Fossil landslide recognition based on object-oriented image analysis technology

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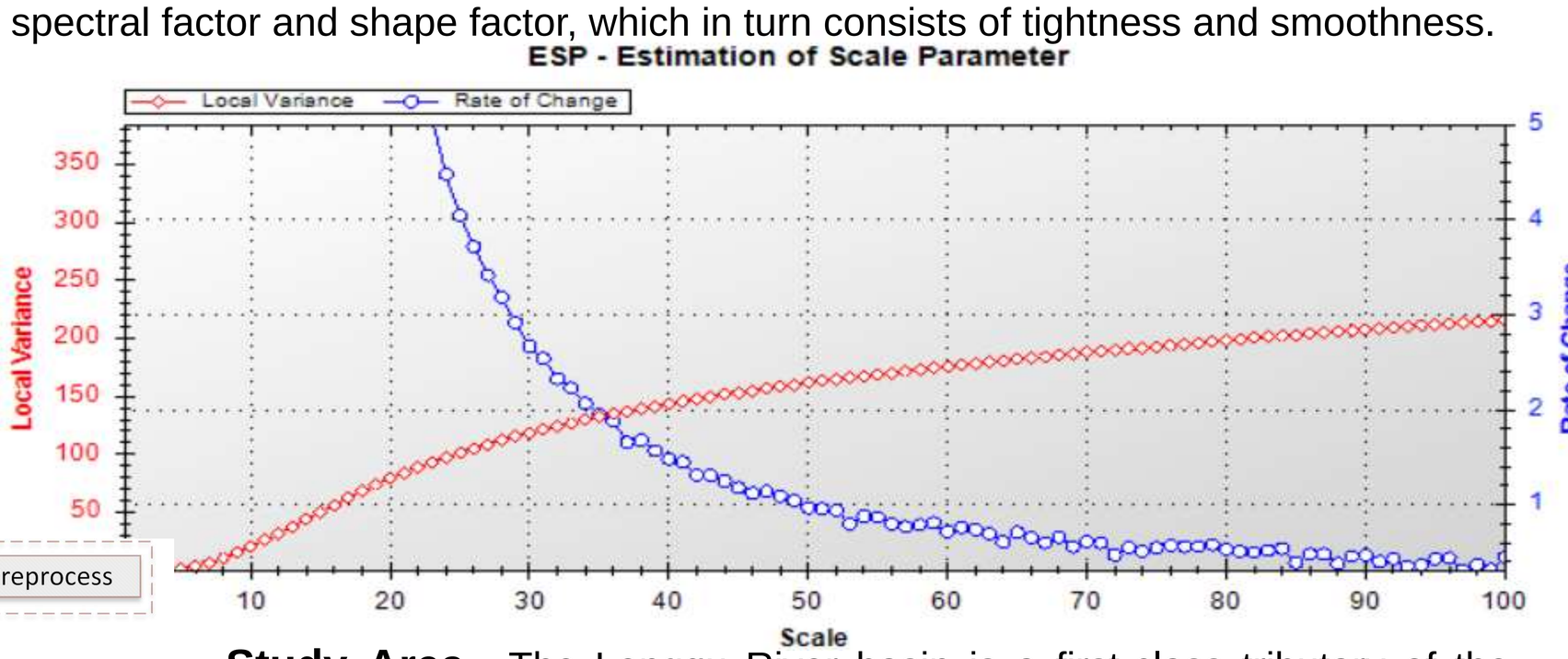
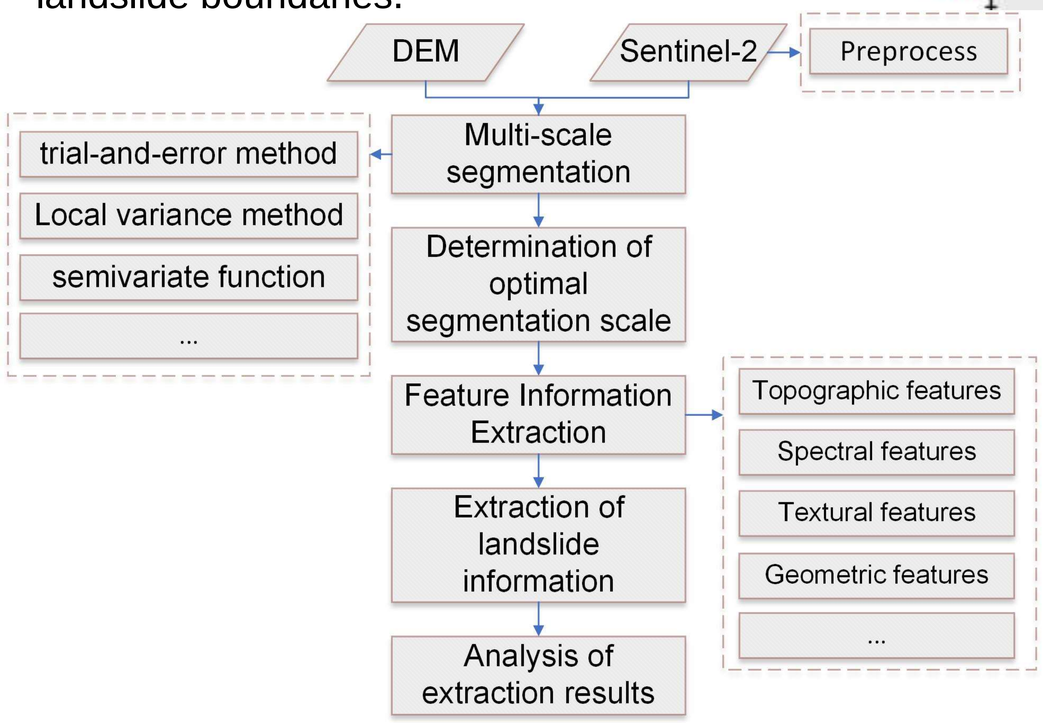
Abstract: Landslides are one of the most serious geological disasters in the world, which seriously damage the property and safety of people. In this paper, an object-oriented segmentation method is used to combine spectral, topographic and textural features. The Lengqu basin of China and part of Hunza basin of Pakistan were used as the study area. The landslides in the study area were identified using 12.5 m elevation data and Sentinel-2 data. The identification results were validated based on the images on Google Earth and the collected landslide data. The results show that the object-oriented extraction method can accurately acquire the landslide boundaries.

