



SCARnewsletter

issue 31

december 2012

Welcome to the December edition of the SCAR Newsletter.

Firstly I'd like to wish everyone a happy holiday season, especially those of our colleagues working South over the period. As ever during this time of year, there are many scientists and support personnel undertaking a huge variety of exciting science, often in difficult circumstances. However, I would like to highlight the various groups working to uncover the secrets of the subglacial lakes in Antarctica – in particular those at Lake Ellsworth (<http://www.ellsworth.org.uk>), the WISSARD team (<http://www.wissard.org>) and the Russians at Lake Vostok. We wish them all a successful season and look forward

to some exciting discoveries...!

Looking forward, the SCAR Strategic Plan 2011-2016 calls for a "Horizon Scanning" activity every four or five years to support SCAR's leadership role in Antarctic science and to assist the organization in planning future directions and resource allocations. At the SCAR Delegates' Meeting, it was agreed to form an Action Group to begin planning and fundraising for such a "Horizon Scanning" activity to be tentatively held in 2014, coinciding with the SCAR biennial meetings in New Zealand (<http://www.scar2014.com>). It is expected that the activity will enhance SCAR's position as a leader in international Antarctic and Southern Ocean science.

The outcomes from this process will support development of SCAR's next Strategic Plan. The first of the planning meetings for this activity is being held in Cambridge this December – for further details see: <http://www.scar.org/horizonscanning/>.

Coming up next year we also have the SCAR Biology Symposium (<http://www.icm.csic.es/XIthSCAR-BiologySymposium/>) in Barcelona, Spain. The SCAR Executive Committee will also meet immediately after. A second circular is now available from the symposium website.

Mike Sparrow,
Executive Director, SCAR

Scanning the Horizon in 2014



Image by Mike Sparrow

Highlights in this issue

- *SCAR focus on* . . . Humanities - pages 2 and 3
- News from SCAR - page 4
- Antarctic Science - page 5
- Antarctic and Polar News - page 6
- Polar News - page 7
- APECS News and Updates - page 7
- Forthcoming Events - page 8

SCAR focus on . . . Humanities

History Expert Group

During the XXXII SCAR OSC in Portland (2012), the SCAR History Expert Group organised a session on “*Historical views on Gateways to Antarctica*”, which focused on the significance of port cities and the exchanges between Antarctic expeditions and local communities. Presentations showcased how colonial outposts like Punta Arenas in Chile and Ushuaia in Argentina changed to important harbour cities or how the Third German Antarctic Expedition (1938/39) influenced later expeditions to Dronning Maud Land. Other papers explained how classrooms can be used as a “Gateway to Antarctica” in the past and present or how Antarctic theatre in the classroom helps to describe the political relation between Chile, Great Britain and the USA. An additional poster described the dedication of three generations of one Russian family to Antarctic research (1955-2012).



Figure 1: From left to right: Adrian Howkins, Jason Kendall Moore, Cornelia Lüdecke, Aant Elzinga, and Colin Summerhayes

The second session of the History EG dealt with “*Voicing Silences in Antarctic History*”, providing a forum for new perspectives on the history of the Antarctic. Papers demonstrated the “in-corporation” of the landscape as a phenomenological approach to the archaeology of the South Shetland Islands to unveil the unwritten past or introduced the British Antarctic Oral History Project for unveiling the unofficial stories of the past. Other topics discussed the history of unsung heroes of the personnel of the first Chilean Antarctic expedition to the Base O’Higgins in 1948,

the aspect of racialisation of Antarctica in South Africa (1955 – 2005), the history of exploration as political performance, the history of SCAR and its close linkage to the Antarctic Treaty, as well as changing perceptions of Antarctic wildlife in form of pliable penguins or the scientific and environmental diplomacy of Antarctica’s marine living resources and ecosystem in the period 1968-1980 within CCAMLR. During the following poster session, Griffith Taylor’s missing lake gave an example of how history can influence science in McMurdo Dry Valleys, while historical cartography and archaeology added to the well

known Antarctic chronology of exploration by voicing the sealers and whalers of the 19th century. Information on the Antarctic Legacy Project as a digital platform for South African Antarctic history since 1959 was also presented.

