

## 1. Identification Information

### 1.1 Citation Information

**8.1 Originator:** Peter A. Noble

**8.1 Originator:** Raphael G. Tymowski

**8.1 Originator:** Madilyn Fletcher

**8.1 Originator:** James T. Morris

**8.1 Originator:** Alan J. Lewitus

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

**8.2 Publication Date:** 20050614

**8.4 Title:** CISNet Project's Phytoplankton Pigment Monitoring Database for the North Inlet and Ace Basin Estuaries, South Carolina: 1999-2001

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

### 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

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

### 8.11 Larger work citation

#### 8. Citation Information

**8.1 Originator:** Dwayne Porter

**8.1 Originator:** James Morris

**8.1 Originator:** John Jensen

**8.1 Originator:** Alan Lewitus

**8.1 Originator:** Madilyn Fletcher

**8.1 Originator:** Peter Noble

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

**8.2 Publication Date:** 1998

**8.4 Title:** Coastal Intensive Site Network (CISNet): Molecular to Landscape-Scale Monitoring of Estuarine Eutrophication

**8.6 Geospatial Data Presentation Form:** EPA/NOAA/NASA Proposal

**8.9 Other Citation Details:** The CISNet Project was an ecological research program composed of several subprojects which were conducted from 1999 to 2001 in the North Inlet and ACE Basin estuaries.

## 1.2 Description

### 1.2.1 Abstract:

#### *EPA/NOAA/NASA CISNet Partnership*

The Coastal Intensive Site Network (CISNet) was developed by the U.S. Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA), and National Aeronautics and Space Administration (NASA) and is composed of intensive, long-term monitoring and research sites around the U.S. marine and Great Lakes coasts. The EPA and NOAA's focus for funding within the CISNet partnership is to support research and monitoring programs, and in particular, those that utilize ecological indicators and investigate the ecological effects of environmental stressors. NASA's funding focus is the development of remote sensing capabilities that can enhance and supplement the in situ research and monitoring programs selected for funding by the EPA and NOAA. The CISNet partnership has three main objectives:

1. To develop a sound scientific basis for understanding ecological responses to anthropogenic stresses in coastal environments, including the interaction of exposure, environment/climate, and biological/ecological factors in the response, and the spatial and temporal nature of these interactions,
2. To demonstrate the value of developing data from selected sites intensively monitored to examine the relationships between changes in environmental stressors, including anthropogenic and natural stresses, and ecological response, and
3. To provide intensively monitored sites for development and evaluation of indicators of change in coastal systems.

Summers, Kevin, Andrew Robertson and Barbara Levinson. 2000. Development of the Coastal Intensive Site Network (CISNet). Environ. Monit. Assess. 64(1):379-390. (ERL,GB 1076).

### ***Baruch's CISNet Project***

The Belle W. Baruch Institute for Marine and Coastal Sciences received funding under the CISNet EPA/NOAA/NASA partnership to further these objectives. Baruch's CISNet project originally proposed to investigate two very different estuaries, North Inlet and Winyah Bay. However, after conducting a preliminary assessment of several South Carolina estuaries, investigators decided to include portions of the ACE Basin Estuary instead of Winyah Bay. While the North Inlet and ACE Basin estuaries are similar in terms of salinity, temperature, and tidal exchange, they differ in terms of the influence of the freshwater drainage basin. North Inlet is a relatively small estuary with minimal fresh water input (nutrient impoverished); ACE Basin is larger and is characterized by a much greater riverine drainage influence (a highly fertile estuary). As a result, they display extreme differences in nutrient loading, nutrient dynamics, and productivity. Baruch's aim was to address the differences in nutrient loading between these two estuaries, and the expected impact on the regulation of their food webs, by addressing these three main hypotheses:

1. The composition and abundance of ACE Basin and North Inlet bacterial and phytoplankton communities will differ and will vary as functions of nutrient availability.
2. Bacterial and phytoplankton communities form associations which vary in complexity (species diversity) as a function of nutrient availability.
3. At a landscape-scale, remote sensing of the concentration of chlorophyll in emergent wetland vegetation will provide a quantitative index of wetland condition, and will demonstrate differences in nutrient loading among estuaries.

Several subprojects were initiated to address these hypotheses. Information on the other subprojects that make up Baruch's CISNet project can be found below under "Other CISNet Datasets". Information on the relevant subproject follows:

### ***CISNet Phytoplankton Pigment Monitoring Subproject***

Phytoplankton community pigment compositions were measured seasonally along salinity gradients at 5 locations in the ACE Basin Estuary, and 5 locations in the North Inlet Estuary. Water samples were collected bimonthly from July to September 1999, from April to October 2000, and from March to September 2001. Samples were analyzed with high-performance liquid chromatography (HPLC), for 18 pigments that have known chemotaxonomic importance for phytoplankton identification. These pigment levels were then used to examine the spatial and temporal distributions of phytoplankton communities within the two estuaries.

