

**NCCOS Metadata:**  
**NCRMP Puerto Rico 2023 Fish**

**Item Identification**

<b>*Dataset Title</b>	National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Puerto Rico from 2023-06-14 to 2023-11-16
<b>Short Title</b>	NCRMP Puerto Rico 2023 Fish
<b>*Status</b> <i>Complete, In Work, Planned</i>	Complete
<b>*Abstract</b> <i>Dataset description</i> ● <i>Parameters included</i> ● <i>Scientific keywords</i>	<p>The National Coral Reef Monitoring Program (NCRMP) assessed coral reef fish communities in Puerto Rico using the stationary point count method (7.5m radius cylinder).</p> <p>This method collects and reports information on species composition, density, size structure, abundance and derived metrics (e.g., species richness, diversity). Data are collected using a 2-stage, stratified random survey design in hardbottom and coral reef habitats less than 30m in depth.</p> <p>Data provided in this dataset are from around 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).</p>
<b>*Purpose</b> <i>Project overview</i> ● <i>Partnerships</i> ● <i>Dataset purpose</i>	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.
<b>Cited Publications</b>	[blank]
<b>Supplemental Information</b> ● <i>Collaborators</i> ● <i>Partner Entities</i> ● <i>Base Funding</i> ● <i>NCCOS Project</i> ● <i>Additional Funding</i> ● <i>Additional Projects</i>	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.
<b>DOI (Digital Object Identifier)</b>	<a href="https://doi.org/10.7289/V5F769MM">https://doi.org/10.7289/V5F769MM</a>

**Keywords**

<b>NCCOS Keywords</b> <i>See <a href="#">Appendix</a></i>	NCCOS Research Priority > Marine Spatial Ecology NCCOS Research Topic > Ecological and Biogeographic Assessments NCCOS Research Location > Region > Caribbean Sea NCCOS Research Location > U.S. States and Territories > Puerto Rico NCCOS Research Data Type > Field Observation NCCOS Research Data Type > Long-term Monitoring
<b>CoRIS Keywords</b>	CoRIS Theme Thesaurus:

**NCCOS Metadata:  
NCRMP Puerto Rico 2023 Fish**

<p><i>(Required if CRCP-funded) See <a href="#">link</a> for CoRIS keywords. Select at least one each for Theme, Discovery, and Place (include both COUNTRY/TERRITORY and matching OCEAN BASIN).</i></p>	<p>EARTH SCIENCE &gt; Biosphere &gt; Zoology &gt; Corals &gt; Reef Monitoring and Assessment &gt; Reef Fish Census &gt; Stationary  EARTH SCIENCE &gt; Oceans &gt; Marine Biology &gt; Fish  EARTH SCIENCE &gt; Oceans &gt; Marine Biology &gt; Fish &gt; Fish Census  CoRIS Discovery Thesaurus:  Numeric Data Sets &gt; Fish Census  CoRIS Place Keywords:  COUNTRY/TERRITORY &gt; United States of America &gt; Puerto Rico &gt; Puerto Rico (18N066W0000)  COUNTRY/TERRITORY &gt; United States of America &gt; Puerto Rico &gt; Culebra Island (18N065W0011)  COUNTRY/TERRITORY &gt; United States of America &gt; Puerto Rico &gt; Isla de Desecho (18N067W0007)  COUNTRY/TERRITORY &gt; United States of America &gt; Puerto Rico &gt; Isla de Mona (18N067W0002)  COUNTRY/TERRITORY &gt; United States of America &gt; Puerto Rico &gt; Vieques &gt; Vieques Island (18N065W0002)  OCEAN BASIN &gt; Atlantic Ocean &gt; Caribbean Sea /North Atlantic Ocean &gt; Puerto Rico &gt; Puerto Rico (18N066W0000)  OCEAN BASIN &gt; Atlantic Ocean &gt; Caribbean Sea /North Atlantic Ocean &gt; Puerto Rico &gt; Culebra Island (18N065W0011)  OCEAN BASIN &gt; Atlantic Ocean &gt; Caribbean Sea /North Atlantic Ocean &gt; Puerto Rico &gt; Isla de Desecho (18N067W0007)  OCEAN BASIN &gt; Atlantic Ocean &gt; Caribbean Sea /North Atlantic Ocean &gt; Puerto Rico &gt; Isla de Mona (18N067W0002)  OCEAN BASIN &gt; Atlantic Ocean &gt; Caribbean Sea /North Atlantic Ocean &gt; Puerto Rico &gt; Vieques Island &gt; Vieques Island (18N065W0002)  CRCP Project:  743  National Coral Reef Monitoring Plan (NCRMP) Implementation</p>
<p><b>GCMD Keywords</b>  Use the <a href="#">current list</a></p>	<p>Earth Science:  Earth Science &gt; Biosphere &gt; Ecosystems &gt; Marine Ecosystems &gt; Reef &gt; Coral Reef  Earth Science &gt; Biological Classification &gt; Animals/Vertebrates &gt; Fish &gt; &gt;  Location:  Ocean &gt; Atlantic Ocean &gt; North Atlantic Ocean &gt; Caribbean Sea &gt; Puerto Rico</p>
<p><b>Sea Areas or Regions</b></p>	<p>[blank]</p>
<p><b>Marine Protected Areas</b></p>	<p>[blank]</p>
<p><b>NOAA Ships</b></p>	<p>[blank]</p>
<p><b>Other Ships or Platforms</b></p>	<p>[blank]</p>