Methods： The multiscale segmentation algorithm is a bottom-up region merging algorithm based on the principle of minimizing heterogeneity.

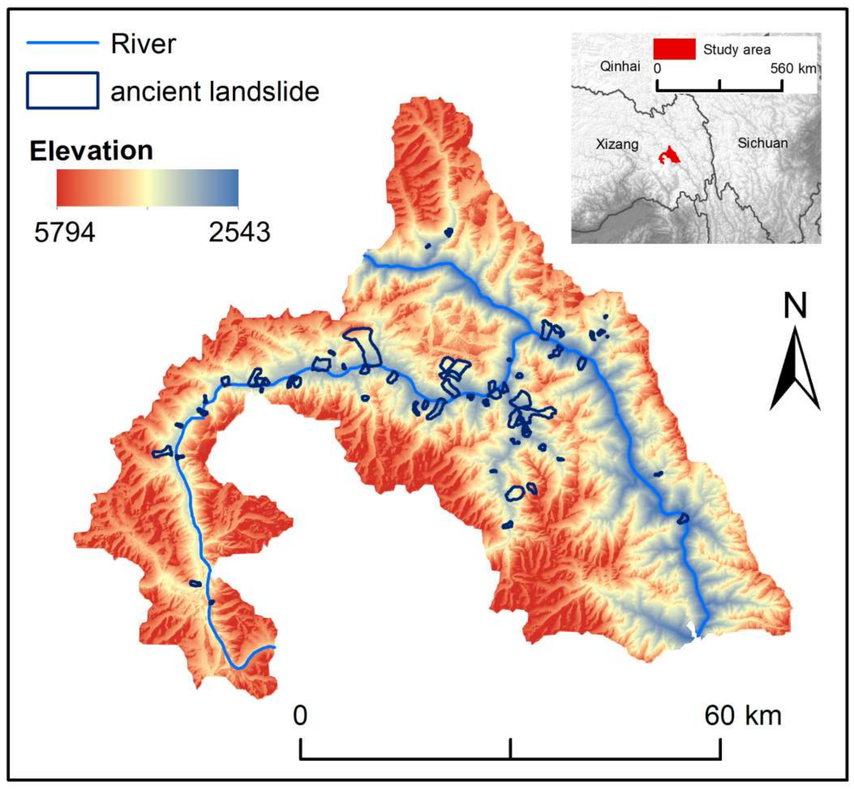
In multiscale segmentation algorithms, the factors affecting heterogeneity include spectral factor and shape factor, which in turn consists of tightness and smoothness.

