

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







Coral Reef Watch's satellite monitoring and modeled outlooks led to first-ever, well-coordinated monitoring, research, and management of a global bleaching event

Third Global Coral Bleaching Event: 2014-17



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- Longest global bleaching event ever (3-years)
- Most widespread global bleaching event ever
- Over 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





Coral Reef Watch 5 km Satellite-Based Products



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



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





Advances in Coral Reef Watch's 5 km Products

Development & implementation of a new climatology:

- STAR's Reprocessed Blended SST (2002-2015) - OSTIA Reanalysis (1985-2002)

Development & implementation of Version 3 product suite:

- Significant improvement in accuracy (initial testing)

Old

Using Pathfinder 4 km SSTbased climatology

Heat Stress using Improved 5 km 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:

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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

50reefs.org

50 Reefs Launch Video







CRW - Member of Scientific Steering Group





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)



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





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Thank you from the NOAA Coral Reef Watch Team!!





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CHASING CORAL AN EXPOSURE LABS PRODUCTION

The ocean is critical to all life on earth, but unfortunately, coral reefs around the globe are vanishing at an unprecedented rate. In search of answers, a special team of divers, photographers, and marine scientists set out on an adventure and reveal a beautiful underwater mystery to the world.



- •Over 1000 media stories (print, online, radio, TV)
- •Chasing Coral feature length documentary
 - Premiered at Sundance Film Festival, January 2017
 - Won Audience Award for Best US Documentary