

# Data Documentation

## Dataset Information

### Dataset Title:

National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Puerto Rico from 2014-05-19 to 2014-12-03 and from 2016-06-07 to 2017-09-15

### Description:

The National Coral Reef Monitoring Program (NCRMP) assessed coral reef communities in in Puerto Rico using the 25m Fish Transect method and stationary point count (Reef Visual Census, RVC) method (7.5m radius cylinder).

These methods collect and report information on species composition, density, size structure, abundance and derived metrics (e.g., species richness, diversity). Data are collected using a random survey design in hardbottom and coral reef habitats less than 30m in depth.

Puerto Rico, including the islands of Vieques, Culebra, Mona and Desecheo. Lead agencies involved include the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Coastal Ocean Science (NCCOS) and NOAA Southeast Fisheries Science Center (SEFSC).

### Purpose:

The National Coral Reef Monitoring Program (NCRMP) details a long-term approach to provide an ecosystem perspective via monitoring climate, fish, benthic, and socioeconomic variables in a consistent and integrated manner. The NCRMP is intended to coordinate various Coral Reef Conservation Program (CRCP) biological, physical, and human dimensions activities into a cohesive NOAA-wide effort. Through the implementation of the NCRMP, NOAA will be able to clearly and concisely communicate results of national-scale monitoring to national, state, and territorial policy makers, resource managers, and the public on a periodic basis.

The National Coral Reef Monitoring Program (NCRMP) is a framework for conducting sustained observations of biological, climate, and socioeconomic indicators at 10 priority coral reefs across the U.S. and its territories. This integrated approach will consolidate monitoring of coral reefs under a uniform method in the Pacific, Atlantic, Caribbean, and the Gulf of Mexico for the first time. NCRMP is funded by the NOAA Coral Reef Conservation Program (CRCP) under CRCP Project #743 "National Coral Reef Monitoring Plan (NCRMP) Implementation," and supported by NOAA's National Centers for Coastal Ocean Science (NCCOS) under NCCOS Project #180 "National Coral Reef Monitoring Program Implementation: Biological and Socioeconomic Monitoring" and NOAA Southeast Fisheries Science Center (SEFSC). These biological monitoring missions gather data on coral reef benthic and fish communities in the U.S. Caribbean, Florida, and the Gulf of Mexico. Each year, NOAA scientists work closely with CRCP and local partners to collect biological data from strategically selected sites. We then develop products that give fellow scientists, managers, decision makers and the public a better understanding of a region's resources and how they are changing over time. The biological component of NCRMP provides a biennial ecological characterization at a broad spatial scale of general reef condition for reef fishes, corals and benthic habitat (i.e., fish species composition/density/size, benthic cover, and

coral density/size/condition). Data collection occurs at stratified random sites where the sampling domain for each region is partitioned by habitat type and depth, sub-regional location (e.g., along-shelf position) and management zone.

## Methods:

2014-2016 fish belt transect and stationary point count (RVC) survey locations were selected using a stratified random sampling design within Puerto Rico. Locations selected for coral demographic surveys are a subset of fish and benthic assessment survey sites. Detailed information describing the sampling design is provided in the NCRMP Sample Frame Generation Protocols and Workflow document.

Briefly, surveys were located on shallow-water coral reefs and hardbottom habitats to a depth of 30 meters. Survey site selection was stratified according to depth classes, benthic habitat types, large marine biotopes and administrative zones. Samples were allocated disproportionate to area and consequently sampling weights are an integral component of data analysis. Variables addressing the sampling design process such as stratum documentation and sampling weights are provided in all data tables as survey attributes

Data provided from this process are provided in all data tables as station information in addition to a main survey attribute table (sample strata, sampling weights).

Refer to data dictionary for complete listing of terms and descriptions.

### 2014 Belt Transect:

The Belt Transect fish census collects and reports information on species composition, density, size, abundance, and derived metrics (e.g., species richness, diversity) using a 25m x 4m belt transect.

In 2015, the fish species *Pterois volitans* (red lionfish) was added to the list of key species requiring actual size measurements.

### 2016 RVC/Stationary Point Count:

In 2016, fish collection changed from the Belt Transect method to the stationary point count (RVC) method to integrate with similar methods used in Florida, another NCRMP sampling location. The stationary point count data collection provides information on fish species collects and reports information on species composition, density, size structure, abundance and derived metrics (e.g., species richness, diversity) and of overall species diversity in a stratified random sampling design in hardbottom and coral reef habitats in the U.S. Caribbean and FGBNMS.

