Machine Learning and Remote sensing method to Determine the Relationship Between Climate and Groundwater Recharge

Adya Aiswarya Dash[1]

[1]Department of Geology and Geophysics

December 8, 2022

Abstract

Machine Learning and Remote sensing method to determine the relationship between Climate and Groundwater Recharge. Adya Aiswarya Dash1, Abhijit Mukherjee1,2,3. 1Department of Geology and Geophysics, Indian Institute of Technology Kharagpur, West Bengal 721302, India 2School of Environmental Science and Engineering, Indian Institute of Technology Kharagpur, West Bengal 721302, India 3Applied Policy Advisory for Hydrogeoscience (APAH) Group, Indian Institute of Technology Kharagpur, West Bengal 721302, India Abstract Through machine learning and remote sensing, a high-end model with a finer resolution for groundwater recharge has been developed for the region of South-East Asia. The groundwater recharge coefficient can be found by the application of Random Forest regression followed by the implication of the water budget method to calculate the Groundwater Recharge values. Climatic factors such as precipitation and actual evapotranspiration to map Groundwater Recharge has been framed with a sophisticated machine learning method to be considered as a scale predicting model. A comprehensive visualization of the dataset has been done; the accuracy of the model is noted through random forest regression. Thus, the model can be used for various regions of the dataset specifically for the area where there is a lack of reach for data. It can be successfully used to form a sophisticated end-to-end ML model. Keywords: Machine Learning, Remote Sensing, Groundwater Recharge, Climate science.

Machine Learning and Remote sensing method to determine the relationship between Climate and Groundwater Recharge.

Adya Aiswarya Dash[1] , Abhijit Mukherjee[1,2,3] .

[1]Department of Geology and Geophysics, Indian Institute of Technology Kharagpur, West Bengal 721302, India

[2]School of Environmental Science and Engineering, Indian Institute of Technology Kharagpur, West Bengal 721302, India

[3]Applied Policy Advisory for Hydrogeoscience (APAH) Group, Indian Institute of Technology Kharagpur, West Bengal 721302, India

Abstract

Through machine learning and remote sensing a high end model with finer resolution for groundwater recharge has been developed for the region of South-East Asia. The groundwater recharge coefficient can be found out by the application of Random Forest regression followed by the implication of water budget method to calculate the Groundwater Recharge values. Climatic factors such as precipitation and actual evapotranspiration to map Groundwater Recharge has been framed with a sophiscated machine learning method to be considered as a scale predicting model. A comprehensive visualization of the dataset has been done; the accuracy of the model is being noted through random forest regression. Thus, the model can be used for various regions of dataset specifically for the area where there is lack of reach for data. It can be successfully used to form a sophiscated end to end ML model.

Keywords: Machine Learning, Remote Sensing, Groundwater Recharge, Climate science.