

The following is the 5-year Coral Grant Plan of the CFMC prepared in 2006. The changes indicated in the document correspond to the availability of researchers to do the work and to the geographical distribution among the areas. The CFMC has established a 30-50 m depth research protocol that has been followed to establish permanent transects at these depths such that these areas can be monitored over time. At present the CFMC is working on the submission of the Coral Grant for 2009 (submitted).

CFMC 5 year Coral Grant Plan
123rd Caribbean Fishery Management Council Meeting
St. Thomas USVI
December 5-6, 2006

SUMMARY

A meeting to discuss the next 5 years of CFMC sponsored research on coral reefs was called by M. Rolón to include Dr. J. Garcia Sais, Dr. R. Nemeth and Graciela García-Moliner. The meeting took place in La Parguera, Puerto Rico on October 5th 2006. The following is a summary of the discussion regarding the (1) research to be done in 2007-2012; (2) the objectives of the research; and (3) dissemination of the results. Previous work conducted under the Coral Grants is schematically presented in Attachment A (CFMC Coral Grants from 2002 to 2007) and has been presented at other Council meetings.

The Coral Grant Objectives for the next 5 year cycle were proposed as follows:

1. To construct bathymetric maps for these important reefs sites:
 - a. Vieques Southeast (El Seco): tiger grouper spawning aggregation site (Coral 2009 to be submitted 083108; DNER letter of support from A. Rosario; to be contracted with Dr. Garcia –Sais; R/V Foster to provide high resolution bathymetry if possible) (Additional proposal to Ocean Exploration from University of the Virgin Islands submitted with collaboration of CFMC.)
 - b. Grammanick Bank, St. Thomas: yellowfin grouper spawning aggregations site.
 - c. Abrir La Sierra: Red hind spawning aggregation site (Coral Grant 2007 on going)
 - d. Tourmaline Bank: red hind spawning aggregation site and old Nassau grouper site.
 - e. Lang Bank: extended beyond the maximum depth sampled
2. To establish quantitative baseline information for coral and fish and invertebrate resources (see list of sites above). (Coral Grant 2008 to assess the Mutton Snapper Aggregation Site in St. Croix, USVI [Dr. B. Kojis –PI] – on going.
3. To provide assessment of spawning aggregation sites
 - a. fish densities at spawning and non-spawning periods;

- b. other fish aggregating at the site
 - c. belt transects with density information at other times
4. To assess seasonal changes at the spawning sites for
 - a. Recruitment patterns of fish (e.g., Spanish hogfish)
 - b. Abundance of certain fish species as food source for larger predators
5. To assess coral recruitment at these sites (coral plates)
6. To assess changes in time, sites should be revisited
 - a. Assess coral health (bleaching, diseases)
 - b. Assess habitat changes (colonization by macro algae, etc.)

Logistics

The EEZ area of interest in the US Caribbean, and for which mapping and species characterization are needed, are found at 30 to 50 m depths. In this upper insular shelf is where most of the known spawning aggregation sites are found and these sites have been under management for a number of years with little or no monitoring. These areas are prioritized below.

The priority locations set by the scientist for the EEZ are: (NOTE: the assessment of Vieques' site El Seco was recommended because it is an area contiguous with the MCD and shows indications of very healthy coral development at the depths of 30 to 50 m.) This would be the 2007 grant¹. However, the logistics of this site are different from the previous PR grants necessitating a live-in boat because of its remoteness (about 30 km from either Isabel II or Esperanza the two towns in Vieques). The rental of e.g., R/V Sultana @ \$1,200/day and the change in diving protocol needed to be assessed. Basic refueling facilities are not easily accessible, most likely would have to be done in St. Thomas, and additional travel arrangements needed to be done also to keep costs of operation low.

The other areas are: (1) Lang Bank (especially because of all the other regulations in St. Croix and the interest of the fishers in changing the managed area) and Grammanick Bank (recently closed in St. Thomas and contiguous with the MCD. These would be the 2008 and 2010 grants. (2) Abrir La Sierra: an area seasonally closed since 1996 and which includes studies on larvae dispersal spawned in the area. This could be the 2009 Coral Grant but most surely it should be the 2007 as the necessary expertise is already in place off the west coast of PR. In fact it will be done in the grant cycle 2007-2009 and then Vieques can be considered for 2009. (3) Bajo de Cico revisited: there is concern about the spreading of disease and bleaching events reaching coral reefs at depth. It is suggested that the Bajo de Cico be revisited for assessment in 2011; including in this year a re-assessment of the Desecho site (2003). (4) Mutton Snapper Area to be assessed in 2012 (Coral Grant approved for FY08 –Dr. B. Kojis, USVI).

