

Integrating permafrost monitoring into a pan-Arctic observing system

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Permafrost is a critical aspect of the Arctic environment and cryosphere in general, and thus is a natural component of a comprehensive pan-Arctic observing system. The development of such a system should link with the datasets and other scientific products already available through the International Permafrost Association (IPA) and the Global Terrestrial Network for Permafrost (GTN-P). The IPA and GTN-P already operate in collaboration with IASC and SAON, and welcome collaborations with other related networks.

The International Permafrost Association (IPA, permafrost.org) fosters dissemination of knowledge concerning permafrost and promotes cooperation among people and organizations engaged in scientific investigation and engineering work on permafrost. The Global Terrestrial Network for Permafrost (GTN-P, gtnp.org) was established in 1999 by the IPA as part of the Global Terrestrial Observing System (GCOS) branch of the Global Climate Observing System (GCOS). Permafrost temperature and active layer thickness are recognized as essential climate variables for land by GCOS, and these variables are the focus of GTN-P. The GTN-P monitoring network, which has grown out of coordination by the IPA, currently includes approximately 1360 boreholes and 250 active layer monitoring sites. The GTN-P database houses these open-access

ground temperature and active layer thickness data. The majority of the sites are located in the Arctic, but data also comes from other permafrost regions including the Alps, high-elevation parts of Asia, and Antarctica.

The IPA is currently supporting new permafrost map development through its Mapping Action Group. New map products will incorporate the model-based maps being developed by the ESA initiative GlobPermafrost and will be validated by GTN-P data, preexisting permafrost maps, and the local knowledge of permafrost scientists and engineers in their respective field areas. These future permafrost map products would also positively contribute to a pan-Arctic observing system.

Both the IPA and GTN-P strive to provide permafrost information to the scientific community, policy makers, and to the public in general. The IPA and GTN-P advocate for permafrost as a primary component of a pan-Arctic observing system and are willing collaborators in Arctic observation.