



## A River Extraction from Satellite Images for Flood Modelling

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### Abstract

River systems are important water carriers that provide many ecosystem services, including drinking water for settlement, fresh water for land-based agriculture, and recreation. Precise and efficient mapping of river systems using remote sensing images is also important in this respect. The placement of the river border is also important for project development and flood management. Unfortunately, additional ground measurements are sometimes needed because the resolution of satellite images is not enough. In these cases, it may be a good idea to choose medium/low resolution images to reduce time and cost. However, the process of river extraction is challenging due to the complexity of river channels, the variable characteristics of the adjacent landscape, and the complexity of the terrain of river systems. In this study, a solution based on python was presented to users to overcome this challenge and produce quick and practical outcomes. The method consists of 4 steps: 1) SRTM-DEM preprocessing with removal sink/ pit for image improvement purposes. 2) Determination of the drainage system by means of the D8-Flow Direction algorithm. 3) Flow accumulation computation using FD8 algorithm, 4) Watershed delineation was revealed at the end of the steps. As a result, according to the accuracy comparison obtained via flow path, approximately 4% deviation from the route was obtained and automatic watershed extraction was performed without manual operations with open access data and software.

**Keywords:** Flow accumulation, Watershed delineation, SRTM-DEM, Python algorithm