- 1.6.2.2 Place Keyword:** southeast
- 1.6.2.2 Place Keyword:** United States
- 1.6.2.2 Place Keyword:** Atlantic coast

**1.6.3 Stratum**

- 1.6.3.1 Stratum Keyword Thesaurus:** None
- 1.6.3.2 Stratum Keyword:** above ground
- 1.6.3.2 Stratum Keyword:** below ground
- 1.6.3.2 Stratum Keyword:** marsh surface
- 1.6.3.2 Stratum Keyword:** high marsh
- 1.6.3.2 Stratum Keyword:** low marsh

**1.6.4 Temporal**

- 1.6.4.1 Temporal Keyword Thesaurus:** None
- 1.6.4.2 Temporal Keyword:** 1984
- 1.6.4.2 Temporal Keyword:** 1985
- 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:** 1980s
- 1.6.4.2 Temporal Keyword:** 1990
- 1.6.4.2 Temporal Keyword:** 1991
- 1.6.4.2 Temporal Keyword:** 1992
- 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:** 1997
- 1.6.4.2 Temporal Keyword:** 1998
- 1.6.4.2 Temporal Keyword:** 1999
- 1.6.4.2 Temporal Keyword:** 1990s
- 1.6.4.2 Temporal Keyword:** 2000
- 1.6.4.2 Temporal Keyword:** 2001
- 1.6.4.2 Temporal Keyword:** 2002
- 1.6.4.2 Temporal Keyword:** 2003
- 1.6.4.2 Temporal Keyword:** 2004
- 1.6.4.2 Temporal Keyword:** 2005
- 1.6.4.2 Temporal Keyword:** 2006
- 1.6.4.2 Temporal Keyword:** 2007
- 1.6.4.2 Temporal Keyword:** 2008
- 1.6.4.2 Temporal Keyword:** 2009
- 1.6.4.2 Temporal Keyword:** 2010
- 1.6.4.2 Temporal Keyword:** 2011
- 1.6.4.2 Temporal Keyword:** 2012
- 1.6.4.2 Temporal Keyword:** 2013
- 1.6.4.2 Temporal Keyword:** 2014
- 1.6.4.2 Temporal Keyword:** 2015

**1.6.4.2 Temporal Keyword:** year

**99.1.6.5 Taxonomy**

#### **99.1.6.5.1 Keywords/Taxon**

**99.1.6.5.2 Taxonomic Keyword Thesaurus:** NONE

**99.1.6.5.2 Taxonomic Keywords:** Poaceae

**99.1.6.5.2 Taxonomic Keywords:** Grasses

**99.1.6.5.2 Taxonomic Keywords:** Spartina

**99.1.6.5.2 Taxonomic Keywords:** Spartina alterniflora

**99.1.6.5.2 Taxonomic Keywords:** smooth cordgrass

**99.1.6.5.2 Taxonomic Keywords:** saltmarsh cordgrass

**99.1.6.5.2 Taxonomic Keywords:** Atlantic cordgrass

**99.1.6.5.2 Taxonomic Keywords:** Marsh periwinkle

**99.1.6.5.2 Taxonomic Keywords:** Common marsh snail

#### **99.1.7.4 Taxonomic Classification**

**99.1.7.4.1 Taxon Rank Name:** Kingdom

**99.1.7.4.2 Taxon Rank Value:** Plantae

### **1.7 Access Constraints:**

None; however, it is strongly recommended that these data be acquired directly from the Belle W. Baruch Institute for Marine Biology and Coastal Research 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 Biology and Coastal Research, 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 Baruch Institute

**10.2.2 Contact Person:** Dr. Jim Morris

**10.3 Contact Position:** Director

#### **10.4 Contact Address**

**10.4.1 Address Type:** Mailing Address

**10.4.2 Address:** Baruch Institute

**10.4.2 Address:** University of South Carolina

**10.4.3 City:** Columbia

**10.4.4 State or Province:** South Carolina

**10.4.5 Postal Code:** 29208

**10.4.6 Country:** USA

**10.5 Contact Voice Telephone:** (803) 777-3916

**10.8 Contact Electronic Mail Address:** morris@biol.sc.edu

### **1.11 Data Set Credit:**

During 1984-1992, funding was provided by the National Science Foundation, grants DEB 8012165 and BSR 8514326, to the North Inlet Long-Term Ecological Research (LTER) Program, Belle W. Baruch Institute, University of South Carolina, Dr. F. J. Vernberg, as project director. During 1992-2010 funding was provided by NSF LTREB grants IBN 0316429, IBN 9816157, and IBN 9306855, to Dr. J. Morris. During 2011-2015 funding was provided by NSF LTREB grant DEB-1052636. Numerous technicians, students, and data managers have contributed to these datasets.

### **1.13 Native Data Set Environment**

From 1989 through 1995, raw and analyzed data were stored on a SUN workstation in the Data Management office of the Baruch Institute in Georgetown and on a SUN and PC in Columbia, with 8 mm tape backups of all the data in Columbia. After 1995, data were stored on PCs in Excel and text formats. Raw data sheets were stored in Columbia or Georgetown.