Finally the SCAR History EG presented the first “Lewander Lecture”, which was created to commemorate one of her founding members, Lisbeth Lewander from Sweden, who passed away early this year. The lecture should be inspiring and deal either with new methods and ideas related to the history of polar research, or with knowledge based on decades of original research. The lecture was given by Heidi Prozesky and her colleague Lize-Marié Van der Watt from South Africa (pictured left) on “*The triple burden of masculinity: A gender analysis of South African Antarctic and sub-Antarctic science, c. 1961-2011*”.

The history sessions of the SCAR OSC 2012 were a great success with about 70 people attending at a time: 19 scholars came from Argentina (2), Australia (1), Chile (2), Germany (1), France (1), United Kingdom (4), Russian Federation (1), Sweden (1), South Africa (3) and USA (3) to present 12 talks and 4 posters.

Cornelia Lüdecke
Chair SCAR History Expert Group,
Munich

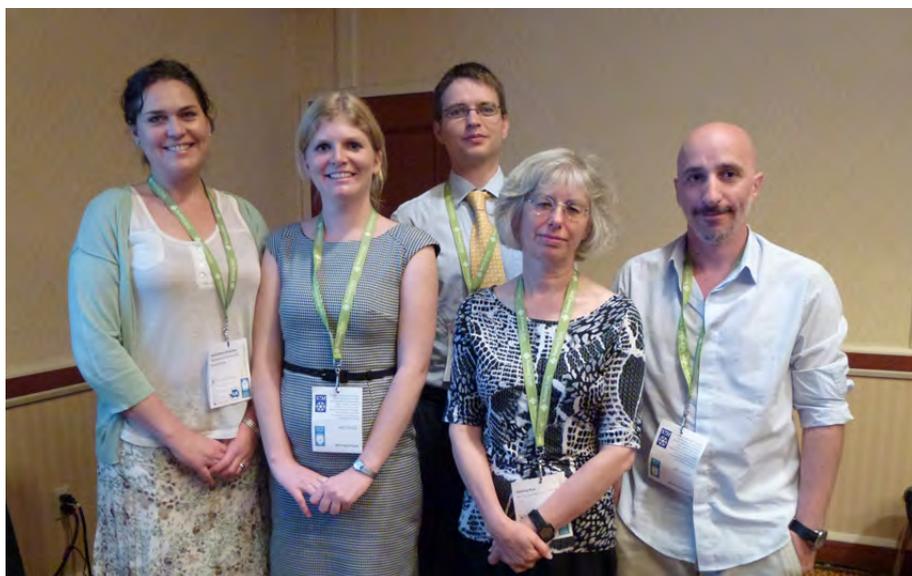


Figure 2: From left to right: Heidi Prozesky, Lize-Marié van der Watt, Peder Roberts, Joanna Rae, and Andrés Zarankin

SCAR focus on Humanities

Social Sciences Action Group

Exploring Human Connections to the Antarctic at the SCAR Open Science Conference.

Under the broad theme “Antarctic Science and Policy Advice in a Changing World”, this year’s SCAR Open Science Conference (OSC) in Portland, Oregon, marked the first OSC for the SCAR Social Sciences Action Group (SSAG) to run its own sessions. Dedicated to transpolar social sciences, one of these sessions explored “Changing Poles: Challenges to Antarctic and Arctic Communities and Institutions” and enabled the SCAR SSAG to connect with their Arctic colleagues. As a short article reflecting on this session is published in the International Arctic Social Sciences Association newsletter “Northern Notes” (Issue 38), we will focus here on the second session run by SSAG representatives at the SCAR OSC.

This session, titled “Human Connections to the Antarctic and Antarctic Values” touched on a wide range of current issues, from questions of environmental management related to value judgements to experiencing and living in Antarctica, to value motivations and perceptions. Setting the framework for this session was Sira Engelbertz’s paper on the role of values in Antarctic policy which provided a fascinating overview of value theory and the implications of values on political decision-making, especially with regard to climate change policy. Another excellent paper was then given by Gary Steel, who discussed value motivations and pro-environmental behaviour in the Ross Sea Region and their strong implications for Antarctic policy and management. On a similar note, Juan Salazar’s thought-pro-

voing and well-received assessment of values and opinions about Antarctica held by Chilean nationals stressed the importance of understanding Antarctic values and knowledge practices for more effective decision-making. Oleksandr Kuzko then offered a quantitative approach to identifying Antarctic values and risks brought along by human activity in the Antarctic. Rohani Mohd Shah offered fascinating insights into the challenges associated with integrating the 1991 Protocol on Environmental Protection to the Antarctic Treaty into Malaysian law. Finally, in a very passionate and vivid presentation, Viviana Alder discussed the role of both Antarctic science and education in the development of a more, peaceful and equitable future of global society.

