

The International Council for Science

ISSN 1998-0337

SCAR **bulletin**

No. 181 May 2012

SCAR Annual Report 2011



Published by the

SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH

at the

Scott Polar Research Institute, Cambridge, United Kingdom

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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 United Nations Framework Convention on Climate Change.

SCAR's Mission is to be the leading, independent, non-governmental facilitator, coordinator, and advocate of excellence in Antarctic and Southern Ocean science and research. Secondly, SCAR's Mission is 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 the scientific academies of 36 nations and 9 ICSU scientific unions.

SCAR provides independent scientific advice in support of the wise management of the Antarctic environment, in partnership with the Antarctic Treaty Parties and other bodies such as the CEP, CCAMLR and COMNAP.

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 short paper summarises past (since the last annual report) highlights and future meetings we believe will be of interest to Treaty Parties and others.

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 would like to be added to the mailing list. As well as the web (www.scar.org), SCAR is also available on Facebook, LinkedIn and Twitter.

3. SCAR Highlights (2011/12)

3.1 *The next Generation of SCAR Research Programmes*

In July 2012 SCAR Delegates will be asked to approve 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 proposed 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 also be used for conservation and management. In essence, we propose to explain what biodiversity is there, how it got there, what it does there, and what threatens it. A primary product of this programme would 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. Such processes depend on a cascade of responses from the genomic and physiological through organismic and population to the ecosystem level. 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 main goal of AnT-ERA is to define and facilitate the science required to determine the resistance, resilience and vulnerability to change of Antarctic biological systems. In particular, the science needs 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 we see being 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 (both on the West and East Antarctic margin);
- 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;
- Communicate and coordinate with other international groups investigating ice mass change, ice sheet contributions to global sea level rise, glacial isostatic adjustment models of Greenland and other ice caps, etc.;
- Work with SCAR action/expert groups and research programmes to promote interdisciplinary science using POLENET data;
- Provide an international framework for maintaining, and potentially augmenting, the remote autonomous POLENET infrastructure after the International Polar Year (IPY).

3.2 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. The science community, led by SCAR and SCOR (the Scientific Committee on Oceanic Research), has established the Southern Ocean Observing System (SOOS) to address this. An International Project Office, established in Australia and supported by the new Institute for Marine and Antarctic Studies at the University of Tasmania in Hobart, was established in August 2011. This is a crucial step in implementing the SOOS. For further details, including a pdf of the initial Science and Implementation plan, see: www.soos.aq.

3.3 The Ice Sheet Mass Balance and Sea Level (ISMASS) group

The Ice Sheet Mass Balance and Sea Level group, which is co-sponsored by the International Arctic Science Committee, will be holding a workshop in conjunction with the Climate and Cryosphere project of the World Climate Research Programme and other organisations on July 14th. The workshop has many aims (see <http://www.climate-cryosphere.org/en/events/2012/ISMASS/Home.html>) but with the overreaching goal to assess the current knowledge of the contribution of the Antarctic and Greenland Ice Sheets to global and regional sea-level rise, taking into account ongoing and proposed projects.

3.4 Antarctic Conservation in the 21st Century

SCAR, in association with several partners, held a meeting and horizon scanning activity in South Africa to start the process of producing a new strategy for Antarctic Conservation in the 21st Century.

For further details, see information paper IP035 submitted to ATCM XXXV / CEP XV – http://www.scar.org/treaty/atcmxxxv/ATCM35_ip035_e.pdf

3.5 **Medals and Awards**

- Dr. José Xavier, from the Institute of Marine Research of the University of Coimbra in Portugal has been awarded the prestigious 2011 Martha T. Muse Prize for Science and Policy in Antarctica. Dr Xavier has conducted outstanding research on the predator-prey dynamics that sustain populations of albatrosses, penguins and other top predators in the Southern Ocean. The Selection Committee of leading Antarctic scientists and policy-makers also cited his leadership in the establishment of a new and thriving Antarctic research programme in Portugal during the International Polar Year (IPY, 2007-2008).
- Professor Diana H. Wall will be awarded the 2012 SCAR President's Medal for Excellence in Antarctic Research. Professor Wall has conducted more than twenty years of research in the Antarctic Dry Valleys examining the response of soil biodiversity and ecosystem processes to environmental change. She is an active member of the SCAR Standing Scientific Group on Life Sciences and has been involved in the development of SCAR's next generation of Scientific Research Programmes and the 21st Century Conservation initiative.

3.6 **New SCAR Project Officer**

Dr Eoghan Griffin was hired for a period one year, 1 day a week to work on the Climate Communications. The funds to hire Dr Griffin were kindly supplied by the UK, Norway and ASOC.

For further details, see information paper IP044 submitted to ATCM XXXV / CEP XV – http://www.scar.org/treaty/atcmxxxv/ATCM35_ip044_e.pdf

4. **SCAR: Future Meetings**

SCAR is involved in several major meetings over the next year (see <http://www.scar.org/events/>), including:

- **IPY Montreal. April 2012.** SCAR is actively involved in the third and final International Polar Year Conference, with the theme “*From Knowledge to Action*”.
- **SCAR Open Science Conference, Business and Delegates’ Meetings. July 2012.** (see <http://scar2012.geol.pdx.edu/>). Almost a 1000 abstracts were submitted to the SCAR Open Science Conference, which has as its theme “*Antarctic Science and Policy Advice in a Changing World*”. Several Treaty Observers and Experts are actively involved in the various symposia and sessions, which promises to help make it an exciting meeting.
- **SCAR Biology Symposium.** SCAR will hold its four yearly biology symposium in Barcelona, Spain, in summer 2013.

For further details on SCAR activities, see www.scar.org or email info@scar.org.

Acronym list

AntClim ²¹	Antarctic Climate Change in the 21st Century
AntEco	State of the Antarctic Ecosystem
AnT-ERA	Antarctic Thresholds - Ecosystem Resilience and Adaptation
ASOC	Antarctic and Southern Ocean Coalition
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CEP	Committee for Environmental Protection
COMNAP	Council of Managers of National Antarctic Programs
GIA	Glacial Isostatic Adjustment
ICSU	International Council for Science
IPCC	Intergovernmental Panel on Climate Change
IPY	International Polar Year
ISMSS	Ice Sheet Mass Balance and Sea Level
PAIS	Past Antarctic Ice Sheet Dynamics
POLENET	Polar Earth Observing Network
SCAR	Scientific Committee on Antarctic Research
SCOR	Scientific Committee on Oceanic Research
SERCE	Solid Earth Response and Cryosphere Evolution
SOOS	Southern Ocean Observing System
SRP	Scientific Research Programmes