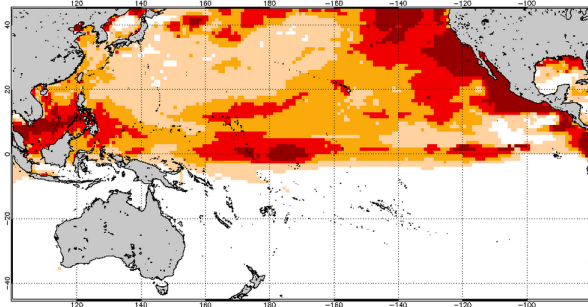




## Report Summary:

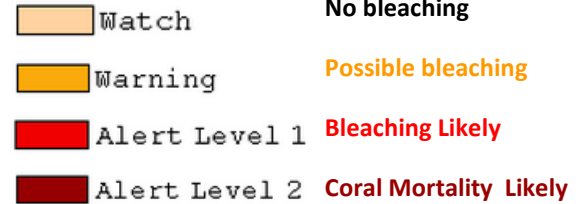
In Spring (Jan—May) 2014, 24 reports were received through the Eyes of the Reef Network. Three Rapid Assessments were initiated. A coral disease outbreak continues to affect the north shore of Kauai. A disease was identified affecting collector sea urchins on Oahu.

## 2014 NOAA Coral Reef Watch Bleaching Outlook



Experimental NOAA CRW Bleaching Outlook for Jun—Sept 2014 (<http://coralreefwatch.noaa.gov/satellite/composites/index.php>)

### NOAA Bleaching Intensity Levels



The experimental NOAA coral bleaching outlook map for 2014 indicates likely coral bleaching for the Main Hawaiian Islands (MHI). The peak season for bleaching in the Pacific Ocean basin is from July – September. Virtual offshore measuring stations indicate that sea surface temperatures did not surpass the maximum monthly mean at any MHI locations during in Spring 2014.

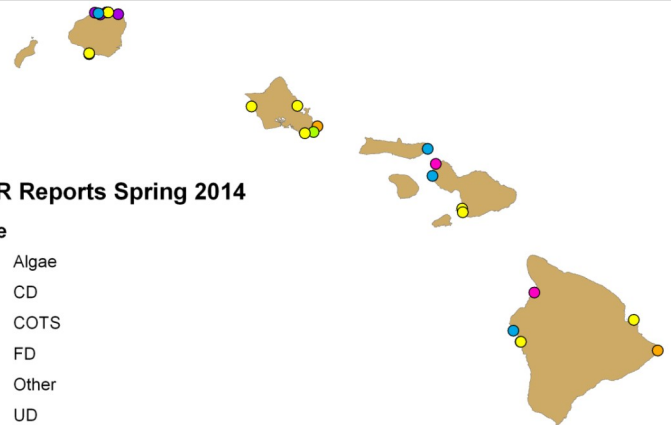
## Spring 2014 EOR Report Summary

### Coral Bleaching

No coral bleaching EOR reports were received in Spring 2014.

### Coral Disease

There were a total of six EOR Network reports of coral disease in Spring 2014. All the reports were from the north shore of Kauai in response to the ongoing Black Band Disease outbreak. No Rapid Assessments were initiated but additional field work is planned for Summer 2014. A DAR-led Management Response was formed in January 2014 to review new data and evaluate management actions. A team website was also created. For more information please visit: [www.dlnr.hawaii.gov/reefresponse](http://www.dlnr.hawaii.gov/reefresponse).



EOR Reports Spring 2014

- Type
- Algae
  - CD
  - COTS
  - FD
  - Other
  - UD

EOR Reports received in Spring 2014 for coral disease, bleaching, fish disease and mortality, and invasive species and miscellaneous reports. CD = coral disease, FD = fish disease, UD = urchin disease

	Total Number of Reports Received in Spring 2014
<b>Coral Bleaching</b>	0
<b>Coral Disease</b>	6
<b>COTS</b>	2
<b>Fish Mortality</b>	4
<b>Other</b>	16

### Other Reports

There were a total of four EOR Network reports of fish (all lanternfish) and 11 sea urchin (mostly collector sea urchin) mortalities in Spring 2014. A Management Response Team was assembled by DAR in both cases. Three Rapid Assessments were conducted as a result of these reports. It was determined that the cause of death for the lanternfish was rapid and severe trauma. The cause of death for the collector sea urchins was a disease, possibly a virus. DAR continues to monitor affected areas.