¹ The dead line for submission of the Coral Grant Proposal for 2007 was November 10, 2006. The time available was not sufficient to develop the logistics for the Vieques project. The CFMF submitted a proposal to map and characterize Abrir La Sierra, a red spawning aggregation site seasonally closed since 1996 and for which hardly any data are available.

The group also considered and recommends the mapping and characterization of EEZ management areas or other important areas for coral habitats in the 30 to 50 m depth range. However, there is very limited bathymetric data and even less habitat description for most of the areas in these depths of interest. These areas might be in the EEZ but also there are important areas to be studied within the State waters.

Recommendation: Characterize the areas for which there is high resolution bathymetry and side scan sonar data (Lang Bank, Mutton Area, MCD, Grammanick Bank, St. John EEZ outside the Monument Areas). These maps should be validated (bounce dives). Then select the optimum coral growth areas for permanent transect (full characterization of these areas for habitat and fish) and also select additional transects for other habitats encountered. The bounce dives would allow for surveying as many locations as possible for validation of the habitat maps –this needs to be done and the first attempt to do this was proposed in the 2005 Coral Grant for the MCD (proposal available at CFMC). This will provide an assessment of habitats and associated fish. Then, carry out quantitative characterization of the significant and predominant coral areas, specially those areas associated with spawning aggregations. Depending on the habitat distribution the intensive surveys will be conducted accordingly. For example high coral cover areas are a top priority as well as colonized hard bottom (low coral cover). Other areas such as patch reefs and sponge and gorgonian fields will be sampled less intensively. This same protocol, different from areas that have no high resolution bathymetry or side scan sonar data will also be followed in Lang Bank and the Mutton Snapper Area. Additionally, more comprehensive characterizations will be done in specific areas in the same manner that Dr. Garcia-Sais has previously done for Desecheo and Bajo de Cico. The Coral Grant 2005 will include the first attempt at carrying out this combined effort between Puerto Rico and the USVI (Dr. Garcia-Sais and Dr. Nemeth).

Recommendations: (1) Permanent transects at depth need to be established and carefully characterized because bleaching events impacting corals at 140 ft (46 m) have already been reported. (2) The sites characterized under the CFMC sponsored research should be revisited at some time in the future to assess changes in coral cover, coral health (onset of disease or bleaching) and community structures (fishes and macro invertebrates).

The group also recommended that in the future environmental parameters such as temperature be monitored during the study period. The use of current meters, CDT casts, temperature recorders, light meters, among others should be considered in the next proposals.

The group also discussed the use of AUV (autonomous underwater vehicles) or ROVs (remotely operated vehicles) in determining the extent of these deep water reefs beyond the diving limits.

Attachment B shows a bathymetric map of the US Caribbean showing the enormous area of potential coral habitat between 30 and 50 m depths. Thus information like this derived from the Inventory and Atlas developed during the 2003-2005 grant cycle can be used in the selection of other area to map and characterized. These larger projects would

necessitate the cooperation of other scientists and partnerships to seek additional funding in order to successfully describe these areas.

