

IASC Network on Arctic Glaciology annual meeting and IASC crosscutting activity on the importance of Arctic glaciers for the Arctic marine ecosystem

22-24 January 2018, Obergurgl, Austria

Summary report

The 2018 annual workshop of the IASC Network on Arctic Glaciology (NAG) took place at the Obergurgl University Center, Obergurgl, Austria. The meeting attracted 42 participants from 16 different countries. The workshop integrated two special activities. The first, “Understanding atmosphere-glacier-ocean interactions and their implications for the pan-Arctic glacier mass budget” represents a long-term strategy of the Cryosphere Working Group and NAG. The second theme broke new ground: an IASC cross-cutting activity of the Cryosphere and Marine working groups of IASC, addressing “The importance of Arctic glaciers for the Arctic marine ecosystem”. Such interdisciplinary work helps to produce research results of relevance to society, here especially for people living in the Arctic or benefiting from Arctic ecosystem services, directly or indirectly. Interdisciplinary work requires that researchers from the involved disciplines get to know each-other and learn to understand each-others scientific jargon. The IASC cross-cutting activity contributed in building a bridge between the cryosphere and biosphere community. NAG aims to elaborate this initiative in the years to come and work towards the involvement of members from other relevant disciplines, such as physical oceanography, ocean biogeochemistry, as well as terrestrial ecology.

Workshop report

Overview

The 2018 workshop on the Dynamics and Mass Budget of Arctic Glaciers and the IASC Network on Arctic Glaciology Annual Meeting took place at the Obergurgl University Center, Obergurgl, Austria. The meeting attracted 42 participants from 16 different countries (Fig. 1). The workshop integrated two special activities, among them an IASC cross-cutting activity of the Cryosphere and Marine working groups of IASC (CWG/MWG). The meeting was organized by the IASC Network on Arctic Glaciology (NAG), chair Thorben Dunse, University of Oslo and Austrian national contact Michael Kuhn, University of Innsbruck. The cross-cutting activity was organized in collaboration with MWG members Renate Degen, University of Vienna and Monika Kedra, Polish Academy of Sciences. The workshop agenda/program and participant list is attached to this report.

Note: A book of extended abstracts, incl. workshop agenda, participants, as well as minutes from the open discussion and open forum meeting will become available on the IASC-NAG website in March 2018: <https://nag.iasc.info/publications>

Workshop objectives

The general objectives of the meeting were:

- to present and discuss new results on observations and modelling of the dynamics and mass budget of Arctic glaciers, including the Greenland ice sheet,
- to provide a forum for glaciologists and marine biologists to present and discuss their work and to stimulate future collaborations,
- to plan and coordinate field work with the aim of using available infrastructure and logistics in

the most efficient way.

Scope of the workshop

Bring together both experts and early-career scientists working in a broad range of topics within Arctic glaciology and proglacial marine ecosystems. Contributions to two special sessions were particularly welcomed:

Understanding atmosphere-glacier-ocean interactions and their implications for the pan-Arctic glacier mass budget

This special session aimed at illuminating glacier-atmosphere and glacier-ocean interactions in order to: (i) identify and quantify atmospheric and oceanographic processes that drive changes in the mass balance and dynamics of Arctic glaciers and ice caps; and (ii) quantify the relative importance of surface melt vs. iceberg calving in accounting for pan-Arctic glacier and ice cap changes.

Keynote speaker:

- Luke Copland (University of Ottawa): A consistent estimate of Pan-Arctic glacier frontal ablation, 2000-2015

The importance of Arctic glaciers for the Arctic marine ecosystem

Arctic glaciers contribute significant amounts of freshwater into Arctic fjords/ocean, in the form of surface melt and runoff and frontal ablation (iceberg calving and submarine melt). While the impact on glacial freshwater-discharge on fjord and ocean circulation is widely recognized (albeit not well understood), awareness of the potential impacts of glacial processes and glacier-change on marine ecosystems and biodiversity is only emerging.

This IASC cross-cutting activity of the Marine and Cryosphere Working Groups/Network on Arctic Glaciology brought together experts from glaciology and marine biology/ecology. Such cross-disciplinary research is required to predict future climate dynamics and ecosystem responses, and to improve our understanding of the vulnerability and resilience of Arctic environments and societies.

Keynote speakers:

- Andy Hodson (The University Centre in Svalbard): Nutrient delivery from polar glaciers to downstream ecosystems
- Harald Steen (Norwegian Polar Institute / Centre for Ice, Climate and Ecosystems): Glacier runoff and its effect on and arctic fjord circulation and ecosystem
- Renate Degen and Monika Kędra (University of Vienna; Institute of Oceanology, Polish Academy of Sciences): Retreating glaciers impacts on Arctic marine fjord ecosystem

The cross-cutting activity consisted of 10 oral presentations, spread over three workshop sessions, and lead into an open discussion.

Central questions of the discussion were:

- What glaciological information/data are useful for the marine biology/ecology community and vice versa?
- What data/information can glaciologists readily provide to the marine biology/ecology

- community and vice versa?
- Collaborations between glacier and marine ecology communities in field work, etc.?

A general recommendation for follow-up activities: work towards the involvement of physical oceanographers, ocean biogeochemists and glacier geomorphologists.

Open Forum meeting

The annual open forum provided an arena to discuss issues related to the organization, activities and general agenda of the network.

Agenda

1. Introduction to IASC and NAG
2. Funding
3. Discussion on future possible activities
4. Future meetings
5. Book of extended Abstracts

Ad. 1:

An introduction to IASC, its working groups and the Network on Arctic Glaciology was presented to the audience.

Ad.2:

The activities of NAG (the annual meeting) are mainly funded by grants from IASC and its Cryosphere Working group (CWG). The Obergurgl 2018 meeting was sponsored by the CWG (€ 6750) as part of its focus area on tidewater glacier dynamics and response to climate change, focusing on atmosphere-glacier-ocean interaction. Additional funding (€ 3500) came directly from IASC for the cross cutting initiative of CWG and MWG. Approximately € 7500 were used for travel funds for nine early career scientists and one senior scientist. Gerlis Fugmann, executive director of the Association of Polar Early Career Scientists (APECSECS) handled the ECS travel funds. The remaining € 2750 were spend for the venue itself (conference room and coffee breaks).

Ad.3:

NAG will continue its commitment about atmosphere-glacier-ocean interactions, representing one strategic foci of the CWG. The cross-cutting activity between the Arctic-glaciology and marine biology/ecology community was considered a success and should be elaborated on in the future. Efforts should be made to include experts from physical oceanography, ocean biogeochemistry and glacier geomorphology. The activity could be extended to also address impacts on terrestrial ecosystems.

Ad.4:

The next Workshop on the dynamics and mass budget of Arctic glaciers and the 2019 NAG annual meeting will be held in Norway, ideally at the end of January 2019. Geilo, former venue of an IGS conference in 2004, is first choice, with Finse and Skeikampen, as backup. Thorben Dunse will follow up workshop arrangements.

Obergurgl is chosen unanimously as the venue for the 2020 meeting. Michael Kuhn is responsible for the arrangements.



Figure 1: The 2018 IASC-NAG workshop attracted 42 participants from 16 countries.