

**HadISST2 – ensemble analyses at two different resolutions.**  
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Ten realisations of the preliminary HadISST2 data set have been produced for assessment within the ERA-CLIM project (see <http://www.era-clim.eu/>). They are provided as globally complete 0.25° resolution daily sea-surface temperature (SST) fields. Half the realisations are based on 1° monthly fields of sea-surface temperature (1899-2010), and half are based on a 1° five-day (pentad) analysis (1961-2010). The SST data sources are: in situ observations from ICOADS v2.5 and from the Met Office observational data base; SST retrievals from AVHRR Pathfinder v5 data (1985-2007); and SST retrievals from the ATSR2 and AATSR (1995-2011) METEO products. In situ data are an update of Kennedy et al. (2011) which have been bias adjusted to account for changes in measurement method. For HadISST2, the data were quality controlled and gridded as anomalies relative to a 0.25° daily climatology. Realisations of the Kennedy et al. (2011) bias adjustments that were consistent with the ATSR series were used. The AVHRR data have been bias adjusted for aerosol contamination and diurnal drift by comparison with coincident ATSR and in situ observations and measurements of aerosol optical depth.

SST data were analysed using a 2-step interpolation procedure. In the first step, an iterative process (Ilin and Kaplan 2009) was used to produce an EOF based large-scale interpolation using 71 EOFs. The resulting principal component series were smoothed using a Kalman filter to ensure month-to-month (or pentad-to-pentad) continuity and a single sample was drawn from the posterior distribution. The residuals from the large-scale reconstruction were then analysed using a non-stationary local covariance function (Karspeck et al., 2012). The resulting fields were then blended with samples drawn from the local covariance function according to the uncertainty in the local analysis. This procedure produces fields that have consistent variability throughout the record.

The sea ice concentration analysis is still under development and not currently available in prototype.

The analysed SST fields were interpolated to 0.25° daily resolution and output as CF-compliant NetCDF files. Monthly anomaly analyses on 1° resolution were also created for 1850-1898, but these have not yet been converted to daily fields.

A “first final” HadISST2 analysis, including the sea ice analysis, will be complete by September 2012. This will include updated satellite retrievals from the ATSR Reprocessing for Climate project, revised adjustments to the AVHRR Pathfinder data and will benefit from feedback obtained from collaborators at ECMWF. Version increments will be created thereafter as and when improved input data are available.

Until acceptance of a peer reviewed paper, access to HadISST2 data will be restricted and on the understanding that the analysis is subject to further development and that no results should be published using the data. Requests for access to preliminary fields for testing should be directed to [nick.rayner@metoffice.gov.uk](mailto:nick.rayner@metoffice.gov.uk).

## **References**

Ilin A. and A. Kaplan. Bayesian PCA for Reconstruction of Historical Sea Surface Temperatures. In Proc. of the Int. Joint Conf. on Neural Networks (IJCNN 2009), pp. 1322-1327, Atlanta, USA, 2009.

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