

## Pacific Climate Update Coral Bleaching Heat Stress Analysis and Seasonal Guidance through September 2019

(Released June 6, 2019)

### *Current conditions:*

NOAA Coral Reef Watch's (CRW) [near real-time satellite monitoring](#) shows above-average sea surface temperatures (SSTs) in much of the equatorial Pacific Ocean, with the highest anomalies (between 1 and 2°C, with some areas exceeding 2°C) stretching from the Gilbert Islands, Kiribati eastward to the Northern Line Islands, and in the South China Sea, especially off the northwest coast of the Philippines and along the coast of Vietnam, where anomalies have reached 3°C (Figure 1). Additionally, over recent months, warm anomalies surrounded Fiji, American Samoa, and Tahiti. In the central and eastern equatorial Pacific, SSTs remain above average and are associated with a weak El Niño that has persisted since January 2019. As of May 9, 2019, the NOAA National Centers for Environmental Prediction's ENSO Alert System remains at El Niño Advisory status. El Niño conditions are expected to continue through Northern Hemisphere summer (70% chance) and fall 2019 (55-60% chance).

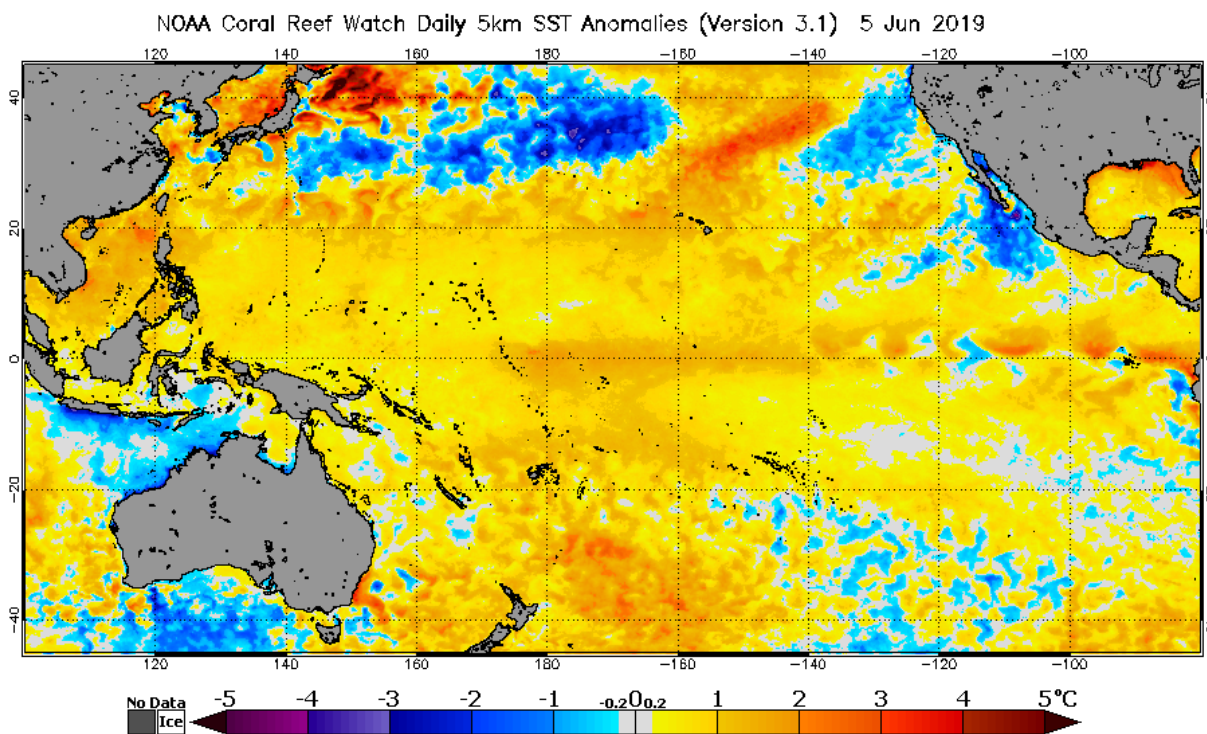


Figure 1. NOAA Coral Reef Watch's Satellite Sea Surface Temperature Anomaly product for the Pacific region.

