**BRIEF: CORAL BLEACHING**
10/5/2015

NOAA CORAL REEF WATCH (http://coralreefwatch.noaa.gov)

---

**NOAA Potential Bleaching Intensity Levels**
- No Stress
- No bleaching
- Bleaching Warning
- Possible bleaching
- Alert Level 1
- Bleaching Likely
- Alert Level 2
- Coral Mortality Likely

---

Main Hawaiian Islands Satellite Coral Bleaching Alert Area and Outlook

2015-10-03

---

Current Coral Bleaching Alert Level

Coral Bleaching Alert Level
Outlook Weeks 1–4

Coral Bleaching Alert Level
Outlook Weeks 5–8

Coral Bleaching Alert Level
Outlook Weeks 9–12

---

Graph showing SST (°C) changes over time with bleaching thresholds and monthly mean climatology.
**Eyes of the Reef Network Reports**

- Coral bleaching training and reporting network
- 126 reports received since 9/1
- *Bleachapalooza* event—63 reports
- Updating Facebook with images, report details
BRIEF: CORAL BLEACHING
10/5/2015

Division of Aquatic Resources Monitoring

SUMMARY

Bleaching information:
- Most severe bleaching impacts being seen on Maui and Hawaii Island
- *Pocillopora* are being the most affected
- DAR bleaching monitoring taking place during regularly scheduled monitoring activities
- Next steps vary, more monitoring planned for some locations
- Need more detailed information from East Hawaii and Kauai

DAR Concerns/Needs:
- PSA - awareness of ocean pollution/run-offs causes stressful environment for corals, so when other stressors are added, it surpasses its tipping point
- Coral survey training for East Hawaii
- Unconfirmed EOR reports of COTS predation in Kona
- Algal/diatom turf overgrowth of large mounding corals (*P. lobata, P. evermanni*)
- Additional funding for staff to rapidly process coral health survey data
- Additional information is needed to estimate species-specific mortality/recovery rates.
- A suggested voluntary break from exploitative coral reef usage, anchoring in affected areas and harvesting of scraping herbivore (e.g. parrotfishes) may be beneficial and enhance recovery through ecosystem intactness.
- Monitoring and research focused on bleaching-resistant/resilient corals and areas and may help guide future management and conservation actions.
- Maui needs more divers and GPS units
- Kauai needs added capacity for any in-water survey work
BRIEF: CORAL BLEACHING
10/5/2015
Division of Aquatic Resources Monitoring

EAST HAWAII

Hilo
Summary of geographical extent of coral bleaching:
- Two sites, Richardson’s Beach Park and Onekahakaha Beach Park in Keaukaha, Hilo, were surveyed on October 1, 2015. Both sites equally displayed considerable levels of bleaching of common corals (i.e., *Pocillopora damicornis, Pocillopora meandrina, Montipora capitata, Montipora flabellata, Porites compressa*).
- A conservative estimate of ≥80% of *Montipora* colonies were either partially or completely bleached, particularly *M. capitata* and *M. flabellata*.
- A conservative estimate of ≥70% of *Pocillopora* colonies were partially or completely bleached.
- Approximately 50% of *P. compressa* and colonies were partially bleached.
- Overall, ~50% of total coral cover was bleached or partially bleached.

Summary of severity of coral bleaching:
- totally bleached: ~20%
- partially bleached: ~30%
- pale: ~25%
- no bleaching: ~25%

Next Steps:
- We do not have any field work planned to explicitly survey bleaching events. However, we will schedule subsequent surveys if needed.

Concerns/Needs:
- Our staff in Hilo does not currently specialize in coral or reef surveys. I suggest that at least some of our staff in Hilo begin working with DAR WHAP surveyors and receive training to conduct such surveys.
WEST HAWAII

Ke‘ei

Acropora gemmifera gardens

Large P. evermanni

South Point

Kua Bay
**BRIEF: CORAL BLEACHING**

**10/5/2015**

**Division of Aquatic Resources Monitoring**

**WEST HAWAII**

**Reporter Name:** DAR Kauai staff, Dr. Bill Walsh

**Summary of geographical extent of coral bleaching:**
- It is evident that coral bleaching is occurring along most, if not all, of West Hawaii.
- DAR has 25 long-term (1999-2015) survey sites are distributed along West Hawaii from Lapakahi, North Kohala to Manuka, Ka‘u, encompassing over 90 miles of West Hawaii coastline.
- Coral bleaching was observed at all sites, with severity and number of species affected worsening toward the end of September.
- Survey transect depth range from 30 ft to 55 ft, and are dominated by expanses of finger coral (*Porites compressa*), large lobe (*P. lobata*) and mound corals (*P. evermanni*).

