A Big Earth Data Platform for Three Poles

**0.25 degree climate dataset in the northeastern part of the Tibetan Plateau (1957-2009)**

1、Description

The 0.25 Degree climate data set in the northeastern part of the Tibetan Plateau from 1957 to 2009 contains four meteorological elements, which are precipitation, maximum and minimum temperatures, and wind speed. The time resolution is daily.
The data set contains 2400 text files, each with precipitation (the 1st column), highest (the 2nd column) and lowest (the 3rd column) temperatures and wind speed (the 4th column). Each file name contains latitude and longitude. Each file represents the four meteorological element values for the corresponding grid point (0.25\*0.25 degrees).
These data are formed by gridding the observation data of 81 meteorological stations in the northeast of the plateau, considering the change of meteorological conditions with the elevation.
The gridding methods and steps are as follows.
Download the original daily maximum and minimum temperatures, precipitation, and wind speed from the China Meteorological Data Network (http://data.cma.cn). Then, perform quality control on the data. The principle used is 1) to remove daily precipitations below 0 and greater than 150 mm, daily temperatures below -50 °C and greater than 50 °C and wind speeds below 0 m / s, 2) draw annual sequence precipitation, temperature and wind speed, check for abnormal year-to-year changes, and conduct quality control through station migration records. For data with abnormal changes but with station migration records, the data are segmented by modifying the station name. For example, at Xining Station (52866), abnormal temperature changes occurred in 1996, which was found through records that Xining Station migrated after 1996. Therefore, the records before 1996 are recorded as virtual station 52867 data, and after 1996, the data are still recorded as 52866 stations. If the data change abnormally but there is no station migration record, the abnormally changed data are eliminated, for example, the data from Delingha Station before 1975. Some stations have migration records, but the data do not change abnormally; then, it is assumed that the stations before and after the migration are still in the same climate environment, so there is no change in station name and data record.
 Interpolation begins after quality control. The method begins with (1) calculating the changes in daily average temperature, precipitation and wind speed as the altitude changes. It is concluded that the temperature decreases with altitude by 4.3 °C/km, and the coefficient of determination R2 is 0.65. In the warm and humid season (from May to September), the average daily precipitation has an insignificant increase with altitude (0.5 mm/km, R2 is 0.1). The average daily precipitation in the cold dry season (from October to April) does not change with altitude. The wind speed also has an insignificant increase with altitude, with an increase rate of 0.4 m/s/km and R2 of 0.1. (2) The spatial interpolation is performed using the Synographic Mapping System (SYMAP, Shepard, 1984) method. In this method, the distance between stations and the angle between surrounding stations are taken into account in interpolation to indicate the density of stations. The distance and angle are integrated into a weight. In addition, the stations that are close and have a large angle between each other are given a large weight. (3) The latitude and longitude of the station, the meteorological element value, the altitude, the rate of change with the altitude, and the weight are considered simultaneously, and the value of the target grid is interpolated. The maximum search range for interpolation is 55 stations around, and the smallest search range is 4 stations around. (4) Integrate the precipitation in the warm and dry seasons to form a precipitation sequence throughout the period. (5) During the method test period, some stations are set aside to check the gridded data. (6) After the verification is passed, all 81 stations are used in the final gridding process and form this set of data sets.
 Shepard, D. S., 1984: Computer Mapping: The SYMAP interpolation algorithm. Spatial Statistics and Models, G.Gaile and C. Willmot, Eds., Reidel 133-145.

2、Keywords

Theme：Precipitation,Temperature,Pressure
Discipline：Atmosphere
Places：Northeastern Tibetan Plateau
Time：

3、Data details

1.Scale：None

2.Projection：

3.Filesize：343.29MB

4.Data format：\*.data

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：40.0 | - |
| west：90.0 | - | east：105.0 |
| - | south：30.0 | - |

5、Time frame:1957-01-09 00:00:00+00:00--2010-01-08 00:00:00+00:00

6、Reference method

References to data:

LAN Cuo. 0.25 degree climate dataset in the northeastern part of the Tibetan Plateau (1957-2009). A Big Earth Data Platform for Three Poles, doi:10.11888/AtmosphericPhysics.tpe.249432.file2018

References to articles:

Cuo L., Zhang Y., Gao Y., Hao Z., Cairang L., 2013, The impacts of climate change and land cover transition on the hydrology in the Upper Yellow River basin, China. Journal of Hydrology, 502, 37-52.

Lan, C., Zhang, Y.X., Wang, Q.C., Zhang, L.L., Zhou, B.R., Hao, Z.C., Su, F.G. (2013). Climate change on the northern Tibetan Plateau during 1957-2009: spatial patterns and possible mechanisms. Journal of Climate, 26(1), 85-109. doi: http:/dx.doi.org/10.1175/JCLI-D-11-00738.1.

7、Supporting project information

8、Data resource provider

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