Stationary point count surveys were conducted at all sample locations and co-located with a subset of Coral Demographic and Benthic Assessment surveys.

### Quality Control:

Quality control procedures are implemented in four main stages: (1) ongoing routine training of observers (initial detailed training, annual refresher training); (2) data check following data collection, where divers trade datasheets immediately upon returning to

boat after dive, to ensure all data were collected accurately and required information is complete; (3) independent reviewers compare datasheets with database entries; and (4) statistical analyses are conducted as the final check before distribution.

Before implementation the sampling design was reviewed and agreed upon by representatives from program partners, as well as NCCOS scientists. For more information, see metadata and protocols included in this accession.

In 2017, NCRMP developed a new data template and structure for data delivery/archiving. All prior year packages have been updated to reflect these changes. Any future data packages will follow this new structure for consistency across years.

#### Associated Datasets:

- NOAA National Centers for Coastal Ocean Science and NOAA Southeast Fisheries Science Center. 2018. National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Puerto Rico. NOAA National Centers for Environmental Information. Dataset. <http://doi.org/10.7289/v5t72frz> [access date]
- National Centers for Coastal Ocean Science (NCCOS) and Southeast Fisheries Science Center (SEFSC). 2020. National Coral Reef Monitoring Program: Assessment of coral reef fish in Puerto Rico from 2019-07-29 to 2019-12-31 (NCEI Accession 0218548). NOAA National Centers for Environmental Information. Dataset.
- NOAA National Centers for Coastal Ocean Science and NOAA Southeast Fisheries Science Center. 2018. National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Puerto Rico. NOAA National Centers for Environmental Information. Dataset. <http://doi.org/10.7289/v5pg1q23> [access date]
- National Centers for Coastal Ocean Science (NCCOS) and Southeast Fisheries Science Center (SEFSC). 2020. National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in the Puerto Rico from 2014-05-19 to 2014-12-03 and from 2016-06-07 to 2017-09-15 (NCEI Accession 0224418). NOAA National Centers for Environmental Information. Dataset. [access date]
- National Centers for Coastal Ocean Science (NCCOS) and Southeast Fisheries Science Center (SEFSC). 2020. National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Puerto Rico from 2019-07-29 to 2019-12-31 (NCEI Accession 0217139). NOAA National Centers for Environmental Information. Dataset.
- Coral Reef Conservation Program. 2016. Documentation for NOAA's Coral Reef Conservation Program (CRCP) National Coral Reef Monitoring Program (NCRMP) data archived at NCEI (NCEI Accession 0157633). NOAA National Centers for Environmental Information.

#### People & Projects

##### Dataset Authors:

- National Centers for Coastal Ocean Science (NCCOS); Southeast Fisheries Science Center (SEFSC).

##### Principal Investigator:

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##### Additional Principal Investigators:

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Primary Point of Contact:

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Partners:

- US DOC; NOAA; NMFS; Southeast Fisheries Science Center (SEFSC)
- HJR Reefscaping, Inc.
- CSS
- University of Puerto Rico
- Puerto Rico Department of Natural and Environmental Resources
- University of the Virgin Islands

Funding:

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

Associated Online Resources:

- NCCOS Project #180, National Coral Reef Monitoring Program Implementation: Biological and Socioeconomic Monitoring, <https://coastalscience.noaa.gov/project/national-coral-reef-monitoring-program-biological-socioeconomic/>
- CRCP Project #743, National Coral Reef Monitoring Plan (NCRMP) Implementation, <http://www.coris.noaa.gov/monitoring/>
- NOAA's SEFSC Reef Visual Census Fish Analysis Ready datasets and custom R-package, [https://grunt.sefsc.noaa.gov/rvc\\_analysis20/](https://grunt.sefsc.noaa.gov/rvc_analysis20/)

Extents

Start Date: 2014-05-19

End Date: 2014-12-03

Northern Boundary: 18.51909

Southern Boundary: 17.86705

Western Boundary: -67.9494

Eastern Boundary: -64.2289

Extent Group 2

Start Date: 2016-06-07

End Date: 2017-09-15

Northern Boundary: 18.46334

Southern Boundary: 17.86206

Western Boundary: -67.946

Eastern Boundary: -65.1936

Keywords

Sea Areas, Water Bodies, Marine Protected Areas:

- Caribbean Sea

NCCOS Keywords: (see [Appendix](#) for NCCOS Keywords)

- NCCOS Research Priorities > Marine Spatial Ecology
- NCCOS Research Topics > Ecological and Biological Characterization
- NCCOS Research Location > Region > Caribbean Sea
- NCCOS Research Location > U.S. States and Territories > Puerto Rico
- NCCOS Research Data Types > Field Observation
- NCCOS Research Data Types > Long-term Monitoring

CoRIS Keywords: *Required if CRCP-funded, see [link](#) for CoRIS keywords.*

- CoRIS Discovery Thesaurus:
  - Numeric Data Sets > Fish Census
- CoRIS Theme Thesaurus:
  - EARTH SCIENCE > Biosphere > Zoology > Corals > Reef Monitoring and Assessment > Reef Fish Census > Transect
  - EARTH SCIENCE > Oceans > Marine Biology > Fish
  - EARTH SCIENCE > Oceans > Marine Biology > Fish > Fish Census > Belt Transect
  - EARTH SCIENCE > Biosphere > Zoology > Corals > Reef Monitoring and Assessment > Reef Fish Census > Stationary
  - EARTH SCIENCE > Biosphere > Ecological Dynamics > Species Richness
- CoRIS Place Keywords:
  - COUNTRY/TERRITORY > United States of America > Puerto Rico > Puerto Rico (18N066W0000)
  - COUNTRY/TERRITORY > United States of America > Puerto Rico > Culebra Island (18N065W0011)
  - COUNTRY/TERRITORY > United States of America > Puerto Rico > Islade Desecheo (18N067W0007)
  - COUNTRY/TERRITORY > United States of America > Puerto Rico > Islade Mona (18N067W0002)
  - COUNTRY/TERRITORY > United States of America > Puerto Rico > Vieques > Vieques Island (18N065W0002)
  - OCEAN BASIN > Atlantic Ocean > Caribbean Sea /North Atlantic Ocean> Puerto Rico > Puerto Rico (18N066W0000)
  - OCEAN BASIN > Atlantic Ocean > Caribbean Sea /North Atlantic Ocean> Puerto Rico > Culebra Island (18N065W0011)
  - OCEAN BASIN > Atlantic Ocean > Caribbean Sea /North Atlantic Ocean> Puerto Rico > Isla de Desecheo (18N067W0007)
  - OCEAN BASIN > Atlantic Ocean > Caribbean Sea /North Atlantic Ocean> Puerto Rico > Isla de Mona (18N067W0002)
  - OCEAN BASIN > Atlantic Ocean > Caribbean Sea /North Atlantic Ocean> Puerto Rico > Vieques Island > Vieques Island (18N065W0002)
- CRCP Project:
  - 743

GCMD Keywords:

- Science Keywords:
  - EARTH SCIENCE > Biosphere > Ecosystems > Marine Ecosystems > Benthic
  - EARTH SCIENCE > Biosphere > Ecosystems > Marine Ecosystems > Reef > Coral Reef

*Data Documentation*  
*NCRMP: PR 2014-2016 Fish*

- EARTH SCIENCE > Solid Earth > Geomorphic Landforms/Processes > Coastal Landforms > Coral Reefs
- Instrument:
  - Visual Observations
- Location:
  - OCEAN > Atlantic Ocean > North Atlantic Ocean > Caribbean Sea > Puerto Rico
- Stratum:
  - VERTICAL LOCATION > Sea Floor

## National Coral Reef Monitoring Program (NCRMP) File Information

### File Information

Total File Size: 454 MB total, 40 files in 7 folders (unzipped), 39.5 MB (zipped)