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# Reef Response

## Coral Bleaching Current Conditions – Spring 2014

Rapid Assessment of Coral Bleaching, Disease, COTS, and Marine Life Mortality events



### Bleaching Conditions Summary:

NOAA Coral Reef Watch indicated no coral bleaching alerts in the MHI in Spring (Jan—May) 2014. NOAA outlook maps predicts likely bleaching this season. The EOR network received no reports of bleaching in June 2014. No Rapid Assessments were initiated in response to bleaching reports.

### NOAA Bleaching Intensity Levels

- Watch
- No bleaching**
- Warning
- Possible bleaching**
- Alert Level 1
- Bleaching Likely**
- Alert Level 2
- Coral Mortality Likely**

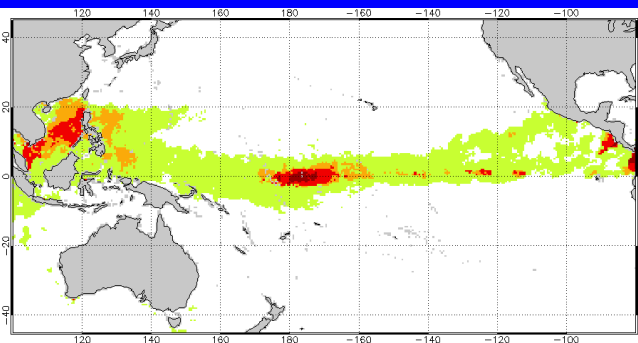


Figure 1. Current NOAA CRW Bleaching Alert Area 6/5/2014  
<http://coralreefwatch.noaa.gov/satellite/baa.php>

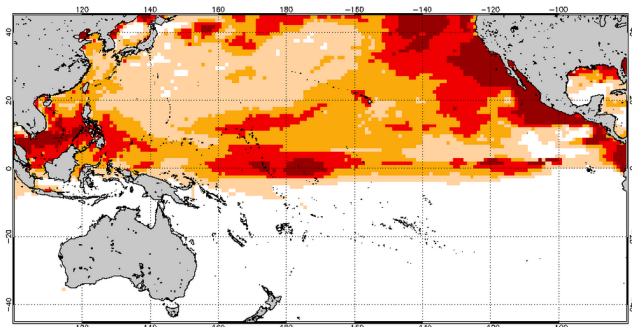


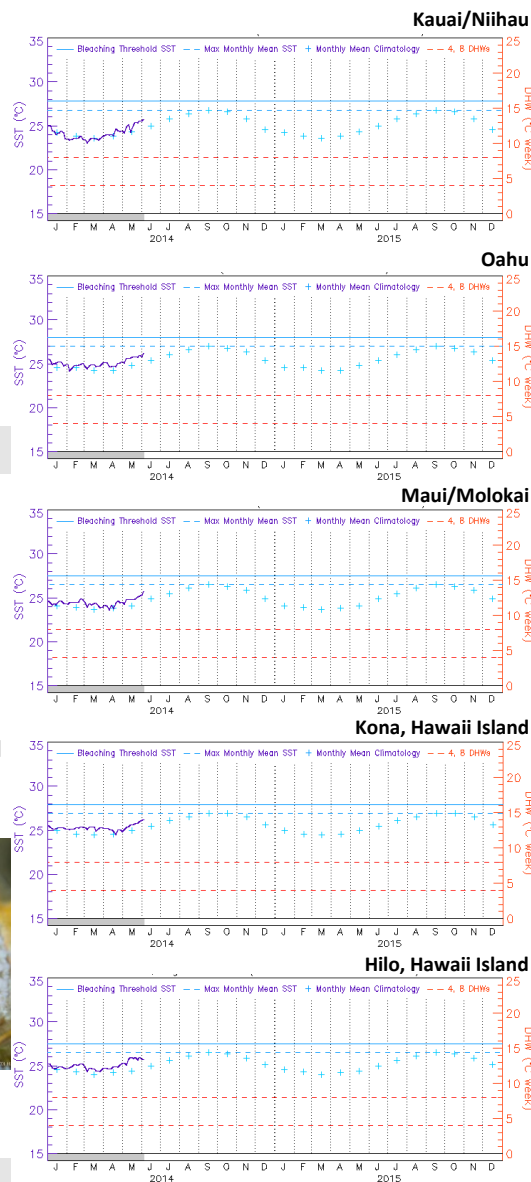
Figure 2. NOAA CRW Bleaching Outlook for Jun—Sept 2014  
<http://coralreefwatch.noaa.gov/satellite/composites/index.php>

### NOAA Potential Bleaching Intensity Levels

- No Stress
- No bleaching**
- Bleaching Watch
- No bleaching**
- Bleaching Warning
- Possible bleaching**
- Alert Level 1
- Bleaching Likely**
- Alert Level 2
- Coral Mortality Likely**

