

Data Dictionary Information

Reports Page –

Fish Surveys

Region

Parguera, Puerto Rico
Vieques, Puerto Rico
Virgin Islands, St. Croix
Virgin Islands, St. John

Year

Parguera, PR (2000-present)
Vieques, PR (2007)
St. Croix, USVI (2001-present)
St. John, USVI (2001-present)

Month (varies by year)

January	August
February	September
March	October
May	December
June	

Structure

Hard
Soft
Mangrove (Parg, PR only)

Permanent/Random

Permanent
Random
Random-Permanent

Management

PR
PR other
STC
STC other
STJ BUIS
EEMP

STJ Other
VIIS
VICR
VICR CBI Study
VICR CBI Study – STJ Other
VICR CBO Study
VICR CBO Study – STJ Other
VICR MSRI Study
VICR MSRO Study

Trophic Level

D	P
H	SI
MI	Z

Species

Fish species

Full-Scale Habitat Surveys

Region (same as fish plus one more)
Flower Garden Banks

Year (same as fish)
Flower Garden Banks (2006-2007)

Month (same as fish)
September (FGB)

Structure (same as fish)

Permanent/Random (same as fish)

Management (same as fish)

Cover Type
Abiotic
Biotic

Cover Group

Algae	Other Invertebrates
Cyanobacteria	Seagrassses
Hard Corals	Soft Corals
Hydroids	Sponges
Mangroves	

Cover Code

To Genus ONLY

RHA (Rapid Habitat Assessment) Surveys

Region

Virgin Islands, St. Croix
Virgin Islands, St. John

Year

STC (2004)
STJ (2002-present)

Month

February (STC and STJ)
July (STJ only)

Structure – HARDBOTTOM only

Permanent/Random (same as fish)

Management

STC	
BUIS	
STJ	
VICR CBI Study	VICR CBI Study – STJ Other
VICR CBO Study	VICR CBO Study – STJ Other
VICR MSRI Study	VICR MSRO Study

Macroinvertebrate Surveys (Subset of Habitat Surveys)

Region (same as habitat)

Year (same as fish)

Flower Garden Banks (2006-2007)

Month (same as fish)

September (FGB)

Structure (same as fish)

Permanent/Random (same as fish)

Management (same as fish)

Query Specific Data Elements – Column Data

Fish

batch_code
survey_index
station_code
survey_date
survey_time
latitude
longitude
habitat_structure
permanent_random
management
species_code
scientific_name
trophic
richness
diversity
abundance
biomass
total_biomass
size_ranges
0
0-5
5-10
10-15
15-20
20-25
25-30
30-35
35 +

RHA Habitat

region
batch_code
survey_index
habitat_structure
permanent_random
management
survey_date
survey_time
latitude
longitude
maxDepth
minDepth
rugosity
hard
sand
rubble
coral
gorgonian
sponge
algae

Full-Scale Habitat

batch_code
survey_index
station_code
survey_date
survey_time
latitude longitude
habitat_structure
permanent_random
management
reef
cover_type
species_group
cover_code
morphotype
species_name
percent_cover
diseased_cover
bleached_cover
height
min_height
max_height
height_variance
individuals
min_individuals
max_individuals
sm_holes
lg_holes
quad_depth
min_depth
max_depth
depth_variance
mean_rugosity

Macro Invertebrate

region
survey_year
batch_code
survey_index
latitude
longitude
survey_date
survey_time
habitat_structure
permanent_random
management
common_name
species_name
immature
mature
total

Dictionary of Terms

abundance – a sum of the total count of fish for a given species at a given site regardless of size; the abundance value is a single value grouped by species, site and batch code

batch_code – an alphanumeric code that identifies the region, month and year of each mission: mm00-yy00

Example: October 2007 = 1000-0700

biomass – biomass values are grouped by site, species and size and then summed. Thus, each individual fish size column will have a separate biomass value for each species seen, and sum column giving the total biomass for that species at that site

