

The International Council for Science

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THE INTERNATIONAL COUNCIL FOR SCIENCE  
SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH

**SCAR BULLETIN**  
**No 158, JULY 2005**

**SCAR Annual Report for 2004**

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**1. SCAR and its Role in Relation to the Antarctic Treaty**

SCAR, the Scientific Committee on Antarctic Research, is the principal organization dealing with Antarctic scientific research (see <http://www.scar.org>). It is the authoritative voice on Antarctic scientific research from the ionosphere to the mantle, from bacteria to seals, from the ice sheet to the deep sea floor, on the role of Antarctica in the Earth System, and on astronomy from Antarctica.

SCAR is an interdisciplinary committee of the International Council for Science (ICSU). Formed in 1958, SCAR was charged with "furthering the coordination of scientific activity in Antarctica, with a view to framing a scientific programme of circumpolar scope and significance". In this role SCAR inherited the mantle of the Antarctic component of the International Geophysical Year for 1957-58 (IGY).

SCAR's area of interest includes Antarctica, its offshore islands, and the surrounding Southern Ocean including the Antarctic Circumpolar Current, the northern boundary of which is the Subantarctic Front. Subantarctic islands that lie north of the Subantarctic Front and yet fall into SCAR's area of interest include: Ile Amsterdam, Ile St Paul, Macquarie Island and Gough Island.

SCAR's has Observer status within the Antarctic Treaty

System, and provides advice and responds to requests in the form of Information Papers and Working Papers to the annual Antarctic Treaty Consultative Meeting (ATCM) and the Committee for Environmental Protection (CEP).

SCAR's remit has evolved in part because of the development of the Antarctic Treaty System. When the Antarctic Treaty came into force in 1961, SCAR accepted the task of being the primary source of objective, independent scientific advice to the Antarctic Treaty Parties through the biennial Antarctic Treaty Consultative Meeting (ATCM), and was granted the status of Observer to the ATCM. Subsequently, some of the tasks formerly addressed by SCAR were taken up by organizations of the Antarctic Treaty System. For instance, in 1982, under the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), the Antarctic Treaty Consultative Parties created a commission and a Scientific Committee to oversee the development of an ecosystem-wide approach to management of the waters south of the Antarctic Convergence. In 1991, the Protocol on Environmental Protection to the Antarctic Treaty was concluded to apply environmental protection principles to human activities in Antarctica. The Protocol required the formation of a Committee for Environmental Protection (CEP) to advise the ATCM on the implementation of the Protocol.

A change in SCAR's remit took place in 1988, when the newly created Council of Managers of National Antarctic Programmes (COMNAP) took over the coordination of the management and logistics of the National Antarctic Research Programmes operating there, a task formerly carried out by the SCAR Working Group on Logistics.

SCAR's Members are representatives of national organizations adhering to ICSU, or nominated by national organizations adhering to ICSU. SCAR's membership has changed from the original 12 countries to 28 Full Members and 4 Associate Members (nations with an interest in becoming full members).

Despite the changes over the years, there is still an essential requirement for the international coordination of science in the Antarctic region and the provision of objective state-of-the-art scientific advice from an independent organization. SCAR continues to play a unique and crucial role in contributing to the scientific understanding of the south polar region of the planet. Under SCAR's leadership, and within the framework of SCAR Scientific Research Programmes, SCAR Members and their national scientific communities increase scientific knowledge about Antarctica and understanding of the processes taking place there on and under the land surface, in the atmosphere and the ocean, in the ice and in outer space. Studies by SCAR scientists increasingly show how Antarctic processes contribute to the working of the Earth System, and vice versa, and of how the south polar environment is influenced by human activities originating both within and outside the region. They also indicate what needs to be done to safeguard the environment. In addition, through the provision of relevant information, assessments and advice to the ATCM, SCAR helps policy makers meet international commitments in the Antarctic. SCAR continues its leading role in international efforts to monitor and protect the environment, by providing critical information on the role of Antarctica in global warming, climate change and sea-level rise, and on the effects of climate change on living organisms. It is axiomatic that improved scientific understanding demands free and unrestricted geographic access to the region, and the free and unrestricted exchange of scientific data and information.

