



National Correspondents Workshop on GTN-P Implementation and Data Policy

May, 6-8, 2013

World Meteorological Organization Headquarters
Geneva, Switzerland

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The International Permafrost Association and the International Arctic Science Committee organized a workshop in May 2013 to continue the development of a long-term, international network of permafrost observatories that will provide data to document the state and changes in frozen ground temperatures and active layer thickness.

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INTERNATIONAL SECRETARIAT

Dr. Inga May
Alfred Wegener Institute for Polar and Marine Research
Telegrafenberg A43
14473 Potsdam, Germany
Tel: +49-331-288-2216
Fax: +49-331-288-2122
contact@ipa-permafrost.org
www.ipa-permafrost.org

Output summary

The main objective of the Geneva National Correspondents Workshop was the training of the National Correspondents (NCs) who were recently appointed by the countries involved in GTN-P. This workshop helped them to establish a strong national participation in this program and to actively contribute to achievement of the GTN-P goals and obligations.

In total there were 50 registered attendees including 19 NCs representing Austria, Canada, China, Denmark/Greenland, France, Germany, Japan, Italy, South Korea, Kyrgyz Republic, Norway, Poland, Portugal, Russia, Sweden, Switzerland, USA, Antarctica, Svalbard.

The workshop started with **presentations** about (i) the scientific management and the framework with international organizations where GTN-P is linked to, (ii) the history of the network, and (iii) the scientific linkages to modelling and remote sensing groups using permafrost data.

The second main part of the workshop was the presentation of the **regional and national reports** from the NCs. This was followed by a **Hands-on training seminar** to introduce the usage of the GTN-P database for up- and downloading data. **Data publishing** issues have been explained to demonstrate how scientific and individual ownership of the data is ensured.

Daily discussion slots focused on how **to partner with other international organizations** and platforms of climate data collection, and how **to provide products to the public**. It was discussed the **role of NCs and the challenges** and opportunities they have. Finally, practical issues such as **deadline for data submission** and **formats** were considered.

Discussion part summary

Global coordination of climate components with existing organizations

- **GCOS and GTN-P**

Issues discussed · Question about the awareness of GCOS with GTN-P scientists; e.g national data policy. Answer is that different countries have different data policies and it is an ongoing issue for most nations. Example from CH: after two years data go public; a graphical form is allowed, a digital is not. It was hard to get funds in the beginning, but once first results were published funds were more easily collected with GCOS participation installed. · IASC is pushing to open access, some international organizations enforce to open the data, but they provide little financing with individual scientists. · What is the role of the NCs in that sense? Taking care about technical quality, being national manager of data (coast, land, sea), training, educating, communicating is part of GCOS to encourage national managers.

- **WCRP and GTN-P**

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Issues discussed · Input variables for modelling are needed, this is similar to CliC; i.e. temperature (and carbon stocks as other permafrost property, here; different permafrost types, different release of carbon).

- **Global Cryosphere Watch (GCW) and GTN-P**

Issues discussed · Observation, monitoring, assessment, product development, and critical “watch” (analysis and evaluation) are essential criteria to meet. It is proposed to also use satellite products, anomaly trackers, super sites for evaluating and highlighting results.

- **History of GTN-P, tasks, and challenges**

Issues discussed · From sectorial permafrost research in the beginning there is now an integrated approach; for example today localities are increasingly measured for both snow and permafrost. · Do active layer depth (ALD) and thermal state of permafrost (TSP) fit into ECV criteria? TSP is in agreement but be careful with subsidence; heaving has to be included to understand ALD. Process understanding must go hand in hand.

- **GTN-G and what to learn for GTN-P**

Issues discussed · A lesson learned is that the program is operated mainly in a scientific environment, there is limited funding for long-term monitoring, there is open data access policy, and the scientific network goes beyond data exchange. · NCs are key for communication (you cannot communicate with thousands of scientists). · Useful to have a printed version of data, it forces people to be more accurate with them. · Discrepancy remains that scientists demand new technology, but keeping the format with traditional records is important.

