Seida / Vorkuta (67°03' N, 62°55' E) A Multifunctional Finnish-Russian Research Site in the European Russian Arctic

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Site, category	Site characteristics
Site name	Seida / Vorkuta
Location	67°03' N, 62°55' E, 100 m a. s. l.
Established	2007
Accessibility	Direct train connection from Moscow / St Petersburg (8 km distance from Seida village to the site); flight connection to Vorkuta (70 km from the site)
Research coordinator	Department of Environmental and Biological Sciences. University of Eastern Finland, Kuopio, Finland. <u>Contact</u> : Christina Biasi, Christina.Biasi@uef.fi
Russian partner institution	Institute of Biology, Komi Science Center, Syktyvkar, Russia. <u>Contact</u> : Dmitry Kaverin.
 Climate Mean annual air temperature Mean annual precipitation Days with snow cover Growing season length Max. Seasonal thaw Ecozone Soil types	Subarctic -5.6 °C 501 mm 245 Mid-June to mid-September, 3 months From <40 cm to >120, depending on surface type Southern tundra, discontinuous permafrost Peat and mineral soils: upland mineral tundra, vast peat plateau complexes with varying vegetation cover, wetlands and thermokarst lakes
Data availability	 Greenhouse gas fluxes (CO₂, CH₄, N₂O) Continuous monitoring of climate, soil temperature, moisture and oxygen status Vegetation monitoring (LAI measurments) Continuous active layer monitoring (CALM grid) Isotopic studies Microbiological studies Palaeo- and soil ecological studies Detailed mapping and soil studies
a)	b)



Fig. 2: QuickBird satellite image (resolution 0.6 m) of the Seida study site.

Fig. 3: Overview of the heterogeneous landscape of the study site: Peat plateau spotted with bare peat surfaces, surrounded by upland tundra.

Research Site

Seida is a heterogeneous tundra site, located in the Subarctic, near the city of Vorkuta. The location of the site close to the tree line near the border of the Southern extent of permafrost distribution makes the site ideal for studying ecosystem dynamics related to Arctic climate change. This is the region where first changes in permafrost distribution and related changes in the vegetation and hydrology are expected, and the region is currently experiencing permafrost warming and thawing. Special features of the study site are it's small-scale heterogeneity and a mosaic of different soil and vegetation types: massive peat plateau complexes, extensive upland tundra landscapes, thermokarst lakes, wetlands, and bare peat surfaces created by frost action. Easy access by railroad facilitate research activities at this site.



The present field infrastructure includes two field cabins. Meteorological parameters, soil temperatures, as well as soil moisture and oxygen content are permanently monitored. Multidisciplinary research is being carried out at the site since 2007, spanning from the microbial to the landscape scale, and research is conducted by highly international research teams. Seida is part of the circumpolar active layer depth monitoring programme (CALM). Further, a long-term experimental *in situ* warming experiment, using open-top chambers, was established at the site in 2012. Various soil, vegetation and permafrost maps are available for the study site, as well as a high-resolution QuickBird satellite images (pixel sixe 2.4 m).

Seida was and is a key research site in one Nordic Center of Excellence (DEFROST), two EU-projects (CARBO-North, PAGE21), and several projects funded by the Academy of Finland. Until now, research in Seida has resulted in more than 30 publications, and the site has generated more than €4 Mio. in research funding.

Fig. 4: a) Meteorological station at the site; b) continuous soil moisture and temperature measurements along the active layer profile; c) thermokarst lake; d) experimental air and soil surface warming on bare peat soil.

Photos and poster design: Carolina Voigt, Biogeochemistry Research Group, University of Eastern Finland