

# Cryosphere Working Group Meeting

23 April 2015

14:00-17:30

(Lunch 12.30-14.00, Coffee Breaks 16.10-16.30)

Toyama, Japan

Toyama International Conference Centre

## Draft Minutes

### Participants:

**WG MEMBERS PRESENT:** Annett Bartsch (Austria); Wolfgang Schöner (Austria); SUN BO (China); Jan Kavan (Czech Republic); René Forsberg (Denmark); Signe Bech Andersen (Denmark); Jari Haapala (Finland); Pentti Kujala (Finland); Michel Fily (France); Hugues Lantuit (Germany); Gudfinna TH. Adalgeirsdottir (Iceland); Arun Chaturvedi (India); Shin Sugiyama (Japan); Hyun Cheol Kim (Korea); Soon Do Hur (Korea); Elisabeth Isaksson (Norway); Jon Ove Hagen (Norway); Jacek Jania (Poland); Krzysztof Migala (Poland); Francisco Navarro (Spain); Pedro Elosegui (Spain); Veijo Pohjola (Sweden); Martin Lüthi (Switzerland); Martin Schneebeli (Switzerland); Elizabeth Hunke (United States); Walter Meier (United States).

**WG MEMBERS NOT PRESENT:** Martin Sharp (Canada); Julian Dowdeswell (United Kingdom); Lars Kaleschke (Germany); Carleen Tijm-Reijmer (The Netherlands).

**SECRETARIAT:** Tetsuo Sueyoshi (Executive Officer); Elena Kuznetsova (IASC Fellow); Louis-Philippe Roy (IASC Fellow); Robert Way (IASC Fellow).

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- 1 OPENING AND REPORTING**
- 1.1 WELCOME AND INTRODUCTIONS** [Jon Ove Hagen]
- 1.2 REPORT FROM THE CHAIR** [Jon Ove Hagen]
- 1.3 APPROVAL OF THE MINUTES OF THE LAST MEETING** [Tetsuo Sueyoshi]
  - The minutes of the 2014 meeting is given in ANNEX 1.3
- 1.4 ADOPTION OF THE AGENDA** [Jon Ove Hagen]
- 2 MAIN ISSUES**
- 2.1 REPORTS ON CWG ACTIVITIES**
- 2.1.1 INTERNATIONAL WORKSHOP ON CALVING, 1-2 June 2014, Grenoble, France** [Jon Ove Hagen on Behalf of Martin Sharp]

The International Workshop on Calving was organized by Martin Sharp from the University of Alberta (Canada) and Jean Krug and Olivier Gagliardini from the LGGE (University of Grenoble, France). During two days, 34 participants from 11 countries, worked around the question of calving of icebergs, from the modelling and observational point of views. The main objectives of the workshop were:

For observers - to learn whether they are observing what the modelers think needs to be observed - and if not to figure out what changes are needed. For modelers - to learn whether they are simulating what is being observed - and, if so, how successfully they are doing it. We may not be able to answer that question - but a numerical benchmarking experiment linked to both simple experiments and attempts to replicate observations could be a big step forward in establishing where we are at. The workshop consisted in 7 keynote lectures on different thematic (see program below), followed by discussions.

The website of the workshop contains a lot of available material: <http://www-lgge.obs.ujf-grenoble.fr/calving2014/>.

Post-presentation feedback: A question was asked by Jenny Baeseman of CliC as to whether an outcome of this meeting consisted of a list of required data sources for modellers to improve their modelling capacity and overall performance. Dr. Baeseman also mentioned that the subject matter in question may be the focus of future CliC funded initiatives.

