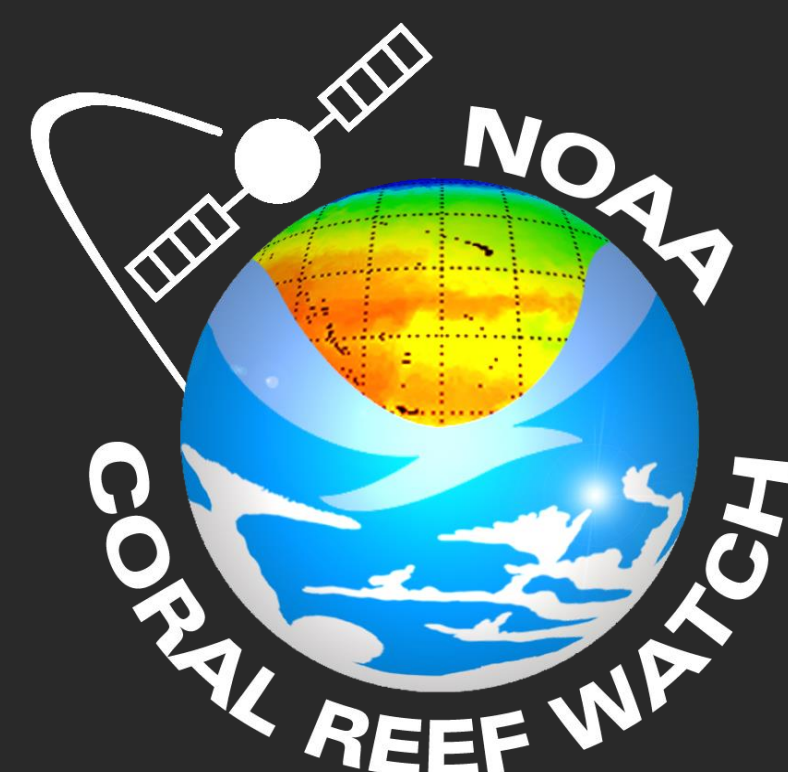


Application of NOAA Coral Reef Watch's Near-Real-Time Satellite and Model-Based Decision Support System to Local Coral Reef Management

