

**Hydrogeological and hydrogeochemical bedrock conditions under an ice sheet,  
Kangerlussuaq, Central West Greenland**

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The *Greenland Analogue Project* (GAP) aims at increasing the scientific understanding of glaciation and permafrost effects on hydrogeological and hydrogeochemical characteristics of fractured, crystalline bedrock within the context of geological disposal of nuclear waste. A borehole, reaching to almost 650 m vertical depth, was drilled in under the ice sheet margin, penetrating the full depth of permafrost in front of and under the ice sheet. The borehole was equipped with pressure monitoring and water sampling devices.

The present study focuses on hydraulic responses in the bedrock due to changing seasonal conditions on top of the ice sheet, and the chemical composition of the groundwater. Specifically, we investigate the pressure responses in the bedrock due to supra-glacial melt events with linked sub-glacial pressure changes, and confirm hydraulic connections through the supra-glacial/sub-glacial/subsurface system. However, local geologic-structural conditions imply differences in response in different borehole sections. The water chemistry confirms penetration of glacial meltwaters to great depths. Intrusion of oxygenated waters to corresponding depths is, however, not observed.