



Analyses of changes in vegetation cover in the South and Sub-Taiga of Western Siberia using Landsat data

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Understanding human impact on vegetation composition and structure, at scales from the patch to the globe, and capacity to monitor change over time is fundamental research problem to address Global Change and ensure sustainable development. Natural ecosystems at the South and Sub-Taiga zone of Western Siberia are characterized by development of an early successional states, given the projected increase in disturbance, or will be converted into human-dominated terrestrial production systems. Disturbances (e.g., fire, dieback due to insect attacks) appear to be increasing in some regions, leading to fragmentation of natural ecosystems and to a generally "weedier," structurally simpler biosphere with fewer systems in a more ecologically complex old-growth state.

The analysis of structure of vegetation cover at two test sites located at the south-west part of the West-Siberian Plain in the South and Sub-Taiga zone was made using LANDSAT space images and ground data. The studied area of the first test site ("Bakchar") is occupied by bogs, paludificated forests and cultivated lands. Test site "Tomsk" covered by cultivated lands in the south, dark coniferous forest complexes an early and old-growth state in the north part. Mire types at the test sites are presented by open fens, ridge-hollow / ridge-lake complexes and pine-shrub-sphagnum communities with different tree height and layer density.

During the XX century the vegetation cover was exposed to natural and anthropogenic changes. Comparison of space images from different years (1990, 1999 and 2007) allowed revealing dynamics in vegetation cover. Forest change was calculated using the Disturbance Index (Healey, 2006). Decrease of forest area in 1990-1999 are primary occurs due to intense forest cutting for timber industry and local use. A strong wind have damaged forests between 1990 and 1999 in stripes oriented from south-west to north -east in the prevailing wind direction. Strong winds were registered in 2003, 2005, and 2007. Tree cutting in 1999-2007 was significantly smaller than in previous time due to depression in economical activity. Some invasion of young trees in to abandoned agricultural lands also can be found at comparison of 1999 and 2007 images. After 1999 many agricultural lands stopped to plug, transformed to unmanaged meadows (grassland) and now occupying by young birch. Small burned areas are exists on the studied territory primary at drainage peatlands but fires does not affect forests significantly.

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