- The Workshop report is given in ANNEX 2.1.1

### **2.1.2 INTERCOMPARISON OF SNOW GRAIN SIZE MEASUREMENTS WORKSHOP, March 2014, Davos, Switzerland [Martin Schneebeli]**

The workshop "Intercomparison of Snow Grain Size Measurements Workshop" in Davos, Switzerland, gathered 25 snow researchers with many different methods to measure snow grain size. In two field days and two days in the cold laboratories of the WSL Institute for Snow and Avalanche Research hundreds of snow grain size measurement were gathered. Grain size and density measurements were taken by multiple individuals with large differences noticeable over a small area. This initiative is a first step towards developing protocols to establish future international standards. An evaluation workshop was also held in August 2014. The result of the two workshops has been published online in *The Cryosphere Discussions* and the data is being made publically available.

Post-presentation feedback: A comment following the presentation identified translation of various snow study terms as being important due to inconsistencies in terminology across different languages. It was noted also that there are efforts planned to reconcile these differences in classification schemes and terminology.

- The Workshop report and summary presentation are given in ANNEX 2.1.2a,b

### **2.1.3 QUANTIFYING ALBEDO FEEDBACK AND THEIR ROLE IN THE MASS BALANCE OF THE ARCTIC TERRESTRIAL CRYOSPHERE, September 2014, Bristol, United Kingdom [Jon Ove Hagen on behalf of Martin Sharp]**

The goals of this workshop were to articulate scientific priorities and a research agenda related to the topic "Quantifying Albedo Feedbacks and their Role in the Mass Balance of the Arctic Terrestrial Cryosphere" and to formulate these in a way that would allow them to be presented at the Toyama Symposium and incorporated into the ICARP III products, which will include a "consensus statement identifying the most important Arctic research needs for the next decade". The workshop started with five plenary presentations to provide an initial basis for discussion, followed by a brainstorming session. From the breakout groups and open discussion, issues are arisen on: albedo measurements, temporal evolution of albedo, impacts of mineral impurities and black carbon on snow/ice albedo, biological impacts on cryospheric albedo. A total of 24 participants attended this workshop

- The Workshop reports are given in ANNEX 2.1.3

#### **2.1.4 1ST EUROPEAN SNOW SCIENCE WINTER SCHOOL, February 2015, Sodankyla, Finland [Martin Schneebeli]**

The 1st European snow winter school took place from 8-14 February 2015 in Sodankylä, Finland. The activity is part of the International Association of Cryospheric Sciences, Working Group "MicroSnow", within Division I of IACS. Endorsement of the activity is also sought by the European Space Agency and by the ESF Research Networking Programme on the Micro- Dynamics of Ice (Micro-DICE). In Snow Grain Size Intercomparison Workshop (2014), it was underlined the need to teach modern techniques of snow microstructure characterization to a wider community, especially to graduate and post-graduate scientist. This winter school, worth three graduate credits, provided an ideal programme as there are currently no university courses focusing specifically on modern snow studies which are available to the general academic community. Classroom lectures and field classes elicited a very positive response from participants whose backgrounds varied substantially but were primarily from terrestrial cryosphere backgrounds.

Post-presentation feedback: A comment following the presentation suggested that there should be a greater effort to include sea ice scientists in snow studies workshops as there is currently a clear knowledge gap in the area of snow on sea ice. The overall consensus of the discussion which followed was that there was a need for more cross-connections between terrestrial snow scientists and marine cryospheric scientists. One member also mentioned the Arctic remote sensing campaign looking at the snow cover on sea ice. A key finding was that there has been a significant decrease in snow cover over the western Arctic.

- The Workshop summary presentation is given in ANNEX 2.1.4

#### **2.1.5 WORKSHOP ON THE DYNAMICS AND MASS BUDGET OF ARCTIC GLACIERS & IASC NETWORK ON ARCTIC GLACIOLOGY ANNUAL MEETING, March 2015, Obergurgl, Austria [Jon Ove Hagen on behalf of Carleen H. Tij-Reijmer]**

From 23 to 25 March 2015 the workshop on the Dynamics and Mass budget of Arctic glaciers & the IASC Network on Arctic glaciology annual meeting took place at the University Centre Obergurgl, Austria. The objective of this meeting was: (1) To present and discuss new results on observations and modelling of the dynamics and mass budget of Arctic glaciers; (2) To plan and coordinate field work on Arctic glaciers with the aim of using the available infrastructure and logistics in the most efficient way and; (3) To develop ideas for future projects and collaboration.