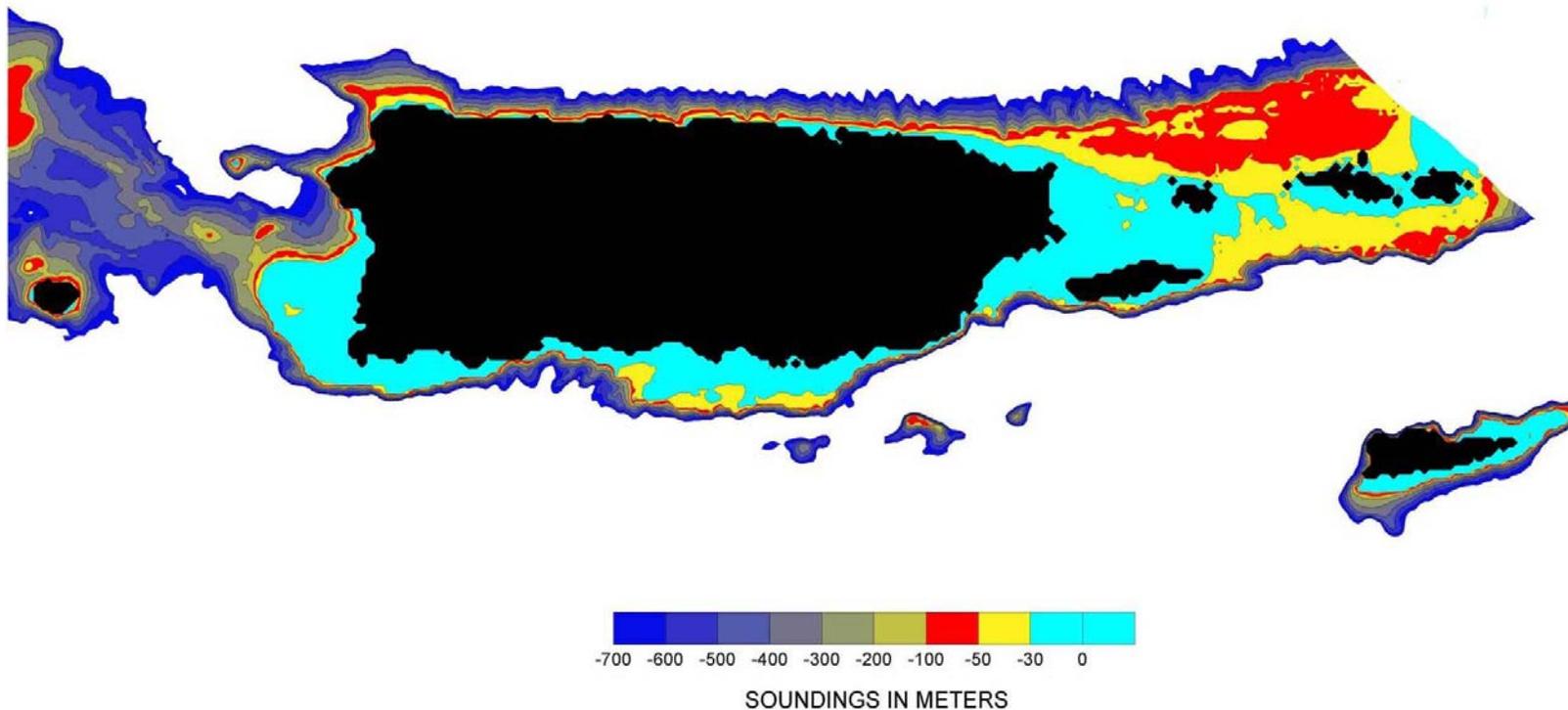
The group talked about the dissemination of the information and agreed that scientists are not in general good at communicating in lay terms. The information has to be translated by people who specialize in these endeavors.

Attachment A					
CFMC Coral Grants					
Year	Location	Purpose	Area	Status	Title
2002	USVI	Multi beam SSS Mapping	MCD Lang Bank Mutton	DONE	Marine Habitat Mapping - Offshore St. Thomas & St. Croix, U. S. Virgin Islands EEZ
2003	PR	Atlas and Inventory deep- water coral reefs Mapping	US Caribbean/ Greater Caribbean	DONE	
		Bathymetry; Characterization	Desecheo	DONE	
2004	PR	Bathymetry; Characterization Mapping	Bajo de Cico	On-going	Biological Assessment of the Upper Reef Slope Community and Mapping of Benthic Habitats at Bajo de Cico, Puerto Rico
2005	USVI	Characterization; ground truthing	MCD	Pending	Characterization of deep water reef communities within the Marine Conservation District, St. Thomas, U. S. Virgin Islands
2006	USVI	Recreational Fishing Regulations NO MAPPING	USVI	Pending	Assessment and Development of Recreational Fishing Regulations for the U.S. Virgin Islands
2007	PR	Characterization/ Bathymetry Mapping	Abrir La Sierra	Submitted	Biological Assessment of the Upper Reef Slope Community and Mapping of Benthic Habitats at Abrir La Sierra, Puerto Rico

0-30 m: 4,325 km² (57%)

30-100 m: 1,738 km² (43%)

Potential
Habitat



ATTACHMENT B

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