This session, which brought together social scientists from a range of different countries and disciplinary backgrounds, offered an excellent platform to learn of different approaches to researching and understanding human values, perspectives, motivations and connections with the Antarctic continent. It explored some of the many challenges faced nowadays by Antarctic policy-makers and stressed that these challenges and many of the still unanswered questions cannot be addressed by individual researchers or within individual disciplines. As Steven Chown emphasised in his keynote address at the SCAR OSC, it will take the collaboration of natural, social and human scientists to meet contemporary challenges humankind faces with regard to Antarctica (and beyond).

There is a huge potential within SCAR to forge a closer integration between the

natural sciences, the social sciences, and the humanities as it is already taking place in several contexts, e.g. in climate change research. On the one hand, this would entail that concepts and methods from the social and human sciences be understood and appreciated by other scientific communities and are included in Antarctic research from the outset, and not just as an add-on linked to dissemination or outreach. On the other hand, an integration of the “hard” and “soft” sciences requires that, if the social and human sciences are to be valued in 21st century Antarctic research, a new relationship is required between these two categories, namely one where the social and human sciences can move beyond commentary and critique. This includes, for example, engaging with physical observation, analysis and modelling systems, as well as with literary texts, social histories and geopolitics. The social sciences and humanities have a critical role to play if we are to produce more holistic and integral understanding of the future challenges confronting Antarctica and how to act on them.



**Workshop announcement:
Joint SCAR History EG/SSAG workshop in Cambridge, UK (1-5 July 2013)**

We are pleased to announce that the SCAR History Expert Group and the SCAR Social Sciences Action Group will hold a joint workshop that will focus on the past, present and future of human connections to the Antarctic (and the polar regions in general) in Cambridge, UK, from 1-5 July 2013. We welcome contributions and participation from Antarctic researchers and our Arctic colleagues to stimulate debate, academic engagement and future dialogue.

A limited amount of funding will be made available to offer a small number of travel grants for research students (PhD and Masters) to attend the workshop - these travel fellowships will be granted on the basis of merit, need (e.g. lack of other funding), and the quality of the abstract submitted.

Those interested in applying for these travel fellowships should submit their applications by 28 February 2013 at the latest. We expect these

applications to include a 200-300 word abstract for a research presentation to be given at the workshop, a short one-page application letter detailing career status and need for travel funding as well as an estimated travel budget.

Please submit your applications by **28 February 2013** to both:
Conny Luedecke (C.Luedecke@lrz.uni-muenchen.de)
chair of the SCAR History EG, and
Daniela Liggett (daniela.liggett@canterbury.ac.nz)
co-chair of the SCAR Social Sciences AG.

If no travel funding is sought, abstracts to be considered for presentation at the workshop should be submitted to Conny and Daniela by 31 March 2013.

