

## Pacific Climate Update Coral Bleaching Heat Stress Analysis and Seasonal Guidance through March 2020

(Released December 3, 2019)

### *Current conditions:*

NOAA Coral Reef Watch's (CRW) [near real-time satellite monitoring](#) shows the sea surface temperature (SST) as alternating between below- and above-average along the equator in the eastern and central equatorial Pacific; as being below-average in the southeast Pacific; and as being above-average throughout the majority of the ocean basin (Figure 1). El Niño Southern Oscillation (ENSO)-neutral conditions remain. Over recent months, warm anomalies ( $>2^{\circ}\text{C}$ ) have surrounded the Main Hawaiian Islands (MHI). In addition, although the SST has decreased over time as the Northern Hemisphere has transitioned from its warm to cold seasons, a mass of anomalously warm water ( $3\text{-}4^{\circ}\text{C}$  above average) has remained off the west coast of the United States and British Columbia, Canada. Dubbed "Son of the Blob", it has been emulating the very prominent, prolonged North Pacific marine heatwave of 2014-16 known as the "Blob". As of November 14, 2019, the NOAA National Centers for Environmental Prediction's ENSO Alert System status is "Not Active". ENSO-neutral conditions are expected to continue through Northern Hemisphere winter 2019-2020 (70% chance) into spring 2020 (60-65% chance).

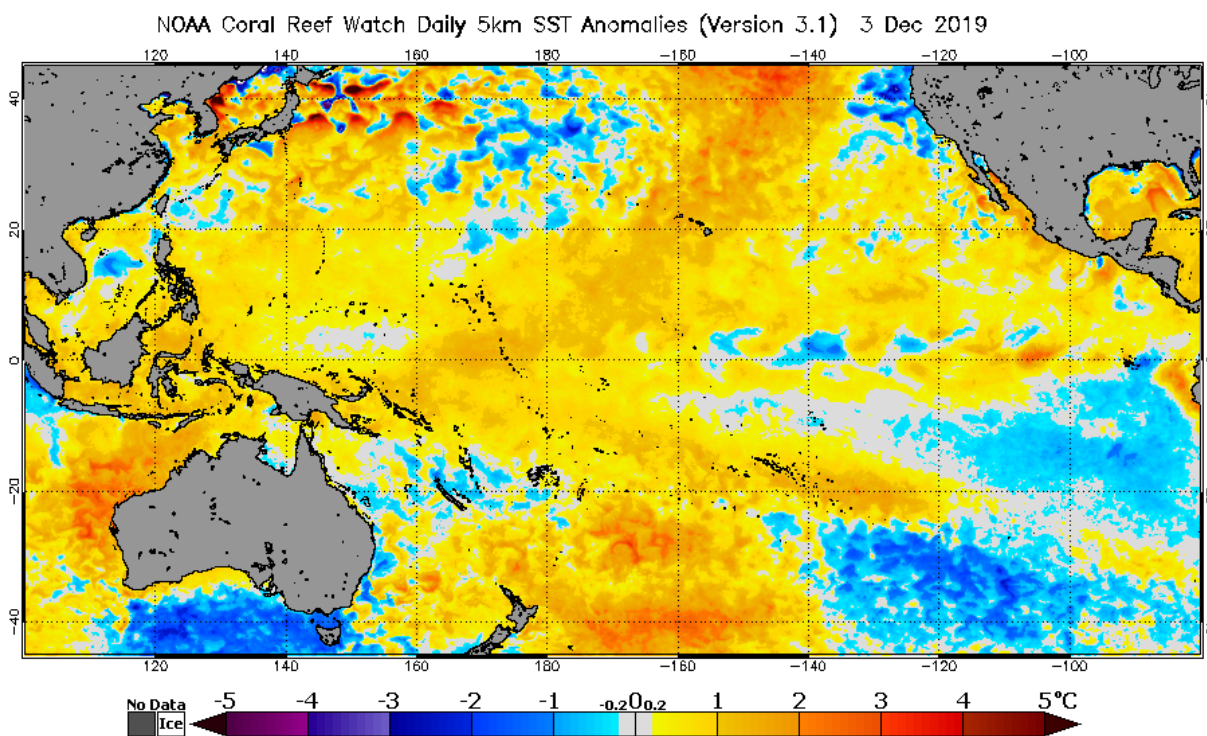


Figure 1. NOAA Coral Reef Watch's Satellite Sea Surface Temperature Anomaly product for the Pacific region.