Fig. 3. NOAA Virtual Station Data Max. Monthly Mean Sea Surface Temp 1/1/14 — 6/5/14

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



## Spring 2014 NOAA Coral Reef Watch Summary

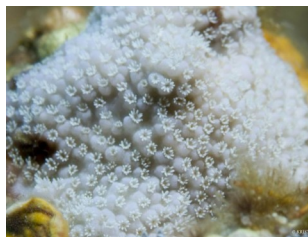
A NOAA Coral Reef Watch “Bleaching Watch” is issued when sea surface temperatures (SST) in those areas may be causing low-level thermal stress to corals. The alerts are scaled based on the intensity of the bleaching risk. These products generally tend to overestimate bleaching conditions. Currently, there are no areas within the Main Hawaiian Islands (MHI) above a “watch” threshold, indicating a low risk of mass coral bleaching in Spring (Jan—Jun) 2014 (Figure 1). An experimental NOAA bleaching outlook map predicts likely bleaching for the MHI (Figure 2). Peak bleaching season is from July—September.

Data from NOAA’s virtual stations are derived from the operational 50m satellite products. Virtual offshore measuring stations indicate that Sea Surface Temperatures (SST) did NOT surpass the maximum monthly mean at any of the MHI locations during Spring 2014 (Figure 3).



Example of coral bleaching, photo: S. Peck

For more information on coral bleaching, please visit DLNR’s Reef Response website:  
[www.dlnr.hawaii.gov/reefresponse](http://www.dlnr.hawaii.gov/reefresponse)



Example of coral bleaching, photo: K. Heide

## EOR Network Coral Bleaching Reports

There were no Eyes of the Reef (EOR) Network reports of coral bleaching in 2014. No Rapid Assessments were initiated.

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# Reef Response

## Coral Disease Current Conditions – Spring 2014

Rapid Assessment of Coral Bleaching, Disease, COTS, and Marine Life Mortality events



### Coral Disease Conditions Summary:

In Spring 2014, the Kauai cyanobacterial coral disease continued to progress affecting three species of rice (*Montipora*) corals along the north shore. A DAR-led Management Response Team was formed in Jan 2014.

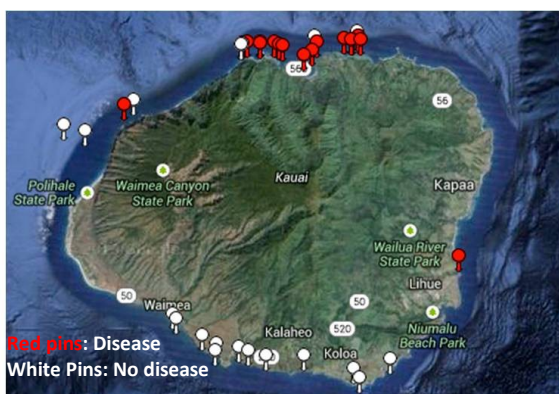
The EOR Network received six reports of coral disease in Spring 2014. No Rapid Response Assessments were conducted as they were all from the ongoing N. Kauai outbreak, but monitoring is scheduled for August 2014.

### Spring 2014 Coral Disease Summary

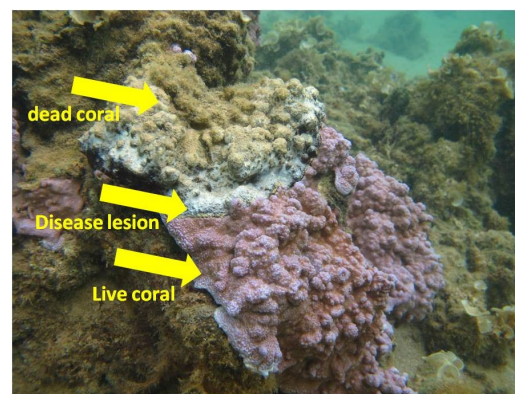
Overall, the causes of coral disease events are relatively poorly understood. Diseased coral often die quickly, outbreaks can change dramatically and can vary seasonally. Disease outbreaks often follow other disturbances including bleaching, flood plumes, and storms. These stresses all disturb coral due to physical injury and/or coral physiology. Reduced coral health leads to an increase in disease risk.

There have been four coral disease outbreaks in the MHI since 2008. The most recent outbreak occurred on the north shore of Kauai, first recorded at an epidemic level in 2012. In 2013, DAR helped to support a PhD student from the Hawaii Institute of Marine Biology who is mapping the prevalence of the Black Band Disease (BBD) and measuring potential environmental drivers. In January 2014, DAR coordinated the formation of a Management Response Team (MRT) to review incoming monitoring data and discuss effective management actions. Several other agency partners have been instrumental in this effort including NOAA, USGS, UH, EPA, UH SeaGrant, and several Kauai-based organizations. The next surveys are planned for August 2014.