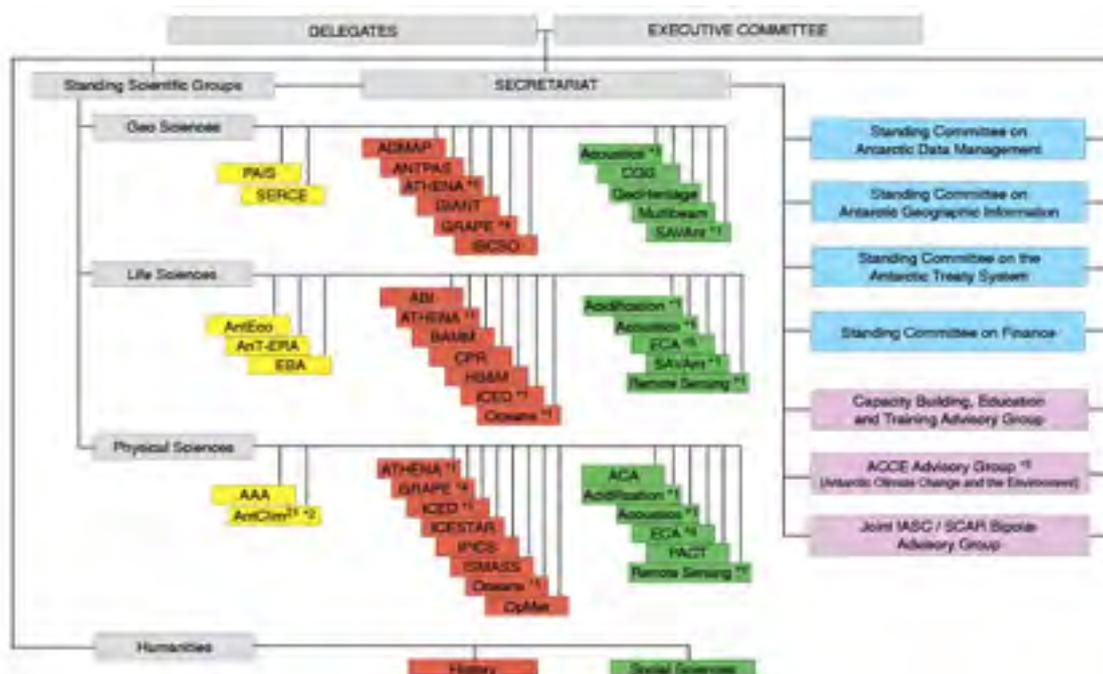
We look forward to seeing many of you at the workshop.

News from SCAR

New Version of the SCAR Organisation Chart

The SCAR Organisation Chart has been updated to take into account the outcomes of the SCAR Meetings held in Portland in July.

To view the full chart and the list of acronyms, please go to the Organisation section of the SCAR website: <http://www.scar.org/about/introduction/organization/>



Our Antarctica – images from the Great White South



Image: René Robert (Belgium) - Abandoned Sledge

A joint SCAR/COMNAP photographic competition was held in early 2012 and resulted in submissions from 22 countries from both scientists and logisticians.

An international jury selected 53 of the photographs for exhibition and both Winners and Highly Commended for each category. A grant from COMNAP allowed the images to be printed and framed for exhibition and they were first displayed at the XXXII SCAR Open Science Conference in Portland, Oregon in July. It is intended to exhibit the collection in several other countries over the next two years.

To see all the the winning and highly-commended photos, visit the Photographic Competition page in our Conferences section: <http://www.scar.org/conferences/photocompetition/>

Ice Sheet Mass Balance and Sea Level workshop: Outcomes available

On 14 July in Portland, prior to the SCAR Open Science Conference, a workshop was held on Ice Sheet Mass Balance and Sea Level. This workshop, sponsored by ICSU (International Council for Science), SCAR, IASC (International Arctic Science Committee), WCRP (World Climate Research Programme), IGS (International Glaciological Society) and

IACS (International Association of Cryospheric Sciences) with support from CliC (Climate and Cryosphere) and APECS (Association of Polar Early Career Scientists), had a number of aims including assessing the current knowledge of the contribution of the Antarctic and Greenland Ice Sheets to global and regional sea level and planning the future of the joint

SCAR/IASC Ice Sheet Mass Balance and Sea Level Expert Group. The workshop was chaired by Francisco Navarro, Frank Pattyn and Edward Hanna.

Thanks to APECS and CliC, movies of all the presentations are available from the ISMASS Workshop website: <http://www.climate-cryosphere.org/en/events/2012/ISMASS/Results.html>

Antarctic Science

Life abounds in Antarctic lake

The mystery of the expansion of sea ice around Antarctica, at the same time as global warming is melting swaths of Arctic sea ice, has been solved using data from US military satellites. Two decades of measurements show that changing wind patterns around Antarctica have caused a small increase in sea ice, the result of cold winds off the continent blowing ice away from the coastline.

This summer saw a record low in Arctic sea ice since satellite measurements began 30 years ago. In their paper, Holland

and Kwok show the changing pattern of sea ice at both poles would also affect global ocean circulation, with unknown effects. They note that while Antarctic sea ice was growing, the Antarctic ice cap – the glacier and snow pack on the continent – was losing mass, with the fresh water flowing into the ocean.

