

Pacific Climate Update Coral Bleaching Heat Stress Analysis and Seasonal Guidance through March 2024

(Released December 7, 2023)

Current conditions:

[NOAA Coral Reef Watch's \(CRW\)](#) near real-time satellite monitoring shows that as of December 6, 2023, above-average sea surface temperatures (SSTs) continue across the entire equatorial Pacific Ocean. SST anomalies are highest in the eastern equatorial Pacific and northwestern Pacific surrounding Japan, with the strongest positive anomalies (as much as 4-5°C above normal) around the Galapagos Islands, the Sea of Japan, and the northeastern coast of Japan (Figure 1). A swath of below-average SSTs remains in the northeastern Pacific, stretching south and east from the Main Hawaiian Islands. In the Northwestern Hawaiian Islands (NWHI), above-average SSTs have begun to appear from Lisianski Island to Kure Atoll.

As of November 9, 2023, the NOAA National Centers for Environmental Prediction's (NCEP) ENSO Alert System status remains at [El Niño Advisory](#). El Niño is anticipated to continue through Northern Hemisphere spring 2024 (with a 62% chance during April-June 2024).

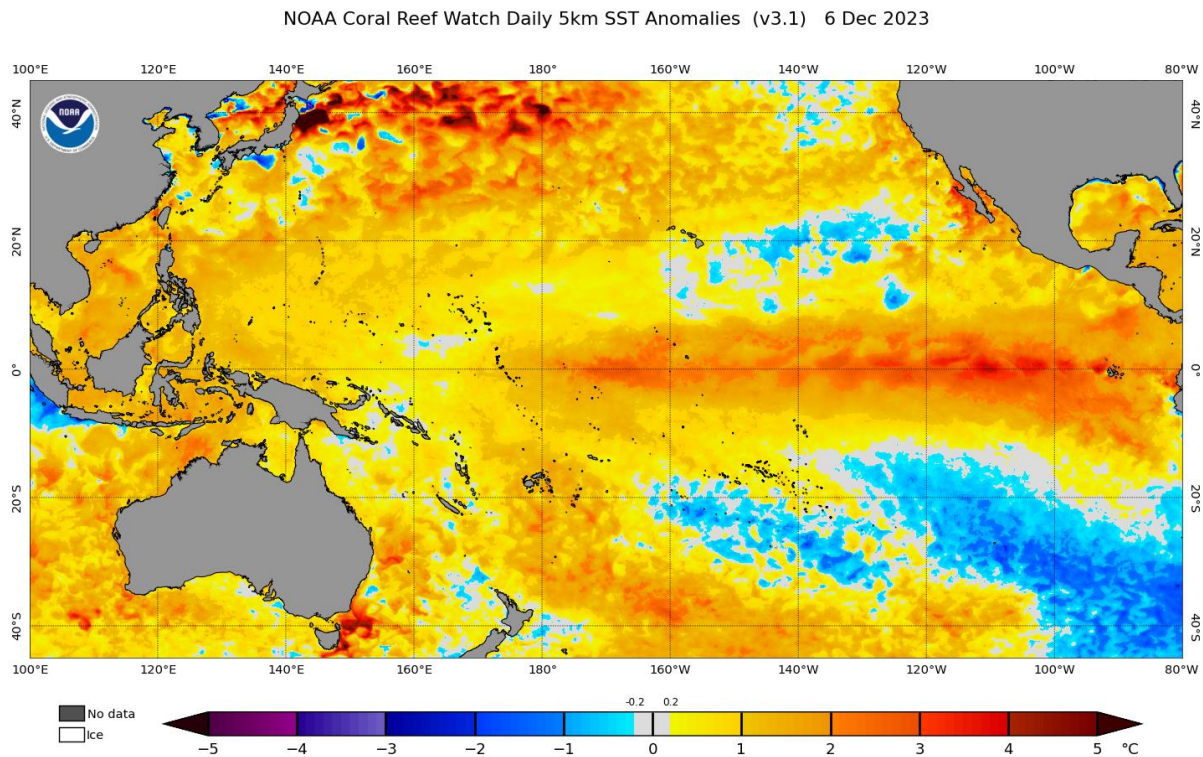


Figure 1. NOAA Coral Reef Watch's Satellite Sea Surface Temperature (SST) Anomaly product for the Pacific region.