#### **1.2.2 Purpose:**

The Phytoplankton Pigment Monitoring portion of Baruch's CISNet project was initiated to develop a High-Performance Liquid Chromatography (HPLC) method for phytoplankton community analysis, to correlate phytoplankton community information with water quality data, and to compare community structure within and between estuary types.

#### **1.2.3. Supplemental Information:**

##### ***Related Publications and Presentations:***

Noble, P.A., R.G. Tymowski, M. Fletcher, J.T. Morris, and A.J. Lewitus. 2003. Contrasting Patterns of Phytoplankton Community Pigment Composition in Two Salt Marsh Estuaries in Southeastern United States. Appl. Environ. Microb. 69:4129-43.

Morris, J. T., M. Fletcher, J. R. Jensen, A. Lewitus, P. A. Noble, D. Porter. 1999. "CISNet: Molecular to Landscape-Scale Monitoring of Estuarine Eutrophication," *Annual Report*.

Morris, J.T., M. Fletcher, J.R. Jensen, A. Lewitus, P. A. Noble, and D. Porter. 2000. "CISNet: Molecular to Landscape-Scale Monitoring of Estuarine Eutrophication." *Annual Report*.

Morris, J.T., M. Fletcher, J.R. Jensen, A. Lewitus, P. A. Noble, and D. Porter. 2001. "CISNet: Molecular to Landscape-Scale Monitoring of Estuarine Eutrophication." *Annual Report*.

**Summary of Important Phytoplankton Pigment Monitoring Results:**

Statistical analyses revealed that phytoplankton community pigments in both estuaries were seasonally variable, with similar diversities but different compositions.

Temporal pigment patterns revealed that there was a relatively weak correlation between the pigments in ACE Basin and the relative persistence of photopigment groups in North Inlet. Differences are presumably a consequence of the unpredictability and relatively greater influence of river discharge in the ACE Basin, in contrast to the greater environmental predictability of the more tidally influenced North Inlet.

The timing, magnitude, and pigment composition of the annual phytoplankton bloom were different in the two estuaries. North Inlet bloom properties reflected the predominance of autochthonous ecological control (e.g., regenerated nutrients, grazing, etc.). ACE Basin bloom properties suggested that there was greater influence of allochthonous environmental factors (e.g., nutrient loading, changes in turbidity).

Noble, P.A., R.G. Tymowski, M. Fletcher, J.T. Morris, and A.J. Lewitus. 2003. Comparing Estuarine Phytoplankton Communities in Southeastern U.S. Salt Marsh Estuaries using High Performance Liquid Chromatography and Statistical Analyses. *Appl. Environ. Microb.* 69:4129-43.

**Other CISNet Datasets:**

CISNet: Bacterial Community Composition and Monitoring at North Inlet and ACE Basin. Bacterial samples were collected from the North Inlet and ACE Basin estuaries, in tandem with phytoplankton and water quality samples, and analyzed using genetic profiling techniques (PCR/DGGE).

CISNet: Water Quality Monitoring at North Inlet and ACE Basin. Water quality samples were collected from the North Inlet and ACE Basin estuaries, in tandem with phytoplankton and bacterial samples, and analyzed for nutrients, suspended solids, and chlorophyll. Light profiles were also recorded.

CISNet Weekly Monitoring at North Inlet: Physical, chemical, and biological variables were monitored weekly, at two depths, for two sites within North Inlet that vary in patterns of nutrient quantity and quality. Correlative relationships between pigments and physicochemical properties were assessed. This subproject was used as a preliminary assessment to help determine methods used for the CISNet: Phytoplankton Pigment Monitoring Database. Results of this investigation illustrated that there were few differences between samples collected near the water's surface (0.5 meters below surface) and near the bottom (0.5 meters above bottom), and as a result, Phytoplankton Pigment Monitoring samples were taken from 0.5 meters below the surface.

CISNet: Remote Sensing in Coastal Wetlands as a Tool for Assessing Chlorophyll Biomass and Fertility. This subproject attempted to develop a mathematical relationship between *in situ* biophysical data and the brightness values associated with remotely sensed imagery. High spatial resolution (70 cm), multispectral ADAR images of the North Inlet and ACE Basin study areas were collected during the spring and late summer, to coincide with field sampling. *In situ* radiometric and biophysical (canopy radiance data, leaf area index, chlorophyll, and CO<sub>2</sub> exchange) data were collected from approximately 50 locations within the two estuaries. These biophysical data were then correlated with canopy radiance data using the field spectrometer and with remotely sensed data.

