

Predicting daily streamflow in ungauged rural catchments: the case of Masinga catchment, Kenya

Access to daily streamflow data at the catchment scale, is a central component of many aspects of water resources and water quality management. However, the majority of river reaches in many catchments in Kenya are ungauged or poorly gauged, and in some cases existing measurement networks are declining. Long-term continuous monitoring is not being done due to high costs of equipment maintenance. Therefore, there is a need for an alternative tool such as a catchment-scale hydrological model that is capable of predicting the daily streamflow. An approach is presented of predicting daily streamflow using a physically-based catchment-scale model, the geospatial Stream Flow Model (SFM). The SFM was developed using the “C” programming language and the user interface was developed using the Avenue script of the ArcView software. The SFM simulates the dynamics of runoff processes by utilizing remotely sensed and widely available global or local data sets. The model was applied in the Masinga catchment, Kenya, and the results gave a model performance coefficient of 0.74 based on the Nash-Sutcliffe statistical criterion.