



Puerto Rico Coral Reef Monitoring Program (PRCRMP) - Data Dictionary

*Submitted to the Department of Natural and Environmental Resources (DNER)
Puerto Rico Coastal Zone Management Program (PRCZMP) and the Coral Reef
Conservation and Management Program (CRCMP)*

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Puerto Rico Coral Reef Monitoring Program (PRCRMP) Data Abstract:

The Puerto Rico Coral Reef Monitoring Program data files include all raw data (by transect) for 86 stations where substrate cover by sessile-benthic categories and fish and motile megabenthic invertebrate taxonomic composition and densities have been characterized from 1999-2021. At present, 42 of these stations are permanent and are surveyed biannually. For the benthic characterization, at each reef station, a set of five 10 meters long permanent transects are surveyed. Sessile-benthic reef communities are characterized by the continuous intercept chain-link method, following the CARICOMP (1994) protocol. Demersal diurnal non-cryptic reef fish populations and motile megabenthic invertebrates are surveyed by sets of five 10 meters long by 3 meters wide (30 m²) belt-transects centered along the reference line of transects used for sessile-benthic characterizations at each reef station. Upon completion of the 10 meters belt-transect survey the diver swims along the same depth and physiographic reef zone for an extra 10 meters to identify fishes and megabenthic invertebrates of commercial value (snappers, groupers, hogfishes, barracuda, mackerels, sharks, lobsters and queen conch) and/or fish species that are considered important reef herbivores (parrotfishes, doctorfishes). For each fish individual within belt-transects, a visual total length (TL) estimate in centimeters was recorded. The cephalothorax length (measurement from the tip of the rostrum to end of the thorax), also known as carapace length (CL) in centimeters was used to report the size of lobsters (*Panulirus* spp., *Scyllarides* sp) within belt-transects. Queen conch (*Strombus gigas*) length was reported as the total (diagonal) shell length in centimeters. With the length-weight relationship information available in FishBase.org, biomass estimates have been calculated for commercially and ecologically important species. The PRCRMP data files also include a site classification spreadsheet with descriptors for each monitoring station, some of which can be used as spatial and temporal factors for statistical analyses. These descriptors include information about depth, habitat type, distance from shore, marine protected areas attributes, coordinates, and other metadata.

Monitoring Design Factors, Site Classification Descriptors, and Indicators

Factors, Descriptors, and Indicators Description:

The PRCRMP factors and descriptors include categorical variables and other metadata to stratify and/or classify monitoring stations based on spatiotemporal characteristics, sampling effort, and other descriptors relevant to assess management and biological condition questions. These are essential in evaluating the publication of the PRCRMP Database Compilation in a Geographical Information System (GIS) based platform as it includes coordinates for each monitoring station and attributes for data visualization related to distance from shore gradients, habitat types, depths, proximity to watersheds, stations within Marine Protected Areas (MPAs), etc. References used for some labels are included in the [references section](#).

In addition, the data files include a list of indicators that serve to classify or group species and categories. Indicators include the taxonomic classification of species to the lowest level possible (i.e., phylum, class, order, family, genus, and species) and other classifications like functional groups and/or targeted categories. Taxonomic classifications were obtained using the [World Register of Marine Species \(WoRMS\) Taxon-Match Tool](#) developed by Tony Rees, Michael Giddens, and Dmitry Mozzherin. These indicators allow for statistical analyses at the functional, community, and taxonomic levels.

The following list of label definitions apply to all PRCRMP datasets (sessile-benthic, fish and macroinvertebrates) and the PRCRMP Site Classification Database.

Factors, Descriptors, and Indicators Label Definitions:

Factors and Descriptors in PRCRMP data files and/or PRCRMP Site Classification Database	
<u>SAMPLE CODE</u>	A label that identifies each unique sample in the data files of the PRCRMP Database Compilation. It consists of the sample year, site name, and transect number.
<u>Site Name</u>	Name of monitoring stations. Each site name belongs to a specific coordinate. Specifications: Site names include a year in parenthesis if the station coordinates shifted over time because of transect re-establishment. Site names include depth (in meters) if there are multiple stations with the same site name at different depths. Site names include the location in parenthesis if there are stations with the same site name in different locations. The purpose of this site name nomenclature is to differentiate each monitoring station while being consistent with site names in PRCRMP reports. However, site names in PRCRMP reports do not make the specifications explained here.
<u>Site Code</u>	An abbreviation of site name. Specification: Site Code includes two letters representing the last 2 digits of the baseline year for the site, followed by four letters of the site name, followed by two numbers that represent station mean depth (standardized to CARICOMP depth intervals).
<u>Transect</u>	A spatial replicate within each site. From 2004-2013 Fish and Macroinvertebrate Size Frequency data was not replicated by transect because there was one Active Search Census (ASEC Survey) done per site.
<u>Location</u>	The geographical area where monitoring stations are located. Most locations are municipalities of Puerto Rico, others are oceanic islands of the Puerto Rican archipelago.
<u>Region</u>	The geographical area where monitoring stations cluster together considering potential bioregions in Puerto Rico (i.e. sites belonging to isolated oceanic islands, continuous reef systems of the insular platform isolated by a submarine canyon, etc.) as well as site replicates. Specification: There is a minimum of 2 current stations in the Southeast Region and a maximum of 14 current stations in the West Region, with an average of 6 (\pm 4) stations per Region.
<u>Geographic Zone</u>	The cardinal geographical area where monitoring stations are located. Specification: There are a minimum of 2 current stations in the North Geographic Zone and a maximum of 17 current stations in the West Geographic Zone, with an average of 8 (\pm 6) stations per Geographic Zone.
<u>Latitude</u>	Latitude of monitoring station in decimal degrees. Specification: Taken at the center (5m) of Transect 3.

<u>Longitude</u>	Longitude of monitoring station in decimal degrees. Specification: Taken at the center (5m) of Transect 3.
<u>Status</u>	Status of the monitoring station. Specification: Previous = monitoring station no longer visited; Current = monitoring station currently being monitored once every two years (biennial).
<u>Baseline Year</u>	Year when the station was first visited for a benthic characterization as part of PRCRMP surveys.
<u>Most Recent Survey</u>	Year of most recent PRCRMP survey. Specification: Latest revision in 2021.
<u># Surveyed Years</u>	# of visits or PRCRMP surveys since the station was first visited as part of PRCRMP. Specification: Latest revision in 2021.
<u>Surveyed Years</u>	Specific years that the stations have been visited (separated by commas).
<u>Insular Shelf Zone</u>	Station position relative to the Puerto Rico insular shelf as seen in bathymetric features when projecting monitoring stations on Esri's Ocean Basemap (2012) * and NOAA's Office of Coast Survey's Electronic [Nautical] Charts (ENC) (2014-2019) *.
<u>Reef Zonation</u>	Station position relative to the reef structure as determined by PRCRMP fieldwork contractor in PRCRMP reports * and/or satellite imagery.
<u>Mean Depth (m)</u>	All-years site average depth in meters. Specification: Mean depth is standardized to CARICOMP (2001) * fore reef depth intervals (0-5m, 5-10m, and >10m). For >10m mean depths, depth was standardized to 15, 20, and 30m depths ad hoc.
<u>Z – true (m)</u>	All-years site average depth in meters recorded in the field by DNER fieldwork contractor.
<u>Depth Zone</u>	Categorical depth range in meters selected based on the distribution of Z- true (m) across stations. Specification: Depth Zone levels were selected to have at least 24 stations level (except Mesophotic with n=5).
<u>Habitat Type</u>	Categorical station habitat description. Specification: Habitat Types are based on NCRMP habitat type definitions (Kendall et al., 2002; NCCOS, 2018) *, except "Spur and Groove", which is adapted from Morelock et al. (1977) * and Storlazzi et al. (2003) * to identify a [typical] shelf-sedge habitat in Puerto Rico. In addition, DNER fieldwork contractor provided the habitat type for some stations in the physical description narrative of PRCRMP reports *.
<u>Mean Rugosity (m)</u>	The all-years rugosity station average. It is an index or measure of topographic complexity for habitats intercepted by transects. It is estimated as the total length of the transect chain (each link is 1.4 cm) divided by the horizontal distance covered (10m). Specification: The method was adopted by DNER fieldwork contractor from the CARICOMP (2001) * protocol. The original reference for the method is Rogers et al. (1982) *.
<u>Topographic Complexity</u>	Categorical rugosity range for each station selected based on the distribution of Rugosity (m) across stations. Specification: Ranges were selected to have at least 20 stations per Topographic Complexity Level.

<u>Coral Biotope</u>	Categorical coral community site descriptor that incorporates before and after the 2005 coral bleaching event data, if available. The purpose of the all-years average in the rules is to identify what type of coral community can describe the station, not only in terms of recent data but considering historical data as well. To see the sites which Coral Biotope descriptor includes data from before and after 2005 bleaching event, verify column Surveyed Years. Specification: Coral Biotope levels are defined by the all-years (1999-2018) site average cover % of the following coral hierarchical rules: O. annularis complex = O. ann >16%; A. palmata = A. palmata >25%; High-Moderate Hard Coral = total hard coral >15% + O. ann <16% + A. palmata <25%; Octocoral canopy = >20 col/10m2 + <15%O.ann + <20% A.pal + <15 hard coral%; Low Coral = <15% hard coral + <20 col/10m2 octocoral. Definitions were established by contractor Miguel G. Figuerola Hernández during the creation of the PRCRMP Site Classification Database.
<u>Coral cover % change since baseline</u>	The site percent change in coral cover between the baseline survey and most recent survey per site. Specification: % Cover Change = [(most recent survey average cover %) - (baseline survey average cover %)] / baseline survey average cover %
<u>Distance from PR Shoreline (km)</u>	The minimum linear distance between site and shoreline of P.R. mainland. Specification: For stations located in oceanic islands (Mona, Desecheo, Caja de Muertos, Vieques, and Culebra) the distance from PR Shoreline is the minimum linear distance of the station to the P.R. “mainland”.
<u>Distance from PR Shoreline (km)[Binned]</u>	The categorical minimum linear distance between station and shoreline of P.R. mainland.
<u>Distance Nearest River Mouth (km)</u>	The minimum linear distance between the station and the nearest river mouth. Specification: Nearest river mouth might be upstream or downstream from the station.
<u>Distance Nearest River Mouth (km) [Binned]</u>	The categorical minimum linear distance between the station and the nearest river mouth.
<u>Nearest River Mouth Direction</u>	Cardinal direction from the station to the nearest river mouth.
<u>Nearest Main Watershed</u>	Name of nearest main watershed associated with the monitoring station.
<u># of Waterways Inputs (<10km)</u>	The # of "river mouths" or waterways inputs 10km or less from the station. Specification: Calculated using measurement tools of ArcGIS online and HOTOSM PRI Waterways shapefile (HOTOSM PRI, 2017) *.
<u># of Waterways Inputs (<10km) [Binned]</u>	Categorical number of river mouths or waterways inputs 10km or less from the station. Specification: Calculated using measurement tools of ArcGIS online and HOTOSM PRI Waterways shapefile (HOTOSM PRI, 2017) *. w = waterways.
<u>Watershed Region</u>	The geographical descriptor of regions with monitoring stations with a higher number (#) of Waterways Inputs (<10km).
<u>PRASA Wastewater Treatment Plant in Near Waterway Inputs</u>	Presence/absence of a PRASA Wastewater Treatment Plant in one of the Near Waterways Inputs (<10km). Specification: Information retrieved from an Esri's ArcGIS online dataset compiled by Sarah Spalding,