In recent months, HotSpots have begun to diminish from American Samoa and portions of French Polynesia and are mainly concentrated in the Northern Line Islands, Phoenix Islands, Kiribati, and Howland and Baker Islands to the north (Figure 2). Palau and the Federated States of Micronesia (FSM) in the western Pacific also have seen an increase in HotSpots since May. As a result, the current bleaching status for the Northern Line Islands, Howland and Baker Islands, Palau, and the Western and Eastern FSM is Bleaching Warning, and the Phoenix Islands have reached Alert Level 1 (Figure 3). Coral bleaching has been reported in the southern portion of French Polynesia. In addition, the Society Archipelago was at Alert Level 1 in April 2019, and severe bleaching was reported in Tahiti and Moorea in May. The high heat stress in the region has since reduced to Bleaching Watch status as the area moves out of its summer season. The majority of remaining coral reef areas in the equatorial and Southern Pacific Ocean are at a Bleaching Watch. Further heat stress is expected as El Niño conditions continue throughout Northern Hemisphere spring.

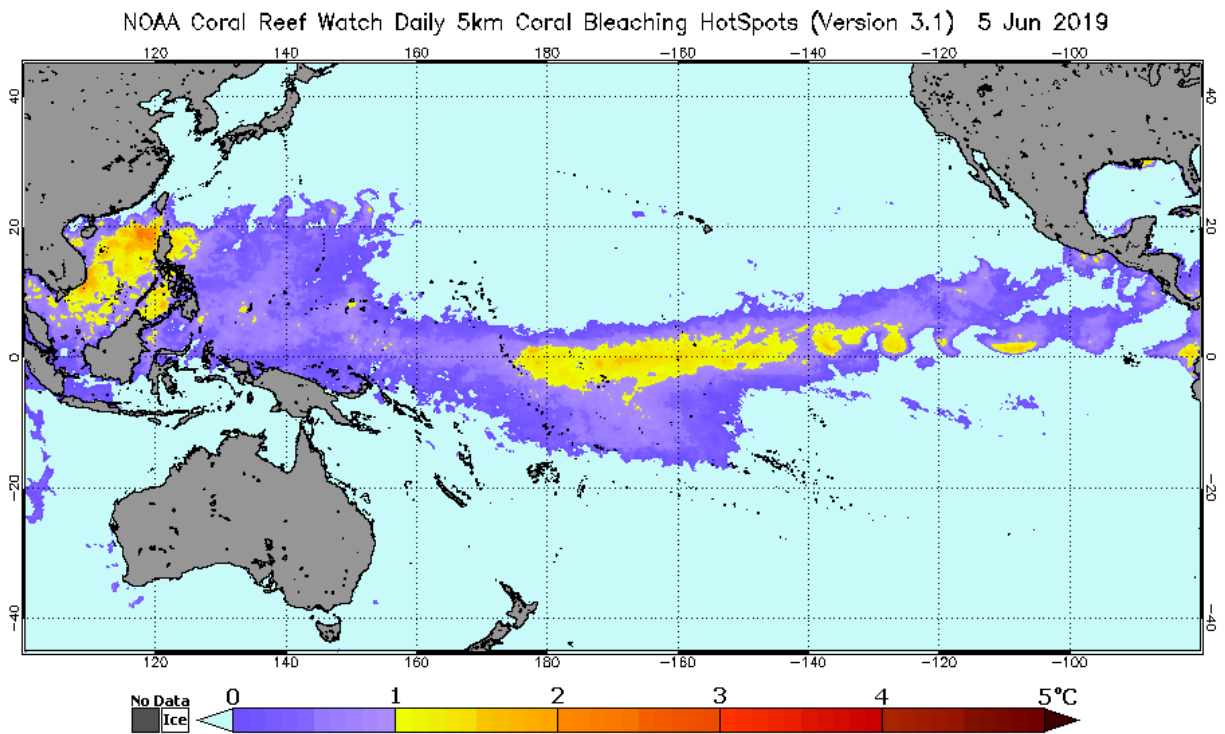


Figure 2. NOAA Coral Reef Watch's Satellite Coral Bleaching HotSpot product for the Pacific region.

