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SCAR REPORT TO XXVII ATCM

CAPE TOWN, SOUTH AFRICA

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THE INTERNATIONAL COUNCIL FOR SCIENCE
SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH



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XXVII ANTARCTIC TREATY CONSULTATIVE MEETING

Cape Town, South Africa, 24 May – 4 June 2004

SCAR Report to XXVII ATCM

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REPORT UNDER RECOMMENDATION XIII-2

Introduction

Since XXVI ATCM in Madrid, Spain, June 2003, the SCAR Executive Committee met in Brest, France, during July 2003 in conjunction with the XV COMNAP annual meeting. At this time a joint meeting was held with the COMNAP Executive Committee. Further meetings were held in Cambridge, United Kingdom, August 2003 and in Bremerhaven, Germany, January 2004. In August 2003, interviews were held for the new post of Executive Director of SCAR and Dr Colin P Summerhayes was appointed. He took up the post part-time from 1 January 2004 by courtesy of IOC-UNESCO and from 1 April 2004 he has been employed full-time at the SCAR Secretariat in Cambridge.

With the appointment of the Executive Director, SCAR has implemented all but one of the recommendations of the *ad hoc* Group on SCAR Organization and Structure adopted by the SCAR Delegates at the biennial XXVII SCAR meeting in Shanghai during July 2002. The final recommendation will be implemented this year with the new structure for the biennial SCAR Meeting. The first week of the meeting will be held in Bremen, Germany, 25–31 July 2004. This will comprise the SCAR Open Science Conference under the title “Antarctica and the Southern Ocean in the Global System” during the first three days of the week with the new Scientific Standing Groups (SSGs) holding their business meetings around the Conference. The XVI COMNAP Meeting will be held in parallel providing opportunities for interaction between the scientific and logistic Antarctic communities. The SCAR and COMNAP Executive Committees will hold a joint meeting during the week. The XXVIII SCAR Delegates Meeting will be held in Bremerhaven, Germany, 3–9 October 2004.

The International Council for Science is planning a Fourth International Polar Year (IPY4) 2007–08 to commemorate the 50th anniversary of the International Geophysical Year (IGY) 1957–58 and to highlight the key role that the polar regions now play in our understanding of the Earth System. A progress report on planning for the IPY will be presented by SCAR at this meeting on behalf of ICSU.

A new programme proposal on Subglacial Antarctic Lake Exploration (SALE) will be presented, along with other new programme proposals (see later in this report), to the XXVIII SCAR Delegates Meeting in Bremerhaven, Germany. At this ATCM there will be a presentation by SCAR on subglacial lake exploration in Antarctica and this will be supported by an Information Paper.

Principal scientific activities

Geosciences SSG

Members of the **SCAR Action Group on Permafrost (PAG)** participated in a workshop on Antarctic Permafrost and periglacial processes at the Eighth International Conference on Permafrost, Zurich, Switzerland during July 2003. The aim was to review current permafrost and periglacial science activities and to consider how Antarctic permafrost and periglacial science should be organized within the International Permafrost Association (IPA) and linked to other groups and programmes.

The **Action Group on Communication and Outreach (COG)** publishes a newsletter *GeoReach* for the SSG on Geosciences that is available on its website at <http://www.geoscience.scar.org/actiongroups/cog/index.htm>. The Group has also been revising and up-dating its own communications networks.

The **Expert Group on Geospatial Information** is currently running 10 projects and has the following products: Antarctic Digital Database; SCAR Map Catalogue; King George Island GIS; SCAR Feature Catalogue; US Antarctic Resource Center; and the SCAR Composite Gazetteer. All these are readily available via the SSG Geosciences website (<http://www.geoscience.scar.org/products.htm>) and may be of use to the CEP.

The **Action Group on Acoustics in the Marine Environment** held a workshop in Cambridge during May 2004 to consider the report of the Berlin Workshop and other matters raised since the original SCAR Workshop in 2001. An Information Paper will be tabled at this meeting and a revised edition of the original SCAR report will be published in due course.