## 2. Delivering Science in the 21st Century

At its 28th session, in Bremerhaven, during October 2004, SCAR completed the restructuring that began with an independent review commissioned in April 1999. The principal changes are as follows (roman numerals (i) through (x), below):

- i. SCAR has converted its Secretariat to an Executive Office run by an Executive Director, Dr C Summerhayes, formerly of UNESCO;
- ii. SCAR has adopted a new Constitution and Rules of Procedure, which embrace a new vision, mission and objectives.

The Vision is

"To establish through scientific research and international cooperation a broad understanding of the nature of Antarctica, the role of Antarctica in the Earth System, and the effects of global change on Antarctica."

The Mission is

"To be the leading independent organization for facilitating and coordinating Antarctic research, and for identifying issues emerging from greater scientific understanding of the region that should be brought to the attention of policy makers".

Five Main Objectives provide a new focus on achieving this mission:

- to initiate, develop, and co-ordinate high quality international scientific research in the Antarctic region, and on the role of the Antarctic region in the Earth system;
- to provide objective and independent scientific advice to the Antarctic Treaty Consultative Meetings and other organizations on issues of science and conservation affecting the management of Antarctica and the Southern Ocean.
- to facilitate free and unrestricted access to Antarctic scientific data and information;
- to develop scientific capacity in all SCAR Members, especially with respect to younger scientists, and to promote the incorporation of Antarctic science in education at all levels;
- to communicate scientific information about the Antarctic region to the public.

In developing the processes and structures to reach these objectives there are two objectives that underpin the way forward:

- to improve the effectiveness, efficiency and flexibility of the structure, working mechanisms and practices of SCAR.
  - to increase funding to match requirements, and to maintain a healthy funding stream.
- iii. SCAR has created a modern science framework of Standing Scientific Groups on Geosciences, Life Sciences, and Physical Sciences, with interdisciplinary cross linkages between them;
  - iv. SCAR has focused its major scientific research on a limited number of major strategic scientific questions of global scientific interest, many of which also have considerable socio-economic significance;
  - v. SCAR has reorganized its meetings to give National Delegates greater contact with the science, and has introduced a major biennial open science conference;
  - vi. SCAR has expanded its geographical remit to include the Southern Ocean from the Antarctic coast north to the Subantarctic Front, to recognize the important role of the Antarctic Circumpolar Current;
  - vii. SCAR has published a Strategic Plan (2004–10) to specify how it proposes to achieve its new mission and objectives;

- viii. SCAR has considerably improved its communications both internally and externally, with a new web page, a quarterly newsletter (starting in January 2005), posters and PowerPoint presentations; hits on the web site reached 62000 in March 2005, up from 16700 in January 2004.
- ix. SCAR is changing, and will continue to change, in response to the changing demands of science and policy, and in the interests of efficiency and effectiveness.
- x. SCAR is requesting a significant increase in contributions from Members, to compensate for inflation over the past decade, and to provide the support essential for the effective functioning of the Executive Office, the effective implementation of its new scientific research programmes, and effective interaction with the Antarctic Treaty System;

### 3. The International Polar Year (2007-2008)

SCAR will make a significant contribution to the proposed International Polar Year (IPY) (1 March 2007 – 1 March 2009). During 2004, SCAR made significant contributions to the activities of ICSU's IPY Planning Group and its development of the "Framework for the IPY". Subsequently, the SCAR Executive Director has been appointed an ex officio member of the new ICSU/WMO Joint Committee on the IPY, which will steer the IPY process, and which will include several SCAR scientists. SCAR's five Scientific Research Programmes (SRPs), described below, prepared Expressions of Interest (EoIs) for submission to the IPY selection process by the end of 2004. At the first meeting of the Joint Committee (March 2005) the SCAR SRPs were designated lead projects for substantial subsets of the 850 EoIs submitted.

### 4. New Developments

SCAR held its first Open Science Conference on 26–28 July 2004, in Bremen, with the title "Antarctica and the Southern Ocean in the Global System". Around 1000 people registered for the meeting, which provided important opportunities to develop cross-disciplinary links.

The Conference was part of the XXVIII SCAR Meeting, which was held in two parts, in Bremen in July, and in Bremerhaven in October. The SCAR and COMNAP Executive Committees held a joint meeting in Bremen in July.