#### 1.14 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, Clemson University

**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 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 National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP), but the data are not considered official SWMP data until the year 2000. This metadata document was produced by Baruch's Data Managers, and is independent of the NERR/CDMO version of the data and metadata.

**8.10 Online linkage:** <http://links.baruch.sc.edu/Data/RAINDAZE/RAINDAZEhome.htm>

#### 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

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

**8.9 Other Citation Details:** LTER Data Set Code: NIN001

**8.10 Online Linkage:** <http://links.baruch.sc.edu/Data/LTERMET/ltermet.htm>

#### 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

**8.9 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), but the data were not considered official SWMP data until the year 2000. 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/NERRMET/NERRmet.htm>

#### 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:** 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

**8.1 Originator:** Jennifer Jarrell

**8.2 Publication Date:** 20060331

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

**8.5 Edition:** Second Edition

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

#### 8.7 Series Information

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

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

#### 8.8 Publication Information:

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

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

**8.9 Other Citation Details:** These data were collected under the auspices and protocols of the National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP) for the North Inlet – Winyah Bay Reserve, which is hosted by the Baruch Marine Field Lab. This metadata document was produced by Baruch's data managers, to the Baruch Institute's data management standards. Both data and metadata may vary from the NERR/CDMO versions.

**8.10 Online linkage:** <http://links.baruch.sc.edu/Data/NERRMET.2000-2004/NERRmet.2000-2004.htm>

#### 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:** comma separated and tab-delimited digital data (spreadsheet)

**8.8 Publication Place:** Georgetown, South Carolina

**8.8.1 Publisher:** NERR Centralized Data Management Office

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

#### 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

**8.9 Other Citation Details:** LTER Data Set Codes: NIN003, NIN004, NIN005; Datasets were merged together

**8.10 Online Linkage:** <http://links.baruch.sc.edu/Data/LTERDWS/LTERDWSIntroPage.htm>

#### 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

**8.2 Publication Date:** 20030328

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

**8.5 Edition:** Second Edition

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

**8.7 Series Information**

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

**8.7.2 Issue Identification:** June 30, 1993 - December 31, 2001

**8.8 Publication Information:**

**8.8.1 Publication Place:** Georgetown, South Carolina, USA

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

**8.9 Other Citation Details:** These data were collected under the auspices and protocols of the North Inlet-Winyah Bay NERR. The National Estuarine Research Reserve's (NERR's) System-Wide Monitoring Program (SWMP) began their own protocols in the year 2002.

**8.10 Online linkage:** <http://links.baruch.sc.edu/Data/NERRWCHEM/NERRWCHEM.IntroPage.htm>

#### 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 Keessee

**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:** 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/QueryPages/data\\_metadata\\_select.cfm](http://cdmo.baruch.sc.edu/QueryPages/data_metadata_select.cfm)

**8.11 Larger Work Citation:**

**8. Citation Information:**

**8.1 Originator:** National Oceanic and Atmospheric Administration (NOAA)

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

**8.1 Originator:** National Estuarine Research Reserve System (NERR)

**8.2 Publication Date:** 1995

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

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

**8.8 Publication Information:**

**8.8.1 Publication Place:** Georgetown, South Carolina

**8.8.2 Publisher:** NERR Centralized Data Management Office

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

## 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

**8.2 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.

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

#### 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/WATQUAL93-02/WATQUAL93-02.html>

## 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:** Erik Smith

**8.2 Publication Date:** 2005

**8.4 Title:** North Inlet - Winyah Bay (NIW) National Estuarine Research Reserve (NERR) Estuarine Water Quality Data for the North Inlet and Winyah Bay Estuaries, Georgetown, South Carolina: 2003-04

**8.6 Geospatial Data Presentation Form:** 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/QueryPages/data\\_metadata\\_select.cfm](http://cdmo.baruch.sc.edu/QueryPages/data_metadata_select.cfm)

#### 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/> and <http://nerrs.noaa.gov/Monitoring/History.html>

## 2. Data Quality Information

### 2.1 Attribute Accuracy

#### 2.1.1 Attribute Accuracy Report:

Plant heights were measured in centimeters. Plant biomass and productivity are calculated and are expressed to the nearest whole gram. Porewater chemistries and nutrients are measured in microMoles per Liter, with chlorinity measured in g/L.

Various standard operating procedures were taken to monitor the operation of the Technicon, Bran+Luebbe and Lachat Auto Analyzers, the chloridometer and spectrophotometers. Standard curves were analyzed in order to insure linearity and instrument stability.

## 2.1.2 Quantitative Attribute Accuracy Assessment

### 2.1.2.1 Attribute Accuracy Value

Attribute	Range of Accuracy	Number of Decimal Places
Plant height	± 0.5 centimeter	0
Biomass	± 1 grams per square meter	0
annual productivity	± 0.5 grams per square meter per year	1
annual productivity stderr	± 0.5 grams per square meter per year	1
Depth	± 1 centimeters	0
PO4	± 0.5 micromoles per liter	1
NH4	± 0.5 micromoles per liter	1
S2	± 0.5 micromoles per liter	1
Cl	± 0.5 grams per liter	1
Fe2	± 0.5 micromoles per liter	1
Elev change	± 0.05 centimeters	1
Elev change stderr	± 0.05 centimeters	1

**2.1.2.2 Attribute Accuracy Explanation:** not available

## 2.2 Logical Consistency Report:

Measured concentrations less than or equal to the minimum detection limit for Salinity, Orthophosphate, Ammonium, Sulfide, Chloride or Iron are reported as the minimum detection limit of the technique. The minimum limits of detection are as follows: Salinity=0.5 ppt; Orthophosphate = 0.1 uM; Ammonium = 0.1 uM; Sulfide = 0.134 uM; Chloride = 0.212 g/L; Iron = 0.3 uM.

