A Big Earth Data Platform for Three Poles

**Global gridded near-surface wind speed dataset on a monthly scale (1973-2021)**

1、Description

Wind speed data is widely used in many sciences, management, and policy fields to assess renewable energy potential, address wind hazards, investigate biological phenomena, and explore climate change/variability, among other applications. The challenge is obtaining complete and accurate wind datasets, as observations are limited in distribution. Global-scale weather stations suffer from spatial and temporal discontinuities that limit their utility. While reanalysis products and climate model simulations achieve data continuity, they often fail to reproduce significant wind speed trends because few of them assimilate in-situ wind observations on land. Data interpolation helps fill gaps, but the high variability of wind speed data, combined with a low distribution of observations worldwide, prevents standard statistical interpolation methods such as kriging or principal component analysis from being accurate for areas with sparse data. As a result, wind speed data has been the bottleneck in related studies.  
  
Here, based on the partial convolutional neural network, we reconstructed the global near-surface wind speed data during 1973-2021 by assimilating simulation outputs from 34 climate models and the HadISD dataset, which the Met Office Hadley Center creates. Our dataset has a spatial resolution of 1.25°×2.5° and containers observed wind speed trends.

2、Keywords

Theme：Winds,wind speed  
Discipline：Atmosphere  
Places：The globe  
Time：1973-2021, monthly

3、Data details

1.Scale：None

2.Projection：

3.Filesize：190.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：90.0 | - |
| west：180.0 | - | east：180.0 |
| - | south：90.0 | - |

5、Time frame:1972-12-31 16:00:00+00:00--2021-12-30 16:00:00+00:00

6、Reference method

References to data:

JIANG Xin , ZENG Zhenzhong , ZHOU Lihong . Global gridded near-surface wind speed dataset on a monthly scale (1973-2021). A Big Earth Data Platform for Three Poles, doi:10.11888/Atmos.tpdc.2728932022

References to articles:

Zhou, L.H., Liu., H.F., Jiang, X., Ziegler, A.D., Azorin-Molina, C., Liu, J., & Zeng, Z.Z. (2022). An artificial intelligence reconstruction of global gridded surface winds. Science Bulletin, online.

7、Supporting project information

8、Data resource provider

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