



## **Supraglacial till on Pasterze Glacier, Austria: spatial distribution, characteristics and significance on change of height**

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Pasterze glacier is the largest glacier of Austria (c.18km<sup>2</sup>, 47°05'N, 12°44'E). The ablation area is separated from the main accumulation area by an extensive icefall forming a glacier tongue with a spatial extent of c.3.8km<sup>2</sup>. The right part of the c.4.8km long glacier tongue is covered by a pronounced debris mantle (c.1.2km<sup>2</sup>), reducing the amount of ablation of underlying ice by shielding it from insolation and atmospheric heat. The thickness of the supraglacial till was measured at 500 locations aligned at five cross profiles (with 1m- or 5m-spacing) distributed over the entire length of the glacier tongue and positioned by GPS. Mean debris thickness (MDT) of the five profiles has been found to be a direct function of distance from the terminus and at all profiles debris thickness generally increases from the centre of the glacier to the right margin. A comparison of annual height changes on 'clean' and adjacent debris-covered glacier surfaces - measured with two different methods - reveals that close to the glacier terminus the change of height of the debris-covered part (MDT=25cm) is c.50% compared to the adjacent clean ice part. At the central part of the glacier tongue this figure is c.60-70% (MDT=16cm). At the uppermost part below the icefall the differences are only minor (MDT=8cm). Thus, variations in the change of height at selected cross profiles are strongly influenced by - besides vertical/horizontal ice movement - the net ablation and therefore by radiation and the supraglacial debris cover.