## 2.3 Completeness Report:

### General Information:

The MS Excel data files are verified for typographical errors by the Data Manager which is the research technician.

### Missing Data:

Missing data values are represented by blank cells. Missing values are usually a result of aborted samplings (weather or equipment problems) or due to samples being lost or contaminated.

## 2.5 Lineage

### 99.2.5.1 Methodology

**99.2.5.1.1 Methodology Type:** Plant height, biomass and productivity determinations

### Relevant Datafiles:

North Inlet\_planths\_1984-2015.csv  
 North Inlet\_biomass\_1984-2015.csv  
 North Inlet\_productivity\_1985-2015.csv

### 99.2.5.1.3 Methodology Description:

**Field Methods:** Duplicate sampling quadrats (10cmx10cm, 10cmx15cm or 20cmx20cm) are permanently installed within triplicate m2 plots at each of five sites on the marsh surface in North Inlet, SC. Plants within each quadrat are tagged, and plant heights are measured monthly. Three plots at one of the sites are fertilized every other month with NH4NO3 and P2O5 for a final annual application rate of 26.7 mol N/m2/y and 12.3 mol P/m2/y.

**Data Processing Methods:** Individual plant heights are entered into an ACCESS database which compiles and outputs stem height data. The data outputs are analyzed with Fortran programs which utilize a series of algorithms to convert plant height to plant biomass for each stem. The Fortran programs also compute plant biomass, plant density and plant growth for each quadrat. SAS is used to further analyze the data generated by the Fortran programs. As of the year 2015, the

computer is a 3.4 GHz machine running Windows 7 with SAS Release 9.4 64-bit. The ACCESS data base and Fortran programs are archived annually with the Baruch Institute data manager.

#### **99.2.5.1.4 Methodology Citation:**

### **8. Citation Information**

**8.1 Originator:** James T. Morris

**8.1 Originator:** Betsy Haskin

**8.2 Publication Date:** 1990

**8.4 Title:** A 5-yr Record of Aerial Primary Production and Stand Characteristics of *Spartina alterniflora*

**8.6 Geospatial Data Presentation Form:** journal article

**8.8 Publication Information:**

**8.8.1 Publication Place:** Washington, DC, USA

**8.8.2 Publisher:** Ecological Society of America

**8.9 Other Citation Details:** Ecology. Vol. 71, No. 6 (Dec., 1990), pp. 2209-2217

### **2.5.1 Methodology**

**99.2.5.1.1 Methodology Type:** Snail density determinations

#### **Relevant Datafiles:**

North Inlet\_snails\_2003-2015

#### **99.2.5.1.3 Methodology Description:**

**Field Methods:** Duplicate sampling quadrats (10cmx10cm, 10cmx15cm or 20cmx20cm) are permanently installed within triplicate m<sup>2</sup> plots at each of five sites on the marsh surface in North Inlet, SC. Plants within each quadrat are tagged.

Beginning in 2003, observations of snails within the plot were initiated. The species of snail, location (plant or ground), plant vitality (live or dead) and plant ID are recorded monthly. Three plots at one of the sites are fertilized every other month with NH<sub>4</sub>NO<sub>3</sub> and P<sub>2</sub>O<sub>5</sub> for a final annual application rate of 26.7 mol N/m<sup>2</sup>/y and 12.3 mol P/m<sup>2</sup>/y.

**Data Processing Methods:** Snail observations are entered into an ACCESS database programs. As of the year 2015, computer is a 3.4 GHz machine running Windows 7. The ACCESS data is archived annually with the Baruch Institute data manager.

### **2.5.1 Methodology**

**99.2.5.1.1 Methodology Type:** Porewater chemistry collection and analysis

**Relevant Datafile:** North Inlet\_porewater\_1993-2015.csv

#### **99.2.5.1.3 Methodology Description:**

**Field Methods:** Triplicate porewater diffusion samplers are permanently installed on the marsh platform in fertilized (26.7 mol N/m<sup>2</sup>/y and 12.3 mol P/m<sup>2</sup>/y) or control plots in a *Spartina alterniflora*-dominated salt marsh in North Inlet, SC.

22mL scintillation vials were attached to 1.5m PVC poles at 10, 25, 50, 75, and 100cm depths. Vials were filled with deionized water and covered with nitex mesh. Samplers were allowed to equilibrate for 1 month, then removed and subsampled for water chemistry. Samples are retrieved monthly. Porewater samples are either filtered (0.45 μm) or preserved with ZnAc (for sulfides) immediately upon return from the field.

