Data set of spatial and temporal distribution of heat wave disaster in One Belt and One Road region

Data Documentation

I. **Dataset/atlas content features**

   i. **Abstract**

The daily apparent temperature was calculated based on the data of daily meteorological stations, and the apparent temperature raster data set of The Belt and Road region was obtained by using the interpolation method based on elevation correction, the high temperature heatwave data set of this region was calculated based on the combined heat wave threshold (CHWT) method.This data set shows the temporal and spatial distribution of high temperature heat waves in the Belt and Road region, which provides a reference and basis for users and further research.

   ii. **Elements (content fields)**

Table 1 Description of data element content

Data name	Item (field)	Field name in Chinese	Field measure unit	Field code description	Remarks
freq	freq	Heat wave frequency	times	Heat wave frequency in a year	
dura	dura	Heat wave total duration	days	Heat wave total duration in a year	
dmax	dmax	Heat wave maximum duration	days	Heat wave maximum duration in a year	
dmin	dmin	Heat wave minimum duration	Days	Heat wave minimum duration in a year	
dmean	dmean	Heat wave mean duration	days	Heat wave mean duration in a year	
tmax	tmax	Heat wave maximum temperature	℃	Heat wave maximum temperature in a year	
tmin	tmin	Heat wave minimum temperature	℃	Heat wave minimum temperature in a year	

tmean	tmean	Heat wave mean temperature	℃	Heat wave mean temperature in a year	
start	start	Start date of the first heat wave	DOY	Start date of the first heat wave in a year	
end	end	End date of the last heat wave	DOY	End date of the last heat wave in a year	

iii. Temporal cover
1989–2018

iv. Spatial cover
66 countries in One Belt and One Road region.

II. Subject/industry scope of dataset/atlas

i. Subject scope
Earth science

ii. Industry scope
Heat wave service

iii. Other classifications (optional)

III. Accuracy of dataset/atlas

i. Time frequency
annually

ii. Spatial reference, accuracy, and granularity
Spatial reference: GCS_WGS_1984
Accuracy: 1 time
Spatial resolution: 0.1 degree * 0.1 degree
Granularity: station

IV. Dataset/atlas storage management

i. Data quantity
1.85 GB

ii. Type format
The data set is stored on hard disk, and the data structure type is raster data.

iii. Update management
Updated from time to time.

V. Quality control of the dataset/atlas

i. Production mode
In the combined heat wave threshold (CHWT), we use a combination of relative temperature threshold (RTT) and absolute temperature threshold (ATT) to define a heat wave: First, when a place's temperature is higher than historical temperature for a long time, it reflects the likelihood of extreme high temperature. Therefore, we established the probability distribution

function (PDF) of the historical temperature of a certain day from 1989 to 2018, and selected the temperatures corresponding to different percentiles as RTT to judge the heat wave, which was defined as climatic relative temperature threshold (CRTT). In addition, when the temperature of a particular day is higher in this year's temperature series, it also reflects the possibility of extreme high temperatures. Therefore, we built a PDF of daily temperature and defined the RTT as an annual relative temperature threshold (ARTT) by setting different percentile thresholds. Finally, higher temperatures than RTT do not necessarily mean a heat wave (such as winter). Therefore, we also set an absolute temperature threshold to avoid this situation. In this study, different combinations of CRTT and ATT, ARTT and ATT were used to define the high temperature threshold. A weather process that reaches both the high temperature threshold and the duration threshold (DT) is called a heat wave.

ii.   **Data sources (condition selection)**

NOAA Meteorological Station Data

iii.   **Methods of the data acquisition and processing (condition selection)**

Firstly, the research team calculated the daily apparent temperature based on the daily meteorological station data, then obtained the apparent temperature raster data set of One Belt and One Road region by using the interpolation method based on elevation correction, and finally calculated the heat wave data set of this region based on the CHWT method.

VI. Sharing and usage method of the dataset/atlas

i.   **Sharing methods and restrictions**

Fully shared

ii.   **Contact information of the sharing service (condition selection)**

The service is as follows:

Name: Yang Fei

Mailing address: A11 Datun Road, Chaoyang District, Beijing

Zip code: 100101

E-mail：yangfei@lreis.ac.cn

iii.   **Conditions and methods of usage**

Use ArcGIS, ENVI and other software to open.

VII. Intellectual property rights of the dataset/atlas

i.   **Property rights (optional)**

"Data set of spatial and temporal distribution of heat wave disaster in One Belt and One Road region" owned by institute of geographic sciences and natural resources research, CAS.

ii.   **Reference method of the dataset/atlas**

Data set of spatial and temporal distribution of heat wave disaster in One Belt and One Road region. Disaster Risk Reduction Knowledge Service of International Knowledge Centre for Engineering Sciences and Technology (IKCEST) under the Auspices of UNESCO,2019.9.18.

iii.   **Usage contacts of the datasets/atlas**

Contact person

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VIII.   Others (optional)

In addition to the above, other information must also be explained.

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