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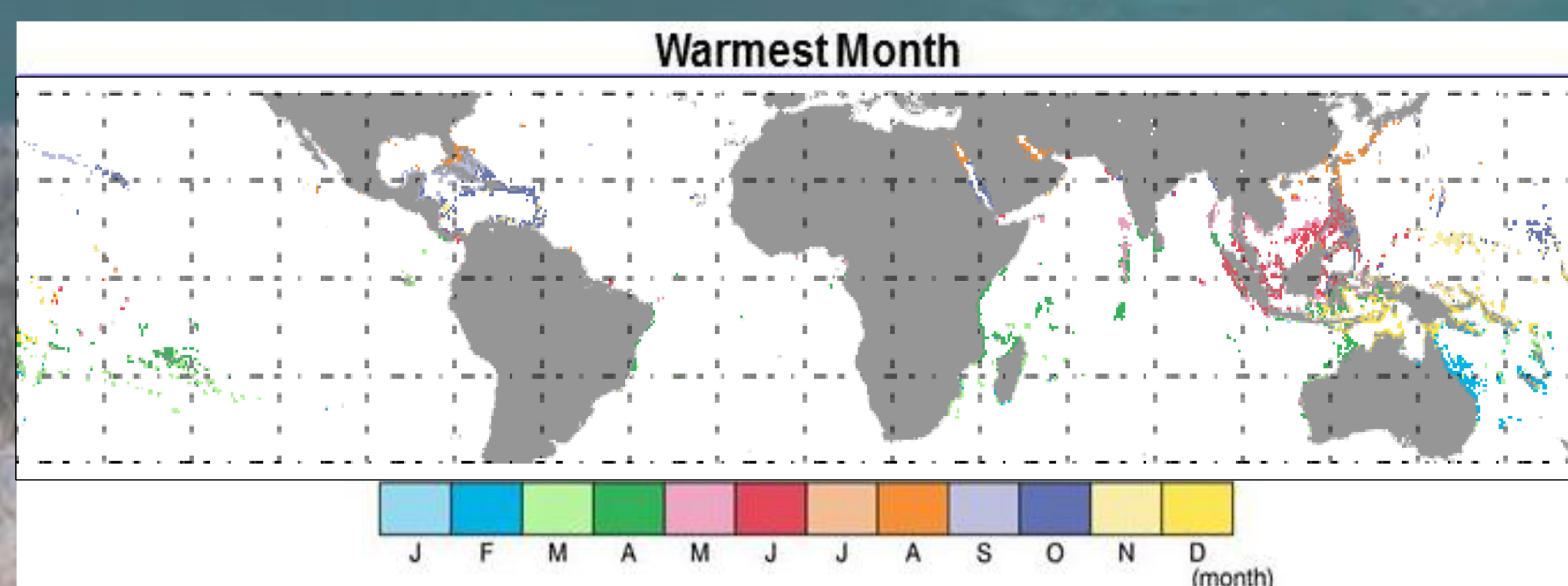
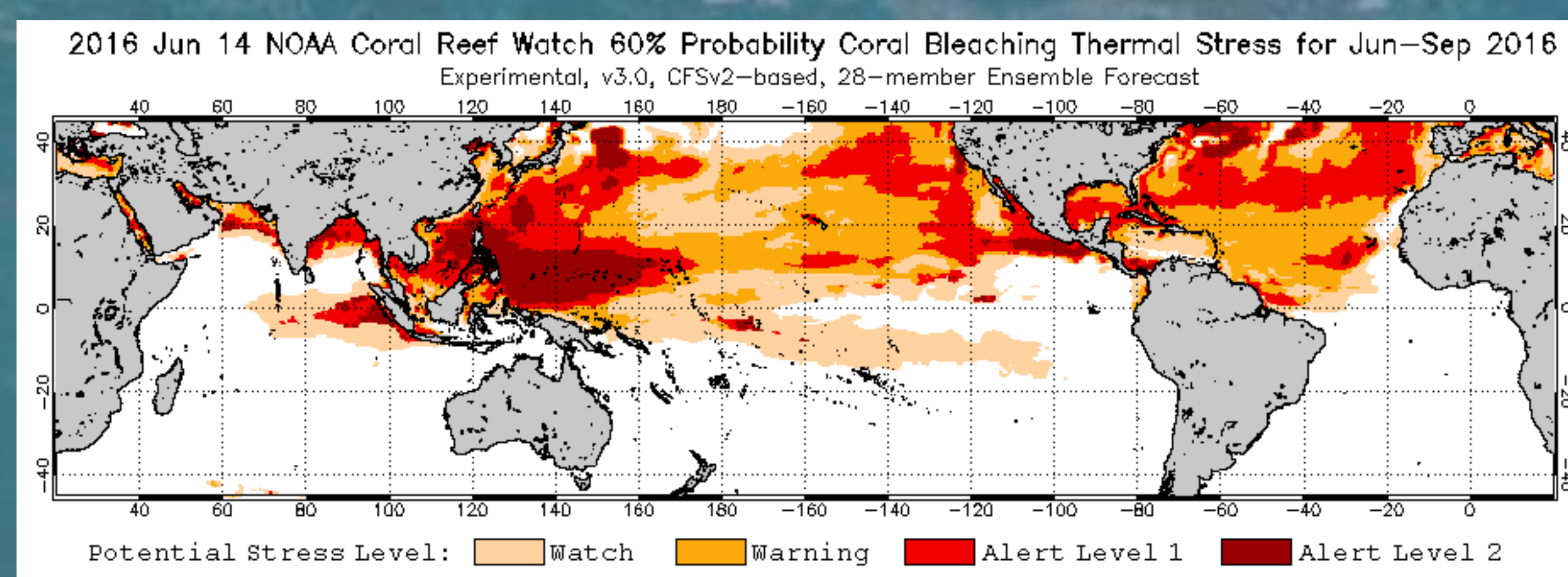
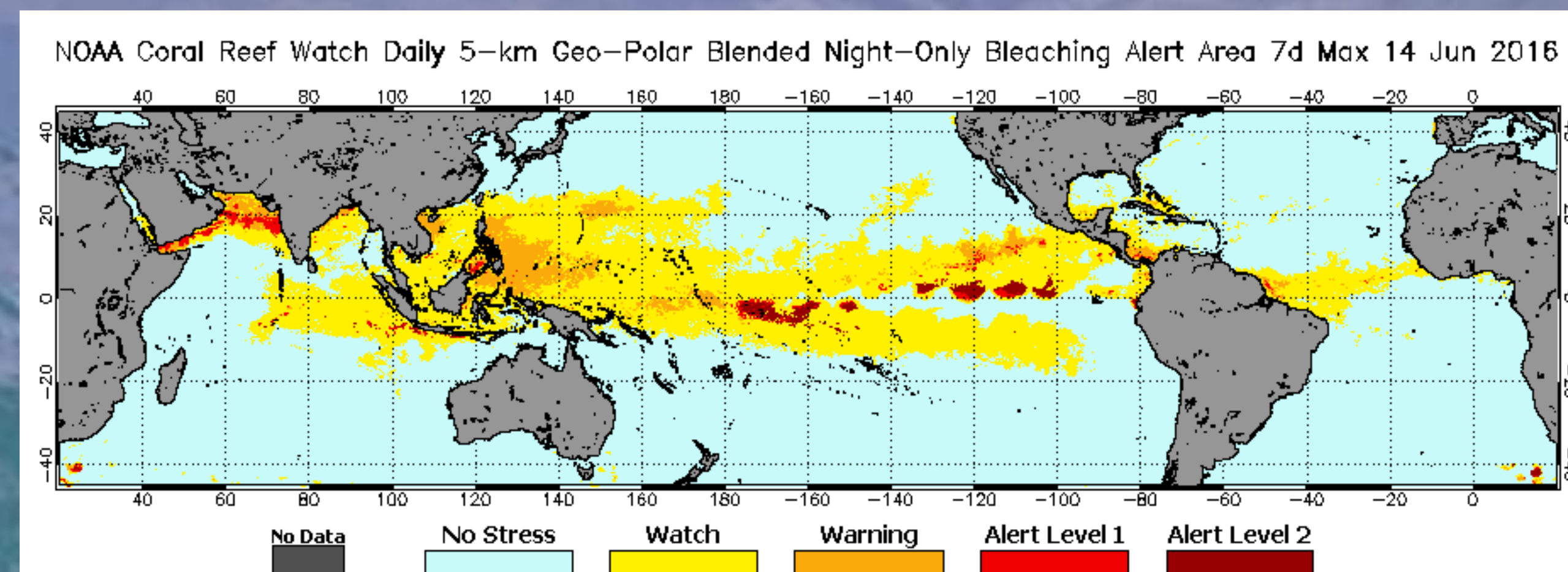
NOAA's Coral Reef Watch (CRW) uses satellite, in-situ, and modeled data to deliver online a global decision support system (DSS) that helps managers prepare for and respond to coral reef environmental stress. Its near-real-time monitoring component includes satellite products derived from sea surface temperature, light, wind, and ocean color data. Its near-term forecast component includes outlooks of reef conditions weeks to months in advance. CRW's DSS is the only global early-warning system for the reef environment. It assists national and international environmental impact monitoring; bleaching risk assessments; and preparation/implementation of timely, effective, and protective management responses and long-term conservation and adaptation actions. CRW's alerts of mass bleaching, including the ongoing global bleaching event that started mid-2014, allow managers to communicate quickly with decision makers and the public to reduce local stressors; this includes closing major dive and fishing areas. CRW also incorporates historical data and climate model predictions to identify regions potentially resilient to climate change, aiding long-term marine protected area planning and establishment. This poster highlights some key local and regional management applications of CRW's DSS.

Guide timely local & regional management responses to acute coral bleaching stress