**Lab Methods:** Filtered porewater samples were analyzed for PO<sub>4</sub>, NH<sub>4</sub>, chloride, sulfide and Fe (+2) concentrations according to standard laboratory protocols. Phosphate and ammonium were measured colorimetrically on an autoanalyzer (Lachat, Technicon or Bran+Leubbe; Strickland and Parsons 1972). Chloride was measured by coulometric titration of silver wire on a Labconco digital chloridometer. Sulfide is measured by a modification of Cline (1969). Iron is measured by a modification of Gibbs (1979). Analysis of Fe<sup>2+</sup> began in 2003.

**Data Processing Methods:** SAS is used to further analyze the data (e.g. means, regressions). As of the year 2015, the computer is a 3.4 GHz machine running Windows 7 with SAS Release 9.4 64-bit.

#### **99.2.5.1.4 Methodology Citation:**

### **8. Citation Information**

**8.1 Originator:** J.D.H. Strickland

**8.1 Originator:** T.R. Parsons  
**8.2 Publication Date:** 1972  
**8.4 Title:** A Practical Handbook of Seawater Analysis  
**8.5 Edition:** Second  
**8.6 Geospatial Data Presentation Form:** Book  
**8.8 Publication Information:**  
**8.8.1 Publication Place:** Ottawa  
**8.8.2 Publisher:** Fisheries Research Board of Canada.  
**8.9 Other Citation Details:** 309pp.

**99.2.5.1.4 Methodology Citation:**

**8. Citation Information**

**8.1 Originator:** J.D. Cline  
**8.2 Publication Date:** 1969  
**8.4 Title:** Spectrophotometric determination of hydrogen sulfide in natural waters  
**8.6 Geospatial Data Presentation Form:** Journal article  
**8.8 Publication Information:**  
**8.8.1 Publication Place:** unknown  
**8.8.2 Publisher:** unknown  
**8.9 Other Citation Details:** Limnology and Oceanography 14: 454-458.

**99.2.5.1.4 Methodology Citation:**

**8. Citation Information**

**8.1 Originator:** M.M Gibbs  
**8.2 Publication Date:** 1979  
**8.4 Title:** A simple method for the rapid determination of iron in natural waters.  
**8.6 Geospatial Data Presentation Form:** Journal article  
**8.8 Publication Information:**  
**8.8.1 Publication Place:** unknown  
**8.8.2 Publisher:** unknown  
**8.9 Other Citation Details:** Water Research 13:295-297.

**2.5.1 Methodology**

**99.2.5.1.1 Methodology Type:** Marsh surface elevation measurements

**Relevant Datafile:** North Inlet\_elevationchange\_1996-2015.csv

**99.2.5.1.3 Methodology Description:**

Field Methods: Triplicate SET benchmarks are permanently installed in the high marsh (HM) and low marsh (LM) on the marsh platform in a *Spartina alterniflora*-dominated marsh at Goat Island, North Inlet, Georgetown, SC. Each SET benchmark is positioned such that elevation readings can be taken in 3 control subplots and 3 fertilized subplots. The treated subplots were fertilized with NH<sub>4</sub>NO<sub>3</sub> and P<sub>2</sub>O<sub>5</sub> for a final annual application rate of 26.7 mol N/m<sup>2</sup>/y and 12.3 mol P/m<sup>2</sup>/y from May 1996 (HM) or Jan 2001 (LM) until Aug 2004. At each subplot, the SET sampling arm is leveled, 9 fiberglass pins are lowered to the marsh surface, and the height of each pin above the sampling plate is measured and recorded. Surface elevations are measured monthly.

Data Processing Methods: Data are entered into an Excel Spreadsheet. The mean elevation for each subplot at time zero was determined. The change in elevation over time is determined for each pin by subtracting the elevation for the subplot at time zero from the elevation of the pin at time x. SAS is used to further analyze the data (e.g. means, regressions). As of the year 2015, the computer is a 3.4 GHz machine running Windows 7 with SAS Release 9.4 64-bit.

**99.2.5.1.4 Methodology Citation:**

**8. Citation Information**

**8.1 Originator:** R.M. Boumans  
**8.1 Originator:** J.W. Day, Jr.

**8.2 Publication Date:** 1993

**8.4 Title:** High precision measurements of sediment elevation in shallow coastal areas using a sediment-erosion table.

**8.6 Geospatial Data Presentation Form:** Journal article

**8.8 Publication Information:**

**8.8.1 Publication Place:** Lawrence, KS USA

**8.8.2 Publisher:** Estuarine Research Federation

**8.9 Other Citation Details:** Estuaries 16:375-380.

**99.2.5.1.4 Methodology Citation:**

## **8. Citation Information**

**8.1 Originator:** D.R. Cahoon

**8.1 Originator:** J.C. Lynch

**8.1 Originator:** P. Hensel

**8.1 Originator:** R.M. Boumans

**8.1 Originator:** B.C. Perez

**8.1 Originator:** B. Segura

**8.1 Originator:** J.W. Day, Jr.

**8.2 Publication Date:** 2002

**8.4 Title:** High precision measurements of wetland sediment elevation: I. Recent improvements to the sedimentation-erosion table.

