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VIEWS AND NEWS

International viewpoint and news

IPY Project: Students on Ice Expeditions

Dirk Notz · Peter Haugan · Karolina Widell · Frank Nilsen

Hardly any other component of the Earth's climate system has received as much public attention in recent years as sea ice. This recent interest was mostly triggered by the surprisingly fast changes that were observed in the Arctic sea-ice cover in 2007 and 2008. While the Arctic sea-ice extent in summer had been decreasing rather continuously since the early 1980s, the last two years displayed a sudden acceleration in the rate of loss. This has taken most scientists by surprise because of the much slower rate of sea ice decline that was projected in the last report of the Intergovernmental Panel on Climate Change (see Fig. 1).

The difference between projections and reality is in part caused by internal variability of the Arctic climate system, but also in part caused by an apparent lack of understanding of many aspects of sea-ice physics, which also holds for sea-ice biology and biogeochemistry.

D. Notz (✉)
Max Planck Institute for Meteorology,
Bundesstr. 53, 20146 Hamburg, Germany
e-mail: dnotz@seaice.info

P. Haugan · K. Widell
Geophysical Institute, University of Bergen,
Allegaten 70, 5007 Bergen, Norway

F. Nilsen
Department of Arctic Geophysics,
The University Centre in Svalbard,
P.O. Box 156, 9171 Longyearbyen, Norway

A. M. de Grosbois
Friedmar-Brendel-Weg 9a, 09599 Freiberg, Germany
e-mail: degrosbois@blue-cable.de

To allow students and researchers from around the world to reflect on the observed changes and the current shortcomings in our understanding of sea ice, an International Sea-Ice Summer School was held in Svalbard (Norway) during the first two weeks of July 2007 (see Fig. 2). The school brought together 92 participants from 16 different nations and 23 lecturers from 12 different nations. It formed a central part of the "Education and Outreach" program of the International Polar Year (IPY) and was supported by a number of national and international funding agencies—most notably the DAMOCLES project, NordForsk and the Norwegian Research Council.

With previous schools organized by Norbert Untersteiner (Italy, 1981) and Matti Leppäranta (Finland, 1994), this summer school was the third such school to focus on sea ice and received an overwhelming response from lecturers and participants alike. Excursions both on land and at sea allowed the participants to experience the Arctic environment and its vulnerability at first hand and offered welcome breaks from the intense scientific program.

In organizing this scientific program, great care was taken to cover a wide as possible range of subjects. This was also reflected by the different backgrounds of the lecturers and participants alike: Grae Worster, professor from the University of Cambridge Applied Maths Department, lectured on the physical processes essential to understanding the small-scale structure of sea ice; meteorologist Anna Sjöblom from the University Centre in Svalbard held lectures on the interaction between sea ice and the atmosphere; biologist Igor Melnikov gave an overview of the biological importance of sea ice; Pat Langhorne, professor in physics at the University of Dunedin in New Zealand discussed the processes of the interaction between sea-ice and the Southern Ocean. Other lecturers covered subjects as diverse

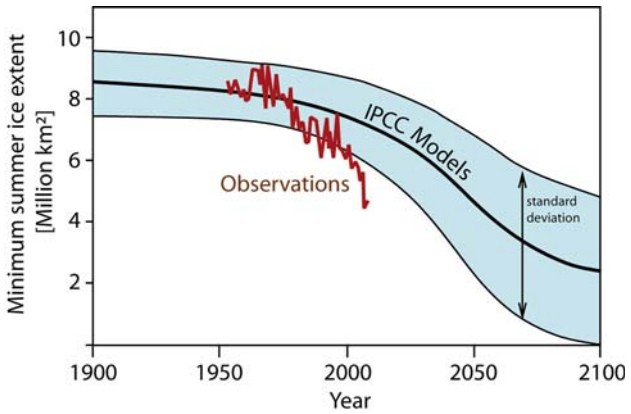

Fig. 1 Comparison of the projected and of the observed evolution of the Arctic sea-ice cover during summer. The projections are model results as obtained for the A1B-emission scenario from the last IPCC report. (For details compare: Stroeve et al. (2007) Arctic sea ice decline: Faster than forecast, Geophys Res Lett, 34, L09501. doi: 10.1029/2007GL029703)

Fig. 2 Area around Svalbard, Norway. Photo: Karolina Widell

as the heat exchange at the bottom of the ice, biogeochemical properties of sea ice, remote sensing, optical properties of sea ice and sea-ice dynamics. All lectures were made available to the school participants through an internal website, which is planned to be opened to the general public in the foreseeable future (see http://www.seaice.info/ for an overview of all lecturers and their topics).