A variety of topics within the field of dynamics and mass budget of Arctic glaciers were discussed, ranging from in situ observations to satellite techniques, observational to modelling approaches, and geographically covering the whole Arctic region. A total of 34 participants attended the workshop representing about 12 different countries. A total of 12 early-career scientists received travel support from the IASC cryosphere working group. Next year's meeting will be held in Benasque, Spain.

Post-presentation feedback: A comment suggested that the network was important but also that there was a necessity in focusing on more specific goals and outcomes from these meetings. Another member mentioned that although there is a general movement in IASC towards cross-cutting initiatives, goal oriented workshops with specific topics were still of interest to the scientific community.

- The Workshop report is given in ANNEX 2.1.5

#### **2.1.6 TIDEWATER GLACIER INITIATIVE AND ICE SHEET MASS BALANCE AND SEA LEVEL (ISMASS), Workshops in April 2014 and August 2014 located in Vienna, Austria and Auckland, New Zealand [Francisco Navaro]**

This presentation describes the major activities of the Tidewater Glacier Initiative and Ice Sheet Mass Balance and Sea Level (ISMASS) initiative over 2014 and presents a number of upcoming ISMASS-related activities for 2015. Ice sheet model inter-comparison splinter group meetings were held at the European Geoscience Union meetings in Vienna, Austria in April 2014 and at the International Glaciology Society's conference on ice sheets and sea level rise at Chamonix, Switzerland in May 2014. At these meetings it was decided that a new marine ice sheet model intercomparison project was needed to assess the impacts of dynamical ice sheet responses to ground line retreat. In August 2014, a workshop was also held in Auckland, New Zealand on future projections for ice sheets. The objective of this workshop was to stimulate the ice-sheet community to improve methods and agree on common frameworks for future projections. In September 2014, a follow-up workshop was held as part of the AGU Chapman Conference through the Ice Sheet Mass Balance Inter-comparison Exercise (IMBIE).

Upcoming ISMASS-related activities will include:

- Workshop on constraining uncertainty in Greenland surface mass balance models, 19-20 May, 2015 at the University of Sheffield, UK;
- Workshop on glacio-isostatic rebound modelling, 26-29 May, 2015, University of Alaska Fairbanks Geophysical Institute, USA and;

- The marine ice sheet model intercomparison project meeting, 16 August, 2015, Churchill College, UK.

Post-presentation feedback: Question was asked about whether there is a report which outlines the outcomes of this meeting – particularly with respect to the variability in ice-sheet projections. A question was also asked about whether the agenda of ISMASS is adequately focused because the many different workshops seemed to not have linkages. An additional comment mentioned that the long term focus should be discussed at the joint meeting between IASC and SCAR and that there should be similar long-term focuses between the Arctic and Antarctic activities with respect to glacier and mass balance activities and workshops.

- The ISMASS summary presentation is given in ANNEX 2.1.6

## **2.2 REVIEW OF IASC ACTIVITIES RELATED TO THE CWG**

### **2.2.1 RAPID TRANSITIONS RELATED TO INFRASTRUCTURE AND CLIMATE CHANGE (RATIC) [Skip Walker]**

A Rapid Arctic Transitions due to Infrastructure and Climate (RATIC) workshop and topical session was held at the Arctic Change 2014 conference in Ottawa, 8 – 12 December 2014. The RATIC meetings were organized so that international scientists who have been working independently in several areas of the Arctic on issues related to Arctic infrastructure could network with each other and share their findings. The studies at the Ottawa workshop and topical sessions document reported major changes to local social-ecological systems, including alternations to permafrost, landforms, hydrology, vegetation, wildlife, and people's livelihoods. The workshop focused on case studies, mainly in small communities of northern Alaska. Two IASC fellows were involved with this initiative and it supported ~5 young researchers.

