

# Data Documentation

## Dataset Information

### Dataset Title:

NCCOS Assessment: Water Quality Data for the South Florida Reef Tract from 2016-09-22 to 2018-12-11

### Description:

This dataset represents three years of water quality data collected in the South Florida Reef Tract. A standard suite of nutrient parameters (nitrate, nitrite, ammonium, urea, total nitrogen, orthophosphate, total phosphorus and silica) monthly from 2016 to 2018.

### Purpose:

Water quality problems, including sedimentation and over enrichment of nutrients, are a major threat to coral reefs worldwide, especially in near shore reefs. In the South Florida Reef Tract, extends from Biscayne Bay National Park in the south to St. Lucie Inlet in the north, local stakeholder perception is that water quality is negatively impacting the reef. However, there is currently little evidence to support that contention, partially due to a relative lack of water quality data in the reef habitats. At the request of the Florida Department of Environmental Protection (FDEP) and the Southeast Florida Coral Reef Initiative (SEFCRI), this study quantified the water quality conditions of the reef tract across its 109 mile extent, including the contribution of inlets and offshore wastewater outfalls. It should be noted that this dataset contains data for both St. Lucie and Government Cut. A parallel effort by Florida Department of Environmental Protection quantified the same analytes at the other seven Inlet Contributing Areas in the region (Baker's Haulover, Port Everglades, Hillsboro, Boca Raton, Boynton Inlet, Lake Worth and Jupiter). Both datasets are discussed in Whitall *et al.*, 2019.

### Methods:

For a complete description of the process and analyses see Whitall *et al.* (2019).

Sites in this data were distributed between two Inlet Contributing Areas (St. Lucie and Government Cut). Four targeted sites (at the inlet, north of inlet, south of inlet and offshore from inlet) were located at each inlet. Additionally, for Government Cut, targeted sites were located at the wastewater outfall. Randomize sites were co-located with previously sampled National Coral Reef Monitoring Program (NCRMP) sites in order to leverage biological data collected at those site. A total of 27 sites were sampled monthly.

Surface water (0.1 m below surface) and bottom water (via Niskin bottle, just above bottom) were collected for water quality analysis; exceptions to this were the outfall sites which were in water too deep to allow bottom water sampling (equipment limitations). The bottles were rinsed three times with site water prior to sampling. Nitrile or latex gloves were worn by field personnel to avoid contamination of the samples during handling. Samples were stored on ice, in the dark while in the field, frozen at -20°C upon returning to the lab and not thawed until immediately prior to analysis.

*Data Documentation*  
*South Florida Water Quality Data*

Chemical analyses were conducted using previously published methods at a NOAA contract laboratory (Geochemical Environmental Research Group at Texas A&M University for nutrients).

Cited Publications:

- Whitall, D., S. Bricker, D. Cox, J. Baez, J. Stamates, K. Gregg, and F. Pagan. 2019. Southeast Florida Reef Tract Water Quality Assessment. NOAA Technical Memorandum NOS NCCOS 271. Silver Spring. 116 pp. <https://doi.org/10.25923/kyft-ja41>
- Armstrong, F., and C. Stearns. 1967. The measurement of upwelling and subsequent biological processes by means of the Technicon Autoanalyzer and associated equipment. *Deep-Sea Research*, 14:381-389. [https://doi.org/10.1016/0011-7471\(67\)90082-4](https://doi.org/10.1016/0011-7471(67)90082-4)
- Hansen, H., and F. Koroleff. 1999. Determination of Nutrients. In: Grasshoff, K., K. Kremling, and M. Ernhardt [Eds.], *Methods of Seawater Analysis*. New York, Wiley-VCH. ISBN 3-527-29589-5
- Harwood, J., and A. Kuhn. 1970. A colorimetric method for ammonia in natural waters. *Water Research*, 4:805-811. [https://doi.org/10.1016/0043-1354\(70\)90037-0](https://doi.org/10.1016/0043-1354(70)90037-0)

Associated Accessions:

- Southeast Fisheries Science Center (SEFSC); National Centers for Coastal Ocean Science (NCCOS). 2018. National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in the Florida Reef Tract. NOAA National Centers for Environmental Information. Collection. <https://doi.org/10.7289/V5XW4H4Z>

People & Projects

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- Francisco Pagan, US DOC; NOAA; NOS; Coral Reef Conservation Program (CRCP)

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- US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)
- US DOC; NOAA; NOS; Coral Reef Conservation Program (CRCP)

*Data Documentation*  
*South Florida Water Quality Data*

Associated Projects:

- NCCOS Project #243, Technical Support for Inception of Florida DEP Coral Reef Nutrient Monitoring Program, <https://coastalscience.noaa.gov/project/technical-support-florida-coral-reef-nutrient-monitoring-program/>
- CRCP Project #30005, Technical Support of Inception of FDEP Coral Reef Nutrient Monitoring Program

Extents

Start Date: 2016-09-22

End Date: 2018-12-11

Northern Boundary: 27.17298

Southern Boundary: 25.65916

Western Boundary: -80.16313

Eastern Boundary: -80.08113

Keywords

Sea Areas, Water Bodies, Marine Protected Areas:

- Coastal Ocean
- Florida
- South Florida Reef Tract

NCCOS Keywords:

- NCCOS Research Priority > Stressor Impacts and Mitigation
- NCCOS Research Topic > Biological Effects of Contaminants and Nutrients
- NCCOS Research Location > Region > Atlantic Ocean
- NCCOS Research Location > U.S. States and Territories > Florida
- NCCOS Research Data Type > Field Observation

CoRIS Keywords:

CoRIS Discovery Thesaurus:

- Numeric Data Sets > Water Quality

CoRIS Theme Thesaurus:

- EARTH SCIENCE > Oceans > Ocean Chemistry > Chemistry Monitoring and Assessment

CoRIS Place Country/Territory Keywords:

- COUNTRY/TERRITORY > United States of America > Florida > Florida Reef Tract (26N080W0007)

CoRIS Place Ocean/Seas Keywords:

- OCEAN BASIN > Atlantic Ocean > North Atlantic Ocean > Florida Reef Tract (26N080W0007)

File Information

Total File Size: 4 files in 1 folder, 314 KB total (218 KB zipped)

Data File Format(s): Comma-separated value (.CSV)

Data File Compression: no compression

Data Files:

- Data-01\_Inorganic-Nutrients.CSV
- Data-02\_Total-Nutrients.CSV

*Data Documentation*  
*South Florida Water Quality Data*

Documentation Files:

- DataDocumentation.PDF
- DataDocumentation\_Site-Info.ODS

**Table 1: Inorganic Nutrients Data Dictionary**

Column	Variable	Label	Definition	Units	Range
1	Site_Name	Site_Name	Site name	n/a	n/a
2	Sample_Depth	Sample_Depth	Surface or bottom	n/a	n/a
3	Date	Collection_Date	Day of the year sample was collected	MM/DD/YYYY	9/26/16 to 12/11/18
4	Nitrate	NO3	Water concentration	mg N/L	0 to 0.448
5	Orthophosphate	PO4	Water concentration	mg P/L	0 to 0.230
5	Silica	Si	Water concentration	mg Si/L	0 to 6.438
6	Ammonium	NH4	Water concentration	mg N/L	0 to 1.398
7	Nitrite	NO2	Water concentration	mg N/L	0 to 0.058
8	Urea	Urea	Water concentration	mg N/L	0 to 0.150

**Table 2: Total Nutrients Data Dictionary**

Column	Variable	Label	Definition	Units	Range
1	Site_Name	Site_Name	Site name	n/a	n/a
2	Sample_Depth	Sample_Depth	Surface or Bottom	n/a	n/a
3	Date	Collection_Date	Day of the year sample was collected and depth (surface or bottom)	MM/DD/YYYY	9/26/16 to 12/11/18
4	Total Nitrogen	Total_N	Water concentration	mg N/L	0.037 to 2.853
5	Total Phosphorus	Total_P	Water concentration	mg P/L	0.005 to 0.504

**Table 3: Site Information Data Dictionary**

Column	Variable	Label	Definition	Units	Range
1	Latitude	Latitude	Latitude of site	decimal degrees	27.17298 to 25.65916
2	Longitude	Longitude	Longitude of site	decimal degrees	-80.16313 to -80.08113
3	Inlet Contributing Area	ICA	St. Lucie or Government Cut	n/a	n/a
4	Site Name	Site_Name	Site Name	n/a	n/a
5	Site Type	Type	Reef, Outfall or Inlet	n/a	n/a

## Parameter Information

### Major parameters:

- Nutrients:
  - Nitrate, Nitrite, Ammonium, Urea, Total Nitrogen
  - Orthophosphate, Total Phosphorus
  - Silica

### Parameter Description:

*Parameter:* Nutrients

*Property Type:* measured

*Units:* mg/L

*Observation Category:* laboratory analysis

*Sampling Instrument:* Niskin bottle

*Sampling and Analyzing Method:*

- Nitrate and nitrite analyses were based on the methodology of Armstrong *et al.* (1967).
- Ammonium analysis was based on the method of Harwood and Kuhn (1970) using dichloro-isocyanurate as the oxidizer.
- Urea was measured using diacetyl-monoximine and themicarbozide with colorimetric analysis.
- The total concentration of nitrogen was determined after an initial decomposition step. This method involves persulfate oxidation while heating the sample in an autoclave (115°C, 20 minutes) (Hansen and Koroleff, 1999). After oxidation of the samples, nitrogen determination was conducted on the Astoria Pacific analyzer for nitrate.
- The total concentration of phosphorus were determined after an initial decomposition step. This method involves persulfate oxidation while heating the sample in an autoclave (115°C, 20 minutes) (Hansen and Koroleff 1999). After oxidation of the samples, phosphorus determination was conducted on the Astoria Pacific analyzer for orthophosphate.
- Silicate determination was accomplished using the methods of Armstrong *et al.* (1967) using stannous chloride.

*Data Quality Method:*

All laboratory data contained blanks, spikes and percent recoveries. Data were QA/QC'd using National Status and Trends protocols.

## Document Information

Date: 2021-04-16

Resource Provider: NCCOS Data Manager, [nccos.data@noaa.gov](mailto:nccos.data@noaa.gov), US DOC; NOAA; NOS; National Centers for Coastal Ocean Science (NCCOS)

Comment: This data documentation describes data files archived as a NOAA NCEI data accession, and is intended to provide dataset-level metadata for the purposes of discovery, use, and understanding.

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