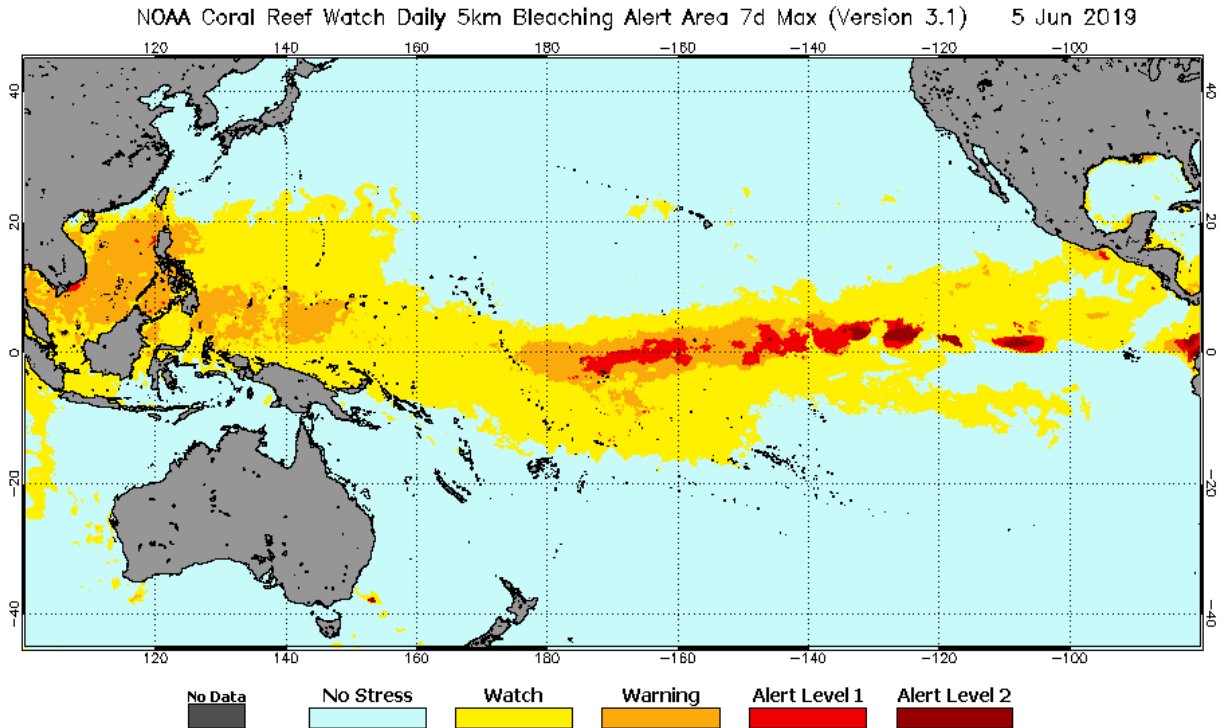


Figure 3. NOAA Coral Reef Watch's Satellite Bleaching Alert Area (7-day maximum) product for the Pacific region.

In addition, multiple locations in Southeast Asia and the Coral Triangle have suffered heat stress and reported variable but often significant amounts of coral bleaching. Terengganu, Malaysia has been at Alert Level 1 since May 30 (Figure 3). Severe bleaching (~25% at 6-10m depth) was first reported at Pulau Redang (an island off the Terengganu coast) on May 21, when the region had been under a Bleaching Warning for five weeks. Bleaching was recorded again at Pulau Redang and at Pulau Bidong during the last week in May, with observations of 10-15% of bleaching on shallow (<12m) coral reefs and some bleaching at deeper sites (~16m). Severe bleaching (~60%) also was recorded at 5m depth at Sibu Island, Mersing in mid-May, when the Johor and Pahang region was at Alert Level 1. Elsewhere in the Johor and Pahang region of Malaysia, minor bleaching ( $\leq 5\%$ ) was recorded in Tioman (at 3-5m depth) in mid-April (when the region was at Bleaching Warning), and at Rawa Island, Johor (at 0.5-6m depth) in mid-May (when the region was at Alert Level 1). Widespread bleaching has occurred in parts of Thailand since early May, including significant bleaching in Koh Tao. As of late May, bleaching began in southwestern Vietnam on Pu Quoc island, and as of early June has been reported in southeastern Vietnam at Ninh Thuan, which just elevated to Alert Level 2 status.