For more information and latest updates, please go to the team's website: <http://dlnr.hawaii.gov/reefresponse>



Map of sites surveyed for BBD, map credit: C. Runyon (UH)



BBD on a Montipora coral, photo credit: C. Runyon (UH)

### EOR Network Coral Disease Reports

There were a total of 6 EOR Network reports of coral disease in Spring 2014. No Rapid Response Assessments were conducted as all reports were from known locations of the BBD affecting the north shore of Kauai.



Coral disease in north Kauai, photo credit: T. Lilley

Tissue Loss

Growth Anomaly

Discoloration

Examples of other coral disease types, photo credit: EOR

For more information on coral disease, please visit DLNR's Reef Response website: [www.dlnr.hawaii.gov/reefresponse](http://www.dlnr.hawaii.gov/reefresponse)



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# Reef Response

## COTS, Fish, and Miscellaneous Current Conditions – Spring 2014

Rapid Assessment of Coral Bleaching, Disease, COTS, and Marine Life Mortality events



### COTS, Fish, and Miscellaneous Conditions

#### Summary:

There were four fish and 11 urchin EOR reports which resulted in five Rapid Assessments in Spring (Jan—May) 2014. It was concluded that the fish death were caused by trauma. It is thought that the collector sea urchins are being affected by a disease, possibly a virus. DAR continues to monitor affected areas.

### Spring 2014 Crown-of-Thorns-Starfish (COTS) and Miscellaneous Summary

Crown-of-thorns-starfish (COTS) are coral-eating starfish that have the potential to take over coral reefs quickly. Damaging outbreaks have been seen in other areas of the Pacific. In 2013, both the Great Barrier Reef in Australia and areas in American Samoa experienced severe outbreaks. In Hawaii, two localized COTS outbreaks were recently reported and assessed in 2012. Those have been the only major reports of COTS in large numbers since 2008.

Although not officially covered in the RRCP, the EOR Network does receive reports of other types of unusual events including fish disease, invasive species, native species blooms, and miscellaneous observations. This was valuable during the 2010 pufferfish die-off when the EOR Network was engaged to collect affected specimens.

### EOR Network COTS Reports

There were two reports of isolated COTS in Hawaii in Spring 2014. No Rapid Assessments were initiated.

### EOR Network Fish Disease/Mortality Reports

There were four EOR reports of suspected fish mortality in Spring 2014. In January, an EOR report described dead lanternfish near Nawiliwili on Kauai. DAR staff responded by collecting samples of the fish and sending them to Dr. Thierry Work, a wildlife disease specialist. Laboratory examination did not reveal evidence of disease and fish were in good body condition. It was concluded that cause of death was likely sudden trauma. Management recommendations were to monitor mortality patterns in lanternfish that may lead to more clues. After the lanternfish event on Kauai, A Call to Action was sent out to the EOR Network. Two more reports of dead lanternfish were received from Maui and Molokai. No specimens were able to be collected from these additional observations. DAR continues to ask the EOR Network to report any observations of dead or dying lanternfish.



Lanternfish on Sandy Beach, Molokai, photo credit: S. Ah Yee

For more information about marine life diseases, please visit DLNR's Reef Response Webpage:

[www.dlnr.hawaii.gov/reefresponse](http://www.dlnr.hawaii.gov/reefresponse)



Lanternfish near Nawiliwili, Kauai, photo credit: D. Heacock (DAR)

### EOR Network Sea Urchin + Miscellaneous Reports

In February 2014, a disease was identified to be affecting collector sea urchins in Maunaloa and Kaneohe Bays on Oahu. DAR coordinated a Management Response Team and a Rapid Assessment was initiated. A Call to Action was sent out to the EOR Network to report observations of sick or dying collector urchins. The EOR Network received 11 reports of sick collector sea urchins in Spring 2014. Several reports were received from W. Maui, specifically Honolua Bay. A Rapid Assessment was conducted and specimens were collected for analysis. More information about the response can be found on the team's website at [www.dlnr.hawaii.gov/reefresponse](http://www.dlnr.hawaii.gov/reefresponse). DAR also responded to two reports of algae at Hanauma Bay. The area was surveyed and it was determined that it was normal algal growth.



Sick collector sea urchin, photo credit: TNC



Urchin monitoring on Oahu, photo credit: DAR



Urchin specimens on Maui, photo credit: DAR



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