### Data Files:

- NCRMP\_PR2014\_Fish\_Data01\_AnalysisReady.CSV
- NCRMP\_PR2014\_Fish\_Data02\_NTOT.CSV
- NCRMP\_PR2014\_Fish\_Data03\_Boatlog.CSV
- NCRMP\_PR2014\_Fish\_SampleFrame.SHP (and ancillary files .CPG, .DBF, .PRJ, .SBN, .SBX, .SHX, .XML)
- NCRMP\_PR2016\_Fish\_Data01\_AnalysisReady.CSV
- NCRMP\_PR2016\_Fish\_Data02\_NTOT.CSV
- NCRMP\_PR2016\_Fish\_Data03\_Boatlog.CSV
- NCRMP\_PR2016\_Fish\_Data04A\_Raw\_Sample.CSV
- NCRMP\_PR2016\_Fish\_Data04B\_Raw\_Substrate.CSV
- NCRMP\_PR2016\_Fish\_Data04C\_Raw\_Species.CSV
- NCRMP\_PR2016\_Fish\_Data05A\_PSU\_Corrected
- NCRMP\_PR2016\_Fish\_Data05B\_PSU\_Imported
- NCRMP\_PR2016\_Fish\_SampleFrame.SHP (and ancillary files .CPG, .DBF, .PRJ, .SBN, .SBX, .SHX, .XML)

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

### Documentation Files:

- NCRMP\_PR2014\_Fish\_BrowseGraphic.JPG
- NCRMP\_PR2016\_Fish\_BrowseGraphic.JPG
- NCCOS\_Archive Submission\_NCRMP\_PR2014-2016\_Fish.PDF
- NCRMP\_PR2014-2016\_Fish\_DataDictionary01\_AnalysisReady.ODS
- NCRMP\_PR2014-2016\_Fish\_DataDictionary02\_NTOT.ODS
- NCRMP\_PR2014-2016\_Fish\_DataDictionary03\_Boatlog.ODS
- NCRMP\_PR2016\_Fish\_DataDictionary04\_Raw.ODS
- NCRMP\_PR2016\_Fish\_DataDictionary05\_PSU\_Verify.ODS
- NCRMP\_PR2014-2016\_Fish\_DataDictionary06\_Codes.ODS
- NCRMP\_CaribGOM\_Protocol\_Fish\_BeltTransect\_2014.PDF
- NCRMP\_CaribGOM\_Protocol\_Fish\_RVC\_2016.PDF
- NCRMP\_CaribGOM\_Protocol\_SampleFrame\_2013-2015.PDF
- NCRMP\_CaribGOM\_Protocol\_SampleFrame\_2016.PDF

## Parameter Information

List of major parameters included in this accession:

- FISH - CORAL REEF

### Parameter Description:

*Parameter:* FISH - CORAL REEF

*Property Type:* measured

*Units:* count

*Observation Category:* *in situ*

*Sampling Instrument:* visual observation

#### *Sampling and Analyzing Method:*

Size and abundance of fish using the Belt Transect Fish Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2014) and Reef Visual Census (RVC) Survey Protocol for the Fish Survey Protocol for Atlantic, U.S. Caribbean and Gulf of Mexico (2016)

#### *Data Quality Method:*

Quality assurance checks for every data sheet and entry into database, as well as analytical checks for using query outputs.

### All Parameters:

*Property Type:* measured

#### *Data Quality Method:*

Quality assurance checks for every data sheet and entry into database, as well as analytical checks for using query outputs.

## Document Information

*Date:* 2020-12-29

*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.

*Use Limitation:* NOAA makes no warranty, expressed or implied, regarding these data, nor does the fact of distribution constitute such a warranty. NOAA cannot assume liability for any damages caused by any errors or omissions in these data.

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Please reference NOAA/NOS/NCCOS and NOAA/NMFS/SEFSC when utilizing these data in a report or peer reviewed publication.

Cite as:

*Data Documentation*  
*NCRMP: PR 2014-2016 Fish*

National Centers for Coastal Ocean Science (NCCOS) and Southeast Fisheries Science Center (SEFSC). 2020. National Coral Reef Monitoring Program: Assessment of coral reef fish communities in the Puerto Rico from 2014-05-19 to 2014-12-03 and from 2016-06-07 to 2017-09-15 (NCEI Accession 0224477). NOAA National Centers for Environmental Information. Dataset. <https://doi.org/10.7289/v5t72frz> [access date]

Additionally, knowledge of how this dataset has been of use and which organizations are utilizing it is of great benefit for ensuring this information continues to meet the needs of the management and research communities. Therefore, it is requested but not mandatory, that any user of this data supply this information to the Project Co-Investigators (Atlantic/Caribbean): Kimberly Edwards ([kimberly.edwards@noaa.gov](mailto:kimberly.edwards@noaa.gov)) and Jay Grove ([jay.grove@noaa.gov](mailto:jay.grove@noaa.gov)).