The school was aimed mostly at students at a graduate level. The participants were asked to present a poster of their work during two extensive poster sessions (see Fig. 3). Together with the lectures, these sessions formed the main scientific core of the school. Additionally, hands-on computer exercises allowed the students to experience some of the difficulties in modelling sea ice themselves.

To give the science community an up-to-date overview of our current understanding of sea ice, a textbook is planned to be published from the school's lectures. This book will be made available online through our website and be published as a "real" textbook in late summer 2009.

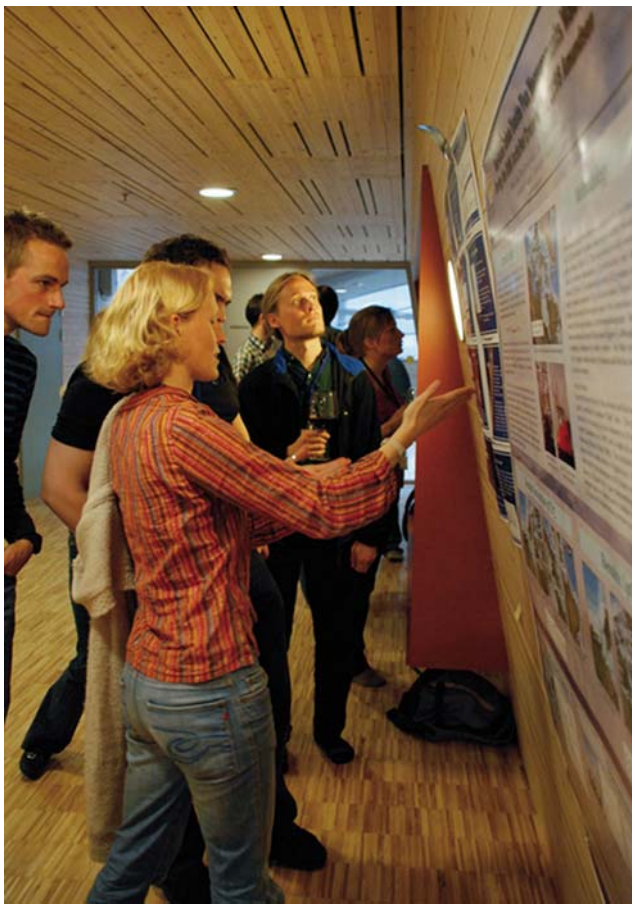

Fig. 3 Poster session. Photo: Karolina Widell

Due to the extraordinary success of the school, a subsequent similar event may hopefully happen in the near future. Given the current speed with which sea ice disappears in Arctic summers, our understanding of this amazing component of the Earth's climate system rapidly increases and makes such schools vital.

AGI's Environmental Geoscience Program disseminates news

Anne Marie de Grosbois

The American Geological Institute's Environmental Geoscience Program reports news to the environmental professional in the geoscience community via its continually updated webpage: http://www.agiweb.org/environment/index.html. Current environmental geoscience related activities of the US government and its agencies can be found here. Numerous links give direct access to reports, environmental impact statements, fact sheets, conference websites, and Internet seminars. The following news excerpts reflect the diversity of AGI's online news bulletins in recent months:

- DOI: The Office of Surface Mining Reclamation and Enforcement (OSM) announces the availability of a final environmental impact statement, which analyzes the potential impacts of a rule concerning excess spoil, coal mine waste, and stream buffer zones. The report is available on the internet at http://www.regulations.gov, Document ID OSM-2007-0008-0553.
- DOE: The Department of Energy announces its intent to prepare an additional supplement to previous environmental impact statements for the proposed nuclear waste repository at Yucca Mountain, Nevada, to consider repository-related impacts on groundwater.
- Nanotechnology for Site Remediation (EPA 542-F-08-009): This EPA fact sheet presents a snapshot of nanotechnology and its current uses in remediation.
- Technology News and Trends (EPA 542-N-08-005): This issue highlights innovative approaches for addressing contaminated sediment sites. View or download at http://clu-in.org/techpubs.htm.
- EUGRIS: New Documents available at EUGRIS, the platform for European contaminated soil and water information. More than 26 resources, events projects and news items were added to EUGRIS 1–24 October, 2008. These can be selectively viewed at http://www.eugris.info/whatsnew.asp.

