

Dataset of Desertification Distribution in Mongolia Plateau in 2015 and 2020

Data Documentation

I. Dataset/atlas content features

i. Abstract

This dataset includes data on the degree of desertification in Mongolia Plateau for 2015 and 2020 . This dataset was composed of 2 raster files. They are produced by the Institute of Geographical Sciences and Natural Resources Research of the Chinese Academy of Sciences. Based on Landsat8 data with 30m resolution, the performance of various machine learning and feature space models for large-scale desertification monitoring is compared, with the gradient boosting tree model being the most adapted for desertification monitoring on the Mongolian Plateau. And based on gradient boosting tree algorithm, we complete the fine extraction of desertification in Mongolia in 2015 and 2020 with Google Earth Engine (GEE) platform. The dataset visually reflects the spatial distribution of land with different degrees of desertification in Mongolia Plateau, which can provide detailed and reliable data support for the delineation of key areas for desertification control and the formulation of restoration strategies in Mongolia Plateau, and is of great significance for the ecological environment and green sustainable development of the China-Mongolia-Russia Economic Corridor.

ii. Elements (content fields)

This dataset was named as “Dataset of Desertification Distribution in Mongolia Plateau in 2015 and 2020” , which included 2 data files. There are mainly 1 data name for different years and they are described as table 1.

Table 1 Description of data element content

Data name	Item (field)	Field name in Chinese	Field measure unit	Field code description	Remarks
Dataset of Desertification Distribution in Mongolia Plateau in 2015 and 2020					

iii. Temporal cover

2015 and 2020

iv. Spatial cover

87°43′–126°04′E, 37°22′–53°20′N.

II. Subject/industry scope of dataset/atlas

i. Subject scope

Earth science, remote sensing, etc.

ii. Industry scope

Geographical information services, remote sensing surveying and mapping services, etc.;

iii. Other classifications (optional)

III. Accuracy of dataset/atlas

i. Time frequency

Five-year period.

ii. Spatial reference, accuracy, and granularity

Spatial reference: GCS_WGS_1984;

Spatial resolution: 30 m.

IV. Dataset/atlas storage management

i. Data quantity

532MB

ii. Type format

TIF

iii. Update management

Irregular updating

V. Quality control of the dataset/atlas

i. Production mode

Based on the 30-meter resolution Landsat8 data, we compared the performance of various machine learning and feature space models in large-scale desertification monitoring, among which the gradient boosted tree model is the most suitable for desertification monitoring on the Mongolian Plateau. Based on the gradient boosting tree algorithm, we utilize the Google Earth Engine (GEE) platform to complete the desertification distribution dataset of the Mongolian Plateau in 2015 and 2020, which will provide detailed data support for the desertification prevention and control and ecological environment planning in the Mongolian Plateau. The data processing environment mainly includes GEE cloud platform, ENVI, and ArcGIS.

ii. Data sources (condition selection)

Landsat 8 images

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

Acquisition method: Landsat 8 remote sensing data is a free and open dataset of GEE platform. The format is TIF, the spatial resolution is 30m, and Mongolia Plateau.

Processing method: Firstly, based on the GEE platform, the 2015 and 2020 Landsat 8 images were pre-processed by de-clouding, filling, mosaicking, cropping and other pre-processing operations to obtain high quality images of the whole territory of Mongolia in 2015 and 2020. Secondly, four desertification feature indicators, FVC, NDVI, Albedo, MSAVI and TGSI, which are required under different geographic subdivisions, were calculated on the GEE platform, and the Albedo-NDVI feature space model and the random forest, support vector machine, maximum-minimum-distance, decision tree and gradient boosting tree models were constructed to extract the desertification information of the Mongolian Plateau and to compare the accuracies. Finally, based on the optimal monitoring model, i.e., the gradient boosting tree model, the desertification distribution dataset of the whole Mongolian Plateau in 2015 and 2020 was obtained.

VI. Sharing and usage method of the dataset/atlas

i. Sharing methods and restrictions

Fully opened sharing

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

Online link address:

Contact Information for Service:

Name: Service group of Disaster Risk Reduction Knowledge Service System of IKCEST

Address: 11A, Datun Road, Chaoyang District, Beijing, 100101, China, Institute of Geographic Sciences and Natural Resources Research, CAS.

Zip Code: 100101

E-mail: ikcest-drr@lreis.ac.cn

iii. Conditions and methods of usage

The dataset can be read by ArcGIS and ENVI software.

VII. Intellectual property rights of the dataset/atlas

i. Property rights (optional)

Intellectual property of the dataset belonged to Institute of Geographic Sciences and Natural Resources Research, CAS.

ii. Reference method of the dataset/atlas

Dataset of Desertification Distribution in Mongolia Plateau in 2015 and 2020. Disaster Risk Reduction Knowledge Service of International Knowledge Centre for Engineering Sciences and Technology (IKCEST) under the Auspices of UNESCO, 2023.12.30.

iii. Usage contacts of the datasets/atlas

Name: Service group of Disaster Risk Reduction Knowledge Service System of IKCEST

Address: 11A, Datun Road, Chaoyang District, Beijing, 100101, China, Institute of Geographic Sciences and Natural Resources Research, CAS.

Zip Code: 100101

E-mail: ikcest-drr@lreis.ac.cn

VIII. Others (optional)

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

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