

The effects of the glaciation for deep geological disposal of spent nuclear fuel in crystalline shield rock settings.

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Deep geological disposal (DGR) of nuclear waste requires a multidisciplinary and iterative approach used to develop an overall understanding of the long term performance of the repository and its surroundings. Features, events and processes that could potentially affect the safety of the repository system are identified and possible releases to the environment are assessed, as well as the consequences of such potential releases.

Given the long time span covered by safety assessments of DGRs for nuclear waste (100,000 years up to one million years), scientific information and knowledge on processes related to cold climate conditions and future glaciations are required. To achieve the required increase of understanding, Greenland Analogue Project (GAP) was initiated. The primary aims of the GAP were to enhance scientific understanding of glacial processes and their influence on both surface and subsurface environments relevant to the performance of deep geological repositories for spent nuclear fuel in crystalline shield rock settings.

The Greenland Ice Sheet (GrIS) was selected by the GAP as a natural analogue for glaciation processes expected to reoccur in Fennoscandia and Canada over DGR safety-relevant time frames.