

Application of Random Forest Model in The Prediction of River Water Quality

Authors : Turuganti Venkateswarlu, Jagadeesh Anmala

Abstract : Excessive runoffs from various non-point source land uses, and other point sources are rapidly contaminating the water quality of streams in the Upper Green River watershed, Kentucky, USA. It is essential to maintain the stream water quality as the river basin is one of the major freshwater sources in this province. It is also important to understand the water quality parameters (WQPs) quantitatively and qualitatively along with their important features as stream water is sensitive to climatic events and land-use practices. In this paper, a model was developed for predicting one of the significant WQPs, Fecal Coliform (FC) from precipitation, temperature, urban land use factor (ULUF), agricultural land use factor (ALUF), and forest land-use factor (FLUF) using Random Forest (RF) algorithm. The RF model, a novel ensemble learning algorithm, can even find out advanced feature importance characteristics from the given model inputs for different combinations. This model's outcomes showed a good correlation between FC and climate events and land use factors ($R^2 = 0.94$) and precipitation and temperature are the primary influencing factors for FC.

Keywords : water quality, land use factors, random forest, fecal coliform

Conference Title : ICWQTEE 2022 : International Conference on Water Quality and Treatment in Environmental Engineering

Conference Location : Melbourne, Australia

Conference Dates : February 07-08, 2022