

*Please provide the following information, and submit to the NOAA DM Plan Repository.*

### **Reference to Master DM Plan (if applicable)**

*As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.*

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

## **1. General Description of Data to be Managed**

### **1.1. Name of the Data, data collection Project, or data-producing Program:**

Fish Community Characterization on Shallow (less than 30m) Hardbottom Shelf Habitats in St. Croix, USVI. A preliminary field survey to assess operational and logistical approaches to implement the National Coral Reef Monitoring Program (NCRMP) in the USVI.

### **1.2. Summary description of the data:**

Reef fish populations are a conspicuous and essential component of USVI coral reef ecosystems. Yet despite their importance, striking population and community level changes have occurred in the recent past due to fishing pressure and habitat degradation. The monitoring methodologies described in this document are necessary for understanding how natural and anthropogenic stressors are changing reef fish populations and communities and will be critical for their sustainable management. A collaborative research effort between the NOAA's National Centers for Coastal Ocean Science, Center for Coastal Monitoring and Assessment's Biogeography Branch (BB) and the National Park Service (NPS) has been used to inventory and assess reef fish populations in reef and reef-associated habitats in the northeast region of St. Croix from 2001-2011. The survey method previously used has been refined to enable broader region-wide coverage at the scale of the USVI yet maintains high precision at the Marine Protected Area (MPA) spatial level. Region-wide population metric estimates are required to effectively manage reef fisheries but are also imperative for spatial management and understanding ecosystem-level processes. For example, the ability to place protected fish resources in the context of the greater region not only allows for the evaluation of management actions but it also provides the ability to determine the ecological role of an MPA in the greater ecosystem. The monitoring method previously used by the Biogeography Branch and other partners in St. Croix and other regions within the USVI and Puerto Rico will be used to characterize and establish baseline data for future monitoring. St. Croix was chosen to serve as the first area to implement the protocol and to evaluate the logistics necessary to implement a long term monitoring program. Characterization and monitoring of fish communities requires a quantitative measure of the spatial distribution and variation of those communities. These measures will enable managers to make targeted management decisions (e.g. where to allow

mooring or where to allow recreational activities such as snorkeling and SCUBA diving). Additionally, the spatial setting, both within and outside protected regions allows managers to assess the impact, if any, of a change in regulation such as the prohibition of fishing. It also enables analysis of any differential effect (i.e. the effect may be the same throughout the region or it may be more effective toward an edge or center of a management area). To quantify patterns of spatial distribution and make meaningful interpretations, we must first have knowledge of the underlying variables determining species distribution. The basis for this work therefore, is the nearshore benthic habitats maps (less than 100 ft depth) created by NOAA's Biogeography Program in 2001 and NOS' bathymetry models. The sampling domain includes all hardbottom habitats around St. Croix at depths less than 30m. The benthic habitat map and a habitat classification scheme were used to create a sample frame constructed with 50 x 50 m grids. Grids were stratified based on three variables: Hardbottom habitat type, depth zone, and region/management area. Habitat within these grids was stratified into 5 habitat categories (scattered coral/ rock, pavement, bedrock, patch reef and linear reef) each with two depth classifications (shallow (0-11.9 m) and deep (12- 30m)). Further stratification was assigned based on management zones and region of the island. There are three managed areas in St. Croix. Two federal marine protected areas are managed by the Department of Interior's National Park Service: Buck Island Reef National Monument and Salt River Bay National Historical Park and Ecological Reserve. The St. Croix East End Marine Park is a territorial marine protected area managed by the USVI Department of Planning and Natural Resources. Other strata include specific regions of St. Croix: North, East, West, and South shores. Overall there were 70 possible strata: 5 habitat types, 2 depth zones and 8 management areas/regions. The monitoring objectives of this protocol are to determine status, trends, and variability in exploited reef fish species and communities within the USVI region and inside vs. outside different management zones, using measures such as relative abundance (density), spatial distribution, size structure and diversity. The survey design is optimized for nine economically and ecologically important species in the USVI: blue tang (*Acanthurus coeruleus*), queen triggerfish (*Balistes vetula*), coney (*Cephalopholis fulva*), red hind (*Epinephelus guttatus*), four-eye butterflyfish (*Chaetodon capistratus*), French grunt (*Haemulon flavolineatum*), yellowtail snapper (*Ocyurus chrysurus*), stoplight parrotfish (*Sparisoma viride*) and threespot damselfish (*Stegastes planifrons*). These species were chosen to include a broad range of life history traits as well as a variety of habitat utilization patterns. The sample design is optimized with the respect to these species, but because all fish species are recorded, monitoring efforts also obtain important information about many non-targeted species, the overall trophic structure, and form the scientific basis for effective management actions. As such, the sample allocation for this mission is based upon the existing community metrics and the above species specific distribution from the northeast region of St. Croix. It was determined that 250 samples among the various strata would be sufficient to characterize hard bottom habitats around the island and have comparable coefficient of variation (CV) to values observed in the northeast region of St. Croix. The goal was to survey as many of the 250 sites as possible in a two week time period. We organized a strong science field team and completed 286 fish

