

# Water Quality Monitoring Project for the Florida Keys National Marine Sanctuary

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## User Defined Information

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**User Defined List Value:**

**Label:** Predominant Data Type:

**Value:** Numeric

**User Defined Text:**

**Label:** Category

**Value:** Water Quality

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## Identification Information

[Section Index](#)

**Citation:****Citation Information:****Originator:****Publication Date:****Publication Time:****Title:** Water Quality Monitoring Project for the Florida Keys National Marine Sanctuary**Edition:****Geospatial Data Presentation Form:****Series Information:****Series Name:****Issue Identification:****Publication Information:****Publication Place:****Publisher:****Other Citation Details:****Online Linkage:****Larger Work Citation:****Description:****Abstract:**

The Southeastern Environmental Research Program at Florida International University operates a network of 331 fixed sampling sites distributed throughout the estuarine and coastal ecosystems of south Florida. The purpose of this network is to address concerns in regional water quality which cross and overlap separate political boundaries. Funding has come from different sources with individual programs being added as funding became available. Biscayne Bay, Florida Bay, Whitewater Bay, Ten Thousand Islands, Rookery Bay, Estero Bay, and Pine Island Sound are sampled monthly while the Florida Keys National Marine Sanctuary (FKNMS) and the southwest shelf are sampled quarterly. Variables currently being measured include surface and bottom temperature, salinity, dissolved oxygen, nitrate, nitrite, ammonium, total nitrogen, total organic nitrogen, total phosphorus, soluble reactive phosphorus, total organic carbon, total silicate, chlorophyll a, alkaline phosphatase activity, turbidity, and light extinction.

**Purpose:**

The purpose of this network is to address concerns in regional water quality which cross and overlap separate political boundaries. One of the products is a quasi-synoptic "big picture" of nutrient and phytoplankton biomass distributions over the south Florida coastal waters. The SERC network will, in time, provide us with

the data necessary to determine whether conditions within the estuaries and sanctuary are improving or declining.

**Supplemental Information:**

This work was supported by the US-EPA under agreement #x994621-94-0 and by the South Florida Water Management District (#C-13178)

**Time Period of Content:**

**Time Period Information:**

**Range of Dates/Times:**

**Beginning Date:** 3/1995

**Beginning Time:** Unknown

**Ending Date:**

**Ending Time:** Unknown

**Currentness Reference:** ground condition

**Status:**

**Progress:** In Work

**Maintenance and Update Frequency:** Quarterly

**Spatial Domain:**

**Description of Geographic Extent:** The Florida Keys National Marine Sanctuary..

**Bounding Coordinates:**

**West Bounding Coordinate:** -83.083

**East Bounding Coordinate:** -80.1

**North Bounding Coordinate:** 25.590

**South Bounding Coordinate:** 24.379

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**Elevation Maximum:**

**Altitude Distance Units:**

**Data Set G-Polygon:**

**Data Set G-Polygon Outer G-Ring:**

**G-Ring:**

**Data Set G-Polygon Exclusion G-Ring:**

**G-Ring:**

**Keywords:**

**Theme:**

**Theme Keyword Thesaurus:** none

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**Theme Keyword:** chemistry

**Theme Keyword:** freshwater

**Theme Keyword:** marine

**Theme Keyword:** nitrate

**Theme Keyword:** nutrients

**Theme Keyword:** organic

**Theme Keyword:** phosphorus

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**Theme Keyword:** saltwater

