Geophysical Research Abstracts
Vol. 21, EGU2019-6434, 2019
EGU General Assembly 2019
© Author(s) 2019. CC Attribution 4.0 license.

# Application of Machine Learning Technique for Groundwater Potential Mapping

Changwook Lee
Kangwon National University, Chuncheon, Korea, Republic Of (cwlee@kangwon.ac.kr)

Application of Machine Learning Technique for Groundwater Potential Mapping

Changwook Lee (1), Prima Riza Kadavi (1), Sung Jae Park (1), and Mutiara Syifa (1)

(1) Division of Science Education, Kangwon National University, 1 Kangwondaehak-gil, Chuncheon-si, Gangwon-do, 24341, South Korea.

For sustainable use of groundwater, this study were analyze the potential productivity of groundwater using a machine learning approach and geographic information systems (GIS) in 8 cities in Korea. This model is based on the relationship between groundwater productivity data, including special capacity (SPC) and transmissivity (T) with 16 related conditioning factors including topography factors, hydrology factors, forest factors, land cover factors, soil factors, and geology factors. Machine learning methods from the Weka tool are applied to construct groundwater productivity potential (GPP) maps using the BayesNet and Naive Bayes algorithms that are fast, unbiased, and efficient. The GPP maps were constructed using 70% from total groundwater data. The generated GPP maps are validated using area-under-the-curve (AUC) analysis with well data that has not been used to train the model (30% from total groundwater data). Based on the AUC value of 8 research fields, it can be concluded that the BayesNet model using SPC data is the best model in the study with an average AUC value of 84.2%, followed by the BayesNet model using T data with an average AUC value of 83.9%, the Naïve Bayes model uses SPC data with an average AUC value of 83.64%, and the Naïve Bayes model uses T data with an average value of AUC 83.58%. These results indicate that machine learning methods can be useful for the development of groundwater resources.