

CHHT 1.0 and future plan in 2011-2015

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The China Homogenized Historical Temperature (CHHT) Dataset (1951–2004) Version 1.0 consists of monthly and daily surface observations from all national stations in mainland China. CHHT 1.0 includes mean, maximum, and minimum temperature data; assessments of data quality; and gridded versions of the three temperature variables. One of the primary goals of CHHT 1.0, released in December 2006, was to build a set of homogenized observational climatic datasets. China is a large country with a large population, located in the East Asian monsoon wind region. China has a huge national surface observational network with (at present) 671 surface stations. In the updating plan, homogenization of surface air temperature data series will be redetected with new and mature methods (and the metadata will play more important role), and the discontinuities parts of series will be readjusted. As to the content, monthly and daily mean, maximum and minimum temperature data (1951-2011) will be updated. In addition, monthly mean, mean maximum and minimum temperature data (1900-2011) will also be considered as an important part of the dataset. During this updating program, advises and comments from inside/outside of data analysis community will be warmly welcomed.

1 Brief review of CHHT1.0

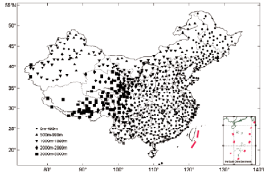


Fig. 1. The location and approximate altitude of the national stations across mainland China.



Fig. 2. Variation of the number of weather stations with time

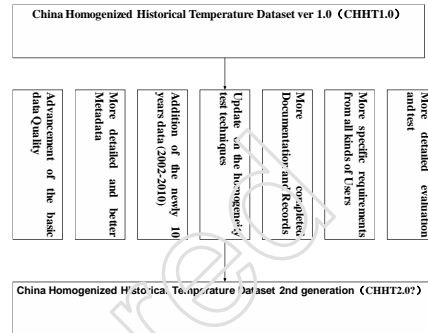


Fig. 3. the Preface of CHHT 1.0

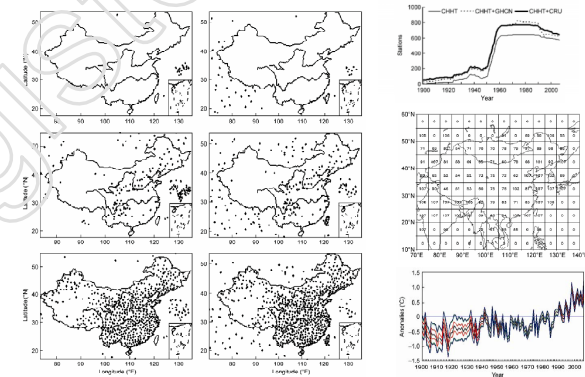
The urgent need of CHHT1.0 updating:

- Time updating, 1951-2004, now it is 2011-2015
- All 700+ stations with no consideration of spatial representivity
- Inhomogeneity test methodology has been advanced greatly
- Metadata has been more and more detailed and completed
- Automatic observation has been widely used in most stations in China during 2000-2005
- Gridding version dataset of higher/different resolutions are required more and more urgent by users.

4. Conception model of dataset updating



5. 100 years temperature change and dataset



Left: The location of the stations of CHHT+GHCN (left) and CHHT+CRUTEM3 (right) in different years (upper: 1900; middle: 1950; bottom: 2006). Right: top: Variation of the number of stations with time during 1900–2006. mid: The length of series for each grid box (years). Bottom: GHCN and CRUTEM3 are only used for stations outside China. Annual temperature anomaly time series during 1900–2006 over China based on the combination of CHHT 1.0 and CRUTEM3 stations. The reference period is 1961–1990. The black line is the best estimate value, the red band gives the 95% uncertainty range caused by station sampling, and measurement errors; the green band adds the 95% error range due to limited coverage; and the blue band adds the 95% error range due to bias errors.

2 Homogenisation in next generation of dataset

Data preparation:

- Raw digitalized data has been rechecked, some problems have been found in the earlier version of raw data;
 - Updated QC procedure;
 - The time duration has been set to 1951-2011, about 7 years of data were added
- Methodology and Software preparation:
- Test: PMT and PMFT based on RHtest V.3, some new functions will added according to this specific use.
 - Adjustment: Qm adjustment based on RHtest V.3 package, with some new functions will added according to this specific use.
- Why RHtest?
- Automatic, Objective;
 - Some straws in the earlier statistics of homogeneity test techniques have been addressed;
 - Metadata information will be fully used when adjusting the station series.
 - And so on

3. Gridding

Resolution:

- Temporal: daily
- Spatially: $2.5^\circ \times 2.5^\circ$, $1^\circ \times 1^\circ$, $0.5^\circ \times 0.5^\circ$, and so on, based on the surveys of all potential users.

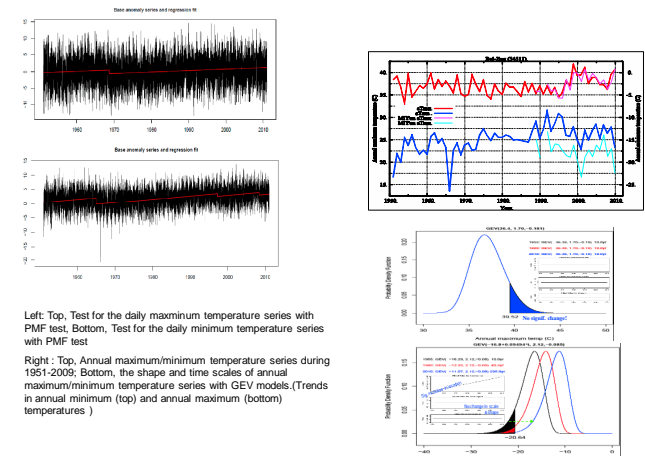
Methodology and scheme designing:

- Gridding methods:
- Thin plate smoothing splines / Kring
 - Shepard / OI
 - Other interpolation techniques

Scheme designing:

- Calculation of the 1971-2000 climatology field (daily, monthly and annual);
- Gridding the climatology field for 1951-2011;
- Calculation of the anomalies field for each day, month and year;
- Gridding the anomalies fields for 1951-2011;
- Obtain the daily, monthly and annual maximum, minimum and mean temperature datasets.

6. Intercomparison and application of the dataset



Left: Top, Test for the daily maximum temperature series with PMF test, Bottom, Test for the daily minimum temperature series with PMF test

Right: Top, Annual maximum/minimum temperature series during 1951-2009; Bottom, the shape and time scales of annual maximum/minimum temperature series with GEV models. (Trends in annual minimum (top) and annual maximum (bottom) temperatures)