Over the past three months, [Coral Bleaching HotSpots](#) $>1^{\circ}\text{C}$ have been concentrated in the central and eastern equatorial Pacific, with some areas of HotSpots $>1^{\circ}\text{C}$ intermittently appearing around Guam, the Commonwealth of the Northern Mariana Islands (CNMI), the Federated States of Micronesia (FSM), and the Marshall Islands (Figure 2). In September and October, seas around Japan reached HotSpot values of $>5^{\circ}\text{C}$. Since June, heat stress has been accumulating at NOAA CRW's [daily 5km satellite Regional Virtual Stations](#) for the [Northern Line Islands](#) (which includes Jarvis Island, Kingman Reef and Palmyra Atoll), [Howland and Baker Islands](#), and the [Gilbert Islands, Kiribati](#). All reached [Alert Level 2](#) in early September and continue under those conditions (Figure 3). Since late September, CNMI and the [Marshall Islands](#) have decreased to [Bleaching Watch](#). Heat stress has been building in [Nauru](#) since mid-April and is currently at [Alert Level 1](#). Reports from Palmyra Atoll in the Northern Line Islands in mid-October show moderate bleaching overall, with bleaching prevalence varying both spatially and across species. The press reported bleaching in Suruga Bay, Japan in September (<https://www.asahi.com/ajw/articles/15003606>).

***** CRW would be very grateful if local stakeholders would continue sharing their in-water data and observations of coral bleaching/no bleaching, to inform what has been and is being observed on their reefs. Users can contribute their data to NOAA CRW via email (to coralreefwatch@noaa.gov), a [Google Form](#), and/or via a more detailed, quantitative observations questionnaire. (Please see https://coralreefwatch.noaa.gov/satellite/research/coral_bleaching_report.php for more information.)*****

