3rd Global Coral Bleaching Event
Overview and US Response

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Talk Overview

• 3rd Global Coral Reef Bleaching Event Overview
• Examples of US Response
• Updating the Reef Manager’s Guide to Coral Bleaching
Coral Reef Watch
5-km Satellite-Based Products

Coral – specific

Bleaching Alert Area

http://coralreefwatch.noaa.gov
2014: Warmest Year Ever
Pacific Dominated by “The Blob”

NOAA Coral Reef Watch Annual Mean SST Anomaly 2014

www.coralreefwatch.noaa.gov
Global Bleaching: Last Half of 2014

NOAA Coral Reef Watch Annual Maximum Satellite Coral Bleaching Alert Area 2014

- No Stress
- Watch
- Warning
- Alert Level 1
- Alert Level 2

Map showing areas of concern for coral bleaching in 2014, with regions highlighted in red and yellow indicating higher levels of stress.

Florida Department of Environmental Protection
Coral Reef Conservation Program
SEAFAN BleachWatch Program
Current Conditions Report #20140902
September 2, 2014

Summary: Based on climate predictions and field observations, the threat for mass coral bleaching in southeast Florida, between Miami-Dade and Martin counties, is currently HIGH.

Environmental Monitoring

The latest CRW experimental 5 kilometer (km) Daily Coral Bleaching Alert Area (Figure 1) indicates that southeast Florida is presently experiencing a moderate to high level of thermal stress, with an Alert Level 1 or Bleaching Warning present throughout the region. This indicates that bleaching is likely in southeast Florida and additional alerts are possible if current conditions continue or worsen.

NOAA’s Bleaching Hotspot Map compares current SST to the maximum monthly mean, which is the average temperature during the
Global Bleaching: 2016 to date

NOAA Coral Reef Watch Maximum Satellite Coral Bleaching Alert Area 1Jan.-23Oct 2016

Western India  Taiwan  Vietnam  Marianas  Kiribati
Seychelles Maldives  Philippines  New Caledonia  Palau  French Polynesia
Kenya/Tanzania  Réunion  Thailand  Fiji  Flower Gardens
Mozambique  Mauritius  Indonesia  Micronesia  Yucatan
Madagascar  E. Australia  Japan  Marshall Is.  Saba
Bleaching Risk Through February 2017

- La Niña likely, but continued risk of bleaching
- Bleaching conditions likely in eastern Micronesia, Marshall Is
- Potential bleaching conditions in PNG, Solomon Is, Samoa
- Bleaching conditions likely in eastern Caribbean

2016 Oct 25 NOAA Coral Reef Watch 60% Probability Coral Bleaching Thermal Stress for Nov–Feb 2017
Experimental, v3.0, CFSv2–based, 28–member Ensemble Forecast
US States, Territories and Areas with Coral Reef Resources
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American Samoa Assessment and Rapid Reef Response Plan

Preparedness for Predicted Bleaching for 2016-2017 season:

- Established 10 long term bleaching monitoring sites
- Updating bleaching monitoring protocols and training all relevant interagency staff
- Coordinating monitoring sites in each agency
- Creating Education and Outreach Materials (PSAs, village outreach materials, etc)
- Drafting possible Management options (short term closures of regions or fish species, etc)
2015 Hawai‘i Bleaching Event

• 40 sites surveyed across shallow and deep reefs in October 2015

• 38-92% of all coral colonies partially or fully bleached

• Northern sites had worse bleaching and generally more degraded water quality

• Just completed re-surveys of these sites to track recovery

• Bleaching and resilience assessment results feeding directly into State and community management initiatives
1. In 2014 and 2015, the Hawaiian Archipelago suffered the consequences of extreme coral bleaching spurred by high ocean temperatures.

2. Coral Bleaching is a stress response where the coral animal will expel dinoflagellates called zooxanthellae that live within their tissue.

3. Coral mortality caused by the 2015 event was estimated at 50% in the West Hawaii region, which holds some of the state’s richest coral reefs and unfortunately also experienced the highest sustained ocean temperatures.

4. DAR’s work to identify effective management actions to promote coral recovery following these events began by gathering information including a global survey to collect opinions from over 80 coral bleaching scientists and a review of all existing scientific literature—a synthesis of over 200 articles.

5. Most recently, a workshop was convened on August 11, 2016 with a total of 44 Hawaii-based scientists and managers to apply a Hawaii lens to the information previously gathered as well as identify management recommendations in four priority locations.

These areas were chosen because they were exposed to the most severe thermal stress over the 2014/2015 coral bleaching event.

6. THE TOP RATED MANAGEMENT ACTIONS FROM THE WORKSHOP:
   1. Establish a network of permanent, fully protected, no-take Marine Protected Areas (MPAs)
   2. Reduce land-based stressors
   3. Effectively manage herbivore populations

7. Development of a decision-making process of where and how DAR implement management actions was a clear next step.

8. DAR is committed to timely implementation of management actions to promote the recovery of coral reefs severely affected by the most recent bleaching event.
TWELVE MOST WANTED HAWAIIAN CORALS

- Montipora dimitata
- Porites divergens
- Pocillopora rosea
- Fungia granulosa
- Cyphastrea agassizi
- Porites hawaiiensis
- Acropora tenuis
- Siderastrea siderea
- Sinularia polychroa
Update Bleaching Response Guidance

HISTORY: Southeast Asia study of socio-economic and ecological impacts in 2010 & 2013/14

VISION:
• A Reef Tourism Operator’s Guide for Responding to Coral Bleaching Events (printable)
• A Reef Manager’s Guide for Responding to Coral Bleaching Events (printable)
• Online updates to TNC’s Reef Resilience Toolkit

NEED: Support, expertise, and development of graphics and effective communication tools.

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Dive Operator’s Guide to CORAL BLEACHING

Paul Marshall and Heidi Schuttenberg

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Marine Park Authority

Reef Ecologic
For a better planet
Thank you

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