

Current state of forest mapping with Landsat data in Siberia

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We review a current state of a forest type mapping with Landsat data in Siberia. Target algorithm should be based on dynamic vegetation approach to be applicable to the analysis of the forest type distribution for Siberia, aiming at capability of mapping Siberian forest landscapes for applications such as predicting response of forest composition to climate change. We present data for several areas in West Siberian middle taiga, Central Siberia and East Siberia near Yakutsk. Analysis of the field survey, forest inventory data was made to produce forest type classification accounting for several stages for forest succession and variations in habitats and landforms. Supervised classification was applied to the areas where the ground truth and inventory data are available, including several limited area maps and vegetation survey transects. In Laryegan basin in West Siberia the upland forest areas are dominated by mix of Scots pine on sandy soils and Siberian pine with presence of fir and spruce on the others. Abundance of Scots pine decreases to the west due to change in soils. Those types are separable using Landsat spectral data. In the permafrost area around Yakutsk the most widespread succession type is birch to larch. 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 generally difficult. Similar problem exist for distinguishing between dark coniferous species (Siberian pine, fir and spruce). Image classification can be improved by applying landform type analysis, such as separation into floodplain, terrace, sloping hills. Additional layers of information can be a promising way to complement Landsat data.