The research on Antarctic sea ice, published in *Nature Geoscience*, revealed large regional variations. In places where warm winds blowing from the tropics towards Antarctica had become stronger,

sea ice was being lost rapidly. Holland stated, “The Arctic is losing sea ice five times faster than the Antarctic is gaining it, so, on average, the Earth is losing sea ice very quickly. There is no inconsistency between our results and global warming.”

For more information, see the *Guardian - Environment website* (http://www.guardian.co.uk/environment/2012/nov/11/poles-scientists-antarctic-sea-ice?CMP=tw_t_gu) or read the full article in *Nature GeoScience* (<http://www.nature.com/ngeo/journal/v5/n12/full/ngeo1627.html>).

Poles apart: satellites reveal why Antarctic sea ice grows as Arctic melts

It is permanently covered by a massive cap of ice up to 27 metres thick, is six times saltier than normal sea water, and at -13 °C is one of the coldest aquatic environments on Earth — yet Lake Vida in Antarctica teems with life.

Scientists drilling into the lake have found abundant and diverse bacteria. “Lake Vida is not a nice place to make a living in,” says Peter Doran, an Earth scientist from the University of Illinois at Chicago and a member of the team that has been exploring the lake — the largest of a number of small bodies of water in the McMurdo Dry Valleys Antarctic desert. “It is quite remarkable that something wants to live in that cold, dark and salty environment at all.”

Doran and his colleagues have drilled into Lake Vida twice: once in 2005 and again in 2010. The remarkable array of microbial life that they found is described in *Proceedings of the National Academy of Sciences*.

Lake Vida is an exceptional environment: because it is ice-sealed, it is likely to be

very different in terms of geochemistry and biology from Antarctica’s numerous subglacial rivers and lakes, which have been under several-kilometre-thick parent ice for millions of years. But efforts are under way to sample three subglacial lakes in various parts of the frozen continent.

Over the next two months, British, US and Russian teams plan to drill into and probe lakes Ellsworth, Whillans and Vostok. These waters may yield clues as to what conditions are needed to support life on Earth and other planets, the teams hope.

Although Lake Vida has not been isolated for nearly as long as the subglacial lakes, the discovery of diverse microbial life below its ice is significant in its own right, says Martin Siegert, a glaciologist at the University of Bristol, UK, who is leading the British Antarctic Survey’s expedition to Lake Ellsworth.

“It is another extreme place where life is found and it provides evidence of a different set of boundary conditions in which life can exist,” he says. “Lake Vida’s extreme saltiness, too, marks a likely difference —

although in truth we’ll only know that for sure next month.”

For more information on the Lake Vida project, please read the article on the *BBC News - Science and Environment website* (<http://www.bbc.co.uk/news/science-environment-20501574>) or see the original paper in *PNAS* (<http://www.pnas.org/content/early/2012/11/21/1208607109>).

For more information on subglacial lake drilling, please see the article in *Nature News* (<http://www.nature.com/news/hunt-for-life-under-antarctic-ice-heats-up-1.11856>).



British Field Camp at Lake Ellsworth
Image: British Antarctic Survey

Winds of Change

Antarctica’s fate is not as simple as that of an ice cube melting in the sun, scaled up a trillionfold.

Jane Qiu discusses the role of Antarctica in the global climate in an article in the journal *Science*: <http://www.sciencemag.org/content/338/6109/879.full>

Workshop on the Climatic Effects of Ozone Depletion in the Southern Hemisphere

WCRP is organising a Special Workshop on the “*Climatic Effects of Ozone Depletion in the Southern Hemisphere: Assessing the Evidences and Identifying the Gaps in Current Knowledge*”. This is a cross-cutting, interdisciplinary workshop whose aim is to promote an enriching exchange from multiple perspectives on the consequences of ozone depletion upon the climate of the Southern Hemisphere.

The workshop will be held in Buenos Aires, Argentina from 25 February to 1 March 2013. The Registration deadline is **15 January 2013**. Abstract submission ended on 30 November 2012.

