A Big Earth Data Platform for Three Poles

**Thematic Atlas of desert ecosystem functional zoning in Qinghai Tibet Plateau (2010-2020)**

1、Description

The atlas includes three thematic maps of the Distribution Map of Desert Ecosystem Types on the Tibetan Plateau, the Distribution Map of Suitable Areas for Agriculture and Animal Husbandry on the Tibetan Plateau, and the Desertification Development Trend Map of Desert Ecosystem on the Tibetan Plateau. The time of the maps spans from 2010 to 2020. The original climatic data come from the monthly TerraClimate dataset with a spatial resolution of 1/24° (about 4 km). The data were preprocessed to be those have a spatial resolution of 30-m. The well-known desertification assessment system and the desert ecosystem classification standards were integrated to formulate the classification rules of the desert ecosystem, which were calibrated and validated by the remote sensing data and field survey results. In addition, the algorithms such as machine learning, Random Forest (RF) and Support Vector Machine (SVM) were introduced to generate the Distribution Map of Desert Ecosystem Types on the Tibetan Plateau. The Distribution Map of Suitable Areas for Agriculture and Animal Husbandry on the Tibetan Plateau reflects the supply services of agricultural and animal husbandry products. The vegetation productivity of modern desert ecosystem on the Tibetan Plateau was estimated, which showed the spatial distribution of potential forage supply. The grazing red line is set based on the experience of USDA, including: 1) the potential annual mean vegetation biomass less than 225kg ha-1; 2) More than 1.6km away from water source; 3) Slope greater than 65%; 4) High intensity erosion area. Grazing activities will be strictly prohibited from the areas under the standard of the red line. The areas of main crops (highland barley, Lycium chinense and wheat) in and around the Tibetan Plateau over recent five years are excluded. Based on the maximum information entropy analysis of the climate and geological environment of the existing planting areas, the growth adaptability of the three crops in the desert ecological area of the Tibetan Plateau is assessed to develop new agricultural planting areas from the desert ecological area of the Tibetan Plateau. By the comparison between the modern desert ecosystem of the Tibetan Plateau and the historical desertification in the early 21st century, the Desertification Development Trend Map of Desert Ecosystem on the Tibetan Plateau diagnosed the evolution pattern of the desert ecosystem during the past 20 years, and simulated the generation and extinction probability of the desert ecosystem on the Tibetan Plateau under the assumption that the climate change trend will be stable in the next 50 years. The probability distribution will be an important tool for evaluating the suitability of desert ecosystem protection and development in the Tibetan Plateau in the next 50 years. This atlas has reference value for monitoring the desert ecosystem of the Tibetan Plateau and developing and utilizing the service function of the desert ecosystem of the Tibetan Plateau.

2、Keywords

Theme：Desert  
Discipline：Terrestrial Surface,Remote Sensing Technology  
Places：Qinghai Tibet Plateau  
Time：2010-2020

3、Data details

1.Scale：None

2.Projection：Albers

3.Filesize：180.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：41.0 | - |
| west：73.5 | - | east：106.0 |
| - | south：24.0 | - |

5、Time frame:2009-12-31 16:00:00+00:00--2020-12-30 16:00:00+00:00

6、Reference method

References to data:

WANG Xunming. Thematic Atlas of desert ecosystem functional zoning in Qinghai Tibet Plateau (2010-2020). A Big Earth Data Platform for Three Poles, doi:10.11888/Ecolo.tpdc.2714832021

References to articles:

7、Supporting project information

Second Tibetan Plateau Scientific Expedition Program

8、Data resource provider

name: WANG Xunming  
unit:   
email: xunming@igsnrr.ac.cn