From STAR’s Geo-Polar Blended SST to the 2014-17 Global Coral Bleaching Event and Beyond:
A Coral Reef Watch Report

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https://coralreefwatch.noaa.gov
Third Global Coral Bleaching Event: 2014-17

- Declared start of third-ever global bleaching event (Oct 2015)
- Announced likely ending of the event (June 2017)

Coral Reef Watch’s satellite monitoring and modeled outlooks led to first-ever, well-coordinated monitoring, research, and management of a global bleaching event
- Longest global bleaching event ever (3-years)
- Most widespread global bleaching event ever
- Over \(\frac{1}{2}\) exposed twice (Guam: 4 years in a row)
- \(~100\%\) coral reefs stressed worldwide; 64\% of reefs with bleaching level heat stress
Coral Reef Watch 5 km Satellite-Based Products

NOAA/STAR’s Operational Geo-Polar Blended Night-Only SST Analysis

- Global, 5 km
- Updated daily
- Posted online

Coral Bleaching HotSpot

Degree Heating Week

Bleaching Alert Area

Early Warning System
Coral Reef Watch 5 km Satellite-Based Products

NOAA/STAR's Operational Geo-Polar Blended Night-Only SST Analysis

NOAA Coral Reef Watch Daily 5-km Geo-Polar Blended Night-Only Sea Surface Temperatures  3 Jun 2016

Polar:  S-NPP (VIIRS), METOP-B
Geo:  GOES-E, GOES-W, METEOSAT-10, HIMAWARI-8

https://coralreefwatch.noaa.gov
Advances in Coral Reef Watch’s 5 km Products

Development & implementation of a new climatology:

Development & implementation of Version 3 product suite:
- Significant improvement in accuracy (initial testing)
Heat Stress using Improved 5 km Climatology

Old
Using Pathfinder 4 km SST-based climatology

New
Using Reprocessed Blended SST and OSTIA SST-based climatology
Advances in Coral Reef Watch’s 5 km Products

Development & implementation of a new climatology:


Development & implementation of Version 3 product suite:

- Significant improvement in accuracy (initial testing)

Development: 1985-present dataset (“CoralTemp”)

- 1985-2002: OSTIA Reanalysis
- 2002-2016: STAR’s Reprocessed Blended SST
- 2017-present: STAR’s near-real-time operational Blended SST
Future plans

STAR’s Reprocessed 5 km Blended SST:

- Delivered: 2002 Sept-2016
- In processing: 1994-2002 August

- VIIRS SST
  - Not available for current version
  - To be included in future version

Higher resolution satellite SST-based monitoring products

- High quality SST available (including VIIRS L2U, L2C)
- Experiments showed gaps in daily data = challenge
- Higher resolution (>2 km) Blended SST is desired

Delayed Science-Quality Geo-Polar Blended SST Analysis??
(CRW’s monitoring accumulates heat stress over three months)
Key Messages

Geo-Polar Blended data (incorporating VIIRS)
• Just in time for 2014-17 Global Coral Bleaching Event
• Higher-resolution, better global & regional products
• Excellent use by scientists and resource managers worldwide

New satellite data needs:
• High-resolution polar & geostationary data needed for blended SST and coral bleaching heat stress products
• JPSS provides needed sub-km SST with global coverage
• High quality reprocessing needed for climatology

@CoralReefWatch
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Thank you from the NOAA Coral Reef Watch Team!!
Over 1000 media stories (print, online, radio, TV)

Chasing Coral – feature length documentary
- Premiered at Sundance Film Film Festival, January 2017
- Won Audience Award for Best US Documentary