- Biomass is calculated using the following formula: $\sum(a_{lw} * \text{average fish_size} \wedge b_{lw})$. The constants a_{lw} and b_{lw} are taken from <http://www.fishbase.org>
- In the biomass query, the average size of animals within a size range is the midpoint of that interval. For example, animals within the 5-10 cm range have an average size of 7.5 cm, while animals within the 10-15 cm range average 12.5 cm. There are two exceptions to the aforementioned methodology. First, because animals <1 cm are typically not observed, the average size of the 0-5 cm range is designated as 3 cm, or the midpoint of 1-5 cm. Secondly, when an animal >35 cm is recorded, no size approximations are made. Rather, the singular recorded size value is incorporated into the biomass calculation.
- A size column of zero is in place to account for surveys in which no fish were seen and therefore the average size for the species is used for the biomass calculation

bleached_cover – the percentage of bleached coral estimated to the nearest 0.1 percent

cover_code – see *species_code*

***For abiotic data the cover code is the type of substrate: hard, rubble, sand, fine sediment*

cover_type – type of substrate cover: abiotic or biotic

abiotic – sand, rubble, hard bottom, and fine sediments. Rubble refers to rocks and coral fragments that are moveable; immovable rocks are considered hard bottom

biotic – algae, seagrass, live corals, sponges, gorgonians, and other biota (tunicates, anemones, zooanthids, and hydroids)

depth_variance – depth value reported as an average of 5 quadrat measurements

diseased_cover – refers to coral skeleton that has recently lost living tissue because of disease or damage that is still visible, and has not yet been colonized by turf algae. Recorded to the nearest 0.1 percent

diversity – value reported is Shannon Diversity, calculated using the following formula: $r = \sum(\pi_i * \log \pi_i)$. π_i is the total number of fish of a given species in a site divided by the total number of fish in that same site; the diversity value is a single value grouped by site and batch code

Family – taxonomic family of fish species

genus_name – taxonomic genus of fish species

habitat_structure – the structure of a specific station: hard, soft or mangrove

height – a measurement (recorded in cm) of the height of the hardbottom from the substrate to get a sense of bottom relief

height_variance – hardbottom height value reported as an average of 5 quadrat measurements

immature - Immaturity of conch species as determined by the absence of a flared lip. This term references conch only

individuals – for sponges, gorgonians and "other" biota type (non-encrusting anemones and non-encrusting hydroids) the number of individuals at the quadrat level is recorded

latitude – The latitude of a station recorded in decimal degrees. Precise to 5 decimal places.

lg_holes – the number of holes greater than 15cm in the largest dimension. Hole-width or length is visually estimated. The number of large holes are reported as an average of 5 quadrat measurements.

longitude – The longitude of a station recorded in decimal degrees. Precise to 5 decimal places.

management – based on jurisdiction at locations sites were sampled and type of benthic habitat composition information collected. Acronyms consisting of CBI/CBO or MSRI/MSRO indicate these sites were surveyed specifically to evaluate the differences between inside and outside the monument

Puerto Rico:

PR OTHER – sites do not fall within fishery management zones

St. Croix:

BUIS – sites sampled fall under the jurisdiction of Buck Island Reef National Monument

EEMP – sites sampled fall under the jurisdiction of the East End Marine Park

STC OTHER – sites do not fall within fishery management zones

St. John:

STJ OTHER – sites do not fall within fishery management zones

VICR – sites sampled fall under the jurisdiction of the Virgin Island Coral Reef National Monument where full- scale habitat data was collected.

VICR CBI – sites sampled fall under the jurisdiction of the Virgin Island Coral Reef National Monument inside Coral Bay where Rapid Habitat Assessment data was collected. These sites were surveyed specifically to evaluate the differences between inside and outside the monument.

