EVALUATE THE ABILITY TO EXPLOIT FREE OPTICAL SATELLITE IMAGES TO MONITOR GROUND COVER IN VIETNAM

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SUMMARY

The combination of different types of optical satellite imageries will increase the chances of obtaining cloudless images more frequently to monitor the surface of the earth. Currently, optical satellites such as Landsat-8 OLI (from 2013), Sentinel-2 MSI (Sentinel-2A - from 2015; Sentinel-2B - from 2017) has now offered free images on a global scale with a spatial resolution of 10 to 30 m, which facilitates terrestrial monitoring. Using sets of Landsat 8 OLI and Sentinel 2 MSI images taken in 2018 on the cloud-based geospatial processing platform of Google Earth Engine, the study identified the potential use of these optical materials and how to combine them in whole territory of Vietnam. The results of the study demonstrated the utilities of combining two types of Sentinel-2 and Landsat-8 images to enhance the frequency and reduce image repetition time for each province in Vietnam. Accordingly, if the effect of clouds and shades is not considered, at one location in Vietnam, on average, the repeat cycle of the image is 15 days (Landsat 8), 4 days (Sentinel 2) and 3 days (two types of images are combined). However, if the effect of clouds and shades is neglected, at one location in Vietnam, on average, the repeat cycle of the image is 30 days (Landsat 8), 10 days (Sentinel 2) and 7 days (two types of images are combined). The ratio of Landsat 8 and Sentinel 2 images that can be used for surface monitoring purposes, compared to the total images collected, is of 51% and 39% respectively. With this repeat cycle, Landsat 8 OLI imageries are suitable for annual fluctuation monitoring. Sentinel 2 MSI imageries are suitable for quarterly fluctuation monitoring. The combination of both types of imageries can meet the goal of monthly fluctuation monitoring.

Keywords: GEE, Landsat 8 OLI, Optical Sattilte Image, Sentinel 2 MSI.

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