A Big Earth Data Platform for Three Poles

**Automatic division system source code of slope unit based on confluence analysis and slope direction Division**

1、Description

1) The work of automatically dividing a wide and complex geospatial area or even a complete watershed into repeatable and geomorphically consistent topographic units is still in the stage of theoretical concept, and there are great challenges in practical operation. Terrain unit is a further subdivision of topography and geomorphology, which can ensure the maximum uniformity of geomorphic features in slope unit and the maximum heterogeneity between different units. It is suitable for geomorphic or hydrological modeling, landslide detection in remote sensing images, landslide sensitivity analysis and geological disaster risk assessment. 2) Slope unit is an important type of topographic unit. Slope unit is defined as the area surrounded by watershed and catchment line. In fact, the area surrounded by watershed and catchment line is often multiple slopes or even a small watershed. Theoretically, each slope unit needs to ensure the maximum internal homogeneity and the maximum heterogeneity between different units. The slope unit is an area with obviously different topographic characteristics from the adjacent area. These topographic characteristics can be based on the characteristics of catchment or drainage boundary, slope and slope direction, such as ridge line, valley line, platform boundary, valley bottom boundary and other geomorphic boundaries. According to the high-precision digital elevation model, the slope unit with appropriate scale and quality can be drawn manually, but the manual drawing method is time-consuming and error prone. The quality of the divided slope unit depends on the subjective experience of experts, which is suitable for small-scale areas and has no wide and universal application value. Aiming at the gap in practical operation in this field, we propose an innovative modeling software system to realize the optimal division of slope units. Automatic division system of slope unit based on confluence analysis and slope direction division v1 0, written in Python programming language, runs and calculates as the grass GIS interpolation module, and realizes the automatic division of slope units in a given digital elevation data and a set of predefined parameters. 4) Based on python programming language, the code is flexible and changeable, which is suitable for scientific personnel with different professional knowledge to make a wide range of customization and personalized customization. In addition, the software can provide high-quality slope unit division results, reflect the main geomorphic characteristics of the region, and provide a based evaluation unit for fine landslide disaster evaluation and prediction. It can serve regional land use planning, disaster risk assessment and management, disaster emergency response under extreme induced events (earthquake or rainfall, etc.), and has great practical guiding significance for the selection of landslide monitoring equipment and the reasonable and effective layout and operation of early warning network. It can be popularized and applied in areas with serious landslide development.

2、Keywords

Theme：Division,Landform type,Natural Disaster,Geomorphology
Discipline：Terrestrial Surface,Human-nature Relationship
Places：The southeast edge of the Qinghai-Tibet Plateau
Time：2022

3、Data details

1.Scale：None

2.Projection：WGS84

3.Filesize：76.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：-1.0 | - |
| west：1.0 | - | east：1.0 |
| - | south：1.0 | - |

5、Time frame:None--None

6、Reference method

References to data:

YANG Zhongkang. Automatic division system source code of slope unit based on confluence analysis and slope direction Division. A Big Earth Data Platform for Three Poles, doi:10.11888/Terre.tpdc.2721832022

References to articles:

7、Supporting project information

Catastrophic mechanisms and risk control of disastrous landslides in the Tibetan Plateau

8、Data resource provider

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