



Commonly Asked Questions: ERSSTv5

Extended Reconstructed Sea Surface Temperature Version 5

About the Update

1. Why is this dataset being updated?

What improvements does this version introduce?

Why is updating datasets good for users?

NOAA periodically updates the ERSST dataset to add new sources of scientific data from the network of global observations and to incorporate more accurate methods to analyze the volumes of available environmental data. The dataset was last updated in 2015.

This updated dataset ensures that business and industry have the best available information to develop tools, products, services, and assessments for decision making and that scientists can use this information in their own specific research interests. The dataset is used for global climate monitoring and assessment, tracking cycles of El Niño–Southern Oscillation (ENSO), oceanic and environmental research, and applications in various industries and economic sectors, such as agriculture and water resources.

ERSSTv5 includes the following improvements:

- More comprehensive data from the latest versions of the International Comprehensive Ocean–Atmosphere Data Set ([ICOADS Release3.0](#))
- New sea–ice estimates from the latest version of the Hadley Centre Sea Ice and Sea Surface Temperature Data Set ([HadISST2](#); Titchner and Rayner 2014, doi: 10.1002/2013JD020316)
- A decade of near-surface sea temperature data from [Argo floats](#)
- An improved way to correct for offsets between ship and buoy sea surface temperatures

Operational Uses

2. Where is the operational dataset?

It is available on the NCEI website at <ftp://ftp.ncdc.noaa.gov/pub/data/cmb/ersst/v5/>. Information on the methodology is outlined in the [Huang et al. \(2017\) paper](#) in *Journal of Climate*.

3. When will it be used by NCEI to conduct monitoring and assessments?

Global sea surface temperature is monitored and reported on each month by NCEI. ERSSTv5 will be available to researchers and reported on by NCEI in July 2017. These data will be used in early 2018 in combination with a new version of NOAA’s land surface temperature dataset (the Global Historical Climatology Network–Monthly, [GHCN-M](#)) to generate a new version of the NOAA Global Surface Temperature dataset ([NOAAGlobalTemp](#)). NOAAGlobalTemp is used for global climate monitoring and assessment.

4. Who will use it, and what kinds of studies does it contribute to?

Oceanographers and atmospheric research scientists constitute the major users of the dataset. Scientists around the world consider global sea surface temperature a critical component to help understand Earth’s climate. They use the data for global climate monitoring and assessment, tracking cycles of El Niño–Southern Oscillation (ENSO), oceanic and environmental research, and to develop informational products and services for various industries and economic sectors, such as agriculture and water. ERSST has previously been used in both U.S. National Climate Assessments and International Panel on Climate Change Assessment Reports.

Peer-review Process / Transparency

5. What kind of testing and peer-review does the dataset undergo before NCEI releases it for use?

During the development of ERSSTv5 over several years, a team of scientists used a series of rigorous quality assurance tests to ensure the accuracy and integrity of ERSSTv5 as compared to previous versions. The final version of ERSSTv5 was validated against other available independent sea surface temperature datasets including satellite-based observations from the European Space Agency's Climate Change Initiative. Finally, the methodology to develop the ERSSTv5 dataset underwent thorough review within NOAA and was anonymously peer-reviewed by the American Meteorological Society's *Journal of Climate*. The dataset also underwent a review process within NCEI to determine its readiness for public release.

6. What do scientists do with user feedback once the dataset is released?

NCEI scientists regularly review user feedback and evaluate its scientific value. Feedback with scientific merit is used in future improvements of this product.

Changes from Version to Version

7. What are the main ways version 5 differs from its predecessor?

This table specifies several major distinctions between ERSST versions 4 and 5

ERSST v4	ERSST v5
Argo SSTs are not included	Argo SSTs are included
Uses ICOADS R2.5	Uses ICOADS R3.0
Uses HadISST1 ice concentration	Uses HadISST2 ice concentration
Slightly weaker ENSO magnitude due to smoothed reconstruction functions	Greater ENSO magnitude due to less smoothed reconstruction functions
Uses ship SSTs as a baseline	Uses buoy SSTs as a baseline
Uses adjusted SSTs in quality control of input data	Uses unadjusted SSTs in quality control of input data

8. What is the impact of including more near-surface sea temperature data from Argo in the ERSSTv5?

Overall, inclusion of the Argo data slightly increases the global sea surface temperature warming trends, but not uniformly. For example, the Argo data increase the warming trend for a midlatitude band of 20°–40°S, while the data decrease the warming trend for the high latitude band of 60°–90°N.

9. Why does there appear to be a slight difference in the recent (2000–2015) trend than the previous version? Is the warming rate similar? Does the data still show significant warming?

Overall, the global sea surface temperature warming trends in v4 and v5 are close over both the short-term (2000–2015) and long-term (1900–2015) periods. The warming trends evident in v4 and v5 are statistically significant at 95% confidence level and indicate there has been no slowdown in global sea surface warming in either version for those time periods. Several reasons for the slight differences are summarized in the table.

10. How does this compare with results in recent studies?

The study of ERSSTv5 supports the conclusions of the work of [Karl et al. \(2015\)](#) regarding sea surface temperature trends. Other studies, such as [Hausfather et al. \(2016\)](#), further support these findings.



Argo float