	containing data on wastewater treatment plants, based on EPA's Facility Registry Service (FRS) (EPA, 2015) *.
<u>Station Within MPA?</u>	Identifies stations inside MPAs. Specification: Yes = station is located within MPA boundaries; No = station is outside MPA boundaries. MPA boundaries obtained from GIS file Natural Protected Areas of Puerto Rico (CLCC and DNER, 2016) * and NOAA's Marine Protected Areas Inventory [GIS Data] (revised in 2017) *.
<u>Distance to nearest MPA (km)</u>	The minimum linear distance between the station and the nearest MPA boundary. Specification: MPA boundaries obtained from GIS file Natural Protected Areas of Puerto Rico (CLCC and DNER, 2016) * and NOAA's Marine Protected Areas Inventory [GIS Data] (revised in 2017) *.
<u>Nearest MPA Name</u>	The name of MPA near monitoring station. Specification: In the case of monitoring station inside an MPA, the MPA name is provided.
<u>MPA Designation Year</u>	MPA designation year. Specification: Taken from Table 2 in Aguilar-Perera et al. (2006) *, DNER Office of Coastal Zone Management (2009) *, and the NOAA's Marine Protected Areas Inventory [GIS Data] (revised in 2017) *.
<u>MPA Years Since Designation</u>	Years since MPA designation year. Specification: Latest revision in 2021.
<u>MPA Seafloor Surface Area (Km^2)</u>	MPA Seafloor Surface Area in km ² . Specification: Taken from Table 2 in Aguilar-Perera et al. (2006) * and the NOAA's Marine Protected Areas Inventory [GIS Data] (revised in 2017) *.
<u>MPA Fishing Restrictions</u>	Fishing restrictions within MPA boundaries. Specification: Identified in NOAA's Marine Protected Areas Inventory [GIS Data] (revised in 2017) *
<u>MPA Level of Protection</u>	Level of Protection within MPA boundaries. Specification: Defined in NOAA's Definition & Classification System for U.S. Marine Protected Areas (2011) *
<u>T1 (Lat''Lon)</u>	Transect 1 coordinates. Specification: Taken at the center [5m] of the benthic transect
<u>T2 (Lat''Lon)</u>	Transect 2 coordinates. Specification: Taken at the center [5m] of the benthic transect
<u>T3 (Lat''Lon)</u>	Transect 3 coordinates. Specification: Taken at the center [5m] of the benthic transect
<u>T4 (Lat''Lon)</u>	Transect 4 coordinates. Specification: Taken at the center [5m] of the benthic transect
<u>T5 (Lat''Lon)</u>	Transect 5 coordinates. Specification: Taken at the center [5m] of the benthic transect
Indicators in PRCRMP data files (sessile-benthic, fish, and macroinvertebrates)	
<u>Phylum</u>	Phylum of benthic, fish, and macroinvertebrate individuals
<u>Class</u>	Class of benthic, fish, and macroinvertebrate individuals
<u>Order</u>	Order of benthic, fish, and macroinvertebrate individuals
<u>Family</u>	Family of benthic, fish, and macroinvertebrate individuals
<u>Genus</u>	Genus of benthic, fish, and macroinvertebrate individuals

<u>Species</u>	Species of benthic, fish, and macroinvertebrate individuals
<u>Benthic Indicator</u>	Classification of functional groups and the main category of benthic cover percentage or colony count measurements

[*References](#)

Sessile-Benthic Communities

Benthic Data Description:

The PRCRMP benthic data file includes 10-meter chain transect substrate cover percentage data of sessile-benthic reef communities for all surveyed stations. Data units are in cover percent, but some benthic categories and their species (octocorals and stony corals) are reported as the number of colonies as well. When the number of colonies is reported, the data label will include the “#col.” characters. Blank cells in this data file represent missing values. Missing values are present because since the beginning of the surveys in 1999 not all benthic categories have been identified to the species level. Also, some benthic categories and/or species have not been considered during benthic surveys at specific years, so the years when they were not considered, they will appear with missing values in the data file (blank cells). That is, this data file includes blank cells, representing species not considered during the survey and transects or stations not completed.

For data collection field methodologies see the Field Methodology of the Puerto Rico Coral Reef Monitoring Program (PRCRMP).

Benthic Categories Species Groupings:

The raw list of benthic variables collected in the field can be grouped by major benthic categories. The sum of all major benthic categories must add to 100 cover percentage. The following list defines the variables that compose each major benthic category. These groupings are identified under column “Benthic Indicator” in the benthic datasheet. If only the major benthic categories are desired, the user can filter the “Benthic Indicator” column by the “Benthic Category” level.

Abiotic (total)

- Gaps/Holes
- Pavement
- Recently dead coral
- Reef overhang
- Rubble
- Sand
- Sand and rubble

Anemones (total)

- Anemone spp.
- Bartholomea annulata
- Lebrunia neglecta
- Phymanthus crucifer

Rhodactis osculifera

Ricordea florida

CCA (total) – only one variable (no sub-variables)

Cyanobacteria (total) – only one variable (no sub-variables)

Macroalgae (total)

Amphiroa spp.

Asparagopsis taxiformis

Asparagopsis taxiformis on Ramicrusta

Caulerpa racemosa

Caulerpa spp.

Caulerpa spp. on Ramicrusta

Dichotomaria marginata

Dictyota spp.

Dictyota spp. on Ramicrusta

Galaxaura spp.

Galaxaura spp. on Ramicrusta

Gracilaria spp.

Halimeda discoidea

Halimeda spp.

Halimeda spp. on Ramicrusta

Halimeda tuna

Jania spp.

Lobophora spp.

Lobophora variegata

Lobophora variegatus on Ramicrusta

Macroalgae spp.

Martensia pavonia

Padina spp.

Sargassum hystrix

Sargassum natans

Styopodium spp.

Styopodium zonale

Udotea spp.

Valonia ventricosa

Wrangelia bicuspidata

Octocorals (total encrusting)

Briareum asbestinum

Erythropodium caribaeorum

Octocoral spp.(encrusting)

Octocorals (total erect)

Antillogorgia acerosa

Antillogorgia americana

Antillogorgia bipinnata

Antillogorgia rigida
Eunicea calyculata
Eunicea flexuosa
Eunicea mammosa
Eunicea pallida
Eunicea spp.
Eunicea succinea
Eunicea tourneforti
Gorgonia mariae
Gorgonia ventalina
Muricea atlantica
Muricea elongata
Muricea muricata
Muricea pinnata
Muriceopsis flavida
Octocoral spp.
Plexaura homomalla
Plexaura kukenthali
Plexaura spp.
Plexaurella nutans
Plexaurella spp.
Pseudoplexaura flagellosa
Pseudoplexaura spp.
Pseudoplexaura wagenaari
Pterogorgia guadalupensis
Pterogorgia spp.

Peyssonneliaceae (total)

Peyssonnelia spp.
Ramicrusta spp.

Seagrass (total)

Thalassia testudinum

Sponges (total)

Agelas citrina
Agelas clathrodes
Agelas conifera
Agelas dispar
Agelas sceptrum
Agelas spp.
Agelas sventres
Agelas tubulata
Aiolochoiria crassa
Amphimedon caribica
Amphimedon compressa

Amphimedon viridis
Aplysina archeri
Aplysina cauliformis
Aplysina fistularis
Aplysina fulva
Aplysina insularis
Aplysina lacunosa
Aplysina spp.
Biemna caribea
Biemna spp.
Callyspongia (Callyspongia) fallax
Callyspongia armigera
Callyspongia plicifera
Callyspongia spp.
Callyspongia tenerrima
Callyspongia vaginalis
Chondrilla caribensis
Chondrosia collectrix
Cinachyrella apion
Cinachyrella kuekenthali
Clathria (Thalysias) venosa
Clathria spp.
Cliona aprica
Cliona caribbaea
Cliona spp.
Cliona tenuis
Cliona varians
Cliothesa delitrix
Coelocarteria bartschi
Cribrochalina vasculum
Desmapsamma anchorata
Desmapsamma spp.
Dictyonella funicularis
Dictyonella spp.
Diplastrella spp.
Dragmacidon reticulatum
Dysidea etheria
Dysidea janiae
Ectyoplasia ferox
Geodia neptuni
Haliclona spp.
Halisarca caerulea
Halisarca spp.

Iotrochota arenosa
Iotrochota birotulata
Ircinia campana
Ircinia felix
Ircinia spp.
Ircinia strobilina
Monanchora arbuscula
Mycale (Mycale) laevis
Mycale laxissima
Neofibularia nolitangere
Neopetrosia carbonaria
Neopetrosia proxima
Neopetrosia rosariensis
Neopetrosia spp.
Niphates alba
Niphates amorpha
Niphates caycedoi
Niphates digitalis
Niphates erecta
Niphates spp.
Petrosia (Petrosia) pellasarca
Petrosia (Petrosia) weinbergi
Petrosia spp.
Phorbas amaranthus
Plakortis angulospiculatus
Plakortis halichondrioides
Plakortis spp.
Prosuberites laughlini
Ptilocaulis walpersii
Scopalina ruetzleri
Smenospongia aurea
Smenospongia conulosa
Spheciospongia vesparium
Spirastrella coccinea
Spirastrella hartmani
Sponge spp.
Suberea spp.
Svenzea cristinae
Svenzea zeai
Tedania (Tedania) klausii
Timea micraster
Topsentia ophiraphidites
Topsentia spp.

Verongula reiswigi
Verongula rigida
Verongula spp.
Xestospongia muta

Stony Corals (total)

Acropora cervicornis
Acropora palmata
Acropora prolifera
Agaricia agaricites
Agaricia fragilis
Agaricia grahamae
Agaricia humilis
Agaricia lamarcki
Agaricia spp.
Colpophyllia natans
Dendrogyra cylindrus
Dichocoenia stokesii
Diploria labyrinthiformis
Eusmilia fastigiata
Helioseris cucullata
Isophyllia rigida
Isophyllia sinuosa
Madracis auretenra
Madracis carmabi
Madracis decactis
Madracis formosa
Madracis pharensis
Madracis senaria
Madracis spp.
Manicina areolata
Meandrina jacksoni
Meandrina meandrites
Millepora alcicornis
Millepora complanata
Millepora spp.
Millepora squarrosa
Montastraea cavernosa
Mussa angulosa
Mycetophyllia aliciae
Mycetophyllia danaana
Mycetophyllia ferox
Mycetophyllia lamarckiana
Mycetophyllia spp.

Oculina diffusa
Orbicella annularis
Orbicella annularis (complex)
Orbicella faveolata
Orbicella franksi
Porites astreoides
Porites colonensis
Porites divaricata
Porites furcata
Porites porites
Pseudodiploria clivosa
Pseudodiploria strigosa
Scolymia cubensis
Scolymia spp.
Siderastrea radians
Siderastrea siderea
Solenastrea bournoni
Stephanocoenia intersepta
Stony Coral spp.
Stylaster roseus

Tunicata (total)

Ascidian spp.
Eudistoma spp.
Trididemnum solidum

Turf Algae (total)

Turf (mixed)
Turf (mixed) on Ramicrusta
Turf (mixed) with sediment

Zoanthids (total)

Condominium spp.
Palythoa caribaeorum
Palythoa grandis

Benthic Data Label Definitions:

<i>Rugosity (m)</i>	It is an index or measure of topographic complexity for habitats intercepted by transects. It is estimated as the total length of the transect chain divided by the horizontal distance covered (10m). Specification: The method was adapted by DNER fieldwork contractor from the CARICOMP (2001) * protocol. The original reference for the method is Rogers et al. (1982) *.
<i>Reef overhang</i>	Substrate cover percentage by the abiotic subcategory Reef overhang. It is a reef space where the chain drops freely to the bottom without being in contact with any recognizable substrate category. Overhangs typically occur below a coral ledge, branch, or rock outcrop.
<i>Rubble</i>	Substrate cover percentage by the abiotic subcategory Rubble
<i>Sand</i>	Substrate cover percentage by the abiotic subcategory Sand
<i>Sand and rubble</i>	Substrate cover percentage by the abiotic subcategory Sand and rubble
<i>Pavement</i>	Substrate cover percentage by the abiotic subcategory Pavement
<i>Gaps/Holes</i>	Substrate cover percentage by the abiotic subcategory Gaps/Holes. It is a narrow open reef space between two other substrate categories. These gaps are typically narrow and deep enough such that the substrate below the chain is unrecognizable.
<i>Abiotic (total)</i>	Substrate cover percentage by all abiotic subcategories
<i>Bartholomea annulata</i>	Substrate cover percentage by the Anemone species Bartholomea annulata
<i>Lebrunia neglecta</i>	Substrate cover percentage by the Anemone species Lebrunia neglecta
<i>Phymanthus crucifer</i>	Substrate cover percentage by the Anemone species Phymanthus crucifer
<i>Ricordea florida</i>	Substrate cover percentage by the Anemone species Ricordea florida
<i>Rhodactis osculifera</i>	Substrate cover percentage by the Anemone species Rhodactis osculifera
<i>Anemone spp.</i>	Substrate cover percentage by the Anemone species Anemone spp. (unidentified)
<i>Anemones (total)</i>	Substrate cover percentage by all Anemone species
<i>Eudistoma spp.</i>	Substrate cover percentage by the Ascidian species Eudistoma spp. (unidentified)
<i>Trididemnum solidum</i>	Substrate cover percentage by the Ascidian species Trididemnum solidum

