



Subglacial hydrology and the basal thermal regime of the West-Antarctic Ice Sheet – an isotopic perspective and its implication for ice sheet dynamics.

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Subglacial hydrology and the basal thermal regime play a key role in the dynamic of ice sheets. High geothermal fluxes in West-Antarctica allow enhanced basal melting in its interior. Basal water flowing in the subglacial hydrological system towards the ocean lubricates the ice sheet base allowing the fast motion in West-Antarctic ice streams and providing a habitat for life. Changes within the thermal regime at the base of the ice sheet can reduce or increase the amount of basal water in the system and in this way influence the dynamic of the ice sheet and its ice stream. Due to its secluded location beneath the ice very little is known about the subglacial hydrological system and its influence on ice stream dynamics.

Over the past decade several drilling operation have recovered geological and hydrological samples from the base of the West-Antarctic ice sheet. We examined these samples and measured the chemical and isotopic composition of subglacial carbonates and water samples. Our measurements indicate significant reduction in the availability of subglacial water in several of the West-Antarctic ice streams in the past. This may be indicative for widespread changes in the thermal regime of the West-Antarctic ice sheet and a shutdown of more than one West-Antarctic ice streams draining into the Ross Sea sometime in the past.