A Big Earth Data Platform for Three Poles

**The East Asian summer monsoon index (1851-2021)**

1、Description

The East Asian summer monsoon (EASM) and its variability involve circulation systems in both the tropics and midlatitudes as well as in both the lower and upper troposphere. Considering this fact, a new EASM index (NEWI) is proposed based on 200-hPa zonal wind, which takes into account wind anomalies in the southern (about 5°N), middle (about 20°N), and northern areas (about 35°N) of East Asia.   
NEWI = Nor[u(2.5°–10°N, 105°– 140°E) - u(17.5°–22.5°N, 105°– 140E) + u(30°– 37.5°N, 105°– 140°E)]  
where Nor represents standardization and u is JJA-mean 200-hPa zonal wind. When easterly anomalies appear around 20°N and westerly anomalies appear around 5° and 35°N, the index is positive, and the EASM is stronger.  
The NEWI can capture the interannual EASM-related climate anomalies and the interdecadal variability well. Compared to previous indices, the NEWI shows a better performance in describing precipitation and air temperature variations over East Asia. It can also show distinct climate anomalous features in early and late summer. The NEWI is tightly associated with the East Asian–Pacific or the Pacific–Japan teleconnection, suggesting a possible role of internal dynamics in the EASM variability. Meanwhile, the NEWI is significantly linked to El Niño–Southern Oscillation and tropical Indian Ocean sea surface temperature anomalies. Furthermore, the NEWI is highly predictable in the ENSEMBLES models, indicating its advantage for operational prediction of the EASM. The physical mechanism of the EASM variability as represented by the NEWI is also explicit. Both warm advection anomalies of temperature by anomalous westerly winds and the advection of anomalous positive relative vorticity by northerly basic winds cause anomalous ascending motion over the mei-yu–changma–baiu rainfall area, and vice versa over the South China Sea area. Hence, this NEWI would be a good choice to study, monitor, and predict the EASM (Zhao et al，2015，J Clim).

2、Keywords

Theme：Monsoons,Precipitation anomalies,Precipitation,Meteorological Disaster  
Discipline：Atmosphere  
Places：East Asia  
Time：1851-2018

3、Data details

1.Scale：None

2.Projection：

3.Filesize：1.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：37.5 | - |
| west：105.0 | - | east：140.0 |
| - | south：2.5 | - |

5、Time frame:1851-06-01 10:22:38+00:00--2021-08-31 08:00:00+00:00

6、Reference method

References to data:

HUANG Gang, ZHAO Guijie. The East Asian summer monsoon index (1851-2021). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2703232019

References to articles:

Zhao, G.J., Huang, G., Wu, R.G., Tao, W.C., Gong, H.N., Qu, X., & Hu, K.M. (2015). A New Upper-level Circulation Index for the East Asian Summer Monsoon Variability. Journal of Climate, 28(24), 9977-9996. doi:10.1175/JCLI-D-15-0272.1

7、Supporting project information

Pan-Third Pole Environment Study for a Green Silk Road-A CAS Strategic Priority A Program

8、Data resource provider

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