Summary report from 3rd user workshop

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Consortium:

ZAMG Zentralanstalt für Meteorologie und Geodynamik

UiO : University of Oslo

AWI Alfred Wegener Institut

GAMMA REMOTE SENSING

H2O Geomatics

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Table of Contents

1. Scope of the workshop

The purpose of the third user workshop of the ESA DUE Globpermafrost initiative was to address the needs of the Asian user community and to discuss joint activities with the IPA action group on permafrost mapping. The prototypes of the thematic product as well as the current version of the permafrost information system were presented.

The workshop was scheduled concurrent to the ACOP in order to enable as many users as possible to attend. During the full day meeting the permafrost extent product was discussed in detail in the morning. General issues of permafrost mapping were addressed in the afternoon. The final part of the workshop covered the latest achievements in rock glacier monitoring in Asia and the European Alps.

2. Discussion synthesis

2.1 Permafrost information system

It has been specifically discussed whether maps from national initiatives can be included into the information system. It was pointed out by the GlobPermafrost team that it is important that datasets are publically available, e.g. via Pangaea with good data description. IPA supports the suggestion of a database of regional maps in PerSys. The IPA action group could support the work. It would be however challenging to fit it into the current framwork and it would take a lot of work to implement it. Concern has been raised regarding the long term guarantee of the AWI Information system beyond the duration of GlobPermafrost.

2.2 Borehole data for calibration and validation

The representativity of borehole measurements in the permafrost transition zones has been discussed in detail. It has been noted that these boreholes are usually in permafrost, surrounded by permafrost free grounds. The pre-processing of the borehole data for comparison with model results is a general issue. Each borehole has different spacing between sensors. So far MAGT from the old TSP program has been used. They have been calculated inconsistently across the borehole locations by individuals who contribute to GTN-P. There has been general agreement that round robin exercises of model attempts cannot be made since there is not suitable benchmark dataset. Maps can be compared among each other, combinations may introduce artefacts. Problems with current state of GTN-P data: not all coordinates correct, deviations of many kilometers, sometimes the proposed coordinate is in river, the ocean etc. What can be used for modelling depends on standardized protocols.

2.3 Updates for southern hemisphere

The update of permafrost information beyond the northern hemisphere is needed. The model results could be used for the southern hemisphere to find new ground data and borehole locations. There are a number of studies ongoing in the dry valleys in Antarctica. It has been pointed out that the Western Peninsula (current GlobPermafrost site) is different from the dry valleys. They are much wetter than Eastern Antarctic Peninsula and McMurdo dry valleys.

2.4 General permafrost mapping issues

Additional features of permafrost maps have been discussed. It has been noted that ground ice is very important for permafrost modelling, there exist no updated detailed dataset on ground ice. It was suggested to also have maps on monitoring infrastructure.

The input of the new IPA permafrost map shall be GTN-P data as well as permafrost modelling. The community is used to permafrost zonation but this is not satisfactory for many applications. Before the permafrost map is accepted it has to be reviewed by regional experts and IPA action group. It should be updated so that it is maybe a hybrid. Traditional permafrost zones could be changed. There has been general agreement in the audience that for permafrost one definition is not as easy: e.g. continuous is homogeneously continuous - but discontinuous not satisfying because 0-100% permafrost within such a grid cell. The current permafrost map is 30 years out of date. The IPA permafrost map was produced from MAAT, a new Map should be modelled and use expert knowledge.

There are different traditions and approaches around the world for permafrost mapping. The IPA action group therefore represents different Arctic and profession communities. It is suggested that the next GlobPermafrost meeting should be organized together with representatives of the IPA action group. IPA action group can contribute to the optimization of the GlobPermafrost map with feedback. A publication on the evaluation of the map is suggested which includes contributions from the community. The publication schedule is however tight within GlobPermafrost.

A climatic baseline 2010-2015 has been proposed for the ESA GlobPermafrost map. It should not be named permafrost map – but 'potential permafrost map'. A permafrost extent change product should not be made, but instead a change product of the forcing for permafrost: temperature, snow etc. It has been noted that the MAGT product shall not be confused with permafrost map. They are understood differently. There has been further agreement in the audience that the permafrost occurrence probability is much more important for IPA mapping.

For more accuracy one needs to use transient modelling. To do this one needs the ice content and stratigraphy. This might be collected from borehole data, but actually more geophysical measurements would be needed.

Scale issues are a general concern. There are no standard methods to collect ground data. There are ongoing current regional initiatives for high resolution modelling and geomorphological mapping. GTN-P data are too sparse for assessment of scale issues. Maps should be reviewed by the respective countries, via GTN-P and the IPA mapping group.

2.5 Additional use of remotely sensed data

It is suggested to use information from remote sensing to get information on the surroundings of the GTN-P boreholes, e.g. use satellite-derived LST and land cover. The impact of the presence of surface water can be assessed using remotely sensed data (e.g. taliks from grounded lake ice). E.g. in the Mackenzie delta models are expected to be wrong since they don't consider the effect of water bodies. It would be beneficial to have information on the trend in time of ice grounding.

2.6 Rock glaciers

There are several national initiatives ongoing concerning rock glaciers, their presence and activity state is assessed. In addition rock glacier deformation monitoring is performed in Antarctica (Hurd P., Liv Island, Antarctica). There are rock glaciers in the dry valleys, but not studied.

It is suggested that the WebGIS should also contain information of processes type apart from movement rate. It is however not straight forward to assign process types. It is noted that moving areas do not necessarily represent the entire landform. The differentiation between rock glaciers and moraines is a general issue.

3. List of attendees

Jambaljav	Institute of Geography and Geoecology, Mongolia
Reynald Delaloye	University of Fribourg, Switzerland
Sarah Strand	The University Centre in Svalbard / IPA
Goncalo Vieira	CEG/IGOT - Universidade de Lisboa
Lin Liu	The Chinese University of Hong Kong
Elchin Jafarov	Los Alamos National Laboratory
Tazio Strozzi	Gamma Remote Sensing
Lingcao HUANG	Chinese University of Hong Kong
Avirmed Dashtseren	Institute of Geography-Geoecology, MAS, Mongolia.
Florence Magnin	University of Oslo
Hanne H. Christiansen	The University Centre in Svalbard, Geology Department
Anarmaa	National University of Mongolia
Toni Lewkowicz	University of Ottawa
Annett Bartsch	ZAMG
Antonie Haas	AWI
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Mamoru Ishikawa	Uni Hokkaido
Justin Czekirda	Uni Oslo
Matej Blatnik	Karst research Institute, Slovenia
Vetle Aune	Uni Oslo
Kjetil Ovesen	Uni Oslo
Yuri Dvornikov	Earth Cryosphere Institute, RAS
Bernd Etzelmüller	Uni Oslo
Kazuyuki Saito	JAMSTEC