**Theme Keyword:** surface water

**Theme Keyword:** water chemistry

**Theme Keyword:** water quality

**Place:**

**Place Keyword Thesaurus:** None

**Place Keyword:** Atlantic Ocean

**Place Keyword:** Dry Tortugas National Park

**Place Keyword:** Everglades National Park

**Place Keyword:** Florida

**Place Keyword:** Florida Keys NMS

**Place Keyword:** Florida Straits

**Place Keyword:** Gulf of Mexico

**Place Keyword:** Hawk Channel

**Place Keyword:** John Pennekamp Coral Reef State Park

**Place Keyword:** Key Largo

**Place Keyword:** Key West NWR

**Place Keyword:** Looe Key NMS

**Place Keyword:** Lower Keys

**Place Keyword:** Middle Keys

**Place Keyword:** National Key Deer Wildlife Refuge

**Place Keyword:** National Marine Sanctuary

**Place Keyword:** Florida Keys NMS

**Place Keyword:** southeast Florida

**Place Keyword:** southwest Florida

**Place Keyword:** state parks

**Place Keyword:** Upper Keys

**Stratum:**

**Stratum Keyword Thesaurus:**

**Stratum Keyword:**

**Temporal:**

**Temporal Keyword Thesaurus:**

**Temporal Keyword:**

**Taxonomy:**

**Keywords/Taxon:**

**Taxonomic Keyword Thesaurus:**

**Taxonomic Keywords:**

**Taxonomic System:**

**Classification System/Authority:**

**Classification System Citation:**

**Classification System Modifications:**

**Identification Reference:**

**Identifier:**

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**Contact Person Primary:**

**Contact Person:**

**Contact Organization:**

**Contact Position:**

**Contact Address:**

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**State or Province:**

**Postal Code:**

**Country:**

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**Contact TDD/TTY Telephone:**  
**Contact Facsimile Telephone:**  
**Contact Electronic Mail Address:**  
**Hours of Service:**  
**Contact Instructions:**

**Taxonomic Procedures:**

**Taxonomic Completeness:**

**Vouchers:**

**Specimen:**

**Repository:**

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**Contact Person:**

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**General Taxonomic Coverage:**

**Taxonomic Classification:**

**Taxon Rank Name:** Kingdom

**Taxon Rank Value:**

**Applicable Common Name:**

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**Taxon Rank Value:**

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**Access Constraints:** Available

**Use Constraints:** Give proper credit

**Point of Contact:**

**Contact Information:**

**Contact Person Primary:**

**Contact Person:** Boyer, Joseph N.

**Contact Organization:** Florida International University

**Contact Position:** Associate Scientist

**Contact Address:**

**Address Type:** mailing and physical address

**Address:**

Southeast Environmental Research Center, OE 148, FIU

**City:** Miami

**State or Province:** FL

**Postal Code:** 33199

**Country:** USA

**Contact Voice Telephone:** 305-348-4076

**Contact TDD/TTY Telephone:**

**Contact Facsimile Telephone:**

**Contact Electronic Mail Address:** boyerj@fiu.edu

**Hours of Service:**

**Contact Instructions:**

**Browse Graphic:**

**Browse Graphic File Name:**

**Browse Graphic File Description:**

**Browse Graphic File Type:**

**Data Set Credit:** Data were provided by the SERC-FIU Water Quality Monitoring Network which is supported by EPA Agreement #X994621-94-0 and SFWMD/SERC Cooperative Agreements #C-13178.

**Point of Contact:**

**Security Information:**

**Security Classification System:**

**Security Classification:**

**Security Handling Description:**

**Native Data Set Environment:** Number of Records: 1,001 - 10,000, File Size (MB):10 MB,

**Cross Reference:**

**Analytical Tool:**

**Analytical Tool Description:**

**Tool Access Information:**

**Online Linkage:**

**Tool Access Instruction:**

**Tool Computer and Operating System:**

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**Contact Instructions:**

**Tool Citation:**

**Analytical Tool:**

**Analytical Tool Description:**

**Tool Access Information:**

**Online Linkage:**

**Tool Access Instruction:**

**Tool Computer and Operating System:**

**Tool Contact:**

**Contact Information:**

**Contact Person Primary:**

**Contact Person:**

**Contact Organization:**

**Contact Position:**

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**Analytical Tool Description:**

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**Online Linkage:**

**Tool Access Instruction:**

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**Hours of Service:**  
**Contact Instructions:**

**Tool Citation:**  
**Web Published:**

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## **Data Quality Information**

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**Attribute Accuracy Report:**  
**Quantitative Attribute Accuracy Assessment:**  
**Attribute Accuracy Value:**  
**Attribute Accuracy Explanation:**  
**Logical Consistency Report:**  
**Completeness Report:**  
**Positional Accuracy:**

