

Final Report
on
Reef Resilience and Climate Change:
A Workshop for Coral Reef Managers

St. Thomas, USVI
May 10-14, 2010

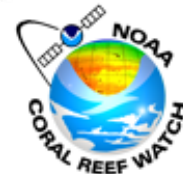
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November 2010



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Great Barrier Reef
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Section 1. Overview

The United States Virgin Islands (USVI) Reef Resilience and Climate Change: A workshop for Coral Reef Managers, held May 10-14, 2010 at the Frenchman's Reef and Morning Star Marriott Beach Resort on St. Thomas in the USVI, was the eighth in a series of capacity-building presentations. This workshop, based on *A Reef Manager's Guide to Coral Bleaching (The Manager's Guide)* and the *Reef Resilience Toolkit: Resources for Reef Managers (R² Toolkit)*, provided a response framework for mass bleaching and climate change and MPA design which incorporates the concept of resilience. This particular workshop was the third that occurred after a curriculum update that was undertaken in partnership with The Nature Conservancy Global Marine Initiative. The updated curriculum merges the NOAA Coral Reef Conservation Program *Responding to Climate Change* curriculum with The Nature Conservancy *Reef Resilience Toolkit* curriculum. The workshop curriculum brings together world-class tools and expertise:

- **NOAA's Coral Reef Watch Program (CRW)**, which uses satellite imagery to predict the onset and severity of mass bleaching events globally;
- **NOAA's Coral Reef Conservation Program (CRCP)**, whose mission is to protect, conserve and restore coral reef resources by maintaining healthy ecosystem function
- **The Nature Conservancy (TNC) Reef Resilience initiative**, which seeks to estimate reef resilience to climate change and integrate resilience into marine protected area design;
- **The Coral Reef Targeted Research Program (CRTR)**, researching climate change impacts on coral reef ecosystems and methods for restoring ecosystem resilience;
- **The Great Barrier Reef Marine Park Authority (GBRMPA)** innovation on practical, science-based management strategies for climate change;
- **The Global Socioeconomic Monitoring Initiative for Coastal Management (SocMon)**, an initiative supported by the CRCP and the Global Coral Reef Monitoring Network (GCRMN) which facilitates community-based socioeconomic monitoring of coral reef areas.
- **The World Wildlife Fund (WWF)** initiatives on climate change adaptation and its "Climate Camps" that help conservation practitioners start working toward adaptation.
- **Papahānaumokuākea Marine National Monument's (PMNM)** initiative to bridge multiple knowledge systems, strengthen partnerships and increase community involvement for better marine management;

Funding and logistical support for the USVI Workshop was provided by the following:

- **NOAA Coral Reef Conservation Program:** The mission of the CRCP is to protect, conserve, and restore coral reef resources by maintaining healthy ecosystem function. The primary objective of the CRCP is to address strategic coral reef management needs in a targeted, cost-effective, and efficient manner.
- **The Nature Conservancy (TNC):** The mission of TNC is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. TNC provided funding, coordination and staff support for this workshop.
- **NOAA Coral Reef Conservation Program:** The mission of the CRCP is to protect, conserve, and restore coral reef resources by maintaining healthy ecosystem function. The primary objective of the CRCP is to address strategic coral reef management needs in a targeted, cost-effective, and efficient manner.
- **US Virgin Islands Department of Planning and Natural Resources:** The mission of the Department of Planning and Natural Resources is to protect, maintain and manage the natural and cultural resources of the Virgin Islands through proper coordination of economic and structural development in collaboration with other local, federal and non-government organizations, for the

benefit of present and future generations so they will live safer, fuller lives in harmony with their environment and cultural heritage.

- **The University of the Virgin Islands:** The University of the Virgin Islands is a learner-centered institution dedicated to the success of its students and committed to enhancing the lives of the people of the U.S. Virgin Islands and the wider Caribbean through excellent teaching, innovative research, and responsive community service.
- **The British Virgin Islands National Parks Trust:** Under the National Parks Act, 2006 the Trust is mandated to maintain, conserve and restore parks and protected areas for the benefit, education and use of the people of the British Virgin Islands and to leave them unimpaired for the benefit of future generations. The Trust currently manages nineteen terrestrial parks and one marine park under five programme areas - Terrestrial Parks Management, Marine Conservation, Historical Sites Preservation, Biodiversity Conservation and Environmental Education.

1.1 Goals

This effort presents a capacity-building program built around the Reef *Manager's Guide to Coral Bleaching* and *The Reef Resilience Toolkit: Resources for Reef Managers*. The workshop was a refinement of the other NOAA presentations of these materials in Australia, American Samoa, the Florida Keys, Hawai'i, Bonaire, and Guam over the last 3 years.

