

Assessing Climate-data Processing Methods Through the International Surface Temperature Initiative's

Benchmark Framework

ISTI benchmarking provides a robust, independent and useable common assessment framework for temperature data product creation methodologies which will aid end-users to choose the best products in a scientifically rigorous manner.

Weather station data form the basis of many of our long-term climate data records. There have been very many changes to these stations over time, resulting in non-climatic artifacts. Careful processing is necessary to remove such features before the records can be appropriately used, but uncertainty remains especially at local scales relevant to impacts of climate change.

Benchmarking in this context is the testing of climate data processing approaches against a common set of synthetic datasets where the added non-climate changes are known beforehand. Method skill can be quantified along with the potential for remaining biases and uncertainties.

In order to be comprehensive, this benchmarking must be done on a global scale with broad participation. The ISTI is well placed to facilitate this, and has embarked on an ambitious project to design and implement the first truly global surface temperature benchmarking system.

ISTI's Databank Working Group, under the leadership of NOAA's National Climatic Data Center, has produced an innovative data holding that brings together new and existing sources of surface air temperature. This data holding provides users a way to better track the origin of the data from their collection through their integration. By providing the data in various stages that lead to the integrated product, by including data origin tracking flags with information on each observation, and by providing the software used to process all observations, the processes

involved in creating the observed fundamental climate record are open and transparent. The integrated data holding contains over 32,000 global stations and was released in June 2014. The data holding is version controlled and will be updated frequently in response to newly discovered data sources and user comments.

