3.4 Seasonal progression of thaw depth dependent on mircrorelief

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3.4.1 Background

The topography of the Lena Delta is fairly flat, but well-structured by a prominent microrelief, caused by the development of ice-wedge polygons. Most common are low-centred polygons. The depressed centres of these polygons are surrounded by elevated rims, which are situated above the ice-wedges. The prominent microrelief causes a high spatial heterogeneity of soil properties on the small scale of decimeters to meters. In order to up-scale results of process studies to the landscape scale, it is necessary to describe and quantify the spatial hetorogeneity of soils. A major factor for all physical and biological processes in permafrost soils is the active layer depth (=thaw depth).

3.4.2 Projects

A thaw depth monitoring programm was conducted on Samoylov Island in the period June 10 – August 30. An investigation site of 28 m x 18 m was established close to the new soil survey station (Chapter 3.2, Figure 3.12). A grid of 150 measurement points in intervals of 2 m x 2 m were marked and mapped with a laser tachymeter (type Trimble 3300). At every measurement point, thaw depth was measured every 3 to 7 days by driving a steel rod into the unfrozen soil until the hard frozen sediments were encountered.

3.4.3 First results

Contour maps of the microrelief at the thaw-depth monitoring site and the spatial variability of the mean thaw velocity during the study period are shown in Figures 3-31 and Figure 3-32.

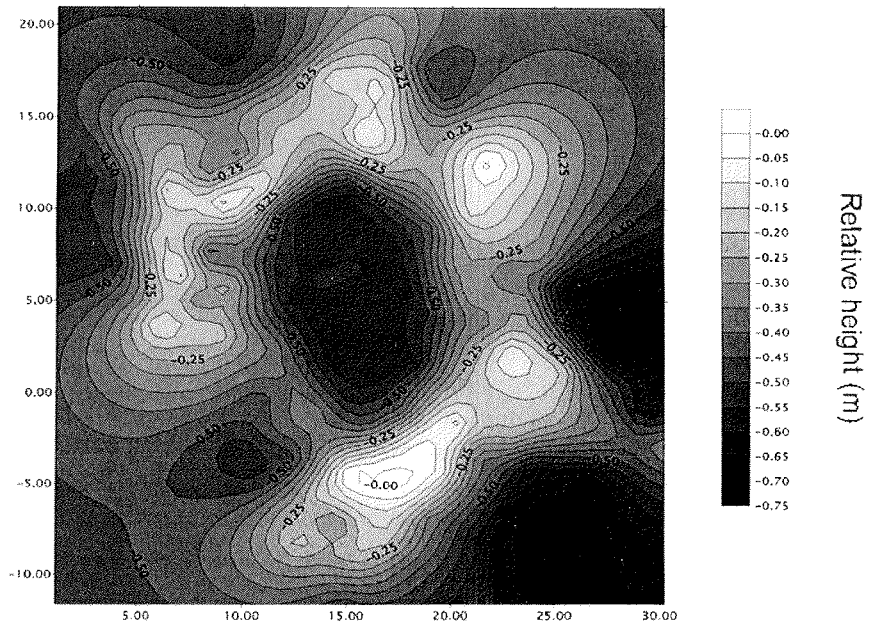

Figure 3-31. Contour map of the microrelief at the thaw-depth monitoring site, Samoylov Island. Units of the coordinate system are meters.

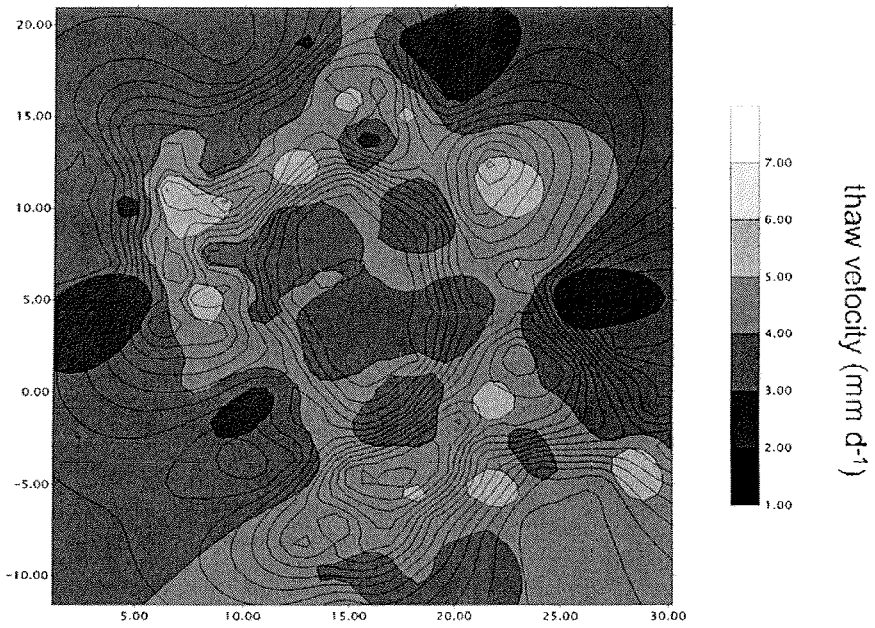

Figure 3-32. Mean thaw velocity during the study period June 10 – August 30 at the thaw depth monitoring site, Samoylov Island. The contour lines of the microrelief (Figure 3-31) are indicated for orientation.