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The Scientific Committee on Antarctic Research (SCAR) Annual Report for 2013/14

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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 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. 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 (2013/14)

In this paper we highlight examples of SCAR activities that we believe to be of particular interest to Treaty Parties. For further details see www.scar.org.

State of the Antarctic Ecosystem (AntEco) www.scar.org/srp/anteco

The Scientific Research Programme (SRP) AntEco focuses on patterns of biodiversity across terrestrial, limnological, glacial and marine environments within the Antarctic, sub-Antarctic and Southern Ocean regions, and will provide scientific knowledge on biodiversity that can be also used for conservation and management. A primary product of this programme will be recommendations concerning Antarctica's management and conservation.

Antarctic Thresholds - Ecosystem Resilience and Adaptation (AnT-ERA) www.scar.org/srp/ant-era

The AnT-ERA SRP examines the current biological processes in Antarctic ecosystems, to define their thresholds and thereby determine resistance and resilience to change. Polar ecosystem processes are 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) www.scar.org/srp/antclim21

The goals of the SRP 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. 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.

Southern Ocean Acidification www.scar.org/ssg/physical-sciences/acidification

SCAR will synthesise the scientific understanding of Southern Ocean acidification. The Action Group tasked with this consists of an international cross-disciplinary team of ocean acidification experts representing the fields of marine carbonate chemistry, global and regional modelling, marine ecology, ecotoxicology/physiology and paleoceanography. The final report will be published in August 2014 and copies made available to Treaty Parties.

Geoheritage Values www.scar.org/ssg/geosciences/geoheritage

A new Action Group on Geoheritage values, conservation and management has been formed by SCAR. In this context, Geological “values” will examine aspects such as unique mineral or fossil localities and landforms or outcrops of special significance. The outcomes of discussions held at the Treaty will be considered when the Terms of Reference and future work plan of this group are discussed during the SCAR Business meetings in August 2014.

Antarctic Biodiversity Informatics www.scar.org/ssg/life-sciences/abi

Biodiversity Informatics is the application of informatics techniques to biodiversity information for improved management, presentation, discovery, exploration and analysis. This Expert Group will coordinate biodiversity informatics activities across SCAR for research, management, conservation and monitoring purposes and promote free and open access.

Environmental Contamination in Antarctica www.scar.org/ssg/life-sciences/eca

The main aims of the Environmental Contamination in Antarctica Action Group are the analysis and comparison of national research projects, the coordination of studies on environmental contamination in Polar Regions and to identify new research on the subject.

Ice Sheet Mass Balance and Sea Level www.scar.org/ssg/physical-sciences/ismass

The SCAR/IASC/CliC Expert Group on Ice Sheet Mass Balance and Sea Level aims to improve estimation of the mass balance of ice sheets and their contribution to sea level, to facilitate coordination of the different international efforts focused on this field of research, to propose directions for future research in this area, to integrate the observations and modelling efforts, as well as the distribution and archiving of the corresponding data, and to attract a new generation of scientists into this field of research.

Operational Meteorology in the Antarctic www.scar.org/ssg/physical-sciences/opmet

This Expert Group focuses on establishing links between groups working in the same area of operational meteorology in Antarctica, in particular the WMO EC-PORS (Panel of Experts on Polar Observations, Research and Services) group.

Remote Sensing www.scar.org/ssg/life-sciences/remotesensing

The SCAR Action Group on Remote Sensing has been established with the full name "Development of a satellite-based, Antarctic-wide, remote sensing approach to monitor bird and animal populations", with the aim to address the topic of "Animal monitoring via remote sensing".

The Southern Ocean Observing System www.soos.aq

The SCAR/SCOR Southern Ocean Observing System (SOOS) has the mission *to establish a multidisciplinary observing system to deliver the sustained observations of the Southern Ocean*. 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.

The Antarctic Climate Change and the Environment www.scar.org/othergroups/acce

The climatic, physical and biological properties of Antarctica and the Southern Ocean are closely coupled to other parts of the global environment by the oceans and the atmosphere. In 2009 SCAR published the landmark Antarctic Climate Change and the Environment Report and since then has provided annual updates. See the separate IP on the ACCE.

The SCAR Science Horizon Scan www.scar.org/horizonscanning/

Following the crowdsourcing of over 850 unique scientific questions and the nomination of almost 500 leading scientist by the SCAR community, the 1st SCAR Antarctic and Southern Ocean Science Horizon Scan assembled more than 70 of the world's leading Antarctic scientists, policy makers and visionaries (including many early career scientists) in Queenstown, NZ, in April this year. Their remit was 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. A full report will be submitted to the 2015 Treaty Meeting.

Antarctic Conservation in the 21st Century www.scar.org/antarctic-treaty-system/scats

SCAR, in collaboration with several partners, are developing a strategy entitled 'Antarctic Conservation for the 21st Century'. The activity will 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 Antarctic Environments Portal. See also the COMNAP-SCAR WP entitled 'Antarctic Conservation Strategy: Scoping Workshop on Practical Solutions'. Note that a conservation 'flipped symposium' will be held during the SCAR Open Science Conference in August 2014 as part of this process.

Antarctic Data Management www.scar.org/data-products

SCAR promotes free and unrestricted access to Antarctic data and information by promoting open and accessible archiving practices, through its Standing Committees on Antarctic Data Management (SCADM) and Antarctic Geographic Information (SCAGI). SCAR also has several Products of use to the Antarctic Community.

4. SCAR Fellowships and Prizes

In order to expand capacity in all its Members, SCAR runs several Fellowship and Prize Schemes (www.scar.awards):

- ***SCAR/COMNAP Fellowships*** are focussed on early career scientists and engineers in Antarctic scientific research, to build new connections and further strengthen international capacity and cooperation in Antarctic research. The fellowships are being launched in tandem with the CCAMLR Scholarships.
- ***Martha T Muse Prize for Science and Policy in Antarctica***, sponsored by the Tinker Foundation, is a US\$ 100,000 unrestricted award presented to an individual in the fields of Antarctic science or policy. See: www.museprize.org.
- ***SCAR Visiting Professor Scheme*** provides mid to late career scientists the opportunity to undertake short-term visits to a facility in or operated by SCAR Member countries, to provide training and mentoring.

5. SCAR wins 2013 Prix Biodiversité of the Prince Albert II of Monaco Foundation

SCAR was awarded the Prince Albert II of Monaco Foundation's 2013 Prix Biodiversité was in recognition of its contribution to science and its work to improve our understanding of the environment.

6. Future SCAR Meetings

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

- ***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>.
- ***XII International Symposium on Antarctic Earth Sciences (ISAES) 2015***. 13-17th July 2015, Goa, India. <http://www.ncaor.gov.in/files/ISAES-2015Flyer1.pdf>