# Estimation of evapotranspiration change due to the 2019 April Gangwon-do wildfire using remote-sensing data

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## Abstract

Three wildfires severely damaged local towns and forests in Gangwon-do, South Korea in 2019 April 4-5. Local hydrological regime could be greatly altered by the wildfires, therefore it is important to assess its damage (e.g. area and severity) and also resultant changes in hydrological fluxes. We retrieved the Normalized-Burned Ratio (NBR) index using remote-sensing data (Moderate Resolution Imaging Spectroradiometer (MODIS) 500-m 8-day surface reflectance data), and delineated the damaged-area based on the difference in the NBR (dNBR) before and after the wildfires. We then estimated changes in the annual evapotranspiration (AET) in 2019 using the MODIS evapotranspiration data (500-m 8-day). It was found that the damaged-area of the three wildfires was 29.50 km^2 in total, which take up 1.00-6.19% area of five catchments. It was estimated that the AET would be decreased as 0.05-1.56% over those five catchments, as compared to the pre-fire AET (2004-2018). The impact of the wildfires on the catchment AET was less severe than expected (i.e. up to 1.56%) mostly because two big wildfires were distributed across two catchments respectively (i.e. four catchments for the two wildfires) and the other wildfire was small and not severe. This study highlights the importance of assessing the area and severity of a wildfire when estimating its impact on the local hydrological cycle.

Keywords : Remote-sensing technique; Evapotranspiration; Hydrological cycle; Water resource management

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