
*IACS promotes the advancement
of cryospheric sciences of
the Earth and solar system*



IACS

International Association
of Cryospheric Sciences

IACS NEWSLETTER

June 2021

The Virtual Atmosphere-Cryosphere-Ocean seminar week, 19-23 July 2021

IACS, in partnership with IAMAS and IAPSO, is pleased to announce a week of online seminars in place of our cancelled BACO-21 joint assembly. Registration is **FREE** at vaco-21-registration-tickets. Details of the programme can be found at <https://cryosphericsscience.org/vaco-21/>, and an outline is given below. The programme includes presentations by IACS 2021 Early Career Scientist award winners David Bigelow and Giulia Mazzotti.

Monday 19 July, 15:00-17:00 UTC. Remote sensing of the atmosphere, ocean and cryosphere

- **Pepijn Veefkind:** The impact of COVID-19 policy measures on air quality and climate: the view from space
- **Paolo Cipollini:** Essential Climate Variables over oceans and ice: a view from space
- **Byongjun Hwang:** Satellite observation of the floe size distribution of Arctic sea ice: implications for sea ice models

Tuesday 20 July, 15:00-17:00 UTC. Field observations of the atmosphere, ocean and cryosphere

- **Laura Stevens:** Stress coupling between Greenland supraglacial lakes during rapid drainage
- **Markus Frey:** Sea salt aerosol from blowing snow above sea ice – observations, modelling and atmospheric impacts
- **Joellen Russell:** Designing the required Southern Ocean observing system for predicting climate change: robot floats, satellites and supercomputers

Wednesday 21 July, 15:00-17:00 UTC. IAMAS-IACS-IAPSO Early Career Scientist Awards

- **Giulia Mazzotti:** Forest snow modelling from tree to regional scales
- **Marta Abalos:** Human impacts on the stratospheric circulation
- **Thomas Wahl:** Bigger ships or less flooding? How tidal changes affect flooding along the U.S. coast
- **Jessica Fitzsimmons:** Micronutrient trace metal dynamics in the Arctic Ocean
- **David Bigelow:** The role of englacial hydrology in the filling and drainage of an ice-dammed lake

Wednesday 21 July, 17:00-17:30 UTC. Coupled changes and variability in the atmosphere, ocean and cryosphere

- **Elizabeth Barnes:** Machine learning and climate projections

Thursday 22 July, 12:00-13:30 UTC. Coupled changes and variability in the atmosphere, ocean and cryosphere

- **Ruzica Dadic:** How much does spatial variability of the sea ice surface (SSL/snow) influence sea ice thickness?
- **Matthew England:** Global ocean-atmosphere climate teleconnections

Friday 23 July, 15:00-17:00 UTC. Modelling atmosphere, ocean and cryosphere interactions

- **Cécile Agosta:** Antarctic surface mass balance: local and large-scale drivers, present and future
- **Jenny Mecking:** Predicting the 2015 North Atlantic Cold Blob
- **Doug Smith:** Robust but weak multi-model atmospheric response to future Arctic sea ice loss

New officers for the GAPHAZ Standing Group

GAPHAZ (Glacier and Permafrost Hazards in Mountains) has been a scientific Standing Group of the International Association of Cryospheric Sciences (IACS) and the International Permafrost Association (IPA) since 2011. The group now has more than 120 members, including scientists, practitioners, policy makers and representatives of the private sector. The 8-year self-evaluation was completed in 2019, and the group is now working to further establish GAPHAZ as a hub for issues related to glacier and permafrost hazards.

In February and March 2021, GAPHAZ coordinated an ad-hoc working group of more than 50 international scientists who have been working on the analysis and reconstruction of the 7 February 2021 rock-ice avalanche in Uttarakhand, India, which caused the Chamoli disaster. Recently, the group released a timely [report](#) (available on the GAPHAZ website) that promoted an active online discussion through the creation of an ad-hoc Slack working space; several GAPHAZ members are now involved in the preparation of scientific papers on the topic. This effort resulted in a [Science article](#), published on June 10, which resulted in widespread international media attention. GAPHAZ members also made major contributions to EGU Online (in particular to session CR5.4 “Risks from a changing cryosphere, and mountains under global change”, co-sponsored by IACS and IPA).