Currently, the highest HotSpots ( $\sim 1^{\circ}\text{C}$ ) are concentrated around the Gilbert Islands, Kiribati; Nauru; and the Solomon Islands in the western Pacific (Figure 2). Bleaching Alert Level 2 conditions (associated with severe bleaching and significant coral mortality) have been present at the Gilbert Islands and Nauru since August 18 and October 1, 2019, respectively (Figure 3). As of the end of October, the Alert Level 2 heat stress that had been surrounding the MHI and the Northwestern Hawaiian Islands (NWHI) for more than a month began to dissipate. However, higher-than-normal ocean temperatures continued, leaving both regions at a Bleaching Watch. The Hawai'i Department of Land and Natural Resources (DLNR) conducted extensive in-water surveys during this year's severe heat stress and mass bleaching event, and stated that while the coral bleaching observed was not as severe as predicted, it was still widespread (<https://dlnr.hawaii.gov/blog/2019/11/05/nr19-186/>). According to the DLNR report, the areas most affected were along the Kona coast, with an average of 40% of live corals bleaching in many survey locations; Molokini's crater, where 50% of corals bleached; Lanikai, in windward Oahu, where 55% of corals bleached; and Kāne'ohe Bay, where bleaching ranged from 10-20% to more than 50% on different reefs. It was noted that previous mass bleaching and mortality from the 2015 event reduced the amount of coral cover in some of these places. This may be why less damage was seen this year – because fewer corals were present at the start of the 2019 event, and those corals that had survived the 2015 event were more resilient to the heat stress this year.