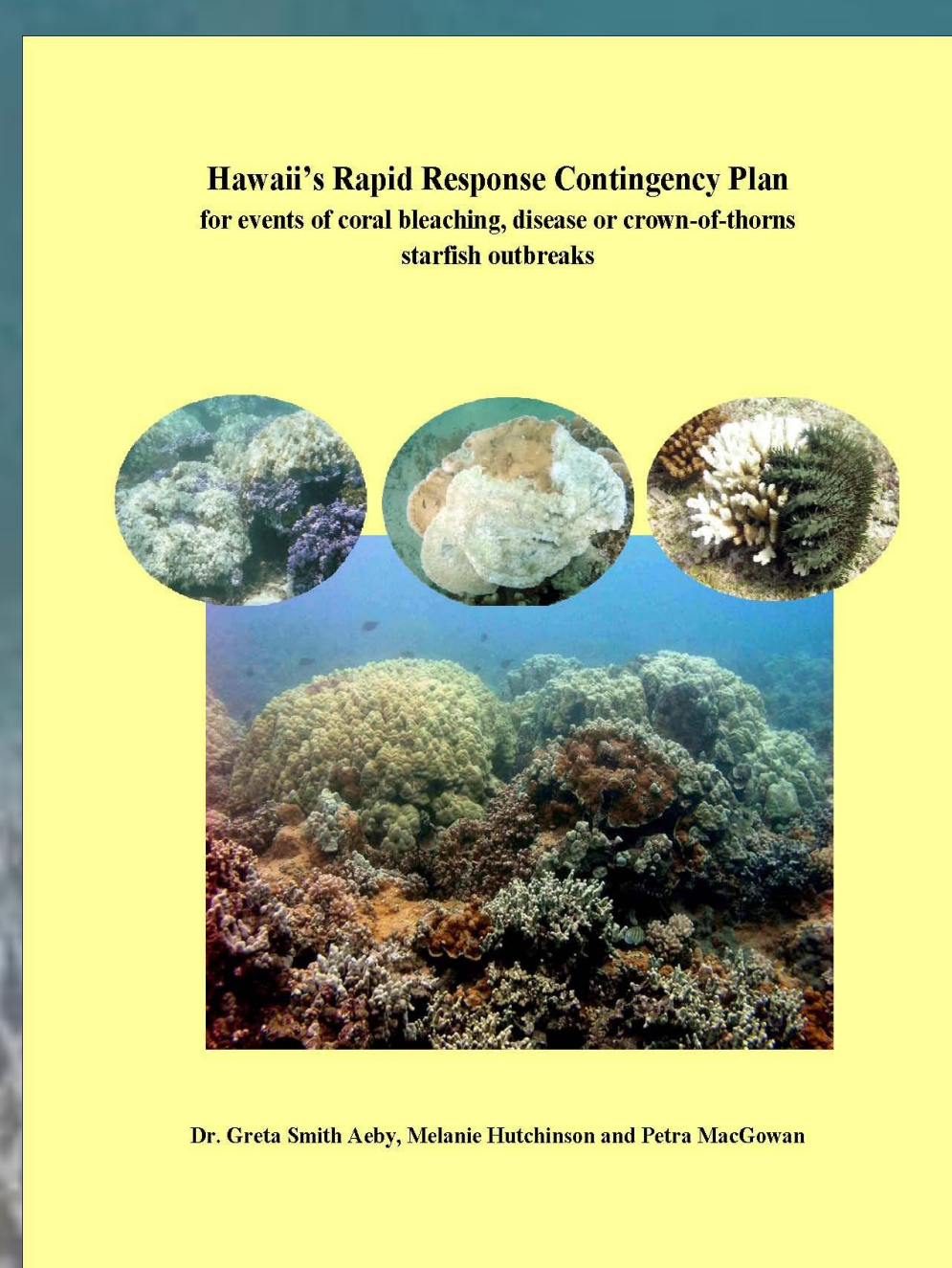


Credit (including background image):
XL Catlin Seaview Survey

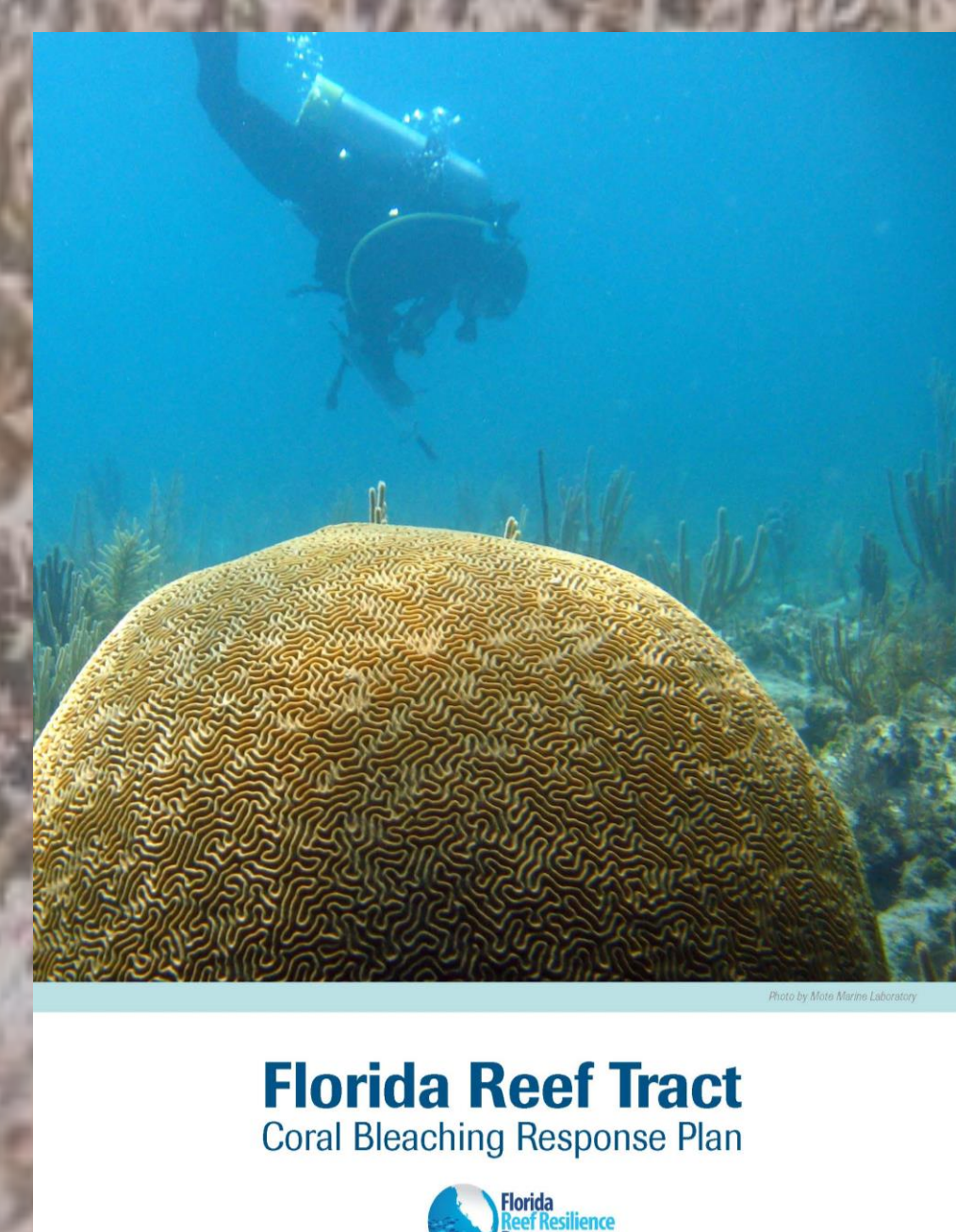