**Horizontal Positional Accuracy:**

**Horizontal Positional Accuracy Report:** 10 m

**Quantitative Horizontal Positional Accuracy Assessment:**

**Horizontal Positional Accuracy Value:**

**Horizontal Positional Accuracy Explanation:**

**Vertical Positional Accuracy:**

**Vertical Positional Accuracy Report:** 10 m

**Quantitative Vertical Positional Accuracy Assessment:**

**Vertical Positional Accuracy Value:**

**Vertical Positional Accuracy Explanation:**

**Lineage:**

**Methodology:**

**Methodology Type:** Field

**Methodology Identifier:**

**Methodology Keyword Thesaurus:**

**Methodology Keyword:**

**Methodology Description:** For each event, field measurements and grab samples were collected from 154 fixed stations within the FKNMS boundary. Depth profiles of temperature ( $^{\circ}\text{C}$ ), salinity (practical salinity scale), dissolved oxygen (DO,  $\text{mg l}^{-1}$ ), photosynthetically active radiation (PAR,  $\mu\text{E m}^{-2} \text{s}^{-1}$ ), in situ chlorophyll a specific fluorescence (FSU), optical backscatterance turbidity (OBS), depth as measured by pressure transducer (m), and density ( $\sigma_t$ , in  $\text{kg m}^{-3}$ ) were measured by CTD casts (Seabird SBE 19). The CTD was equipped with internal RAM and operated in stand alone mode at a sampling rate of 0.5 sec. The vertical light attenuation coefficient ( $K_d$ ,  $\text{m}^{-1}$ ) was calculated at 0.5 m intervals from PAR and depth using the standard exponential equation and averaged over the station depth. This was necessary due to periodic occurrence of optically distinct layers within the water column. During these events,  $K_d$  was reported for the upper layer. To determine the extent of stratification we calculated the difference between surface and bottom density as delta sigma-t ( $\Delta\sigma_t$ ), where positive values denoted greater density of bottom water relative to the surface. A  $\Delta\sigma_t > 1$  is weakly stratified, while anything  $> 2$  is considered strongly stratified.

In the Backcountry area where it was too shallow to use a CTD, surface salinity and temperature were measured using a combination salinity-conductivity-temperature probe (Orion model 140). DO was measured using an oxygen electrode (Orion model 840) corrected for salinity and temperature. PAR was measured using a Li-Cor irradiance meter equipped with two  $4\pi$  spherical sensors (LI-193SB) separated by 0.5 m in depth and

oriented at 90° to each other. The light meter measured instantaneous difference between sensors which was then used to calculate  $K_d$  from in-air surface irradiance.

Water was collected from approximately 0.25 m below the surface and at approximately 1 m from the bottom with a teflon-lined Niskin bottle (General Oceanics) except in the Backcountry and Sluiceway where it was collected directly into sample bottles. Duplicate, unfiltered water samples were dispensed into 3x sample rinsed 120 ml HDPE bottles for analysis of total constituents. Duplicate water samples for dissolved nutrients were dispensed into 3x sample rinsed 150 ml syringes which were then filtered by hand through 25 mm glass fiber filters (Whatman GF/F) into 3x sample rinsed 60 ml HDPE bottles. The resulting wet filters, used for chlorophyll a (CHLA) analysis, were placed in 1.8 ml plastic centrifuge tubes to which 1.5 ml of 90 % acetone/water was added (Strickland and Parsons 1972).

Unfiltered samples were kept at ambient temperature in the dark during transport to the laboratory. During shipboard collection in the Tortugas/Marquesas and overnight stays in the Keys, unfiltered samples were analyzed for alkaline phosphatase activity ( $\mu\text{M h}^{-1}$ ) and turbidity (NTU) prior to refrigeration. Filtered samples and CHLA filters were kept on ice in the dark during transport. During shipboard collection in the Tortugas/Marquesas and overnight stays in the lower Keys, filtrates and filters were frozen until further analysis.

Unfiltered water samples were analyzed for total organic carbon (TOC), total nitrogen (TN), total phosphorus (TP), silicate ( $\text{Si}(\text{OH})_4$ ), alkaline phosphatase activity (APA), and turbidity. TOC was measured by direct injection onto hot platinum catalyst in a Shimadzu TOC-5000 after first acidifying to  $\text{pH} < 2$  and purging with  $\text{CO}_2$ -free air. TN was measured using an ANTEK 7000N Nitrogen Analyzer using  $\text{O}_2$  as carrier gas to promote complete recovery of the nitrogen in the water samples. TP was determined using a dry ashing, acid hydrolysis technique.  $\text{Si}(\text{OH})_4$  was measured using the molybdosilicate method. The APA assay measures the activity of alkaline phosphatase, an enzyme used by bacteria and algae to mineralize orthophosphate from organic compounds. The assay is performed by adding a known concentration of methylfluorescein phosphate to an unfiltered water sample. Alkaline phosphatase in the water sample cleaves the orthophosphate, leaving methylfluorescein, a highly fluorescent compound. Fluorescence at initial and after 2 hr incubation were measured using a Gilford Fluoro IV Spectrofluorometer (excitation = 430 nm, emission = 507 nm) and subtracted to give APA in  $\mu\text{M h}^{-1}$ . Turbidity was measured using an HF Scientific model DRT-15C turbidimeter and reported in NTU.

