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PRELIMINARY CRUISE REPORT

STATE DEPARTMENT CRUISE ID:
DOS-2006-113

NOAA CRUISE ID:
NF-07-05

SHIP NAME:
NOAA Ship Nancy Foster

OPERATING AGENCY:
National Oceanic and Atmospheric Administration (NOAA)

PROJECT TITLE:
Coral Reef Ecosystem Research

CRUISE DATES:
March 28, 2007 through April 9, 2007

CHIEF SCIENTIST:
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CLEARANCE COUNTRIES:
United Kingdom, for Anguilla and British Virgin Islands
Dominican Republic
Guadeloupe/France, for Saint Martin and Saint Barthelemy
Netherlands Antilles, for Saba, Sint Eustatius, and Sint Maarten
Saint Kitts and Nevis

PARTICIPANTS (SCIENTIFIC PERSONNEL):

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PROJECT OVERVIEW

The United States Virgin Islands' (USVI) Grammanik Bank, located to the south of St. Thomas, is the site of multi-species spawning aggregation for economically important fish including yellowfin grouper, Nassau grouper, tiger grouper, and dog snapper. Fishing pressure at this suspected source of larval recruits prompted the Caribbean Fisheries Council in 2004 to close the bank yearly from February - April. A series of banks south of the USVI (St. Thomas and St. John) and the British Virgin Islands (BVI) provide similar habitats and spawning aggregation sites. Unfortunately, the biological and physical processes which drive production on these banks, the circulation connecting these banks, and the flows across these banks have yet to be quantified. Absent such data, management decisions (including Marine Protected Area [MPA] designations and temporary closures) are presently based on professional judgment rather than quantifiable, defensible scientific information.

To address this data gap, National Oceanic and Atmospheric Administration (NOAA) scientists from the Southeast Fisheries Science Center (SEFSC) and Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, Florida, working with scientists from the University of the Virgin Islands (UVI) in St. Thomas are conducting a three-year interdisciplinary research project using the *NOAA Ship Nancy Foster* to conduct biological and physical oceanographic surveys of the Virgin Islands' (VI) bank ecosystems and surrounding regional waters. The long-term sustainability of fisheries in the VI and surrounding regions will depend on a comprehensive understanding of regional spawning aggregations, larval transport, and overall larval recruitment in the study area.

The project is directed at answering one over-arching question: How are unprotected VI banks, MPAs such as the Hind Bank Marine Conservation District, seasonally closed areas such as the Grammanik Bank, and inshore areas ecologically linked via regional reef fish larval dispersal, transport, and life-history patterns?

To gain the information necessary to develop more specific hypotheses, the first research cruise of this project (DOS-2006-113 / NOAA-NF0705) was conducted between March 28, 2007 and April 9, 2007 aboard the *NOAA Ship Nancy Foster*. This survey sampled water properties, currents, and dispersal and transport of settlement-stage larvae in the VI and neighboring regions. Once the biological samples have been sorted and the oceanographic data have been analyzed, results from this cruise should yield not only an understanding of regional spatial variation in the supply of settlement-stage fishes, but also insights into the relative importance of Grammanik Bank and its MPAs as a source of juvenile fishes recruiting to the waters of the VI.

Specifically, results should address the following questions:

How do the abundance and composition of ichthyoplankton around Grammanik Bank and other similar banks change with space and time?

How much of this variation in abundance and composition can be explained by the oceanographic setting?

How do the oceanography and ichthyoplankton assemblages interface with the boundary areas of seasonally or permanently closed MPAs?

This survey included bongo, and 1 meter MOCNESS trawl tows, as well as CTDO2/LADCP casts profiling, temperature, salinity, dissolved oxygen, chlorophyll, and water velocity. Continuous surface measurements of temperature, salinity, chlorophyll, and water velocity were also collected via the ship's flow-through system and hull-mounted ADCP. 9 satellite-tracked, Lagrangian surface drifters were also deployed to study regional circulation.

Initially, the success of the project will be measured by the extent of the surveys made and the number of samples collected, as well as the utility and quality of useful information generated from analysis of the data collected. Settlement-stage larvae collected from inshore sampling will constitute another measure of success for the field study portion of this project. Determination of the utility of stable isotope analysis of these larvae will provide an additional benchmark. The synthesis of these data, to determine the location and relative importance of spawning sites, and the incorporation of this information into fisheries oceanographic models that help local resource managers in making decisions as to MPA sites and optimal seasonal closures with respect to time and place, will provide the ultimate measure of project success.

SCHEDULE OF DATA DELIVERY:

Identification and analysis of biological samples and shipboard data analysis commenced immediately following the conclusion of the cruise and should be completed by mid 2008. All processed data (biological and oceanographic) collected during the cruise will be delivered to the U.S. Department of State within 18 months of the completion of the cruise (by October 9, 2008).

