

## **LiDAR -based interpretation of deglacial dynamics in SW Finland**

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The aim of the research was to develop a proper working procedure for LiDAR data interpretation over large deglaciaded areas and to promote the understanding of ice stream dynamics and related ice-marginal behavior of the Scandinavian Ice Sheet, especially in SW Finland. The detailed dynamic behavior of the ice streams is still poorly understood, but now the ALS-based high-resolution LiDAR (Light Detection And Ranging) data will facilitate the mapping of glacial landsystems (a holistic approach of terrain evaluation). It enables more accurate and uniform landform analysis over wide areas than with traditional geomorphological techniques and other methods of remote sensing. Like all remote sensing methods, LiDAR interpretations are also dependent on ground control, but the needed field work is much more focused and minimal.

The study area exhibits the withdrawal of the Scandinavian ice sheet from the II and III Salpausselkä ice-marginal complexes in SW Finland, recording the end of the relatively cold Younger Dryas period. A detailed picture of deglaciation and related ice-marginal depositional patterns, ice flow indicators, and hydrological changes depicted by esker patterns has been established for the deglacial Loimaa and Vanajavesi sublobes on the eastern part of the Baltic Sea ice stream. New landform features or assemblages supplemented with field observations have been mapped for the area.

The overall results support the usefulness of glacial landsystem approach even for deglacial environments with varying maturity of landsystem development. Moreover, the results explain the complex behaviour and ice flow patterns at the NE end of the III Salpausselkä affected by the deglacial activity of the Vanajavesi sublobe or ice flow corridor that best describes the landsystem development within the area. Fast deglacial changes in ice flow and landform patterns were affected by subtle changes in bed topography, proglacial water depths as well as changes in hydrological regime of the ice. We also suggest the presence of large subglacial lake and related outburst route within Urjala-Toijala area.