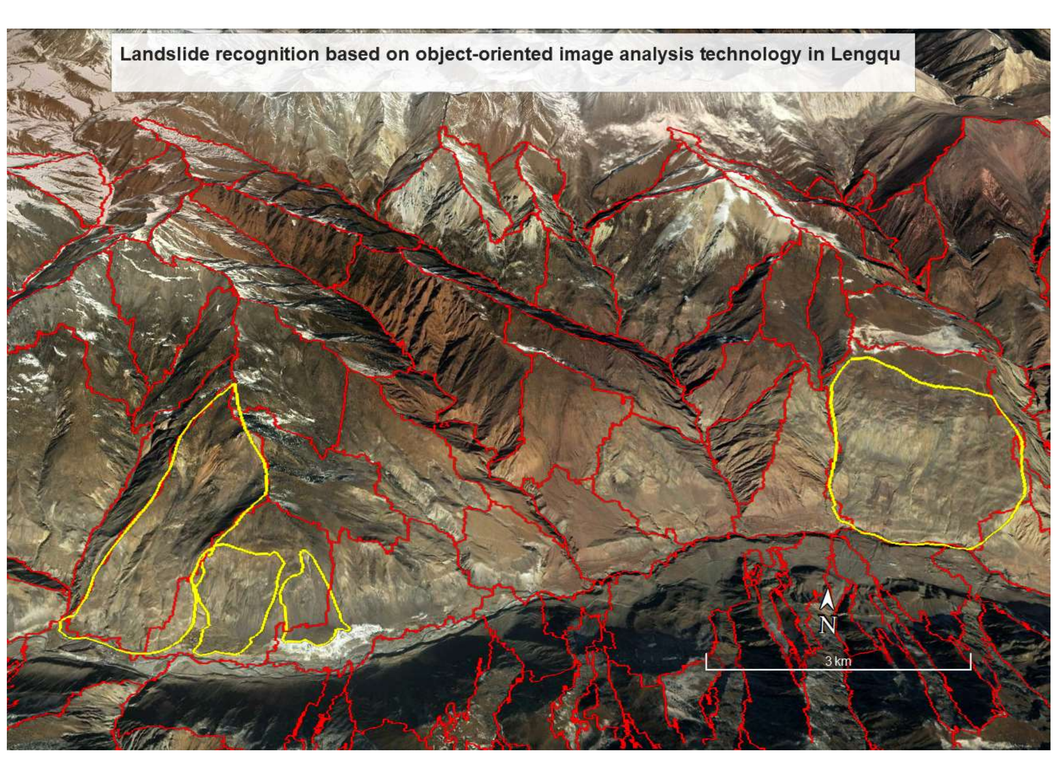




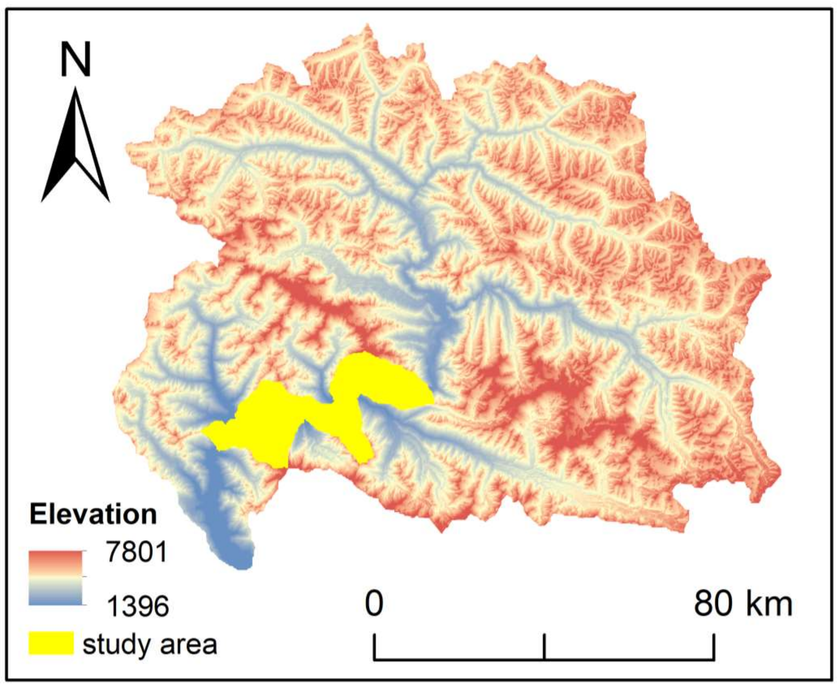
Study Area： The Lengqu River basin is a first-class tributary of the Nujiang River, with a total length of about 110 km. The eastern side of the Lengqu River valley is the fold belt of the Hengduan Mountains, a nearly north-south system consisting of faults, folds and granite bodies. To the west of the valley is the Lha-sa-Bomi fold belt, a near east-west fault system along the Yarlung Tsangpo River

