

Elongate and Radial Hummocky Tracts in Southern Sweden — Evidence for Extensive Subglacial Drainage?

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Complete understanding of glacial melt-water processes is crucial for a profound view on former and contemporary ice sheets. Investigating sediments and landforms below ice sheets is complicated; however, formerly glaciated regions are easily accessible. For over a century, the hummocky characteristics of the South Swedish Uplands (SSU) have been recognized, and several explanations have been proposed since. Most of these studies describe hummocks shown to be products of a stagnant ice environment. The arrival of detailed elevation models (LiDAR) has revealed this landscape in an unprecedented detail. We have made an inventory of glacial landforms on detailed DEMs covering SSU, and can present a more diverse view of the hummocky tracts. In the field we have investigated the sedimentology and stratigraphy in machine dug sections.

It is possible to manually distinguish at least four different hummocky tracts: I) Ribbed moraine, II) Dead ice moraine, III) An enigmatic landform type with a fish scale pattern, and IV) Hummocky tracts in elongate zones. This abstract will focus on the last type (IV). The four most striking morphological characteristics are: First, there are distinct elongate zones of hummocks with a radial pattern with distinct borders to the surrounding lineated till plains. Second, the hummocky zones in some places show an anastamosing pattern. Third, in analyzing these elongate zones, it is clear that they do not follow regional lows but instead runs over highlands. Fourth, in these zones there are localities with eskers superposed on hummocks. Sedimentological excavations yield a compact sandy silty till. Fabric measurements are not very strong; however, they are sub-parallel to lineations on nearby upland till surfaces.

Taken together, these observations can possibly explain the elongate hummocky zones invoking processes of subglacial meltwater eroding hummocks in the bottom of tunnel valleys. A large amount of subglacial meltwater is controversial and a better understanding of water sources is needed. However, if these features are produced by subglacial meltwater they would alter the view of the deglaciation of the Fennoscandian ice sheet significantly.