

Overview of NOAA Coral Reef Watch's Daily 5km-resolution Satellite Regional Virtual Stations for Monitoring and Responding to Mass Coral Bleaching

*Erick F. Geiger¹, Gang Liu¹, Jacqueline L. De La Cour¹, Benjamin L. Marsh²,
Roxana Vasile², William Skirving², C. Mark Eakin³*

NOAA Coral Reef Watch-University of Maryland/ESSIC, College Park, MD 20740, U.S.A.

NOAA Coral Reef Watch-ReefSense, Townsville, Queensland 4817, Australia.

NOAA Coral Reef Watch, College Park, MD 20740, U.S.A.

Abstract

In early 2015, the National Oceanic and Atmospheric Administration's (NOAA) Coral Reef Watch (CRW) program released a set of daily 5km-resolution satellite Regional Virtual Stations (RVS) that provide comprehensive, regional summaries of coral bleaching heat stress conditions for all tropical reef locations. The RVS bring together CRW's daily 5km satellite-monitored and 50km climate-model projected sea surface temperature (SST) products to track environmental conditions in near real-time, and provide bleaching outlooks up to 16 weeks out. In 2019, CRW updated the RVS to include its latest daily global 5km satellite coral bleaching heat stress monitoring products. These are based on 'CoralTemp', CRW's daily, global gap-free, internally-consistent 5km SST dataset spanning 1985-present. Use of the 'CoralTemp' time series in the RVS allows for the addition of enhanced graphs and analyses to alert users to heat stress changes at their reefs of interest. CRW's user community around the world can now better assess climate change impacts at a regional level and plan management resources accordingly. There are currently 213 RVS, each of which provides regionally representative statistics based on all reef-containing satellite data pixels contained within the defined area augmented with a 20km buffer. RVS locations were created primarily based on political/jurisdictional boundaries; they use global coral reef locations from the Millennium Coral Reef Mapping Project, the World Atlas of Coral Reefs, and other external and in-house sources. The RVS are used in a suite of products including Regional Bleaching Heat Stress Gauges; an automated, free Satellite Bleaching Alert email system; time series graphs; multi-year graphs; interactive Google Maps and Google Earth interfaces; and associated data files. These products alert coral reef managers, scientists, citizen science monitoring networks, decision makers, and other stakeholders to potential environmental threats to their local reefs, especially mass bleaching, to help facilitate effective preparation, communication, and response. This poster describes the RVS product in detail and explains how to interpret the data.