The **Scientific Programme Planning Group on Cenozoic Antarctic Climate Evolution (CACE)** is developing a new, international research initiative to study the climate and glacial history of Antarctica through palaeoclimate and ice sheet modelling investigations, purposefully integrated with terrestrial and marine geological and geophysical evidence for past changes. A draft proposal for a SCAR Scientific Research Programme was favourably received at the SCAR Executive Meeting in Brest and a full programme proposal will be submitted to the SCAR Delegates Meeting in October 2004.

This fifth **SCAR Antarctic Geodesy Symposium (AGS03)** was held at the Polytechnic University of Lviv, Ukraine, during September 2003, hosted by the University and the Ukrainian Antarctic Centre. The programme included 36 presentations by participants from nine SCAR countries. The symposium concluded with a business meeting on Geodetic Infrastructure for Antarctica (GIANT) at which a proposal was endorsed to study and to improve the stability of the Terrestrial Reference Frame over Antarctica as the basis for precise measurement of small tectonic motions.

The **9th International Symposium on Antarctic Earth Sciences** was held in Potsdam, Germany, during September 2003. More than 170 oral papers and more than 200 poster displays were presented covering all aspects of the geological sciences in Antarctica.

During the Symposium, the **Action Group on Age, Growth & Evolution of Antarctica (AGEANT)** held a discussion session of AGEANT's role. Topics included:

- Developing links, and maintenance of a common geochronology
- Compilation of comparable tectonic features and geochronological regions within continental blocks
- Integrating geophysical initiatives into continental tectonics,
- Establishing the thermal evolution of the continental crust

The programme on **Antarctic Neotectonics (ANTEC)** continues to be very active and contributed a major theme to the Symposium. The future of the programme will be reviewed at the XXVIII SCAR Delegates Meeting,

Life Sciences SSG

The **Expert Groups on Seals, on Birds, and on Human Biology and Medicine** have continued their intersessional work, responding, *inter alia*, to requests from SCAR to provide scientific advice to the Antarctic Treaty System on specially protected species. These groups are now all represented on the SCAR homepage or have other links directly to their web sites, and the website for the Expert Group on Seals will be accessible in the near future.

The programme on the **Ecology of the Antarctic Sea-Ice Zone (EASIZ)** has now been completed. An EASIZ Final Symposium will be held in Kor ula, Croatia, 27 October – 1 October 2004. The **IX SCAR International Biology Symposium** will be held in Curitiba, Brazil, 25 –29 July 2005. Further information on both these symposia can be found at:

<http://www.nioo.knaw.nl/projects/scarlsssg/>

The **Scientific Programme Planning Group on Evolutionary Biology in Antarctica** held a planning meeting in The Netherlands in early 2004 to develop a full science programme proposal for presentation to the XXVIII SCAR Delegates Meeting in October 2004. A key aspect of this programme will be to integrate it closely with the proposed programme on Cenozoic Antarctic Climate Evolution (CACE).

There is a major new proposal for a **Marine Biodiversity Information Network** that will aim to contribute to the compilation, dissemination, and integration of fundamental information on the Antarctic marine biodiversity for scientific, monitoring, management and conservation purposes. The Southern Ocean biodiversity is an important and significant component of the World marine biodiversity. The Antarctic marine region covers 10% of the World Ocean area, and is the habitat of numerous and highly adapted species. A large part of the Southern Ocean biodiversity remains unknown, in particular in the deep sea. There is a widely recognized need to establish reliable and comprehensive baseline information about marine biodiversity over the world to provide a reference state against which subsequent changes may be monitored and compared. For the Antarctic marine biodiversity (vertebrates excepted), this baseline information is still largely incomplete, widely scattered and not easily available. A number of former or current international SCAR, SCAR-related as well as national programmes and projects include a strong component of biodiversity science. These efforts have generated substantial data and results in terms of Antarctic marine biodiversity

survey and an understanding of biodiversity patterns and processes. As a preliminary step and as a feasibility study, it is proposed that, in the framework of the Belgian BIANZO project, a common web site and portal for the three Belgian Antarctic biodiversity databases should be developed with cross-links to the SCAR EASIZ web site.

