Analysis of forest watershed impact by climate change in Kangwon province

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Abstract: Due to the heat wave and heavy rain caused by climate change, the importance of managing water resources in the forest is increasing. Forest watershed function can increase the clean water. In addition, it can prevent drought and flood damage and supply public and agricultural water. This study found out correlation about variables such as Potential Evapotranspiration(PET), Land surface Temperature(LST), Temperature(Temp), and Precipitation(Prep), by the impact of climate change on the water supply of forests by utilizing remote sensing data. This study is aimed at Gangwon province in July from 2016 to 2018. Increase in temperature, decrease in precipitation or change in pattern of precipitation cause increase in evapotranspiration, decrease in soil moisture and water quality, and the change of watershed. Potential evapotranspiration(PET) can be calculated using only the highest, lowest, and average temperature by Hargreaves function which is known to accurate equation. Land surface Temperature(LST) is calculated by data acquired by Earth Observation (EO) data. Temperature, Precipitation, PET, and LST were analyzed by R which is is a free software environment for statistical computing and graphics. The result is that correlation analysis between each variables was found that ET, LST, Temperature had a negative correlation, and ET and prep had a positive correlation. Based on this study, the relationship between water and forest will be analyzed, and through systematic management of forests and water, the agriculture-water-forest nexus will be able to be expanded to the effect of agriculture on them. Finally, this study can be carried out come up with measurement to analyze synergy and trade-off.

Keywords: PET, LST, Climate change, EO data