

Title	Multi-sensor Integration of Vegetation Index Products for Long-term Monitoring of Vegetation Dynamics: A Case Study from MODIS to VIIRS
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Abstract	<p>Spectral vegetation index (VI) time series data from moderate resolution sensors, such as Earth Observing System Moderate Resolution Imaging Spectroradiometer (MODIS), have widely been used to identify “hot spot” areas of vegetation changes and to characterize long-term trends of vegetation changes. The Visible Infrared Imaging Radiometer Suite (VIIRS) sensor series of the Joint Polar Satellite System program is slated to continue the highly calibrated data stream initiated with MODIS. The first VIIRS sensor has operationally been acquiring Earth-reflected radiation since March 2012. The second VIIRS sensor (NOAA-20) was launched in November 2017, which is to continue the measurements made by the first VIIRS sensor. In this study, we examined an integrated use of MODIS and VIIRS VI time series data on capturing vegetation dynamics in the Asia-Pacific region using their overlapped period of observations (2013-2017). Three VIs, the “top-of-canopy (TOC)” normalized difference vegetation index (NDVI), TOC enhanced vegetation index (EVI), and TOC two-band enhanced vegetation index (EVI2), were investigated. For all the three VIs, VIIRS VIs were systematically higher than the MODIS counterparts due mainly to their spectral bandpass differences. However, both VIIRS and MODIS VIs showed the comparable spatial patterns in their temporal variations. Empirical spectral corrections allowed to merge the two data streams, which slightly improved the temporal resolution of the VI temporal profiles. These results suggest the suitability of VIIRS data to extend and merge into the MODIS VI record for long-term vegetation dynamics studies.</p>
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