SCAR has been invited to provide the Antarctic regional component to the **Global International Waters Assessment (GIWA)** being undertaken by the United Nations Environment Programme (UNEP). A workshop is planned to be held in Germany in conjunction with the XXVIII SCAR Meeting in Bremen at which the relevant data will be collated and a text prepared for inclusion in the GIWA global report.

Physical Sciences SSG

Under the **Action Group on Reference Antarctic Data for Environmental Research project (READER)**, digitization of the surface meteorological data has been essentially finished with the monthly mean data online and the data set is updated periodically. The main emphasis now is on the digitization of the Russian upper air data which is due for completion in the near future. The data and meta data can be accessed at:

<http://www.antarctica.ac.uk/met/READER/>

The **Action Group on Antarctic Peninsula Tropospheric-Ionospheric Coupling (APTIC)** is continuing to develop the ionospheric data base, and this should eventually include hourly values and copies of ionograms from San Martin (Argentina), Vernadsky (Ukraine) and Great Wall (China) for March, June, September and December 1996 and 1999. Copies of ionograms for San Martin and hourly values for Vernadsky are now available.

At a meeting in Rome, Italy, October 2003, devoted to research in **Oceanography and Atmospheric Science** it was recommended that SCAR, SCOR and IOC establish a Coordinating Group on Inter-disciplinary Southern Ocean Science (ISOS). This group would facilitate coordination between the different discipline research groups currently active in the Southern Ocean; encourage an inter-disciplinary approach to Southern Ocean observational and modelling research, recognising the inter-dependence of physical, chemical and biological processes in the ocean; identify historical and reference data sets of value to researchers; and coordinate the transfer of near real-time data (or a sub-set of such data) to operational users. The work of ISOS should greatly improve the coordination of Southern Ocean research both at the national and international levels, to the benefit of the nations and research programmes presently active there.

The **Action Group on Modelling and Observational Studies of Antarctic Katabatics (MOSAK)** has obtained wind data from automatic weather stations along the transect Dome C to Cape Denison, and these are being quality controlled. Once completed, streamlines will be produced and a time series analysis of a number of katabatic wind events will be carried out.

The **Action Group on Antarctic Tropospheric Aerosols and their Role in Climate (ATAC)** held a workshop in October 2003 to discuss future development related to the joint activities on the Aerosol Optical Depth (AOD) network in the Antarctic,

originally proposed by an Italian group, together with United States, German and Japanese groups.

The **Expert Group on Antarctic Astronomy and Astrophysics (AAA)** and the **Action Group on Plateau Astronomy Site Testing in Antarctica (PASTA)** held their first formal joint meeting in Sydney following the "Future Visions for Antarctic Astronomy" workshop in Sydney on 19 July 2003. This workshop coincided with the XXV General Assembly of the International Astronomical Union, bringing together as many as 2000 astronomers from around the world.

The **Expert Group on Operational Meteorology in the Antarctic** produced a digital version of the *International Antarctic Weather Forecasting Handbook* that has been widely distributed on CD-ROM. This has now been published in book form with generous financial assistance from WMO.

TURNER, J and PENDLEBURY, S (eds). 2004. *The International Antarctic Weather Forecasting Handbook*. Cambridge, British Antarctic Survey, 663 pp.

The **VII SCAR International Symposium on Antarctic Glaciology (ISAG 7)** was held in Milan, Italy, 25–29 August 2003. More than 250 abstracts were submitted for presentation covering a wide spectrum of Antarctic glaciological research. The proceedings of the symposium will be published in the *Annals of Glaciology*.

