

1st Newsletter

IPA Task Force on Remote Sensing of Permafrost

Co-Chairs:

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http://www.permafrostwatch.org/news/ipa_taskforce_remotesensing.html

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European Space Agency (ESA) Data User Element (DUE) Permafrost funded

The multi-institutional DUE PERMAFROST project has recently been approved for funding by the European Space Agency (ESA) [Data User Element \(DUE\)](#) program, which is a component of the Earth Observation Envelope Program (EOEP).

For more info contact Annett Bartsch of the Institute of Photogrammetry and Remote Sensing at Vienna University of Technology (permafrost@ipf.tuwien.ac.at) or see: <http://www.ipf.tuwien.ac.at/permafrost>



ASTER Global Digital Elevation Model (G-DEM) released on June 29th

ASTER GDEM is an easy-to-use, highly accurate DEM covering all the land on earth, and available to all users regardless of size or location of their target areas.

- Global DEM for all the land area covered by ASTER
- Enhanced accuracy due to the use of multiple ASTER images over the same area
- User-friendly, allowing selective cropping

For more info see: <http://www.ersdac.or.jp/GDEM/E/1.html>

Data tiles can be searched and downloaded at no cost in NASA's WIST webtool:

<https://wist.echo.nasa.gov/api>

New open access Remote Sensing journal launched

A new open access journal of the remote sensing process, from instrument design and signal processing to the retrieval of geophysical parameters and their application in geosciences was launched. 'Remote Sensing' (ISSN 2072-4292) is published under the leadership of Prof. Dr. Wolfgang Wagner from the Institute of Photogrammetry and Remote Sensing (I.P.F.), Vienna University of Technology (TU Wien), Vienna, Austria. The first two issues of Remote Sensing are available at:

<http://www.mdpi.com/journal/remotesensing>

Remote sensing activities in the Arctic Circumpolar Coastal Observatory Network (ACCO-Net)

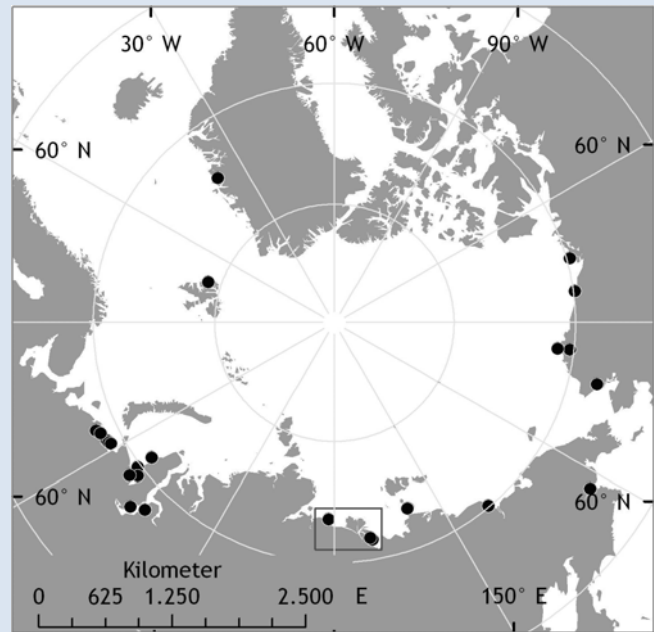
The high latitude coastal zone is the interface of land-ocean exchanges in the Arctic and where most human activity takes place. To detect and quantify trajectories in coastal systems, their components must be monitored. A coordinated monitoring programme incorporating diverse regions and providing site-specific, fine-scale baseline and time-series data will yield maximum value, facilitating local and circum-arctic studies, such as validation of multi-scale biodiversity and coastal community models. To address these issues, an internationally coordinated circum-arctic network of coastal observatories sponsored by the International Permafrost Association was suggested by the Second International Conference on Arctic Research Planning (ICARP II) and established within the IPY 2007-2008 framework as a coordinating project. The observatory sites are locations for multi-disciplinary, multi-resolution studies set within a broader eco- and socio-regional frame of reference and include sensitive areas with varying degrees of human impact.

With the support of a European Space Agency IPY grant, acquisition of remote sensing data for ACCO-Net sites began in 2007. The growing database includes historical imagery (LANDSAT, SPOT, Corona, aerial) and modern high spatial resolution optical data (ALOS PRISM and AVNIR-2, KOMPSAT-2). The spatial resolution of the recent data products is comparable to the mean annual coastline change rate for many sites, so that annual scale monitoring has become possible.