<i>Ascidian spp.</i>	Substrate cover percentage by the Ascidian species Ascidian spp. (unidentified)
<i>Tunicata (total)</i>	Substrate cover percentage by all Tunicata species
<i>CCA (total)</i>	Substrate cover percentage by all Crustose Coraline Algae, red algae in the Order Corallinales that secrete Mg-calcite skeletons. CCA excludes encrusting algae from the family Peyssonneliaceae.
<i>Cyanobacteria (total)</i>	Substrate cover percentage by Cyanobacteria. Microscopic free-living marine autotrophic (photosynthetic/oxygenic) bacteria in the Phylum Cyanophyta that grow together forming reddish mats or patches over reef surfaces. Also known as “blue-green algae”.
<i>Thalassia testudinum</i>	Substrate cover percentage by the Seagrass species <i>Thalassia testudinum</i>
<i>Seagrass (total)</i>	Substrate cover percentage by all Seagrass species
<i>Amphiroa spp.</i>	Substrate cover percentage by the Macroalgae species <i>Amphiroa</i> spp. (unidentified)
<i>Asparagopsis taxiformis</i>	Substrate cover percentage by the Macroalgae species <i>Asparagopsis taxiformis</i>
<i>Asparagopsis taxiformis on Ramicrusta</i>	Substrate cover percentage by the Macroalgae species <i>Asparagopsis taxiformis</i> on <i>Ramicrusta</i>
<i>Caulerpa racemosa</i>	Substrate cover percentage by the Macroalgae species <i>Caulerpa racemosa</i>
<i>Caulerpa spp.</i>	Substrate cover percentage by the Macroalgae species <i>Caulerpa</i> spp. (unidentified)
<i>Caulerpa spp. on Ramicrusta</i>	Substrate cover percentage by the Macroalgae species <i>Caulerpa</i> spp. (unidentified) on <i>Ramicrusta</i>
<i>Dichotomaria marginata</i>	Substrate cover percentage by the Macroalgae species <i>Dichotomaria marginata</i>
<i>Dictyota spp.</i>	Substrate cover percentage by the Macroalgae species <i>Dictyota</i> spp. (unidentified)
<i>Dictyota spp. on Ramicrusta</i>	Substrate cover percentage by the Macroalgae species <i>Dictyota</i> spp. (unidentified) on <i>Ramicrusta</i>
<i>Galaxaura spp.</i>	Substrate cover percentage by the Macroalgae species <i>Galaxaura</i> spp. (unidentified)
<i>Galaxaura spp. on Ramicrusta</i>	Substrate cover percentage by the Macroalgae species <i>Galaxaura</i> spp. (unidentified) on <i>Ramicrusta</i>
<i>Gracilaria spp.</i>	Substrate cover percentage by the Macroalgae species <i>Gracilaria</i> spp. (unidentified)
<i>Halimeda discoidea</i>	Substrate cover percentage by the Macroalgae species <i>Halimeda discoidea</i>
<i>Halimeda spp.</i>	Substrate cover percentage by the Macroalgae species <i>Halimeda</i> spp. (unidentified)

<i>Halimeda spp. on Ramicrusta</i>	Substrate cover percentage by the Macroalgae species Halimeda spp. (unidentified) on Ramicrusta
<i>Halimeda tuna</i>	Substrate cover percentage by the Macroalgae species Halimeda tuna
<i>Jania spp.</i>	Substrate cover percentage by the Macroalgae species Jania spp. (unidentified)
<i>Lobophora spp.</i>	Substrate cover percentage by the Macroalgae species Lobophora spp. (unidentified)
<i>Lobophora variegata</i>	Substrate cover percentage by the Macroalgae species Lobophora variegata
<i>Lobophora variegatus on Ramicrusta</i>	Substrate cover percentage by the Macroalgae species Lobophora variegatus on Ramicrusta
<i>Martensia pavonia</i>	Substrate cover percentage by the Macroalgae species Martensia pavonia
<i>Padina spp.</i>	Substrate cover percentage by the Macroalgae species Padina spp. (unidentified)
<i>Sargassum hystrix</i>	Substrate cover percentage by the Macroalgae species Sargassum hystrix
<i>Sargassum natans</i>	Substrate cover percentage by the Macroalgae species Sargassum natans
<i>Styopodium spp.</i>	Substrate cover percentage by the Macroalgae species Styopodium spp. (unidentified)
<i>Styopodium zonale</i>	Substrate cover percentage by the Macroalgae species Styopodium zonale
<i>Udotea spp.</i>	Substrate cover percentage by the Macroalgae species Udotea spp. (unidentified)
<i>Valonia ventricosa</i>	Substrate cover percentage by the Macroalgae species Valonia ventricosa
<i>Wrangelia bicuspidata</i>	Substrate cover percentage by the Macroalgae species Wrangelia bicuspidata
<i>Macroalgae spp.</i>	Substrate cover percentage by the Macroalgae species Macroalgae spp. (unidentified)
<i>Macroalgae (total)</i>	Substrate cover percentage by all Macroalgae species
<i>Ramicrusta spp.</i>	Substrate cover percentage by the Peyssonneliaceae species Ramicrusta spp. (unidentified)
<i>Peyssonnelia spp.</i>	Substrate cover percentage by the Peyssonneliaceae species Peyssonnelia spp. (unidentified)
<i>Peyssonneliaceae (total)</i>	Substrate cover percentage by all Peyssonneliaceae species
<i>Turf (mixed) on Ramicrusta</i>	Substrate cover percentage by Turf algae growing on Ramicrusta
<i>Turf (mixed) with sediment</i>	Substrate cover percentage by Turf algae with sediment

<i>Turf (mixed)</i>	Substrate cover percentage by a mixed assemblage of turf algae. It is a mixed assemblage of short algae (< 2cm) growing as a rug over reef hard bottom.
<i>Turf Algae (total)</i>	Substrate cover percentage by all Turf Algae subcategories
<i>Antillogorgia acerosa</i>	Substrate cover percentage by the Octocoral species Antillogorgia acerosa
<i>Antillogorgia americana</i>	Substrate cover percentage by the Octocoral species Antillogorgia americana
<i>Antillogorgia bipinnata</i>	Substrate cover percentage by the Octocoral species Antillogorgia bipinnata
<i>Antillogorgia rigida</i>	Substrate cover percentage by the Octocoral species Antillogorgia rigida
<i>Eunicea calyculata</i>	Substrate cover percentage by the Octocoral species Eunicea calyculata
<i>Eunicea flexuosa</i>	Substrate cover percentage by the Octocoral species Eunicea flexuosa
<i>Eunicea mammosa</i>	Substrate cover percentage by the Octocoral species Eunicea mammosa
<i>Eunicea pallida</i>	Substrate cover percentage by the Octocoral species Eunicea pallida
<i>Eunicea spp.</i>	Substrate cover percentage by the Octocoral species Eunicea spp. (unidentified)
<i>Eunicea succinea</i>	Substrate cover percentage by the Octocoral species Eunicea succinea
<i>Eunicea tourneforti</i>	Substrate cover percentage by the Octocoral species Eunicea tourneforti
<i>Gorgonia mariae</i>	Substrate cover percentage by the Octocoral species Gorgonia mariae
<i>Gorgonia ventalina</i>	Substrate cover percentage by the Octocoral species Gorgonia ventalina
<i>Muricea atlantica</i>	Substrate cover percentage by the Octocoral species Muricea atlantica
<i>Muricea elongata</i>	Substrate cover percentage by the Octocoral species Muricea elongata
<i>Muricea muricata</i>	Substrate cover percentage by the Octocoral species Muricea muricata
<i>Muricea pinnata</i>	Substrate cover percentage by the Octocoral species Muricea pinnata
<i>Muriceopsis flavida</i>	Substrate cover percentage by the Octocoral species Muriceopsis flavida
<i>Plexaura homomalla</i>	Substrate cover percentage by the Octocoral species Plexaura homomalla

<i>Plexaura kukenthali</i>	Substrate cover percentage by the Octocoral species <i>Plexaura kukenthali</i>
<i>Plexaura spp.</i>	Substrate cover percentage by the Octocoral species <i>Plexaura spp.</i> (unidentified)
<i>Plexaurella nutans</i>	Substrate cover percentage by the Octocoral species <i>Plexaurella nutans</i>
<i>Plexaurella spp.</i>	Substrate cover percentage by the Octocoral species <i>Plexaurella spp.</i> (unidentified)
<i>Pseudoplexaura flagellosa</i>	Substrate cover percentage by the Octocoral species <i>Pseudoplexaura flagellosa</i>
<i>Pseudoplexaura spp.</i>	Substrate cover percentage by the Octocoral species <i>Pseudoplexaura spp.</i> (unidentified)
<i>Pseudoplexaura wagnaari</i>	Substrate cover percentage by the Octocoral species <i>Pseudoplexaura wagnaari</i>
<i>Pterogorgia guadalupensis</i>	Substrate cover percentage by the Octocoral species <i>Pterogorgia guadalupensis</i>
<i>Pterogorgia spp.</i>	Substrate cover percentage by the Octocoral species <i>Pterogorgia spp.</i> (unidentified)
<i>Octocoral spp.</i>	Substrate cover percentage by the Octocoral species <i>Octocoral</i> (unidentified)
<i>Octocorals (total erect)</i>	Substrate cover percentage by all erect or branching <i>Octocoral</i> species
<i>Briareum asbestinum</i>	Substrate cover percentage by the Octocoral species <i>Briareum asbestinum</i>
<i>Erythropodium caribaeorum</i>	Substrate cover percentage by the Octocoral species <i>Erythropodium caribaeorum</i>
<i>Octocoral spp. (encrusting)</i>	Substrate cover percentage by the Octocoral species <i>Octocorals</i> (encrusting) unidentified
<i>Octocorals (total encrusting)</i>	Substrate cover percentage by all encrusting <i>Octocoral</i> species
<i>Antillogorgia acerosa (# col.)</i>	Number of colonies of the Octocoral species <i>Antillogorgia acerosa</i>
<i>Antillogorgia americana (# col.)</i>	Number of colonies of the Octocoral species <i>Antillogorgia americana</i>
<i>Antillogorgia bipinnata (# col.)</i>	Number of colonies of the Octocoral species <i>Antillogorgia bipinnata</i>
<i>Antillogorgia spp. (# col.)</i>	Number of colonies of the Octocoral species <i>Antillogorgia spp.</i> (unidentified)
<i>Briareum asbestinum (# col.)</i>	Number of colonies of the Octocoral species <i>Briareum asbestinum</i>
<i>Erythropodium caribaeorum (# col.)</i>	Number of colonies of the Octocoral species <i>Erythropodium caribaeorum</i>
<i>Eunicea asperula (# col.)</i>	Number of colonies of the Octocoral species <i>Eunicea asperula</i>