Filtrates were analyzed for nitrate+nitrite ( $\text{NO}_x^-$ ), nitrite ( $\text{NO}_2^-$ ), ammonium ( $\text{NH}_4^+$ ), and soluble reactive phosphorus (SRP) by flow injection analysis (Alpkem model RFA 300). Filters for CHLA content ( $\mu\text{g l}^{-1}$ ) were allowed to extract for a minimum of 2 days at  $-20^\circ\text{C}$  before analysis. Extracts were analyzed using a Gilford

Fluoro IV Spectrofluorometer (excitation = 435 nm, emission = 667 nm). All analyses were completed within 1 month after collection in accordance to SERC laboratory QA/QC guidelines.

Some parameters were not measured directly, but were calculated by difference. Nitrate ( $\text{NO}_3^-$ ) was calculated as  $\text{NO}_x^- - \text{NO}_2^-$ , dissolved inorganic nitrogen (DIN) as  $\text{NO}_x^- + \text{NH}_4^+$ , and total organic nitrogen (TON) defined as TN - DIN. All concentrations are reported as  $\mu\text{M}$  unless noted. All elemental ratios discussed were calculated on a molar basis.

**Methodology Citation:** JONES, R. D., AND J. N. BOYER. 2002. FY2001 Annual Report of the Water Quality Monitoring Project for the Florida Keys National Marine Sanctuary. EPA Agreement #X994621-94-0. <http://serc.fiu.edu/wqmnetwork/FKNMS-CD/2001FKNMS.pdf>

**Source Information:**

**Source Citation:**

**Source Scale Denominator:**

**Type of Source Media:**

**Source Time Period of Content:**

**Time Period Information:**

**Single Date/Time:**

**Calendar Date:**

**Time of Day:**

**Source Currentness Reference:**

**Source Citation Abbreviation:**

**Source Contribution:**

**Process Step:**

**Process Description:**

**Source Used Citation Abbreviation:**

**Process Date:**

**Process Time:**

**Source Produced Citation Abbreviation:**

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**Contact TDD/TTY Telephone:**  
**Contact Facsimile Telephone:**  
**Contact Electronic Mail Address:**  
**Hours of Service:**  
**Contact Instructions:**

Cloud Cover:

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## **Spatial Data Organization Information**

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**Indirect Spatial Reference:**  
**Direct Spatial Reference Method:**  
**Raster Object Information:**  
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    **Vertical Count:**

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## **Spatial Reference Information**

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**Horizontal Coordinate System Definition:**

**Geographic:**

**Latitude Resolution:**

**Longitude Resolution:**

**Geographic Coordinate Units:**

**Geodetic Model:**

**Horizontal Datum Name:**

**Ellipsoid Name:**

**Semi-major Axis:**

**Denominator of Flattening Ratio:**

**Vertical Coordinate System Definition:**

**Altitude System Definition:**

**Altitude Datum Name:**

**Altitude Resolution:**

**Altitude Distance Units:**

**Altitude Encoding Method:**

**Depth System Definition:**

**Depth Datum Name:**

**Depth Resolution:**

**Depth Distance Units:**

**Depth Encoding Method:**

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## **Entity and Attribute Information**

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**Entity Type Label:**  
**Entity Type Definition:**  
**Entity Type Definition Source:**

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**Attribute Label:** %IO  
**Attribute Definition:** % surface light penetration to bottom (%)  
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**Attribute Label:** %SAT-B  
**Attribute Definition:** bottom percent DO saturation (%)  
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**Attribute:**

**Attribute Label:** %SAT-S

**Attribute Definition:** surface percent DO saturation (%)

**Attribute Definition Source:**

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**Attribute Label:** APA-B

**Attribute Definition:** bottom alkaline phosphatase activity ( $\mu\text{M h}^{-1}$ )

**Attribute Definition Source:**

**Attribute Domain Values:**

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**Attribute Definition:** surface alkaline phosphatase activity ( $\mu\text{M h}^{-1}$ )

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**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** DO-S

