A Big Earth Data Platform for Three Poles

**High-resolution climate projection dataset in Central Asia (1986-2005 and 2031-2050)**

1、Description

Central Asia (referred to as CA) is among the most vulnerable regions to climate change due to the fragile ecosystems, frequent natural hazards, strained water resources, and accelerated glacier melting, which underscores the need of high-resolution climate projection datasets for application to vulnerability, impacts, and adaption assessments. We applied three bias-corrected global climate models (GCMs) to conduct 9-km resolution dynamical downscaling in CA. A high-resolution climate projection dataset over CA (the HCPD-CA dataset) is derived from the downscaled results, which contains four static variables and ten meteorological elements that are widely used to drive ecological and hydrological models. The static variables are terrain height (HGT, m), land use category (LU\_INDEX, 21 categories), land mask (LANDMASK, 1 for land and 0 for water), and soil category (ISLTYP, 16 categories). The meteorological elements are daily precipitation (PREC, mm/day), daily mean/maximum/minimum temperature at 2m (T2MEAN/T2MAX/T2MIN, K), daily mean relative humidity at 2m (RH2MEAN, %), daily mean eastward and northward wind at 10m (U10MEAN/V10MEAN, m/s), daily mean downward shortwave/longwave flux at surface (SWD/LWD, W/m2), and daily mean surface pressure (PSFC, Pa). The reference and future periods are 1986-2005 and 2031-2050, respectively. The carbon emission scenario is RCP4.5. The results show the data product has good quality in describing the climatology of all the elements in CA, which ensures the suitability of the dataset for future research. The main feature of projected climate changes in CA in the near-term future is strong warming (annual mean temperature increasing by 1.62-2.02℃) and significant increase in downward shortwave and longwave flux at surface, with minor changes in other elements. The HCPD-CA dataset presented here serves as a scientific basis for assessing the impacts of climate change over CA on many sectors, especially on ecological and hydrological systems.

2、Keywords

Theme：2m temperature,Precipitation,Radiative flux,Radiation,Temperature,Winds,Precipitation amount,Surface pressure,Humidity/Dryness,Pressure,wind speed
Discipline：Atmosphere
Places：Central Asia
Time：near-term future

3、Data details

1.Scale：None

2.Projection：Lambert\_Conformal\_Conic

3.Filesize：168182.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：57.78 | - |
| west：36.87 | - | east：93.65 |
| - | south：30.69 | - |

5、Time frame:None--None

6、Reference method

References to data:

QIU Yuan , QIU Yuan. High-resolution climate projection dataset in Central Asia (1986-2005 and 2031-2050). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2717592021

References to articles:

7、Supporting project information

Pan-Third Pole Environment Study for a Green Silk Road-A CAS Strategic Priority A Program
The General Project of the National Natural Science Foundation of China

8、Data resource provider

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