

Samoylov Island Observatory

possibilities of controlled high precision instrumentation to obtain new insights in environmental conditions of the high arctic lowland tundra

Background

Samoylov Island (5km²) and its surrounding areas of the Lena River Delta (72°22' N, 126°30' E) serve as a baseline observatory for the validation and development of remote sensing products as well as climate models in the Arctic. The observatory is located in a typical high latitude lowland tundra landscape, characterized by wet polygonal tundra, and hence represents one of the dominating and most important landscape types in the Arctic. The continuous permafrost in the area reaches depths of 500 to 600 m. The observatory is equipped with leading edge environmental monitoring systems which are used to observe changes in permafrost and soils, vegetation, boundary layer meteorology, soil/water biology, energy- and trace gas fluxes, geomorphology, and snow cover. Since 1998 continuous long time measurements delivering several climate and soil parameters.

The observatory is currently under enhancement by the HGF road map project ACROSS⁺ by setting up a new field lab, which is partly finished. From summer 2017 on the new field lab will operate and be open for interested researchers to set up and maintain scientific instruments for their research.

New field observatory



Field lab igloo (Summer 2017)

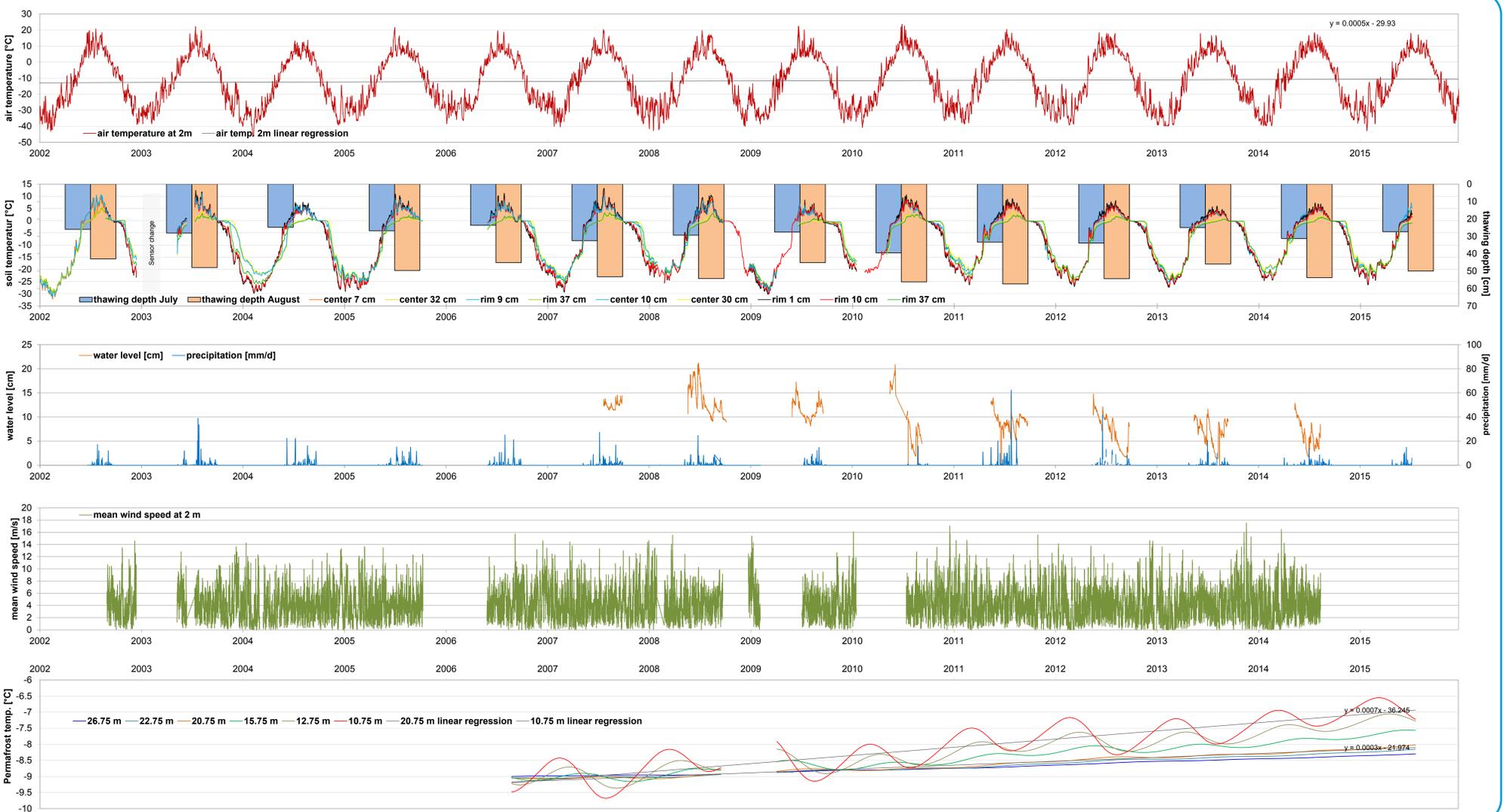
- isolated fiberglass construction
- streamlined igloo shape
- 15 m³ inside space
- up to three 19" instrument racks
- 24/7 220 V power, battery pack
- all time temperature controlled

Tower (April 2016)

- 10 m height, aluminum
- individual platforms for instrumentation
- equipped with instruments to measure temperature, humidity, wind speed & direction, radiation
- certified climbing safety system

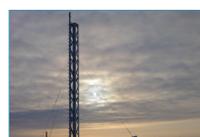
Additional infrastructure

- 850 m boardwalk
- 5 electrical field power stations



Summary

Samoylov is characterized by an average temperature of -12.5 °C (-33.1 °C in February and 10.5 °C in July). The surface temperature is respectively cold (mean annual value of -10.1 °C); the average temperature of the active layer is -8.4 °C (at 0.03 m depth). In August the mean thaw depth reaches 0.6 m. Within the last 9 years a continuous warming of the permafrost is observed (about 2.3 K in 10.75 m depth and 1 K in 20.75 m depth). The average summertime rainfall is about 125 mm with strong interannual differences.



* HGF road map project "Advanced Remote Sensing - Ground-Truth Demo and Test Facilities" (<http://across-project.de>)



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