Post-presentation feedback: Comment was mentioned that a whitepaper is being passed around which mentions that this is one of the ICARP3 activities and this will give an outline of the RATIC initiative. Question was asked about whether this is being asked to be endorsed as a cross-cutting activity. There was commentary about whether this should be involved with the IPA in an official capacity and it was suggested that contact should be made. There was a question about whether RATIC should be listed as a cross-cutting initiative and whether it will be asked to received funding from the Cryosphere Working Groups.

- Summary of the RATIC program is given in ANNEX 2.2.1

## **2.3 OTHER CRYOSPHERE ACTIVITIES EXTERNAL TO IASC [Jon Ove Hagen]**

### **2.3.1 CLIMATE AND CRYOSPHERE (CliC) [Jenny Baesemann]**

This short presentation outlines a number of workshops, meetings and projects which were funded through CliC initiatives. The full details of these various initiatives can be found in CliC's annual report for 2014. A particular focus was placed on initiatives that aim to improve the representation of cold processes in models and on analyses of model performance. A primary goal of CliC's activities over the past year has been focusing on promoting internationally coordinated targeted activities such as workshops, teleconferences and videoconferences to engage early career scientists. This also includes outreach and community building activities such as a CliC Fellows program and field schools. CliC and IASC currently have a memorandum of understanding. Joint IASC-CliC foci include satellite product comparisons, standardized methods and measurements, snow on sea ice analysis and CryoMIP-fest.

Post-presentation feedback: Comment was made that a new satellite launch of the SMAP initiative is applicable. This sensor collects both passive and active L-band radar imagery.

- The CliC summary presentation is given in ANNEX 2.3.1

### **2.3.2 INTERNATIONAL ASSOCIATION OF CRYOSPHERIC SCIENCES (IACS) [Martin Schneebeli on behalf of Hiroyuki Enomoto]**

Martin Schneebeli presented a brief presentation on the IACS. IACS focuses its efforts on the cryosphere across all of the globe rather than specifically being in the Arctic or Antarctic. IACS have five different divisions and several working groups aimed at specific projects with clear goals. The divisions consist of Snow and Avalanches; Glaciers and Ice Sheets; Sea Ice, Lake Ice, River Ice; Cryosphere, Atmosphere and Climate and; Planetary and Other Ices of the Solar System. Notably there is no permafrost division. Current working groups include MicroSnow, Randolph Glacier Inventory and Ice thickness and volume evaluation. There is also a proposal for a working group on dust and black carbon impacts on glaciers. IACS will have several sessions at the IUGG in Prague, Czech Republic from June 22<sup>nd</sup> to July 2<sup>nd</sup>, 2015.

Post-presentation feedback: Questions concerned how to keep track of all the various organizations, working groups and divisions, particularly given the similarities across the various acronyms. There was also discussion amongst the participants about the upcoming IUGG conference this June in Prague, Czech Republic. There was also commentary emphasizing the importance of dialogue

between IACS and the IPA to avoid duplication since there is no permafrost division specifically within IACS.

- The IACS summary presentation is given in ANNEX 2.3.2

### **2.3.3 INTERNATIONAL PERMAFROST ASSOCIATION (IPA) CORE ACTIVITIES** [Hugues Lantuit]

This presentation outlines most of the work by the IPA over the past year with a particular focus on the linkages with IASC activities. The IPA workshops are aimed at outputting focused deliverables and funding is provided over 2 years. The presentation also discusses the IPA action groups and their various activities which focused on establishing permafrost conditions at the last glacial maximum in the northern hemisphere, submarine permafrost mapping, permafrost research priorities for the future, permafrost and culture, last permafrost maximums and minimums, the Yedoma region and a new circum-Arctic soil organic carbon map.