- **How to focus when partner with other organisations**

Issues discussed · Example from EC-PORS; GTN-P has become an attractive partner, because strong management structure is visible, and this has been the case, because for the first time definite people were working for GTN-P. · Should a country take over leadership like CH did for glaciers? It did not work in the past. Question is addressed to IPA EC, if this is possible. CH had a history for more than 100 years of glacier monitoring. It was “easy” to follow up in terms of scientific justification. Generally countries do not like long-term commitments. · How about SAON? SAON still new platform, GTN-P was partner from the beginning. Advice: Be prepared for the dialogue and metadata and data overviews are welcome. · INTERACT is a perfect platform to materialize selection of key sites / super sites. Be prepared to run the network sometimes without funding. · What about non-European countries; e.g. China? China’s strategy is with the government; GCOS is connected to UN and this might be the way for interaction. · Management needs to be professionalized. The advice is to define IT needs for projects, to define standard of measurements. GCOS, GTN-P and NCs should do this. · Do we want a book? It should be citable. The layout should be guided by the question; who is your final customer? Customer may help to choose how the

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product should look like. Up to now everything was for permafrost scientists with some exceptions; i.e. the involvement of modellers. There are products available already together with modellers. Climate community needs high spatial data of near surface temperature data. One is science: a published book (every five years or so) as a stable database. One is outbound: glossy publication, little text plus many figures, to convince policy makers, funding agencies. · Be aware; many countries want to be a member of UN approved international program. · US, Russia, China need to decide on sustained effort, otherwise there is no global coverage of GTN-P. · European situation with funding opportunities and public and scientific perception is unusual. · Northern residents have limited understanding of where they live on, but there is an obligation to provide information to them. - Public safety issues (hazards), infrastructure, transportation, mining industry; there is a need to inform about permafrost dynamics. Many countries have interest in accessing the Arctic; finance, industry, government, and Worldbank have interest in GTN-P data. · Is a question possible like; imagine a permafrost temperature increase of 1°C / 10 years; how much does it cost? Recognition on a national and international political level is sometimes small, needs to be increased. Glossy version may do in that sense. However, AMAP recognizes permafrost 25 times in its reports; there is a perception, which can be built on. · From a communicator perspective, production of figures is vital e.g. in PAGE21; 9% of the budget goes into it, policy makers and media people are addressed with this. · Sites with industrial and infrastructure meaning should be used to present to governments (local, regional, national). · Be aware of the variety of landscapes; the topography has to be addressed, some people in the public and also with the modellers take soil as a little variable component. · General advice; start with making something little, and then expand it to something bigger. · GTN-P reports are to reach out to media and decision makers. It is proposed to release at ICOPs and RCOPs. At the next conference a report is probably not yet available, maybe a state-of-the-art report can do. · Reservation: the community is still speaking to itself; adding to structure that industry and climate research is addressed.

Coordination with climate modellers

Issues discussed · Transects are needed; e.g. N-S in Canada and in Russia. It is better to have few data in uniform format than widespread but non-uniform data. · Generally, representing spatial heterogeneities of earth surface topography is challenging. It is suggested to establish nests of thermistor strings to match cell size in climate models; e.g. nested sites in boreal forest, tundra, etc. Some have done that already with meteo stations. · CliC can improve communication with modellers to help them how to ask the permafrost scientists.

Implementation of GTN-P: national challenges and opportunities

Issues discussed · The combined presentation of NCs - as is available now - can serve as a superb first product in its own right. · NC needs a “letter of support” from IPA for raising funds. · The costs per site and maintaining the sites should be demonstrated to funding agencies. · Importance of meetings and deadlines is stressed. New candidates can be invited. · What about including private companies for raising funds? This has been successful in

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Austria. · A Russian data portal is needed; passing data to international organizations is forbidden; Russian scientists therefore need help for exchange between national and international organizations. Mirrors of data portals are feasible, possibly this is true also for China. · Note the difficulty to manage e.g. Greenland, because different nations are active; who is in charge? Individual researchers are in charge for managing a site. They represent their nation, independent of study area. Still, NC wants to be aware of other nations' activity in his/her own country. · What about remote sensing (RS)? People do RS anywhere without asking the countries they study. This is an open problem. · What about other countries incl. non-IPA countries? Need to approach any country where there might be data, otherwise they do not know about GTN-P. For example five prospective countries were not at the meeting (Argentina, Finland, Mongolia, Netherlands, New Zealand, Spain) but should be approached, because they have distinct permafrost research. · What about a multinational approach for specific sites? This needs round table discussions. E.g. ANTPAS was about realizing gaps, informing people, making aware of research plans. A pragmatic approach is suggested, the communication is important, but also keeping the laws. There is no responsibility of NC to advise on project planning. Other example; Italy has bi-lateral agreement with NZ and UK in Antarctica. Now South Korea is arriving. Maybe GTN-P should give a formal way, how to arrange cooperation. · Alignment to WMO is envisaged; the NC should be prepared for that. · NCs were crucial to GTN-G, they channelize the information, make PR for international standards and platforms. · Data catching and searching from yet unknown sources is also important, not only managing of available data.

