The derivation of the green vegetation fraction from Landsat TM data on three gorges area

Ding Yanmei, Liu Zhengjun,Wang Jian,Zhang Jixian

chinese academy of surveying and mapping

ding_0@163.com

ABSTRACT: The increasing use of satellite Remote Sensing has proved to be an effective means of monitoring environment changes in terms of vegetation. Remotely sensed images can be obtained as frequently as required to provide information for determination of quantitative and qualitative changes in a specific region. Fraction of vegetation cover is one of the most useful parameters for vegetation cover analysis, which is also a sensitive indicator of land use, land degradation and desertification.In this paper, on the one hand , we have explored the potential of deriving fraction of vegetation cover from normalized difference vegetation Index (NDVI) data considering the leaf area index (LAI) of non-forest area in Three Gorges Reservoir Area. Firstly, geometric, radiometric and atmospheric corrections of the Landsat TM imagery were performed before further analysis. Secondly, NDVI were calculated from the spectral reflectance of various vegetation covers. Then, According to the pixel structure characteristics, we choose the dense vegetation model and the non-dense vegetation mosaic-pixel model for calculating percent vegetation cover. To quantitatively retrieve the percent vegetation cover, the corresponding LAI of each pixel should be firstly inverted. An improved method was put forward to estimate leaf area index from visible and near infrared measurements of vegetation based on the two stream approximation model in non-forest area. on the other hand, Forest canopy density model developed by other researcher has been used to get percent vegetation cover in forest cover area in Three Gorges Reservoir Area considering four indice of soil, shadow, thermal and vegetation. Comparing the percent vegetation cover derived from two different model mentioned above, we can observe that percent vegetation cover derived from our improved hybrid model resorting to the LAI and vegetation index (VI) is higher than that estimated from conventional empirical model. Summarizing, in some respect, our improved model is an effective model that could yield good results and performs better in some repect than conventional empirical model.