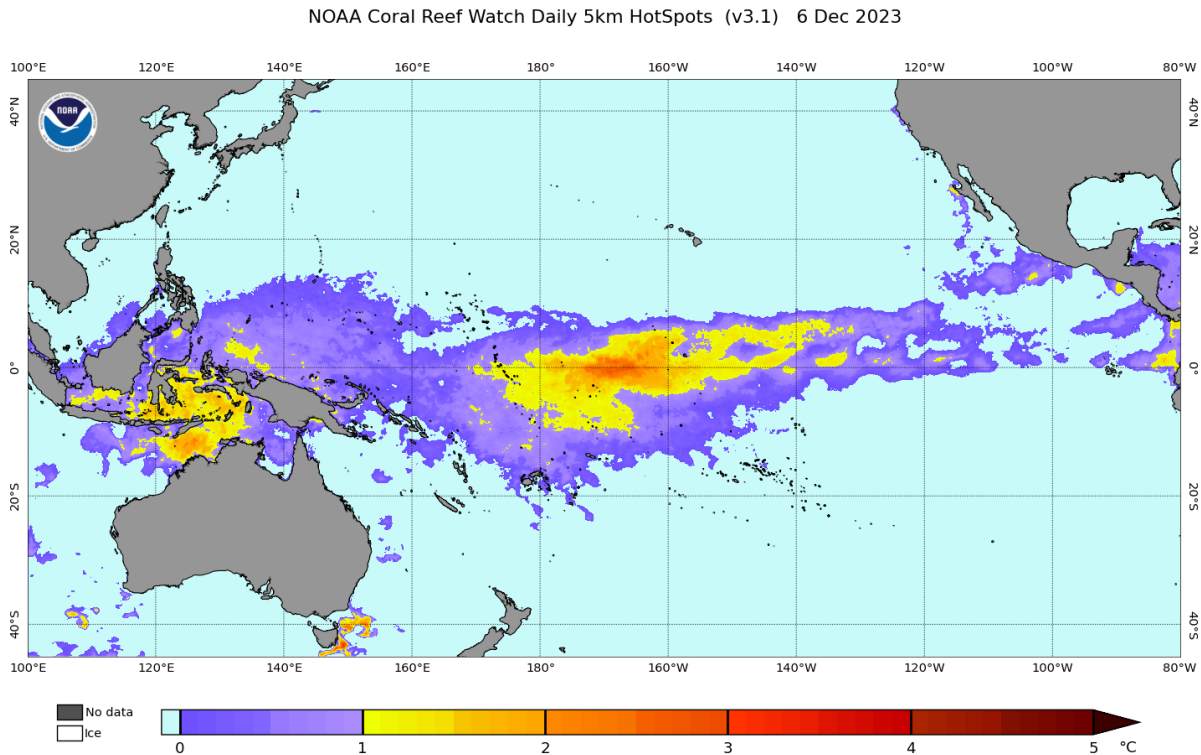


Figure 2. NOAA Coral Reef Watch's Satellite Coral Bleaching HotSpot product for the Pacific region.

NOAA Coral Reef Watch Daily 5km Bleaching Alert Area 7-day Maximum (v3.1) 6 Dec 2023

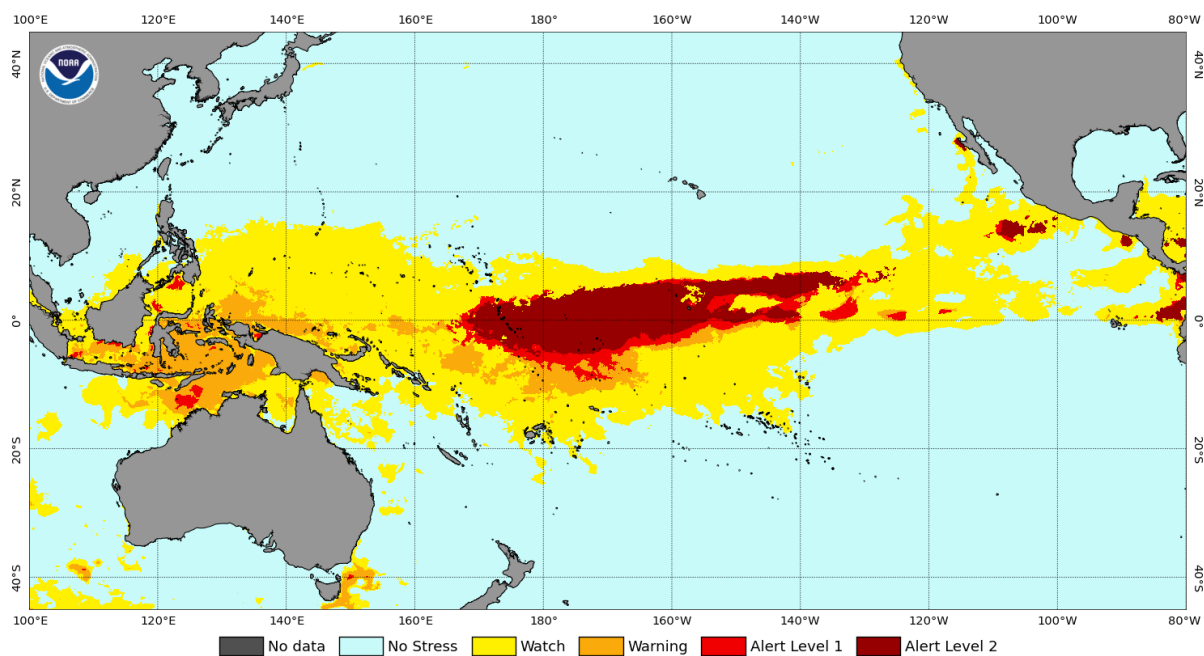


Figure 3. NOAA Coral Reef Watch’s Satellite Bleaching Alert Area (7-day maximum) product for the Pacific region.