**1.3 Time Period of Content:**

**9.3 Range of Dates/Times**

**9.3.1 Beginning Date:** 19990727

**9.3.3 Ending Date:** 20010918

**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 North Inlet Estuary lies east of the uplands of Hobcaw Barony (also known as the Belle W. Baruch Property). The Estuary is located in Georgetown County, South Carolina. Sample Sites for the North Inlet Estuary are located within the following bounding coordinates: West -79.256, East -79.174, North 33.349, and South 33.299. The ACE Basin is named for its three rivers, the Ashepoo, Combahee, and Edisto, all of which empty into the St. Helena Sound. The ACE Basin Estuary is located south of Charleston, in Charleston and Beaufort Counties, South Carolina. Sample Sites for the ACE Basin Estuary are located within the following bounding coordinates: West -80.418, East -80.324, North 32.560, and South 32.484.

#### ***North Inlet and ACE Basin Sample Sites:***

**1.5.1.1 West Bounding Coordinate:** -80.418

**1.5.1.2 East Bounding Coordinate:** -79.174

**1.5.1.3 North Bounding Coordinate:** 33.349

**1.5.1.4 South Bounding Coordinate:** 32.484

### **1.6 Keywords**

#### **1.6.1 Theme**

<b>1.6.1.1 Theme Keyword Thesaurus:</b>	None
<b>1.6.1.2 Theme Keyword:</b>	COASTAL
<b>1.6.1.2 Theme Keyword:</b>	CREEK
<b>1.6.1.2 Theme Keyword:</b>	ESTUARINE
<b>1.6.1.2 Theme Keyword:</b>	ESTUARINE COMMUNITIES
<b>1.6.1.2 Theme Keyword:</b>	ESTUARY
<b>1.6.1.2 Theme Keyword:</b>	HIGH-PERFORMANCE LIQUID CHROMATOGRAPHY
<b>1.6.1.2 Theme Keyword:</b>	HPLC
<b>1.6.1.2 Theme Keyword:</b>	INTERTIDAL CREEK
<b>1.6.1.2 Theme Keyword:</b>	MARSH
<b>1.6.1.2 Theme Keyword:</b>	NUTRIENT LOADING
<b>1.6.1.2 Theme Keyword:</b>	PHYTOPLANKTON
<b>1.6.1.2 Theme Keyword:</b>	PHYTOPLANKTON BLOOM
<b>1.6.1.2 Theme Keyword:</b>	PHYTOPLANKTON COMMUNITY
<b>1.6.1.2 Theme Keyword:</b>	PIGMENT
<b>1.6.1.2 Theme Keyword:</b>	PLANKTON
<b>1.6.1.2 Theme Keyword:</b>	SALT MARSH
<b>1.6.1.2 Theme Keyword:</b>	TIDAL
<b>1.6.1.2 Theme Keyword:</b>	WATER SAMPLE

#### **1.6.2 Place**

<b>1.6.2.1 Place Keyword Thesaurus:</b>	None
<b>1.6.2.2 Place Keyword:</b>	ACE BASIN ESTUARY
<b>1.6.2.2 Place Keyword:</b>	ASHEPOO RIVER
<b>1.6.2.2 Place Keyword:</b>	BEAUFORT COUNTY
<b>1.6.2.2 Place Keyword:</b>	CHARLESTON COUNTY
<b>1.6.2.2 Place Keyword:</b>	CLAMBANK CREEK
<b>1.6.2.2 Place Keyword:</b>	COASTAL
<b>1.6.2.2 Place Keyword:</b>	COMBAHEE RIVER
<b>1.6.2.2 Place Keyword:</b>	EAST COAST
<b>1.6.2.2 Place Keyword:</b>	EDISTO RIVER
<b>1.6.2.2 Place Keyword:</b>	GEORGETOWN COUNTY
<b>1.6.2.2 Place Keyword:</b>	NORTH INLET ESTUARY
<b>1.6.2.2 Place Keyword:</b>	OLD MAN CREEK
<b>1.6.2.2 Place Keyword:</b>	SOUTH CAROLINA
<b>1.6.2.2 Place Keyword:</b>	SOUTHEAST COAST
<b>1.6.2.2 Place Keyword:</b>	TOWN CREEK
<b>1.6.2.2 Place Keyword:</b>	USA

### 1.6.3 Stratum

**1.6.3.1 Stratum Keyword Thesaurus:** None

**1.6.3.2 Stratum Keyword:** WATER COLUMN

### 1.6.4 Temporal

**1.6.4.1 Temporal Keyword Thesaurus:** None

**1.6.4.2 Temporal Keyword:** 1999

**1.6.4.2 Temporal Keyword:** 2000

**1.6.4.2 Temporal Keyword:** 2001

### 1.7 Access Constraints:

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

### 1.8 Use Constraints:

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

### 1.9 Point of Contact:

#### 10.2 Contact Person Primary

**10.2.2 Contact Person:** Raphael Tymowski

**10.3 Contact Position:** Research Technician

#### 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 238

**10.7 Contact Facsimile Telephone:** (843) 546-1632

**10.8 Contact Electronic Mail Address:** [raph@belle.baruch.sc.edu](mailto:raph@belle.baruch.sc.edu)

### 1.11 Data Set Credit:

Funding was provided by grant R826944 from the U.S. Environmental Protection Agency (EPA-CISNET), to University of South Carolina's Belle W. Baruch Institute under Principal Investigator James T. Morris. Numerous researchers and students contributed to these datasets.