The SCAR Delegates, meeting in October, approved plans for a new set of five major Scientific Research Programmes (SRPs) that will be SCAR's scientific flagships for the next 5–10 years. They are:

- Antarctica and the Global Climate System (AGCS) a study of the modern ocean-atmosphere-ice system;
- Antarctic Climate Evolution (ACE) a study of climate change over the past 34 million years since glaciation began;
- Evolution and Biodiversity in the Antarctic (EBA)

a study of the response of life to change;

- Subglacial Antarctic Lake Exploration (SALE) a study of the chemistry and biology of long buried lakes beneath the ice sheet;
- Interhemispheric Conjugacy Effects in Solar-Terrestrial and Aeronomy Research (ICESTAR) a study of how the Earth's outer atmosphere responds to the changing impact of the solar wind at both poles.

Brief descriptions of the programmes are given in Appendix 4. Most of the activities contributing to these programmes will be funded nationally. SCAR's international coordination will add value to national efforts. Scientists interested in participating in and contributing to the 5 scientific research programmes are invited to contact the SCAR Secretariat ([info@scar.org](mailto:info@scar.org)).

SCAR also supports a variety of other scientific activities in which value is added to national efforts through international cooperation. These activities are coordinated by Action Groups operating for short periods, and Expert Groups where more time is needed to achieve success. Brief descriptions of these activities are given in Appendix 5.

SCAR's activities will make significant contributions to achieving the goals of the International Polar Year (IPY) (2007–09). During 2004 SCAR had considerable input into the IPY Science and Implementation Plans prepared by ICSU and WMO. From the end of 2004 onwards, SCAR will be a member ex officio of the Joint ICSU-WMO Steering Committee for the IPY, and will work with partner organizations to influence the development of the IPY.

SCAR's Standing Committee on the Antarctic Treaty System will work closely with the Standing Scientific Groups and the Executive Committee to bring key scientific issues to the attention of the Antarctic Treaty Consultative Meeting.

### 5. Highlights of Scientific Coordination Activities

This report gives selected examples and is not exhaustive.

#### 5.1 Scientific Research Programmes

During the year, SCAR's Standing Scientific Groups (SSGs) put considerable effort into developing the five new Scientific Research Programmes. All five programmes were evaluated by external reviews, on the basis of which they were approved by the Delegates for start up at the beginning of 2005.

Determining the extent of environment change across the Antarctic in recent decades is a high priority activity. The SSG on Physical Sciences (SSG-PS) contributed to this work through the creation of a number of new data sets of key environmental variables. Analyses of these data sets have resulted in assessments of climatic change over the Antarctic since the IGY in 1957–58. Details of some of these data sets are given below under the various Action

and Expert Groups. A major conclusion is that there has been a complex pattern of change across the Antarctic over the last 50 years with the Antarctic Peninsula warming more than anywhere else on Earth while the rest of the continent has shown little change.

Recognizing that Southern Ocean biodiversity is an important and significant component of the World marine biodiversity, and that a large part of the Southern Ocean biodiversity remains unknown, in particular in the deep sea, the SSG on Life Sciences (SSG-LS) agreed to co-sponsor a Southern Ocean component of the global Census of Marine Life (CoML). To that end it formed a new Action Group on a Census on Antarctic Marine Life (CAML) to take this initiative forward as a contribution to EBA. The Group is led by Michael Stoddart of the Australian Antarctic Division, and has been awarded a start-up grant of US\$525,000 by the Alfred P Sloan Foundation.

The SSG-LS is also developing a Marine Biodiversity Information Network (MarBIN) that will contribute to the compilation, dissemination, and integration of fundamental information on the Antarctic marine biodiversity for scientific, monitoring, management and conservation purposes. This will be connected to the CoML's Ocean Biodiversity Information System (OBIS).

The evolution of climate is the focus of attention of the newly approved Antarctic Climate Evolution (ACE) programme within the SSG on Geosciences. Initial work by the ACE team has been published as a set of 13 papers in a Special Issue of *Global and Planetary Change* 45 (pages 1–332) in 2005, with an introduction on “Long-term changes in Southern high-latitude ice sheets and climate, the Cenozoic history” by the editors, F Florindo, D M Harwood and G S Wilson. ACE is placing a high priority on following up the work of the ANTIME project (part of the former GLOCHANT programme) that focused on the Antarctic environment during the Last Glacial Maximum.