For more information please contact Dr. Paul Overduin, AWI Potsdam: Paul.Overduin@awi.de

Left: Colour-enhanced AVNIR-2 image of ACCO-Net site Bykovsky Peninsula, N-Siberia

Right: Circumarctic map with location of ACCO-Net sites



AGU Fall Meeting 2009

We invite abstract submissions to AGU Fall Meeting sessions relevant to remote sensing of permafrost. Abstract submissions will open end of July, submission deadline is Sep 3. For more information please see: <http://www.agu.org/meetings/fm09>

C04: The Changing Cryosphere and Hydrosphere through Remote Sensing, Geodesy and Modeling (R. Muskett, G. Grosse, S. Marchenko)

The cryosphere and hydrosphere play critical roles in the energy balance and climate of Earth. Satellite remote sensing and geodetic measurements are leading to definition and evaluation of the changes and their uncertainties. Physical processes governing the changes of the coupled cryosphere-hydrosphere are non-stationary; a complication for modeling, forecasting and predicting the pace and direction of future changes from current trends. We encourage presentations on remote sensing and geodesy applied to measurements of changes of ice sheets and shelves, glaciers and snow cover, polar sea ice, land water storage, permafrost and frozen ground, and global and regional sea-level. Synergies of satellite remote sensing and geodesy, with air-land-sea based automated sensing technologies to improve spatial-temporal resolution and modeling for evaluations of the changing cryosphere and hydrosphere are encouraged.

C09: Remote Sensing of the Cryosphere (M. Tedesco, T. Painter)

Remote sensing represents an efficient tool for monitoring and mapping the cryosphere over large areas where, otherwise, it would be difficult if not impossible. This session will bring together recent advances in remote sensing of components of the cryosphere such as frozen soil, snow, sea ice, ice sheets, etc. including results from recent field experiments, development and improvement of models, evaluation/development of techniques for the retrieval of geophysical parameters, data assimilation and data fusion. Contributions regarding remote sensing of cryosphere are kindly invited and strongly encouraged.



Task Force Questionnaire: Changes in Permafrost Detected with Remote Sensing Methods

Permafrost dynamics during periods of global change are increasingly recognized as an important factor in biogeochemical cycling, topographic and hydrological change, and in northern engineering and infrastructure development. The possible rapid changes in permafrost during climate warming or after surface disturbance can be monitored directly with a broad variety of remote sensing techniques. Of highest interest for the permafrost and climate change research community are quantitative analyses of change, matter and energy fluxes, and the physical properties of permafrost.

We request and encourage that the permafrost community submits information on past and ongoing studies that generated data on change in permafrost as observed with remote sensing methods, including ground-based remote sensing techniques (see [Table 1](#) below and attached Excel-file). The main goal is to show a more coherent picture of observed changes in permafrost, get an overview of the remote sensing methods currently used, and explore the focus of interest in our research community. Relevant observations include, but are not limited to, the thermal erosion and abrasion of coasts, lake shores, and stream banks, thermokarst subsidence, thermo-erosion, frost heave and thaw subsidence, sink hole formation, thaw slumping, solifluction, and rock glacier movement.

The information collected will be used for outreach activities of the IPA and the IPA Task Force on Remote Sensing, and likely will get wide attention by researchers outside the permafrost science community and by the media. Data from this questionnaire will be entered in a database and submitted to the IPA Standing Committee on Data, Information, and Communication for future publication on the next Circumpolar Active Layer-Permafrost System (CAPS) – DVD. The dataset will also enter the database of the National Snow and Ice Data Center (NSIDC) in Boulder, Colorado, USA. We eventually envision approaching space and funding agencies action to acquire further high-quality imagery over selected key sites contained in this new database. If successful, imagery will then be distributed to the local PIs to continue change detection studies and to gather highly important information on changing permafrost landscapes.

We encourage submitting complete datasets of finished and published research. However, if you would like to highlight ongoing research with unpublished data that cannot be released at this point, please feel free to omit relevant fields and complete them at a later point. All entered information should be short and concise.

Any comments and suggestions are highly welcome.

Please contact Guido Grosse (UAF): ffgg1@uaf.edu

Task Force Questionnaire: Changes in Permafrost Detected with Remote Sensing Methods**Table 1:** Database fields and descriptions

Database field	Description	Examples
Site name	Unique identifier (name or ID#) of study site	
Region	Location of the study site	Alaska North Slope, North Yakutia, N.W.T.
Country	Location of the study site	USA, Russia, Canada, China
Lat	Geographic latitude in decimal degrees	66.5456; optional you can submit a Google Earth kmz-file
Long	Geographic longitude in decimal degrees	-164.5365; optional you can submit a Google Earth kmz-file
Observed parameter	Which parameter is observed?	Land elevation; coastline position; retrogressive thaw slump volume; thermokarst lake area
Observed process	What is the underlying process studied?	Surface subsidence; coastal erosion; retrogressive thaw slumping; thermokarst lake expansion; sink hole formation
Observation period	For which period were observations made?	1950-2009
Remote sensing data used	What type of remote sensing data was used?	Landsat-1 MSS and Landsat-7 ETM+; b/w aerial imagery and airborne LIDAR
Observation methods	What methods were used to analyze the remote sensing data?	Supervised image classification; DEM subtraction; manual feature mapping
Temporal resolution	What is the temporal resolution of the data used?	10 years; yearly; bi-annual; irregularly ca. 10 years
Spatial resolution	What is the spatial resolution of the data used?	1 m; variable 1-15 m
Observed rate of change	What is the observed rate of change over the monitoring period?	Linear: m/yr; Area: m ² /yr; Volume: m ³ /yr; Percentage: 10 % increase
References	References for more detailed information or that should be cited when referring to the data	
Comments	Free comments	Study is ongoing; study finished in 2007
Database contributor	Contributor who submitted the data to this database	Your name