

EGU21-3698, updated on 26 Jan 2022

<https://doi.org/10.5194/egusphere-egu21-3698>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Regional Scale Distribution of Gully in Loess Plateau Based on High Resolution Google Earth Satellite Imagery

Jianhua Su, Chunmei Wang, Guowei Pang, Qinke Yang, Xin Liu, Zitian Guo, and Yuan Zhong

Shaanxi Key Laboratory of Earth Surface System and Environmental Carrying Capacity, College of Urban and Environmental Sciences, Northwest University, Xi'an, 710127, China

Gully erosion is one of the most important erosion gully types in the Loess Plateau. Its generation and development seriously affect and destroy the ecological environment. Therefore, it is the premise of scientific management to make clear the spatial distribution of gully region scale. At present, scholars at home and abroad mainly focus on the spatial distribution of gully in a specific small watershed, and there are few reports on the regional scale. In view of this, this study, based on Google Earth sub meter image combined with GIS method, uses the means of manual visual interpretation to conduct sampling survey of gully in the Loess Plateau. A total of 137 sampling units were set up, and the area of each sampling unit was about 0.2 square kilometers. The results showed that: (1) there were 75 gullies in 54.7% of the survey units, with a total of 712 gullies. The sampling units with gullies were mainly located in the northeast of the Loess Plateau (yan'an-dongsheng area on both sides of the Shanxi Shaanxi Yellow River) and the middle of the Loess Plateau (the border area of Guyuan, Ningxia and Huining, Dingxi, Gansu), with an average gully density of $3.32\text{km}/\text{km}^2$ and a maximum of $19.94\text{km}/\text{km}^2$; (2) the grassland was the most gullied area. The main land use types of gully development accounted for 40.03%, followed by cultivated land and forest land, accounting for 30.06% and 20.08% respectively, and 9.83% of gully development was in bare land, orchard and residential land, collectively referred to as other land; (3) the average values of gully width, length and distance from watershed were 7.76m, 69.81m and 79.19m, respectively, and the gully width was mainly distributed in 3-5m, accounting for 50% 39.6%. The length of gully was mainly distributed in 30-70m, accounting for 46.3%. The distance between gully and watershed was mainly 25-50m, accounting for 41.6%; (4) gully existed most in sub region I of Loess Plateau (22.7%), followed by sub region III of Loess Plateau (20.0%), sub region V of Loess Plateau (12.0%) and sub region II of Loess Plateau (9.3%); (5) according to the existing erosion classification standards, erosion intensity of Loess Plateau reached strong level No. The gully density and gully length show obvious spatial differentiation characteristics. The highest density area is in yan'an-dongsheng area on both sides of Shanxi Shaanxi Yellow River, and the gully length in this area is about 100m. This study will help to better understand the spatial distribution characteristics of gully in the Loess Plateau, support management in the Loess Plateau, and promote scientific decision-making of gully control in the Loess Plateau.