A detailed report of the recommendations of the **Expert Group on Ice Sheet Mass Balance and Sea Level (ISMASS)** has been submitted for publication in a "Global and Planetary Change" Special Issue on "Ice Sheet mass balance and Neotectonics". More than 50 papers submitted for presentation to the Seventh SCAR International Symposium on Antarctic Glaciology (ISAG7), Milan, Italy, August 2003 were concerned with Antarctic Ice Sheet mass balance.

The **Scientific Programme Planning Group on Antarctica and the Global Climate System (AGCS)** is developing a new programme that will seek to answer key questions concerning extra-polar/ Antarctic coupling:

- How does variability of tropical and mid-latitude atmospheric and oceanic conditions modulate the Antarctic climate?
- What are the mechanisms that transfer the tropical signals to the Antarctic?
- What are the relative roles of the ocean and atmosphere in this transfer?
- How can we relate signals in ice cores, Antarctic sea ice and the Antarctic atmospheric circulation to the varying extra-polar signals?

The **Scientific Programme Planning Group on Inter-hemispheric Conjugacy on Environmental, Solar–Terrestrial and Atmospheric Research (ICESTAR)** is developing a proposal for an international research programme for coordinated bi-polar research in the field of solar-terrestrial physics and polar aeronomy. The programme will focus for the first time on quantification of various mechanisms that control bi-polar regional differences (or commonalities) in the magnetosphere–ionosphere coupling and corresponding upper atmospheric phenomena over both the northern and southern polar regions. It is proposed that SCAR will lead this new programme in collaboration with the International Arctic Science Committee (IASC).

Both these programme proposals will be presented to the XXVIII SCAR Delegates Meeting for adoption.

Antarctic data

The Antarctic Master Directory (AMD) is hosted by the Global Change Master Directory (GCMD) on behalf of SCAR. The AMD holds metadata (descriptions of Antarctic data sets and how to access them). The number of entries is steadily increasing as these are processed into the correct format by staff of the GCMD. The number of “hits” to the AMD is also increasing as more scientists and others make use of this valuable resource. The AMD can be accessed at:

<http://gcmd.gsfc.nasa.gov/Data/portals/amd/>

International Relations

In addition to those international organizations mentioned earlier, SCAR also has active links with the International Geosphere-Biosphere Programme (IGBP); the World Climate Research Programme (WCRP); the International Arctic Science Committee (IASC); and other ICSU bodies. SCAR is also seeking co-sponsorship of the WCRP’s Climate and Cryosphere (CliC) programme and the IGBP-SCOR-IOC Southern Ocean – Global Ocean Ecosystems Dynamics (SO-GLOBEC) project. Such international links are expected to increase as the IPY programme develops and enters its operational phase.

SCAR website

In addition to those websites specified in this report, further information on all SCAR and SCAR-related activities can be reached via the SCAR website at:

<http://www.scar.org>

Appendix 1

MEMBERSHIP OF SCAR

<i>Full members:</i>	<i>Date of admission to Associate Membership</i>	<i>Date of admission to Full Membership</i>
Argentina		3 February 1958
Australia		3 February 1958
Belgium		3 February 1958
Chile		3 February 1958
France		3 February 1958
Japan		3 February 1958
New Zealand		3 February 1958
Norway		3 February 1958
South Africa		3 February 1958
Russia (formerly Union of Soviet Socialist Republics)		3 February 1958
United Kingdom		3 February 1958
United States of America		3 February 1958
Germany (including former German Democratic Republic)		22 May 1978
Poland		22 May 1978
India		1 October 1984
Brazil		1 October 1984
China		23 June 1986
Sweden	(24 March 1987)	12 September 1988
Italy	(19 May 1987)	12 September 1988
Uruguay	(29 July 1987)	12 September 1988
Spain	(15 January 1987)	23 July 1990
Netherlands	(20 May 1987)	23 July 1990
Korea, Republic of	(18 December 1987)	23 July 1990
Finland	(1 July 1988)	23 July 1990
Ecuador	(12 September 1988)	15 June 1992
Canada	(5 September 1994)	27 July 1999
Peru	(14 April 1987)	22 July 2002
<i>Associate Members:</i>		
Switzerland	16 June 1987	
Pakistan	15 June 1992	
Ukraine	5 September 1994	
Bulgaria	5 March 1995	