For more information, please visit the Workshop website: <http://www.uca.edu.ar/index.php/site/index/es/uca/investigacion/pepacg/wcrp-special-workshop/>

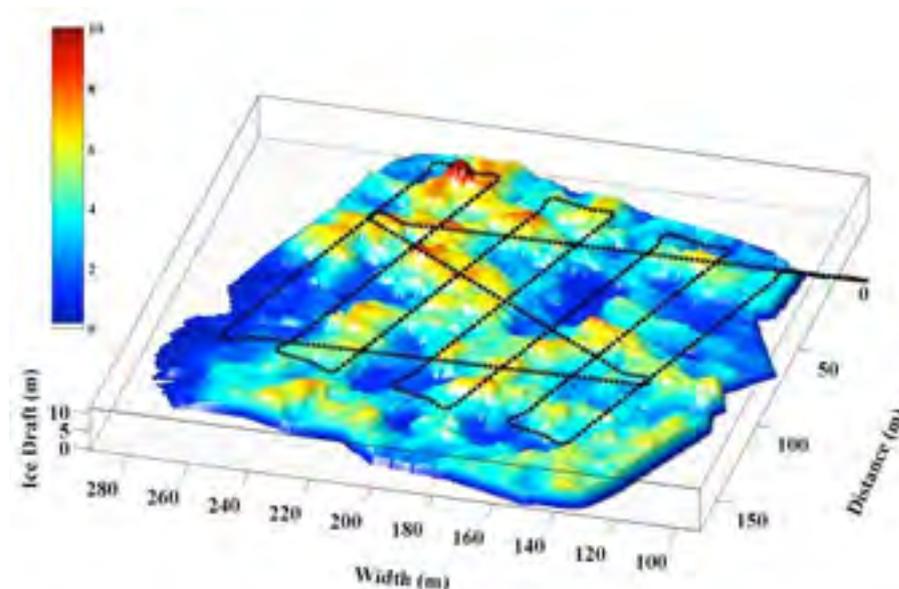
Antarctic and Polar News

SIPEX II produces first 3D map of Antarctic sea ice

Scientists from eight countries (Australia, Belgium, Canada, France, Germany, Japan, New Zealand and the United States) have created the first detailed 3D map of the underside of sea ice in Antarctica.

Working aboard the Australian Antarctic Division's *Aurora Australis* under SIPEX II (the 2nd Sea Ice Physics and Ecosystem eXperiment, a long-term mission to map Antarctic sea ice), the team deployed an autonomous underwater vehicle (AUV) to map the topography of the ice from below. Using multibeam sonar, the robot submarine was able to create a clear picture of the inverted 'mountains and valleys' in the sea ice, giving a clearer picture of its volume and thickness.

By combining this with data from satellites and helicopter surveys, the scientists are getting a better understanding how the sea ice is changing over time due to the changing climate. This in turn will give insight into how climate change is affecting not only the sea ice and the ocean, but also the ecosystems influenced by sea ice and the biota that inhabit them. Changes in sea ice thickness also influence the formation of cold, salty Antarctic bottom wa-



A preliminary 3-D map produced from multibeam sonar data collected by the AUV under an ice floe on 4 October 2012. The map shows a typical 'lawnmower' grid of about 150 x 150 m and the depth bar on the left shows deeper ice in red (up to about 10 m below the surface) and shallower ice in blue. Image © AUV team/Australian Antarctic Division

ter, which drives the global thermohaline circulation and influences global climate.

For more details, watch the video on *YouTube* (<http://www.youtube.com/watch?v=4mJCVDs08wk&noredirect=1>) or read the news item on the Australian Antarctic Division's website (<http://www.antarctica.gov.au/media/news/2012/first-3-d-map-of-under-the-east-antarctic-sea-ice>).

ish staff, which included marine biologists, geologists and mechanics.

Horror Film shot in Antarctica

Scottish climbing instructor and documentary-maker Kirk Watson filmed *South of Sanity* while working for the British Antarctic Survey (BAS). Rated '18' by the British Board of Film Classification, the movie follows 14 staff at an Antarctic station as they are stalked by a killer. Shot entirely in the Antarctic, the horror movie's cast and crew were made

up of fellow BAS contractors and staff.

In winter, when the continent is locked in darkness and freezing conditions, staff learn skills such as woodwork and black and white photography to help while away their free time. Mr Watson decided to hone his film-making by shooting a low budget fictional feature with help from other Brit-

ish staff, which included marine biologists, geologists and mechanics.