Planning for exploration of a new scientific frontier, subglacial lakes, has continued under the aegis of the SSG on Geosciences through the newly approved Subglacial Antarctic Lake Environments (SALE) Scientific Research Programme, following the initial work of the Group of Specialists on Subglacial Antarctic Lake Exploration (SALEGOS). Much of the effort has been devoted to planning drilling activities that will avoid contaminating the lake environments. Plans are being made to start drilling into some of the smaller subglacial lakes during the forthcoming International Polar Year.

## 5.2 Action and Expert Groups

Recognizing the need to invest more effort in understanding the role of the Southern Ocean in climate and biodiversity, SCAR now co-sponsors much Southern Ocean research with global programmes having Antarctic interests, through recent joint agreements with the World Climate Research Programme and with the Global Ocean Ecosystem Dynamics programme (GLOBEC). As a further step

in this direction, SCAR upgraded its Action Group on Oceanography to an Expert Group, which complements the activities of other groups active in the Southern Ocean. It will be managed in concert with SCOR and iAnZone.

SCAR is working with the space agencies and UN agencies through the Partnership for an Integrated Global Observing Strategy (IGOS) to devise a bi-polar programme to improve observations of the cryosphere.

The MOSAK Action Group carried out a modelling study that has produced a new, improved high resolution near surface wind field for the Antarctic. This will be of value in studies of blowing snow, sea ice advection and the investigation of katabatic winds.

The Expert Group of Operational Meteorology has worked with COMNAP to produce an International Antarctic Weather Forecasting Handbook. The WMO provided funding for a hardcopy version that is being distributed to all nations active in the Antarctic.

The READER Action Group has produced a new, improved database of mean, Antarctic tropospheric/stratospheric temperatures, winds and heights from surface observations and radiosonde ascents

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

Significant new astronomical results have been obtained from the Amundsen-Scott South Pole Station, including measurements of the Cosmic Microwave Background Radiation (CMBR) and galactic/interstellar emission in a sub-millimetre diapason, as well as infrared observations of the Milky Way. More than 50 refereed papers have come from these data, and the cosmic microwave background polarization has been measured for the first time from the Antarctic.

The ASPECT Expert Group has continued to develop its database of sea ice parameters from in-situ ship observations. Data from 81 voyages were added over the last two years. The data archive has been used in a number of studies, including comparisons with satellite ice edge location to determine seasonal variability in the reliability in the satellite estimates, comparisons with sea ice-ocean models and the development of a circumpolar climatology of area-averaged albedo.

The ITASE Expert Group collected more than 240 firn cores (for a total of 7,000 m) and about 20,000 km of snow radar, resulting in numerous publications. In addition ITASE developed multi-centennial scale proxies for sea ice, regional temperature, and major atmospheric circulation features plus new continental scale maps depicting the distribution of major chemical species over the ice sheet.

In the Life Sciences, the Expert Group on Human Biology and Medicine came to the conclusion that it would operate more effectively if it amalgamated with the COMNAP group MEDINET. Discussions on this merger are ongoing.

The research programme EVOLANTA published the



proceedings of one of their workshops as a special issue of *Antarctic Science* (16, no. 1, March 2004).

The research programme RiSCC completed three successful field campaigns:

1. the three island study (Marion, Kerguelen, and Heard islands);
2. the Antarctic Peninsula transect (Netherlands – United Kingdom), and
3. the Latitudinal Gradient Project in Victoria Land (New Zealand – Italy – United States). The RiSCC community is also planning research in the Arctic, the Northern RiSCC, to be hosted by Canada.

The EASIZ programme was successfully terminated with a closing symposium in September 2004 in Croatia. The proceedings will be published in a special issue of *Deep Sea Research*.

The SSG Geosciences Action Group on Communication and Outreach (COG) plays an essential role in gathering, collating and disseminating geospatial and geoscientific information for the benefit of the entire Antarctic research community. This is achieved through the SSG on Geosciences website

(<http://www.geoscience.scar.org>)

and through Georeach, the geosciences newsletter which can be downloaded from the website. In addition, the SSG on Geosciences has a listserver with 134 subscribers and listservers have also been established for the Expert Groups on Geodetic Infrastructure in Antarctica (GIANT), on Antarctic Neotectonics (ANTEC), and on the Antarctic Digital Magnetic Anomaly Project (ADMAP).

A new Action Group on Marine Survey Coordination has been established to improve coordination of planned marine surveys within the Antarctic community.

