Geophysical Research Abstracts,
Vol. 11, EGU2009-12974, 2009
EGU General Assembly 2009

Using Remotely Sensed Data and the FAREAST Forest Succession Model to Estimate Biomasss and LAI across a Complex Landscape in the Russian Far East

N.J. Sherman and H.H. Shugart

University of Virginia, Environmental Sciences, Charlottesville, United States (njs6f@virginia.edu, 1-434-982-2137)

Using Remotely Sensed Data and the FAREAST Forest Succession Model to Estimate Biomass and LAI Across a Complex Landscape in the Russian Far East

The remaining natural habitat of the critically endangered Amur tiger (Panthera tigris altaica) and Amur leopard (Panthera pardus orientalis) is a vast, biologically and topographically diverse area in the Russian Far East (RFE). The FAREAST model is an individual, gap-based model that simulates forest growth in a single location and demonstrates temporally explicit forest succession leading to mature forests. This work represents the first attempt to validate model output across a large region and to compare it with remotely-sensed data products as well as with in situ assessments of forest structure. We ran the FAREAST model at 1,000 randomly selected points within forested areas in the RFE, as well as at 987 points corresponding with Geoscience Laser Altimeter System (GLAS) data locations. At each point, the model was calibrated for temperature, precipitation, soil characteristics and elevation. The output of the model includes biomass and leaf area index (LAI) estimates for 44 tree species that occur in the RFE, grouped by genus. We compared the model outputs with land cover classifications derived from the Moderate Resolution Imaging Spectroradiometer (MODIS) data and LIDAR-based estimates of biomass across the entire region, as well as Russian forest inventory records at selected sites. We also ran the model with a fire probability parameter, as fire is an important disturbance factor in the RFE. Initial analysis shows that FAREAST estimates of forest biomass and LAI are consistent with a large fraction of the observed results, which will be analyzed further by year of succession, elevation, forest cover type, soil characteristics, and aspect. Addition of fire occurrence to the model produced increased biomass in heavily forested areas, as might be expected, since fire can re-start the succession process.

Authors: N. J. Sherman, H.H. Shugart

Environmental Sciences Dept., University of Virginia, P.O. Box 400123, Charlottesville, VA 22904

1-434-924-3186
njs6f@virginia.edu