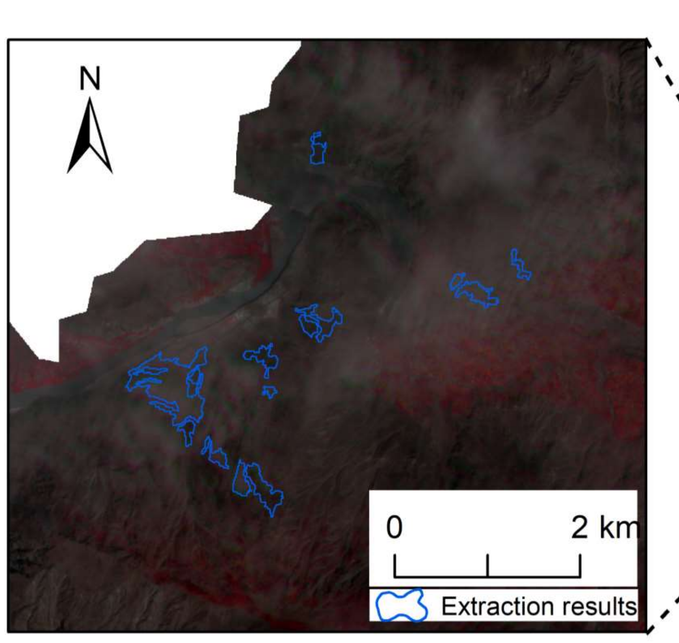
The Hunza Valley is located in the far north of Pakistan, where the main areas of the valley include the Gilgit District, Gulmit, Passu and Hunza areas. The region is also the main route of the Karakoram Highway (KKH), which makes the Hunza Valley an important connection between China and Pakistan.

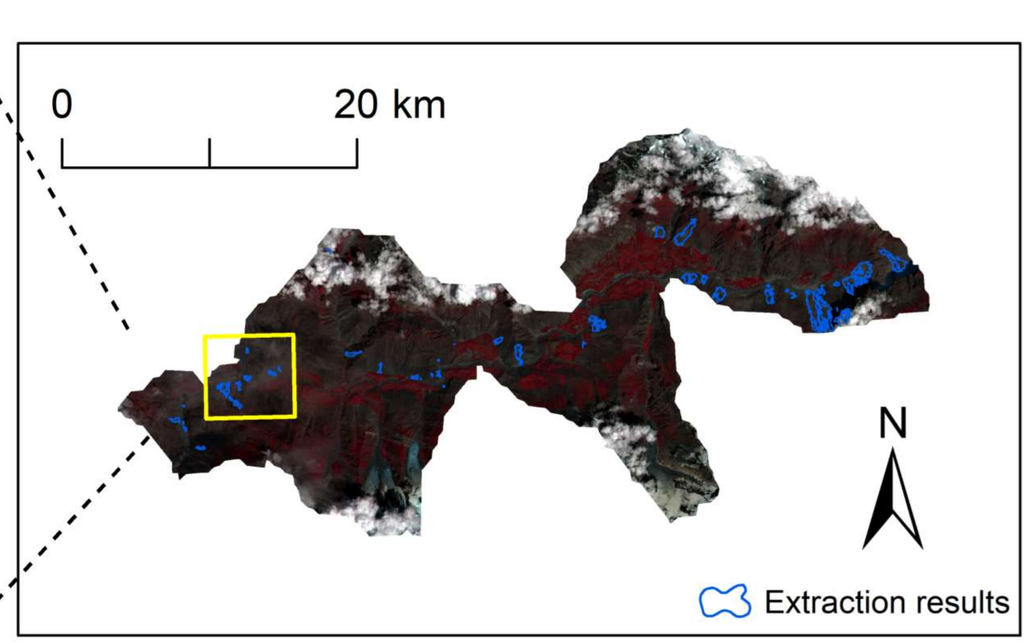




Results： In this study, using Sentinel-2 remote sensing image data and DEM data, a method for rapid landslide identification in object-oriented classification is proposed. Using this method, the boundaries of landslides can be accurately identified, providing a reliable method for landslide identification.







Landslide recognition based on object-oriented image analysis technology in Hunza

Major references:

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