<i>Eunicea calyculata</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea calyculata</i>
<i>Eunicea flexuosa</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea flexuosa</i>
<i>Eunicea lacinata</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea lacinata</i>
<i>Eunicea laxispica</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea laxispica</i>
<i>Eunicea mammosa</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea mammosa</i>
<i>Eunicea spp.</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea spp.</i> (unidentified)
<i>Eunicea succinea</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea succinea</i>
<i>Eunicea tourneforti</i> (# col.)	Number of colonies of the Octocoral species <i>Eunicea tourneforti</i>
<i>Gorgonia ventalina</i> (# col.)	Number of colonies of the Octocoral species <i>Gorgonia ventalina</i>
<i>Muricea atlantica</i> (# col.)	Number of colonies of the Octocoral species <i>Muricea atlantica</i>
<i>Muricea elongata</i> (# col.)	Number of colonies of the Octocoral species <i>Muricea elongata</i>
<i>Muricea laxa</i> (# col.)	Number of colonies of the Octocoral species <i>Muricea laxa</i>
<i>Muricea muricata</i> (# col.)	Number of colonies of the Octocoral species <i>Muricea muricata</i>
<i>Muricea spp.</i> (# col.)	Number of colonies of the Octocoral species <i>Muricea spp.</i> (unidentified) (# col.)
<i>Muriceopsis flavida</i> (# col.)	Number of colonies of the Octocoral species <i>Muriceopsis flavida</i>
<i>Plexaura homomalla</i> (# col.)	Number of colonies of the Octocoral species <i>Plexaura homomalla</i>
<i>Plexaura kukenthalii</i> (# col.)	Number of colonies of the Octocoral species <i>Plexaura kukenthalii</i>
<i>Plexaura kuna</i> (# col.)	Number of colonies of the Octocoral species <i>Plexaura kuna</i>
<i>Plexaura spp.</i> (# col.)	Number of colonies of the Octocoral species <i>Plexaura spp.</i> (unidentified)
<i>Plexaurella dichotoma</i> (# col.)	Number of colonies of the Octocoral species <i>Plexaurella dichotoma</i>
<i>Plexaurella nutans</i> (# col.)	Number of colonies of the Octocoral species <i>Plexaurella nutans</i>
<i>Plexaurella spp.</i> (# col.)	Number of colonies of the Octocoral species <i>Plexaurella spp.</i> (unidentified)
<i>Pseudoplexaura flagellosa</i> (# col.)	Number of colonies of the Octocoral species <i>Pseudoplexaura flagellosa</i>

<i>Pseudoplexaura porosa</i> (# col.)	Number of colonies of the Octocoral species <i>Pseudoplexaura porosa</i>
<i>Pterogorgia citrina</i> (# col.)	Number of colonies of the Octocoral species <i>Pterogorgia citrina</i>
<i>Pterogorgia guadalupensis</i> (# col.)	Number of colonies of the Octocoral species <i>Pterogorgia guadalupensis</i>
<i>Pterogorgia spp.</i> (# col.)	Number of colonies of the Octocoral species <i>Pterogorgia</i> spp. (unidentified)
<i>Octocoral</i> (total # col.)	Total number of Octocoral colonies
<i>Agelas citrina</i>	Substrate cover percentage by the Sponge species <i>Agelas citrina</i>
<i>Agelas clathrodes</i>	Substrate cover percentage by the Sponge species <i>Agelas clathrodes</i>
<i>Agelas conifera</i>	Substrate cover percentage by the Sponge species <i>Agelas conifera</i>
<i>Agelas dispar</i>	Substrate cover percentage by the Sponge species <i>Agelas dispar</i>
<i>Agelas sceptrum</i>	Substrate cover percentage by the Sponge species <i>Agelas sceptrum</i>
<i>Agelas spp.</i>	Substrate cover percentage by the Sponge species <i>Agelas</i> spp. (unidentified)
<i>Agelas sventres</i>	Substrate cover percentage by the Sponge species <i>Agelas sventres</i>
<i>Agelas tubulata</i>	Substrate cover percentage by the Sponge species <i>Agelas tubulata</i>
<i>Aiolochoiria crassa</i>	Substrate cover percentage by the Sponge species <i>Aiolochoiria crassa</i>
<i>Amphimedon caribica</i>	Substrate cover percentage by the Sponge species <i>Amphimedon caribica</i>
<i>Amphimedon compressa</i>	Substrate cover percentage by the Sponge species <i>Amphimedon compressa</i>
<i>Amphimedon viridis</i>	Substrate cover percentage by the Sponge species <i>Amphimedon viridis</i>
<i>Aplysina archeri</i>	Substrate cover percentage by the Sponge species <i>Aplysina archeri</i>
<i>Aplysina cauliformis</i>	Substrate cover percentage by the Sponge species <i>Aplysina cauliformis</i>
<i>Aplysina fistularis</i>	Substrate cover percentage by the Sponge species <i>Aplysina fistularis</i>
<i>Aplysina fulva</i>	Substrate cover percentage by the Sponge species <i>Aplysina fulva</i>

<i>Aplysina insularis</i>	Substrate cover percentage by the Sponge species <i>Aplysina insularis</i>
<i>Aplysina lacunosa</i>	Substrate cover percentage by the Sponge species <i>Aplysina lacunosa</i>
<i>Aplysina spp.</i>	Substrate cover percentage by the Sponge species <i>Aplysina spp.</i> (unidentified)
<i>Biemna caribea</i>	Substrate cover percentage by the Sponge species <i>Biemna caribea</i>
<i>Biemna spp.</i>	Substrate cover percentage by the Sponge species <i>Biemna spp.</i> (unidentified)
<i>Callyspongia armigera</i>	Substrate cover percentage by the Sponge species <i>Callyspongia armigera</i>
<i>Callyspongia fallax</i>	Substrate cover percentage by the Sponge species <i>Callyspongia fallax</i>
<i>Callyspongia plicifera</i>	Substrate cover percentage by the Sponge species <i>Callyspongia plicifera</i>
<i>Callyspongia spp.</i>	Substrate cover percentage by the Sponge species <i>Callyspongia spp.</i> (unidentified)
<i>Callyspongia tenerrima</i>	Substrate cover percentage by the Sponge species <i>Callyspongia tenerrima</i>
<i>Callyspongia vaginalis</i>	Substrate cover percentage by the Sponge species <i>Callyspongia vaginalis</i>
<i>Chondrilla caribensis</i>	Substrate cover percentage by the Sponge species <i>Chondrilla caribensis</i>
<i>Chondrosia collectrix</i>	Substrate cover percentage by the Sponge species <i>Chondrosia collectrix</i>
<i>Cinachyrella apion</i>	Substrate cover percentage by the Sponge species <i>Cinachyrella apion</i>
<i>Cinachyrella kuekenthali</i>	Substrate cover percentage by the Sponge species <i>Cinachyrella kuekenthali</i>
<i>Clathria spp.</i>	Substrate cover percentage by the Sponge species <i>Clathria spp.</i> (unidentified)
<i>Clathria venosa</i>	Substrate cover percentage by the Sponge species <i>Clathria venosa</i>
<i>Cliona aprica</i>	Substrate cover percentage by the Sponge species <i>Cliona aprica</i>
<i>Cliona caribbaea</i>	Substrate cover percentage by the Sponge species <i>Cliona caribbaea</i>
<i>Cliona delitrix</i>	Substrate cover percentage by the Sponge species <i>Cliona delitrix</i>
<i>Cliona laticavicola</i>	Substrate cover percentage by the Sponge species <i>Cliona laticavicola</i>

<i>Cliona spp.</i>	Substrate cover percentage by the Sponge species <i>Cliona</i> spp. (unidentified)
<i>Cliona tenuis</i>	Substrate cover percentage by the Sponge species <i>Cliona tenuis</i>
<i>Cliona varians</i>	Substrate cover percentage by the Sponge species <i>Cliona varians</i>
<i>Cribrochalina vasculum</i>	Substrate cover percentage by the Sponge species <i>Cribrochalina vasculum</i>
<i>Desmapsamma spp.</i>	Substrate cover percentage by the Sponge species <i>Desmapsamma</i> spp. (unidentified)
<i>Desmapsamma anchorata</i>	Substrate cover percentage by the Sponge species <i>Desmapsamma anchorata</i>
<i>Dictyonella funicularis</i>	Substrate cover percentage by the Sponge species <i>Dictyonella funicularis</i>
<i>Dictyonella spp.</i>	Substrate cover percentage by the Sponge species <i>Dictyonella</i> spp. (unidentified)
<i>Diplastrella spp.</i>	Substrate cover percentage by the Sponge species <i>Diplastrella</i> spp. (unidentified)
<i>Drummacidon reticulatum</i>	Substrate cover percentage by the Sponge species <i>Drummacidon reticulatum</i>
<i>Dysidea etheria</i>	Substrate cover percentage by the Sponge species <i>Dysidea etheria</i>
<i>Dysidea janiae</i>	Substrate cover percentage by the Sponge species <i>Dysidea janiae</i>
<i>Ectyoplasia ferox</i>	Substrate cover percentage by the Sponge species <i>Ectyoplasia ferox</i>
<i>Geodia neptuni</i>	Substrate cover percentage by the Sponge species <i>Geodia neptuni</i>
<i>Haliclona spp.</i>	Substrate cover percentage by the Sponge species <i>Haliclona</i> spp. (unidentified)
<i>Halisarca caerulea</i>	Substrate cover percentage by the Sponge species <i>Halisarca caerulea</i>
<i>Halisarca spp.</i>	Substrate cover percentage by the Sponge species <i>Halisarca</i> spp. (unidentified)
<i>Iotrochota arenosa</i>	Substrate cover percentage by the Sponge species <i>Iotrochota arenosa</i>
<i>Iotrochota birotulata</i>	Substrate cover percentage by the Sponge species <i>Iotrochota birotulata</i>
<i>Ircinia campana</i>	Substrate cover percentage by the Sponge species <i>Ircinia campana</i>
<i>Ircinia felix</i>	Substrate cover percentage by the Sponge species <i>Ircinia felix</i>

<i>Ircinia spp.</i>	Substrate cover percentage by the Sponge species <i>Ircinia</i> spp. (unidentified)
<i>Ircinia strobilina</i>	Substrate cover percentage by the Sponge species <i>Ircinia strobilina</i>
<i>Monanchora arbuscula</i>	Substrate cover percentage by the Sponge species <i>Monanchora arbuscula</i>
<i>Mycale laevis</i>	Substrate cover percentage by the Sponge species <i>Mycale laevis</i>
<i>Mycale laxissima</i>	Substrate cover percentage by the Sponge species <i>Mycale laxissima</i>
<i>Neofibularia nolitangere</i>	Substrate cover percentage by the Sponge species <i>Neofibularia nolitangere</i>
<i>Neopetrosia carbonaria</i>	Substrate cover percentage by the Sponge species <i>Neopetrosia carbonaria</i>
<i>Neopetrosia proxima</i>	Substrate cover percentage by the Sponge species <i>Neopetrosia proxima</i>
<i>Neopetrosia rosariensis</i>	Substrate cover percentage by the Sponge species <i>Neopetrosia rosariensis</i>
<i>Neopetrosia spp.</i>	Substrate cover percentage by the Sponge species <i>Neopetrosia</i> spp. (unidentified)
<i>Niphates alba</i>	Substrate cover percentage by the Sponge species <i>Niphates alba</i>
<i>Niphates caribica</i>	Substrate cover percentage by the Sponge species <i>Niphates caribica</i>
<i>Niphates caycedoi</i>	Substrate cover percentage by the Sponge species <i>Niphates caycedoi</i>
<i>Niphates digitalis</i>	Substrate cover percentage by the Sponge species <i>Niphates digitalis</i>
<i>Niphates erecta</i>	Substrate cover percentage by the Sponge species <i>Niphates erecta</i>
<i>Niphates spp.</i>	Substrate cover percentage by the Sponge species <i>Niphates</i> spp. (unidentified)
<i>Petrosia pellararca</i>	Substrate cover percentage by the Sponge species <i>Petrosia pellararca</i>
<i>Petrosia spp.</i>	Substrate cover percentage by the Sponge species <i>Petrosia</i> spp. (unidentified)
<i>Petrosia weinbergi</i>	Substrate cover percentage by the Sponge species <i>Petrosia weinbergi</i>
<i>Phorbas amaranthus</i>	Substrate cover percentage by the Sponge species <i>Phorbas amaranthus</i>
<i>Placosphaerastra micraster</i>	Substrate cover percentage by the Sponge species <i>Placosphaerastra micraster</i>