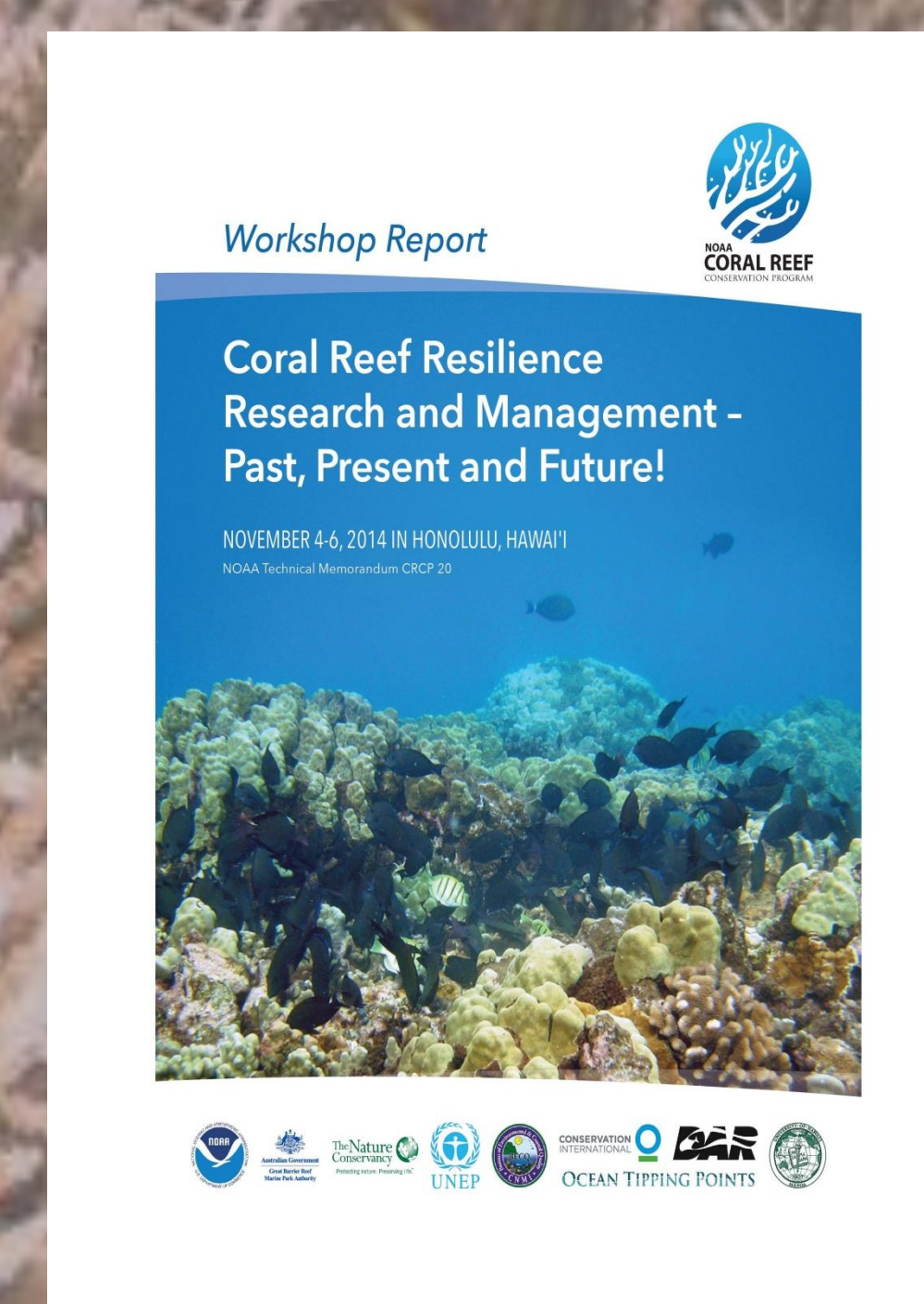
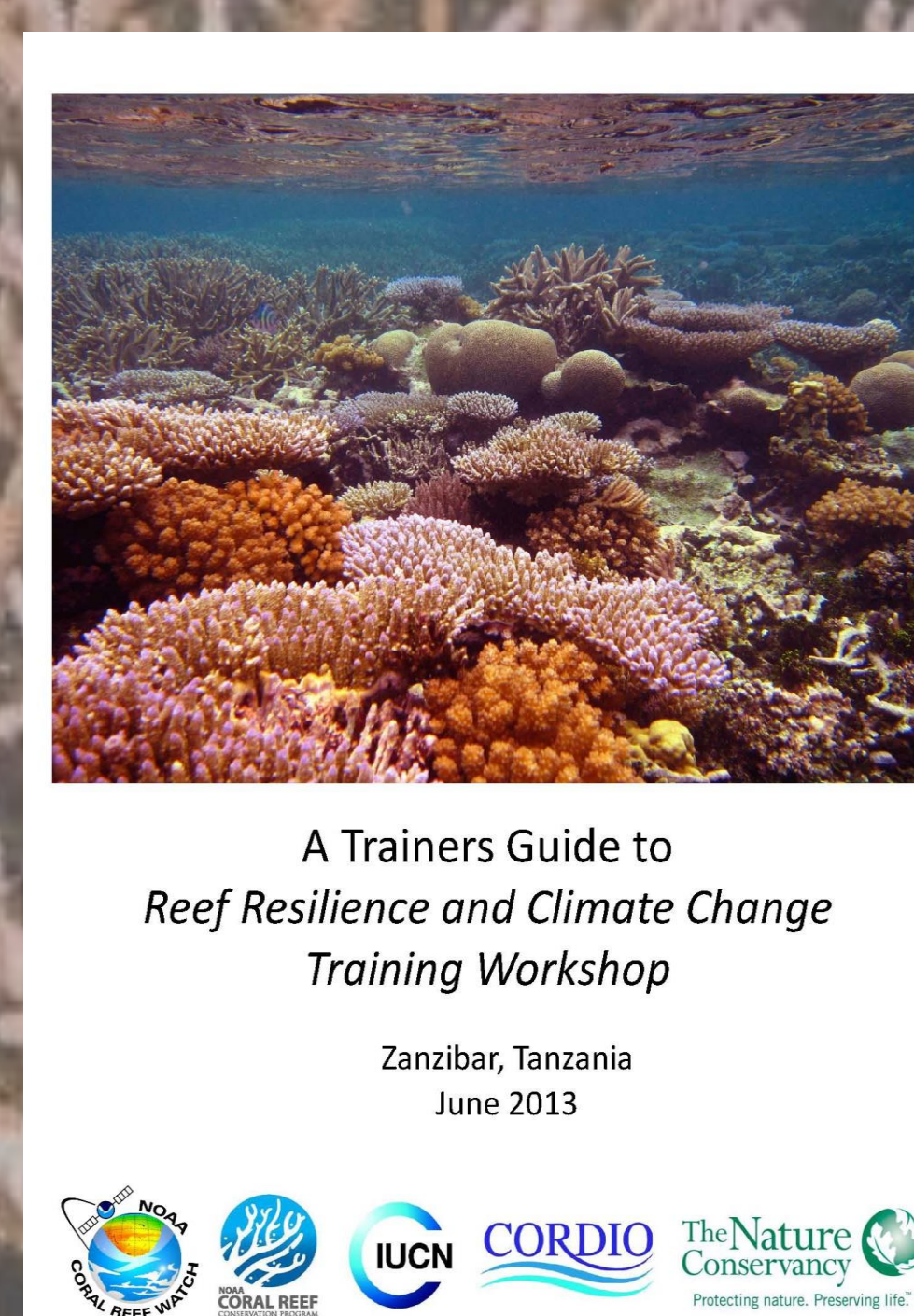
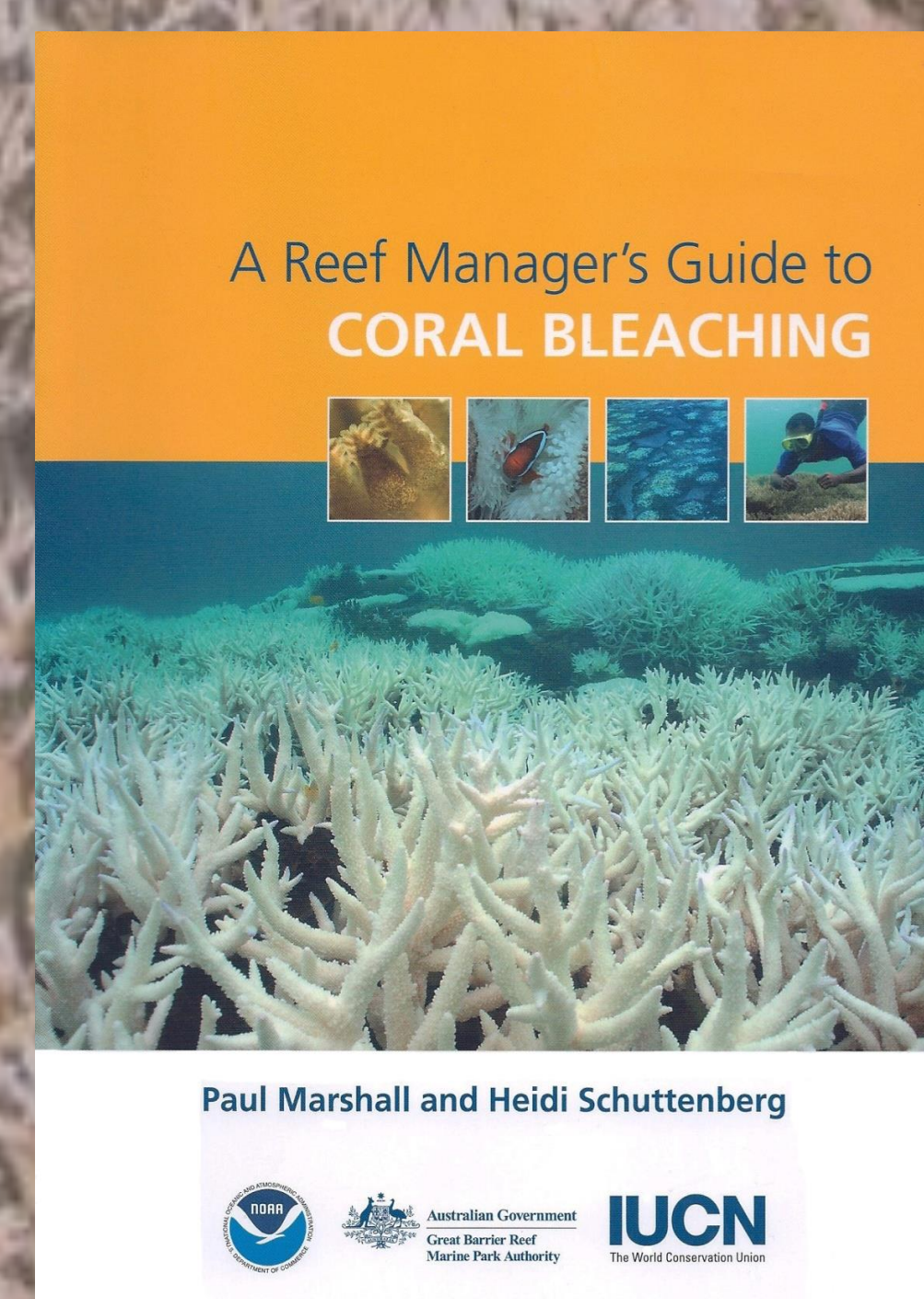
Provide near-real-time imagery, seasonal outlooks & historical data for effective management planning and resource allocation