**Summary of severity of coral bleaching:**
- *P. meandrina* (~75-95% bleached), *M. capitata* (~75-100% pale to bleached), *P. evermanni* (~50-75% pale to bleached), *P. lobata* (~50% pale to bleached), *P. varians* (unshaded surfaces, ~30% of colonies bleached) and *P. compressa* (~30-50% pale to bleached).
- Through Eyes of the Reef reports: South Point (*P. meandrina* -100% bleached), Ho‘okena (*P. meandrina* 90% bleached, mounding corals-31-50%), Manini Beach/Kealakekua (100% *P. meandrina* bleaching), Kahaluu (10-30% of mounding coral bleached), La‘aloa (Magic Sands -30% of mounding and branched corals bleached), Kohanaiki (10% of corals upper surfaces bleached), Kua Bay (100% *P. meandrina* bleached), Puako (10% coral bleaching), Wa‘alea Bay (51-75% of *P. meandrina* bleached), Hapuna south (10% of *P. evermanni* bleached), Honoko‘ape (100% of *P. meandrina* bleached, *P. lobata* pale), and Mahukona (30% *P. meandrina* bleached).
- To date, minimal algal/diatom turf overgrowth has occurred on *P. meandrina* but the most recent DAR surveys (9/30/15) suggest this is changing.
- It is significant to note that no bleaching has occurred (as of 9/18/15) of the 70+ colonies of *Acropora gemmifera* discovered in North Kona, Hawaii in 2013. Bleaching of other species in the area, particularly *P. meandrina* was common however.

**Next Steps:**
- October - DAR Kona team will conduct dedicated coral health (including disease and bleaching) surveys at WHAP transects beginning the week of October 12th and continuing through October 29th; 10 priority sites have been selected from the 25 WHAP transect sites; results will be compared to 2007 and 2010 coral health surveys
- November - fish and habitat surveys at all of long-term monitoring sites. A video overview of the benthic habitat along transect lines will be conducted to visually document coral bleaching.
- January - benthic photographic images will be taken at survey sites to more fully quantify impacts to the coral communities of West Hawaii.
- Approximately 50 attendees were trained to participate in the Oct. 3rd EOR statewide reporting event for coral bleaching (aka “Bleachapalooza”).

**Concerns/Needs:**
- Unconfirmed EOR reports of COTS predation (~25-50 individuals) on shallow, bleached corals have been reported for Ho‘okena and La‘aloa.
- Algal/diatom turf overgrowth of large mounding corals (*P. lobata, P. evermanni*) is of concern and is being qualitatively monitored.
- Additional funding for staff to rapidly process coral health survey data would be beneficial for rapid reporting and possible rapid response for Hawaii Island
- Additional information is needed to estimate species-specific mortality/recovery rates.
- A suggested voluntary break from exploitative coral reef usage, anchoring in affected areas and harvesting of scraping herbivore (e.g. parrotfishes) may be beneficial and enhance recovery through ecosystem intactness.
- Monitoring and research focused on bleaching-resistant/resilient corals and areas and may help guide future management and conservation actions.
MAUI

Molokini

Olowalu

Honokowai

Wailea
MAUI

Reporter Name: Russell Sparks, Darla White, Itana Silva

Summary of geographical extent of coral bleaching:

- **North Shore (Waihee and Paia):**
  - Estimate = 30% of corals in this region showing signs of bleaching/paling
  - 90% of all cauliflower coral (*P. Meandrina*) and rice coral (*M. flabelata*) fully bleached
  - 25% of lobe coral (*P. Lobata* and *P. Evermani*) bleached and covered with turf algae in deeper water (30 - 50' depth) off of Waihee point area
  - Other species *M. capitata* and *M. patula* appear to be bleached as well.
  - Much of the *P. lobata* that is not fully bleached is clearly paling.