The film was premiered in Aviemore on 31 October. For more information, see the full article on the *BBC News - Highlands and Islands* website: <http://www.bbc.co.uk/news/uk-scotland-highlands-islands-19980602>

Warming and melting

Mass loss from the ice sheets of Greenland and Antarctica account for a large fraction of global sea-level rise. Part of this loss is because of the effects of warmer air temperatures, and another because of the rising ocean temperatures to which they are being exposed.

Joughin et al. review how ocean-ice interactions are impacting ice sheets and discuss the possible ways that exposure of floating ice shelves and grounded ice margins are subject to the influences of warming ocean currents. Estimates of the mass balance of the ice sheets of Green-

land and Antarctica have differed greatly - in some cases, not even agreeing about whether there is a net loss or a net gain - making it more difficult to project accurately future sea-level change.

Shepherd et al. combined data sets produced by satellite altimetry, interferometry, and gravimetry to construct a more robust ice-sheet mass balance for the period between 1992 and 2011. All major regions of the two ice sheets appear to be losing mass, except for East Antarctica. All told, mass loss from the polar ice sheets is contributing about 0.6 millimeters per year

(roughly 20% of the total) to the current rate of global sea-level rise.

For more information, read the article in *Nature News* (http://www.nature.com/news/grim-picture-of-polar-ice-sheet-loss-1.11921?WT.ec_id=NEWS-20121204) and see the full papers in *Science*:

Joughin et al. "Ice-Sheet Response to Oceanic Forcing": <http://www.sciencemag.org/content/338/6111/1172>

Shepherd et al. "A Reconciled Estimate of Ice-Sheet Mass Balance": <http://www.sciencemag.org/content/338/6111/1183>

Polar News

Future Earth Initiative is announced

Future Earth is a new 10-year international research initiative that will develop the knowledge for responding effectively to the risks and opportunities of global environmental change and for supporting transformation towards global sustainability in the coming decades. *Future Earth* will mobilize

thousands of scientists while strengthening partnerships with policy-makers and other stakeholders to provide sustainability options and solutions in the wake of Rio+20. It will build on the success of existing global environmental change programmes (Diversitas, IGBP, IHDP, WCRP and ESSP), to help develop a stronger

and broader community.

For more information, visit the *Future Earth* website: http://www.icsu.org/future-earth?utm_source=Future+Earth+newsletter&utm_campaign=c02569927e-Future_Earth_Newsletter_October_2012&utm_medium=email

The International Polar Initiative (IPI)

To address the emerging challenges identified within the IPY, a new and novel framework for long-term cooperation between the stakeholders with mandate and interest in the Polar Regions, entitled “International Polar Initiative” (IPI), has been proposed. An

International Steering Group is currently developing the concept for this long-term initiative. Based on the input from various international organizations and communities, the Steering Group is aiming at designing a common implementation plan for the development of observing systems,

research, services, related education and outreach, and practical applications of scientific knowledge in the Polar Regions.

See the latest version of the draft concept at <http://www.iasc.info/home/initiatives/22>

APECS News and Updates

On December 1st we had a joint Antarctica Day 2012 celebration between the Foundation for the Good Governance of International Spaces (Our Spaces), APECS, Teachers and Researchers (PolarTrec), and Polar Educators International (PEI). Another year of great community driven activities! Check out at Our Spaces website: <http://www.ourspaces.org.uk/?q=node/143>.

At the beginning of November, representatives of APECS and UK Polar Network took part in a traditional meeting called “*Antarctica 100*” that was hosted by the Scott Polar Research Institute, organized by the UK Antarctic Heritage Trust, and visited by HRH The Princess Royal Anne. More about this activity at <http://apecs.is/antarctica-100-meeting>.

APECS is preparing for next year’s XXXVI Antarctic Treaty Consultative Meeting (ATCM) to be held in Brussels in May 2013. APECS Belgium, a great and enthusiastic national committee that includes a large number of Antarctic scientists, is eager to organize a set of activities during the week of the ATCM meeting. This will include plans for an Antarctic science fair for the general public. During this event, we plan to have several labs from all around Belgium, that focus on Antarctic research, to set up small experiments to explain their work, as well as educating the general public about the extraordinary work that comes out of Antarctica. Additionally, they may plan a photo exhibition and talks from several generations of Antarctic scientists to tell about their fieldwork and experiences in the Antarctic. At the same time, this event might become another good step in forming the APECS BeNeLux synergy. More from APECS Belgium in the next months on their Facebook page - <https://www.facebook.com/apecs.belgium>.

