

Hydro-Gravimetric Ann Model for Prediction of Groundwater Level

Authors : Jayanta Kumar Ghosh, Swastik Sunil Goriwale, Himangshu Sarkar

Abstract : Groundwater is one of the most valuable natural resources that society consumes for its domestic, industrial, and agricultural water supply. Its bulk and indiscriminate consumption affects the groundwater resource. Often, it has been found that the groundwater recharge rate is much lower than its demand. Thus, to maintain water and food security, it is necessary to monitor and management of groundwater storage. However, it is challenging to estimate groundwater storage (GWS) by making use of existing hydrological models. To overcome the difficulties, machine learning (ML) models are being introduced for the evaluation of groundwater level (GWL). Thus, the objective of this research work is to develop an ML-based model for the prediction of GWL. This objective has been realized through the development of an artificial neural network (ANN) model based on hydro-gravimetry. The model has been developed using training samples from field observations spread over 8 months. The developed model has been tested for the prediction of GWL in an observation well. The root means square error (RMSE) for the test samples has been found to be 0.390 meters. Thus, it can be concluded that the hydro-gravimetric-based ANN model can be used for the prediction of GWL. However, to improve the accuracy, more hydro-gravimetric parameter/s may be considered and tested in future.

Keywords : machine learning, hydro-gravimetry, ground water level, predictive model

Conference Title : ICSEG 2023 : International Conference on Stream Ecosystems and Groundwater

Conference Location : San Francisco, United States

Conference Dates : September 25-26, 2023