Contribute to local & regional coral bleaching/disease response plans



Contribute to reef resilience capacity building, responding to climate change training, and MPA design



Assist comprehensive risk assessments of climate impacts to coral ecosystems



CRW directly engages local stakeholders and users for product development and implementation. This ensures CRW can provide a cutting-edge decision support system to address management needs in an era of changing climate conditions.

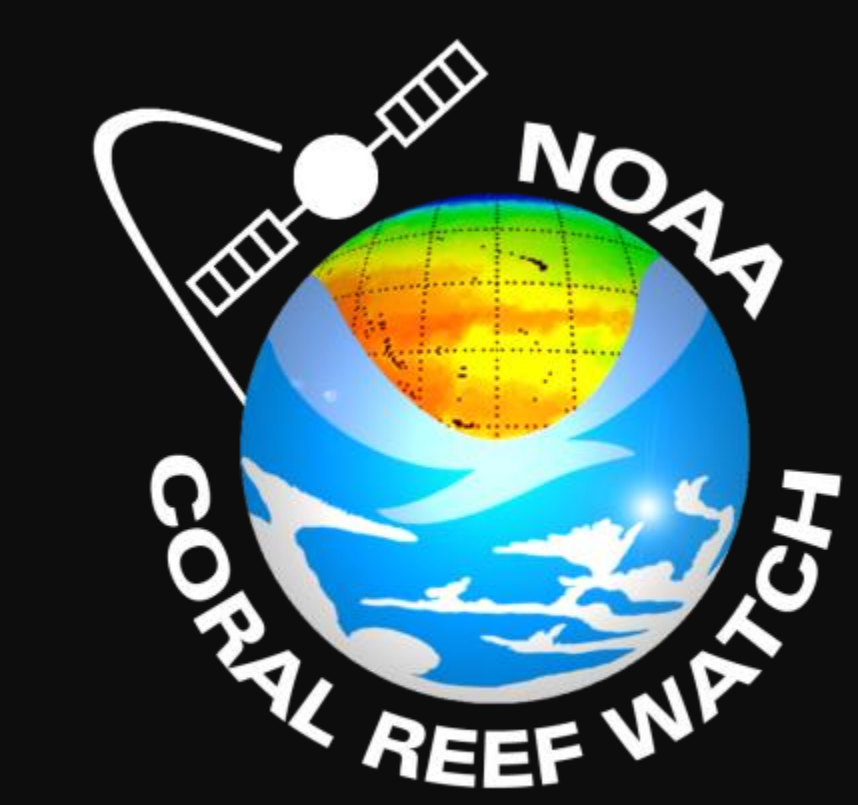
<https://coralreefwatch.noaa.gov>



Coral Reef Watch



@CoralReefWatch



Use of NOAA Coral Reef Watch Ecoforecasts by Resource Managers During the 2014-2017 Global Coral Bleaching Event

C. Mark Eakin¹, Gang Liu^{1,2}, Jacqueline De La Cour^{1,2}, Erick F. Geiger^{1,2}, William J. Skirving^{1,3}, Scott F. Heron^{1,3}, Denise A. Devotta^{1,4}, Andrea M. Gomez⁵, Benjamin L. Marsh^{1,3}, Kyle V. Tirak^{1,4}

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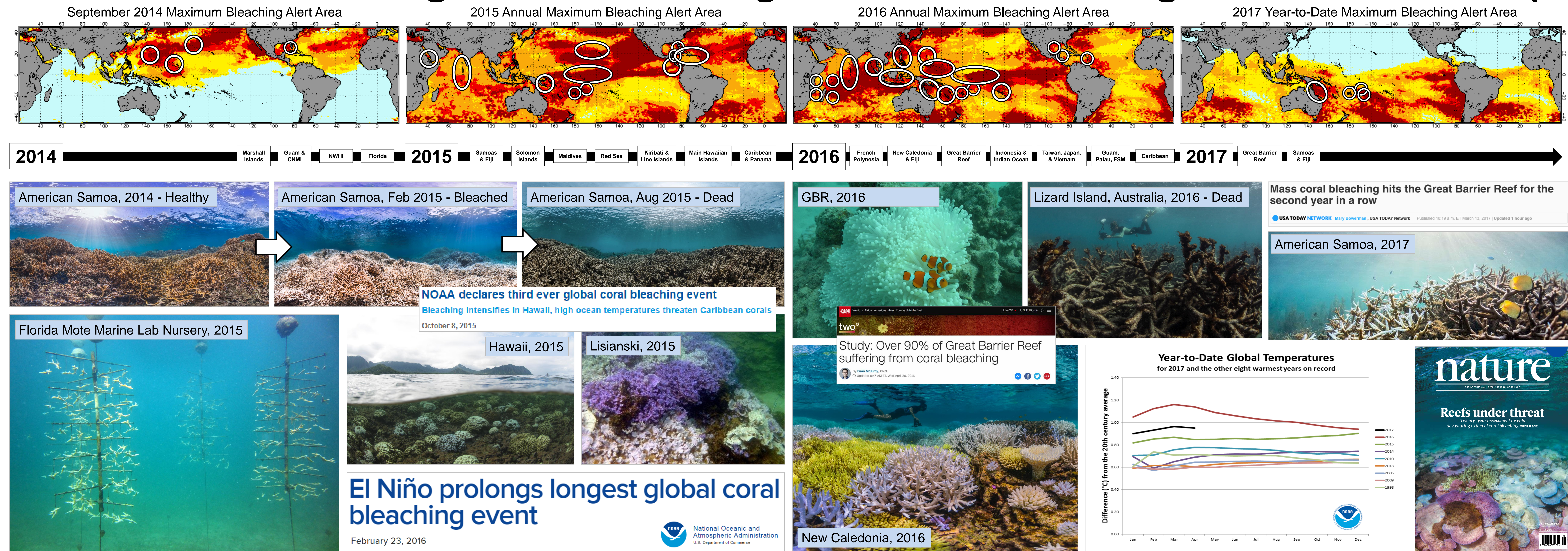
Poster PA21B-0979

Since 1997, NOAA's Coral Reef Watch (CRW) has used near real-time satellite monitoring to provide ecological nowcasting of the ocean heat stress that can cause mass coral bleaching. While this benefitted coral reef managers, scientists, and other stakeholders, our users desired longer-range forecasts. In 2012, CRW launched its probabilistic, global Four-Month Coral Bleaching Outlook system based on NOAA's operational Climate Forecast System (now CFSv2). The Outlook proved accurate in local bleaching events over the following two years. Subsequently, June 2014-May 2017 brought the longest, most widespread, and probably most damaging coral bleaching event on record. The Outlook system proved critical in helping users worldwide prepare for and respond to bleaching – including actions to reduce damage from these intense marine heatwaves.