CRW's most recent [Four-Month Coral Bleaching Outlook](#) (Figure 4) projects heat stress in the equatorial Pacific Ocean to increase (Alert Levels 1 and 2) around the Phoenix Islands, Kiribati, the Northern Line Islands, and the Gilbert Islands, Kiribati by July 2019 and then diminish by August. While high heat stress is expected to diminish in the Terengganu region of Malaysia in the next few weeks, in the Johor and Pahang region, heat stress should decrease in July but then return to Alert Level 1 in August and remain into September. Heat stress is forecasted to end in Thailand and Vietnam in July. Waters to the north surrounding the Marshall Islands and the

Main Hawaiian Islands are expected to reach Alert Level 1 by September and possibly Alert Level 2 by October. Similarly, waters surrounding Guam and the Eastern FSM are expected to reach Alert Level 1 during this time.

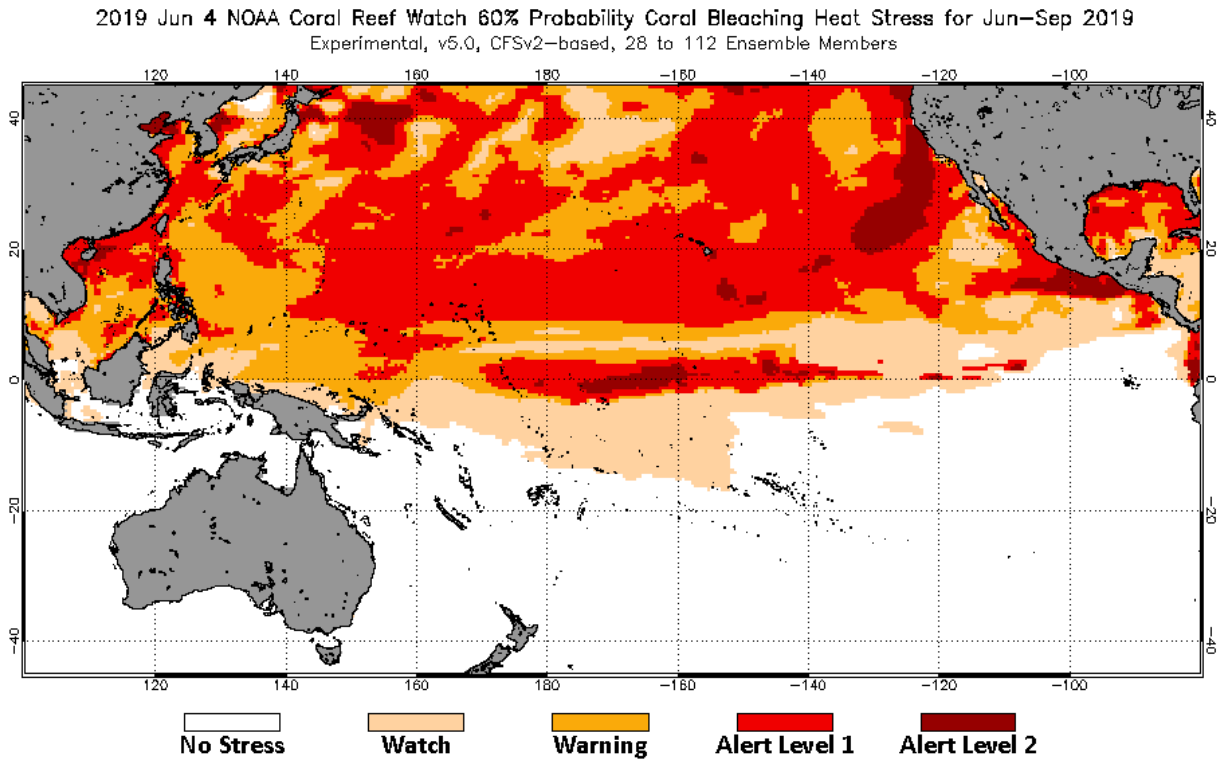


Figure 4. NOAA Coral Reef Watch's Four-Month Coral Bleaching Heat Stress Outlook of June 4, 2019 for the period June-September 2019 for the Pacific region.

**\*\*\*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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