GTN-P data management and online interface

Issues discussed · Many NCs have own databases; how to connect with existing databases? Technically this is possible, but labour intensive (manpower needed) for maintaining and updating regularly. · A history of metadata change is demanded in the database. · NC should check quality and completeness of metadata. · No flags are to put on the map of other nations, when having measurements there.

GTN-P data reporting and analysis

Issues discussed · Is there an "indicator of change" possible; e.g. temperature maps? This has been published in Russia incl. trends for the last 30 years. · Suggestion is made to have selection of super sites for offering a "permafrost index". · Temperature at ZAA (zero annual amplitude) is an important input variable; otherwise the deepest sensor should be used. · What about defining the "uncertainty" in the measurements; normally this is ignored. · Figures need to show wealth of data, the vertical and horizontal variation. · The progression towards 0°C can be an index, expressed as % value of increase (decrease). · What about representation of ALD? This is a need from modellers, but not yet provided, because maps are extrapolations, they are not purely based on physical measurements. The recommendation is to measure first, and then to show results; models are another step added later. · Air temperature, GST (ground surface temperature), near surface permafrost temperature has been used in recent paper on Carbon in permafrost; those variables show how modellers use permafrost data. · It is suggested to publish a report in a four-year cycle

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when ICOP takes place. This may do to attract public and media, because headlines may not be the case every year. · What about seasonal freezing sites? This is difficult to manage, since possibly frost is absent for many years. · What about existing databases of other countries? Partly they have more variables than in GTN-P. Not to repeat data input for database manager, but the NC needs to have a clear agenda to take home. · Chinese and Russians need to be represented in the system, because of WMO and CliC connection to attain global coverage. · Generally, think long-term when setting up the data system. · The suggestion is made to test the database and the uploading portal using data of 2012. The deadline for NCs is October 2013. Using subsets of data is sufficient at first. Metadata should be possible to re-enter to the system from other databases. Copy+Paste should be possible. · Emphasis is made that the available data is inconsistent, thus it is unique chance to clean and clear the data with the new database. · A template for CALM data needs to be developed including input forms for grids, transects. By the end of the year 2013 CALM data are readily available to the GTN-P database. · What about the old GTN-P web site? The domain and the web site have been saved under the roof of the IPA. Still some technical issues need to be solved. · What about the regular deadline for data uploading? Might be different for northern and southern hemisphere campaigns. As a user a full year (best with overlap) is needed to extract yearly mean temperature. · Public looks at recent change, so be aware to upload in time. · Comment on that: GTN-P provides long-term observations and averaging. You can never avoid that people will misuse your data. If the interest is in science or in short timescales, people will not use GTN-P data but will go through GTN-P to address the individual researchers. It is stressed that most recent data can be subject to revision and the preliminary state should be outlined in any fast reporting of the data. · Minimum input of the data is a 1-year time series but can be more. A next realistic aim can be to extend the IPY snapshot up to now. · How about data processing? This is not yet discussed but a quality issue, and was a big effort for e.g. PERMOS. · Big countries can have more than one NC. · NC to collect standardized data, expert group can define the format, NC informs individuals in the country. The role of NC is to collect simple xls-files.

“To do” for the NC in the upcoming months?

