

## **Ice-Sheet Mass balance and sea level (ISMASS) 2012 Workshop**

The ISMASS 2012 Workshop was held on 14 July 2012 in Portland, Oregon, USA, under the auspices of the XXXII SCAR and Open Science Conference. More than 60 participants from all five continents attended the workshop, which was co-sponsored/supported by the Scientific Committee on Antarctic Research (SCAR), the International Arctic Science Committee (IASC), the World Climate Research Programme (WCRP) Climate and Cryosphere (CliC) Project, the International Council of Scientific Unions (ICSU), the International Glaciological Society (IGS), the International Association of Cryospheric Sciences (IACS) and the Association of Polar Early Career Scientists (APECS). A substantial ICSU grant, complemented by contributions from the other sponsors, allowed funding the participation of many young researchers and eight invited lecturers. The latter were Erik Ivins (JPL, Caltech), Ben Smith (Univ. Washington), Pippa Whitehouse (Durham Univ.), Jay Zwally (NASA), Catherine Ritz (LGGE, Grenoble), Slawek Tulaczyk (Univ. California Santa Cruz), Catia Domingues (ACE CRC) and Robert Nicholls (Univ. Southampton).

The workshop was organized by the ISMASS Interim Steering Committee, formed of Francisco Navarro (appointed by IASC), Frank Pattyn (appointed by SCAR) and Edward Hanna (appointed by WCRP).

Among the main objectives of the workshop were:

- 1) the assessment of the current knowledge of the contribution of the Antarctic and Greenland Ice Sheets to global and regional sea-level rise (SLR), with a focus on quantifying the uncertainties, and on understanding and resolving the current discrepancies among the estimates from different observational and modelling methods;
- 2) the analysis of how model-based predictions of ice-sheet discharge contributions to sea-level changes can be improved, with an emphasis on identifying the main shortcomings of the currently available models and suggesting improvements for the next generation of ice-sheet models.

The workshop was organized as a series of invited lectures on the above topics and closely related ones, followed by three round-tables (Ice-sheet mass balance from remote sensing, and GIA; Modelling of ice-sheet dynamics; Contributions from thermal expansion of oceans, and impacts of SLR), and ended with an open discussion on organizational aspects of the ISMASS expert group.

A review paper and a report are being prepared that will include the main scientific outcomes of the workshop. A summary of the main outcomes, the invited lecture abstracts and videos of the entire sessions can be found at the workshop website

<http://www.climate-cryosphere.org/en/events/2012/ISMASS/Results.html>

Among the outcomes, it became apparent that recent efforts and inter-comparison experiments have led to an improved convergence of the estimates of ice-sheet mass balance determined using the three satellite geodetic techniques of altimetry, interferometry, and gravimetry, though some discrepancies still remain. A consensus was reached that new post-glacial rebound (PGR) models tested and evaluated against geodetic GPS data, lead to significant downwards revision in PGR and GRACE gravimetric satellite estimates of mass loss. Furthermore, since the 2007 IPCC report, ice sheet models have been improved beyond the commonly used Shallow-Ice Approximation. An advance in the numerical schemes has been accompanied by improved model representation of the complex interactions of the ice-sheet with its bed, atmosphere and ocean. However, there is still much room for improvement, especially regarding linking together all the model components in a 3D prognostic fashion.

Among the organizational aspects, it was agreed that ISMASS should continue to focus on ice-sheets and, rather than including glaciers and ice caps in its focus of interest, strengthen the co-operation with the existing groups dealing with them (IACS, GLIMS, ...). Similarly, rather than creating focus groups under ISMASS, it was preferred to strengthen the co-operation with, and to serve as a liaison among, the many already existing groups/programmes (IMBIE, IACS, GLIMS, FRISP, SERCE/POLENET, AntClim21, PAIS, ...). It was also agreed, after some debate, that it is not the role of ISMASS to generate updates of cryospheric contributions to SLR in between successive IPCC reports. Other subjects of discussion were the interest of extending the ISMASS expert group to the WCRP, the need to redefine the terms of reference of ISMASS and the need to appoint a new Steering Committee and Chair, a process that is now underway.

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