### 1.14 Native Data Set Environment

Data are in Microsoft Excel 2000 Professional and comma separated value (csv) formats. Metadata are in Microsoft (MS) Word 2000 Professional and text formats. Images are in JPEG (.JPG) format.

### 1.15 Cross Reference:

#### 8. Citation Information

**8.1 Originator:** Alan Lewitus

**8.1 Originator:** Raphael Tymowski

**8.1 Originator:** Ivy Collins

**8.1 Originator:** Department of Marine Science, Coastal Carolina University

**8.1 Originator:** Belle W. Baruch Institute for Marine and Coastal Sciences and Department of Statistics of the University of South Carolina

**8.2 Publication Date:** 20050228

**8.4 Title:** CREEK Project's Phytoplankton Pigment Monitoring Database for Eight Creeks in the North Inlet Estuary, South Carolina: 1997-1999

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

**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

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

**8.11 Larger work citation**

**8. Citation Information**

**8.1 Originator:** Richard Dame

**8.1 Originator:** Dave Bushek

**8.1 Originator:** Dennis Allen

**8.1 Originator:** Don Edwards

**8.1 Originator:** Alan Lewitus

**8.1 Originator:** Eric Koepfler

**8.1 Originator:** Bjorn Kjerfve

**8.1 Originator:** Leah Gregory

**8.1 Originator:** Department of Marine Science, Coastal Carolina University

**8.1 Originator:** Belle W. Baruch Institute for Marine and Coastal Sciences, Department of Marine Science, and Department of Statistics of the University of South Carolina

**8.2 Publication Date:** 20000730

**8.4 Title:** CREEK Project: RUI: the Role of Oyster Reefs in the Structure and Function of Tidal Creeks.

**8.6 Geospatial Data Presentation Form:** NSF Proposal

**8.8 Publication Information:**

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

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

**8.9 Other Citation Details:** The CREEK Project (January 1996 – June 2000) was an ecological research program that investigated relationships between oysters and other estuarine subcomponents including nekton, microzooplankton, phytoplankton, oyster diseases, and water chemistry. See cross-reference section - this metadata file.

**1.15 Cross Reference:**

**8. Citation Information**

**8.1 Originator:** Raphael Tymowski

**8.1 Originator:** Ken Hayes

**8.1 Originator:** Alan Lewitus

**8.1 Originator:** James Morris

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

**8.2 Publication Date:** unpublished material

**8.4 Title:** CISNet Project's Water Quality Monitoring Database for North Inlet and ACE Basin Estuaries, South Carolina: 1999-2001.

**8.6 Geospatial Data Presentation Form:** unknown

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

**8.11 Larger work citation**

**8. Citation Information**

**8.1 Originator:** Dwayne Porter

**8.1 Originator:** James Morris

**8.1 Originator:** John Jensen

**8.1 Originator:** Alan Lewitus

**8.1 Originator:** Madilyn Fletcher

**8.1 Originator:** Peter Noble

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

**8.2 Publication Date:** 1998

**8.4 Title:** Coastal Intensive Site Network (CISNet): Molecular to Landscape-Scale Monitoring of Estuarine Eutrophication

**8.6 Geospatial Data Presentation Form:** EPA/NOAA/NASA Proposal

**8.9 Other Citation Details:** The CISNet Project was an ecological research program composed of several subprojects which were conducted from 1999 to 2001 in the North Inlet and ACE Basin estuaries.

### 1.15 Cross Reference:

#### 8. Citation Information

**8.1 Originator:** Madilyn Fletcher

**8.1 Originator:** Peter Noble

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

**8.2 Publication Date:** unpublished material

**8.4 Title:** CISNet Project's Bacterial Community Composition and Monitoring Database for North Inlet and ACE Basin Estuaries, South Carolina: 1999-2001.

**8.6 Geospatial Data Presentation Form:** unknown

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

#### 8.11 Larger work citation

##### 8. Citation Information

**8.1 Originator:** Dwayne Porter

**8.1 Originator:** James Morris

**8.1 Originator:** John Jensen

**8.1 Originator:** Alan Lewitus

**8.1 Originator:** Madilyn Fletcher

**8.1 Originator:** Peter Noble

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

**8.2 Publication Date:** 1998

**8.4 Title:** Coastal Intensive Site Network (CISNet): Molecular to Landscape-Scale Monitoring of Estuarine Eutrophication

**8.6 Geospatial Data Presentation Form:** EPA/NOAA/NASA Proposal

**8.9 Other Citation Details:** The CISNet Project was an ecological research program composed of several subprojects which were conducted from 1999 to 2001 in the North Inlet and ACE Basin estuaries.

