

Abstract

Maps of Monthly Mean Surface Temperature Anomalies over the Northern Hemisphere for 1891-1981*

In Japan, we have three kinds of map for the monthly mean surface temperature anomalies over the Northern Hemisphere.

However, they were made from different data periods which are relatively short and one of which is a 500mb-1000mb thickness height anomaly.

We obtained from NCAR (U. S. A.) in 1984 a data set of a monthly mean surface temperature extending over 91 years (1891-1981).

This data set was first produced by experienced Soviet climatologists with great care in the analysis of the maps. In this they took into considerations of station locations, breaks in the record, and errors in the data. The data set covers the Northern Hemisphere on a $5^{\circ} \times 10^{\circ}$ latitude-longitude grid.

The following numbers of stations were used when the maps were constructed.

At 1881, 246 stations

At 1913, 753 stations

At 1940, 976 stations

At 1981, 2000 stations.

The original data set by the Soviet group was calculated with the use of different Normal values which were constructed from various data periods.

Allen Robock (1982) transformed them into the anomalies from the Normal for the period from 1881 to 1975. We made the anomaly maps using this data set.

The isotherm lines were drawn by making use of the calculation program by O. Chiba in this maps. We aim at taking quick look of the temperature anomaly maps. Since the anomalies from the long-term Normal are hard to see on account of long-term climatic change, we newly calculated anomalies from the 30-years Normals which are recommended by WMO

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and are used in the Japan Meteorological Agency.

Shadow parts in the maps show negative anomalies. Isotherms are drawn at intervals of 2°C in the cold season (Oct.-March) and by 1°C in warm season (April-September).

Seasonal mean surface temperature anomalies in every 30° latitude belt and in the Northern hemisphere north of 15°N were shown in the last figures for the four seasons.

Beside this, monthly surface temperature anomaly data sets are prepared by some research groups in the world, but they have both merits and demerits. And there are a few hemispheric grid data set for a long terms. In this respect, the Russian data set is superior.

These maps will be useful in the routine works of the long range weather forecasting and of taking against climatic change in the Japan Meteorological Agency.

Further an original magnetic tape of the data set are kept in the Office of Planning of the MRI.

Lastly, the authors wish to express their thanks to Dr. Allen Robock for his permission to publish these maps.