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The Scientific Committee on Antarctic Research (SCAR) Annual Report for 2012/13

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1. Background

The Scientific Committee on Antarctic Research (SCAR) is a non-governmental, Interdisciplinary Scientific Body of the International Council for Science (ICSU), and Observer to the Antarctic Treaty and the UNFCCC.

SCAR's Mission is (i) to be the leading, independent, non-governmental facilitator, coordinator, and advocate of excellence in Antarctic and Southern Ocean science and research and (ii) to provide independent, sound, scientifically-based advice to the Antarctic Treaty System and other policy makers including the use of science to identify emerging trends and bring these issues to the attention of policy makers.

2. Introduction

SCAR's scientific research adds value to national efforts by enabling national researchers to collaborate on large-scale scientific programmes to accomplish objectives not easily obtainable by any single country. SCAR's Members currently include 37 nations and 9 ICSU scientific Unions.

SCAR's success depends on the quality and timeliness of its scientific outputs. Descriptions of SCAR's research programmes and scientific outputs are available at: www.scar.org. This paper summarises SCAR highlights since the last annual report and future SCAR meetings we believe will be of interest to Treaty Parties. This should be read in conjunction with a separate Background paper that highlights recent science papers published since the last Treaty meeting.

SCAR produces an electronic quarterly Newsletter highlighting relevant science and other SCAR related issues (<http://www.scar.org/news/newsletters/>). Please email: info@scar.org if you wish to be added to the mailing list. As well as the web (www.scar.org), SCAR is also available on Facebook, LinkedIn, Google+ and Twitter.

3. SCAR Highlights (2012/13)

1. New SCAR Scientific Research Programmes

In July 2012, SCAR Delegates approved five new Scientific Research Programmes (SRPs). The new SRPs will continue the important scientific foci of SCAR, whilst expanding into newly identified high priority areas for research, including a stronger emphasis on scientific advice to the Treaty. For further details see <http://www.scar.org/researchgroups/progplanning/>. The new SRPs are:

- **State of the Antarctic Ecosystem (AntEco)**

Biological diversity is the sum of all those organisms that are present in an ecosystem, that dictate how ecosystems function, and that underpin the life-support system of our planet. This programme has been designed to focus on patterns of biodiversity across terrestrial, limnological, glacial and marine environments within the Antarctic, sub-Antarctic and Southern Ocean regions, and to provide the scientific knowledge on biodiversity that can be also used for conservation and management. In essence, SCAR proposes to explain what biodiversity is there, how it got there, what it does there, and what threatens it. A primary product of this programme will be recommendations for its management and conservation.

- **Antarctic Thresholds - Ecosystem Resilience and Adaptation (AnT-ERA)**

AnT-ERA will examine the current biological processes in Antarctic ecosystems, to define their thresholds and thereby determine resistance and resilience to change. The extreme environment and

marked difference in community complexity between the polar regions and much of the rest of the planet may mean that consequences of stress for ecosystem function and services, and their resistance and resilience, will differ from elsewhere. Polar ecosystem processes are therefore key to informing wider ecological debate about the nature of stability and change in ecosystems. The programme will attempt to determine the likelihood of cataclysmic shifts or "tipping points" in Antarctic ecosystems.

- **Antarctic Climate Change in the 21st Century (AntClim²¹)**

The goals of AntClim²¹ are to deliver improved regional predictions of key elements of the Antarctic atmosphere, ocean and cryosphere for the next 20 to 200 years and to understand the responses of the physical and biological systems to natural and anthropogenic forcing factors. A primary form of data that will be used by AntClim²¹ are the global coupled atmosphere-ocean model runs that form the basis of the Fifth Assessment Report (AR5) of the IPCC. Palaeo-reconstructions of selected time periods, recognised as past analogues for future climate predictions, will be used to validate model performances for the Antarctic region.

- **Past Antarctic Ice Sheet Dynamics (PAIS)**

PAIS aims to improve our understanding of ice sheet dynamics during past warm world conditions by:

- targeting the study of vulnerable areas around the continent;
- linking ice-proximal records with coastal and offshore records including far field paleoceanographic and sea level records;
- integrating data into the latest generation of coupled Glacial Isostatic Adjustment (GIA)-Ice Sheet-Climate models.

- **Solid Earth Response and Cryosphere Evolution (SERCE)**

SERCE aims to improve understanding of the solid earth response to cryospheric and tectonic forcing. SERCE will:

- Identify and develop key disciplinary and interdisciplinary science components of a science programme aimed at advancing understanding of the interactions between the solid earth and the cryosphere;
- Coordinate with other groups investigating ice mass change, ice sheet contributions to global sea level rise, glacial isostatic adjustment models of ice caps, etc.;
- Work with groups and research programmes to promote interdisciplinary science using POLENET project data;
- Provide an international framework for maintaining, and potentially augmenting, the remote autonomous POLENET infrastructure.