### 1.15 Cross Reference:

#### 8. Citation Information

**8.1 Originator:** James T. Morris

**8.1 Originator:** John Jensen

**8.1 Originator:** Dwayne Porter

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

**8.2 Publication Date:** unpublished material

**8.4 Title:** CISNet Project's Remote Sensing in Coastal Wetlands as a Tool for Assessing Chlorophyll Biomass and Fertility, North Inlet and ACE Basin Estuaries, South Carolina: 1999-2001.

**8.6 Geospatial Data Presentation Form:** unknown

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

#### 8.11 Larger work citation

##### 8. Citation Information

**8.1 Originator:** Dwayne Porter

**8.1 Originator:** James Morris

**8.1 Originator:** John Jensen

**8.1 Originator:** Alan Lewitus

**8.1 Originator:** Madilyn Fletcher

**8.1 Originator:** Peter Noble

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

**8.2 Publication Date:** 1998

**8.4 Title:** Coastal Intensive Site Network (CISNet): Molecular to Landscape-Scale Monitoring of Estuarine Eutrophication

**8.6 Geospatial Data Presentation Form:** EPA/NOAA/NASA Proposal

**8.9 Other Citation Details:** The CISNet Project was an ecological research program composed of several subprojects which were conducted from 1999 to 2001 in the North Inlet and ACE Basin estuaries.

## 2. Data Quality Information

### 2.1 Attribute Accuracy

#### 2.1.1 Attribute Accuracy Report:

Over the course of the database, two different trained technicians were responsible for HPLC analysis. All values were calculated and compiled by one of these technicians. Along with personnel changes, there were also changes

in analysis software (see the Methodology Section of this document). However, the detector portion of the HPLC apparatus, which determines sensitivity/accuracy, did NOT change during sample analysis for this database. HPLC detector specifications are included below. Information on Anomalous/Erroneous data may be found in the Completeness Report below.

#### Model 168 DAD Detector\*

Wavelength Range: 190 to 600 nanometers

Wavelength Accuracy: plus or minus 1 nanometer

Bandwidth: Adjustable, 4 to 410 nanometers

Linearity: plus or minus 1 percent to 1.5 absorbance units (AU) with acetone at 265 nanometers

Sensitivity Range: Adjustable from 0.001 to 2.0 absorbance units full scale (AUFS), no lower limit with digital signal

\* For more information on HPLC system specifications for this database, please see the System Gold Pre-Installation Guide archived along with this document in the CISNET.PHYTOPLNKTN.FINAL Directory on CD, Baruch's Server, and in the CISNET Project's Notebook, or go to: <http://www.beckman.com/products/pr2.asp>.

### **2.1.2 Quantitative Attribute Accuracy Assessment**

#### **2.1.2.1 Attribute Accuracy Value**

<u>Parameter</u>	<u>Number of Decimal Places</u>
All Pigments	3 (measured in nanograms per milliliter)

#### **2.1.2.2 Attribute Accuracy Explanation**

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

CISNET #: These values are integers and have no decimal places assigned to them, they are accurate to the whole number.

Site/Rep: The site designation (ace or ni, 1-5) and replicate designation (a) are integers and letters and have no decimal places assigned to them.

All Pigment Parameters: Pigment concentrations (reported in nanograms per milliliter) were calculated by the HPLC technician using the following formula:  $(\text{Peak Area} * R_f * 20) / \text{Volume}$ . See the Process Section for more information on this equation. The HPLC technician felt that the resulting concentration values were accurate to the second decimal place and that the third place was a valid estimate.

### **2.2 Logical Consistency Report: not applicable**

### **2.3 Completeness Report:**

#### ***Missing Data:***

##### All parameters (pigments):

09/24/1999, sample ni5a: Entire sample is missing from the dataset. Documentation indicated that it may have been considered anomalous and removed. The 2005 Data Rescue Manager inserted a row in the spreadsheet for this sample and filled it with missing data markers (periods).

#### ***Anomalous Data:***

##### All parameters (pigments):

07/28/1999, sample ni5a: Entire sample is suspect. Most pigments are at the highest levels registered in the database. In addition, documentation indicates that a second sample from this site (the first is noted above as missing data) was determined to be anomalous and excluded from analysis. The 2005 Data Rescue Manager determined that it was likely to be this one.

