

Identification_Information:

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Originator: National Oceanic and Atmospheric Association (NOAA)/National Ocean Service (NOS)/National Centers for Coastal Ocean Science (NCCOS)/Center for Coastal Monitoring and Assessment (CCMA)/Biogeography Branch

Publication_Date: 20121114

Title: Characterization of reef fish populations and benthic habitats within St. Thomas East End Reserve (STEER), USVI

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Description:

Abstract:

NCCOS' Center for Coastal Monitoring and Assessment (CCMA) is working closely with a number of divisions in the USVI DPNR (e.g., Divisions of Fish and Wildlife and Coastal Zone Management), the University of the Virgin Islands (UVI), and The Nature Conservancy (TNC) to develop the baseline characterization of chemical contamination, toxicity, and the marine resources in the St. Thomas East End Reserve (STEER) in St. Thomas, USVI. The STEER contains extensive mangroves, seagrass beds and coral reefs. Within the watershed, however, are a large active landfill, numerous marinas, various commercial/industrial activities, an EPA Superfund Site, resorts, and several residential areas served by individual septic systems. This baseline assessment will provide managers with critical information needed to help preserve and restore habitats, including a number of nursery areas within the STEER that are important to commercial and recreational fisheries. As part of the characterization, a field survey was conducted in June 2012 to conduct a biological assessment of fish communities and benthic habitats within the STEER and at select hardbottom locations adjacent to STEER.

The basis for this work was the nearshore benthic habitats maps (less than 100 ft depth) created by NOAA's Biogeography Program in 2001 and NOS' bathymetry models. Using ArcView GIS software, the digitized habitat maps were stratified to select sampling stations. Sites were randomly selected within strata to ensure coverage of the entire study region. The habitat stratification was divided into three major habitat types: hardbottom which includes reef, pavement, etc. inside STEER; softbottom which consists of sand and seagrass, and mangrove. In addition, two hardbottom areas outside STEER of interest to STEER's Core Team were included as a separate stratum. Using standardized protocols of NOAA's Coral Reef Ecosystem Monitoring Project, the fish and benthic habitat survey was conducted by two scientific divers. During each dive one diver quantified the species and size of fish within a 25 x 4 m transect while a second diver characterized the habitat and invertebrate community.

Purpose: Conduct biological assessment to characterize fish communities and benthic habitats within the STEER and at select hardbottom locations adjacent to STEER.

Supplemental_Information: This work is being conducted in collaboration with the Virgin Islands Department of Planning and Natural Resources, The Nature Conservancy and the University of the Virgin Islands.

Time_Period_of_Content:

Time_Period_Information:

Range_of_Dates/Times:

Beginning_Date: 20120612

Ending_Date: 20120622

Currentness_Reference: Ground Condition

Status:

Progress: Complete

Maintenance_and_Update_Frequency: one time only

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -64.883

East_Bounding_Coordinate: -64.818

North_Bounding_Coordinate: 18.326

South_Bounding_Coordinate: 18.295

Keywords:

Theme:

Theme_Keyword_Thesaurus: NOS Data Explorer Topic Category

Theme_Keyword: Environmental Monitoring

Theme:

Theme_Keyword_Thesaurus: CoRIS Discovery Thesaurus

Theme_Keyword: Numeric Data Sets > Benthic

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Category

Theme_Keyword: biota

Theme_Keyword: 002

Theme_Keyword: environment

Theme_Keyword: 007

Theme_Keyword: oceans

Theme_Keyword: 014

Theme:

Theme_Keyword_Thesaurus: CoRIS Theme Thesaurus

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Baseline studies

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Benthos analysis

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Benthos analysis > Transect monitoring

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Benthos analysis > Transect monitoring > Belt transect

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Benthos analysis > Quadrat monitoring

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Benthos analysis > Quadrat monitoring > In situ

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Rapid assessment studies

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > In situ biological

Theme_Keyword: EARTH SCIENCE > Oceans > Marine Biology > Marine Invertebrates > Census > Population density

Theme_Keyword: EARTH SCIENCE > Oceans > Marine Biology > Marine Invertebrates > Macroinvertebrates

Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Algal cover

Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Calcareous macroalgae

Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Coralline algae

Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Crustose coralline algae

Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Encrusting macroalgae

Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Fleshy macroalgae

Theme_Keyword: EARTH SCIENCE > Biosphere > Vegetation > Algae > Turf algae

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Biodiversity

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Coral cover

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Hard coral cover

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Hard coral cover Live percentage

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Hard coral cover Dead percentage

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Octocoral cover

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Rugosity

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Biodiversity

Theme_Keyword: EARTH SCIENCE > Oceans > Coastal Processes > Coral Reefs > Coral Reef Ecology > Habitats

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Coral Diseases

Theme_Keyword: EARTH SCIENCE > Biosphere > Aquatic Habitat > Reef Habitat > Description

Theme_Keyword: EARTH SCIENCE > Biosphere > Aquatic Habitat > Benthic Habitat

Theme_Keyword: EARTH SCIENCE > Oceans > Marine Biology > Marine Plants > Seagrass

