

Data Documentation

Dataset Information

Dataset Title:

National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Flower Garden Banks National Marine Sanctuary from 2013-09-02 to 2013-09-06 and from 2015-08-24 to 2015-08-28

Description:

The National Coral Reef Monitoring Program (NCRMP) assessed coral reef communities in Flower Garden Banks National Marine Sanctuary (FGBNMS) using two benthic surveys: the Benthic Assessment (includes Line Point-Intercept) and the Coral Demographic method.

Benthic Assessment provides benthic cover estimates for ecologically important cover types/groups (e.g., macroalgae, turf algae, crustose coralline algae, corals, sponges, sand/sediment, etc.) using a 1-stage stratified random survey design in hardbottom and coral reef habitats less than 30m in depth. The goals of these surveys are to provide: (1) a quantification of percent cover of biotic and abiotic benthic components using a line point-intercept (LPI) method; (2) information on topographic complexity (substratum rugosity) of the survey locations (3) quantitative information on local commercially and ecologically-important macroinvertebrates (Caribbean spiny lobster [*Panulirus argus*], queen conch [*Lobatus gigas*], long-spined sea urchin [*Diadema antillarum*]); and (4) presence-absence information for ESA-listed Threatened corals.

The goal of the coral demographic surveys is to collect and report information on species composition, density, size, abundance, and specific parameters of condition (% live vs. dead, bleaching, disease) of non-juvenile scleractinian corals (>4 cm maximum diameter), and of overall species diversity (all corals) using 10m x 1m belt transects in a stratified random sampling design in hardbottom and coral reef habitats less than 30m in depth.

Both Benthic Assessment and Coral Demographic surveys are concurrent.

Data provided in this dataset are from East Bank and West Bank within FGBNMS. Lead agencies involved include the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Coastal Ocean Science (NCCOS), NOAA Southeast Fisheries Science Center (SEFSC) and Office of National Marine Sanctuaries (ONMS).

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.

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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:

2013-2015 benthic assessment and coral demographic survey locations were selected using a stratified random sampling design within FGBNMS study area. Detailed information describing the sampling design is provided in the NCRMP Caribbean-Gulf of Mexico Sampling Design Protocol.

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).

2013 and 2015 Line Point-intercept (LPI):

The LPI data collection provides benthic cover estimates for ecologically important cover types/groups (e.g. macroalgae, turf algae, corals, sponges, sand/sediment, etc.). This survey provides a measure of percent biotic and abiotic components of the benthos. Tables included in the LPI dataset include:

1. LPI data: 100 points, at 20cm intervals, starting at the 20cm mark and ending at the 20m mark on the transect tape.
2. Macroinvertebrate counts for spiny lobster, queen conch and long-spined sea urchins (*Diadema*) within the 25x2m area of the belt transect area.
3. Presence-absence of ESA candidate (2013 only, refer to process step 3 for 2015) scleractinian coral species in the 25x2m belt transect area.

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2015 Updates and Modifications:

The LPI protocols were modified for the 2015 USVI sampling year at all USVI locations. Changes from 2013 LPI protocols are listed below and are reflected in the 2015 FGB efforts.

In 2013, LPI surveys collected presence/absence data for ESA-candidate coral species to be determined in 2014. ESA data collected after 2014, include only ESA-listed corals based on the August 2014 final decision: *Acropora palmata*, *Acropora cervicornis*, *Dendrogyra cylindrus*, *Mycetophyllia ferox*, *Montastraea annularis*, *Orbicella faveolata* and *Orbicella franksi*. *Agaricia lamarcki*, *Dichocoenia stokeii* were not selected for ESA status; therefore, post-2014 ESA data sets do not include these species.

2013 to 2015 Coral Demographics:

Coral Demographics were conducted at a subset of sites and benthic transects established independently of the fish surveys.

In 2015, all coral demographic surveys started at meter 0 in the transect for data collection regardless of abiotic substrate (hardbottom, softbottom). In 2017, benthic transects were actively placed on hardbottom habitat to begin the survey (0m).

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 (NCCOS) and NOAA Southeast Fisheries Science Center (SEFSC). 2019. National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Flower Garden Banks National Marine Sanctuary (NCEI Accession 0208240). NOAA National Centers for Environmental Information. Dataset. <https://doi.org/10.7289/V5VD6WTS> [access date]
- National Centers for Coastal Ocean Science (NCCOS) and Southeast Fisheries Science Center (SEFSC). 2020. Assessment of coral reef benthic communities in Flower Garden Banks National Marine Sanctuary from 2018-06-11 to 2018-06-14 (NCEI Accession 0208241). NOAA National Centers for Environmental Information. Dataset.

