A Big Earth Data Platform for Three Poles

**Reanalysis data for surface meteorological elements for western China (2002)**

1、Description

The research project on land surface data assimilation system in western China belongs to the major research plan of "environment and ecological science in western China" of the national natural science foundation. the person in charge is Li Xin, researcher of the institute of environment and engineering in cold and arid regions of the Chinese academy of sciences. the project runs from January 2003 to December 2005.
One of the data collected in this project is the reanalysis data of surface climate factors in western China in 2002. This data set is generated based on the daily 1 × 1 provided by the National Environmental Prediction Center (NCEP). However, the re-analysis of the data has the following problems: (1) the temporal and spatial resolution is not high enough (the horizontal resolution is 1 degree and the time is 6 hours); (2) The low-level errors in plateau areas are large; (3) The data are standard isosurface data and need interpolation.
The 2002 reanalysis data set of surface climate elements in western China was generated by combining NCEP reanalysis data and MM5 model by Dr. Longxiao and Professor Qiu Chongjian of Lanzhou University using Newton relaxation data assimilation method (Nudging), including 10m horizontal and vertical wind speed (m/s), 2m air temperature (k), 2m mixing ratio, surface pressure (Pa), upstream and downstream short wave and long wave radiation (w/m2), convective precipitation and large scale precipitation (mm/s) at 0.25 degree per hour throughout 2002.
I. preparation background
The quality of the driving data seriously affects the ability of the land surface model to simulate the land surface state, so a very important component of the land surface modeling research is the driving data used to drive the land surface model. No matter how realistic these models are in describing the surface process, no matter how accurate the boundary and initial conditions they input, if the driving data are not accurate, they cannot get the results close to reality. Land surface models are so dependent on the quality of externally provided data that any error in these externally provided data will seriously affect the ability of land surface models to simulate soil moisture, runoff, snow cover and latent heat flux. These externally provided data include: precipitation, radiation, temperature, wind field, humidity and pressure. The 2002 reanalysis data set of surface climate elements in western China uses Newton relaxation data assimilation method (Nudging) to combine NCEP reanalysis data and MM5 model to generate driving data with higher spatial and temporal resolution suitable for complex terrain in western China.
Second, the basic parameters of the operation mode
1. Using the US PSU/NCAR mesoscale model MM5 as a simulation model;
The selection of simulation grid domain: center (32°N, 90°E), grid distance of 36km, number of horizontal grid points of 131\*151, vertical resolution of 25 layers, and mode top of 100hPa；;
2. The data used for initialization are 1 \* 1 GRIB grid data of NCEP in the United States.
3. The time step is 120s.
Third, the physical process
1. physical process treatment of cloud and precipitation: Grell cumulus cloud parameterization scheme is adopted for sub-grid scale precipitation, and Reisner mixed phase microphysical explicit scheme is adopted for distinguishable scale precipitation;
2. MRF parameterization scheme is adopted for planetary boundary layer process.
3. the radiation process adopts CCM2 radiation scheme.
IV. File Format and Naming
It is stored in a monthly folder and contains 24 hours of data every day. The naming rules are as follows: 2002\*\*\*&amp;.forc, where \* \* \* is Julian day and 2002\*\*\*&amp; is time (in hours), where. forc is the file extension.
V. data format
Stored in binary floating point type, each data takes up 4 bytes.

2、Keywords

Theme：Precipitation,Radiation,Temperature,Winds,wind speed
Discipline：Atmosphere,Others
Places：Western China
Time：2002

3、Data details

1.Scale：None

2.Projection：None

3.Filesize：56300.0MB

4.Data format：二进制浮点数据

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：49.36 | - |
| west：73.45 | - | east：111.2 |
| - | south：20.9 | - |

5、Time frame:2002-01-09 16:00:00+00:00--2003-01-09 15:00:00+00:00

6、Reference method

References to data:

LONG Xiao, QIU Chongjian. Reanalysis data for surface meteorological elements for western China (2002). A Big Earth Data Platform for Three Poles, doi:10.3972/westdc.004.2013.db2013

References to articles:

7、Supporting project information

8、Data resource provider

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