VICR CBI-STJ OTHER – sites sampled fall under the jurisdiction of the Virgin Island Coral Reef National Monument inside Coral Bay where Rapid Habitat Assessment **AND** full-scale data were collected

VICR CBO – sites located outside of the Virgin Island Coral Reef Monument jurisdiction but inside Coral Bay where Rapid Habitat Assessment data was collected. These sites were surveyed specifically to evaluate the differences between inside and outside the monument.

VICR CBO-STJ OTHER – sites sampled fall under the jurisdiction of the Virgin Island Coral Reef National Monument along the Mid-Shelf Reef where Rapid Habitat Assessment data **AND** full-scale data were collected.

VICR MSRI – sites sampled fall under the jurisdiction of the Virgin Island Coral Reef National Monument along the Mid-Shelf Reef where Rapid Habitat Assessment data was collected. These sites were surveyed specifically to evaluate the differences between inside and outside the monument.

VICR MSRO – sites located outside of the Virgin Island Coral Reef Monument jurisdiction but along the Mid-Shelf Reef where Rapid Habitat Assessment data was collected. These sites were surveyed specifically to evaluate the differences between inside and outside the monument.

VIIS – sites sampled fall under the jurisdiction of the Virgin Island National Park

mature – Maturity of conch species as determined by the presence of a flared lip. This term references conch only.

max_depth – maximum depth recorded out of 5 quadrat measurements at site

max_height – maximum canopy height recorded out of 5 quadrat measurements at site

max_individuals – minimum number of individuals recorded out of 5 quadrat measurements at site

maxDepth* – the maximum depth at that site

mean_rugosity – a mean of two rugosity values measured by placing a 6-m chain at two randomly selected positions along the 25m belt transect. The chain is placed such that it follows the substrate's relief along the centerline of the belt transect.

min_depth – minimum depth recorded out of 5 quadrat measurements at site

min_height – minimum canopy height recorded out of 5 quadrat measurements at site

min_individuals – minimum number of individuals recorded out of 5 quadrat measurements at site

minDepth* – the minimum depth at that site

morphotype – grouping of like forms within each *cover_group*

algae – red, brown, green

cyanobacteria – filamentous/cyanobacteria

hard corals – brain, branching/pillar, encrusting/mound/boulder, fleshy, flower/cup, leaf/plate/sheet

hydroids – fire coral, hydroids

mangroves – flowering plant

other invertebrates – sea anemone, tunicate, sea urchin, lobster, snail/nudibranch, zooanthids

seagrasses – flowering plant

soft corals – black coral, encrusting gorgonian, sea fan, sea plume/rod/whip/etc.

sponges – barrel/tube/vase/etc., encrusting

percent_cover – as the percent cover (to the nearest 0.1 percent) of living algae, seagrass, live corals, sponges, gorgonians, and other biota (tunicates, anemones, zooanthids and hydroids) within a 1m² quadrat

permanent_random – a label each site is assigned based on how the site was selected and sampled. A small subset of sites were resampled during some of the missions through June 2002 in Puerto Rico and October 2002 in St. Croix. These stations were randomly selected then resampled at later dates.

random – a randomly selected site

permanent – a site that was previously sampled (pre-existing survey site – resampled)

random-permanent – the first time a site was sampled that later became a permanent site was given this label

reef – on seagrass and sand sites, the habitat diver records the absence or presence of reef or hard structure within 3m of the belt transect. A score of zero (0) indicates that no reef or other hard structure is present; one (1) indicates that a reef or hard structure smaller than 4m² is present; and (2) indicates that a reef or hard structure larger than 4m² is present within 3m of the diver.