2. The Southern Ocean Observing System (SOOS)

The Southern Ocean plays a key role in the climate and ecosystem functioning of the whole planet, but understanding has long been hampered by lack of data. A SOOS International Project Office, established in Australia and supported by the Institute for Marine and Antarctic Studies at the University of Tasmania in Hobart and Antarctica New Zealand, supports implementation of the SOOS. A new SOOS data portal has also been established: <http://www.soos.aq/index.php/data/data-portal>. See: www.soos.aq or the accompanying paper.

3. The Antarctic Climate Change and the Environment (ACCE) Report Update

SCAR has published a major update to the 'key points' from the Antarctic Climate Change and the Environment (ACCE) report. In this update we summarize subsequent advances in knowledge of how the climate of the Antarctic and Southern Ocean have changed in the past, how they might change in the future, and examine the associated impacts on the marine and terrestrial biota. See the accompanying paper.

4. The SCAR Science Horizon SCAN

The 1st SCAR Antarctic and Southern Ocean Science Horizon Scan will assemble some of the world's leading Antarctic scientists, policy makers, leaders, and visionaries to identify the most important scientific questions that will or should be addressed by research in and from the southern polar regions over the next two decades. The Scan outcomes will assist in aligning international programmes, projects and resources to

effectively facilitate Antarctic and Southern Ocean science in the coming years. See the accompanying paper.

5. Antarctic Conservation in the 21st Century

SCAR, COMNAP, New Zealand and the IUCN, in collaboration with several partners, are developing a strategy entitled 'Antarctic Conservation for the 21st Century'. The activity will actively encourage participation from all stakeholders in the region. The approach will be structured to align with both the Protocol on Environmental Protection to the Antarctic Treaty and the Five Year Work Plan of the Committee for Environmental Protection. The Antarctic Conservation Strategy links closely with the Environments Portal being developed by New Zealand, SCAR and Australia. See accompanying papers.

6. Fellowships and Prizes

In order to expand capacity in all its Members, SCAR runs several Fellowship and Prize Schemes, including:

- **SCAR/COMNAP Fellowships** (applications close 4 June 2013). The Fellowships are designed to encourage the active involvement of early career scientists and engineers in Antarctic scientific research, and to build new connections and further strengthen international capacity and cooperation in Antarctic research. This year they have been launched in tandem with the **CCAMLR Scholarships**. For further details see: <http://www.scar.org/awards/fellowships/information.html>.
- **Martha T Muse Prize for Science and Policy in Antarctica** (nominations close 23 May 2013). Sponsored by the Tinker Foundation, this is a US\$ 100,000 unrestricted award presented to an individual in the fields of Antarctic science or policy who has demonstrated potential for sustained and significant contributions that will enhance the understanding and/or preservation of Antarctica. See: www.museprize.org.
- **SCAR Visiting Professor Scheme** (nomination dates to be confirmed). The Visiting Professorships are for mid- to late-career stage scientists and academics. It provides them the opportunity to undertake short-term visits to a facility in or operated by SCAR Member countries, to provide training and mentoring. See: <http://www.scar.org/awards/>.

7. New SCAR Executive Committee

Jerónimo López-Martínez, from the Universidad Autónoma of Madrid, Spain, was elected the new SCAR President. SCAR also has two new Vice-Presidents: Karin Lochte from the AWI in Germany and Bryan Storey from the University of Canterbury, New Zealand. They will join Yeadong Kim (Korea) and Sergio Marensi (Argentina) as well as Mahlon "Chuck" Kennicutt (USA), who will remain on the Executive Committee until July 2014 as Past President.

8. Venezuela joins SCAR

Venezuela is the latest country to join SCAR as an Associate Member in 2012.

4. Future SCAR Meetings

There are several major SCAR Meetings coming up (<http://www.scar.org/events/>), including:

- **SCAR Biology Symposium**. 15-19 July 2013, Barcelona, Spain. See: <http://www.icm.csic.es/XIthSCARBiologySymposium>.
- **SCAR Executive Committee Meeting and cross linkages meeting of the chief officers of SCAR Standing Scientific Groups, Committees and Research Projects**. 20-23th July 2013, Barcelona, Spain.
- **SCAR Astronomy and Astrophysics from Antarctica (AAA) Workshop**. 24 - 26 July 2013, Siena, Italy. See: <http://www.astronomy.scar.org/AAA2013>.
- **XXXIII SCAR Meetings and Open Science Conference**. 22 August - 3 September 2014, Auckland, New Zealand. The SCAR Open Science Conference will be held on 25-29 August. See: <http://www.scar2014.com>.