

Project acronym: SiberMire

Project title: Climatic sensitivity of taiga-tundra mire vegetation; a multi-proxy palaeo approach to evaluating changing biome dynamics and C accumulation

Project leader: Angelica Feurdean, Senckenberg Biodiversity and Climate Research, Frankfurt am main, Germany

Discipline: Earth Sciences & Environment

Station(s): Kajbasovo Research Station (Russia)

Most of the data concerning the response of plant communities (species, biomass) and biogeochemical cycles to recent warming is based on current observational studies, with comparatively little research focusing on centennial to millennial scale change. This proposal aims at using long term ecological reconstruction on cores from several peatlands around the Kajbasovo Research Station in order to explore the sensitivity of plant communities, peatlands and C accumulation from cold area to various drivers of changes. We will apply multiproxy methods including pollen, charcoal, plant macrofossils, testate amoebe, sediment geochemistry, mineral magnetic analysis, particle size determination, total C and N, $\delta^{13}C$, $\delta^{15}N$ and radiocarbon dating (AMS) on these peat cores. By employing proxy data to contextualise current changes, we seek past analogues that will ultimately enhance our understanding of the future's trajectory. Our multiproxy approach will allow to determine pattern but also drivers of environmental changes.

Using sediment cores from Kajbasova research station we aim to reconstruct: Response of local to regional vegetation communities to past climate warming; Fire regime dynamics (frequency of fire episodes, severity/burnt area); How functional properties of dominant species determining fire resistance and regeneration affect fire regime; Reconstruct local hydroclimate variability; Reconstruct changes in C and N accumulations and the relative importance of hydrological variability, plant composition and disturbances on these fluxes; Reconstruct long-term mire particulate inputs; Spatial perspective: Regional and intercontinental patterns by comparing this region with other study regions; Temporal perspective: Place the very recent and last century (post-industrial) into and longer-term (Holocene) context