Geophysical Research Abstracts,
Vol. 11, EGU2009-3589-1, 2009
EGU General Assembly 2009

CRYOLINK - Permafrost and seasonal frost in Southern Norway: understanding and modelling the atmosphere-ground temperature

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Recent years have witnessed a growing interest in Arctic and high-mountain regions. Above the natural tree line Norway is characterised by a modern Arctic environment, and the modern southern boundary for Scandinavian permafrost is located in the mountains of Southern Norway. Permafrost and seasonal frost are considered key components of the cryosphere, and the climate-permafrost relation has acquired added importance with the increasing awareness and concern of rising temperatures. CRYOLINK aims at improving knowledge on past and present ground temperatures, seasonal frost, permafrost distribution and related periglacial processes in Southern Norway and adjoining regions of the North Atlantic region (Greenland and Iceland), by addressing the fundamental problem of heat transfer between the atmosphere and the ground surface. Methodologically, the project develops functional thermal offset models linking air temperatures to ground and permafrost temperatures through seasonal surface transfer functions and subsurface thermal properties based on field observations. The project further develops and apply transient heat transfer models in 1D and 2D to address past and future heat transport into the ground. The project ultimately develops regionally distributed models to address the distributions of surface and ground temperatures in space, and annual thaw and freezing depths. This poster presents the borehole monitoring network established in summer 2008 in Southern Norway, and provides first results.