NF0705 - AREA OF OPERATION

shown below in Figures 1 and 2…

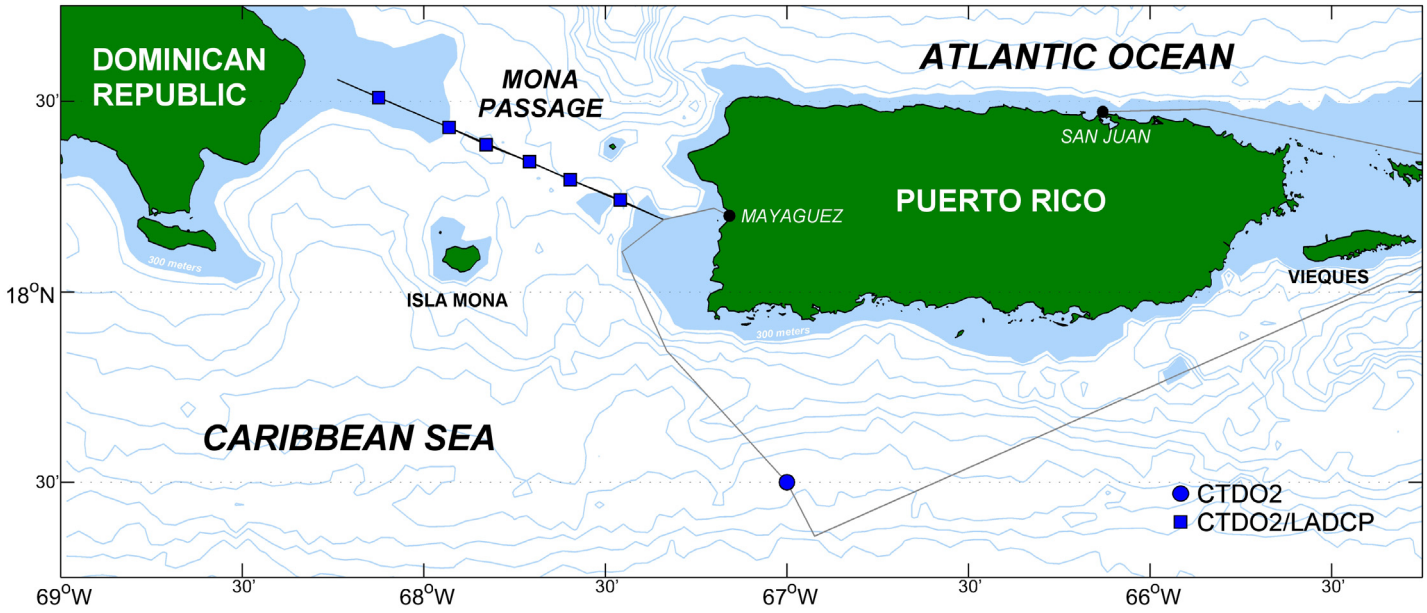

Figure 1. NF0705 Western Region cruise track with completed casts (no tows were conducted in the Western Region).

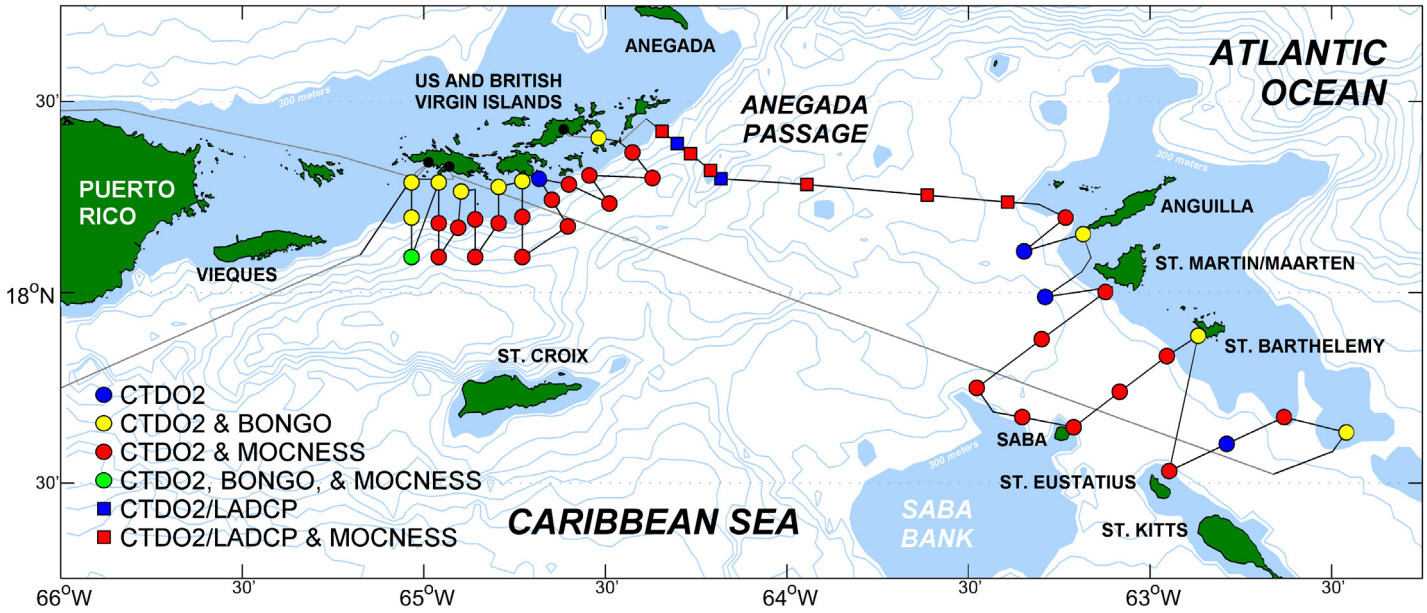

Figure 2. NF0705 Eastern Region cruise track with completed casts and tows.