ICSU Union Members

IGU	International Geographical Union
IUBS	International Union of Biological Sciences
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
IUPAC	International Union of Pure and Applied Chemistry
IUPS	International Union of Physiological Sciences
URSI	Union Radio Scientifique Internationale

Appendix 2

SCAR EXECUTIVE COMMITTEE

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Appendix 4

LIST OF ACRONYMS AND ABBREVIATIONS

AAA	Antarctic Astronomy and Astrophysics
AGCS	Antarctica and the Global Climate System
AGEANT	Age, Growth & Evolution of Antarctica
AGS03	Antarctic Geodesy Symposium
AMD	Antarctic Master Directory
ANTEC	Antarctic Neotectonics
AOD	Aerosol Optical Depth
APTIC	Antarctic Peninsula Tropospheric–Ionospheric Coupling
ATAC	Antarctic Tropospheric Aerosols and their Role in Climate
ATCM	Antarctic Treaty Consultative Meeting
BIANZO	Biodiversity of Antarctic Zoobenthos
CACE	Cenozoic Antarctic Climate Evolution
CEP	Committee for Environmental Protection
CD-ROM	Compact Disc – Read Only Memory
CliC	Climate and Cryosphere
COG	Communication and Outreach
COMNAP	Council of Managers of National Antarctic Programmes
EASIZ	Ecology of the Antarctic Sea-Ice Zone
EBA	Evolution and Biodiversity in Antarctica
GCMD	Global Change Master Directory
GIANT	Geodetic Infrastructure for Antarctica
GIWA	Global International Waters Assessment
IASC	International Arctic Science Committee
ICESTAR	Inter-hemispheric Conjugacy on Environmental, Solar–Terrestrial and Atmospheric Research
ICSU	International Council for Science
IGBP	International Geosphere–Biosphere Programme
IGU	International Geographical Union
IGY	International Geophysical Year
IOC	Intergovernmental Oceanographic Commission
IPA	International Permafrost Association
IPY	International Polar Year
ISAG	International Symposium on Antarctic Glaciology
ISMASS	Ice Sheet Mass Balance and Sea Level
ISOS	Inter-disciplinary Southern Ocean Science
IUBS	International Union of Biological Sciences
IUGG	International Union of Geodesy and Geophysics
IUGS	International Union of Geological Sciences
IUPAC	International Union of Pure and Applied Chemistry
IUPS	International Union of Physiological Sciences
MOSAK	Antarctic Katabatic Winds
PAG	Permafrost Action Group
PASTA	Plateau Astronomy Site Testing in Antarctica

READER	Reference Antarctic Data for Environmental Research
SALE	Subglacial Antarctic Lake Exploration
SCAR	Scientific Committee on Antarctic Research
SCOR	Scientific Committee on Oceanic Research
SO-GLOBEC	Southern Ocean – Global Ocean Ecosystems Dynamics
SSG	Scientific Standing Group
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
URSI	Union Radio Scientifique Internationale
WCRP	World climate Research Programme
WMO	World Meteorological Organization

Appendix 5

SCAR PAPERS SCHEDULED TO BE PRESENTED TO XXVII ATCM

Information Papers

SCAR Report to XXVII ATCM
 Antarctic Specially Protected Species
 Marine Acoustic Technology and the Antarctic Environment
 Progress with planning the International Polar Year 2007–2008
 Subglacial Lakes of Antarctica