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- NOAA National Centers for Coastal Ocean Science and NOAA Southeast Fisheries Science Center. 2019. National Coral Reef Monitoring Program: Assessment of coral reef fish communities in National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Flower Garden Banks National Marine Sanctuary. NOAA National Centers for Environmental Information. Dataset. <https://doi.org/10.7289/V5057D81> [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 communities in Flower Garden Banks National Marine Sanctuary from 2013-09-02 to 2013-09-06 and from 2015-08-24 to 2015-08-28 (NCEI Accession 0224405). NOAA National Centers for Environmental Information. Dataset. [access date]
- National Centers for Coastal Ocean Science; Southeast Fisheries Science Center. 2019. National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Flower Garden Banks National Marine Sanctuary from 2018-06-11 to 2018-06-14 (NCEI Accession 0208240). NOAA National Centers for Environmental Information. Dataset. [access date]
- 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); z Southeast Fisheries Science Center (SEFSC).

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Partners:

- US DOC; NOAA; NMFS; Southeast Fisheries Science Center (SEFSC)
- US DOC; NOAA; NOS; Office of National Marine Sanctuaries (ONMS)

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/>

Extents

Extent Group 1

Start Date: 2013-09-02

End Date: 2013-09-06

Northern Boundary: 27.9224

Southern Boundary: 27.8725

Western Boundary: -93.823

Eastern Boundary: -93.5966

Extent Group 2

Start Date: 2015-08-24

End Date: 2015-08-28

Northern Boundary: 27.9197

Southern Boundary: 27.8723

Western Boundary: -93.823

Eastern Boundary: -93.5966

Keywords

Sea Areas, Water Bodies, Marine Protected Areas:

- Gulf of Mexico
- Flower Garden Banks National Marine Sanctuary (FGBNMS)

NOAA Ships, Other Ships, Platforms:

- R/V Manta

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

- NCCOS Research Priorities > Marine Spatial Ecology
- NCCOS Research Topics > Ecological and Biological Characterization
- NCCOS Research Locations > Regions > Gulf of Mexico
- 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 Theme Thesaurus:
 - EARTH SCIENCE > Biosphere > Zoology > Corals
 - EARTH SCIENCE > Biosphere > Aquatic Habitat > Reef Habitat > Description
 - EARTH SCIENCE > Biosphere > Zoology > Corals > ESA Listed Species
 - EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Benthos analysis > Transect monitoring > Linear transect (point)
 - EARTH SCIENCE > Oceans > Marine Biology > Marine Invertebrates > Macroinvertebrates
 - EARTH SCIENCE > Biosphere > Zoology > Corals > Reef Monitoring and Assessment > Coral Colony Size and Condition
 - EARTH SCIENCE > Biosphere > Ecological Dynamics > Species Richness
- CoRIS Discovery Thesaurus:

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- Numeric Data Sets > Benthic
- CoRIS Place Keywords:
 - COUNTRY/TERRITORY > United States of America > Texas > East Flower Garden Banks (27N093W0001)
 - COUNTRY/TERRITORY > United States of America > Texas > West Flower Garden Banks (27N093W0002)
 - OCEAN BASIN > Atlantic Ocean > Gulf of Mexico > Flower Garden Banks > East Flower Garden Banks (27N093W0001)
 - OCEAN BASIN > Atlantic Ocean > Gulf of Mexico > Flower Garden Banks > West Flower Garden Banks (27N093W0002)
- CRCP Project:
 - 743

GCMD Keywords:

- Science Keywords:
 - EARTH SCIENCE > Biosphere > Ecosystems > Marine Ecosystems > Benthic
 - EARTH SCIENCE > Biosphere > Ecosystems > Marine Ecosystems > Reef > Coral Reef
 - EARTH SCIENCE > Solid Earth > Geomorphic Landforms/Processes > Coastal Landforms > Coral Reefs
- Instrument:
 - Visual Observations
- Location:
 - OCEAN > Atlantic Ocean > North Atlantic Ocean > Gulf of Mexico
- Stratum:
 - VERTICAL LOCATION > Sea Floor

National Coral Reef Monitoring Program (NCRMP) File Information

File Information

Total File Size: 8.62 MB total, 40 files in 7 folders (unzipped), 7.11 MB (zipped)

Data Files:

- NCRMP_FGB2013_Benthic_Data01_BenthicCover.CSV
- NCRMP_FGB2013_Benthic_Data02_CoralDemographics.CSV
- NCRMP_FGB2013_Benthic_Data03_InvertebratesESAcorals.CSV
- NCRMP_FGB2013_Benthic_Data04_NTOT.CSV
- NCRMP_FGB2013_Benthic_Data05_Boatlog.CSV
- NCRMP_FGB2013_Benthic_SampleFrame.SHP (and ancillary files .CPG, .DBF, .PRJ, .SBN, .SBX, .SHX, .XML)
- NCRMP_FGB2015_Benthic_Data01_BenthicCover.CSV
- NCRMP_FGB2015_Benthic_Data02_CoralDemographics.CSV
- NCRMP_FGB2015_Benthic_Data03_InvertebratesESAcorals.CSV
- NCRMP_FGB2015_Benthic_Data04_NTOT.CSV
- NCRMP_FGB2015_Benthic_Data05_Boatlog.CSV
- NCRMP_FGB2015_Benthic_SampleFrame.SHP (and ancillary files .CPG, .DBF, .PRJ, .SBN, .SBX, .SHX, .XML)

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

Documentation Files:

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- NCRMP_FGB2013_2015_Benthic_BrowseGraphic.JPG
- NCCOS_Archive Submission_NCRMP_FGB2013-2015_Benthic.PDF
- NCRMP_FGB2013-2015_Benthic_DataDictionary01_BenthicCover.ODS
- NCRMP_FGB2013-2015_Benthic_DataDictionary02_CoralDemographics.ODS
- NCRMP_FGB2013-2015_Benthic_DataDictionary03_InvertebratesESAcorals.ODS
- NCRMP_FGB2013-2015_Benthic_DataDictionary04_NTOT.ODS
- NCRMP_FGB2013-2015_Benthic_DataDictionary05_Boatlog.ODS
- NCRMP_FGB2013-2015_Benthic_DataDictionary06_Codes.ODS
- NCRMP_CaribGOM_Protocol_Benthic_LinePointIntercept_2013.PDF
- NCRMP_CaribGOM_Protocol_Benthic_CoralDemographic_2013.PDF
- NCRMP_CaribGOM_Protocol_Benthic_LinePointIntercept_2015.PDF
- NCRMP_CaribGOM_Protocol_Benthic_CoralDemographic_2015.PDF
- NCRMP_CaribGOM_Protocol_SampleFrame_2013-2015.PDF

Parameter Information

List of major parameters included in this accession:

- BENTHIC SPECIES - TAXA COUNTS
- BENTHIC SPECIES
- CORAL - SPECIES IDENTIFICATION
- CORAL
- CORAL - CENSUS

Parameter Description:

Parameter: BENTHIC SPECIES - TAXA COUNTS

Units: count

Observation Category: *in situ*

Sampling Instrument: visual observation

Sampling and Analyzing Method:

Benthic taxa enumerated using Line Point-Intercept (LPI) Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2013; 2015)

Parameter Description:

Parameter: BENTHIC SPECIES

Units: count

Observation Category: *in situ*

Sampling Instrument: visual observation

Sampling and Analyzing Method:

Abundance of *Diadema antillarum*, *Panulirus argus*, and *Lobatus gigas* species using Line Point-Intercept (LPI) Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2013; 2015)

Parameter Description:

Parameter: CORAL - SPECIES IDENTIFICATION

Units: presence

Observation Category: *in situ*

Sampling Instrument: visual observation

Sampling and Analyzing Method:

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Presence/absence of ESA-listed and potential ESA coral species using Line Point-Intercept (LPI) Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2013; 2015)

Parameter Description:

Parameter: CORAL
Units: count
Observation Category: *in situ*
Sampling Instrument: visual observation
Sampling and Analyzing Method:

Coral colony counts, measurements and condition recorded using Coral Demographic Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2013; 2015).

Parameter Description:

Parameter: CORAL - CENSUS
Units: colony
Observation Category: *in situ*
Sampling Instrument: ruler
Sampling and Analyzing Method:

Coral colony counts, measurements and condition recorded using Coral Demographic Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2013; 2015).

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: 2020-12-23
Resource Provider: NCCOS Data Manager, 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:

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 Flower Garden Banks National Marine Sanctuary from 2013-09-02 to 2013-09-06 and from 2015-08-24 to 2015-08-28 (NCEI Accession 0224589). NOAA National Centers for Environmental Information. Dataset.
<https://doi.org/10.7289/V5VD6WTS> [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) and Jay Grove (jay.grove@noaa.gov).