**8.6 Geospatial Data Presentation Form:** Journal article

**8.8 Publication Information:**

**8.8.1 Publication Place:** Tulsa, OK USA

**8.8.2 Publisher:** SEPM Society for Sedimentary Geology

**8.9 Other Citation Details:** Journal of Sedimentary Research 72(5):730-733.

**2.5.3.1 Process Step:**

**2.5.2.1 Process Description:** Data processing steps are detailed in the Methodology sections above.

**2.5.2.3 Process Date:** 20151231

## **5. Entity and Attribute Information**

### **5.2 Overview Description**

#### **5.2.1 Entity and Attribute Overview**

**Datafile:** North Inlet\_planthts\_ 1984-2015.csv

Heights of individual plants measured monthly at Goat Island and Oyster Landing marsh study sites from 1984-2014.

#### **5.2.2 Entity and Attribute Detail Citation**

#### **Variable Names and Definitions**

Site = name of the sampling station where stem biomass was collected.

Location = location of sampling plot within the sampling station.

Treatment = the designation and/or manipulation of the sampling plot in the experimental design.

Plot = Plot identification number

Subplot = Subplot identification number

Plant ID = Plant identification number

No of Months = Number of months for which that plant was measured

mm1 = First month in which that plant was measured

mm final = Final month in which that plant was measured

ht mm1 = Plant height in centimeters in month 1

ht mmx = Plant height in centimeters in month x

#### **Variable Type**

Site = Alpha

Location = Alpha

Treatment = Alpha  
Plot = Alpha  
Subplot = Alpha  
Plant ID = Alpha  
Number of Months = Integer  
Month Initial = Integer  
Month Final = Integer  
Height Month x = Real

### **Variable Range**

Site = GI, OL  
Location = HM, LM  
Treatment = NP, C  
Plot = 1,2,3,4,5,6,7,8,9,12,13,14,15  
Subplot = 1,2,3,4,5,6,9,10,11,15,16,17,18,19,20,21,22,23,24,25  
Plant ID = Not Applicable  
Number of Months = 1-30  
Month Initial = 1-368  
Month Final = 1-369  
Height Month x = 0-177  
Comments = not applicable

### **Variable Codes**

Site: GI = Goat Island, OL = Oyster Landing  
Location: HM = High Marsh, LM = Low Marsh  
Treatment: C= Control plot  
Plant ID: 999999.xxxxxx = dead plant  
Height Month x; a negative sign (-) indicates a flowering plant

### **Other**

mm1 = May 1984  
mm369 = Nov 2015

## **5.2 Overview Description**

### **5.2.1 Entity and Attribute Overview**

#### **Datafile: North Inlet\_productivity\_1985-2015.csv**

Annual production in grams dry weight per meter square per year at four study sites from 1985-2015.

### **5.2.2 Entity and Attribute Detail Citation**

#### **Variable Names and Definitions**

Year = the year that the monthly biomass samples were collected and processed.  
Site = name of the sampling station where stem biomass was collected.  
Location = location of sampling plot within the sampling station.  
Treatment = the designation and/or manipulation of the sampling plot in the experimental design.  
Annual Productivity = mean annual dry weight of the above ground Spartina stems.  
Stderr = standard error of Annual Productivity.  
Comments = text information pertaining to the individual year/site/location/treatment's data point.

#### **Variable Type**

Year (yyyy) = Integer/datetime  
Site = Alpha  
Location = Alpha  
Treatment = Alpha

Productivity = Real; grams Per Meter Squared Per Year  
stderr = Real; grams Per Meter Squared Per Year  
Comments = Alpha

### **Variable Range**

Year (yyyy) = 1985 - 2015  
Site = GI, OL  
Location = HM, LM  
Treatment = NP, C  
Productivity = 364.7 – 7663.5 grams Per Meter Squared Per Year  
stderr = 32.2 – 1730.5 grams Per Meter Squared Per Year  
Comments = not applicable

### **Variable Codes**

Site: GI = Goat Island; OL = Oyster Landing  
Location: HM = High Marsh; LM = Low Marsh  
Treatment: NP = Fertilized plot; C= Control plot

## **5.2 Overview Description**

### **5.2.1 Entity and Attribute Overview**

#### **Datafile: North Inlet\_biomass\_1984-2015.csv**

Monthly biomass in grams dry weight per meter square at four study sites from 1984-2015.

### **5.2.2 Entity and Attribute Detail Citation**

#### **Variable Names and Definitions**

Year = the year that the monthly biomass samples were collected.  
Month = the month that the biomass samples were collected.  
Day = the day that the biomass samples were collected.  
Site = name of the sampling station where stem biomass was collected.  
Location = location of sampling plot within the sampling station.  
Treatment = the designation and/or manipulation of the sampling plot in the experimental design.  
Plot = identifies the area within the site/location/treatment that was sampled  
Subplot = identifies the area within the site/location/treatment/plot that was sampled  
Biomass = biomass dry weight of the above ground Spartina stems.  
Comments = text information pertaining to the individual year/site/location/treatment's data point.

