



## Monitoring Permafrost Conditions & Processes

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### 12A - Monitoring Techniques and Feedback of Snow, Vegetation, and Permafrost

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Snow, vegetation, and permafrost are intricately linked across the cold regions of the globe. Snow protects the ground during the winter and provides insulation for the permafrost, which guards against cold temperatures from penetrating deep into the soils. Vegetation changes, including shrub expansion, are observed, and linked to increases in snow depth, redistribution of the snowpack, and soil moisture changes. However, the dynamic nature of snow and vegetation mean that these interactions could shift with potential for large climate impacts. While the interactions among snow-dominated landscapes and permafrost are abundant, research efforts linking these disparate fields remain sparse.

Part of the challenge is the paucity of accurate distributed snow measurements and model results. Single-point and remote sensing data collection campaigns are limited in their range and/or resolution in space and time. Meanwhile, recent in situ field- and watershed-scale observations using dense sensor deployments have captured multi-scale transformations of permafrost. Such observations create opportunities to test hypotheses and numerical models.

In this session, we invite papers on snow, vegetation, and permafrost interactions—including advancements in remote sensing and monitoring technologies of such interactions—within cold regions across the globe with particular emphasis on the impacts to the hydrologic cycle and climate change effects. We also encourage contributions on novel advances in the field of in situ sensor technology observing the evolution of permafrost systems.

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