

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

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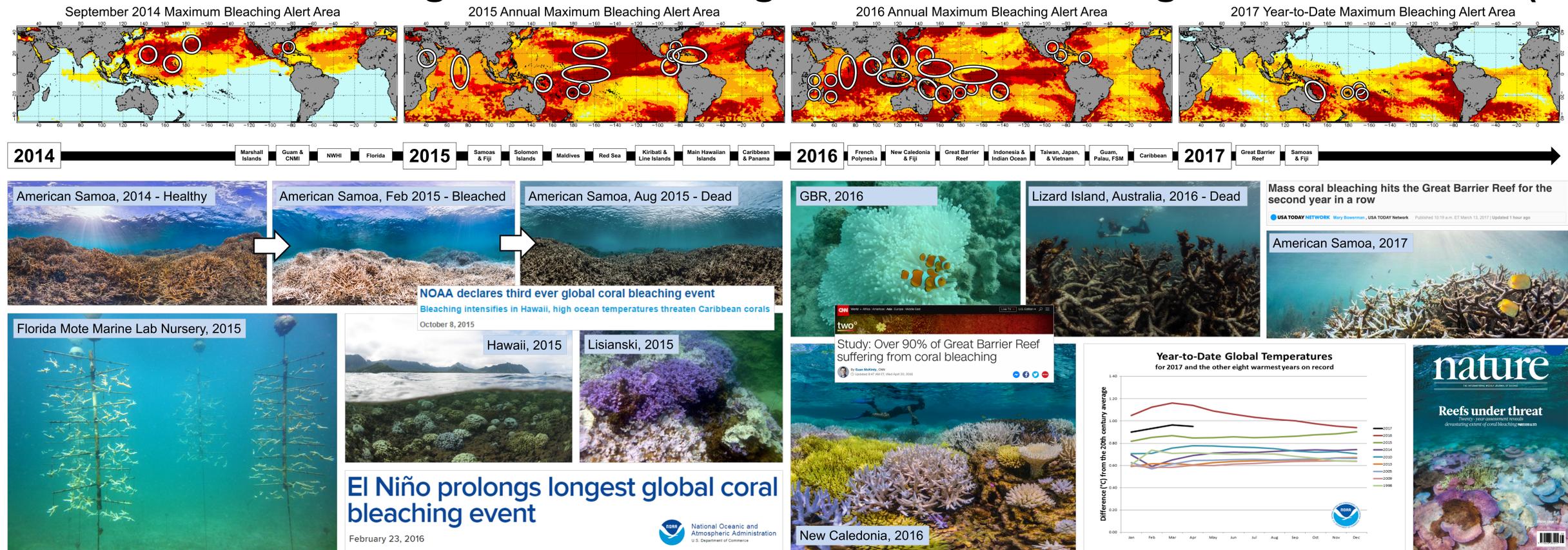
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Since 1997, NOAA's Coral Reef Watch (CRW) has used near real-time satellite monitoring to provide ecological nowcasting of the ocean heat stress that can cause mass coral bleaching. While this benefitted coral reef managers, scientists, and other stakeholders, 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.

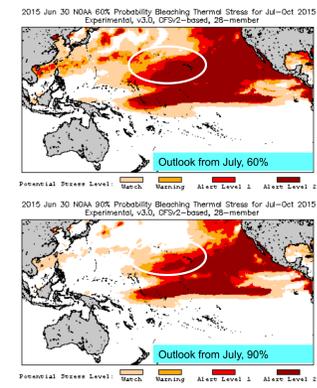
Responses to CRW's Outlooks prompted:

- 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.

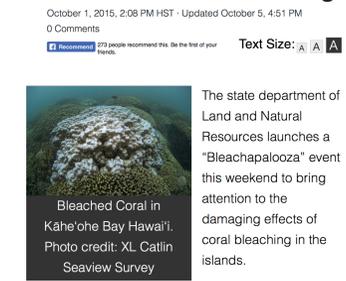
2014-2017 Global Bleaching Event: The Longest Global Bleaching Event on Record (3 years)



2015 4-Month Bleaching Outlook: Hawai'i



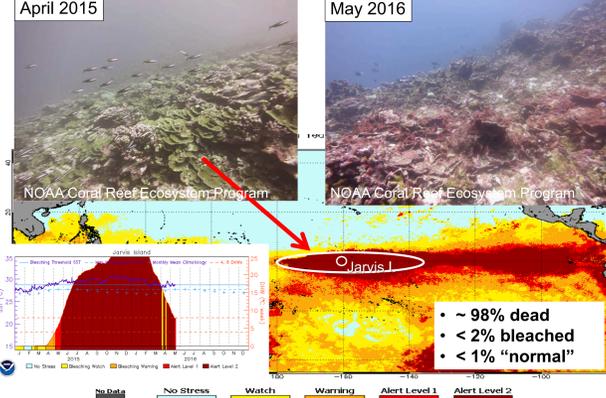
1. Maui Women Launch Statewide Bleachapalooza to Combat Coral Bleaching



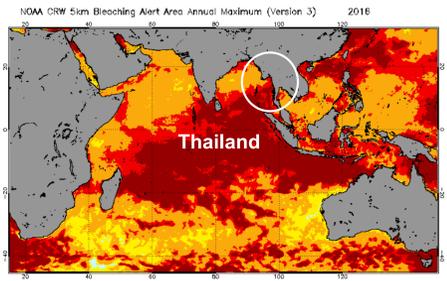
2. Reduce Local Stressors 2015 Hawai'i Division of Aquatic Resources Develops Rare Coral "Ark"



3. Record 12 Months of Continuous Heat Stress



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



<http://coralreefwatch.noaa.gov>
The only satellite-based system available for U.S. and global coral reef management