#### **Variable Type**

Year = Integer/datetime  
Month = Integer/datetime  
Day = Integer/datetime  
Site = Alpha  
Location = Alpha  
Treatment = AlphaC  
Plot = Integer  
Subplot = Alpha  
Biomass = Real; grams per square meter  
Comments = Alpha

#### **Variable Range**

Year = 1984 – 2015  
Month = 1-12  
Day = 1-31  
Site = GI, OL  
Location = HM, LM



Treatment = NP, C  
Plot = 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14, 15  
Subplot = a, b  
Biomass = 0-10912 grams per square meter  
Comments = not applicable

### **Variable Codes**

Site: GI = Goat Island; OL = Oyster Landing  
Location: HM = High Marsh; LM = Low Marsh  
Treatment: NP = Fertilized plot; C= Control plot

## **5. Entity and Attribute Information**

### **5.2 Overview Description**

#### **5.2.1 Entity and Attribute Overview**

**Datafile:** North Inlet\_snails\_ 1984-2015.xlsx

Observations of snails in permanent plots at Goat Island and Oyster Landing marsh study sites from 2003-2015.

#### **5.2.2 Entity and Attribute Detail Citation**

### **Variable Names and Definitions**

Site = name of the sampling station where stem biomass was collected.  
Location = location of sampling plot within the sampling station.  
Treatment = the designation and/or manipulation of the sampling plot in the experimental design.  
Plot = Plot identification number  
Subplot = Subplot identification number  
Plant ID = Plant identification number  
Census month = Month snail was observed  
Year= year observation was made  
Month=month observation was made  
Day=day observation was made  
Plant vitality=plant vitality in month that snail was observed on it  
#Littorina on plant=number of Littorina irrorata snails observed on the plant  
#Melampus on plant=number of Melampus bidentatus snails observed on the plant  
#Littorina on ground=number of Littorina irrorata snails observed on the ground  
#Melampus on ground=number of Melampus bidentatus snails observed on the ground

### **Variable Type**

Site = Alpha  
Location = Alpha  
Treatment = Alpha  
Plot = Alpha  
Subplot = Alpha  
Plant ID = Alpha  
Census month = Integer  
Year=Integer  
Month = Integer  
Day=Integer  
Plant vitality= Integer  
#Littorina on plant= Integer  
#Melampus on plant= Integer  
#Littorina on ground= Integer  
#Melampus on ground= Integer

### **Variable Range**

Site = GI, OL  
Location = HM, LM  
Treatment = NP, C

Plot = 1,2,3,4,5,6,7,8,9,12,13,14,15  
Subplot = 1,2,3,4,5,6,9,10,11,15,16,17,18,19,20,21,22,23,24,25  
Plant ID = Not Applicable  
Census month = 232-375  
Year=2003-2015  
Month = 1-12  
Day=1-31  
Plant vitality= 0-7  
#Littorina on plant= 0-3  
#Melampus on plant= 0-3  
#Littorina on ground= 0-8  
#Melampus on ground= 0-3

### **Variable Codes**

Site: GI = Goat Island, OL = Oyster Landing  
Location: HM = High Marsh, LM = Low Marsh  
Treatment: C= Control plot  
Plant ID: 999999.xxxxxx = dead plant; 777777.777777=snail on ground only  
Plant Vitality: 1=live; 0=dead; 7=not applicabale

### **Other**

mm1 = May 1984  
mm369=Nov 2015

## **5.2 Overview Description**

### **5.2.1 Entity and Attribute Overview**

#### **Datafile: North Inlet\_porewater\_1993-2015.csv**

Concentrations of Salinity, PO<sub>4</sub>, NH<sub>4</sub>, Chloride, Sulfide and Iron at varying depths at five sites in a *Spartina alterniflora* salt marsh from 1993-2015.

### **5.2.2 Entity and Attribute Detail Citation**

#### **Variable Names and Definitions**

Site = name of the sampling station where the porewater sample was collected.  
Location = location of sampling plot within the marsh at the sampling site.  
Year = the year that the porewater sample was collected.  
Month = the month that the porewater sample was collected.  
Treatment = the treatment and/or manipulation of the sampling plot in the experimental design.  
Replicate = replicate porewater sample.  
Depth = identifies the vertical depth into the marsh soil that the porewater sample was collected.  
Salinity=the salinity that was measured in the porewater sample.  
PO<sub>4</sub> = the concentration of phosphate that was measured in the porewater sample.  
NH<sub>4</sub> = the concentration of ammonium which was measured in the porewater sample.  
S<sub>2</sub> = the concentration of sulfide which was measure in the porewater sample.  
Cl = the concentration of chloride which was measure in the porewater sample.  
Fe<sub>2</sub> = the concentration of iron which was measure in the porewater sample.  
Comments = text information pertaining to the individual year/site/location/treatment's data point.

#### **Variable Type**

Site = Alpha  
Location = Alpha  
Year (yyyy) = Integer/datetime  
Month (mm) = Integer/datetime  
Trt = Alpha  
Rep = Alpha  
Depth = Integer

Salinity=Real; parts per thousand  
PO4 = Real; micromoles per liter  
NH4 = Real; micromoles per liter  
S2 = Real; micromoles per liter  
Cl = Real; grams per liter  
Fe2 = Real; micromoles per liter  
Comments = Alpha

### **Variable Range**

Site = GI, OL, DB  
Location = HM, LM  
Year (yyyy) = 1993 – 2015  
Month (mm) = 1-12  
Treatment = NP, C  
Replicate = a, b, c  
Depth = 10, 25, 50, 75, 100 centimeters  
PO4 = 0.1 – 399.1 micromoles per liter  
NH4 = 0.3 – 1983.9 micromoles per liter  
S2 = 0.1 – 6484.3 micromoles per liter  
Cl = 0.2 – 27.9 grams per liter  
Fe2 = 0.4 – 491.5 micromoles per liter  
Comments = not applicable

