

**User Interaction within ESA DUE PERMAFROST: Evaluation of Circumpolar Remote Sensing Products and their usability for models (permafrost and climate modelling)**

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The ESA DUE Permafrost project (2009-2012) developed a suite of remote sensing products indicative for the subsurface phenomenon permafrost: Land Surface Temperature (LST), Surface Soil Moisture (SSM), Surface Frozen and Thawed State (Freeze/Thaw), Terrain, Land Cover, and Surface Water. Snow parameters (Snow Extent and Snow Water Equivalent) are being developed through the DUE GlobSnow project (Global Snow Monitoring for Climate Research, 2008-2011). The final DUE Permafrost remote sensing products cover the years 2007 to 2011 with a circumpolar coverage (north of 50°N). The products are released in early 2012, to be used to analyze the temporal dynamics and map the spatial patterns of permafrost indicators. Further information is available at [www.ipf.tuwien.ac.at/permafrost](http://www.ipf.tuwien.ac.at/permafrost).

Since the beginning, scientific stakeholders and the International Permafrost Association (IPA) were involved in the science plan. Interactive User Workshops took place in 2010 at the Technical University of Vienna, Vienna (AT), and in 2011 at the International Arctic Research Center (IARC), Fairbanks, Alaska (US). The final User Workshop was held between Feb 15-17 2012 at the Alfred-Wegener-Institute for Polar and Marine Research (AWI) in Potsdam. It brought together a multidisciplinary permafrost community working on satellite-derived products, in-situ field validation and modelling. About 60 participants from Austria, Canada, Finland, France, Germany, Italy, Japan, Norway, Poland, Russia, Sweden Switzerland, UK, and USA participated and gave oral and poster presentations.

The involvement of the user communities and the ongoing evaluation of the indicators derived from remote sensing data for high-latitude permafrost regions make the DUE Permafrost products trustworthy for the permafrost and the climate research community. Ground data is provided by user groups and global networks. A major part of the DUE Permafrost core user group is contributing to GTN-P, the Global Terrestrial Network of Permafrost (IPA). Its main programmes, the Circumpolar Active Layer Monitoring (CALM) and the Thermal State of Permafrost (TSP) has been extended during the last International Polar Year (2007-2008) to provide a true circumpolar network. Ground data ranges from active layer- and snow depths, to air-, ground-, and borehole temperature data as well as soil moisture measurements and the description of landform and vegetation.

The adaption of the remote sensing products for the permafrost and climate modelling is experimental. For a few years already, the Geophysical Institute Permafrost Laboratory (GIPL), University of Alaska Fairbanks, US

(<http://www.gi.alaska.edu/research/snowicepermafrost/Permafrost>) has successfully demonstrated the value of using LST derived from remote sensing data for driving its permafrost models. Further experimental testing of the use of DUE Permafrost products for the permafrost-modelling and climate-modelling communities will range from (i) the evaluation of external data of the models, with modifying or providing new external data (e.g. tundra land cover, surface water ratio, soil distribution), to (ii) new drivers for regional models derived from remote sensing data (e.g., LST), to (iii) the evaluation of the output data from the models (e.g. spatial patterns of moisture and temperature).