1. Input meta data first (next two months)
2. Make a selection of flagship sites where the data come from
3. Input data from 2012 until October 2013; Level 1 at least: i.e. the variable ZAA (= zero annual amplitude), the depth, and the date, the averaging period
4. Discuss partnership with other organisations for the bulletin publication (IPA, UNEP) to broaden the audience
5. Consolidate field choices in the database
6. DOI structure to be circulated
7. Provide basic text for GTN-P website
8. Plan GTN-P workshop in 2014 (Portugal)
9. Plan GTN-P workshop in 2015 (China)
10. Define open / restricted data policy
11. Test of database in May-June 2013; Chair: P. Pogliotti, others: W. Cable, J. Nötzli, R. Delaloye, G. Vieira, M. Johannsson, P. Schoeneich
12. Deadline: data from 2013 to be submitted until end of March 2014 for the report

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Future development of GTN-P

Issues discussed · Global ambitions with good governance, management, networking, observing, reporting and expansion are acknowledged. But focus on relatively simple way to do is demanded. · Funding issue is discussed. GTN-P does (and will) not have funds and will need it from elsewhere. · A small team is needed to professionalize, consider a fancy name for it including a “Director” to have impact with the politicians and governments. IPA has the legitimation for establishing such a team. · End of March 2014 is deadline for 2013 data; then first reporting. Future Project Manager (to be named in fall 2013 in the frame of the PAGE21 project) is in charge for this. Until the secretariat is established V. Romanovsky is in charge. · It is emphasized that first the database becomes operational, and then there is waiting for data entry, then the NC network is to be established and is to become functional, and then any future steps will be taken. · The GTN-P EC is asked to propose a person for the future project management. · A “Partner Letter” by the GTN-P EC in the frame of GCOS should help the NCs to promote GTN-P in their countries. · When going international an appropriate wording for non-scientists is recommended; e.g. max. thaw depth (instead of active layer). Next to “polar” the GTN-P naming has also to include “low latitude and high altitude” when addressing global organizations. A good name + mission + structure is needed from the beginning.

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Program

The program of the workshop is provided below.

Monday, 6 May 2013 (WMO Headquarters, Room Salle B)

- 1200 - 1300 Registration
1300 - 1315 Welcome from a WMO Official
1315 - 1330 Opening: Welcomes from the organizers, introductions, and objectives of the meeting
1330 - 1400 **Carolin Richter**, Director, GCOS Secretariat, *Global Climate Observing System (GCOS) and GTN-P as a Part of GCOS*
1400 - 1430 **Vladimir Ryabinin**, Joint Planning Staff for the World Climate Research Programme, *WCRP and CliC: Hot Science and Cold Matters*
1430 - 1500 **Barry Goodison**, Observing and Information Systems Department, WMO, *Global Cryosphere Watch and GTN-P*
1500 - 1530 Coffee Break
1530 - 1550 **Wilfried Haerberli**, Professor emeritus at the Geography Department, University of Zurich, Switzerland, *Origin and Evolution of GTN-P - Reflections on Roots, Tasks and Challenges*
1550 - 1620 **Michael Zemp**, Director WGMS, University of Zurich, Switzerland, *Opportunities and Limitations of a Scientific Collaboration Network - Lessons Learned from the GTN-Glaciers*
1620 - 1720 **Discussion: "Involvement of GTN-P with various international organizations"**
Moderator: **Hugues Lantuit**, Alfred Wegener Institute, Potsdam, Germany
1720 - 1900 Reception

Tuesday, 7 May 2013 (WMO Headquarters, Room Salle B)

- 0900 - 0930 **Vladimir Romanovsky**, Chair of the GTN-P Executive Committee, *Implementation of GTN-P and Data Policy. The Role of National Correspondents*
0930 - 1000 **Gerhard Krinner**, National Center for Scientific Research, France;
WMO/WCRP/CliC, *Climate Modeling Needs in GTN-P Permafrost Data and How Modelers Can Help in GTN-P Planning*
1000 - 1010 **Michel Allard**, Université Laval, Canada, *Arctic Development and Adaptation on Permafrost in Transition: field protocols and data integration*

1010 - 1204 Regional and national reports from National Correspondents - All – 3 min each
(see schedule below)

- 1030 - 1100 Coffee Break
1204 - 1300 **Discussion: "Implementation of GTN-P: National challenges and opportunities"**
Moderator: **Hanne Christiansen**, IPA, The University Centre in Svalbard, Norway
1300 - 1400 Lunch
1400 - 1510 **Kirsten Elger**, Alfred Wegener Institute, Potsdam, Germany, and **Jean-Pierre Lanckman**, The Arctic Portal, Akureyri, Iceland, *Introduction to the GTN-P Data Management System and its Online Interface*
1510 - 1530 Break
1530 - 1630 **Hands-on Training Seminar: How to use the GTN-P database for uploading and downloading data and other information**
1630 - 1650 Coffee Break