The SSG on Geosciences has upgraded some of its short term Action Groups to longer term Expert Groups.

The Action Group on Permafrost has been up-graded to a longer-term Expert Group on Permafrost and Periglacial Environments that will address science questions pertaining to the age and history of Antarctic permafrost, landscape dynamics and evolution (including erosion, ground ice formation, patterned ground).

Similarly, the former Action Group on Geographic Information has been changed to an Expert Group that will create an Antarctic Spatial Data Infrastructure (ANTSDI) by integrating and coordinating Antarctic mapping and GIS programmes to provide a fundamental geographical base for all Antarctic research.

The former Action Group on Geodetic Infrastructure of Antarctica (GIANT) has also been converted to an Expert Group that will continue to define an accurate geodetic reference frame. This is essential for all scientists undertaking mapping application and geodynamics studies in Antarctica. The Expert Group will continue its activity for better planning of Geodetical and Geophysical

Observatories, and to enhance continental and global data processing.

The Action Group on the Antarctic Digital Magnetic Anomaly Project (ADMAP) has also been up-graded to an Expert Group to maintain the database and make it a permanent tool available to the scientific community.

A new Expert Group on the International Bathymetric Chart of the Southern Ocean (IBCSO) will develop new compilations of bathymetric data for inclusion in the Chart.

The former Group of Specialists on Antarctic Neotectonics (ANTEC), established in 1998 to promote and coordinates multidisciplinary, multinational research relevant to Antarctic neotectonics, has been changed to an Expert Group. In conjunction with the ISMASS programme of the SSG on Physical Sciences, the Expert Group presented a thematic set of 21 papers on “Ice Sheets and Neotectonics” that was published in a Special Issue of *Global and Planetary Change* 42 (pages 1–326) in 2004, including an editorial by T S James, T H Jacka, A Morelli and R Dietrich.,

## 6. Future Plans

This report gives selected examples and is not exhaustive.

### 6.1 Scientific Coordination

The first priority is implementation of the five newly approved Scientific Research Programmes. The first task is to draft Implementation Plans for the five new programmes. These will be complete for the meeting of the SCAR Executive in July.

The Steering Committee for the AGCS SRP will meet in Cambridge, UK over 27 June – 1 July 2005.

The meeting of the SALE SRP will be held in Vienna, 22–23 April 2005, in association with the European Geophysical Union meeting.

The ACE SRP meeting will also be held in Vienna, on 25 April 2005.

The first ICESTAR workshop will be held in Spring 2005. This will focus on data portal/virtual-observatory specifications, identification and metadata description of all available Antarctic data on the Internet for ICESTAR and identification of available value-added products on- and off-line and prioritization of the data and products based on their science merit.

The Implementation Plan for the EBA SRP will be completed, following a draft, written during a workshop in Cambridge in March 2005, during the IX SCAR International Biology Symposium, which will be held in Curitiba, Brazil, 25–29 July 2005. These highly successful symposia bring together over 75% of the biologists currently active in the Antarctic and Southern Ocean environment. Further information on this symposium

can be found at:

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

Prior to the symposium, several workshops will be held including, among others, on Antarctic Conservation matters.

SCAR will also maintain the key activities of its Action and Expert Groups. A detailed record of the activities of these groups during 2005 can be found under EVENTS on the SCAR web page. The efforts of the Action Group on Marine Acoustics, which is investigating the relationship between noise in the ocean and the behaviour of cetaceans, and which resulted in a report to the XXVII ATCM, is continuing, as a means of providing scientific advice to the ATCM.

Several activities are planned as part of the European Geophysical Union (EGU) meeting in Vienna in April, or as part of the American Geophysical Union (AGU) Assembly in New Orleans (23–27 May 2005) or the AGU fall meeting in San Francisco (December 2005).

SCAR will continue to provide inputs to the IPY process through its membership of the ICSU/WMO Joint Committee for the IPY. In addition, its Scientific Research Programmes will plan their leadership of subsets of the Expressions of Interest received by the IPY planners, and by the end of June 2005 will convert these EoIs into full proposals for IPY endorsement.