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Coral Diseases > Bleaching

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Damage assessment > visual

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Corals > Reef monitoring and assessment > Damage assessment > photographic

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Sponges

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Sponges > Boring

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Sponges > Encrusting

Theme_Keyword: EARTH SCIENCE > Biosphere > Zoology > Sponges > Erect

Place:

Place_Keyword_Thesaurus: CoRIS Place Thesaurus

Place_Keyword: COUNTRY/TERRITORY > United States of America > US Virgin Islands > St. Thomas > St. Thomas (18N064W0033)

Place_Keyword: OCEAN BASIN > Atlantic Ocean > Caribbean Sea > Virgin Islands > Virgin Islands > St. Thomas

Access_Constraints: None

Use_Constraints: Please reference NOAA/NOS/NCCOS/CCMA/Biogeography Branch when utilizing these data in a report or peer reviewed publication. Additionally, knowledge of how this dataset has been of use and which organizations are utilizing it is of great benefit for ensuring this information continues to meet the needs of the management and research communities. Therefore, it is requested but not mandatory, that any user of this data supply this information to the Project Manager: Laurie Bauer (laurie.bauer@noaa.gov).

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: NOAA/NOS/NCCOS/CCMA/Biogeography Branch

Contact_Position: Contact_Position: Characterization of St. Thomas East End Reserve (STEER), USVI, Project Manager

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Address_Type: Mailing and Physical Address

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Hours_of_Service: 9:00 - 5:00

Data_Set_Credit: This is a cooperative effort between NOAA's Biogeography and COAST Branches, the National Park Service and the Virgin Islands Department of Planning and Natural Resources, The Nature Conservancy and the University of the Virgin Islands.

Data_Quality_Information:

Logical_Consistency_Report: Not applicable

Completeness_Report: This data consists of multiple fish community surveys across the St. Thomas East End Reserve (STEER), USVI. Sites were randomly selected and stratified across by habitat types using NOAA's benthic habitat maps of St. Thomas.

Lineage:

Process_Step:

Process_Description:

Once on site, divers are deployed and maintain contact with each other throughout the entire census. One diver is responsible for collecting data on the benthic composition. The habitat diver follows the belt-transect diver and records data on small-scale benthic habitat composition and structure along the 25m transect. The habitat diver places a 1m² quadrat divided into 100 (10 x 10cm) smaller squares (1 square equals 1 percent cover) at five separate positions. Each position is randomly chosen before entering the water such that there is one random point within every 5m interval along the transect. Percent cover is obtained as if looking at the quadrat in a two dimensional plane (i.e. a photograph) vs. three dimensions where percent cover could add up to greater than 100%.

Data are collected on the following:

1) Logistic information - diver name, dive buddy, date, time of survey, site code, and meter numbers at which the quadrat is placed.

2) Habitat structure - to characterize the benthic habitats of the dive site, the habitat diver first categorizes the habitat structure of the site: hard, soft or mangrove.

3) Proximity of structure - 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. The point-count diver also uses this scoring system to record the absence, presence, and proximity of reef or hard structures within their cylinder.

4) Transect depth profile - the depth at each quadrat position. Depth is measured with a digital depth gauge to the nearest 1ft.

5) Abiotic footprint - defined as the percent cover (to the nearest 1 percent) of sand, rubble, hard bottom, and fine sediments within each quadrat position. Rubble refers to rocks and coral fragments that are moveable; immovable rocks are considered hard bottom. The percent cover given as a part of the abiotic footprint should total 100 percent. In a seagrass area for example, despite the fact that seagrass may provide 50 percent cover, the underlying substrate is 100 percent sand so this is what is recorded. To estimate percent cover, the habitat diver first positions the quadrat at the chosen meter mark along one side of the transect tape, alternating sides of the transect for subsequent quadrats. Next, the habitat diver lays the quadrat along the substrate (regardless of the slope) and estimates percent cover based on a two-dimensional (planar) view (e.g. if bottom is sloping, the quadrat is not held horizontally). Also, the diver should try to use the same planar view for all estimates of percent cover. The habitat diver then estimates, for each quadrat, the height (in cm) of the hardbottom from the substrate to get a sense of bottom relief. Note: Height is collected for all hardbottom substrates, excluding rubble; height is not collected for softbottom substrate.

6) Biotic footprint - defined as the percent cover (to the nearest 0.1 percent) of algae, seagrass, live corals, sponges, gorgonians, and other biota (tunicates, anemones, zooanthids, and

hydroids) within each quadrat position. The remaining cover is recorded as bare substrate to bring the total to 100 percent. Again, the diver must use a planar view to estimate percent cover of the biota. Seagrasses and gorgonians should not be stacked upright. For example, if a single seagrass blade crosses 10 squares, then total seagrass coverage should be the sum of the area taken up by that blade in all 10 squares instead of the area covered if the blade was held upright. Species covering less than 0.1 percent of the area are not recorded. Taxa are identified to the following levels: stony coral-species, algae-morphological group (macro, turf, crustose, rhodolith, filamentous, cyanobacteria), sponge-morphological group, and gorgonians-morphological group. When estimating percent cover, it is important to realize there is a balance between precision and time. For stony corals, the approximate area covered by living coral tissue is recorded. Coral skeleton (without living tissue) is usually categorized as turf algae or uncolonized substrate. Data on the condition of coral colonies are also recorded. When coral is noticeably bleached, the entire colony is considered affected and is recorded to the nearest 0.1 percent. Coral colonies are reported as entirely bleached if they contain any portion of white, blotchy, mottled, or pale tissue. This protocol assumes stress throughout the colony and estimates maximum bleaching impact. Diseased/dead coral 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. Turf algae include a mix of short (less than 1cm high) algae that colonize dead coral substrate.

