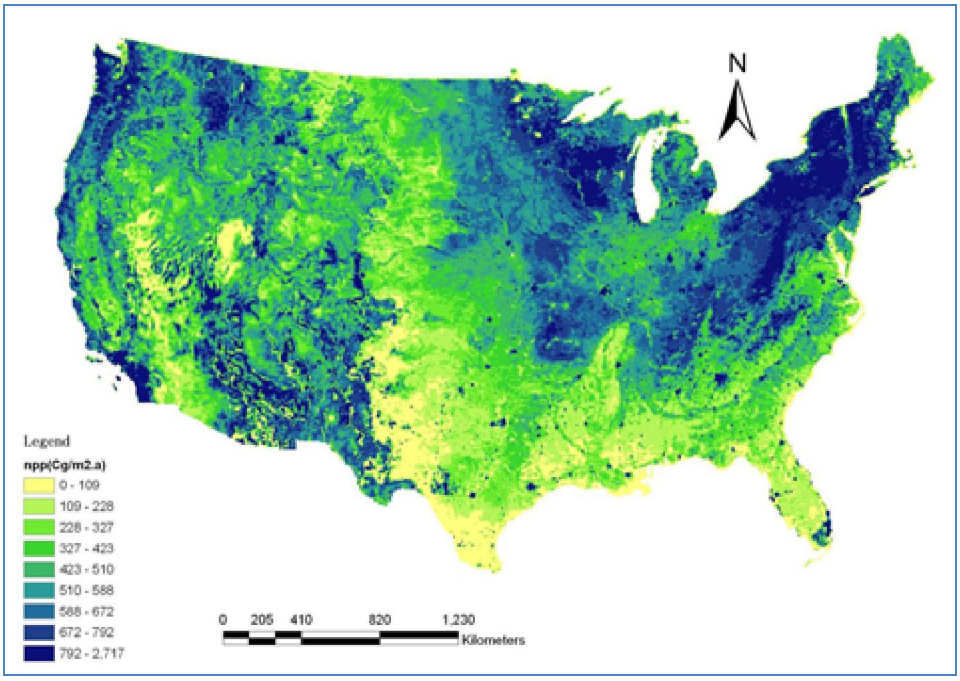
Remote Sensing Application



The effects of UV-B radiation on plants get much more complicated and convoluted when the enhancement of UV-B radiation is accompanied with other changing abiotic and biotic factors such as high temperature and water stress as predicted in global warming. Recent studies show significant crossing effects of UV-B radiation, water stress, high temperature, and CO2 concentration on soybean, cotton, rice, and cowpea. Therefore, all effects of elevated UV-B on plants should be considered in the context of other factors such as water stress, increased atmospheric CO2, tropospheric air pollution, and temperature.

While the effects of one factor or few more factors can be examined with the resort to controlled growth chamber, computer modeling has to be exploited to carry out comprehensive studies of interacted effects of multiple factors. Coupling crop growth models with climate models is an efficient and feasible way to assess the potential integrated impacts of enhanced UV-B levels, high temperature, water stress, and CO2 under the context of global warming. Remote sensing techniques and data are particularly useful to extend these studies to a regional or global scale.

Works have been conducted or have been ongoing on various applications of remote sensing techniques and datasets, including:

- Computation of net primary productivity using remote sensing techniques and datasets.
- Comparison of ground measurements of erythema-weighted UV radiation with TOMS data retrievals.
- Spatial distribution of UV radiation, PAR, and temperature in the United States.
- Grid values of input data for climate models.