



Extraction of small mountain river information based on China-made GF series satellites remote sense images: A case study of the Loess Plateau, China

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Extraction of high-resolution geomorphic information from remote sensing images is a key technology supporting research on mountain rivers. It is still so far a challenging issue to extract narrow rivers from complex backgrounds with roads and shadows of mountains.

In this research, we propose a DEM-aided approach to shadow water index decision tree classification for water information extraction. It is a modified version of the Wenqian Chen et al. (2015) shadow water index decision tree, and has the advantage of high accuracy and efficiency. We used the Huangfuchuan River Basin on the Loess Plateau, China, as a case study area. Both the China-made GF-1 satellite images with a resolution of 2 m and the GF-2 satellite images with a resolution of 1m were adopted as the primary data source, while the DEM data obtained by a UAV is implemented as the secondary data source. We compared the proposed method with previous techniques including the single-band threshold method, the NDWI method, the single band method combined with the SWI decision tree classification, and oblique photogrammetry. The results show that the proposed method has a higher accuracy because of the implementation of high-resolution elevation data. The new approach can provide an effective tool for extracting GF-series satellite image information for water resources management and watershed topography research in plateaus and arid regions [U+FF0E]