The goals of the workshop were:

- To provide coral reef managers with a learning opportunity to better understand coral reef resilience and the tools available to them
- To facilitate the incorporation of resilience into coral reef management and planning
- To provide managers with innovative approaches and tools that lead to practical solutions for coral reef management in the face of global change
- To initiate a draft version of a protected area or network design for each participating country
- To initiate a draft Bleaching Response Plan for each participating country.
- To facilitate an exchange between Pacific Island coral reef managers
- To integrate Pacific Island managers into a global practitioners network for managers working to incorporate resilience at their sites

1.2 Participants

The workshop was mainly attended by coral reef managers, conservation practitioners and scientists from the Caribbean Region. The twenty participants were from the US Virgin Islands (St. Croix, St. Thomas, and St. John), Puerto Rico, and the British Virgin Islands (BVI).

The USVI workshop brought together a few of the same instructors from previous workshops, as well as past participants returning in an instructor role, plus multiple new instructors who provided local and regional expertise on the subject matter. The following instructors took part in the workshop:

- Britt Parker, NOAA Coral Reef Conservation Program
- Christy Loper, NOAA Coral Reef Conservation Program
- Christine Settar, University of the Virgin Islands
- Tyler Smith, University of the Virgin Islands
- Marilyn Brandt, University of the Virgin Islands
- Nancy Woodfield-Pascoe, British Virgin Islands National Parks Trust
- Kemit-Amon Lewis, The Nature Conservancy
- Paige Rothenberger, USVI Department of Planning and Natural Resources

1.3 Structure

Workshop instruction as delivered in lectures, hands-on activities, focused group discussions and field exercises. The participants added lively discussion from their personal experience; this enhanced the value of the workshop, and also allowed participants to get to know one another better and to network with one another.

Module 1 was a synthesis of the latest science about observed and expected climate change impacts on coral reef ecosystems as well as the physiology of coral bleaching. Participants were also introduced to the bleaching response plan framework so that they could begin thinking about how to incorporate the information being presented into their own response plans. This module included a presentation on local impacts of climate change to the Caribbean as well as information on climate change and coral disease and the current state of coral diseases impacting the reefs of USVI, BVI and Puerto Rico.

Module 2 provided participants with NOAA tools available to predict where conditions are conducive to coral bleaching and the utility of community based monitoring programs which can provide more eyes on the ground to inform managers of reef condition. There was also discussion of how to incorporate these early warning systems in bleaching response plans.

Module 3 defined both biological and social resilience, presented the four principles of resilience and how to identify resilience and resilient communities.

Module 4 followed on with the incorporation of resilience factors into MPA and MPA network design and management and included a case study from BVI. The participants then took part in a group exercise in which they considered their reef area classification and MPA design and zoning based on guiding principles for incorporating resilience into MPAs.

Module 5 introduced importance of understanding and assessing the ecological impacts, as well as the social and economical impacts, of mass bleaching. The module continued with a brief review of reef characteristics that promote resilience, protocols for rapidly assessing resilience, and the importance of incorporating resilience monitoring into long term monitoring programs. There was also a discussion of socioeconomic indicators with a case study on Environmental Awareness and Social Resilience and a facilitated discussion on setting social science research priorities for climate change. A field exercise where participants were asked to rate the resilience of two coral reef sites was one of the highlights of the workshop.

Module 6 was about the incorporation of resilience into management strategies and included a discussion amongst participants and staff about management strategies as well as coral reef nurseries and restoration.

Module 7 was on communicating about climate change, mass bleaching, and management activities to constituents, decision makers, local community organizations, community members and the general public.

Module 8 included a brief presentation reviewing the components of a bleaching response plan and also provided examples of bleaching response plans from Bonaire, Hawai'i and Australia's Great Barrier Reef. Participants then worked in their group to develop a draft bleaching response plans for their regions. This exercise synthesized the lessons learned in the other modules.

Section 2. Outcomes

2.1 Curriculum

In addition to providing training, this workshop also produced an improved library of presentations for future use. The agenda and presentations have been improved based on feedback from Australia, American Samoa, Florida Keys, Hawai'i, and Bonaire participants. The information and presentations will continue to be updated and feedback from USVI has already been incorporated into the curriculum and agenda for the Training of Trainer workshop series that is also a partnership between NOAA Coral Reef Conservation Program and The Nature Conservancy. The workshop materials will be publicly available on the CRW website: <http://coralreefwatch.noaa.gov/satellite/education/workshop/>.

2.2. Participant Feedback

Participants were asked to complete evaluations at the close of the workshop. Feedback was overwhelmingly positive. 90% of participants either agreed or strongly agreed that the modules presented were useful, interesting, clearly delivered, and helpful to their jobs. Examples of comments included:

“I found this to be an excellent workshop. It is so inspiring to discuss these issues in a group with our close geographical neighbors, all thinking and even brainstorming about the same issues. Thank you for inviting me. I will take this back to our Reef Check/ARK group and continue working with our government and non-government partners.”

“A very productive workshop. Having an afternoon for the field trip was a good idea. Identification of the coral disease, fish bites, etc was very valuable to me. It's not that easy to distinguish the different types of disease and more training is needed in that area. Good job done!”

A number of participants made suggestions to improve the workshop and these changes will be incorporated into future trainings. Most of these comments focused on workshop organization, the amount of information being presented, keeping information and examples relevant to the local region.