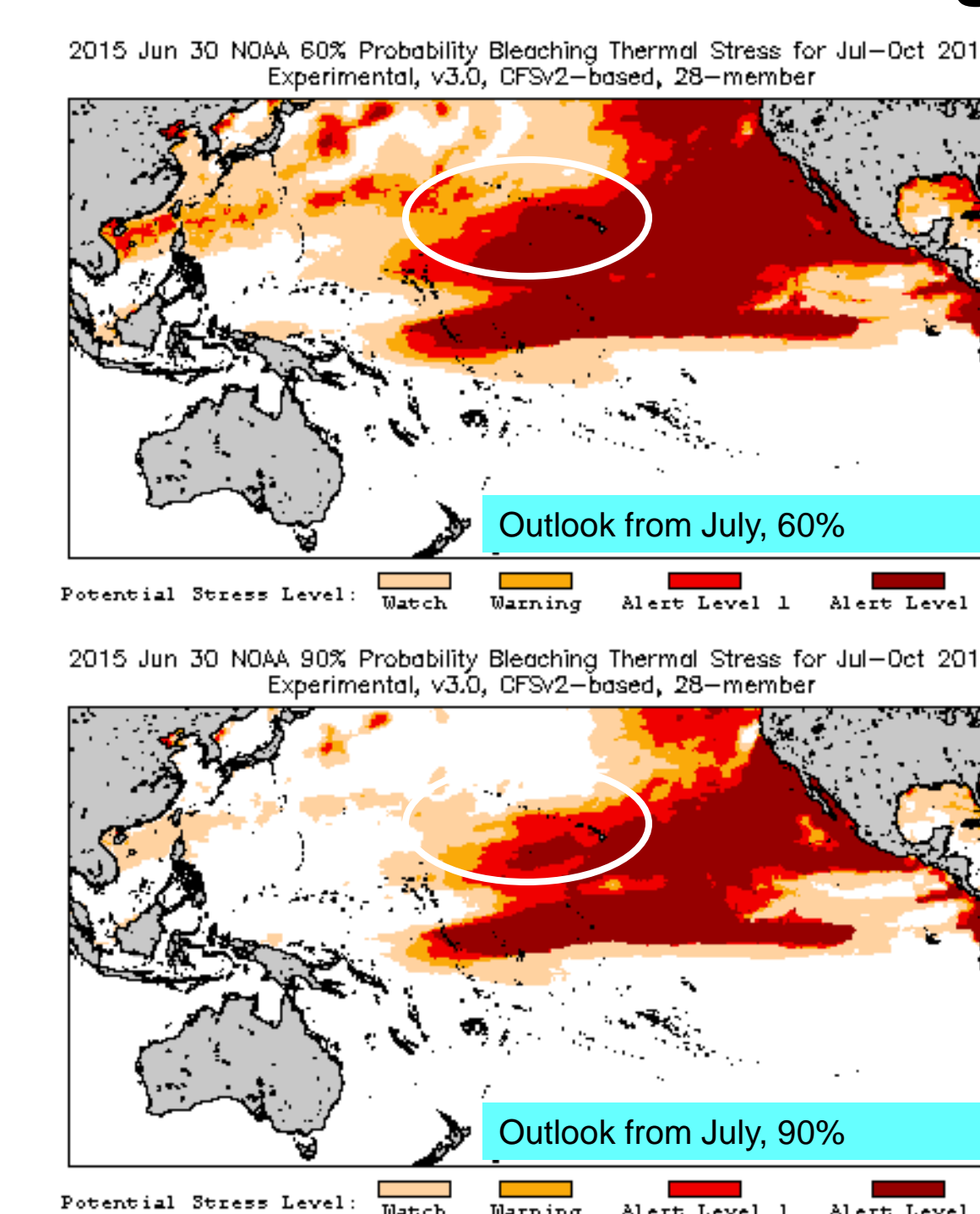
Responses to CRW's Outlooks prompted:

- 1) Hawaii “Eyes of the Reef” volunteer network organized first state-wide Bleach Watch “Bleachapalooza” to monitor bleaching across the state.
- 2) Hawaii scientists collected specimens of rare corals to preserve them in onshore nurseries. One of these species is now locally extinct on Hawaii’s reefs, and these rescued specimens are being prepared for re-introduction.
- 3) NOAA mounted a special cruise to monitor these remote coral reefs. The record heat stress killed over 98% of the corals at Jarvis Island.
- 4) In 2016, prior to peak bleaching, Thailand used CRW's prediction of severe heat stress to close ten heavily used coral reefs to tourism as a way to reduce further stress to the reefs.

2014-2017 Global Bleaching Event: The Longest Global Bleaching Event on Record (3 years)



