Abstract:

Investigation of spatial variations of soil erosion is one of the most important soil characteristics in agronomy management, land degradation, modeling of water erosion in each region and environmental studies. The present study aimed to zoning soil erodibility and determining the most important variables in the area of Ravang watershed in Minab County. For this purpose, firstly, auxiliary environmental variables including 16 ground characteristics (such as elevation of points, slope, tilt direction, longitudinal curvature, transverse curvature, arachnoid index, specific surface area of the catchment area ...) from the altitude and indexing model Vegetation and salinity index from Landsat satellite images of 8 study areas were calculated and extracted using ArcGIS software (SAGA) and (10.2). In addition, land use maps, geology and geomorphology were used from previous studies. To determine the location of sampling points, the conditional square square cubic technique was used to determine the location of 120 points for sampling, and in field operations, 110 points from 0-30 cm depth of soil surface layer were sampled. After transferring samples to the laboratory, physical and chemical tests are carried out on samples and using standard methods of soil characteristics including soil texture and amount of lime, fine grains, acidity, electrical conductivity and organic carbon Finally, soil erodibility was calculated using Washmeier and Smith equations. To determine the relationship between soil erosion and auxiliary variables, a random forest (Random forest) model and a soil digital mapping method were used. Map of clay, lime, sand, electrical conductivity of saturated extract, lime and organic carbon Using random forest method, the study area was determined. Correctness of the soil erosion-susceptibility map was determined using root mean square error (RMSE), mean error (ME) and correlation coefficient (R2), which was 0.1, 08 0 and 0.3 were evaluated. The soil erodibility varied from 0.05 to 0.5 ton / ha / ha / mega jol / mm. The results showed that the highest soil erosion values in the southern areas of the area were estimated by low vegetation and with agronomic application. Also, the results showed that the surface layer of the channel-channel and the height of the most important factors affecting soil erosion and the variables of the base of the grid, the height, the difference between the slope, land use, hydrology and slope were the most important factors in the foreground. The nose is composed of soil texture, lime and carbon fiber. The results showed that the extracted variables from the digital elevation model had the most effect in modeling the physical and chemical properties of the soil as a result of the presence of high elevations in the region. It also showed that the use of random forest model and digital soil mapping method can provide valuable information on the spatial distribution of soils and management of the watershed should be used.

Keywords: erosion, random forest, digital mapping, ravang watershed.

University of Zabol
Graduate School
Faculty of Water and Soil
Department of Range and Watershed Management

Soil Erodibility Zoning Using Digital Mapping (Case study: Ravang Watershed, Minab County)

Supervisors:

Dr. Hossein Piri Sahragard

Dr. Mohamad Reza Pahlavanrad

Advisors:

Dr. Mohamad Nohtani

By:

Fahimeh Torkamani sarmasti

February 2019