GAPHAZ has recently completed its biannual rotation of Officers, and is pleased to welcome Holger Frey (University of Zurich) as the Secretary, with Michele Koppes (University of British Columbia) and Marta Chiarle (Italian National Research Council) moving to vice-Chair and Chair, respectively. The new officers and the members of the GAPHAZ Advisory Board are working to define the horizon and activities of the Standing Group for 2021-2022. Next month, GAPHAZ will patronize the “First global conference and workshop on glacial lake outburst floods”, aimed to address various aspects of GLOFs and global geographical coverage. The event will take place online from 7 to 9 July 2021 (see www.gaphaz.org/events for updates).

(Report by Chiarle, Koppes and Frey)



Marta Chiarle, new GAPHAZ chair.



Michele Koppes, GAPHAZ co-chair.



Holger Frey, GAPHAZ secretary.

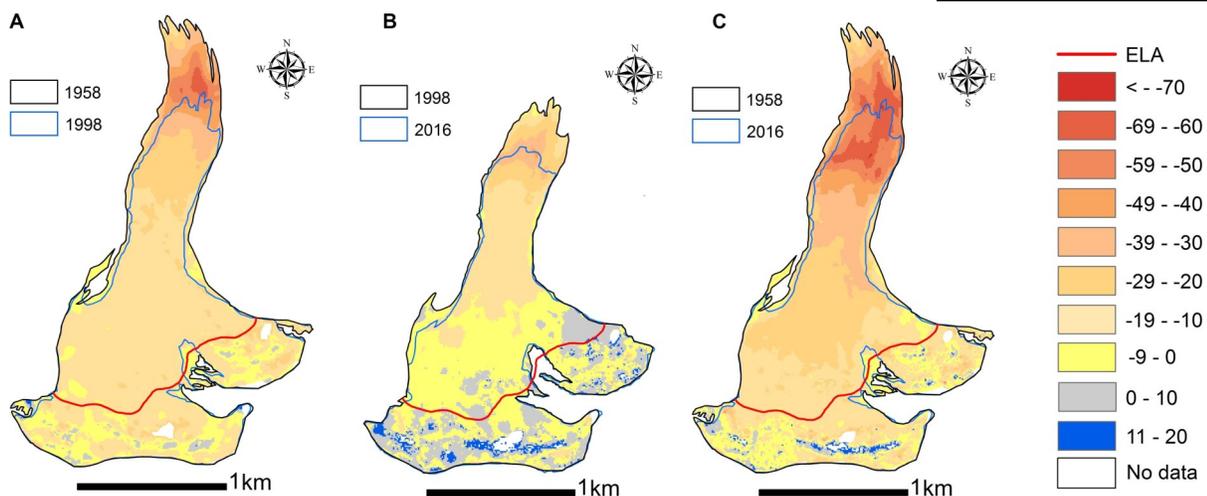


Figure 3 from Kapatsi et al. 2020 on assessing changes in mass balance of the Tuyuksu group of glaciers, Northern Tien Shan, between 1958 and 2016 using ground-based observations and Pléiades satellite Imagery. Changes in surface elevation of the Central Tuyuksu glacier (m): (A) 1958–1998; (B) 1998–2016; (C) 1958–2016. The solid line shows the glacier area at the beginning and at the end of each assessment period. See description of the full Frontiers volume on p3.

Chilean Cryosphere Meeting

SoChiCri stands for “Sociedad Chilena de la Criósfera” (Chilean Cryosphere Society, www.sochicri.cl). Established in 2018, it is the only academic society dedicated to glaciology in Chile. The main goal of the SoChiCri is to further the study and knowledge of the country’s cryosphere. 2021 marks the year of the third annual meeting, delayed due to COVID restrictions and carried out entirely online by the Universidad de Concepción, Departments of Geography (Alfonso Fernández) and Geophysics (Rodrigo Abarca). More than 35 talks and posters presented this year attest for a vibrant and growing cryosphere community that studies diverse aspects of snow and ice: from mountain glaciers to polar regions, from paleoperspectives to future projections. Highlights of the meeting were keynote speakers Simon Gascoïn and Jorge Daniel Taillant, who provided thorough perspectives on available monitoring tools and legislative efforts regarding the protection of glaciers. Furthermore, the meeting offered workshop sessions that provided basic training on rock glaciers, SAR, and Lidar.