The last big international event of the year, the AGU Fall Meeting, was also marked by APECS’ involvement. APECS representatives held a Panel Discussion (<http://apecs.is/agu-panel-2012>) and took part in a number of side meetings (e.g. Cryospheric Organizations and International Polar Initiative meetings). Some inspiring news came from the AGU where Allen Pope, former APECS President and current Executive Committee Ex-Officio, was elected among several students to serve on the AGU Council for 2013-2014. “This is the whole new level,” says Allen and



enables the APECS community to contribute to better synergies between APECS and AGU in the future with more opportunities for APECS members! Read more here (<http://apecs.is/pope-agu-council>).

Latest developments on the APECS website include an introduction of new Research Highlights Concept. Now APECS members can highlight their recently published research findings in a short (1 paragraph) and popular way through a separate page created on the APECS website - <http://apecs.is/research/research-highlights>. It is organized in the form of a database that can be updated with descriptions, list of authors, and a link to the original publications.

We concluded a series of 8 APECS Career Development Webinars at the beginning of December. Thanks to Kristin Timm, our webinars coordinator, and support from our partners High North Academy and Bredbandfylket, all these webinars are now available online. Another new feature we created is the introduction of a “Tip Jar” option on the APECS Vimeo Channel (<http://vimeo.com/apecs>). Now all APECS career development webinars and other videos are accompanied by a donation button. Contributions are collected and will be forwarded towards the next series of webinars.

The new APECS Executive Committee and Council 2012-13, elected in October, have been active over these last few months and are enthusiastic to challenge themselves with new tasks in the coming year.

On behalf of the APECS leadership, we wish the Polar Community wonderful holidays! Merry Christmas and Happy New Year!

Contributed by A. Pavlov, P. Wagner and the APECS Executive Committee

Forthcoming Events



The main theme of this meeting is the examination of high frequency climate changes reflected in the geological re-

Holocene Climate Change Meeting 4 - 5 April 2013, Burlington House, London, UK

cord, and the paces of change and their geological consequences, during the Holocene – the past 11,700 years. The results of the meeting should help to inform the ongoing deliberation of the IPCC and

to dispel some current misconceptions.

For more information, visit the Holocene Meeting website:

<http://www.geolsoc.org.uk/holocene13>

XIth SCAR Biology Symposium

'Life in Antarctica: Boundaries and Gradients in a Changing Environment'

15-19 July 2013, Barcelona, Spain



This symposium links the functional importance of land and water ecosystems and their biocomplexity under an ecosystemic perspective in order to understand the Antarctic trophic web, effects of human impacts such as the ozone hole, climate change, the increase in tourism activities, the flexible boundaries and dynamic gradients in the Antarctic ecosystem, and Antarctic marine biodiversity through its patterns, processes and trends.

An important aspect of the symposium is outreach and education, which will emphasize the importance of communication between polar researchers and educators to improve understanding and connections between scientists and society. The general public

will be able to take an active part in post-symposium hands-on activities, open lectures, seminars, courses and exhibitions. APECS Spain will be highly involved by organizing round table sessions and preparing outreach content.

The symposium will be also the perfect opportunity to show the final results of the SCAR programme "Evolution and Biodiversity in the Antarctic" (EBA). Similarly, the new SCAR programmes "State of the Antarctic Ecosystem" (AntEco) and "Antarctic Thresholds - Ecosystem Resilience and Adaptation" (AnT-ERA) will be presented to the scientific community and will outline their objectives and perspectives for the coming years.

Abstract submission and Registration are now open:

www.icm.csic.es/XIthSCARBiologySymposium/abstract.php

www.icm.csic.es/XIthSCARBiologySymposium/registration.php

Second Circular is now available:

www.icm.csic.es/XIthSCARBiologySymposium/documents/second_circular.pdf

For more information, visit the Symposium website:

www.icm.csic.es/XIthSCARBiologySymposium/



For details of further events, please visit: <http://www.scar.org/events/>

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