

## 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  
BUIS  
EEMP  
STJ  
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	Seagrasses
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:  $r = \sum(pi * \log pi)$ .  $pi$  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 1m<sup>2</sup> 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 4m<sup>2</sup> is present; and (2) indicates that a reef or hard structure larger than 4m<sup>2</sup> 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](http://www.fishbase.org), version (12/2007).