What the Earth might be like in 2050?

Anne Marie de Grosbois

In 2006 the International Geosphere–Biosphere Programme (IGBP) launched the research initiative "The Planet in 2050". Based on expert knowledge from a wide range of disciplines, it was to address what the Earth might be like in 2050. In October 2008 in Lund, Sweden, an exploratory workshop and meeting of high profile experts from 22 countries confirmed that climate change, water and food scarcity, energy security and dangerous pollution were problems that were urgent and happening faster than expected across all aspects of the Earth system. The comments and vision papers of the participants may be read at: http://www.theplanet2050.org/. "The Planet in 2050" project has sought to define desirable visions of the planet at the next half-century and identify pathways to achieve them, obstacles and opportunities. The project has announced its plans to publish a public report in a book form. Visit the project page on IGBP's website http://www.igbp.kva.se/page.php?pid=370 for more details.

Google invests in geothermal

Anne Marie de Grosbois

Google.org (the philanthropic arm of Google.com) has launched in an initiative entitled "Renewable energy cheaper than coal" with a goal to produce 1 GW of renewable energy capacity within a time frame of years. This ambitious initiative focuses on a broad range of potential alternative technologies that encompass solar thermal power, advanced wind, enhanced geothermal systems and others. In addition to Google's already established own R&D branch for renewable technology, Google.org announced in 2008 financial support of over $10 million (USD) for the projects of one university and two companies working on geothermal energy. These projects include R&D developments for enhanced geothermal systems and heat mapping reconnaissance.

More information on enhanced geothermal systems, including a 3D model of a project in Australia, a Google Earth layer, and an introductory YouTube video can be found at their websites: http://www.google.org/egs (see image Fig. 4) and http://www.google.org/rec.html.

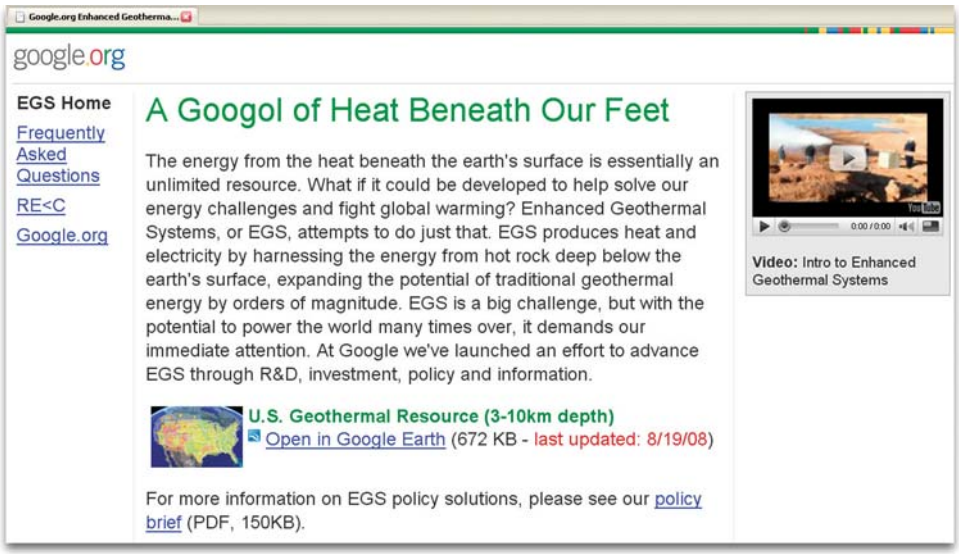

Fig. 4 Screenshot of Google.org website