

EGU2020-541

<https://doi.org/10.5194/egusphere-egu2020-541>

EGU General Assembly 2020

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Impacts of LULC and climate change on streamflow in Netravati basin, Karnataka, India

Dinu Maria Jose¹ and Gowdagere Siddaramaiah Dwarakish²

¹Department of Applied Mechanics and Hydraulics, National Institute of Technology Karnataka, Mangaluru, India (dinumarijose@gmail.com)

²Department of Applied Mechanics and Hydraulics, National Institute of Technology Karnataka, Mangaluru, India (dwaraki.gs@gmail.com)

Human activities and climate affect the hydrology of a basin. The effect of Land Use Land Cover (LULC) change and climate change on streamflow are basin specific. In this study, an attempt has been made to evaluate the effects of LULC and climate change on streamflow in the Netravathi basin, Karnataka, India. The SWAT model, which reasonably simulates the streamflow of a basin, is used for this study. The analysis was done from the year 1990 to 2018. The watershed is delineated by using ALOS PALSAR DEM. Rainfall and temperature obtained from IMD are used as the climate variables. LULC maps were prepared using Landsat images of 1990 and 2018 in order to assess the LULC changes in the basin. The results showed that the spatial extent of the LULC classes of built-up (3.82%–6.51%), water bodies (0.76%–0.99%), and agriculture (11.96%–17.89%) increased, whereas that of forest (66.56%–51.7%), fallow (3.82%–6.13%), and barren land (13.07%–16.76%) decreased from 1990 to 2018. The streamflow increased steadily (5.02%) with changes in LULC from 1990 to 2018. The results indicate that LULC changes in urbanisation and agricultural intensification have contributed to the increase in runoff, in the catchment during this period. Thus, hydrological modelling integrating climate change and LULC can be used as an effective tool in estimating streamflow of the basin.