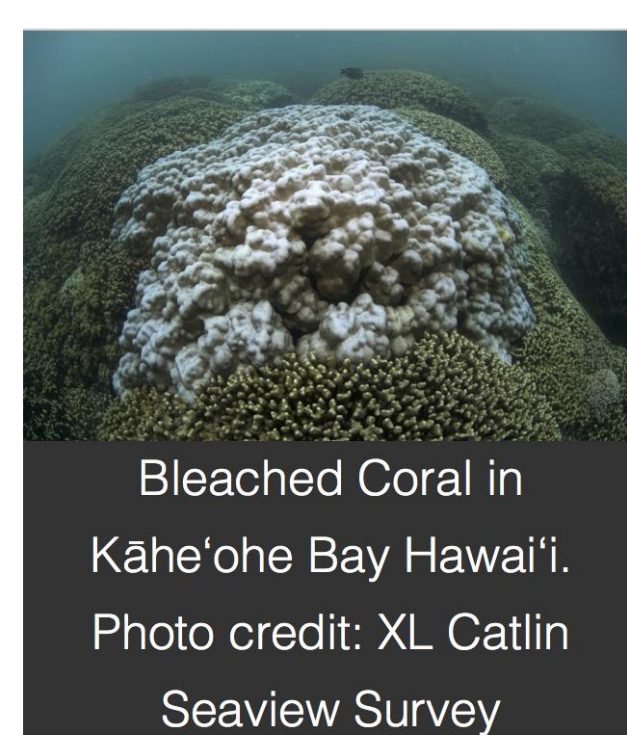
2015 4-Month Bleaching Outlook: Hawai'i



1. Maui Women Launch Statewide Bleachapalooza to Combat Coral Bleaching

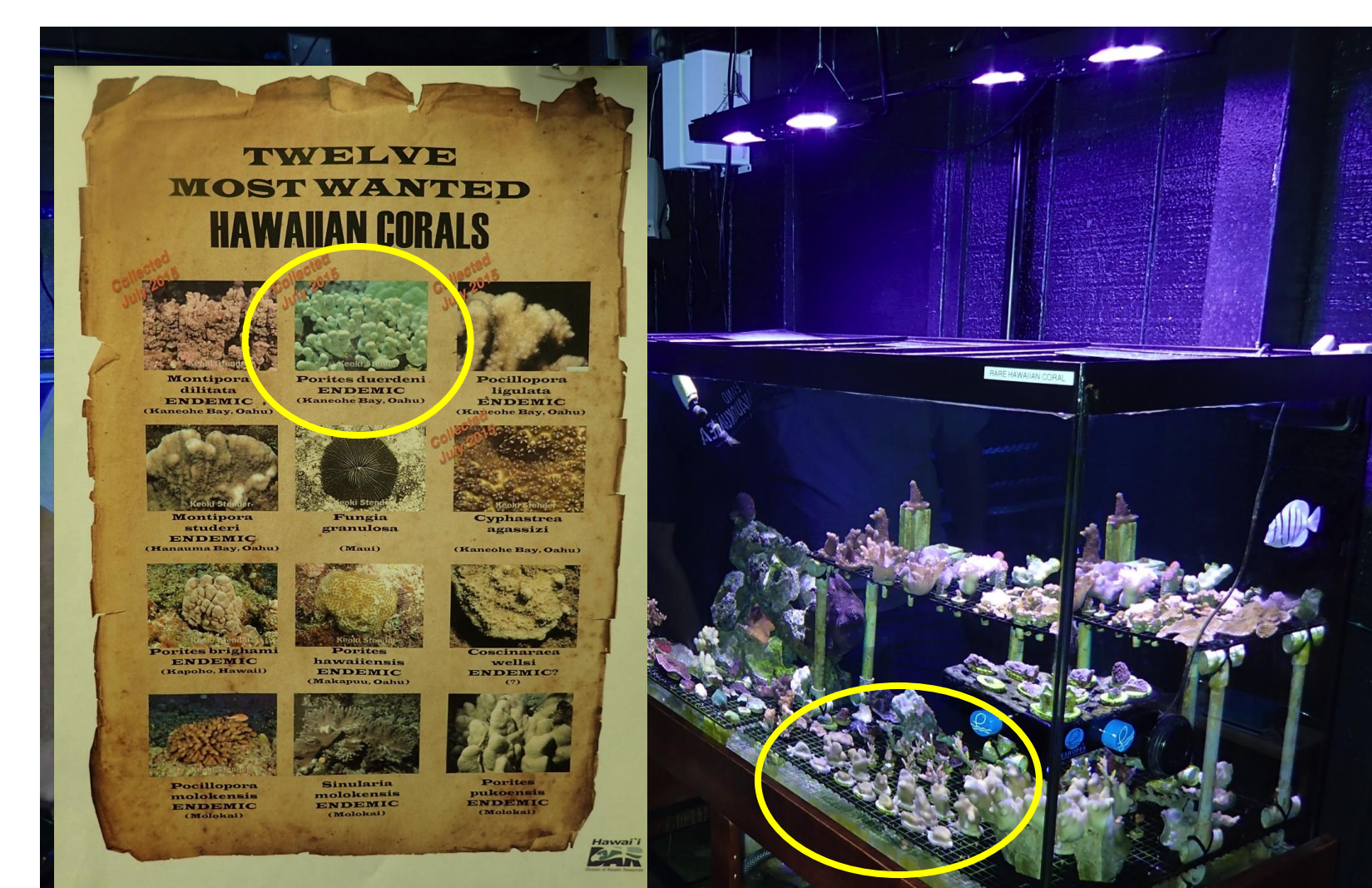
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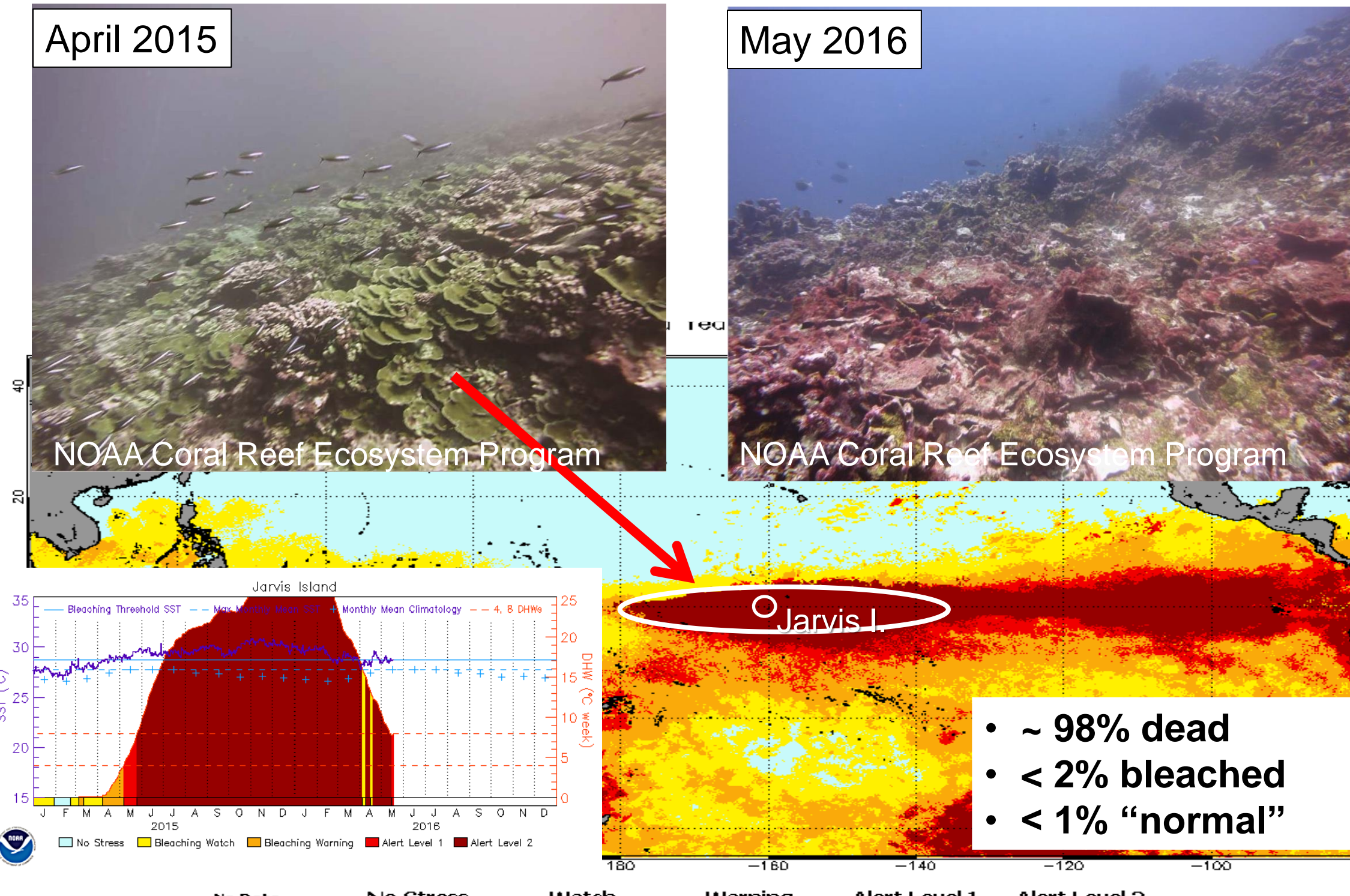


Bleached Coral in Kahe'one Bay Hawai'i.
Photo credit: XL Catlin Seaview Survey

2. Reduce Local Stressors 2015 Hawai'i Division of Aquatic Resources Develops Rare Coral "Ark"



3. Record 12 Months of Continuous Heat Stress



4. Thailand Closes Dive Sites in Response to Bleaching Outlook – prior to event peak

