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### 1D - Permafrost Climate Services

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Permafrost knowledge and data must be useable and accessible for persons living on permafrost, planning adaptation, or doing research. And yet, few services concerning changing permafrost exist. For comparison, imagine not having weather forecasts, or where atmospheric science would be today without national weather services. Climate-driven permafrost thaw is already observed in polar and high-mountain regions. The benefits of effective adaptation and, conversely, the escalating costs and risks of delayed action are clear from national and international assessments. While policies and standards for adaptation to permafrost thaw are emerging, our ability to deliver the knowledge to underpin adaptation decisions is often inadequate.

The concept of Permafrost Climate Services builds on the WMO Global Framework for Climate Services that emphasizes the importance of user needs and co-development. Climate services are understood as climate information prepared and delivered to meet user needs, and there is growing experience in delivering them. Permafrost Climate Services will have distinct attributes such as the combination of knowledge and data about the atmosphere, the land surface, and the subsurface.

In this session, we invite contributions that envision and demonstrate permafrost climate services from diverse perspectives. For example, about the need for information and its form of delivery from the perspective of Indigenous communities, about turning observations or simulations into user products, about information needs for engineering design, about examples of co-developing prototype services, or about policy related to generating and delivering permafrost knowledge.

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