

Abstract

Simulation of natural phenomenon is becoming important due to climate change concerns. In recent years many data on the surface of the earth are available online in sites like Google Earth, Bhuvan etc. Open source softwares & simulation models are being continuously developed world wide for analysis of these data. In this project we explored various open source GIS (Geographic Information System) softwares like GRASS & Quantum GIS & then used them to process data for SWAT (Soil Water Assessment Tool) Model to estimate sediment & water flow out at river basin.

For the purpose of exploration & learning full capability of the softwares two areas viz; Tezpur University campus & River Basin of Nurangchu River near Tawang were selected.

In analysis of Tezpur University campus we analyzed trend of geographical changes in the campus during years 2003, 2005, 2009 & 2010. Images of campus area were downloaded from Google Earth. We calculated area under each kind of geographical object like buildings, roads, forest, grassland, water-body etc. for each of 4 years. We observed following trends: Construction was growing every year. Forest area decreased every year. Rapid construction took place between 2005 & 2009. In 2009 grassland increased due to increase in campus boundary but further decreased in 2010 due to growing construction.

For River basin analysis, required data for SWAT model is downloadable from suggested websites by the developers. The Nurangchu was selected as it has clearly distinguishable land covers such as snow capped areas, forest areas & barren rocky areas. We used MWSWAT for analysis. MWSWAT is a MapWindow GIS based model for SWAT. We are simulating results for water flow & sedimentation at the outlet. This project will contribute in making use of the latest stable versions for predictions of valuable data for dealing with the climate change which is looming before us.