**Physical Location**

<p><b>*Organization</b></p>	<p>National Centers for Coastal Ocean Science (NCCOS)  Silver Spring, MD</p>
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**Data Set Information**

<p><b>Data Set Scope Code</b></p>	<p>Data Set</p>
<p><b>Data Set Type</b></p>	<p>CSV Files</p>
<p><b>Maintenance Frequency</b></p>	<p>None Planned</p>
<p><b>*Data Set Publication Status</b>  Published, Unpublished, or Unknown</p>	<p>Published</p>
<p><b>*Data Set Publication Date</b></p>	<p>2024</p>
<p><b>*Data Presentation Form</b>  Document, Image, Map, Profile, Table, Video, Audio, Other</p>	<p>Table (digital)</p>
<p><b>Entity Attribute Overview</b></p>	<p>Three datasets are provided under the stationary point count fish protocols and are distributed as one compiled package: (1) Analysis Ready dataset, (2) Boatlog/Station dataset, and (3) raw QAQC'd sample data file. The</p>

**NCCOS Metadata:  
NCRMP Puerto Rico 2023 Fish**

	<p>methodology used for this survey can be found in the point count fish protocols.</p> <p>All three datasets contain data fields on general station information (survey strata, depth, rugosity). Each of these data tables contain additional survey-specific data fields. For complete information and descriptions of attributes and data fields for all data tables, refer to the data dictionaries.</p> <p>Fish protocols for 2023:</p> <p>CRCP. 2022. National Coral Reef Monitoring Program (NCRMP) Reef Visual Census (RVC) Fish Survey Protocols U.S. Atlantic: Florida, Flower Garden Banks, Puerto Rico, and U.S. Virgin Islands. 2022. NOAA Coral Reef Conservation Program. 21 pp. doi: 10.25923/1baa-5g44</p>
<b>Distribution Liability</b>	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.
<b>Data Set Credit</b>	Lead agencies NOAA NCCOS and SEFSC, and partners HJR Reefscaping, Inc., Coastal Survey Solutions, the University of Puerto Rico, Puerto Rico Department of Natural and Environmental Resources.