### **2.5.1 Methodology**

#### **2.5.1.1 Methodology Type:** Field Collection Procedures and Protocols

#### **2.5.1.3 Methodology Description:** Phytoplankton Pigment Field Collection Protocol

As part of the CISNet database, one-liter bottles were used to collect water samples in triplicate (a, b, and c), approximately mid-way between the daytime high and low tide stages, from a depth of 0.5 meters below the surface. This depth was chosen based on a preliminary CISNet subproject that determined there was little or no difference in



pigment results for samples collected from 0.5 meters below the surface and those collected 0.5 meters above the sediment (see the CISNet: Weekly Monitoring at North Inlet database for these data). Light profiles were determined and salinity and water temperature measurements were taken at the time of sample collection. Sample bottles were immediately placed on ice and rushed to the laboratory for processing. The triplicate samples were processed for nutrients, suspended solids, and chlorophyll (see the CISNet: Water Quality Monitoring at North Inlet and ACE Basin database for these data). One of the triplicate samples (a) was analyzed for phytoplankton pigment levels using HPLC. Samples were collected on a bimonthly basis from July to September 1999, from April to October 2000, and from March to September 2001.

**2.5.1.4 Methodology Citation:**

**8. Citation Information**

**8.1 Originator:** Peter A. Noble

**8.1 Originator:** Raphael G. Tymowski

**8.1 Originator:** Madilyn Fletcher

**8.1 Originator:** James T. Morris

**8.1 Originator:** Alan J. Lewitus

**8.2 Publication Date:** 072003

**8.4 Title:** "Contrasting Patterns of Phytoplankton Community Pigment Composition in Two Salt Marsh Estuaries in Southeastern United States"

**8.6 Geospatial Data Presentation Form:** Scientific Publication

**8.8 Publication Information:**

**8.8.1 Publication place:** unknown

**8.8.2 Publisher:** American Society for Microbiology

**8.9 Other Citation Details:** Volume 69, Number 7, pages 4129-43

**2.5.1 Methodology**

**2.5.1.1 Methodology Type:** Laboratory Procedures and Protocols

**2.5.1.3 Methodology Description:** Phytoplankton Pigment Sample processing and HPLC Analysis

The water samples were filtered using a 25-millimeter glass fiber grade F (GF/F) filter, with a vacuum of 10 inches mercury or less, within a couple hours of collection. The filter and the algae it contained were stored in a -80 degree Celsius freezer until the samples were needed. From this freezer, each sample (filter with algae) was placed into a glass vial. The HPLC technician added 2 milliliters of HPLC grade acetone and agitated the mixture with a vortex mixer for about 20 seconds, or until the filter broke down. The filter and algae "slurry" were then placed in a -20 degree Celsius freezer overnight. The next morning, the sample was vortexed again and then syringe filtered through a 0.2 micron pore size PTFE membrane. The filtrate was stored at -20 degrees Celsius until it was analyzed, usually within a day or two. Analysis was conducted using a Beckman System Gold HPLC (125 pump unit and 168 detector), initially with the Beckman Gold software (1999 samples) and later with the 32 Karat Gold software (2000 and 2001 samples), following the method of Van Heukelem and Thomas (2001) specific for the Agilent XDB C8 column.

**2.5.1.4 Methodology Citation:**

**8. Citation Information**

**8.1 Originator:** Laurie Van Heukelem

**8.1 Originator:** Crystal S. Thomas

**8.2 Publication Date:** 2001

**8.4 Title:** "Computer-assisted high-performance liquid chromatography method development with applications to the isolation and analysis of phytoplankton pigments"

**8.6 Geospatial Data Presentation Form:** Scientific Publication

**8.8 Publication Information:**

**8.8.1 Publication place:** unknown

**8.8.2 Publisher:** Journal of Chromatography A

**8.9 Other Citation Details:** Volume 910, pages 31-49

**2.5.1.4 Methodology Citation:**

**8. Citation Information**

**8.1 Originator:** Beckman Coulter, Inc.

**8.2 Publication Date:** 2002

**8.4 Title:** Beckman Coulter System Gold HPLC literature

**8.6 Geospatial Data Presentation Form:** various published manuals

**8.8 Publication Information:**

**8.8.1 Publication place:** Fullerton California

**8.8.2 Publisher:** Beckman Coulter

**8.9 Other Citation Details:** [www.beckmancoulter.com](http://www.beckmancoulter.com)

#### **2.5.3.1 Process Description:**

##### ***Overall Description***

After HPLC analysis was completed, the HPLC technician used Microsoft Excel spreadsheets to calculate pigment concentrations using the following formula:  $(\text{Peak Area} * \text{Rf} * 20) / \text{Volume} = \text{concentration}$ . The Peak Area is the pigment measurement output resulting from HPLC analysis. The Rf value is the response factor calculated from a standard, 20 is a multiplier based on the amount of sample injected, and Volume refers to the volume of original sample filtered (not the amount of extract that was analyzed). These Process Excel spreadsheets contained each pigment's Peak Area, Rf value, and the calculated concentrations for the specified sample, as well as the, date, sample location and volume filtered. The HPLC technician verified all data entered into the spreadsheet.