Three activities discussing submarine permafrost mapping, permafrost research priorities, permafrost and culture, were particularly affiliated with IASC funding. Notably, a permafrost young researcher's workshop was held in Evora, Portugal prior to the EUCOP4, this workshop was funded through IASC, APECS, CliC and others. This workshop lead to the creation of focused goals for the future of permafrost research that are summarized in a publication at *The Cryosphere*.

Post-presentation feedback: A question from the audience concerned the inclusion of Antarctica in the IPA.

- The IPA summary presentation is given in ANNEX 2.3.3

### **2.4 REVIEW OF WORKING GROUP FOCI** [Jon Ove Hagen]

The Scientific Foci of the Working Group had been discussed and agreed upon at the first WG meeting in Potsdam (Germany) in January 2011. Under this agenda item, the WG is asked to revisit these foci and to discuss possible changes or additions.

**Summary of discussion:** The general conclusion of this discussion was that changes to the working group focus areas will be needed in the future but that this decision requires more time than was available to hash out direct foci. A general timeline was decided as being necessary in order to meet the cross-cutting call for proposals expected to occur next fall. Members agreed that an open workshop should be held to discuss the foci in detail. Hugues Lantuit suggested that foci should have clear deliverables and a long-term focus but that there is a necessity for additional information on the activities of other organizations to ensure efforts are not duplicated. Hugues also suggested

that it may be worthwhile to place a focus on contacting various organizations to see the current gaps in their initiatives so that working group foci could be established at the above mentioned workshop. Jenny Baeseman suggested that snow on sea ice would be a good focus area as it would allow for cross-cutting initiatives to be developed in conjunction with the atmosphere and terrestrial working groups in particular. Martin Schneebeli suggested that more effort is required to find cross-cutting topics and to incorporate expertise from outside the individual working group. It was also suggested that a meeting of the leadership of the IASC working groups would be beneficial for establishing the details and structure of the working groups.

## **2.5 UPCOMING ACTIVITIES**

### **2.5.1 TIDEWATER GLACIER INITIATIVE AND ICE SHEET MASS BALANCE AND SEA LEVEL (ISMASS) [Francisco Navarro on behalf of Martin Sharp]**

CWG will also continue its support of the Ice Sheet Mass Balance and Sea Level (ISMASS) group which is now co-sponsored by IASC, the Scientific Committee on Antarctic Research (SCAR) and the Climate and Cryosphere (CliC) project. Upcoming activities of ISMASS will focus on surface mass balance estimation, glacial isostatic rebound and marine ice sheet model intercomparisons.

Post-presentation feedback: A question from the audience asked whether IASC should be a mechanism to facilitate the organization of collaborations amongst researchers with similar goals (such as ISMASS). It was discussed that there was a need to see an outline and a tangible outcome for these upcoming workshops.

### **2.5.2 POLAR AND ALPINE MICROBIOLOGY CONFERENCE [Josef Elster]**

The 6th International Conference on Polar and Alpine Microbiology is to be held in 6 – 9 September 2015 in České Budějovice, Czech Republic. This meeting is a continuation of the highly successful meetings previously held in Rovaniemi 2004 (Finland), Innsbruck 2006 (Austria), Banff 2008 (Canada), Ljubljana 2011 (Slovenia) and Big Sky 2013 (USA). The conference will bring together the scientific community for discourse on the latest aspects of cold- living microorganisms and their role in polar and alpine environments. The 2015 conference will again provide an opportunity to share ideas and build research collaborations addressing the latest developments in microbiology in polar and alpine habitats.

## **2.6 PROPOSED ACTIVITIES**

### **2.6.1 NEW ACTIVITIES/TASKS BROUGHT FORWARD BY THE MEMBERS**

Under this agenda item, new suggestions and proposals on WG activities will be brought forward by members of the Working Groups. This will include short presentations followed by a discussion.