NOAA CRW’s most recent modeled [Four-Month Coral Bleaching Outlook](#) (Figure 4) projects heat stress will remain in the central equatorial Pacific Ocean during Northern Hemisphere winter and expand around Indonesia by January and Australia’s Great Barrier Reef by February 2024. Additionally, [Alert Level 2](#) heat stress is predicted to persist around the Northern Line Islands and the Gilbert Islands, Kiribati through February 2024.

2023 Dec 5 NOAA Coral Reef Watch 60% Probability Coral Bleaching Heat Stress for Dec–Mar 2024
Experimental, v5.0, CFSv2–based, 28 to 112 Ensemble Members

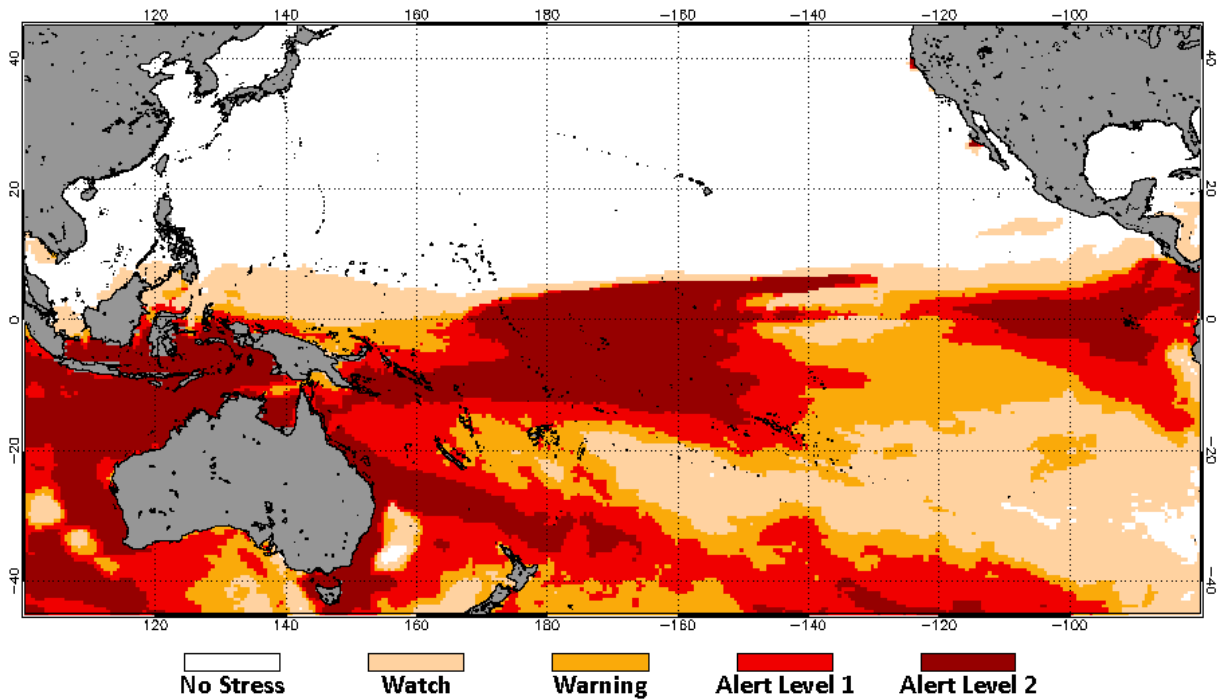


Figure 4. NOAA Coral Reef Watch’s Four-Month Coral Bleaching Outlook of December 5, 2023, for December 2023-March 2024, for the Pacific region.

*****CRW recommends regular review of its Four-Month Coral Bleaching Outlook maps (https://coralreefwatch.noaa.gov/satellite/bleachingoutlook_cfs/index.php) and near real-time satellite product updates (<https://coralreefwatch.noaa.gov/product/5km/index.php>), for all regions of interest/concern, over the months ahead.*****