### Support Roles

<b>Principal Investigator</b>	2024 Kimberly Edwards <a href="mailto:kimberly.edwards@noaa.gov">kimberly.edwards@noaa.gov</a> National Centers for Coastal Ocean Science (NCCOS) <a href="http://coastalscience.noaa.gov/">http://coastalscience.noaa.gov/</a>
<b>Additional Principal Investigator(s)</b>	2024 Jay Grove <a href="mailto:jay.grove@noaa.gov">jay.grove@noaa.gov</a> Southeast Fisheries Science Center (SEFSC) <a href="http://www.sefsc.noaa.gov">www.sefsc.noaa.gov</a>
<b>*Data Steward</b>	2021 Jay Grove <a href="mailto:jay.grove@noaa.gov">jay.grove@noaa.gov</a> Southeast Fisheries Science Center (SEFSC) <a href="http://www.sefsc.noaa.gov">www.sefsc.noaa.gov</a>
<b>*Distributor</b>	2014 National Centers for Environmental Information - Silver Spring, Maryland (NCEI-MD) (301) 713-3277
<b>*Metadata Contact</b>	2021 Jay Grove <a href="mailto:jay.grove@noaa.gov">jay.grove@noaa.gov</a> Southeast Fisheries Science Center (SEFSC) <a href="http://www.sefsc.noaa.gov">www.sefsc.noaa.gov</a>
<b>Originator</b>	2014 NCCOS Scientific Data Coordinator <a href="mailto:nccos.data@noaa.gov">nccos.data@noaa.gov</a> National Centers for Coastal Ocean Science (NCCOS) <a href="http://coastalscience.noaa.gov/">http://coastalscience.noaa.gov/</a>
<b>Originator</b>	2014 NOAA Coral Reef Conservation Program (CRCP) <a href="http://coralreef.noaa.gov">http://coralreef.noaa.gov</a>
<b>Originator</b>	2016 Southeast Fisheries Science Center (SEFSC) <a href="http://www.sefsc.noaa.gov">www.sefsc.noaa.gov</a>
<b>Point of Contact</b>	2020 Jay Grove <a href="mailto:jay.grove@noaa.gov">jay.grove@noaa.gov</a> Southeast Fisheries Science Center (SEFSC) <a href="http://www.sefsc.noaa.gov">www.sefsc.noaa.gov</a>

**NCCOS Metadata:  
NCRMP Puerto Rico 2023 Fish**

**Extents**

<b>Currentness Reference</b>	Ground Condition
<b>*Western Boundary</b>	-67.94736
<b>*Eastern Boundary</b>	-65.20602
<b>*Northern Boundary</b>	18.49307
<b>*Southern Boundary</b>	17.86274
<b>Description</b>	Data were collected in the shallow (<30m) hardbottom shelf habitats around Puerto Rico
<b>*Time Frame Type</b> <i>Continuing, Range, Discrete</i>	Range
<b>*Start Date</b>	2023-06-14
<b>*End Date</b>	2023-11-16
<b>Description</b>	

<b>Access Information*Security Class</b>	Unclassified
<b>Security Classification System</b>	Not applicable
<b>Security Handling Description</b>	Not applicable
<b>*Data Access Procedure</b>	Data can be accessed via the NOAA National Centers for Environmental Information (NCEI) Ocean Archive.
<b>*Data Access Constraints</b>	None
<b>*Data Use Constraints</b>	<p>Please reference NOAA/NOS/NCCOS and NOAA/NMFS/SEFSC when utilizing these data in a report or peer reviewed publication.</p> <p>Cite as:</p> <p>National Centers for Coastal Ocean Science (NCCOS) and Southeast Fisheries Science Center (SEFSC). 2024. National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Puerto Rico from 2023-06-14 to 2023-11-16 (NCEI Accession TBD). NOAA National Centers for Environmental Information. Dataset. doi: TBD [access date]</p> <p>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 (<a href="mailto:kimberly.edwards@noaa.gov">kimberly.edwards@noaa.gov</a>) and Jay Grove (<a href="mailto:jay.grove@noaa.gov">jay.grove@noaa.gov</a>).</p>

**Distribution Information (copy/paste for each downloadable file)**

<b>*Download URL</b>	<a href="https://doi.org/10.7289/v5t72frz">https://doi.org/10.7289/v5t72frz</a>
<b>File Name</b>	NCRMP PR Fish Data Collection
<b>Description</b>	NOAA National Centers for Coastal Ocean Science; 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.
<b>*File Type</b>	NCEI Archived Data Accession

<b>*Download URL</b>	<a href="https://www.ncei.noaa.gov/archive/accession/0270582">https://www.ncei.noaa.gov/archive/accession/0270582</a>
<b>File Name</b>	NCRMP Puerto Rico 2021 Fish Data Accession
<b>Description</b>	National Centers for Coastal Ocean Science (NCCOS); Southeast Fisheries Science Center (SEFSC) (2022). National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Puerto Rico from 2021-06-14 to 2021-08-13 (NCEI Accession 0270582). [indicate subset used]. NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

<b>*Download URL</b>	<a href="https://www.ncei.noaa.gov/archive/accession/0218548">https://www.ncei.noaa.gov/archive/accession/0218548</a>
<b>File Name</b>	NCRMP Puerto Rico 2019 Fish Data Accession

