Analysis of Forest Fire Change using Multi-temporal Sentinel2 Images and Land-cover

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Abstract: A forest fire is one of the major disturbances in the ecological diversity, succession of a forest's ecosystem. The forest fire in Sokcho started on 4 April, 2019 and continued for 2 days until 6 April, 2019. The Sentinel-2A(S2A) mission is very important due to 10m spatial resolution bands in the visible and the near infrared region(VNIR) as well as four bands(5, 6, 7, 8a). Several methods have been developed for detecting forest fire area and mapping fire affected area. Normalized Burn Ratio(NBR) is the representative spectral indices method for detecting forest fire damage. The NBR is a typical way to detect forest fire damage areas but, the NBR is uneffective formula for containing the urbanization area. To improve this part, we use Land-cover map provided Ministry of Environment for extracting forest area. In this study, we quantify the response of a burned area according to forest classification such as broad-leaf, coniferous and mixed forest. For results, severity area was classified 519.6ha and April 8th to May 10, severity area decreased 272.9ha. Especially, High severity of forest fire decreased 16.7ha. Through this results, we find misclassification dNBR pixels like converting unburned to low severity area according to the forest. Results of the present study indicate the error of dNBR spectral indices. The results of this study have significance in carrying out more automated classification of forest fire damage area.

Keywords: Forest Fire, Sentinel 2A, Normalized Burn Ratio(NBR), Land-cover map, ROI