Key meetings in 2005 include:

1. SCAR–COMNAP Workshop on Practical Biological Indicators of Human Impacts in Antarctica, 16–18 March 2005, College Station, USA; to assess biological indicators of human impact and advise on implementing meaningful monitoring programmes in Antarctica.
2. Continental drilling 2005: A Decade of Progress and Opportunities for the Future; 30 March – 1 April 2005, Potsdam, Germany.
3. Climate and Cryosphere (CliC) 1st Science Conference; 11–15 April 2005, Beijing, China.
4. SCAR Workshop on Antarctic Conservation in the 21st Century, 23–25 May 2005, Stellenbosch, South Africa.
5. Southern Ocean Implementation Panel Meeting; 27–30 June 2005 Cambridge, UK; to discuss modes of variability and the IPY.
6. SCAR IX International Biology Symposium; 25–29 July 2005, Curitiba, Brazil.
7. International Association of Meteorology and Atmospheric Sciences Meeting; 2–11 August 2005, Beijing, China; to discuss Climate Variability and Change in the Polar Regions: Causality and Prediction.
8. SCAR will co-sponsor special IAG/IAPSO sessions on “Oceanography and geodesy in polar regions” and on “Ocean interactions with sea ice, polynyas, ice shelves, and icebergs” as part 8 of the IAPSO/IABO Symposium, 22–26 August 2005, Cairns, Australia.
9. International Conference on Glacial Sedimentary Processes and Products; August 2005, Aberystwyth, UK.
10. Sixth International Conference on Geomorphology; 7–11 September 2005, Zaragoza, Spain; to discuss Antarctic Geomorphology.
11. Third International Conference on the Oceanography of the Ross Sea; 10–14 October 2005, Venice, Italy.
12. International Symposium on Sea Ice; 4–9 December 2005, Dunedin, New Zealand

## 6.2 Developing Scientific Capacity

The Antarctic research programmes of SCAR Member nations vary greatly in their size and capacity. Some have scientific communities that are large, scientifically advanced and long standing. Others have relatively small and new Antarctic science communities that are still developing. To enable all in the SCAR family to participate in, contribute to and benefit from SCAR’s activities, it is incumbent on SCAR to work with appropriate national agencies to help to enhance the research capacity of all of its Members and Associate Members. This requirement has become more pressing with the significant increase in SCAR Membership in recent years. SCAR is in the process of developing a strategy for capacity building. One aspect of the potential capacity building programme that is already active is the SCAR Fellowship Programme, which provides a small number of annual awards. SCAR also arranges training workshops. For example, the MOSAK Action Group proposes to hold a workshop on the Antarctic wind field in early 2006 in Kuala Lumpur, Malaysia.

SCAR hopes that the nations participating in the ATCM will work actively with SCAR to support this scientific capacity building programme as it develops in the coming years.

## 7. Concluding Remarks

SCAR continues to play a central role in the development of scientific understanding in the Antarctic region. This role will be enhanced in future by SCAR’s involvement at the heart of the planning process for the International Polar Year. SCAR’s five new Scientific Research Programmes will make a major contribution to, and will help to lead the development of, the International Polar Year in the region. SCAR is keen to continue to play a major role as the scientific partner to the ATCM, and the driver for scientific research performed to acceptable scientific standards.

**Appendix 1****MEMBERSHIP OF SCAR**

<b>Full members:</b>	<b>Date of admission to Associate Membership</b>	<b>Date of admission to Full Membership</b>
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
Switzerland	(16 June 1987)	3 October 2004
<b>Associate Members:</b>		
Pakistan	15 June 1992	
Ukraine	5 September 1994	
Bulgaria	5 March 1995	
Malaysia	3 October 2004	
<b>ICSU Union Members</b>		
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	