##### ***2005 Data Rescue Process Description***

The 2005 Data Rescue Manager obtained all available raw, process, and final data files from Raphael Tymowski and Alan Lewitus (primary investigators). Raw files were originally exported and saved in a format that is readable only with the HPLC software. Hardcopies of the HPLC output contained within these files are maintained onsite by the HPLC technician. In order to archive the raw data in a more usable digital format, they were exported as text files. The original raw data files and the exported text files were archived on CD and on Baruch's Rescue Server in the CISNET.PHYTOPLNKTN.RAW Archive Directory. Hardcopies of the HPLC output remain at the Baruch Marine Field Lab and are maintained by the HPLC Technician.

In order to archive the data process step, the 2005 Data Rescue Manager standardized and merged five process Excel spreadsheets, used to calculate pigment concentrations, into one master process file for archival. The Data Manager inserted missing data markers and zero values where appropriate, formatted/standardized date and site/rep values, removed formulas (leaving only calculated values), inserted CISNet sample numbers, and formatted the parameters for ease of use and consistency. This combined file contains the sample date, CISNet sample number, sample site/replicate, and the Rf values, Peak Area values, and calculated concentrations. The file was named CISNET.HPLC.1999-2001.PROCESS and archived in both MS Excel and CSV formats, along with the original process data files, on CD and Baruch's Rescue Server, in the CISNET.PHYTOPLNKTN.PROCESS Directory.

The HPLC Technician had previously created a final spreadsheet using the processed data noted above. This data file contained only sample date, CISNET sample number, sample site/replicate, and the calculated pigment concentrations. The 2005 Data Rescue Manager used this final spreadsheet to quality check the data. All questionable data were discussed with the HPLC Technician and verified using the process spreadsheets and raw data files where necessary. All corrections and questionable data were noted under the Anomalous Data portion of the Completeness Report in this document. After completing this quality check, the Data Rescue Manager verified that all missing data were marked with a period (.) and documented completely in the Missing Data portion of the Completeness Report. This final file was then named CISNET.PHYTOPLNKTN.1999-2001 and archived in both MS Excel and CSV formats, along with this metadata document, in the CISNET.PHYTOPLNKTN.FINAL Directory on CD, Baruch's Server, and Baruch's website as part of the final, published database. Hardcopies of both the metadata document and final spreadsheet were printed for archival in the CISNet Project's Notebook, which is maintained by Baruch's Data Manager onsite at the Field Lab.

#### **2.5.2.3 Process Date:** 20050501

### **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. The ACE Basin Estuary is located south of Charleston, in Charleston and Beaufort Counties, South Carolina, USA.

### 3.2 Direct Spatial Reference Method: Point

#### 5. Entity and Attribute Information:

##### 5.2 Overview Description:

##### 5.2.1 Entity and Attribute Overview:

Date = the month day and year that the sample was collected, not necessarily processed or analyzed.

CISNET # - the sample designation for the CISNet project. Each sampling event (may have occurred over 2 days) was given a number.

Site/Rep = sample designation information. Site refers to sample locations 1-5 at either ace (ACE Basin) or ni (North Inlet). The replicate refers to one of three replicates (a-c), for the purpose of this subproject/dataset, only replicate "a" was analyzed.

All Pigment Parameters = designation of the pigment isolated and quantified in the water sample. A list of all pigment parameters follows:

- Chlorophyll c2
- Chlorophyll c1
- Peridinin
- 19'-Butanoyloxyfucoxanthin
- Fucoxanthin
- Neoxanthin
- Prasinoxanthin
- Violaxanthin
- 19'-Hexanoyloxyfucoxanthin
- Diadinoxanthin
- Alloxanthin
- Diatoxanthin
- Zeaxanthin
- Lutein
- Canthaxanthin
- Chlorophyll b
- Chlorophyll a
- Carotenes (a+b) = alpha and beta Carotenes together

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

<u>Variable</u>	<u>Type and Total Size of Value.Number of Decimal Places</u>	<u>Range of Measurement and Units</u>
Date (mm/dd/yyyy)	Integer	1-12, 1-31, 1999-2001
CISNET #	Integer	1-15
Site/Rep (ace3a)	Integer/Alpha	ace or ni, 1-5, a
Chlorophyll c2	Real 5.3	0.000 – 7.248 nanograms per milliliter
Chlorophyll c1	Real 5.3	0.000 – 9.112 nanograms per milliliter
Peridinin	Real 6.3	0.000 – 14.767 nanograms per milliliter
19'-Butanoyloxyfucoxanthin	Real 5.3	0.000 – 1.787 nanograms per milliliter
Fucoxanthin	Real 6.3	0.095 – 24.246 nanograms per milliliter
Neoxanthin	Real 5.3	0.000 – 0.301 nanograms per milliliter
Prasinoxanthin	Real 5.3	0.000 – 0.373 nanograms per milliliter
Violaxanthin	Real 5.3	0.000 – 3.661 nanograms per milliliter
19'-Hexanoyloxyfucoxanthin	Real 5.3	0.000 – 0.081 nanograms per milliliter
Diadinoxanthin	Real 5.3	0.030 – 8.596 nanograms per milliliter
Alloxanthin	Real 5.3	0.000 – 1.826 nanograms per milliliter
Diatoxanthin	Real 5.3	0.000 – 1.017 nanograms per milliliter
Zeaxanthin	Real 5.3	0.000 – 0.782 nanograms per milliliter
Lutein	Real 5.3	0.000 – 0.497 nanograms per milliliter
Canthaxanthin	Real 5.3	0.000 – 0.141 nanograms per milliliter