**Attribute Definition:** surface dissolved oxygen ( $\text{mg l}^{-1}$ )

**Attribute Definition Source:**

**Attribute Domain Values:**

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**Enumerated Domain Value Definition Source:**

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**Attribute Value Accuracy Information:**

**Attribute Value Accuracy:**

**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** DSIGT

**Attribute Definition:** delta sigma-t ( $\text{kg m}^{-3}$ )

**Attribute Definition Source:**

**Attribute Domain Values:**

**Enumerated Domain:**

**Enumerated Domain Value:**

**Enumerated Domain Value Definition:**

**Enumerated Domain Value Definition Source:**

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**Ending Date of Attribute Values:**

**Attribute Value Accuracy Information:**

**Attribute Value Accuracy:**

**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** KD

**Attribute Definition:** diffuse light attenuation coefficient ( $m^{-1}$ )

**Attribute Definition Source:**

**Attribute Domain Values:**

**Enumerated Domain:**

**Enumerated Domain Value:**

**Enumerated Domain Value Definition:**

**Enumerated Domain Value Definition Source:**

**Beginning Date of Attribute Values:**

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**Attribute Value Accuracy Information:**

**Attribute Value Accuracy:**

**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** LATDEC

**Attribute Definition:** decimal latitude

**Attribute Definition Source:**

**Attribute Domain Values:**

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**Attribute Value Accuracy:**

**Attribute Value Accuracy Explanation:**

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**Attribute Measurement Frequency:**

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**Attribute Measurement Frequency:**

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**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** NH4-S  
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**Attribute Label:** NO2-B  
**Attribute Definition:** bottom nitrite ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** NO2-S  
**Attribute Definition:** surface nitrite ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute:**

**Attribute Label:** NO3-B  
**Attribute Definition:** bottom nitrate ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** NO3-S

**Attribute Definition:** surface nitrate ( $\mu\text{M}$ )

**Attribute Definition Source:**

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**Attribute:**

**Attribute Label:** NOX-B

**Attribute Definition:** bottom nitrate+nitrite ( $\mu\text{M}$ )

**Attribute Definition Source:**

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**Attribute:**

**Attribute Label:** NOX-S

**Attribute Definition:** surface nitrate+nitrite ( $\mu\text{M}$ )

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**Attribute:**

**Attribute Label:** SAL-B

**Attribute Definition:** bottom salinity (psu)

**Attribute Definition Source:**

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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** SAL-S

**Attribute Definition:** surface salinity (psu)

**Attribute Definition Source:**  
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**Attribute:**

**Attribute Label:** SI-B  
**Attribute Definition:** bottom total silicate ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute:**

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**Attribute Definition:** surface total silicate ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute:**

**Attribute Label:** SRP-B  
**Attribute Definition:** bottom soluble reactive phosphorus ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Label:** SRP-S  
**Attribute Definition:** surface soluble reactive phosphorus ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Definition:** sampling station  
**Attribute Definition Source:**  
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**Attribute Definition:** survey number  
**Attribute Definition Source:** the authority of the definition.  
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**Attribute Measurement Frequency:** As needed

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**Attribute Label:** TEMP-B

**Attribute Definition:** bottom temperature (°C)

**Attribute Definition Source:**

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**Attribute:**

**Attribute Label:** TEMP-S

**Attribute Definition:** surface temperature (°C)

**Attribute Definition Source:**

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**Attribute Label:** TIME

**Attribute Definition:** time of sample collection

**Attribute Definition Source:**

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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TN-B

**Attribute Definition:** bottom total nitrogen ( $\mu\text{M}$ )

**Attribute Definition Source:**

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**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TN-S

**Attribute Definition:** surface total nitrogen ( $\mu\text{M}$ )

**Attribute Definition Source:**

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**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TN:TP

**Attribute Definition:** surface total nitrogen to total phosphorus ratio (molar)

**Attribute Definition Source:**

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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TOC-B

**Attribute Definition:** bottom total organic carbon ( $\mu\text{M}$ )

**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TOC-S  
**Attribute Definition:** surface total organic carbon ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

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**Attribute Label:** TON-B  
**Attribute Definition:** bottom total organic nitrogen ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Value Accuracy Explanation:**  
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**Attribute:**

**Attribute Label:** TON-S  
**Attribute Definition:** surface total organic nitrogen ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TP-B  
**Attribute Definition:** bottom total phosphorus ( $\mu\text{M}$ )  
**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TP-S  
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**Attribute Definition Source:**  
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**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TURB-B  
**Attribute Definition:** bottom turbidity (NTU)  
**Attribute Definition Source:**  
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**Attribute Value Accuracy:**