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- 1650 - 1720 (Continue) **Hands-on Training Seminar: How to use the GTN-P database for uploading and downloading data and other information**
- 1720 - 1750 **Philippe Schoeneich**, Université Joseph Fourier, Grenoble, France, *Temperature Data Representation and Analysis: What Do We Wish to Do and to Show With the Data?*
- 1750 - 1830 **Discussion:** “Data reporting and analysis. Regional Data Centers (China, Nordic Countries, Russia, USA), Moderator: **Vladimir Romanovsky**, University of Alaska Fairbanks, USA

Wednesday, 8 May 2013 (WMO Headquarters, Room Salle B)

- 0900 - 0920 **Vladimir Romanovsky**, UAF: *Questions to be discussed*
- 0920 - 1000 **Hanne Christiansen** and **Hugues Lantuit**, International Permafrost Association, *Future Development of GTN-P, the Vision*
- 1000 - 1030 **Nikolai Shiklomanov**, George Washington University, USA, *Active Layer Thickness Data Representation and Analysis*
- 1030 - 1100 **Annett Bartsch**, Ludwig-Maximilians-University, Munich, Germany, *Complementing Field Site Records with Time Series from Satellite Data*
- 1100 - 1130 Coffee Break
- 1130 - 1300 **General discussion** and future meetings: “Role of remote sensing and modeling in GTN-P activities: Challenges and Opportunities. Next steps in GTN-P development”, Moderator: **Vladimir Romanovsky**, University of Alaska Fairbanks, USA
- 1300 Adjourn

1010 - 1204 National reports from National Correspondents - All – about 3 min each

- 1010 – 1013 Austria, **Ingo Hartmeyer**
- 1013 – 1018 Canada, **Toni Lewkowicz**
- 1018 – 1023 China, **Jin Huijun**
- 1023 – 1027 China, **Zhao Lin**
- 1027 – 1030 Denmark, **Thomas Ingeman Nielson**
- 1030 – 1100 Coffee Break
- 1100 – 1103 France, **Philippe Schoeneich** or **Xavier Bodin**
- 1103 – 1106 Germany, **Michael Krautblatter**
- 1106 – 1109 Japan, **Mamoru Ishikawa**
- 1109 – 1112 Italy, **Mauro Guglielmin**
- 1112 – 1115 Korea, **Sang Jong Park**
- 1115 – 1118 Kyrgyzstan, **Ryskul Usubaliev**
- 1118 – 1121 Mongolia, for Jamabaljav Yamkhin: **Mamoru Ishikawa**
- 1121 – 1124 Norway, **Ketil Isaksen**
- 1124 – 1127 Poland, **Grzegorz Rachlewicz**
- 1127 – 1130 Portugal, **Goncalo Vieira**
- 1130 – 1140 Russia, **Dmitri Drozdov** and **Dmitri Sergeev**
- 1140 – 1143 Sweden, **Margareta Johansson**
- 1143 – 1149 Switzerland, **Renald Delaloye**
- 1149 – 1154 USA, **William Cable** and **Frank Urban**
- 1154 – 1159 Antarctica, **Goncalo Vieira**
- 1159 – 1204 Svalbard, **Hanne Christiansen**

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Permafrost is identified as an Essential Climate Variable (ECV) under the Global Climate Observing System (GCOS) and its associated organizations, and is monitored under its Global Terrestrial Network for Permafrost (GTN-P). It currently builds on two observational components: active layer (CALM) and thermal state of permafrost (TSP). The overall goal of the network is to provide key data to characterize the current state of permafrost and support regional and global assessment of changes in permafrost in polar and high-mountain regions. This requires an organized international activity to ensure appropriate site selection, standardized data collection and compilation, synthesis, analysis and reporting. GTN-P has been coordinated by the International Permafrost Association (IPA) since its establishment and is currently being consolidated by the permafrost communities. The current network includes more than 860 boreholes in both hemispheres with more than 25 participating countries. The vast majority of sites are equipped for long-term permafrost temperature observations. A borehole inventory and mean annual ground temperatures during the IPY for 600 boreholes from all permafrost areas, including locations outside the polar areas, is available online in ISO-compliant format at the National Snow and Ice Data Center (NSIDC). At present, the network of active layer thickness and shallow temperature observatories includes over 200 active-layer monitoring sites in both hemispheres. Most of these sites are re-visited on an annual basis.

