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CONTROL ID: 1793816

TITLE: Mapping forest succession types in Siberia with Landsat data

ABSTRACT BODY: We develop a forest typology system based on dynamic vegetation approach and apply it to the analysis of the forest type distribution for several test areas in West Siberia and Central Siberia, aiming at capability of mapping whole Siberian forests based on Landsat data. Test region locations are: two in West Siberian middle taiga (Laryegan and Nyagan), one in Central Siberia and one in East Siberia near Yakutsk. The ground truth data are based on analysis of the field survey, forest inventory data from the point of view of the successional forest type classification. Supervised classification was applied to the areas covered with analysis of the ground truth and inventory data, using several limited area maps and vegetation survey transects published in literature.

In Laryegan basin the upland forest areas are dominated (as climax forest species) by Scots pine on sandy soils and Siberian pine with presence of fir and spruce on the others. Those types are separable using Landsat spectral data alone. In the permafrost area around Yakutsk the most widespread succession type is birch to larch succession. Three stages of the birch to larch succession are detectable from Landsat image. When Landsat data is used in both West and East Siberia, distinction between deciduous broad-leaved species (birch, aspen, and willow) is difficult due to similarity in spectral signatures. Same problem exist for distinguishing between dark coniferous species (Siberian pine, fir and spruce). Image classification can be improved by applying landscape type analysis, such as separation into floodplain, terrace, sloping hills. Additional layers of information seem to be promising way to complement Landsat data including SAR-based biomass maps and terrain data

CURRENT SECTION/FOCUS GROUP: Global Environmental Change (GC)

CURRENT SESSION: GC049. Environmental, Socio-Economic and Climatic Changes in Northern Eurasia and their Feedbacks to the Global Earth System

INDEX TERMS: 1600 GLOBAL CHANGE, 0480 BIOGEOSCIENCES Remote sensing, 0439 BIOGEOSCIENCES Ecosystems, structure and dynamics .

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TITLE OF TEAM:

(No Image Selected)

(No Table Selected)

PRESENTATION TYPE: Assigned by Committee (Oral or Poster)