

COMPARISON OF THE VEGETATION INDEX COMPUTED FROM MODIS , AVHRR AND ASTER DATA OVER HOKKAIDO, JAPAN

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An attempt is made to compare the vegetation index computed from the data of different spatial and spectral resolution, i.e. the data of MODIS (MODerate resolution Imaging Spectrometer), AVHRR (Advanced Very High Resolution Radiometer) and ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer). As the vegetation index the most widely used NDVI (Normalized Difference Vegetation Index) is selected. Since the index is computed from the ratio of the data of two bands the effects of atmosphere, temporal degradation of sensor sensitivity, viewing geometry, etc are eliminated to a certain extent. The spectral ranges and spatial resolution of each NDVI are as follows. MODIS-NDVI: 0.62-0.70, 0.841-0.876 μ m 250m ; AVHRR-NDVI: 0.58-0.68, 0.82-0.87 μ m; 1.1km. ASTER-NDVI: 0.63-0.69, 0.76-0.86 μ m, 15m. The computation is made for the data of Hokkaido, Japan. In addition to NDVI, EVI (Enhanced Vegetation Index) and LAI (Leaf Area Index) are also computed for the data of MODIS.

The result indicates that both MODIS-NDVI and AVHRR-NDVI show a good result, with MODIS-NDVI a little better result. Between NDVI and EVI computed from the data of MODIS, EVI shows a little better result for the study of phenological change of vegetation. MODIS-LAI is useful in distinguishing the vegetation in a wetland.

Since the spatial resolution of ASTER is more than one order of magnitude higher than that of MODIS and AVHRR it is rather difficult to obtain a reasonable evaluation since it depends on the purpose of application. In the area with a complicated vegetation and topographical distribution it is found that ASTER-NDVI is very useful.