Hans Fernández won the best student presentation for his talk entitled “Fluctuaciones glaciales durante el Pleistoceno y Holoceno en Chile Central” (Glacier Fluctuations during the Pleistocene and Holocene in Central Chile).

Andrés Pérez won the best student presentation with the poster entitled “Mapeando el análisis bibliométrico en la Cordillera Darwin entre 2009 – 2019” (Mapping the bibliometric analysis on Cordillera Darwin).

IACS co-sponsored prizes to the best student talk and posters. The winners were provided a Diploma and book of choice. Andrés selected the book “Past Glacier Environments” by John Menzies while Hans chose “Glaciers and Climate Change” by Johannes Oerlemans.

(Report by Alfonso Fernández)



Hans Fernández.



Andrés Pérez.

Observational Assessments of Glacier Mass Changes at Regional and Global Level

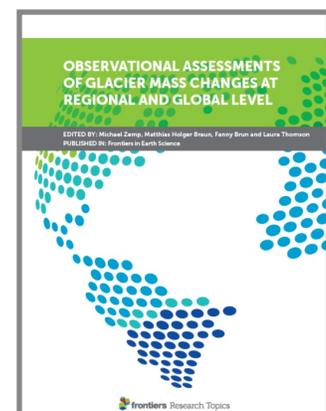
Glaciological mass-balance observations are available from a worldwide network of a few hundred glaciers. Increasingly, air and space-borne sensors provide high-resolution digital elevation models and allow the assessment of thickness and volume changes for thousands of individual glaciers within a region on decadal time scales, filling the spatial-scale gap between point-based glaciological records and coarse-resolution space-borne gravimetry. Indeed, original works within a recently completed Frontiers’ Research Topic (<https://www.frontiersin.org/research-topics/9957>) alone represent more than 9,900 new geodetic mass change contributions to the World Glacier Monitoring Service (WGMS) and the IPCC AR6.

The Research Topic entitled “Observational Assessments of Glacier Mass Changes at Regional and Global Level” is a contribution to the working group on Regional Assessments of Glacier Mass Change (RAGMAC) of the International Association of Cryospheric Sciences (IACS) <https://cryosphericciences.org/activities/wg-ragmac/>

It consists of eleven research articles and an editorial from 67 authors. The articles are providing insights into glacier changes from in-situ and remotely sensed observations and address diverse methodological challenges in dealing with this new wealth of data.

Geographically, the Research Topic includes two global assessments and a series of regional studies from the Patagonian and Central Andes, Greenland, Svalbard, Iceland, European Alps, and Central Asia. All is put into context by an editorial summary.

(Report by M. Zemp)





Snow depth measurements Hofsjökull ice cap, Central Iceland, early in May 2021. Mass balance measurements were started on the ice cap in 1988 and continue to this day. Winter and summer balance has been measured at 25 locations on the 810 km² ice cap, which has lost 20% of its area since 1890 and nearly 15% of its volume since 1988.

The picture shows a skidoo towing an IceMap snow radar which is now routinely used to measure winter snow thickness on Hofsjökull during spring trips, on profiles totalling 200 km. The inset picture shows snow core drilling.

Photos: Thorsteinn Thorsteinsson

IACS annual meeting 2021

IACS will held its annual meeting after the summer in August/ September. All IACS working groups and standing groups and joint commissions are asked to send their annual report prior to the meeting. We also plan to held an open bureau meeting with short presentations on IACS activities. Information will be put on our website and on our [IACS twitter account](#)



Members of the IACS bureau in Montreal, CA, in July 2019. In 2021 our annual meeting will be held online.

About IACS

The International Association of Cryospheric Sciences (IACS) is a constituent Association of the International Union of Geodesy and Geophysics (IUGG).

- IACS promotes and sponsors workshops, symposia and educational activities.
- IACS has targeted working groups on cryospheric topics.
- IACS offers free individual membership: www.cryosphericciences.org
- The IACS newsletter is issued 2-4 times a year.
- Previous newsletters are found on: cryosphericciences.org/newsletter/