

NOAA CORAL REEF WATCH DATA SET METHODOLOGY

Special Note Product is another name for dataset.

1. Sea Surface Temperature (SST)

The near real time SST is produced from nighttime-only data, to eliminate the effect of solar glare and reduce variability caused by heating during the day. SST data come from NOAA's polar-orbiting satellites, which measure infrared radiation from the ocean surface across the entire globe every day. This SST product is updated twice-weekly.

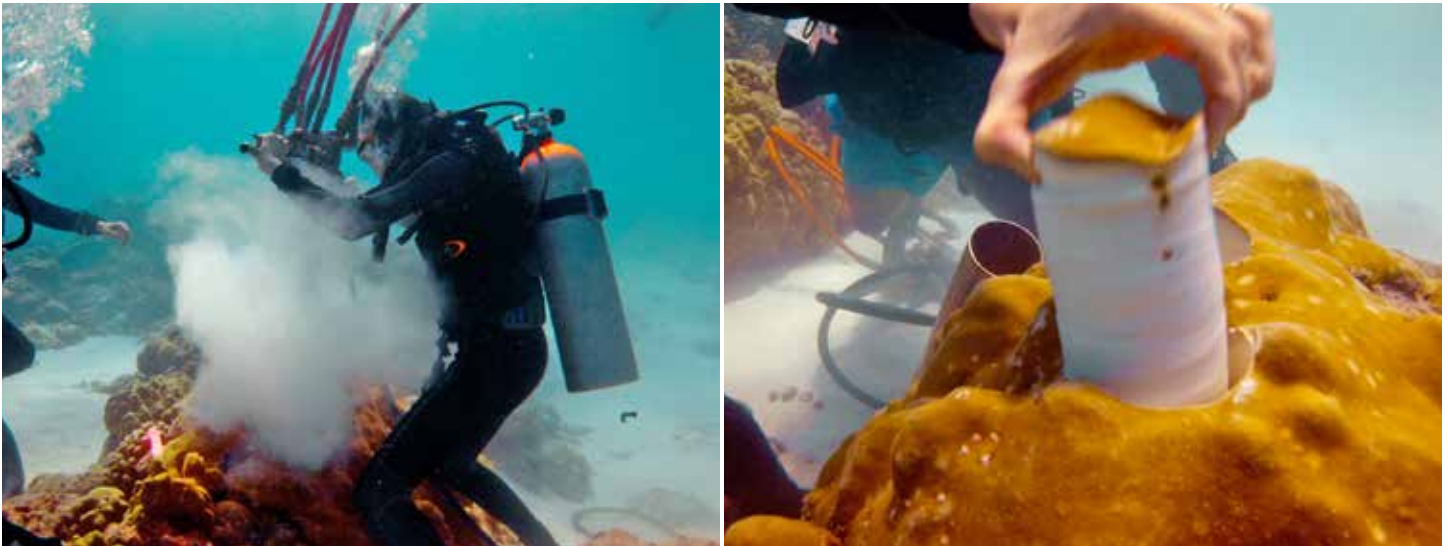
2. HotSpot

Corals are vulnerable to bleaching when the SST exceeds the temperatures normally experienced in the hottest month. This is shown in the Coral Bleaching HotSpot product, which highlights regions where the SST is currently warmer than the highest climatological monthly mean SST for that location. The HotSpot value of 1° C is a threshold for thermal stress leading to coral bleaching. To highlight this threshold, HotSpot values below 1.0 C are shown in purple, and HotSpots of 1.0° C or greater range from yellow to red. Global images are updated twice weekly.

3. Degree Heating Weeks (DHW)

Mass coral bleaching has been shown to be caused by prolonged periods of thermal stress. The DHW product accumulates any HotSpots greater than 1° C over a 12 week window, thus showing how stressful conditions have been for corals in the last three months. It is a cumulative measurement of the intensity and duration of thermal stress, and is expressed in the unit ° C weeks. DHWs over 4° C-weeks have been shown to cause significant coral bleaching; values over 8° C-weeks have caused widespread bleaching and some mortality (death). The global data is updated twice a week.





4. Sea Surface Temperature (SST) Anomaly

SST Anomaly is produced by subtracting the long-term mean SST (for that location in that time of year) from the current value. A positive anomaly means that the current sea surface temperature is warmer than average, and a negative anomaly means it is cooler than average. The images are updated twice weekly.

5. Bleaching Alert Area

These global maps summarize the current DHW (Degree Heating Weeks) and HotSpot values. At a glance, this product outlines the location, coverage, and potential risk level of the current bleaching thermal stress. Alert levels are defined below. The global data are updated twice weekly.

LEVEL	DESCRIPTION
NO STRESS	No Color: Corals are not currently experiencing any thermal stress
WATCH	Lime Green: Temperatures are above normal summer maximums, but corals are not yet stressed.
WARNING	Orange: Corals are experiencing a low-level buildup of thermal stress.
BLEACHING ALERT 1	Red: Corals are currently stressed, accumulating to a level where bleaching is expected.
BLEACHING ALERT 2	Maroon: Corals are currently stressed, accumulating to a level where widespread bleaching and some coral mortality is expected.

6. Bleaching Outlook

Currently in the experimental or beta phase, this product is based on SST forecasts from the NOAA operations Climate Forecast System (CFS). Displayed here are the most recent seasonal outlooks at probabilities of 60%-90%, thereby identifying the lowest thermal stress levels that 60% and 90% of all the ensemble members predict, respectively. Four potential bleaching thermal stress levels are color coded (see the color legend in Google Earth) in this bleaching outlook layer. In a normal year, the prediction system will forecast no potential for bleaching thermal stress. When sea surface temperature forecasts exceed bleaching thresholds and continue long enough to cause bleaching, the outlook products display the bleaching potential during the upcoming warm season. Actual conditions may vary due to subsequent changes in climatic conditions or weather patterns.