- **Kaanapali (Honakaoo to Mahinahina):**
  - Bleaching severity was somewhat variable across the region, most bleaching observed at Honakaoo reef area, north of Honokowai point, and shallow aggregate reef at Kahekili Beach Park and the Westin Kaanapali Ocean Resort.
  - *Pocillopora* spp: 95% or more were stark white
  - *Porites* spp: 50% affected to some degree; 10% white. *P. monticulosa* and *P. evermanni*,
  - *Montipora* spp: 1/3 paling; 1/3 white.
  - *Pavona* spp: both *P. varians* and *P. duerdeni* demonstrate a high degree of bleaching.

- **Olowalu**
  - 99% of the *P. meandrina* is bleached in the survey area

Next Steps:

- 170 sites around Maui will be surveyed annually quantifying fish biomass and abundance as well as benthic composition.
- Also have annual coral reef monitoring sites around Maui including the north shore (should pick up large scale changes in coral cover and species composition.)
- No other bleaching specific work is schedule for the North Shore area as it is very rough and difficult to reliably schedule field work in this area.
- Bleaching and disease work is being conducted at Molokini (will return 10/6) and Olowalu (will return 10/1)
- The Scripps researchers returning mid-October to re-do coral benthic mosaic sites to catch bleaching event, DAR supporting this effort through boat and driver time
- XL Catlin Seaview team will return November 2-8 to photograph bleaching effects

Concerns/Needs:

- Need a couple of more divers for the bleaching surveys
- Need two more GPSs and two cameras (e.g. Canon G-16) with housings
BRIEF: CORAL BLEACHING
10/5/2015
Division of Aquatic Resources Monitoring

OAHU

Kaneohe Bay
Summary of geographical extent of coral bleaching:

Waianae:
- Widespread bleaching for Pocillopora and Porites colonies found at a mean rate of 48.8% inside and 43.5% outside of the MMA. Estimated coral cover for the area was 20.6% and 9.5%, respectively.

Pokai Bay:
- Bleaching was evident with white Pocillopora and Porites colonies, but it was not widespread. Monitoring site within the MMA has an estimated coral cover of 10.5%, of which, roughly 6.5% was bleached. Site outside the MMA has an estimated coral cover of 20%, of which, roughly 8% was bleached.

Ko Olina:
- Bleaching was evident with white Pocillopora and Porites colonies, but it was not widespread. It is estimated that 2.4% of the total coral cover, approximately 46.3%, was bleached.

Hanauma Bay:
- Bleaching was evident with white Pocillopora and Porites colonies, but it was not widespread. It is estimated that 1.7% of the total coral cover (15.7%) was bleached.

Kaneohe Bay:
- Kaneohe Bay is approximately 30% bleached. All species are showing signs of bleaching. Almost all P. damicornis and M. flabellate are bleached.

South shore-Reef off of Sand Island is showing bleaching in the 10-15% range. P. meandrina was the most affected.

Next Steps:
- Returning to all sites next quarter

Concerns/Needs:
- Would like to see a PSA - awareness of ocean pollution/run-offs causes stressful environment for corals, so when other stressors are added, it surpasses its tipping point
RECORD OCEAN TEMPERATURES CAUSING CORAL BLEACHING ACROSS HAWAII

HONOLULU – As predicted, coral reefs across Hawaii from Kure Atoll to the northernmost feature in the Hawaiian Archipelago, to Hawaii Island are starting to feel the effects of coral bleaching. This is a result of coral sensitivity to rises in ocean temperatures as small as 1°-2°C. Climate experts from the National Oceanic and Atmospheric Administration’s Coral Reef Watch program (coralwatch.noaa.gov) have predicted severe coral bleaching conditions for Hawaiian waters beginning in August and continuing through October. The warnings indicate that higher temperatures combined with an El Niño event have a strong likelihood of causing mass bleaching across Hawaii. Last summer saw the first documented event of mass bleaching across the entire archipelago, and reefs in the Northwestern Hawaiian Islands (NWHI) experienced their third worst reported mass bleaching event to date.

Brian Nelson, an acoustics biologist with the Division of Aquatic Resources (DAR) said, “Coral bleaching is a result of a loss of algae within the coral’s tissue that provide them with energy and give them their colors. This is

FOR IMMEDIATE RELEASE
Sept. 11, 2015

BRIEF: CORAL BLEACHING

2 media releases
Support for Bleachapalooza event
Main points = what is coral bleaching, report your observations to Eyes of the Reef website

Reef Response

2 media releases
Support for Bleachapalooza event
Main points = what is coral bleaching, report your observations to Eyes of the Reef website

Reef Response