**NCCOS Metadata:  
NCRMP Puerto Rico 2023 Fish**

<b>Description</b>	National Centers for Coastal Ocean Science (NCCOS); Southeast Fisheries Science Center (SEFSC) (2020). National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Puerto Rico from 2019-07-18 to 2019-12-29 (NCEI Accession 0218548). [indicate subset used]. NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

<b>*Download URL</b>	<a href="https://accession.nodc.noaa.gov/0174525">https://accession.nodc.noaa.gov/0174525</a>
<b>File Name</b>	NCRMP Puerto Rico 2016 Fish Data Accession
<b>Description</b>	National Centers for Coastal Ocean Science (2018). National Coral Reef Monitoring Program: Assessment of coral reef fish communities in Puerto Rico from 2016-06-07 to 2017-09-01 (NCEI Accession 0174525). NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

<b>*Download URL</b>	<a href="https://accession.nodc.noaa.gov/0131260">https://accession.nodc.noaa.gov/0131260</a>
<b>File Name</b>	NCRMP Puerto Rico 2014 Fish Data Accession
<b>Description</b>	National Centers for Coastal Ocean Science (2016). National Coral Reef Monitoring Program - Assessment of coral reef fish communities in Puerto Rico from 2014-05-19 to 2014-12-03 (NCEI Accession 0131260). NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

<b>*Download URL</b>	<a href="https://doi.org/10.7289/v5pg1q23">https://doi.org/10.7289/v5pg1q23</a>
<b>File Name</b>	NCRMP PR Benthic Data Collection
<b>Description</b>	NOAA National Centers for Coastal Ocean Science; 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.
<b>*File Type</b>	NCEI Archived Data Accession

<b>*Download URL</b>	<a href="https://www.ncei.noaa.gov/archive/accession/0272313">https://www.ncei.noaa.gov/archive/accession/0272313</a>
<b>File Name</b>	NCRMP Puerto Rico 2021 Benthic Data Accession
<b>Description</b>	National Centers for Coastal Ocean Science (NCCOS); Southeast Fisheries Science Center (SEFSC) (2022). National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Puerto Rico from 2021-04-30 to 2021-12-24 (NCEI Accession 0272313). [indicate subset used]. NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

<b>*Download URL</b>	<a href="https://www.ncei.noaa.gov/archive/accession/0217139">https://www.ncei.noaa.gov/archive/accession/0217139</a>
<b>File Name</b>	NCRMP Puerto Rico 2019 Benthic Data Accession
<b>Description</b>	National Centers for Coastal Ocean Science (NCCOS); Southeast Fisheries Science Center (SEFSC) (2020). National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Puerto Rico from 2019-07-18 to 2019-12-29 (NCEI Accession 0217139). [indicate subset used]. NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

<b>*Download URL</b>	<a href="https://accession.nodc.noaa.gov/0174524">https://accession.nodc.noaa.gov/0174524</a>
<b>File Name</b>	NCRMP Puerto Rico 2016 Benthic Data Accession
<b>Description</b>	National Centers for Coastal Ocean Science (2016). National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Puerto Rico from 2016-06-07 to 2017-09-01 (NCEI Accession 0174524). Version 2.2. NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

<b>*Download URL</b>	<a href="https://accession.nodc.noaa.gov/0151729">https://accession.nodc.noaa.gov/0151729</a>
<b>File Name</b>	NCRMP Puerto Rico 2014 Benthic Data Accession
<b>Description</b>	National Centers for Coastal Ocean Science (2016). National Coral Reef Monitoring Program: Assessment of coral reef benthic communities in Puerto

**NCCOS Metadata:**  
**NCRMP Puerto Rico 2023 Fish**

	Rico from 2014-05-19 to 2014-12-03 (NCEI Accession 0151729). Version 2.2. NOAA National Centers for Environmental Information. Dataset.
<b>*File Type</b>	NCEI Data Archive Accession

**URLS - Related Webpages (copy/paste for each URL)**

<b>*URL</b>	<a href="https://coastalscience.noaa.gov/project/national-coral-reef-monitoring-program-biological-socioeconomic/">https://coastalscience.noaa.gov/project/national-coral-reef-monitoring-program-biological-socioeconomic/</a>
<b>!Description</b>	National Coral Reef Monitoring Program Implementation: Biological and Socioeconomic Monitoring - NCCOS Project Page
<b>*URL Type</b>	Online Resource

