

Topographic index enhanced with soil moisture

Workspace

Topographic Wetness Index (TWI) is an index used to quantify effects on wetness of area based on topography data for the area; this is typically derived using the digital elevation model (DEM) of an area. Using only elevation data via TWI present limitations in respect to other properties of an area of study that could affect wetness such as soil and land use data. The purpose of this project is to modify the original formula used to classify TWI to include soil composition, a parameter that can measure the capacity of the soil to retain water. Adding this parameter to the formula can prove to be advantageous when predicting areas of flooding and could also help predict vegetation growth and biodiversity changes before and after periods of rainfall. Extensive literature review is necessary to determine soil parameters with highly impact probabilities in respect to water retention and methodology for normalizing these parameters to TWI. The modification is conducted through use of soil data parameters from the Natural Resources Conservation Service (NRCS) and the topography data from the United States Geological Survey (USGS) input into Geospatial Information System (GIS) software and normalized to scale. The project has resulted in successful computation of a modified TWI with multiple parameters and is currently in the process of being validated against multiple other sources to determine the accuracy of results.

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