



Estimation of Gross Primary Productivity in South Korea using Deep Neural Network

Nari Kim (1), Bora Lee (2), Eun-Sook Kim (2), and Yang-Won Lee (3)

(1) Geomatics Research Institute, Dept. of Spatial Information Engineering, Pukyong National University, Korea, Republic Of (kim.nari13@gmail.com), (2) Center for Forest and Climate change, National Institute of Forest Science., Korea, Republic Of, (3) Dept. of Spatial Information Engineering, Pukyong National University, Korea, Republic Of

The gross primary production (GPP) is considered to be an indicator of the photosynthesis in relation to the growth of vegetation. Monitoring the GPP can analyze changes in terrestrial ecosystems and can provide important information such as vegetation health, crop yield, food security, and others. The GPP has been estimated quantitatively using the statistical models, ecosystem models, and others. Recently, the outstanding performance of Artificial Intelligence (AI) methods has been verified through related studies. Particularly, the deep neural network (DNN) is evaluated as a more advanced technique that combines with the advantages of traditional neural networks and machine learning methods through an intensive learning process in a deep network. Therefore, we are expected that DNN can contribute to improving the estimation accuracy of GPP. The purpose of this study is to conduct the GPP estimation modeling based on DNN model and to evaluate for its accuracy. The GPP was obtained from Terra MODIS and input data used the Local Data Assimilation and Prediction System (LDAPS) from Korean Meteorological Administration (KMA).