Estimating forest area and analysing its amount of CO₂ uptake using spatio-temporal data

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Abstract: This study analyzed spatial characteristics of forest areas in Republic of Korea by using satellite images, National Forest Inventory Data (NFI) and forest type map, and estimated the amount of CO_2 uptake change based on growing stock in forest. According to the analysis of the Chuncheon area based on satellite images through a pilot study, the area of the forest was 88,293 ha and 88,402 ha, respectively, during the two periods of 2013 and 2018, showing an area difference of about 100 ha. species of trees classification and forest floor classification were carried out based on forests extracted from the above satellite data. At this time, the age class was mainly composed of III and IV, and the growing stock was calculated as $125.6719 m^3$ and $145.6309 m^3$. It is easy to estimate the amount of CO_2 uptake according to the growing stock in III and IV, where the growth of trees in Chuncheon is maximized. Thus, if the analysis is conducted nationwide on this basis, it can contribute to policy suggestions for achieving the 2030 greenhouse gas reduction road map. It can also contribute to the development of Sustainable Development Goals (SDGs).

Keywords: climate change, greenhouse gas reduction, growing stock, CO₂ uptake rate, satellite data