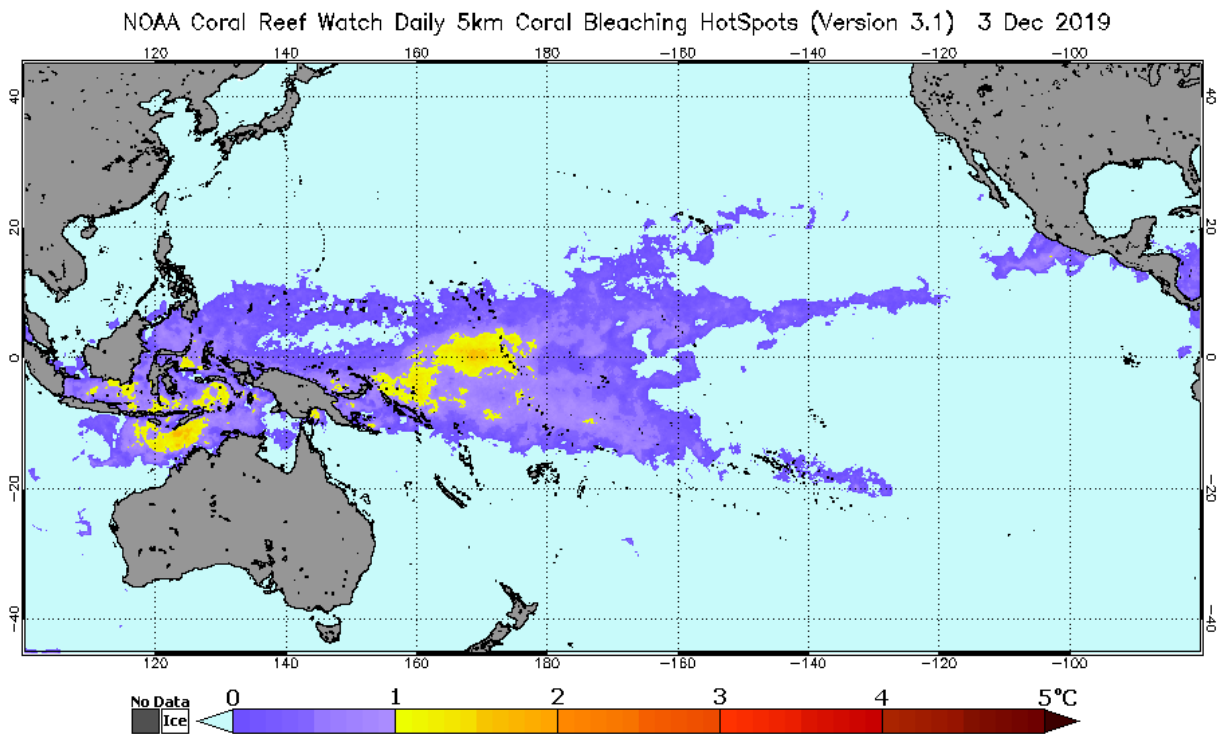


Figure 2. NOAA Coral Reef Watch's Satellite Coral Bleaching HotSpot product for the Pacific region.

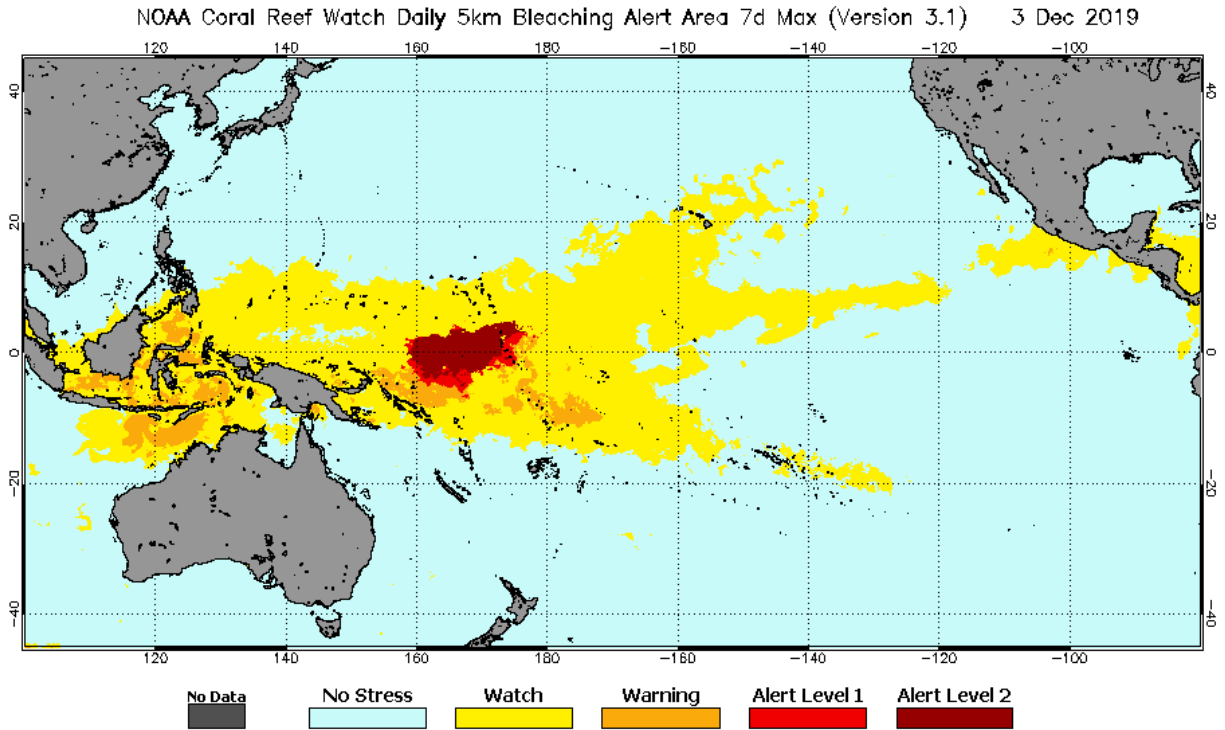


Figure 3. NOAA Coral Reef Watch's Satellite Bleaching Alert Area (7-day maximum) product for the Pacific region.