<i>Plakortis angulospiculatus</i>	Substrate cover percentage by the Sponge species Plakortis angulospiculatus
<i>Plakortis halichondrioides</i>	Substrate cover percentage by the Sponge species Plakortis halichondrioides
<i>Plakortis spp.</i>	Substrate cover percentage by the Sponge species Plakortis spp. (unidentified)
<i>Prosuberites laughlini</i>	Substrate cover percentage by the Sponge species Prosuberites laughlini
<i>Ptilocaulis walpersii</i>	Substrate cover percentage by the Sponge species Ptilocaulis walpersii
<i>Scopalina ruetzleri</i>	Substrate cover percentage by the Sponge species Scopalina ruetzleri
<i>Smenospongia aurea</i>	Substrate cover percentage by the Sponge species Smenospongia aurea
<i>Smenospongia conulosa</i>	Substrate cover percentage by the Sponge species Smenospongia conulosa
<i>Sphaciospongia vesparium</i>	Substrate cover percentage by the Sponge species Sphaciospongia vesparium
<i>Spirastrella coccinea</i>	Substrate cover percentage by the Sponge species Spirastrella coccinea
<i>Spirastrella hartmani</i>	Substrate cover percentage by the Sponge species Spirastrella hartmani
<i>Suberea spp.</i>	Substrate cover percentage by the Sponge species Suberea spp. (unidentified)
<i>Svenzea zeai</i>	Substrate cover percentage by the Sponge species Svenzea zeai
<i>Tedania klausii</i>	Substrate cover percentage by the Sponge species Tedania klausii
<i>Topsentia ophiraphidites</i>	Substrate cover percentage by the Sponge species Topsentia ophiraphidites
<i>Topsentia spp.</i>	Substrate cover percentage by the Sponge species Topsentia spp. (unidentified)
<i>Verongula reiswigi</i>	Substrate cover percentage by the Sponge species Verongula reiswigi
<i>Verongula rigida</i>	Substrate cover percentage by the Sponge species Verongula rigida
<i>Verongula spp.</i>	Substrate cover percentage by the Sponge species Verongula spp. (unidentified)
<i>Xestospongia muta</i>	Substrate cover percentage by the Sponge species Xestospongia muta
<i>Sponge spp.</i>	Substrate cover percentage by the Sponge species Sponge spp. (unidentified)

<i>Sponges (total)</i>	Substrate cover percentage by all Sponge species
<i>Acropora cervicornis</i>	Substrate cover percentage by the Stony Coral species <i>Acropora cervicornis</i>
<i>Acropora palmata</i>	Substrate cover percentage by the Stony Coral species <i>Acropora palmata</i>
<i>Acropora prolifera</i>	Substrate cover percentage by the Stony Coral species <i>Acropora prolifera</i>
<i>Agaricia agaricites</i>	Substrate cover percentage by the Stony Coral species <i>Agaricia agaricites</i>
<i>Agaricia fragilis</i>	Substrate cover percentage by the Stony Coral species <i>Agaricia fragilis</i>
<i>Agaricia grahamae</i>	Substrate cover percentage by the Stony Coral species <i>Agaricia grahamae</i>
<i>Agaricia humilis</i>	Substrate cover percentage by the Stony Coral species <i>Agaricia humilis</i>
<i>Agaricia lamarcki</i>	Substrate cover percentage by the Stony Coral species <i>Agaricia lamarcki</i>
<i>Agaricia spp.</i>	Substrate cover percentage by the Stony Coral species <i>Agaricia spp.</i> (unidentified)
<i>Colpophyllia natans</i>	Substrate cover percentage by the Stony Coral species <i>Colpophyllia natans</i>
<i>Dendrogyra cylindrus</i>	Substrate cover percentage by the Stony Coral species <i>Dendrogyra cylindrus</i>
<i>Dichocoenia stokesii</i>	Substrate cover percentage by the Stony Coral species <i>Dichocoenia stokesii</i>
<i>Diploria labyrinthiformis</i>	Substrate cover percentage by the Stony Coral species <i>Diploria labyrinthiformis</i>
<i>Eusmilia fastigiata</i>	Substrate cover percentage by the Stony Coral species <i>Eusmilia fastigiata</i>
<i>Helioseris cucullata</i>	Substrate cover percentage by the Stony Coral species <i>Helioseris cucullata</i>
<i>Isophyllia rigida</i>	Substrate cover percentage by the Stony Coral species <i>Isophyllia rigida</i>
<i>Isophyllia sinuosa</i>	Substrate cover percentage by the Stony Coral species <i>Isophyllia sinuosa</i>
<i>Madracis auretenra</i>	Substrate cover percentage by the Stony Coral species <i>Madracis auretenra</i>
<i>Madracis carmabi</i>	Substrate cover percentage by the Stony Coral species <i>Madracis carmabi</i>
<i>Madracis decactis</i>	Substrate cover percentage by the Stony Coral species <i>Madracis decactis</i>

<i>Madracis formosa</i>	Substrate cover percentage by the Stony Coral species <i>Madracis formosa</i>
<i>Madracis pharensis</i>	Substrate cover percentage by the Stony Coral species <i>Madracis pharensis</i>
<i>Madracis senaria</i>	Substrate cover percentage by the Stony Coral species <i>Madracis senaria</i>
<i>Madracis spp.</i>	Substrate cover percentage by the Stony Coral species <i>Madracis spp.</i> (unidentified)
<i>Manicina areolata</i>	Substrate cover percentage by the Stony Coral species <i>Manicina areolata</i>
<i>Meandrina jacksoni</i>	Substrate cover percentage by the Stony Coral species <i>Meandrina jacksoni</i>
<i>Meandrina meandrites</i>	Substrate cover percentage by the Stony Coral species <i>Meandrina meandrites</i>
<i>Montastraea cavernosa</i>	Substrate cover percentage by the Stony Coral species <i>Montastraea cavernosa</i>
<i>Mussa angulosa</i>	Substrate cover percentage by the Stony Coral species <i>Mussa angulosa</i>
<i>Mycetophyllia aliciae</i>	Substrate cover percentage by the Stony Coral species <i>Mycetophyllia aliciae</i>
<i>Mycetophyllia danaana</i>	Substrate cover percentage by the Stony Coral species <i>Mycetophyllia danaana</i>
<i>Mycetophyllia ferox</i>	Substrate cover percentage by the Stony Coral species <i>Mycetophyllia ferox</i>
<i>Mycetophyllia lamarckiana</i>	Substrate cover percentage by the Stony Coral species <i>Mycetophyllia lamarckiana</i>
<i>Mycetophyllia spp.</i>	Substrate cover percentage by the Stony Coral species <i>Mycetophyllia spp.</i> (unidentified)
<i>Oculina diffusa</i>	Substrate cover percentage by the Stony Coral species <i>Oculina diffusa</i>
<i>Orbicella annularis</i>	Substrate cover percentage by the Stony Coral species <i>Orbicella annularis</i> . <i>Orbicella</i> species-specific data only available since 2018.
<i>Orbicella annularis (complex)</i>	Substrate cover percentage by all the Stony Coral species part of the <i>Orbicella annularis</i> (complex). Since 2018, when species of the complex are being identified, this is calculated as the aggregate of cover percentage of <i>Orbicella</i> species.
<i>Orbicella faveolata</i>	Substrate cover percentage by the Stony Coral species <i>Orbicella faveolata</i> . <i>Orbicellid</i> species-specific data only available since 2018.

<i>Orbicella franksi</i>	Substrate cover percentage by the Stony Coral species <i>Orbicella franksi</i> . Orbicellid species-specific data only available since 2018.
<i>Porites astreoides</i>	Substrate cover percentage by the Stony Coral species <i>Porites astreoides</i>
<i>Porites colonensis</i>	Substrate cover percentage by the Stony Coral species <i>Porites colonensis</i>
<i>Porites divaricata</i>	Substrate cover percentage by the Stony Coral species <i>Porites divaricata</i>
<i>Porites furcata</i>	Substrate cover percentage by the Stony Coral species <i>Porites furcata</i>
<i>Porites porites</i>	Substrate cover percentage by the Stony Coral species <i>Porites porites</i>
<i>Pseudodiploria clivosa</i>	Substrate cover percentage by the Stony Coral species <i>Pseudodiploria clivosa</i>
<i>Pseudodiploria strigosa</i>	Substrate cover percentage by the Stony Coral species <i>Pseudodiploria strigosa</i>
<i>Scolymia cubensis</i>	Substrate cover percentage by the Stony Coral species <i>Scolymia cubensis</i>
<i>Scolymia spp.</i>	Substrate cover percentage by the Stony Coral species <i>Scolymia spp.</i> (unidentified)
<i>Siderastrea radians</i>	Substrate cover percentage by the Stony Coral species <i>Siderastrea radians</i>
<i>Siderastrea siderea</i>	Substrate cover percentage by the Stony Coral species <i>Siderastrea siderea</i>
<i>Solenastrea bournoni</i>	Substrate cover percentage by the Stony Coral species <i>Solenastrea bournoni</i>
<i>Stephanocoenia intersepta</i>	Substrate cover percentage by the Stony Coral species <i>Stephanocoenia intersepta</i>
<i>Stony Coral spp.</i>	Substrate cover percentage by the Stony Coral species <i>Stony Coral spp.</i> (unidentified)
<i>Millepora alcicornis</i>	Substrate cover percentage by the Stony Coral species <i>Millepora alcicornis</i>
<i>Millepora complanata</i>	Substrate cover percentage by the Stony Coral species <i>Millepora complanata</i>
<i>Millepora spp.</i>	Substrate cover percentage by the Stony Coral species <i>Millepora spp.</i> (unidentified)
<i>Millepora squarrosa</i>	Substrate cover percentage by the Stony Coral species <i>Millepora squarrosa</i>
<i>Stylaster roseus</i>	Substrate cover percentage by the Stony Coral species <i>Stylaster roseus</i>

<i>Stony Corals (total)</i>	Substrate cover percentage by all Stony Coral species, including hydrocorals (Millepora)
<i>Stony Corals (total # diseased col.)</i>	Total number of diseased Stony Coral colonies
<i>Stony Corals (total #col.)</i>	Total number of [healthy and diseased] Stony Coral colonies
<i>Stony Corals (total # bleached col.)</i>	Total number of bleached Stony Coral colonies
<i>Partially bleached coral (total)</i>	Substrate cover percentage by Partially bleached coral
<i>Recently dead coral (total)</i>	Substrate cover percentage by Recently dead coral
<i>Condominium spp.</i>	Substrate cover percentage by the Zoanthid species Condominium spp. (unidentified)
<i>Palythoa grandis</i>	Substrate cover percentage by the Zoanthid species Palythoa grandis
<i>Palythoa caribaeorum</i>	Substrate cover percentage by the Zoanthid species Palythoa caribaeorum
<i>Zoanthids (total)</i>	Substrate cover percentage by all Zoanthid species

Fish and Macroinvertebrate Abundance

Fish and Macroinvertebrate Abundance Data Description:

This data file includes reef fish and macroinvertebrates counts in 30-meter squared band transects from 1999-2021. The data units are number (#) of individuals/30 m². This data file includes blank cells, representing species not considered during the survey and transects or stations not completed.

For data collection field methodologies see the Field Methodology of the Puerto Rico Coral Reef Monitoring Program (PRCRMP).