### **Variable Codes**

Site: GI = Goat Island; OL = Oyster Landing; DB= Sixty Bass Creek  
Location: HM = High Marsh; LM = Low Marsh  
Treatment: NP = Fertilized plot; C= Control plot

## **5.2 Overview Description**

### **5.2.1 Entity and Attribute Overview**

#### **Datafile: North Inlet\_elevationchange\_1996-2015.csv**

Changes in marsh surface elevation at 2 sites in a *Spartina alterniflora* marsh from 1996-2015.

### **5.2.2 Entity and Attribute Detail Citation**

#### **Variable Names and Definitions**

Site = name of the sampling station where the marsh elevation was measured.  
Location = location of sampling plot within the marsh at the sampling site.  
Year = the year that the marsh elevation was measured.  
Month = the month that the marsh elevation was measured.  
Treatment = the treatment and/or manipulation of the sampling plot in the experimental design.  
Mean elevation change = mean change in elevation from measurements at nine subplots.  
Stderr = standard error of the mean change in elevation from measurements at nine subplots.  
Comments = text information pertaining to the individual year/site/location/treatment's data point.

#### **Variable Type**

Site = Alpha  
Location = Alpha  
Year = Integer/datetime  
Month = Integer/datetime  
Treatment = Alpha  
Mean elevation change = Real; centimeters  
Stderr = Real; centimeters  
Comments = Alpha

#### **Variable Range**

Site = GI, OL  
Location = HM, LM  
Year = 1984 – 2015  
Month = 1-12  
Treatment = NP, C  
Mean elevation change = -0.96 to 4.43 centimeters  
Stderr = 0.05 to 0.36 centimeters  
Comments = not applicable

### **Variable Codes**

Site: GI = Goat Island; OL = Oyster Landing  
Location: HM = High Marsh; LM = Low Marsh  
Treatment: NP = Fertilized plot; C= Control plot

## **5.2 Overview Description**

### **5.2.1 Entity and Attribute Overview** Variable Definition Source

### **5.2.2 Entity and Attribute Detail Citation:**

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

## **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) 904-9032

##### **10.7 Contact Facsimile Telephone:**

(843) 546-1632

##### **10.8 Contact Electronic Mail Address:**

ginger@belle.baruch.sc.edu

##### **10.9 Hours of Service:**

8:30 am to 4:30 pm EST/EDT Mon.- Friday

### **6.2 Resource Description:**

#### ***Dataset Identification names:***

LTER or LTREB Spartina production  
Spartina production  
North Inlet Estuary Long-Term Spartina database  
Long-Term Spartina Production and Pore Water Parameters  
North Inlet Estuary Long-Term SET Marsh Elevations  
North Inlet Spartina 1984-2012

#### **Raw Directory: (Contents: 510 Folders; 7387 Files; 1.77GB)**

**This Raw Directory has not been re-archived after 2010 because nothing has or will be changing  
The files and folders in the Raw Directory can be found in the North Inlet Spartina 1984-2009 & -2010 archival.**

The Raw Directory archived at the BMFL contains scanned images (jpg's) of Goat Island (GI) & Oyster Landing (OL)

Census Field Sheets and Porewater Chemistry Lab Notes and Data. GI Census Field Sheets cover all monthly plots from Years 1-20 (1984-2003); OL Census Field Sheets cover all monthly plots from Years 1-18 (1986-2003). It was determined that the census sheets are not the best form to derive the raw data from, so they were no longer scanned after 2003. The census data in digital form should be used for the raw/original level. These digital census files are now archived in the Process Directory. **PoreWaterChemistry** folder contains lab notes and data for Cl, NH4, PO4, pH, S2, and refraction.

**Folder: CensusArchive.Fieldsheets (458 Folders; 6579 Files; 1.6GB)**

**Folder: PoreWaterChemistry (50 folders; 807 Files; 155 MB)**

**Folder: CL** (contains monthly data from 1993-2004)

**Folder: NH4** (contains monthly data from 1993-2002)

**Folder: NH4 & PO4**(contains monthly data from 2002-2004)

**Folder: pH** (contains data from Feb 1994)

**Folder: PO4** (contains monthly data from 1993-2002)

**Folder: Refraction** (contains data from Mar 1995)

**Folder: S2** (contains monthly data from 1993-2004)

### ***BMFL Contents & Description for: North Inlet Spartina 1984-2012 DVD & Hard Drive Archival***

**Processed Directory: (Contents: 76 Folders; 540 Files; 367MB)**

The Process Directory contains data, metadata (in their various forms of completeness) and programs used to verify and analyze the data from 1984 through to 2015. The folder **LTER.1984-1992** contains the original LTER data and documentation which was published to the LTER website in 1993, and data and programs which were used on USC's mainframe computers along with mass storage tape backup files. The folder **Spartina.1984-2012** contains 1984-1997 census, productivity and porewater chemistry data from the LTREB project which took over funding after the LTER project ended in 1992. Yearly directories in **Spartina.1984-2012** contain data, programs, and readme files used to process the raw data into the final values. The folder **Documentation.97-2012** contains program and data management documentation over the life of the project. Folder **Web.Work.Published.2006-12** contains correspondences between the PI, technician and Baruch's Data Manager regarding the publishing of the Spartina database to the web. Data, graphics, metadata, and images used to publish the North Inlet Spartina database to the web and federal clearinghouses are included in this directory.

