

Natural Science Research of the Forest-Tundra Ecotone Structure and Changes in Russia

E.I. Golubeva¹, O.V. Tutubalina¹, A. Hofgaard², W.G. Rees³, H. Tømmervik⁴, L.G. Isaeva⁵,
N.V. Lukina⁶

¹*Moscow State University, Moscow, Russia.*

²*Norwegian Institute for Nature Research, Trondheim, Norway*

³*Scott Polar Research Institute, Cambridge, UK*

⁴*Norwegian Institute for Nature Research, Tromsø, Norway*

⁵*Institute of the North Industrial Ecology Problems of the Kola Scientific Centre, Russian Academy of Sciences, Apatity, Russia*

⁶*Centre for Forest Ecology and Productivity, Russian Academy of Sciences, Moscow, Russia*

We present results of collaborative research carried under nationally funded project BENEFITS as part of the IPY core project PPS Arctic. We apply the PPS Arctic concepts in the Russian territory by characterising structure, position and dynamics of the forest-tundra ecotone and comparing these in mountains and plains, in continental and oceanic climatic conditions. We analyse specific roles of soils and terrain, and of anthropogenic factors, including aerial pollution and land use.

We build upon integrating i) field ecological research, characterising vegetation, soils and terrain of key sites; and ii) traditional and novel ways of extracting information on position and structure of the ecotone areas from remotely sensed imagery, with particular focus on very high resolution (0.5-4 m, for key sites) and moderately-high resolution (15-30 m, for larger areas) satellite images. Project activities have been carried out in two contrasting regions: north-west Russia (2008-2010, centre and north of Kola Peninsula) and north-central Siberia (2010, Ary-Mas in south Taimyr and south-central shore of Lake Lama in western Putorana Plateau). Key tree species include birch, pine and spruce in NW Russia and larch in Siberian sites. Within sites controlled by mostly natural factors, advance or stagnation of treeline is recorded; recession of treeline is noted only in sites severely damaged by industrial activity, e.g. near Monchegorsk nickel smelters.

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