NOAA Office of Ocean Exploration Quick Look Report

Expedition Title: Protecting a Shifting Baseline: Shallow to Deep Reefs on Bonaire

Results (please check all disciplines in which this cruise collected data)	Details (please describe any novel discoveries in the discipline, answers such as "possible, awaiting data analysis" and "no apparent discoveries" are acceptable)
Bathymetric Mapping X Yes ☐ No	Gavia AUV configured with a phase measuring bathymetric sonar was used daily during the period 11-18 January. Surveys encompassed over 12 sites and approximately 108,000 m^2 with approximately 100 hours of water time. Bathymetric mapping documented previously uncharted ledges at twilight zone depths (80 to 120 meters)
New Species Discovered ☐ Yes X No	Possible, awaiting data analysis, one (1) sample of an unidentified cyanobacterium, and one (1) sample of the encrusting tunicate, most likely *Trididemnum solidum* were obtained during the expedition
Bio-prospecting ☐ Yes X No	No apparent discoveries
Habitat Range Extended X Yes ☐ No	Our preliminary analysis suggests that coral disease is less prevalent below 30 meters. SCUBA observations indicated an extension of the zonation of both an encrusting tunicate and an unidentified cyanobacterium.
Chemical Processes X Yes ☐ No	Profiles of dissolved oxygen in the water column show interesting structure and will be the subject of a paper by Patterson, and postdoctoral CASEE fellow from the National Oceanography Centre, Daniel Jones.
Biological Processes X Yes ☐ No	We used technical diving (trimix) to assess the ecological condition and health of the deep reefs. Video transect data was collected normal to the shoreline at 12 locations collected by SCUBA diving, 5 days of fish survey data, and phototransect data at depths from 80-20 m collected by Trimix and Nitrox SCUBA. All of these observations were aimed at exploring the biological processes of the reefs surrounding Bonaire.
Geologic Processes X Yes ☐ No	30 sediment cores at various locations around Bonaire were collected for subsequent analysis of grain size, composition, and foraminiferal assemblages. Bathymetry mapping indicated the presence of slump features of possible tsunamigenic origin in the twilight zone.
Physical Processes X Yes ☐ No	Physical environment parameters (temperature, light, and nutrients) were measured. We deployed and recovered Benthic Observatory Arrays, and 2 Acoustic Doppler Current Profilers at two locations using SCUBA.
Sub/ROV/AUV Dives X Yes ☐ No	We collected a voluminous AUV data set consisting of bathymetry, side-scan sonar, video imagery, and CTD data from the 3 vehicles (2 Gavia and 1 Fetch1), and dissolved oxygen or pH data from the Fetch1 AUV.
New Technology X Yes ☐ No	This project was the first time a field campaign using 3 AUVs had been conducted in a reef setting. We used the world's only man-portable Geo-Swath AUV, which can perform underwater bathymetry, side-scan sonar, underwater video, and measure water quality. Also, newly improved Benthic Observatory Arrays (measuring water temperature and pressue at over 100 nodes on multiple strings) were used. Finally, a handheld diver-profiling instrument was used to measure dissolved oxygen, pH, and temperature in the bottom boundary layer (2 m) of the reef.
Maritime Cultural Heritage X Yes ☐ No	All of the waters surrounding Bonaire from the shore to a depth of 200 feet are held as a marine protected area since 1979. Activities within the marine park are regulated. This project was given special dispensation to access parts of the reef known as the Bonaire Marine Reserve that are normally off limits to all diving activity. Our AUVs and divers were given access to this area for some of the first-ever large-scale surveys of this region.
Outreach V Yes ☐ No	We summarized our preliminary results at the kickoff event for the International Year of the Reef press conference hosted by Vice Admiral Conrad Lautenbacher, the NOAA Administrator, in Washington, D.C., with a link up to the Bonaire team via telephone.

	We presented talks on the expedition to scientific audiences, the local government of Bonaire (including Governor of Bonaire Mr. Herbert Domacassé) and the lay public. Several articles appeared in the local Bonaire newspapers. The NOAA press conference also generated an Associated Press wire story that was picked by newspapers worldwide, including the Washington Post, MSNBC's Today Show, and many derivative pieces in the print media and on the Internet.
Students Involved X Yes ☐ No	16 students from the University of Delaware participated in a month-long study abroad program in parallel association to this project. Students assisted in field deployments, participated in the scientific dive team (2) and conducted their own independent research project in consultation with members of the science project team. 3 graduate students (UDel, UBC, and VIMS) participated in the project and data from the project will form the part of the Ph.D.dissertation of Patterson's graduate student, Noelle Relles, who is supported by a VIMS Minority Fellowship.
Multidisciplinary XYes ☐ No	From the outset this project was design to be multidisciplinary in approach. The project involved the fusion of techniques from geophysics, physical oceanography, biomechanics, benthic ecology, and ocean engineering.
Exploration of New Regions X Yes ☐ No	This expedition included new exploration into deep reef regions down to depths of 220 m. Our project also involved exploration of the marine reserve area of Bonaire an area off limits to all activities and limited exploration on the windward side of the island.