Chlorophyll b	Real 5.3	0.018 – 1.734 nanograms per milliliter
Chlorophyll a	Real 6.3	0.236 – 61.006 nanograms per milliliter
Carotenes (a+b)	Real 5.3	0.050 – 2.362 nanograms per milliliter

### 5.2.2 Entity and Attribute Detail Citation:

Definitions were developed by the Baruch Institute's data managers, researchers, and technicians; no published standards for entity definitions were used to define the entities used in this dataset. However, some of the entity type definitions are standard for the field of estuarine and microbial 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) 546-6219 extension 225

#### 10.7 Contact Facsimile Telephone:

(843) 546-1632

#### 10.8 Contact Electronic Mail Address:

ginger@belle.baruch.sc.edu

#### 10.9 Hours of Service:

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

### 6.2 Resource Description:

#### *Dataset Identification names:*

CISNET PHYTOPLNKTN

CISNet Phytoplankton Monitoring Database

CISNet Phytoplankton Pigments Database

CISNet HPLC Database

#### *Final Rescued and Archived Directory and File Names (June 2005)*

**CISNET.PHYTOPLNKTN.FINAL** (Directory Size: 4.15 MB, 2 folders, 7 files)

**FINAL.DATA** (Directory Size: 92.0 KB, 2 files)

CISNET.PHYTOPLNKTN.1999-2001.xls

CISNET.PHYTOPLNKTN.1999-2001.csv

**FINAL.DOCUMENTATION** (Directory Size: 7.30 MB, 1 folder, 9 files)

CISNET.PHYTOPLNKTN.1999-2001.METADATA.doc

CISNET.PHYTOPLNKTN.1999-2001.METADATA.txt

CISNET.PHYTOPLNKTN.1999-2001.METADATA.pdf

CISNET.ACEBasinSampleSites.pdf

CISNET.NorthInletSampleSites.pdf

CISNET.SiteCoordinates.xls

#### **Additional Documentation**

(Directory Size: 2.92 MB, 3 files)

BeckmanSystemGoldGuide.pdf

ContrastingPhyto.pdf (publication)

ExampleChromatogram.jpg

**CISNET.PHYTOPLNKTN.PROCESS** (Directory Size: 544 KB, 1 folder, 7 files)

CISNET.HPLC.ProcessCompiled.xls  
CISNET.HPLC.ProcessCompiled.csv

**Original.ProcessFiles** (Directory Size: 304 KB, 5 files)

1999 cisnet pigments  
hplc-cisnet-1-2000  
hplc-cisnet-2-2000  
hplc-cisnet-3-2000  
hplc-cisnet-2001

**CISNET.PHYTOPLNKTN.RAW Archive** (Directory Size: 44.7 MB, 35 folders, 340 files)

RAW.ArchiveDirectory.doc: details the contents of the CISNET.PHYTOPLNKTN.RAW Archive directory.  
RAW.ArchiveDirectory.txt: a duplicate version of the above file in text only format.

CisnetRawHPLC.FileDirectory.xls: corresponds the raw file names to sample date, number, and site/replication.  
CisnetRawHPLC.FileDirectory.csv: a duplicate version of the above file in comma separated version format.

**RawHPLCfiles** (Directory Size: 22.3 MB, 33 folders, 191 files)

This directory contains the raw HPLC output files as they were exported by the Beckman System Gold HPLC.

**ExportedTXTfiles** (Directory Size: 22.6 MB, 151 files)

This directory contains the raw HPLC output files exported in text version for usability.

### **6.3 Distribution Liability:**

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

### **6.4 Standard Order Process**

#### **6.4.2. Digital Form**

##### **6.4.2.1 Digital Transfer Information**

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

**6.4.2.1.2 Format Version Number:** Microsoft Office Professional 2000

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

##### **6.4.2.2 Digital Transfer Option**

###### **6.4.2.2.1 Computer Contact Information**

###### **6.4.2.2.1.1 Network Address**

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

**6.4.3 Fees:** None

### **6.5 Custom Order Process:**

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

## **7. Metadata Reference Information**

**7.1 Metadata Date:** 20050629

**7.2 Metadata Review Date:** 20050629

**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**

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29442

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USA

**10.5 Contact Voice Telephone:**

(843) 546-6219 extension 225

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(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