The main goal of the Geneva National Correspondents Workshop on GTN-P Implementation and Data Policy is to continue the development of a long-term, international network of permafrost observatories that will provide data to document the state and changes in ground temperatures and active layer thickness. Key data will be therefore provided for testing models and scenarios of cryospheric changes and resulting impacts, providing answers to socio-economical issues directly relevant to the populations living in permafrost areas and beyond. This will generate necessary information for land management decisions including those related to development of resources and of strategies to adapt to climate change.

Although the responses of permafrost to climate changes are apparently regionally systematic over time, these responses have specific features for the different regions in the permafrost zone. This diversity in responses is driven by the differences in climate and in surface conditions (snow, vegetation, topography), as well as in subsurface material and ground ice content, geological structure, geomorphic dynamics and history of the surface disturbances. In order to understand the state and changes in the permafrost areas on Earth an effective international global monitoring strategy is required. It will provide field observations essential for the comprehensive detection of the terrestrial climate change signal, for the assessment of its lag and attenuation, and provide indications of the spatial variability of change across the high latitudes and mountain of both hemispheres. This information is critical not only for the improvement of predictive models and the reliability of impact assessments including that of the Intergovernmental Panel on Climate Change (IPCC), but also to further understand the sensitivity of permafrost conditions and processes to climate variability and change.

The main objective of the Geneva National Correspondents Workshop is the training of the National Correspondents who were recently appointed by the countries involved in GTN-P. This Workshop will help them to establish a strong national participation in this program and to actively contribute to achievement of the goals and the obligations of GTN-P.