quad_depth – the depth at each quadrat position. Depth is measured to the nearest 1ft

region – location of mission

GULF-FGBS – Flower Garden Banks National Marine Sanctuary

PUER-PARG – La Parguera region, southwest Puerto Rico

PUER-VIEQ – Vieques, Puerto Rico

VIRG-ST C – Buck Island and East End Marine Park region of St. Croix, USVI

VIRG-ST J – Mid-shelf reef and entire area around St. John, USVI

RHA – Rapid Habitat Assessment; type of habitat survey modified from a detailed (microscale) habitat assessment used to characterize nearshore habitats. The RHA survey has the advantage of reducing bottom time at greater depths (i.e., sites below 80 ft) and provides a general habitat assessment of the survey site.

richness – a count of the total number of unique species in a given site; the richness value is a single value grouped by site and batch code

rugosity* – based on the height of the tallest hardbottom structure: low (1), medium (2), high (3)

scientific_name – taxonomic species name of fish created from the genus and species of fish

size_ranges – the number of individuals per species is tallied in 5cm size class increments up to 35cm using visual estimation of fork length. If an individual is greater than 35cm, then an estimate of the actual fork length is recorded. All fish sizes less than 35cm are displayed as ranges. Hence, a fish that is approximately 18 cm in length will be counted as 15–20cm. All ranges increase in increments of 5cm. Prior to 2002, divers were instructed to exclusively record count for fish greater than 35cm. Therefore, the sizes of fish observed over this duration have been input as 0. However, a small proportion of entries prior to 2002 include size values concurrently with fish counts. Beginning in 2002, divers were directed to record both size and count for fish

greater than 35cm. However, a few select instances exist after 2002 where only fish count was recorded. Thus, in accordance with the pre-2002 methodology, a size value of 0 has been entered for these cases.

sm_holes – the number of holes smaller than 15cm in the largest dimension. Hole-width or length is visually estimated. The number of small holes are reported as an average of 5 quadrat measurements.

species_code – four letter codes are used that consist of the first two letters of the genus name followed by the first two letters of the species name. In the rare case that two species have the same four-letter code, a fifth letter is added to the code. This will be the first letter that differs between the organisms' species names. If the fish can only be identified to the family or genus level then this is all that is recorded. If the fish cannot be identified to the family level then no entry is necessary.

species_group – the hierarchical grouping of species in the same class or order

- algae – includes macroalgae, crustose algae, filamentous and turf algae
- cyanobacteria – includes blue-green algae
- hard corals – all scleractinian corals
- hydroids – includes hydroids and fire coral
- mangroves – includes mangrove prop roots and leaves
- other invertebrates – includes anemones, tunicates, zooanthids
- seagrasses – includes aquatic/marine flowering plants
- soft corals – encrusting and upright/erect forms (i.e. sea fans/plumes/rods/whips)
- sponges – includes encrusting and upright/erect forms (i.e. barrel/tube/rope/vase)

species_name – see *scientific_name*

station_code – an alphanumeric code describing each specific station done within a mission. Certain stations containing the prefixes MSR or CB have different types of habitat data associated with them.

survey_date – the date in which a specific survey is done formatted as mm/dd/yyyy

survey_index – a numerical index that uniquely identifies each specific station done within a mission

survey_time – the specific time of a dive formatted in military time

total_biomass – the sum of all the columns of biomass values for each species

trophic – trophic group of fish derived from <http://www.fishbase.org> and/or Randall (1965) and indicated by trophic codes based on majority in species diet. If more than one food type accounts for majority of diet then multiple codes are used.

- P – Main diet consists of fish (piscivorous)
- H – Main diet consists of algae, seagrasses, organic detritus, etc.
- SI – Main diet consists of sessile invertebrates
- MI – Main diet consists of mobile invertebrates
- Z – Main diet consists of plankton such as phytoplankton and/or zooplankton

* indicates data reported only for RHA queries

Randall, J.E., 1967. Food habits of reef fishes of the West Indies. Stud. Trop. Oceanogr. Miami 5: 665-847.

Froese, R. and D. Pauly. Editors. 2007. FishBase. World Wide Web electronic publication. www.fishbase.org, version (12/2007).

