

Ishii, M., A. Nishimura, S. Yasui, S. Hirahara, 2025: Historical high-resolution daily SST analysis (COBE-SST3) with consistency to monthly land surface air temperature. *J. Meteor. Soc. Japan*, **103**, <http://doi.org/10.2151/jmsj.2025-002>.

Plain Language Summary: An updated historical sea surface temperature (SST) analysis called COBE-SST3 has been produced on a daily $0.25^\circ \times 0.25^\circ$ grid for the period from 1850 to 2020, with a higher spatial resolution than the previous analysis, COBE-SST2 defined on a $1^\circ \times 1^\circ$ grid. The trends and the monthly components of COBE-SST3 are simultaneously analyzed with land surface air temperatures (LSATs). This moderates the rather steep SST changes seen around 1940 in other SST analyses as well as in COBE-SST2. The analysis dataset includes an additional daily SST analysis with direct input of satellite observations, a monthly LSAT analysis called COBE-LSAT3, and perturbed COBE-SST3 based on the estimated uncertainties in the analysis.

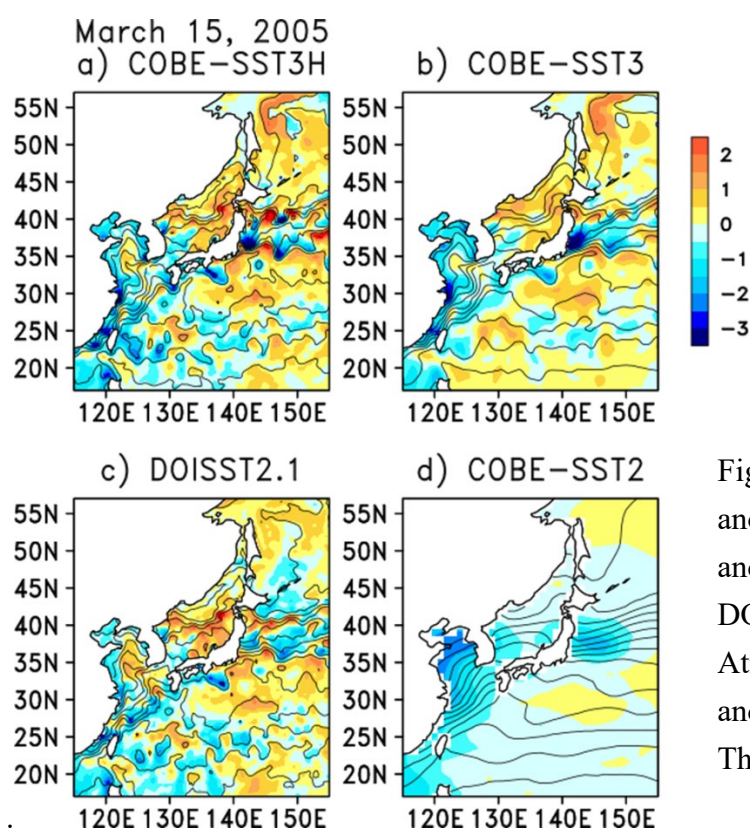


Figure 1. SST (contour, K) and SST anomalies (shade, K) of a) COBE-SST3H and b) COBE-SST3 compared with c) DOISST2.1 of the National Oceanic and Atmospheric Administration of the USA and d) COBE-SST2 on March 15, 2005. The contour interval of SST is 2 K.

- Uncertainties in SST analyses between institutes are still large in the period leading up to the International Geophysical Year. They arise from the observational biases that are not well known.
- The SST (LSAT) observations can reproduce the interannual variations of the LSAT (SST) in the simultaneous SST-LSAT analysis.
- The daily SST changes of COBE-SST3H are somewhat poorly correlated with those of DOISST2.1 in areas where the amplitudes of the daily changes are larger than the interannual variations.