

## Characterizing landscape-scale distribution of sparse larch forest and surrounding wetland in Taiga-Tundra boundary ecosystem, Northeastern Siberia

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Vegetation cover is essential information for upscaling GHG emission in local to regional scale. Taiga-Tundra boundary ecosystem consists of sparse Larch forest and polygonal wetland in eastern Siberia, and it is no easy task to know the structure of heterogeneous landscape. Field observation and high resolution satellite image provide information for vegetation cover on a microtopographic level, while coarser resolution image contains mixed pixels. To evaluate fraction of small vegetation patch, subpixel classification has been applied at coarser resolution satellite image. In this study ALOS AVNIR2 (JAXA) reflectance image (70 x 70 km) was classified into landscape unit and then subpixel vegetation cover was obtained by linear spectral unmixing (LSU) method based on vegetation endmember of field reflectance and tree distribution survey in Indigirka lowland eastern Siberia (70°N, 148°E) in July summer. Result was validated by higher resolution vegetation map that was derived from WorldView-2 (Digital Globe) for 10 x 10 km.

AVNIR2 image was classified into 15 landscape units by ISODATA unsupervised classification. Each landscape unit in 10m resolution AVNIR2 image contained usually 2 to 4 dominated vegetation classes in 2-0.5 resolution WorldView-2 vegetation map. For example, a landscape unit near tributary consisted of Sedge, Shrub and smaller fraction such as Tree and Salix endmembers. After endmember collection, subpixel vegetation cover was estimated for 70 x 70km scale, and it revealed landscape-scale distribution and zonation of vegetation cover in Taiga-Tundra boundary. Prior to this study, we have investigated CH<sub>4</sub> emission and biomass production of willow bush for 10 x 10km local scale in this observation area. This subpixel vegetation data will allow us to upscale these parameters on biogeochemical cycles for larger spatial scale.

Keywords: vegetation, landscape, subpixel classification