#### **2.6.1.1 ILULISSAT CLIMATE DAYS [Rene Forsberg]**

“Ilulissat Climate Days” will be held in Greenland, June 2-5, 2015. This meeting is a stakeholder/science meeting, following up on the highly successful Nuuk Climate Days 2009, where cryosphere changes in Greenland were in focus, and more than 150 participants came from Greenland, Europe and the US. A total of 5000 USD is being sought to support the attendance of young scientists at this workshop.

- WG request of the workshop is given in ANNEX 2.6.1.1

#### **2.6.1.2 PERMAFROST CARBON NETWORK [Christina Schaedel]**

A Working Group Lead Meeting of the Permafrost Carbon Networks will take place in Flagstaff, Arizona, 11 – 12 May 2015. The upcoming meeting brings together network participants that have been leading syntheses in the last four years and continue to be engaged in new synthesis activities planned over the next couple of years. This workshop is also a key event in engaging new participants to start new synthesis activities that have been identified in previous meetings based on missing gaps and important research areas. A total of 5000 Euros is being sought to support this workshop.

- Working Group request of the workshop is given in ANNEX 2.6.1.2

#### **2.6.1.3 2ND GTN-P NATIONAL CORRESPONDENCE WORKSHOP ASSOCIATED WITH THE 7TH CANADIAN PERMAFROST CONFERENCE [Hugues Lantuit]**

A follow up to the data management workshop for data providers, users and national correspondents held in November 2011 in Potsdam. This workshop is to be held in association with the 7<sup>th</sup> Canadian Permafrost Conference in Quebec City from September 20<sup>th</sup> to the 23<sup>rd</sup>, 2015. This workshop is focused on international correspondence on the data management system and on the implementation of the governance structure. It will also coincide with the release of the first GTN-P collective science publication on permafrost temperature and active layer depth. A total of 5000

Euros is being sought to support the attendance of young scientists at this workshop. The submission of the request was just before the initiation of the IASC meetings in Toyoma, Japan.

- Short outline of the workshop is given in ANNEX 2.6.1.3

## **EXECUTIVE (CLOSED) SESSION**

### **3 CRYOSPHERE WORKING GROUP BUSINESS**

#### **3.1 STRATEGY FOR ALLOCATING FUNDING [Jon Ove Hagen]**

The cryosphere working group would like to receive requests for funding in advance of the IASC meetings whenever possible. It was also noted that in the future there should be a means for allocating funding for periods after the IASC meetings and a set protocol for allocations.

#### **3.2 BUDGET 2015 AND 2016/2017 [Tetsuo Sueyoshi]**

The Secretariat presented the WG accounts for 2015 and the budget for 2016/2017

- The Working Group budget is given in ANNEX 3.2

#### **3.3 ALLOCATION OF FUNDS FOR 2016/2017 [Jon Ove Hagen]**

Under this agenda item, the WG is asked to discuss the proposed new activities presented under agenda item 2.6 and to allocate WG funds to ongoing and new WG activities. The working group decided to fund all proposed activities on the basis of the small size of the requests for support (18,000 Euros total) relative to the available funds in this year's budget (33,000 Euros). It was also suggested that funding could be made available for IASC fellows to stay involved with the working group for longer than the 1 year period allocated currently. One comment also noted that the application process should become more open and transparent in the future.

#### **3.4 ELECTIONS [Tetsuo Sueyoshi]**

According to the WG Terms of Reference, the Chair and Vice Chairs shall be elected for a term of two years, and may be re-elected for one additional term. The first term of the current WG Steering Group members comes to an end this year and thus elections are due at the meeting. Formal elections were not required given that all candidates were unopposed.

The new chair will be Francisco Navarro. Vice-chairs will be Jon Ove Hagen and Walt Meier. Past-chair will now be Martin Sharp.

- The election procedure is given in ANNEX 3.4