AUTOMATIC EXTRACTION OF STREAM NETWORKS FROM DEM DATA

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This study discusses about deriving a computer software algorithm to extract stream networks using different sources of Digital Elevation Model (DEM) data. Raster format DEM image data were used as primary input for the algorithms. Software algorithms were made to input different file formats of DEM data types such as DTED DEM, USGS DEM, and SRTM DEM. Elevation image inputs were converted into two dimensional data arrays to apply drainage network extraction algorithms.

Major steps incorporated in stream network extraction process were, merging and clipping of DEM images to obtain desired study area, fill depressions in input DEM, creation of flow direction image and finally create flow accumulation image to represent stream network system. Widely used D8 algorithm is applied to calculate flow direction image. Output flow accumulation image with some visual enhancements was used to represent extracted stream network system.

New GIS software tool have been used to support input and output data handling functionalities. Input maps and output maps of the algorithms were viewed using this software system. Several additional capabilities were implemented in this software tool to ease the process of automatic stream network extraction.

Two case studies have been presented to show the performance of derived algorithms. DEM images with different properties were used in two case studies. Results of the algorithms were verified with accurate topographic vector stream layers. Finally, the software algorithms were made available to be used by the stake holders.