CRW's most recent [Four-Month Coral Bleaching Outlook](#) (Figure 4) projects high heat stress (Alert Level 2) will continue in the western Pacific Ocean around the Gilbert Islands and Nauru for the next 3 months, and expand southward and eastward (at Alert Level 1) toward Tuvalu, American Samoa, and French Polynesia in January and February 2020. By February, the southern portion of the Great Barrier Reef in Australia may reach Alert Level 1.

2019 Dec 3 NOAA Coral Reef Watch 60% Probability Coral Bleaching Heat Stress for Dec–Mar 2020  
Experimental, v5.0, CFSv2–based, 28 to 112 Ensemble Members

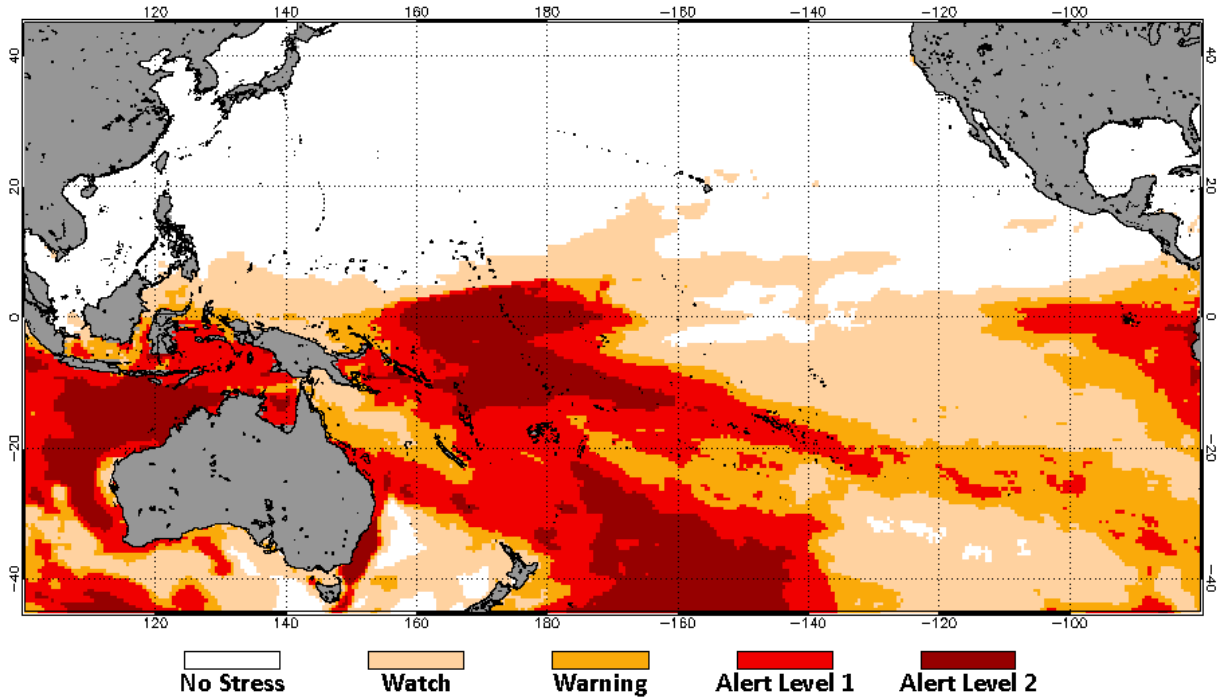


Figure 4. NOAA Coral Reef Watch's Four-Month Coral Bleaching Heat Stress Outlook of December 3, 2019 for the period December 2019–March 2020 for the Pacific region.

**\*\*\*NOTE: This report incorporates NOAA Coral Reef Watch's Version 3.1 (or v3.1) [5km satellite-based coral bleaching heat stress products](#) and v5 [Four-Month Coral Bleaching Heat Stress Outlook](#).\*\*\***

To monitor the intensity and location of bleaching heat stress in your coral reef region of interest, please follow NOAA Coral Reef Watch's satellite monitoring and outlooks closely in the coming weeks: <https://coralreefwatch.noaa.gov/product/5km/index.php> and [https://coralreefwatch.noaa.gov/satellite/bleachingoutlook\\_cfs/outlook\\_cfs.php](https://coralreefwatch.noaa.gov/satellite/bleachingoutlook_cfs/outlook_cfs.php).

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