**Folder: LTER.1984-1992 (12 Folders; 133 Files; 8.2 MB)**

**Folder: Spartina.1984-2012 (15 Folders; 106 Files; 294 MB)**

**Folder: Documentation.97-2012 (10 Folders; 52 Files; 3.8 MB)**

**Folder: Web.Work.Published.2006-12 (35 Folders; 249 Files; 61.3 MB)**

**Final.2012 Directory: (Contents: 6 Folders; 52 Files; 35.3 MB)**

The Final Directory is archived at the BMFL on DVD, hard drive, and hardcopy. It contains final data, metadata, and programs which are up to date as of 31 December 2012. Web & Federal Clearinghouse products were created and published from the final data and metadata.

**Folder: Data (10Files; 6.1 MB)**

Files are in Microsoft Excel (2007) Workbook (xlsx)

North Inlet\_planthts\_1984-2012

North Inlet\_biomass\_1984-2012

North Inlet\_productivity\_1985-2012

North Inlet\_porewater\_1993-2012

North Inlet\_elevationchange\_1996-2012

**Folder: Graphics (13 Files; 1.4 MB)**

Files are powerpoint, jpgs, and xlsx versions of the graphics used on the web.

Elevationchange.2015

GoatIslandProdFertVsControl.2015

GoatIslandProductivity.2015

OysterLandingProductivity.2015

SeasonalBiomass.2015

**Folder: Images (5Files; 5.1 MB)**

Files are in jpg format.

NI.Hobcaw.map  
OLpanoram  
PV.SET10  
SiteMap  
SpartinaSampleSites.jpg

**Folder: Metadata (1 Folder 15 Files; 1 MB)**

Files are in Microsoft Word (2003 & 2007: .doc & docx) and Adobe (pdf) formats.

NorthInlet.2015.Spartina.Metadata  
Files in the cns/mp folder for clearinghouse publishing

**Folder: Programs (9 Files; 21.7 MB)**

Files are in Microsoft Word (2003 & 2007) (doc & docx) & Access (mdb) and FORTRAN code formats.

NIprod\_2008.sas  
Nlcensus\_EOY2012.mdb  
newcens2012.exe  
newtrans2010.exe  
LTREB readme Dec2012.docx & rtf  
fortran source code NEWCENS2009.doc & rtf  
fortran source code newtrans2010.FOR

**Spartina.Web.Work.Publish.2012 Directory: (Contents: 5 Folders; 47 Files; 14 MB)**

The Web.Work.Publish.2012 Directory is archived at the BMFL on DVD, hard drive, and in part on Baruch's website. It contains final graphics, self-extracting zipped data with metadata, and other information which are used to publish to the web and federal clearinghouses. Web & federal clearinghouse products were created and published from the final data and metadata.

**Folder: Data (12 Files; 6.3 MB)**

Files are in (csv & pdf) and self-extracting zipped formats.

North Inlet\_planthts\_1984-2012  
North Inlet\_biomass\_1984-2012  
North Inlet\_productivity\_1984-2012  
North Inlet\_porewater\_1993-2012  
North Inlet\_elevationchange\_1996-2012  
NorthInlet.2012.Spartina.Metadata  
NorthInlet.SpartinaPlantHtsFile.Readme2012

**Folder: Graphics (13 Files; 1.4 MB)**

Files are jpgs, xls, xlsx, SigmaPlot, and Powerpoint versions of the graphics used on the web.

**Folder: Metadata (1 Folder; 18 Files; 1 MB)**

Files are versions of the metadata used for the web and federal clearinghouse publication.

**Folder: Images (5 Files; 5.1 MB)**

Files are in jpg format.

NI.Hobcaw.map  
OLpanoram  
PV.SET10  
SiteMap  
SpartinaSampleSites.jpg

**6.3 Distribution Liability:**

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

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 Biology and Coastal Research. 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 Biology and Coastal Research 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 Biology and Coastal Research, nor the National Oceanic & Atmospheric Administration's Office of Ocean and Coastal Resource Management, Estuarine Reserves Division shall be held liable for the use and/or misuse 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:** Microsoft Excel (.xlsx) or Word (.docx) format as well as .csv (comma separated) or .txt (text only) format.

**6.4.2.1.2 Format Version Number:** Microsoft Office Professional 2007

**6.4.2.1.6 File Decompression Technique:** No compression applied

#### 6.4.2.2 Digital Transfer Option

##### 6.4.2.2.1 Computer Contact Information

###### 6.4.2.2.1.1 Network Address

**6.4.2.2.1.1.1 Network Resource Name:** <http://links.baruch.sc.edu/Data/NISpartina/index.html>

**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:** 20130104

**7.2 Metadata Review Date:** 20130220

### 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) 904-9032

#### 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

### 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