

How Vegetation Indices Perform in Estimating of Vegetation Biophysical Characteristics?

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There is considerable interest in assessing biophysical characteristics of vegetation, such as vegetation fraction (VF), leaf area index (LAI), density / biomass and the magnitude of carbon sources and sinks for agricultural lands, grasslands, and forests. In this paper, we compare performance of widely used vegetation indices such as NDVI, ARVI, SAVI, EVI, PRI, MCARI, as well as recently developed indices for estimating of vegetation biophysical characteristics. We assessed accuracy of VF, LAI, biomass and net ecosystem carbon dioxide exchange retrieval for maize and soybean from remotely sensed data taken by two-heads hyperspectral radiometer. We compared sensitivity of the indices to such biophysical characteristics as vegetation fraction, leaf area index, biomass as well as minimal value of biophysical characteristic that can be detected using each index. Then, using images from the SPOT-4 Vegetation sensor we compared performances of the indices for forests, savanna, grasslands and croplands among others.