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List of Participants

Last Name	First Name	Email	Organization	City	Country
Allard	Michel	Michel.Allard@cen.ulaval.ca	Centre d'études nordiques	Québec	Canada (Quebec)
Bartsch	Annett	annett.bartsch@tuwien.ac.at	LMU Munich	Munich	Germany
Bodin	Xavier	xavier.bodin@univ-savoie.fr	Laboratoire EDYTEM, CNRS / Université de Savoie	Le Bourget-du-Lac	France
Cable	William	wlcable@alaska.edu	University of Alaska Fairbanks, GI	Fairbanks	United States
Christiansen	Hanne H.	hanne.christiansen@unis.no	The University Centre in Svalbard, UNIS	Longyearbyen	Norway (Svalbard)
Delaloye	Reynald	reynald.delaloye@unifr.ch	University of Fribourg	Fribourg	Switzerland
Drozdo	Dmitry	ds_drozdo@mail.ru	Earth Cryosphere Institute SB RAS	Tyumen	Russian Federation
Elger	Kirsten	kirsten.elger@awi.de	Alfred-Wegener-Institute	Potsdam	Germany
Goodison	Barry	barrygo@rogers.com	WMO	Geneva	Switzerland
Guglielmin	Mauro	mauro.guglielmin@uninsubria.it	Insubria University	Varese	Italy
Haeberli	Wilfried	wilfried.haeberli@geo.uzh.ch	Geography Department, University of Zurich	Zurich	Switzerland
Hartmeyer	Ingo	ingo.hartmeyer@sbg.ac.at	alps - Center for Climate Change Adaptation	Innsbruck	Austria
Hubberten	Hans-Wolfgang	Hans-Wolfgang.Hubberten@awi.de	Alfred-Wegener-Institute	Potsdam	Germany
Ingeman-Nielsen	Thomas	tin@byg.dtu.dk	Technical University of Denmark	Kgs. Lyngby	Denmark (Greenland)
Isaksen	Ketil	ketil.isaksen@met.no	Norwegian Meteorological Institute	Oslo	Norway
Ishikawa	Mamoru	mishi@ees.hokudai.ac.jp	Hokkaido University	Sapporo	Japan
Jiang	Guanli	atos@lzb.ac.cn	Cold and Arid Regions Environmental and Engineering Research Institute	Lanzhou	China
Jin	Huijun	hijin@lzb.ac.cn	Cold and Arid Regions Environmental and Engineering Research Institute	Lanzhou	China
Johannsson	Halldor	halldor@arcticportal.org	Arctic Portal	Akureyri	Iceland
Johansson	Margareta	margareta.johansson@nateko.lu.se	Lund University / Royal Swedish Academy of Sciences	Lund	Sweden
Konstantinov	Pavel	konst109y@yandex.ru	Permafrost Institute SB RAS	Yakutsk	Russian Federation
Krautblatter	Michael	m.krautblatter@tum.de	LMU Munich	Munich	Germany
Krinner	Gerhard	krinner@lge.observatoire.fr	LGGE/CNRS	Grenoble	France
Lanckman	Jean-Pierre	jean@arcticportal.org	Arctic Portal	Akureyri	Iceland
Lantuit	Hugues	Hugues.Lantuit@awi.de	Alfred-Wegener-Institute	Potsdam	Germany
Larsen	Jan Rene	jan.rene.larsen@amap.no	AMAP	Oslo	Norway
Lewkowicz	Antoni	alewkowi@uottawa.ca	University of Ottawa	Ottawa	Canada
Malkova	Galina	galina_malk@mail.ru	Earth Cryosphere Institute SB RAS	Moscow	Russian Federation
Noetzi	Jeannette	jeannette.noetzi@geo.uzh.ch	PERMOS	Zurich	Switzerland
Park	Sang-Jong	sangjong@kopri.re.kr	Korea Polar Research Institute	Incheon	South Korea
Pogliotti	Paolo	paolo.pogliotti@gmail.com	ARPA Valle d'Aosta	Saint-Christophe	Italy
Rachlewicz	Grzegorz	grzera@amu.edu.pl	Institute of Geoeology and Geoinformation, Adam Mickiewicz University	Poznan	Poland
Richter	Carolin	CRichter@wmo.int	GCOS Secretariat	Geneva	Switzerland
Romanovsky	Vladimir	veromanovsky@alaska.edu	University of Alaska Fairbanks	Fairbanks	USA
Rosati	Antonia	trosati@nsidc.org	National Snow and Ice Data Center	Boulder	USA
Ryabinin	Vladimir	vryabinin@wmo.int	WCRP	Geneva	Switzerland
Schaefer	Kevin	kevin.schaefer@nsidc.org	National Snow and Ice Data Center	Boulder	USA
Schoeneich	Philippe	Philippe.Schoeneich@ujf-grenoble.fr	Institut de Géographie Alpine	Grenoble	France
Schrott	Lothar	lothar.schrott@sbg.ac.at	Department of Geography and Geology, University of Salzburg	Salzburg	Austria
Schwamborn	Georg	Georg.Schwamborn@awi.de	Alfred-Wegener-Institute	Potsdam	Germany
Sergeev	Dmitry	sergeevdo@mail.ru	IEG RAS	Moscow	Russian Federation
Shiklomanov	Nikolay	shiklom@gwu.edu	The George Washington University	Washington, DC	USA
Usabaliev	Ryskul	r.usabaliev@caia.kg	Central-Asian Institute of Applied Geosciences	Bishkek	Kyrgyz Republic
Vieira	Goncalo	vieira@campus.ul.pt	CEG/IGOT - University of Lisbon	Lisbon	Portugal (Antarctica)
Vonder Mühl	Daniel	daniel.vondermuehl@systemsx.ch	PERMOS	Zurich	Switzerland
Witt	Ron	Ron.Witt@unepgrid.ch	UNEP	Geneva	Switzerland
Wu	Tonghua	thuawu@lzb.ac.cn	Cryosphere Research Station on the Qinghai-Tibet Plateau	Lanzhou	China
Zemp	Michael	michael.zemp@geo.uzh.ch	WGM5, UZH	Zurich	Switzerland
Zhao	Lin	linzhao@lzb.ac.cn	Cold and Arid Regions Environmental and Engineering Research Institute	Lanzhou	China

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INTERNATIONAL SECRETARIAT

Dr. Inga May
 Alfred Wegener Institute for Polar and Marine Research
 Telegrafenberg A43
 14473 Potsdam, Germany
 Tel: +49-331-288-2216
 Fax: +49-331-288-2122
contact@ipa-permafrost.org
www.ipa-permafrost.org