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Change of snow cover and its implications on arctic permafrost by using gravimetric satellite data

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The aim of this project is to detect the influence of changing snow cover characteristics on permafrost degradation, with a focus on the active layer, in the Arctic over a ten year period. Therefore, gravimetric satellite data should be applied. To determine the snow component, further data from hydrological models and from other satellites will be used. Permafrost distribution and the development of the active layer thickness are primary forced by air temperatures and snow cover characteristics. Interactions between permafrost and snow cover are complex, because snow thickness and on- and offset of a consistent snow cover play an important role. Due to climate change, permafrost is degrading and the active layer thickness is increasing, the degradation is primary forced by the increasing active layer thickness. Directly from remote sensing data, the active layer is difficult to determine, and snow cover is used as an indicator. By using gravimetric satellite data together with data of the snow cover extent and snow density, large scale assumptions of the changing of snow thickness can be made. Together with data on the thickness of the active layer, dependencies of both parameters can be assessed.