h and benthic surveys around the island.

**1.3. Is this a one-time data collection, or an ongoing series of measurements?**

One-time data collection

**1.4. Actual or planned temporal coverage of the data:**

2012-05-07 to 2012-05-19

**1.5. Actual or planned geographic coverage of the data:**

W: -64.965, E: -64.433, N: 17.86, S: 17.616

**1.6. Type(s) of data:**

*(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)*

**1.7. Data collection method(s):**

*(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)*

**1.8. If data are from a NOAA Observing System of Record, indicate name of system:**

**1.8.1. If data are from another observing system, please specify:**

**2. Point of Contact for this Data Management Plan (author or maintainer)**

**2.1. Name:**

NCCOS Scientific Data Coordinator

**2.2. Title:**

Metadata Contact

**2.3. Affiliation or facility:**

**2.4. E-mail address:**

NCCOS.data@noaa.gov

**2.5. Phone number:**

**3. Responsible Party for Data Management**

*Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.*

**3.1. Name:**

NCCOS Scientific Data Coordinator

**3.2. Title:**

Data Steward

**4. Resources**

*Programs must identify resources within their own budget for managing the data they produce.*

**4.1. Have resources for management of these data been identified?****4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):****5. Data Lineage and Quality**

*NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.*

**5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible**

*(describe or provide URL of description):*

Process Steps:

- 2012-10-25 00:00:00 - Once in the field, the boat captain navigates to previously selected sites using a handheld GPS unit. On-site, divers are deployed and maintain contact with each other throughout the entire census. One diver is responsible for collecting data on the fish communities utilizing the belt-transect visual census technique over an area of 100m<sup>2</sup> (25m length X 4m width). The belt-transect diver obtains a random compass heading for the transect prior to entering the water and records the compass bearing (0-360°) on the data sheet. Visibility at each site must be sufficient to allow for identification of fish at a minimum of 2m away. Once reasonable visibility is ascertained, the diver attaches a tape measure to the substrate and allows it to roll out for 25m while they are collecting data. Although the habitat should not be altered in any manner by lifting or moving structure, the observer should record fish seen in holes, under ledges and in the water column. To identify, enumerate, or locate new individuals, divers may move off the centerline of the transect as long as they stay within the 4m transect width and do not look back along area already covered. The diver is allowed to look forward toward the end of the transect for the distance remaining (i.e. if the diver is at meter 15, he can look 10 meters distant, but if he is at meter 23, he can only look 2 meters ahead). On-site, no attempt to avoid structural features within a habitat such as a sand patch or an anchor should be made as these features affect fish communities and are "real" component of the habitats. The only two instances where the transect should deviate from the designated path is to stay above 110 ft (limitations imposed by diving) or while surveying mangrove habitats. In mangrove areas, the diver swims close to the prop roots and looks as far into the mangroves as possible; up to 2m and then out to the edge of the mangrove overhang such that the total area surveyed is still 100m<sup>2</sup>. In this case, some of the survey may necessarily fall on seagrass habitat. This is