Fish and Macroinvertebrate Abundance Data Label Definitions:

<i>Abudefduf saxatilis</i>	# of Abudefduf saxatilis individuals / 30 m2
<i>Abudefduf taurus</i>	# of Abudefduf taurus individuals / 30 m2
<i>Acanthemblemaria aspera</i>	# of Acanthemblemaria aspera individuals / 30 m2
<i>Acanthemblemaria chaplini</i>	# of Acanthemblemaria chaplini individuals / 30 m2
<i>Acanthemblemaria maria</i>	# of Acanthemblemaria maria individuals / 30 m2
<i>Acanthemblemaria spinosa</i>	# of Acanthemblemaria spinosa individuals / 30 m2
<i>Acanthocybium solandri</i>	# of Acanthocybium solandri individuals / 30 m2
<i>Acanthostracion polygonius</i>	# of Acanthostracion polygonius individuals / 30 m2
<i>Acanthostracion quadricornis</i>	# of Acanthostracion quadricornis individuals / 30 m2
<i>Acanthurus chirurgus</i>	# of Acanthurus chirurgus individuals / 30 m2
<i>Acanthurus coeruleus</i>	# of Acanthurus coeruleus individuals / 30 m2
<i>Acanthurus tractus (bahianus)</i>	# of Acanthurus tractus and/or bahianus individuals / 30 m2
<i>Aetobatus narinari</i>	# of Aetobatus narinari individuals / 30 m2

<i>Aliger gigas</i>	# of Lobatus gigas individuals / 30 m2
<i>Aluterus scriptus</i>	# of Aluterus scriptus individuals / 30 m2
<i>Aluterus spp.</i>	# of Aluterus spp. (unidentified) individuals / 30 m2
<i>Amblycirrhitus pinos</i>	# of Amblycirrhitus pinos individuals / 30 m2
<i>Ancylomenes pedersoni</i>	# of Ancylomenes pedersoni individuals / 30 m2
<i>Anguilla rostrata</i>	# of Anguilla rostrata individuals / 30 m2
<i>Anisotremus surinamensis</i>	# of Anisotremus surinamensis individuals / 30 m2
<i>Anisotremus virginicus</i>	# of Anisotremus virginicus individuals / 30 m2
<i>Anomura spp.</i>	# of Anomura spp. (unidentified) individuals / 30 m2
<i>Apogon binotatus</i>	# of Apogon binotatus individuals / 30 m2
<i>Apogon maculatus</i>	# of Apogon maculatus individuals / 30 m2
<i>Apogon robinsi</i>	# of Apogon robinsi individuals / 30 m2
<i>Apogon spp.</i>	# of Apogon spp. (unidentified) individuals / 30 m2
<i>Apogon townsendi</i>	# of Apogon townsendi individuals / 30 m2
<i>Astrophyton muricatum</i>	# of Astrophyton muricatum individuals / 30 m2
<i>Atherinomorus stipes</i>	# of Atherinomorus stipes individuals / 30 m2
<i>Aulostomus maculatus</i>	# of Aulostomus maculatus individuals / 30 m2
<i>Balistes vetula</i>	# of Balistes vetula individuals / 30 m2
<i>Blenniidae spp.</i>	# of Blenniidae spp. (unidentified) individuals / 30 m2
<i>Bodianus rufus</i>	# of Bodianus rufus individuals / 30 m2
<i>Bothus lunatus</i>	# of Bothus lunatus individuals / 30 m2
<i>Calamus calamus</i>	# of Calamus calamus individuals / 30 m2
<i>Calamus pennatula</i>	# of Calamus pennatula individuals / 30 m2
<i>Calamus spp.</i>	# of Calamus spp. (unidentified) individuals / 30 m2
<i>Cantherhines macrocerus</i>	# of Cantherhines macrocerus individuals / 30 m2
<i>Cantherhines pullus</i>	# of Cantherhines pullus individuals / 30 m2
<i>Canthidermis sufflamen</i>	# of Canthidermis sufflamen individuals / 30 m2
<i>Canthigaster rostrata</i>	# of Canthigaster rostrata individuals / 30 m2
<i>Carangoides bartholomaei</i>	# of Carangoides bartholomaei individuals / 30 m2
<i>Caranx crysos</i>	# of Caranx crysos individuals / 30 m2
<i>Caranx hippos</i>	# of Caranx hippos individuals / 30 m2
<i>Caranx latus</i>	# of Caranx latus individuals / 30 m2
<i>Caranx lugubris</i>	# of Caranx lugubris individuals / 30 m2
<i>Caranx ruber</i>	# of Caranx ruber individuals / 30 m2
<i>Carcharhinus perezii</i>	# of Carcharhinus perezii individuals / 30 m2
<i>Carpilius corallinus</i>	# of Carpilius corallinus individuals / 30 m2
<i>Centropyge argi</i>	# of Centropyge argi individuals / 30 m2
<i>Cephalopholis cruentata</i>	# of Cephalopholis cruentata individuals / 30 m2
<i>Cephalopholis fulva</i>	# of Cephalopholis fulva individuals / 30 m2
<i>Chaenopsis ocellata</i>	# of Chaenopsis ocellata individuals / 30 m2
<i>Chaetodipterus faber</i>	# of Chaetodipterus faber individuals / 30 m2

<i>Chaetodon capistratus</i>	# of Chaetodon capistratus individuals / 30 m2
<i>Chaetodon ocellatus</i>	# of Chaetodon ocellatus individuals / 30 m2
<i>Chaetodon sedentarius</i>	# of Chaetodon sedentarius individuals / 30 m2
<i>Chaetodon striatus</i>	# of Chaetodon striatus individuals / 30 m2
<i>Chromis cyanea</i>	# of Chromis cyanea individuals / 30 m2
<i>Chromis insolata</i>	# of Chromis insolata individuals / 30 m2
<i>Chromis multilineata</i>	# of Chromis multilineata individuals / 30 m2
<i>Chromis spp.</i>	# of Chromis spp. (unidentified) individuals / 30 m2
<i>Ciphoma gibbosum</i>	# of Ciphoma gibbosum individuals / 30 m2
<i>Clepticus parrae</i>	# of Clepticus parrae individuals / 30 m2
<i>Coralliophila caribaea</i>	# of Coralliophila caribaea individuals / 30 m2
<i>Coralliophila spp.</i>	# of Coralliophila spp. (unidentified) individuals / 30 m2
<i>Coryphopterus glaucofraenum</i>	# of Coryphopterus glaucofraenum individuals / 30 m2
<i>Coryphopterus hyalinus</i>	# of Coryphopterus hyalinus individuals / 30 m2
<i>Coryphopterus lipernes</i>	# of Coryphopterus lipernes individuals / 30 m2
<i>Coryphopterus personatus</i>	# of Coryphopterus personatus individuals / 30 m2
<i>Coryphopterus spp.</i>	# of Coryphopterus spp. (unidentified) individuals / 30 m2
<i>Cosmocampus albirostris</i>	# of Cosmocampus albirostris individuals / 30 m2
<i>Cryptotomus roseus</i>	# of Cryptotomus roseus individuals / 30 m2
<i>Ctenogobius saepepallens</i>	# of Ctenogobius saepepallens individuals / 30 m2
<i>Ctenoides scaber</i>	# of Ctenoides scaber individuals / 30 m2
<i>Cyphoma gibbosum</i>	# of Cyphoma gibbosum individuals / 30 m2
<i>Dactyloscopus crossotus</i>	# of Dactyloscopus crossotus individuals / 30 m2
<i>Damithrax spinosissimus</i>	# of Damithrax spinosissimus individuals / 30 m2
<i>Decapterus macarellus</i>	# of Decapterus macarellus individuals / 30 m2
<i>Derilissus altifrons</i>	# of Derilissus altifrons individuals / 30 m2
<i>Diadema antillarum</i>	# of Diadema antillarum individuals / 30 m2
<i>Diodon holocanthus</i>	# of Diodon holocanthus individuals / 30 m2
<i>Diodon hystrix</i>	# of Diodon hystrix individuals / 30 m2
<i>Doratonotus megalepis</i>	# of Doratonotus megalepis individuals / 30 m2
<i>Echeneis naucrates</i>	# of Echeneis naucrates individuals / 30 m2
<i>Echinometra lucunter</i>	# of Echinometra lucunter individuals / 30 m2
<i>Echinometra spp.</i>	# of Echinometra spp. (unidentified) individuals / 30 m2
<i>Echinometra viridis</i>	# of Echinometra viridis individuals / 30 m2
<i>Elacatinus dilepis</i>	# of Elacatinus dilepis individuals / 30 m2
<i>Elacatinus evelynae</i>	# of Elacatinus evelynae individuals / 30 m2
<i>Elacatinus horsti</i>	# of Elacatinus horsti individuals / 30 m2
<i>Elacatinus saucrus</i>	# of Elacatinus saucrus individuals / 30 m2
<i>Enneanectes atrorus</i>	# of Enneanectes atrorus individuals / 30 m2
<i>Epinephelus adscensionis</i>	# of Epinephelus adscensionis individuals / 30 m2
<i>Epinephelus guttatus</i>	# of Epinephelus guttatus individuals / 30 m2

<i>Epinephelus spp.</i>	# of Epinephelus spp. (unidentified) individuals / 30 m2
<i>Epinephelus striatus</i>	# of Epinephelus striatus individuals / 30 m2
<i>Equetus lanceolatus</i>	# of Equetus lanceolatus individuals / 30 m2
<i>Equetus punctatus</i>	# of Equetus punctatus individuals / 30 m2
<i>Eucidaris tribuloides</i>	# of Eucidaris tribuloides individuals / 30 m2
<i>Galeocerdo cuvier</i>	# of Galeocerdo cuvier individuals / 30 m2
<i>Gastropoda spp.</i>	# of Gastropoda spp. (unidentified) individuals / 30 m2
<i>Gerres cinereus</i>	# of Gerres cinereus individuals / 30 m2
<i>Gillelus greyae</i>	# of Gillelus greyae individuals / 30 m2
<i>Ginglymostoma cirratum</i>	# of Ginglymostoma cirratum individuals / 30 m2
<i>Gnatholepis thompsoni</i>	# of Gnatholepis thompsoni individuals / 30 m2
<i>Gobiosoma spp.</i>	# of Gobiosoma spp. (unidentified) individuals / 30 m2
<i>Gonioplectrus hispanus</i>	# of Gonioplectrus hispanus individuals / 30 m2
<i>Gramma linki</i>	# of Gramma linki individuals / 30 m2
<i>Gramma loreto</i>	# of Gramma loreto individuals / 30 m2
<i>Grapsus spp.</i>	# of Grapsus spp. (unidentified) individuals / 30 m2
<i>Gymnothorax funebris</i>	# of Gymnothorax funebris individuals / 30 m2
<i>Gymnothorax miliaris</i>	# of Gymnothorax miliaris individuals / 30 m2
<i>Gymnothorax moringa</i>	# of Gymnothorax moringa individuals / 30 m2
<i>Gymnothorax spp.</i>	# of Gymnothorax spp. (unidentified) individuals / 30 m2
<i>Gymnothorax vicinus</i>	# of Gymnothorax vicinus individuals / 30 m2
<i>Haemulon album</i>	# of Haemulon album individuals / 30 m2
<i>Haemulon aurolineatum</i>	# of Haemulon aurolineatum individuals / 30 m2
<i>Haemulon carbonarium</i>	# of Haemulon carbonarium individuals / 30 m2
<i>Haemulon chrysargyreum</i>	# of Haemulon chrysargyreum individuals / 30 m2
<i>Haemulon flavolineatum</i>	# of Haemulon flavolineatum individuals / 30 m2
<i>Haemulon macrostomum</i>	# of Haemulon macrostomum individuals / 30 m2
<i>Haemulon melanurum</i>	# of Haemulon melanurum individuals / 30 m2
<i>Haemulon parra</i>	# of Haemulon parra individuals / 30 m2
<i>Haemulon plumierii</i>	# of Haemulon plumierii individuals / 30 m2
<i>Haemulon sciurus</i>	# of Haemulon sciurus individuals / 30 m2
<i>Haemulon spp.</i>	# of Haemulon spp. (unidentified) individuals / 30 m2
<i>Haemulon squamipinna</i>	# of Haemulon squamipinna individuals / 30 m2
<i>Haemulon vittatum</i>	# of Haemulon vittatum individuals / 30 m2
<i>Halichoeres bivittatus</i>	# of Halichoeres bivittatus individuals / 30 m2
<i>Halichoeres cyanocephalus</i>	# of Halichoeres cyanocephalus individuals / 30 m2
<i>Halichoeres garnoti</i>	# of Halichoeres garnoti individuals / 30 m2
<i>Halichoeres maculipinna</i>	# of Halichoeres maculipinna individuals / 30 m2
<i>Halichoeres poeyi</i>	# of Halichoeres poeyi individuals / 30 m2
<i>Halichoeres radiatus</i>	# of Halichoeres radiatus individuals / 30 m2
<i>Halichoeres spp.</i>	# of Halichoeres spp. (unidentified) individuals / 30 m2