<b>*URL</b>	<a href="http://www.coris.noaa.gov/monitoring/">http://www.coris.noaa.gov/monitoring/</a>
<b>!Description</b>	NOAA's National Coral Reef Monitoring Program - CRCP Project Page
<b>*URL Type</b>	Online Resource

<b>*URL</b>	<a href="https://grunt.sefsc.noaa.gov/rvc_analysis20/">https://grunt.sefsc.noaa.gov/rvc_analysis20/</a>
<b>!Description</b>	NOAA's SEFSC Reef Visual Census Fish Analysis Ready datasets and custom R-package
<b>*URL Type</b>	Online Resource

**Data Quality**

<b>*Completeness Report</b>	[OK]
<b>Quality Control Procedures Employed</b>	<p>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.</p> <p>Before implementation the sampling design was reviewed and agreed upon by representatives from program partners, as well as NCCOS scientists.</p>

**Lineage**

<b>*Lineage Statement</b>	Datasets and protocols are year specific. Datasets are based on year-specific protocols utilized for data collection.
<b>*Source</b>	<p>Title: Sampling Design Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2018)</p> <p>Originator: National Centers for Coastal Ocean Science (NCCOS)</p> <p>URL: <a href="https://coastalscience.noaa.gov/project/national-coral-reef-monitoring-program-biological-socioeconomic/">https://coastalscience.noaa.gov/project/national-coral-reef-monitoring-program-biological-socioeconomic/</a></p>
<b>Additional Source</b>	<p>Title: Reef Visual Census (RVC) Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2016)</p> <p>Originator: National Centers for Coastal Ocean Science (NCCOS)</p> <p>URL: <a href="https://coastalscience.noaa.gov/project/national-coral-reef-monitoring-program-biological-socioeconomic/">https://coastalscience.noaa.gov/project/national-coral-reef-monitoring-program-biological-socioeconomic/</a></p>
<b>*Process Step</b>	<p>Number: 1</p> <p>Description:</p> <p>2016 RVC survey locations were selected using a stratified random sampling design within the Puerto Rico study area. 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.</p> <p>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</p>

**NCCOS Metadata:**  
**NCRMP Puerto Rico 2023 Fish**

	<p>design process such as stratum documentation and sampling weights are provided in all data tables as survey attributes</p> <p>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).</p> <p>Refer to data dictionary for complete listing of terms and descriptions.</p> <p>Process Date/Time: [blank]</p> <p>Process Contact: National Centers for Coastal Ocean Science</p> <p>Citation: Sampling Design Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2018)</p>
<b>Additional Process Step</b>	<p>Number: 2</p> <p>Description: 2016 Stationary Point Count:</p> <p>The Stationary Point Count component of the protocols were modified for the 2016 sample year to integrate with similar methods used in Florida, another NCRMP sampling location. The changes from 2014 protocols are listed below and are reflected in the 2016-present Puerto Rico data sets. 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.</p> <p>Stationary point count surveys were conducted at all sample locations and co-located with a subset of Coral Demographic and Benthic Assessment surveys.</p> <p>Process Date/Time: [blank]</p> <p>Process Contact: National Centers for Coastal Ocean Science</p> <p>Citation: Reef Visual Census (RVC) Survey Protocol for the U.S. Caribbean and Flower Garden Banks National Marine Sanctuary (2016)</p>

## Appendix: NCCOS Discovery Keywords

### Research Priorities

- Marine Spatial Ecology
- Stressor Impacts and Mitigation
- Coastal Change: Vulnerability, Mitigation, and Restoration
- Social Science

### Research Topics

- Ecological and Biogeographic Assessments
- Habitat Mapping
- Regional Ecosystem Science
- Coastal Aquaculture Siting and Sustainability
- Harmful Algal Bloom (HAB) Detection and Forecasting
- Biological Effects of Contaminants and Nutrients
- Vulnerability and Risk Assessment
- Natural and Nature-based Features
- Climate Impacts on Ecosystems
- Restoration
- Ecosystem Services Valuation
- Assessing Human Use
- Assessing Vulnerability and Resilience

### Research Locations

- Regions
  - Atlantic Ocean
  - Bering Sea
  - Caribbean Sea
  - Great Lakes
  - Gulf of Mexico
  - Pacific Ocean
  - International
- U.S. States and Territories
  - [list all applicable]

### Research Data Types

- Field Observation
- Long-term Monitoring
- Geospatial
- Derived Data Product
- Model
- Field Experiment
- Laboratory Experiment