Geophysical Research Abstracts,
Vol. 10, EGU2008-A-04050, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-04050
EGU General Assembly 2008

Assessing Regional Differences in Carbon Storage across Russia Using the Individual Based Gap Model FAREAST and Detailed Forest Inventory Data

J. Shuman (1), H. Shugart (1), O. Krankina (2)

(1) University of Virginia, Charlottesville, USA (2) Oregon State University, Corvallis, USA (jkshuman@virginia.edu)

The individual-based gap model FAREAST was developed to simulate forest dynamics of Changbai Mountain in China, and then applied to 31 sites in Siberia and the Russian Far East. For this study independent forest inventory data arranged in 10-year intervals based on the age of the dominant cohort was used for validation of a subset of 223 simulation sites across Russia. Regional forest age structure was determined as cohort percent coverage of area surveyed for sites aggregated in the northwest, south, and far eastern regions. The simulation data, sorted according to proximity to inventory sites, was re-compiled as biomass ($tCha^{-1}$) for plots summed at 10 year intervals from year zero to mature forest then multiplied by percent coverage of each age cohort to obtain forest age structure. The change in carbon storage was found by calculating the difference between expected biomass of mature forest, current forest state, and a managed condition characterized by an even distribution of age cohorts. Validation used 46 simulation sites and inventory data arranged by species biomass ($tCha^{-1}$) from 43 forests. Transition from current state to mature forest resulted in higher carbon storage with regional increases of 11.84 $tCha^{-1}$ in the east, 12.17 $tCha^{-1}$ in the south, and 29.56 $tCha^{-1}$ in the northwest. Alternately, transition from current state to an even distribution of age cohorts resulted in a regional loss of 0.238 $tCha^{-}1$ in the east, and an accumulation of 1.423 $tCha^{-1}$ in the south, and 8.179 $tCha^{-1}$ in the northwest. The current Russian forests are found to be similar in carbon storage to an even-aged forest suggesting heavily managed conditions. The validation of simulated biomass with independent inventory data confirms that FAREAST is a robust model of

Russian forest dynamics and therefore appropriate for use across the Russian region.