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

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IACS
International Association of Cryospheric Sciences

IACS NEWSLETTER

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IACS contributed to IPCC report

The IPCC Special Report on the Ocean and Cryosphere in a Changing Climate was approved in Monaco on 24 September 2019 by the 195 IPCC member governments after a 4-day plenary session. The report has been written by more than 100 authors from 36 countries and assesses new knowledge on recent and future changes in the ocean and the cryosphere, the associated risks and opportunities to ecosystems and people, and adaptation and governance options for reducing future risks. The cryosphere is dealt with in chapters on high mountain areas, polar regions and sea level change. The report highlights the rapid and widespread shrinking of the cryosphere including mass loss from ice sheets and glaciers, reductions in snow cover and Arctic sea ice extent and thickness, and increased permafrost temperatures. It also shows that different emission pathways matter for future responses highlighting the escalating costs and risks of delayed action.

Several IACS bureau members played key roles in the report, with Regine Hock as Coordinating Lead Author and Hiroyuki Enomoto, Andrew Mackintosh, and Stanislav Kutuzov as Lead Authors. Recent bureau member Valerie Masson Delmotte, plays an instrumental role as co-chair of IPCC's Working Group I. Several other past IACS bureau members and IACS award winners also served as lead authors or review editors including Xiao Cunde, Georg Kaser and Ben Marzeion.

The report can be downloaded at
https://www.ipcc.ch/srocc/home/

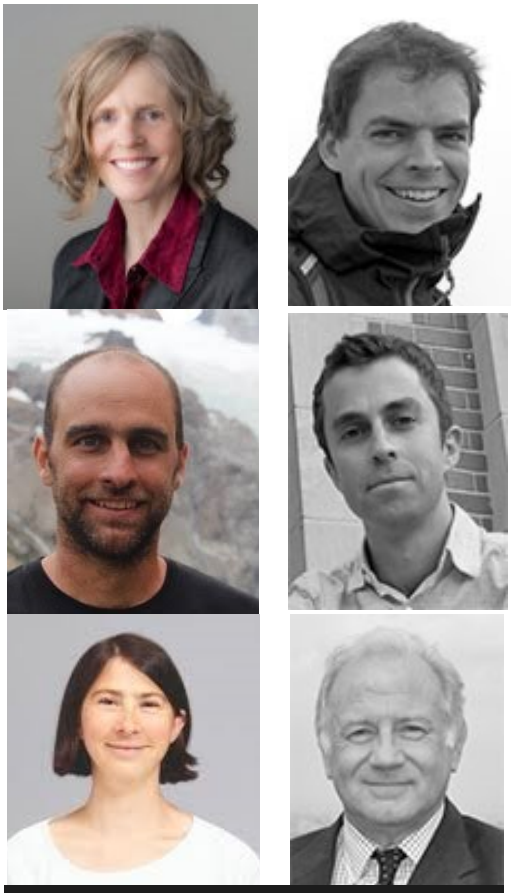
Pictures from the IPCC plenary session in Monacco in September where previous IACS bureau member Valerie Masson Delmotte and present IACS president Regine Hock participated. Lower picture: Discussing how to address government interventions on the text of the Summary for Policymakers. Upper picture: Celebrating final appovement after last day's 27-hour session. Photos: IPCC

GTN-G Advisory Board 2019-2023

The Global Terrestrial Network – Glaciers (GTN-G) was established in 1998 and links existing networks and systems for integrated observations of glacier systems and their fluctuations. Since its creation, the GTN-G has been run by the World Glacier Monitoring Service (WGMS) in rather informal cooperation with the National Snow and Ice Data Center (NSIDC) and the Global Land Ice Measurements from Space initiative (GLIMS). To further strengthen, support and coordinate the cooperation between WGMS, NSIDC and GLIMS, a GTN-G Steering Group was established as an IACS Standing Group in 2011. This consists of an Executive Board of representatives of the three operational organisations and an independent Advisory Board that supports, consults with, and periodically evaluates the work of the Executive Board and the three operational organisations.

A new advisory board is now elected for the period 2019-2023 and comprises: Gwenn Flowers, Canada (chair, representing IACS), Alex Gardner, USA, Ben Marzeion, Germany, Stephen Briggs, UK, Fanny Brun-Barriére, France, Pierre Pitte, Argentina.

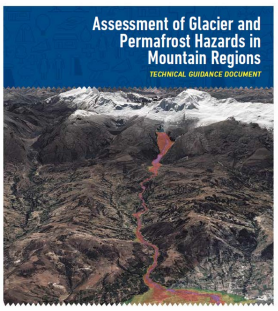
The previous advisory board for 2015-2019 conducted a mid-term evaluation of GTN-G that was delivered before the summer. A full evaluation of GTN-G is planned in 2023. The previous full term evaluation of GTN-G was conducted in 2014. IACS thanks the outgoing members Liss M. Andreassen, Anthony Arendt and late Graham Cogley for their service in the advisory board since the start 2011.



