NOAA

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Due to planned system maintenance, significant order processing delays will occur from certain NCEI web systems. The maintenance will be on May 10, 2018 from 8:00 AM until 6:00 PM ET.

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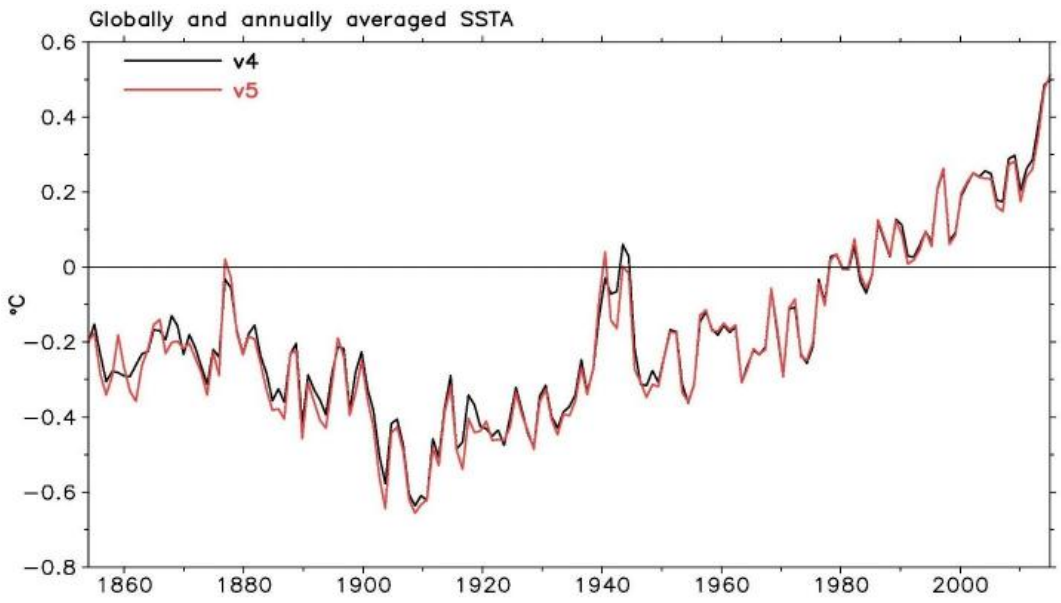
Extended Reconstructed Sea Surface Temperature (ERSST) v5

The Extended Reconstructed Sea Surface Temperature (ERSST) dataset is a global monthly sea surface temperature dataset derived from the International Comprehensive Ocean–Atmosphere Dataset (ICOADS). Production of the ERSST is on a 2° × 2° grid with spatial completeness enhanced using statistical methods. This monthly analysis begins in January 1854 continuing to the present and includes anomalies computed with respect to a 1971–2000 monthly climatology. The newest version of ERSST, version 5, uses new data sets from ICOADS Release 3.0 (Sea Surface Temperatures) SST; SST comes from Argo floats above 5 meters, Hadley Centre Ice-SST version 2 (HadISST2) ice concentration. ERSSTv5 has improved SST spatial and temporal variability by (a) reducing spatial filtering in training the reconstruction functions Empirical Orthogonal Teleconnections (EOTs), (b) removing high-latitude damping in EOTs, and (c) adding 10 more EOTs in the Arctic. ERSSTv5 improved absolute SST by switching from using Nighttime Marine Air Temperature (NMAT) as a reference to buoy-SST as a reference in correcting ship SST biases. Scientists have further improved ERSSTv5 by using unadjusted First-Guess instead of adjusted First-Guess.



Monthly and globally averaged ERSST v5 anomaly from 1854–2016 in comparison with v4. Note that the data are more reliable after the 1940s.

The monthly analysis extends from January 1854 to the present, but because of sparse data in the early years, there is damping of the analyzed signal before 1880. After 1880, the strength of the signal is more consistent over time. ERSST is suitable for long-term global and basin-wide studies, and smoothed local and short-term variations are used in the dataset. The NOAA Global Surface Temperature (NOAAGlobalTemp) (formerly known as the Merged Land-Ocean Surface Temperature dataset) product uses ERSST as input along with land surface air temperature data from the Global Historical Climatology Network-Monthly dataset.

Data Access

To receive email notifications for ERSST updates, please visit the ERSST Data Optional Registration. For information about the data status, changes to processes, and corrections, visit the ERSST status page.

- ASCII ERSST GRIDDED DATA
  Monthly ERSST gridded data in ASCII format are available from 1854 to present.
- Network Common Data Form (NetCDF) ERSST Gridded Data
  Monthly NetCDF format gridded data are available from 1854 to present.

References

The following publications describe the processes and procedures for each version of the ERSST dataset.

ERSST v1

Smith, T.M., and R.W. Reynolds, 2003: Extended reconstruction of global sea surface temperatures based on COADS data (1854–1997). Journal of Climate, **16**, 1495–1510. doi:10.1175/1520-0442-16.10.1495.

ERSST v2

Smith, T.M., and R.W. Reynolds, 2004: Improved extended reconstruction of SST (1854–1997). Journal of Climate, **17**, 2466–2477. doi:10.1175/1520-0442(2004)017<2466:IEROS>2.0.CO;2.

ERRST v3

Smith, T.M., R.W. Reynolds, T.C. Peterson, and J. Lawrimore, 2008: Improvements to NOAA's historical merged land–ocean temperature analysis (1880–2006). Journal of Climate, **21**, 2283–2296. doi:10.1175/2007JCLI2100.1.

Xue, Y., T.M. Smith, and R.W. Reynolds, 2003: Interdecadal changes of 30-Yr SST normals during 1871–2000. Journal of Climate, **16**, 1601–1612. doi:10.1175/1520-0442-16.10.1601.

ERSST v4

Huang, B., V.F. Banzon, E. Freeman, J. Lawrimore, W. Liu, T.C. Peterson, T.M. Smith, P.W. Thorne, S.D. Woodruff, and H.-M. Zhang, 2014: Extended Reconstructed Sea Surface Temperature version 4 (ERSST.v4): Part I. Upgrades and intercomparisons. Journal of Climate, **28**, 911–930, doi:10.1175/JCLI-D-14-00006.1.

Liu, W., B. Huang, P.W. Thorne, et. al, 2014: Extended Reconstructed Sea Surface Temperature version 4 (ERSST.v4): Part II. Parametric and structural uncertainty estimations. Journal of Climate, **28**, 931–951, doi:10.1175/JCLI-D-14-00007.1.

Huang, B., P. Thorne, T. Smith, et. al, 2015: Further Exploring and Quantifying Uncertainties for Extended Reconstructed Sea Surface Temperature (ERSST) Version 4 (v4). Journal of Climate, **29**, 3119–3142, doi:10.1175/JCLI-D-15-0430.1.

Huang, B., Peter W. Thorne, et. al, 2017: Extended Reconstructed Sea Surface Temperature version 5 (ERSSTv5), Upgrades, validations, and intercomparisons. J. Climate, doi: 10.1175/JCLI-D-16-0836.1

Cite dataset when used as a source. See the dataset's DOI landing page for citation details at doi:10.7289/V5T72FNM.

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