7) Maximum canopy height - for each soft biota type (e.g., gorgonians, seagrass, algae), structure is recorded to the nearest 1cm at the quadrat level.

8) Number of 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.

9) Rugosity - 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. Two divers measure the straight-line horizontal distance covered by the chain. The chain is placed on top of any hard substrate encountered, but not on top of soft corals or sponges since we are measuring hard bottom rugosity. Data on rugosity are collected for reef sites only. Rugosity measurements typically are made by the point-count and belt-transect divers while awaiting the completion of other benthic habitat measurements by the habitat diver. Upon completion of the dive, the rugosity data are transferred from the fish data sheet to the habitat data sheet by the habitat diver.

10) Abundance and maturity of queen conchs (*Eustrombus gigas*) - a count of the total number of conch encountered within the 25 x 4m belt transect are enumerated. The maturity of each conch is determined by the presence or absence of a flared lip and labeled mature or immature, respectively.

If conch abundance is counted by a fish diver, the data are then reported to the habitat diver. The decision of who will collect conch data should be made prior to entering the water.

11) Abundance of spiny lobsters (*Panulirus argus*) - a count of the total number of lobsters encountered within the 25 x 4m belt transect. No measurements are taken. If lobster abundance is

counted by a fish diver, the data are then reported to the habitat diver. The decision of who will collect lobster data should be made prior to entering the water.

12) Abundance of long-spined urchin (*Diadema antillarum*) - a count of the total number of urchins encountered within the 25 x 4m belt transect. No measurements are taken. If urchin abundance is counted by a fish diver, the data are then reported to the habitat diver. The decision of who will collect urchin data should be made prior to entering the water.

NOTE: If rugosity, conch, lobster or urchin data are collected by a fish diver, data must be transferred to the habitat data sheet. The habitat diver is responsible for transferring the data to their data sheet; however, the fish diver should assist the habitat diver with this task by reporting the data once the dive concludes.

13) Marine debris - type of marine debris within the transect is noted. The size of the marine debris and the area of affected habitat is also recorded along with a note identifying any flora or fauna that has colonized the debris.

14) *Acropora* presence - mark if *A. palmata* or *A. cervicornis* are seen along the transect or at the site.

15) Photography - the point count or habitat diver will take at least two photos in different directions at each site to maintain an anecdotal and permanent visual description of the sites that were sampled. Proper care and maintenance is necessary for all camera and camera housings. It is important to maintain the cameras and housings before, after and in between dives.

Data Caveats: Due to water quality concerns and low visibility, a portion of Mangrove Lagoon and Benner Bay were excluded from the study area. In addition, extra precautions were taken in the area where the ferries traverse.

Process Date: 201211

Process_Date: Complete

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Geographic:

Latitude_Resolution: 0.00001

Longitude_Resolution: 0.00001

Geographic_Coordinate_Units: Decimal degrees

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview: We supply percent cover, relative abundance, size, and composition of benthic communities. This information is collected across all nearshore habitat types. In addition, we provide photographs of many of the taxa. For specific information please see the data dictionary available on the database website.

Entity_and_Attribute_Detail_Citation: NOAA/NOS/NCCOS/CCMA/Biogeography Branch
Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: NOAA/NOS/NCCOS/CCMA/Biogeography Branch

Contact_Position: Caribbean Coral Reef Ecosystem Monitoring Database Manager

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Hours_of_Service: 9:00 - 5:00

Resource_Description: Downloadable data

Distribution_Liability: These data were prepared by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference therein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. Any views and opinions expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof. Although all data have been used by NOAA, no warranty, expressed or implied, is made by NOAA as to the accuracy of the data and/or related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by NOAA in the use of these data or related materials.

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: tab delimited text file

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name:

http://www8.nos.noaa.gov/biogeo_public/query_habitat.aspx

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Digital_Transfer_Information:

Format_Name: .jpg

Digital_Transfer_Option:

Online_Option:

Computer_Contact_Information:

Network_Address:

Network_Resource_Name:

http://www8.nos.noaa.gov/biogeo_public/habitat_photos.aspx

Fees: None

Metadata_Reference_Information:

Metadata_Date: 20121108

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Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: NOAA/NOS/NCCOS/CCMA/Biogeography Branch

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Hours_of_Service: 9:00 - 5:00

Metadata_Standard_Name: Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998