Catchment Area Delineation Using GIS technique for Bekhma Dam

Mudher N. Abdullah
MOWR Iraq

This paper represents a methodology for DEM pre-processing that provides the basis for fast and consistent watershed delineation on DEMs of any resolution and size using desktop GIS technology.
- The main data is the DEM with 1 arc second to get as much accurate results as could.

- Raster analysis is performed to generate data on flow direction, flow accumulation, stream definition, stream segmentation, and watershed delineation.

- The utility of Arc Hydro tools (GIS) is used to develop attributes that can be useful in hydrologic modeling.

- Watershed delineation is one of the most commonly performed activities in hydrologic analyses.

- Digital elevation models (DEMs) provide good terrain representation from which watersheds can be derived automatically using GIS technology.
Grid Network

D.E.M for the study area
This function computes the flow direction for a given grid. The values in the cells of the flow direction grid indicate the direction of the steepest descent from that cell.
Drainage Line Processing

Adjoint Catchment Process
Flow path of upper zab tributary

TIN For Bechma dam
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Area = 26500 km²

Russian Study Area = 26530 km²
Conclusion

1. We find the great importance of using the D.E.M. in hydrographic studies.
2. Instead of studying the contour lines for many topographic maps which take long time to understand the topo surface, then delineated the watershed of each stream or river, we used here the ArcHydro extension that use the D.E.M. as a base for analyze and delineate the watershed in few hours and find it’s area directly.
3. One of the great advantages of using GIS for hydrologic studies is to suggest the best location for dams or to locate monitoring (gauge) points.
Thank you