GIS 4 Geomorphology

Geomorphometry of Mountain Landscapes &
Upland Watersheds…a little Wildlife, too

Dissection Index

Assess the degree of incision of a landscape.
1.) Create a Local Relief raster from the DEM, see Local Relief lesson.

2.) Determine the "local base level" elevation, which depending on your study area and scale of analysis, may be one of the following. Recall that "ultimate base level" is sea level.
– where a river enters a lake, inland sea, or dammed reservoir (height of dam)
– where a stream's gradient temporarily nearly reaches zero before increasing again
– where a small tributary enters a large river
– where resistant band of rock crosses the stream valley
– at a significant waterfall

3.) Create an Absolute Relief raster from the DEM using Raster Calculator. Absolute relief is dependent on the lo base level elevation. Subtract the local base level value from each pixel value in the DEM. The resulting raster wil appear much the same as the original DEM, but all elevations will be lower by the fixed amount.

4.) Divide the first raster by the second in Raster Calculator. The resulting raster contains the Dissection Index values, which should scale between 0 and 1.

Refs

Dov (1957) Geographical Review 47
Salvan et al. (2011) ARPN Journal of Science and Technology LINK
Sharma, H.S. (1982) Perspectives in Geomorphology, Concept Publishing, 358 pgs. LINK
Wikipedia: Base Level LINK