Left column: Gwenn Flowers, Pierre Pitte and Fanny Brun-Barriére.
Right column: Ben Marzeion, Alex Gardner and Stephen Briggs

Glacier and Permafrost Hazards in Mountains

GAPHAZ was established as a scientific Standing Group of the International Association of Cryospheric Sciences (IACS) and the International Permafrost Association (IPA) in 2011. The group now stands at > 100 members, comprising primarily academic researchers, but also including business organisations, policy makers and practitioners. There have been regular meetings at national and international conferences (e.g. EGU; ICOP) to review activity and establish goals for future work, as well as bespoke workshops focussing specifically on sharing information around advances in the mountain hazard field. In 2018 the group published a Technical Guidance document for the assessment of factors that can condition or trigger hazardous glacier and permafrost hazards, focussing on interlinking atmospheric, cryospheric, geological, geomorphological, and hydrological processes. The document, which is available for download at the GAPHAZ site (gaphaz.org) in both English and Spanish, is aimed at scientists, government agencies and consultants undertaking glacial hazard assessment and while it does not provide step-by-step prescriptive guidance on management responses, it does provide a unified framework that promises to standardise assessment approaches.



Recent GAPHAZ activities include the completion of their 8-year self-evaluation in 2019, which was presented to and accepted by IACS and IPA during the IUGG assembly in Montreal, and the co-organisation of a debris-covered glacier workshop held at the Geological Society in London in September, which promises to lead to several key publications to set future research agendas.

WGMS General Assembly

In 2019, the WGMS National Correspondents meet to discuss achievements and future challenges in glacier monitoring. The General Assembly was organized in three regional meetings, which allowed to focus on regional challenges and networks and to cut in half the related carbon footprint.

In August, the National Correspondents from Europe, North America, and Africa met at the University of Zurich. The meeting stands in the light of 125 years of internationally coordinated glacier monitoring – in August 1894, worldwide collection of glacier data was initiated at the 6th International Geological Congress in Zurich. 125 years later, the focus changed and many receding and even vanishing glaciers challenge monitoring efforts all over the world.

In September, the meeting in Almaty was jointly organized with the colleagues from the Institute of Geography of the Republic of Kazakhstan. Here, the main focus was on the national status of glacier monitoring programs and on the progress needed to better support water resource management and disaster risk reduction. As an outcome, the participants aim for the establishment of a Central Asian Working Group on Snow and Ice to improve cooperation and capacity building within the region.

The General Assembly is completed with the meeting in El Calafate, with a focus on regional challenges and strengthening of the regional network as well as dedicated public outreach in view of the upcoming COP25 in Chile.

14-17 August 2019. WGMS General Assembly , part 1, Zurich, Switzerland. Photo: Rebecca Hawkins.

10-14 September 2019. WGMS General Assembly Asia, Almaty, Kazakhstan (part 2/3). Photo: LevanTielidze

Vanishing glaciers

One of the topics on the WGMS General Assembly in Zurich in August was vanishing glaciers. As Matthias Huss, national WGMS correspondent of Switzerland pointed out: «We are about to lose what we are supposed to monitor». Valuable long-term observational series have to be abandoned due to climate change, and timely shifting of the monitoring activities to larger glaciers is crucial. In Switzerland more than 500 glaciers have completely disappeared since 1850. The small ones are the first, and many more glaciers are at risk. Vanishing glaciers leave a rock desert behind.

Pizolgletscher, Eastern Switzerland, in 2017 and 2019. The glacier diminished rapidly over the past decade. In September 2019 a funeral ceremony took place to mark its disapperance. Photos: Matthias Huss

Ocean waves propagating in the marginal ice zone (MIZ) of the Sea of Okhotsk, taken from the Japanese PV "Soya" at N45.49 E142.66, close to the Soya Strait, on 13 February 2018. Photo: Takenobu Toyota

MIZ lies close to an open ocean, and is characterized by vigorous interactions among sea ice, ocean, and atmosphere. These interactions promote sea ice formation like pancake ice in the ice growth season, as shown in this figure, whereas they work to enhance ice melting rate through ice break-up processes in the melting season. Understanding these processes is key to the prediction of sea ice extent in the future. Thus, attention to this topic is inceasing recently. The photo also indicates vigorous wave-ice interactions in MIZ. Waves with relatively long wavelength (~ a few tens of meters) are dominant due to the attenuation of shorter waves in the vast pancake ice area. The floe size of individual pancake ice is approximately 0.5 m. A westerly wind of 11 m s-1 was blowing, and the temperature was -7.3 °C.

Sessions for next IACS assembly

The next IACS assembly (8-23 July 2021 in Busan, Republic of Korea) will be held in conjunction with the International Association of Meteorology and Atmospheric Sciences (IAMAS) and the International Association for the Physical Sciences of the Oceans (IAPSO). Details of how to propose oral and poster sessions will be announced soon, but for now please send any ideas for session titles to richard.essery@ed.ac.uk.

Topics concerning interactions of components of the cryosphere with the atmosphere and/or oceans will be of particular interest for joint sessions.

BACO-21
Busan IAMAS-IACS-IAPSO

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.cryosphericsciences.org

The IACS newsletter is issued 2-4 times a year.