



Final Report
on
Responding to Climate Change:
A Workshop for Coral Reef Managers

Kaneohe Bay, Hawaii
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Section 1. Overview

The Hawaii Responding to Climate Change: A workshop for Coral Reef Managers (RtCC) was the fourth in a series of capacity-building presentations based on *A Reef Manager's Guide to Coral Bleaching (Manager's Guide)*, providing a response framework for mass bleaching and climate change. The workshop 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's (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's (GBRMPA) innovation** on practical, science-based management strategies for climate change;
- **The Hawaii Institute of Marine Biology's (HIMB) experience** with mass bleaching events in Hawaii and throughout the Pacific, including efforts to implement restoration strategies and a local action strategy to build a coral bleaching response plan;
- **The Global Socioeconomic Monitoring Initiative for Coastal Management (SocMon)**, an initiative supported by the CRCP and the Global Coral Reef Monitoring Network (GCRMN) that facilitates community-based socioeconomic monitoring of coral reef areas.
- **The World Wildlife Fund's (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;
- **Malama Maunalua's** communication strategies to increase community involvement in Hawaii and throughout the Pacific.

Funding was provided by the CRCP, NOAA International Program Office and PMNM. In-kind contributions by the CRCP, CRW, Malama Maunalua, HIMB, PMNM, and OHA supported staff time and materials. HIMB hosted a closing reception open to the public. The dedicated staff from the PMNM and HIMB was also essential to the workshop's success.

1.1 Goals

This effort aimed to present a capacity-building program around the *Reef Manager's Guide to Coral Bleaching*. The workshop was a refinement of the other presentations of these materials in Australia and American Samoa in

2007 and Florida Keys in 2008, but was unique in the sense that it focused primarily on Pacific reefs and integrated multiple knowledge systems as a key strategy for developing a coral bleaching response plan.

The training package aims to provide coral reef managers with a working understanding of:

- Impacts of climate change on coral reef ecosystems
- Strategies for responding to mass bleaching events
- Approaches for building resilience into coral reef management
- Tools managers may utilize to integrate multiple knowledge systems into bleaching response plans

The plan teams were strategic in organizing this particular workshop. The venue, Moku o Loe (Coconut Island – Hawaii Institute of Marine Biology), was strategically chosen to place participants on a semi-remote island located in Kaneohe Bay near one of Hawaii’s largest barrier reefs.

1.2 Participants

The workshop was mainly attended by coral reef management practitioners. Other attendees served in roles where they directly influence the design and implementation of coral reef management initiatives. Twenty-two participants were from the US: Hawaii and American Samoa. These US attendees were mostly from federal and state government agencies. Participants also came from four nations throughout the Pacific: Palau, Pohnpei, New Zealand, and independent Samoa. The five international attendees represented nonprofits and national government agencies.



The Hawaii workshop brought together a few of the same instructors from previous workshops, plus multiple new instructors who provided local and regional expertise on the subject matter. The following instructors are:

- Mark Eakin, PhD., NOAA Coral Reef Watch
- Britt Parker, MSc., NOAA Coral Reef Watch
- Christy Loper, PhD., NOAA Coral Reef Conservation Program
- Paul Jokiel, PhD., Hawaii Institute of Marine Biology
- Jean Kenyon, PhD., Hawaii Institute of Marine Biology
- Greta Aeby, PhD., Hawaii Institute of Marine Biology

- Kuulei Rodgers, PhD., Hawaii Institute of Marine Biology
- Risa Oram, NOAA National Marine Fisheries Service
- Mahina Duarte, NOAA Papahānaumokuākea Marine National Monument
- Janna Shackeroff, PhD., NOAA Papahānaumokuākea Marine National Monument
- Darren King, New Zealand National Institute of Water and Atmosphere
- Mehanaokala Hind, University of Hawaii Manoa, Center for Hawaiian Studies
- Chuck Birkeland, PhD., USGS
- Hi'ilei Kawelo, Paepae o He'eia

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 provided several additions that have been incorporated into the workshop syllabus.

Module 1 was a synthesis of the latest science about observed and expected climate change impacts on coral reef ecosystems. It also presented a strategy for responding to mass bleaching from the *Manager's Guide*. Participants also learned from Hawaii's current efforts in developing a bleaching response plan and began their own framework of bleaching response plans.

Modules 2-5 presented the components of a mass coral bleaching response: predicting mass bleaching; monitoring ecological and socio-economic impacts; and implementing management interventions. These components were brought together when participants worked in teams to develop draft bleaching response plans for their regions.

Module 6 was for communicating about mass bleaching to constituents, decision makers, cultural practitioners, local community organizations, community members and the general public. As part of this module, participants developed their own key messages on coral bleaching and climate change.

Module 7 included lectures, discussions, and a field exercise on factors that may confer resilience to climate change. Working in groups, participants drafted resilient MPAs for their region. The field exercise took the group to two reefs in Kaneohe Bay, where participants evaluated the expected resilience of the site and performed a bleaching survey.



In Module 8, participants finalized their bleaching response plans for their regions. This exercise synthesized the lessons learned in the other modules, and many participants considered this the best part of the workshop.



During this workshop we also introduced two activities outside the classroom; a sunrise activity looking at weather patterns and predictions and an evening activity preparing a meal of local fish and macro-algae prepared in a traditional Hawaiian manner by the participants.

(Photos courtesy of Darla White, RtCC Hawaii participant)

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 and Florida Key participants. World renowned HIMB scientists also added up-to-date information to address pacific reefs. The materials are now publicly available on the <http://coralreefwatch.noaa.gov/satellite/education/workshop/> .

The CRCP plans to present the next workshops in 2009 in Bonaire and Guam.

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. The majority of participants either agreed or strongly agreed that the traditional knowledge integration was useful and would help them in their jobs. Examples of comments included:

“I especially appreciated and benefitted from other pacific cultures attending and giving examples of their project challenges and successes as well as the opportunity to interact in a relaxed atmosphere.”

“A wonderful, informative, stimulating and practically useful experience. The presenters were excellent and the course materials provided are probably the best and most useful I have received in any

forum. The venue couldn't have been better. Having a captive audience on an island led to many unexpected connections which probably would not have occurred otherwise. ”

A number of participants made suggestions to improve the workshop and these changes will be incorporated into future trainings. Most of these comments focused time management, and the need to allow more time for the activity on developing a bleaching response plan. Discussions and recommendations will be currently being developed and will be provided for the planning of future workshops.