allowed as the mangrove habitat is defined as a transition zone habitat. The transect should take 15 minutes regardless of habitat type or number of animals present. This allows more mobile animals the opportunity to swim through the transect, and standardizes the samples collected to allow for comparisons. Data are collected on the following: 1) Logistic information - diver name, dive buddy, date, time of survey, site code, transect bearing. 2) Taxa presence - as the tape rolls out at a relatively constant speed, the diver records all fish species to the lowest taxonomic level possible that come within 2m of either side of the transect. To decrease the total time spent writing, 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, alternate four-letter codes are used to distinguish between the species. These alternate codes contain the first two letters of the genus, the first letter of the species and then the first letter in the species name that differs from the other code. 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. 3) Abundance and size - 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. 4) Photos - individuals too difficult to identify or unique in some manner may be photographed for later clarification. (continued...)

- 2012-10-25 00:00:00 - (continued from above) Data Caveats: Site selection is different from prior Caribbean Coral Reef Ecosystem Monitoring Program (CCREMP) data collection. This data set is the first time a sampling frame has been used to do site selection. CCREMP surveys (2000-2011) had stations on hard- and soft-bottom habitats; this dataset is from hardbottom sites only. CCREMP surveys were conducted only in the northeast portion of St. Croix; primarily waters less than 30 m from Green Cay to Point Udall. This dataset reflects surveys from hardbottom habitats in waters less than 30m around the entirety of St. Croix. (end continuation)

**5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:**

**5.2. Quality control procedures employed (describe or provide URL of description):**

## 6. Data Documentation

*The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.*

**6.1. Does metadata comply with EDMC Data Documentation directive?**

No

**6.1.1. If metadata are non-existent or non-compliant, please explain:**

Missing/invalid information:

- 1.6. Type(s) of data
- 1.7. Data collection method(s)
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
  - 7.1.1. If data are not available or has limitations, has a Waiver been filed?
  - 7.1.2. If there are limitations to data access, describe how data are protected
- 7.2. Name of organization of facility providing data access
  - 7.2.1. If data hosting service is needed, please indicate
- 7.3. Data access methods or services offered
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

**6.2. Name of organization or facility providing metadata hosting:**

NMFS Office of Science and Technology

**6.2.1. If service is needed for metadata hosting, please indicate:**

**6.3. URL of metadata folder or data catalog, if known:**

<https://www.fisheries.noaa.gov/inport/item/39571>

**6.4. Process for producing and maintaining metadata**

*(describe or provide URL of description):*

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive:

[https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC\\_PD-Data\\_Documentation\\_v1.pdf](https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf)

**7. Data Access**

*NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.*

**7.1. Do these data comply with the Data Access directive?**

**7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?**

**7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:**

**7.2. Name of organization of facility providing data access:**

**7.2.1. If data hosting service is needed, please indicate:**

**7.2.2. URL of data access service, if known:**

[https://www8.nos.noaa.gov/biogeo\\_public/reef\\_photos.aspx](https://www8.nos.noaa.gov/biogeo_public/reef_photos.aspx)

<https://www8.nos.noaa.gov/bpdmWeb/queryMain.aspx>

**7.3. Data access methods or services offered:**

**7.4. Approximate delay between data collection and dissemination:**

**7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:**

## **8. Data Preservation and Protection**

*The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.*

**8.1. Actual or planned long-term data archive location:**

*(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)*

**8.1.1. If World Data Center or Other, specify:**

**8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:**

**8.2. Data storage facility prior to being sent to an archive facility (if any):**

National Centers for Coastal Ocean Science - Silver Spring, MD

**8.3. Approximate delay between data collection and submission to an archive facility:**

**8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?**

*Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection*

**9. Additional Line Office or Staff Office Questions**

*Line and Staff Offices may extend this template by inserting additional questions in this section.*