<i>Hemiramphus brasiliensis</i>	# of Hemiramphus brasiliensis individuals / 30 m2
<i>Hermodice carunculata</i>	# of Hermodice carunculata individuals / 30 m2
<i>Heteropriacanthus cruentatus</i>	# of Heteropriacanthus cruentatus individuals / 30 m2
<i>Holacanthus bermudensis</i>	# of Holacanthus bermudensis individuals / 30 m2
<i>Holacanthus ciliaris</i>	# of Holacanthus ciliaris individuals / 30 m2
<i>Holacanthus tricolor</i>	# of Holacanthus tricolor individuals / 30 m2
<i>Holocentrus adscensionis</i>	# of Holocentrus adscensionis individuals / 30 m2
<i>Holocentrus rufus</i>	# of Holocentrus rufus individuals / 30 m2
<i>Holothuria (Halodeima) mexicana</i>	# of Holothuria (Halodeima) mexicana individuals / 30 m2
<i>Hypoleurochilus bermudensis</i>	# of Hypoleurochilus bermudensis individuals / 30 m2
<i>Hypoatherina harringtonensis</i>	# of Hypoatherina harringtonensis individuals / 30 m2
<i>Hypoplectrus aberrans</i>	# of Hypoplectrus aberrans individuals / 30 m2
<i>Hypoplectrus chlorurus</i>	# of Hypoplectrus chlorurus individuals / 30 m2
<i>Hypoplectrus gummigutta</i>	# of Hypoplectrus gummigutta individuals / 30 m2
<i>Hypoplectrus guttavarius</i>	# of Hypoplectrus guttavarius individuals / 30 m2
<i>Hypoplectrus indigo</i>	# of Hypoplectrus indigo individuals / 30 m2
<i>Hypoplectrus nigricans</i>	# of Hypoplectrus nigricans individuals / 30 m2
<i>Hypoplectrus puella</i>	# of Hypoplectrus puella individuals / 30 m2
<i>Hypoplectrus spp.</i>	# of Hypoplectrus spp. (unidentified) individuals / 30 m2
<i>Hypoplectrus unicolor</i>	# of Hypoplectrus unicolor individuals / 30 m2
<i>Hypsoblennius exstochilus</i>	# of Hypsoblennius exstochilus individuals / 30 m2
<i>Isostichopus badionotus</i>	# of Isostichopus badionotus individuals / 30 m2
<i>Jenkinsia lamprotaenia</i>	# of Jenkinsia lamprotaenia individuals / 30 m2
<i>Kaupichthys nuchalis</i>	# of Kaupichthys nuchalis individuals / 30 m2
<i>Kyphosus sectatrix</i>	# of Kyphosus sectatrix individuals / 30 m2
<i>Kyphosus spp.</i>	# of Kyphosus spp. (unidentified) individuals / 30 m2
<i>Labrisomus kalisherae</i>	# of Labrisomus kalisherae individuals / 30 m2
<i>Labrisomus spp.</i>	# of Labrisomus spp. (unidentified) individuals / 30 m2
<i>Lachnolaimus maximus</i>	# of Lachnolaimus maximus individuals / 30 m2
<i>Lactophrys bicaudalis</i>	# of Lactophrys bicaudalis individuals / 30 m2
<i>Lactophrys trigonus</i>	# of Lactophrys trigonus individuals / 30 m2
<i>Lactophrys triqueter</i>	# of Lactophrys triqueter individuals / 30 m2
<i>Liopropoma mowbrayi</i>	# of Liopropoma mowbrayi individuals / 30 m2
<i>Liopropoma rubre</i>	# of Liopropoma rubre individuals / 30 m2
<i>Liopropoma spp.</i>	# of Liopropoma spp. (unidentified) individuals / 30 m2
<i>Lipogramma regia</i>	# of Lipogramma regia individuals / 30 m2
<i>Lutjanus analis</i>	# of Lutjanus analis individuals / 30 m2
<i>Lutjanus apodus</i>	# of Lutjanus apodus individuals / 30 m2
<i>Lutjanus buccanella</i>	# of Lutjanus buccanella individuals / 30 m2
<i>Lutjanus cyanopterus</i>	# of Lutjanus cyanopterus individuals / 30 m2
<i>Lutjanus griseus</i>	# of Lutjanus griseus individuals / 30 m2

<i>Lutjanus jocu</i>	# of <i>Lutjanus jocu</i> individuals / 30 m2
<i>Lutjanus mahogoni</i>	# of <i>Lutjanus mahogoni</i> individuals / 30 m2
<i>Lutjanus synagris</i>	# of <i>Lutjanus synagris</i> individuals / 30 m2
<i>Lythrypnus crocodilus</i>	# of <i>Lythrypnus crocodilus</i> individuals / 30 m2
<i>Malacanthus plumieri</i>	# of <i>Malacanthus plumieri</i> individuals / 30 m2
<i>Malacoctenus gilli</i>	# of <i>Malacoctenus gilli</i> individuals / 30 m2
<i>Malacoctenus spp.</i>	# of <i>Malacoctenus spp.</i> (unidentified) individuals / 30 m2
<i>Malacoctenus triangulatus</i>	# of <i>Malacoctenus triangulatus</i> individuals / 30 m2
<i>Malacoctenus versicolor</i>	# of <i>Malacoctenus versicolor</i> individuals / 30 m2
<i>Melichthys niger</i>	# of <i>Melichthys niger</i> individuals / 30 m2
<i>Microspathodon chrysurus</i>	# of <i>Microspathodon chrysurus</i> individuals / 30 m2
<i>Monacanthus spp.</i>	# of <i>Monacanthus spp.</i> (unidentified) individuals / 30 m2
<i>Monacanthus tuckeri</i>	# of <i>Monacanthus tuckeri</i> individuals / 30 m2
<i>Mugil curema</i>	# of <i>Mugil curema</i> individuals / 30 m2
<i>Mulloidichthys martinicus</i>	# of <i>Mulloidichthys martinicus</i> individuals / 30 m2
<i>Muraena robusta</i>	# of <i>Muraena robusta</i> individuals / 30 m2
<i>Muraena spp.</i>	# of <i>Muraena spp.</i> (unidentified) individuals / 30 m2
<i>Mycteroperca interstitialis</i>	# of <i>Mycteroperca interstitialis</i> individuals / 30 m2
<i>Mycteroperca spp.</i>	# of <i>Mycteroperca spp.</i> (unidentified) individuals / 30 m2
<i>Mycteroperca tigris</i>	# of <i>Mycteroperca tigris</i> individuals / 30 m2
<i>Mycteroperca venenosa</i>	# of <i>Mycteroperca venenosa</i> individuals / 30 m2
<i>Myrichthys breviceps</i>	# of <i>Myrichthys breviceps</i> individuals / 30 m2
<i>Myrichthys ocellatus</i>	# of <i>Myrichthys ocellatus</i> individuals / 30 m2
<i>Myripristis jacobus</i>	# of <i>Myripristis jacobus</i> individuals / 30 m2
<i>Myrophis platyrhynchus</i>	# of <i>Myrophis platyrhynchus</i> individuals / 30 m2
<i>Neoniphon marianus</i>	# of <i>Neoniphon marianus</i> individuals / 30 m2
<i>Octopus vulgaris</i>	# of <i>Octopus vulgaris</i> individuals / 30 m2
<i>Ocyurus chrysurus</i>	# of <i>Ocyurus chrysurus</i> individuals / 30 m2
<i>Odontoscion dentex</i>	# of <i>Odontoscion dentex</i> individuals / 30 m2
<i>Ogilbia spp.</i>	# of <i>Ogilbia spp.</i> (unidentified) individuals / 30 m2
<i>Ophidion lagochila</i>	# of <i>Ophidion lagochila</i> individuals / 30 m2
<i>Ophioblennius atlanticus</i>	# of <i>Ophioblennius atlanticus</i> individuals / 30 m2
<i>Ophioblennius macclurei</i>	# of <i>Ophioblennius macclurei</i> individuals / 30 m2
<i>Ophioderma spp.</i>	# of <i>Ophioderma spp.</i> (unidentified) individuals / 30 m2
<i>Ophiothrix (Acanthophiothrix) suenoni</i>	# of <i>Ophiothrix (Acanthophiothrix) suenoni</i> individuals / 30 m2
<i>Paguristes spp.</i>	# of <i>Paguristes spp.</i> (unidentified) individuals / 30 m2
<i>Pagurus spp.</i>	# of <i>Pagurus spp.</i> (unidentified) individuals / 30 m2
<i>Panulirus argus</i>	# of <i>Panulirus argus</i> individuals / 30 m2
<i>Panulirus guttatus</i>	# of <i>Panulirus guttatus</i> individuals / 30 m2
<i>Paraclinus cingulatus</i>	# of <i>Paraclinus cingulatus</i> individuals / 30 m2

<i>Paraclinus fasciatus</i>	# of Paraclinus fasciatus individuals / 30 m2
<i>Paralabrax dewegeri</i>	# of Paralabrax dewegeri individuals / 30 m2
<i>Paranthias furcifer</i>	# of Paranthias furcifer individuals / 30 m2
<i>Pareques acuminatus</i>	# of Pareques acuminatus individuals / 30 m2
<i>Pempheris schomburgkii</i>	# of Pempheris schomburgkii individuals / 30 m2
<i>Pempheris spp.</i>	# of Pempheris spp. (unidentified) individuals / 30 m2
<i>Percnon gibbesi</i>	# of Percnon gibbesi individuals / 30 m2
<i>Periclimenes pedersoni</i>	# of Periclimenes pedersoni individuals / 30 m2
<i>Periclimenes spp.</i>	# of Periclimenes spp. (unidentified) individuals / 30 m2
<i>Phaeoptyx conklini</i>	# of Phaeoptyx conklini individuals / 30 m2
<i>Plectrypops retrospinis</i>	# of Plectrypops retrospinis individuals / 30 m2
<i>Polydactylus oligodon</i>	# of Polydactylus oligodon individuals / 30 m2
<i>Polydactylus virginicus</i>	# of Polydactylus virginicus individuals / 30 m2
<i>Pomacanthus arcuatus</i>	# of Pomacanthus arcuatus individuals / 30 m2
<i>Pomacanthus paru</i>	# of Pomacanthus paru individuals / 30 m2
<i>Priacanthus arenatus</i>	# of Priacanthus arenatus individuals / 30 m2
<i>Priacanthus spp.</i>	# of Priacanthus spp. (unidentified) individuals / 30 m2
<i>Priolepis hipoliti</i>	# of Priolepis hipoliti individuals / 30 m2
<i>Prognathodes aculeatus</i>	# of Prognathodes aculeatus individuals / 30 m2
<i>Prognathodes aya</i>	# of Prognathodes aya individuals / 30 m2
<i>Pseudupeneus maculatus</i>	# of Pseudupeneus maculatus individuals / 30 m2
<i>Psilotris celsa</i>	# of Psilotris celsa individuals / 30 m2
<i>Pteria columbus</i>	# of Pteria columbus individuals / 30 m2
<i>Pterois volitans</i>	# of Pterois volitans individuals / 30 m2
<i>Remora remora</i>	# of Remora remora individuals / 30 m2
<i>Rypticus saponaceus</i>	# of Rypticus saponaceus individuals / 30 m2
<i>Sargocentron coruscum</i>	# of Sargocentron coruscum individuals / 30 m2
<i>Sargocentron vexillarium</i>	# of Sargocentron vexillarium individuals / 30 m2
<i>Scartella cristata</i>	# of Scartella cristata individuals / 30 m2
<i>Scarus coelestinus</i>	# of Scarus coelestinus individuals / 30 m2
<i>Scarus coeruleus</i>	# of Scarus coeruleus individuals / 30 m2
<i>Scarus guacamaia</i>	# of Scarus guacamaia individuals / 30 m2
<i>Scarus iseri</i>	# of Scarus iseri individuals / 30 m2
<i>Scarus spp.</i>	# of Scarus spp. (unidentified) individuals / 30 m2
<i>Scarus taeniopterus</i>	# of Scarus taeniopterus individuals / 30 m2
<i>Scarus vetula</i>	# of Scarus vetula individuals / 30 m2
<i>Scomberomorus cavalla</i>	# of Scomberomorus cavalla individuals / 30 m2
<i>Scomberomorus regalis</i>	# of Scomberomorus regalis individuals / 30 m2
<i>Scorpaena plumieri</i>	# of Scorpaena plumieri individuals / 30 m2
<i>Scyllarides spp.</i>	# of Scyllarides spp. (unidentified) individuals / 30 m2
<i>Seriola rivoliana</i>	# of Seriola rivoliana individuals / 30 m2