**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Attribute:**

**Attribute Label:** TURB-S

**Attribute Definition:** surface turbidity (NTU)

**Attribute Definition Source:**

**Attribute Domain Values:**

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**Beginning Date of Attribute Values:**

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**Attribute Value Accuracy Information:**

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**Attribute:**

**Attribute Label:** YEAR

**Attribute Definition:** decimal year

**Attribute Definition Source:**

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**Attribute Value Accuracy:**

**Attribute Value Accuracy Explanation:**

**Attribute Measurement Frequency:**

**Overview Description:**

**Entity and Attribute Overview:**

**Entity and Attribute Detail Citation:**

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## **Distribution Information**

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**Distributor:**

**Contact Information:**

**Contact Person Primary:**

**Contact Person:** Boyer, Joseph N.

**Contact Organization:** Florida International University

**Contact Position:** Associate Scientist

**Contact Address:**

**Address Type:** mailing and physical address

**Address:**

Southeast Environmental Research Center, OE 148, FIU

**City:** Miami

**State or Province:** FL

**Postal Code:** 33199

**Country:** USA

**Contact Voice Telephone:** 305-348-4076

**Contact TDD/TTY Telephone:**

**Contact Facsimile Telephone:**

**Contact Electronic Mail Address:** boyerj@fiu.edu

**Hours of Service:**

**Contact Instructions:**

**Resource Description:**

**Distribution Liability:**

**Standard Order Process:**

**Digital Form:**

**Digital Transfer Information:**

**Format Name:**

**Format Version Number:**

**Format Specification:**

**ASCII File Structure:**

**Record Delimiter:**

**Number Header Lines:**

**Description of Header Content:**

**Orientation:**

**Case Sensitive:**

**Authentication:**

**Quote Character:**

**Data Field:**

**Data Field Name:**

**Missing Value Code:**

**Data Field Width:**

**Format Information Content:**

**File Decompression Technique:**

**Transfer Size:**

**Digital Transfer Option:**

**Online Option:**

**Computer Contact Information:**

**Network Address:**

**Network Resource Name:**

**Access Instructions:**

**Online Computer and Operating System:**

**Fees:**

**Ordering Instructions:**

**Turnaround:**

**Custom Order Process:**

**Technical Prerequisites:**

**Available Time Period:**

**Time Period Information:**

**Single Date/Time:**  
**Calendar Date:**  
**Time of Day:**

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## Metadata Reference Information

### [Section Index](#)

**Metadata Date:** 9/10/2002

**Metadata Review Date:** 1/20/2000

**Metadata Future Review Date:**

**Metadata Contact:**

**Contact Information:**

**Contact Person Primary:**

**Contact Person:** Boyer, Joseph N.

**Contact Organization:** Florida International University

**Contact Position:** Associate Scientist

**Contact Address:**

**Address Type:** mailing and physical address

**Address:**

Southeast Environmental Research Center, OE 148, FIU

**City:** Miami

**State or Province:** FL

**Postal Code:** 33199

**Country:** USA

**Contact Voice Telephone:** 305-348-4076

**Contact TDD/TTY Telephone:**

**Contact Facsimile Telephone:**

**Contact Electronic Mail Address:** boyerj@fiu.edu

**Hours of Service:**

**Contact Instructions:**

**Metadata Standard Name:** FGDC Biological Data Profile of the Content Standard for Digital Geospatial Metadata

**Metadata Standard Version:** 1998

**Metadata Time Convention:** local time

**Metadata Access Constraints:**

**Metadata Use Constraints:**

**Metadata Security Information:**

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**Metadata Security Classification:**

**Metadata Security Handling Description:**

**Metadata Extensions:**

**Online Linkage:**

**Profile Name:**

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## Keywords

### [Section Index](#)

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**Theme Keyword:**

**Place:**

**Place Keyword Thesaurus:**

**Place Keyword:**

**Stratum:**

**Stratum Keyword Thesaurus:**

**Stratum Keyword:**

**Temporal:**

**Temporal Keyword Thesaurus:**

**Temporal Keyword:**

**Keywords/Taxon:**

**Methodology Identifier:**

**Methodology Keyword Thesaurus:**  
**Methodology Keyword:**

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[SMMS](#) Metadata report generated 2002/09/10