Development of multi-year vegetation indices databases for Northern Eurasia from VEGETATION and MODIS sensors

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For large-scale remote sensing study, the AVHRR sensors and the Normalized Difference Vegetation Index (NDVI) that is calculated as a normalized ratio between red and near infrared bands have dominated the literature over the last few decades. Advanced VEGETATION (VGT) sensors onboard SPOT-4/5 satellites (since 3/1998) and MODIS sensors onboard Terra and Aqua satellites (since 12/1999) offer additional spectral bands for studying vegetation, in comparison to the AVHRR sensors that have red and near infrared bands, and thus enable development and calculation of other vegetation indices, including Enhanced Vegetation Index (EVI), and Land Surface Water Index (LSWI). These new vegetation indices could lead us to go beyond the NDVI. In this presentation, we reported our effort in developing the geospatial databases of vegetation indices for Northern Eurasia, and the databases are composed of NDVI, EVI and LSWI. While NDVI is related to the fraction of photosynthetically active radiation (PAR) absorbed by the vegetation canopy (FAPAR), EVI may be related to the fraction of PAR absorbed by chlorophyll in the canopy (FAPARchl) and LSWI may be related to equivalent water thickness (EWT, g $H_2O/m2$) in leaf and canopy. We have processed the 10-day composites of VGT from 4/1/1998 to 12/2003 (1-km spatial resolution) and are processing the 8-day composites of MODIS from 3/2000 to 12/2003 (500-m spatial resolution). In this presentation, we will highlight some preliminary comparisons among the three vegetation indices (NDVI, EVI and LSWI) and the potentials of EVI and LSWI.