<i>Serranus baldwini</i>	# of <i>Serranus baldwini</i> individuals / 30 m2
<i>Serranus spp.</i>	# of <i>Serranus spp.</i> (unidentified) individuals / 30 m2
<i>Serranus tabacarius</i>	# of <i>Serranus tabacarius</i> individuals / 30 m2
<i>Serranus tigrinus</i>	# of <i>Serranus tigrinus</i> individuals / 30 m2
<i>Sparisoma atomarium</i>	# of <i>Sparisoma atomarium</i> individuals / 30 m2
<i>Sparisoma aurofrenatum</i>	# of <i>Sparisoma aurofrenatum</i> individuals / 30 m2
<i>Sparisoma chrysopterum</i>	# of <i>Sparisoma chrysopterum</i> individuals / 30 m2
<i>Sparisoma radians</i>	# of <i>Sparisoma radians</i> individuals / 30 m2
<i>Sparisoma rubripinne</i>	# of <i>Sparisoma rubripinne</i> individuals / 30 m2
<i>Sparisoma spp.</i>	# of <i>Sparisoma spp.</i> (unidentified) individuals / 30 m2
<i>Sparisoma viride</i>	# of <i>Sparisoma viride</i> individuals / 30 m2
<i>Sphoeroides greeleyi</i>	# of <i>Sphoeroides greeleyi</i> individuals / 30 m2
<i>Sphoeroides spp.</i>	# of <i>Sphaeroides spp.</i> (unidentified) individuals / 30 m2
<i>Sphoeroides testudineus</i>	# of <i>Sphoeroides testudineus</i> individuals / 30 m2
<i>Sphyraena barracuda</i>	# of <i>Sphyraena barracuda</i> individuals / 30 m2
<i>Starksia smithvanizi</i>	# of <i>Starksia smithvanizi</i> individuals / 30 m2
<i>Stathmonotus tekla</i>	# of <i>Stathmonotus tekla</i> individuals / 30 m2
<i>Stegastes adustus</i>	# of <i>Stegastes adustus</i> individuals / 30 m2
<i>Stegastes diencaeus</i>	# of <i>Stegastes diencaeus</i> individuals / 30 m2
<i>Stegastes fuscus</i>	# of <i>Stegastes fuscus</i> individuals / 30 m2
<i>Stegastes leucostictus</i>	# of <i>Stegastes leucostictus</i> individuals / 30 m2
<i>Stegastes partitus</i>	# of <i>Stegastes partitus</i> individuals / 30 m2
<i>Stegastes planifrons</i>	# of <i>Stegastes planifrons</i> individuals / 30 m2
<i>Stegastes variabilis</i>	# of <i>Stegastes variabilis</i> individuals / 30 m2
<i>Stenopus hispidus</i>	# of <i>Stenopus hispidus</i> individuals / 30 m2
<i>Stenorhynchus seticornis</i>	# of <i>Stenorhynchus seticornis</i> individuals / 30 m2
<i>Stephanolepis hispidus</i>	# of <i>Stephanolepis hispidus</i> individuals / 30 m2
<i>Stephanolepis setifer</i>	# of <i>Stephanolepis setifer</i> individuals / 30 m2
<i>Stramonita rustica</i>	# of <i>Stramonita rustica</i> individuals / 30 m2
<i>Syngnathus spp.</i>	# of <i>Syngnathus spp.</i> (unidentified) individuals / 30 m2
<i>Synodus intermedius</i>	# of <i>Synodus intermedius</i> individuals / 30 m2
<i>Synodus saurus</i>	# of <i>Synodus saurus</i> individuals / 30 m2
<i>Synodus synodus</i>	# of <i>Synodus synodus</i> individuals / 30 m2
<i>Thalassoma bifasciatum</i>	# of <i>Thalassoma bifasciatum</i> individuals / 30 m2
<i>Tomicodon rupestris</i>	# of <i>Tomicodon rupestris</i> individuals / 30 m2
<i>Trachinotus goodei</i>	# of <i>Trachinotus goodei</i> individuals / 30 m2
<i>Tripneustes ventricosus</i>	# of <i>Tripneustes ventricosus</i> individuals / 30 m2
<i>Unidentified spp. (fish)</i>	# of <i>Unidentified spp. (fish)</i> individuals / 30 m2
<i>Urobatis jamaicensis</i>	# of <i>Urobatis jamaicensis</i> individuals / 30 m2
<i>Xanthichthys ringens</i>	# of <i>Xanthichthys ringens</i> individuals / 30 m2

Fish and Macroinvertebrate Size-Frequency Abundance

Fish and Macroinvertebrate Size-Frequency Abundance Data Description

This data file includes commercially, and ecologically important reef fish and macroinvertebrates counts per size class between 2004 - 2021. Between 2004 – 2013, these counts by size were annotated using the Active Search Census (ASEC) methodology, a time-sensitive visual fish census approach to target large elusive commercially important species for 30 minutes per monitoring station.. In 2015, the methodology was shifted from ASEC to an extended fish and macroinvertebrate abundance band transect. The data units between 2004 - 2013 are number (#) of individuals / 30 mins per site (collected using the Active Search Census - ASEC), and from 2015 - present are number (#) of individuals / 60 m². This data file includes blank cells, representing species not considered during the survey and transects or stations not completed. Each data label represents the scientific name of the species followed by a code identifying its size class interval.

For data collection field methodologies see the Field Methodology of the Puerto Rico Coral Reef Monitoring Program (PRCRMP).

Size class intervals and the size class size median in this data file are the following:

Classes	Size (cm)	*Median (cm)
c1	1-5	3
c2	6-10	8
c3	11-15	13
c4	16-20	18
c5	21-25	23
c6	26-30	28
c7	31-35	33
c8	36-40	38
c9	41-45	43
c10	46-50	48
c11	51-55	53
c12	56-60	58
c13	61-65	63
c14	66-70	68
c15	71-75	73
c16	76-80	78
c17	81-85	83
c18	86-90	88
c19	91-95	93
c20	96-100	98
c21	101-105	103

c22	106-110	108
c23	111-115	113
c24	116-120	118
c25	121-125	123
c30	146-150	148
c31	151-155	153
c32	156-160	158
c33	161-165	163
c34	166-170	168
c35	171-175	173
c36	176-180	178
c41	201-205	203

*The size class median was used as the length value to estimate fish biomass using fishbase.org tools (see [fish biomass data description](#)).

Fish Biomass

Fish Biomass Data Description:

This data file includes commercially, and ecologically important reef fish biomass estimates between 2004 - 2021. Between 2004 - 2013 these estimates are based on size-frequency data annotated using the Active Search Census (ASEC) for 30 minutes per monitoring station and from 2015 – present estimates are based on five 60 m² band transects per station. The current (2015 - present) biomass data units are in grams per 60 meters squared (gr / 60 m²), while previous data (2004-2013) units are in grams per 30 minutes per site. Data is presented per transect between 2015-present.

Biomass estimates were calculated using weight-length relationship coefficients and biomass calculator tools available in [Fishbase.org](#). Fish species with no weight-length relationship information are not included in the biomass data file. The coefficients from fishbase.org used to obtain biomass estimates are those developed from fish samples geographically related to Puerto Rico, when available. The length values used [either as total length or fork length] to calculate the biomass of each species size class was the median size of the size class. First the estimated biomass of one individual of each species size class was calculated. Then, each individual biomass estimate was multiplied by the number of individuals observed per transect. Lastly, all biomass estimates per species size class are aggregated to report one biomass value per species. This data file includes blank cells, representing species not considered during the survey and transects or stations not completed.

For data collection field methodologies see the Field Methodology of the Puerto Rico Coral Reef Monitoring Program (PRCRMP).

Fish Biomass Data Label Definitions:

<i>Acanthurus tractus (bahianus)</i>	grams of Acanthurus tractus and/or bahianus
<i>Acanthurus chirurgus</i>	grams of Acanthurus chirurgus
<i>Acanthurus coeruleus</i>	grams of Acanthurus coeruleus
<i>Aetobatus narinari</i>	grams of Aetobatus narinari
<i>Alectis ciliaris</i>	grams of Alectis ciliaris
<i>Balistes vetula</i>	grams of Balistes vetula
<i>Calamus pennatula</i>	grams of Calamus pennatula
<i>Canthidermis sufflamen</i>	grams of Canthidermis sufflamen
<i>Caranx crysos</i>	grams of Caranx crysos
<i>Caranx hippos</i>	grams of Caranx hippos
<i>Caranx latus</i>	grams of Caranx latus
<i>Caranx lugubris</i>	grams of Caranx lugubris
<i>Caranx ruber</i>	grams of Caranx ruber
<i>Carcharhinus limbatus</i>	grams of Carcharhinus limbatus
<i>Carcharhinus perezii</i>	grams of Carcharhinus perezii
<i>Cephalopholis cruentata</i>	grams of Cephalopholis cruentata
<i>Cephalopholis fulva</i>	grams of Cephalopholis fulva
<i>Chaetodon ocellatus</i>	grams of Chaetodon ocellatus
<i>Chaetodon sedentarius</i>	grams of Chaetodon sedentarius
<i>Chaetodon striatus</i>	grams of Chaetodon striatus
<i>Decapterus macarellus</i>	grams of Decapterus macarellus
<i>Elagatis bipinnulata</i>	grams of Elagatis bipinnulata
<i>Epinephelus adscensionis</i>	grams of Epinephelus adscensionis
<i>Epinephelus guttatus</i>	grams of Epinephelus guttatus
<i>Epinephelus itajara</i>	grams of Epinephelus itajara
<i>Epinephelus striatus</i>	grams of Epinephelus striatus
<i>Gerres cinereus</i>	grams of Gerres cinereus
<i>Ginglymostoma cirratum</i>	grams of Ginglymostoma cirratum
<i>Gymnothorax moringa</i>	grams of Gymnothorax moringa
<i>Haemulon plumierii</i>	grams of Haemulon plumierii
<i>Holacanthus ciliaris</i>	grams of Holacanthus ciliaris
<i>Holacanthus tricolor</i>	grams of Holacanthus tricolor
<i>Hypanus americanus</i>	grams of Hypanus americanus
<i>Istiophorus albicans</i>	grams of Istiophorus albicans
<i>Lachnolaimus maximus</i>	grams of Lachnolaimus maximus
<i>Lactophrys trigonus</i>	grams of Lactophrys trigonus
<i>Lactophrys triqueter</i>	grams of Lactophrys triqueter
<i>Lutjanus analis</i>	grams of Lutjanus analis
<i>Lutjanus apodus</i>	grams of Lutjanus apodus
<i>Lutjanus cyanopterus</i>	grams of Lutjanus cyanopterus
<i>Lutjanus griseus</i>	grams of Lutjanus griseus

<i>Lutjanus jocu</i>	grams of <i>Lutjanus jocu</i>
<i>Lutjanus mahogoni</i>	grams of <i>Lutjanus mahogoni</i>
<i>Lutjanus synagris</i>	grams of <i>Lutjanus synagris</i>
<i>Microspathodon chrysurus</i>	grams of <i>Microspathodon chrysurus</i>
<i>Mycteroperca interstitialis</i>	grams of <i>Mycteroperca interstitialis</i>
<i>Mycteroperca tigris</i>	grams of <i>Mycteroperca tigris</i>
<i>Mycteroperca venenosa</i>	grams of <i>Mycteroperca venenosa</i>
<i>Negaprion brevirostris</i>	grams of <i>Negaprion brevirostris</i>
<i>Ocyurus chrysurus</i>	grams of <i>Ocyurus chrysurus</i>
<i>Pomacanthus paru</i>	grams of <i>Pomacanthus paru</i>
<i>Pterois spp.</i>	grams of <i>Pterois spp.</i>
<i>Scarus coelestinus</i>	grams of <i>Scarus coelestinus</i>
<i>Scarus iseri</i>	grams of <i>Scarus iseri</i>
<i>Scarus taeniopterus</i>	grams of <i>Scarus taeniopterus</i>
<i>Scomberomorus regalis</i>	grams of <i>Scomberomorus regalis</i>
<i>Seriola rivoliana</i>	grams of <i>Seriola rivoliana</i>
<i>Sparisoma aurofrenatum</i>	grams of <i>Sparisoma aurofrenatum</i>
<i>Sparisoma chrysopteron</i>	grams of <i>Sparisoma chrysopteron</i>
<i>Sparisoma radians</i>	grams of <i>Sparisoma radians</i>
<i>Sparisoma rubripinne</i>	grams of <i>Sparisoma rubripinne</i>
<i>Sparisoma viride</i>	grams of <i>Sparisoma viride</i>
<i>Sphyraena barracuda</i>	grams of <i>Sphyraena barracuda</i>
<i>Trachinotus falcatus</i>	grams of <i>Trachinotus falcatus</i>

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