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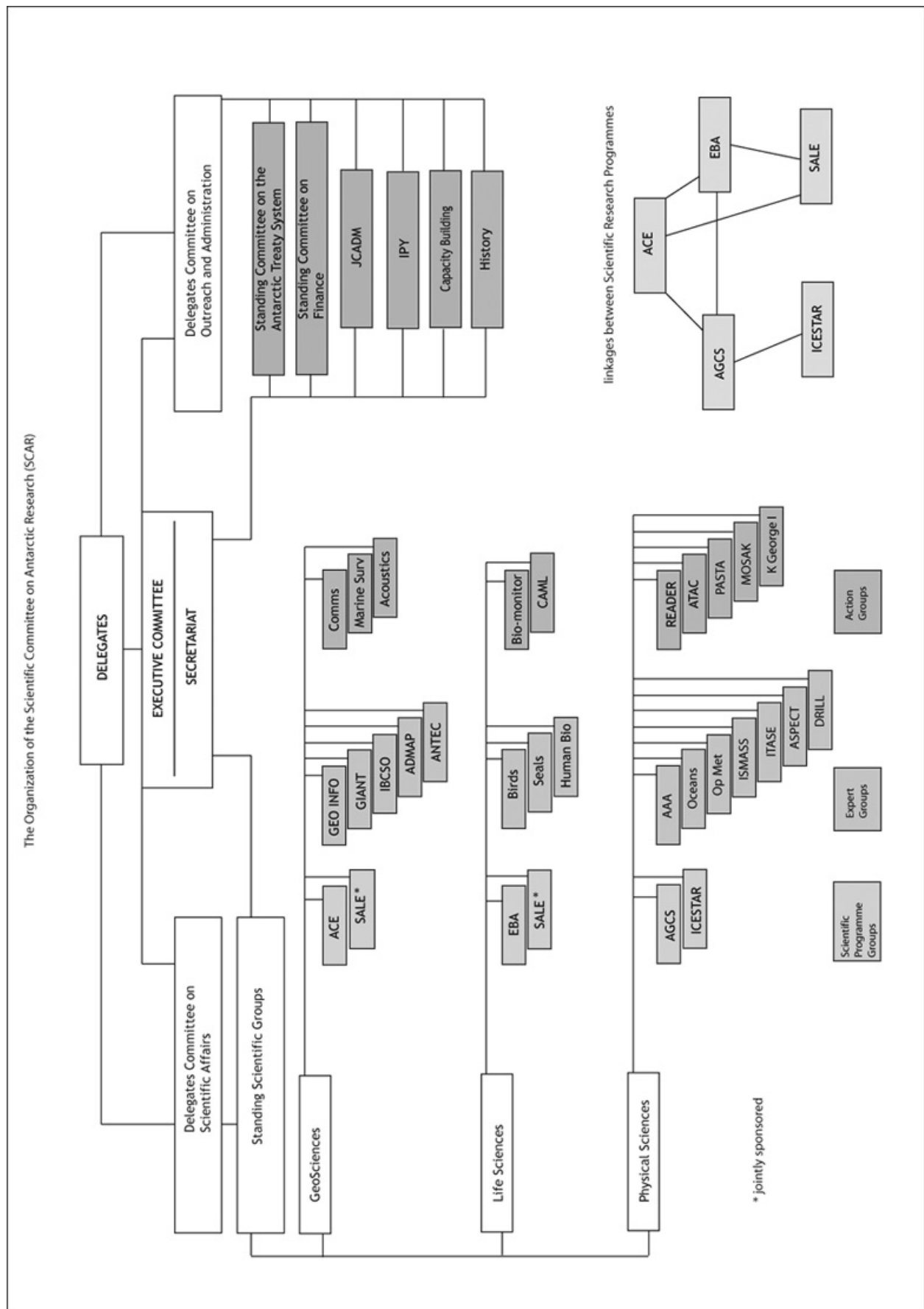
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## Appendix 3:

## New SCAR Structure



## **List of constituent sub-groups in the SCAR Organization**

### **Delegates Committee on Scientific Affairs**

#### *Standing Scientific Group on Geosciences*

##### Expert Groups on:

- Geographic Information
- Geodetic Infrastructure for Antarctica
- International Bathymetric Chart of the Southern Ocean
- Antarctic Digital Magnetic Anomaly Project
- Antarctic Neotectonics

#### *Standing Scientific Group on Life Sciences*

##### Expert Groups on:

- Birds
- Seals
- Human Biology and Medicine

#### *Standing Scientific Group on Physical Sciences*

##### Expert Groups on:

- Antarctic and Astronomy and Astrophysics
- Oceanography of the Southern Ocean
- Operational Meteorology
- Ice Sheet Mass Balance and Sea-Level
- International Trans-Antarctic Scientific Expedition
- Antarctic Sea-Ice Processes and Climate
- Ice Drilling Technology

#### *Scientific Research Programmes*

- Antarctic Climate Evolution
- Antarctica and the Global Climate System
- Evolution and Biodiversity in the Antarctic

#### *Other sub-groups*

- Standing Committee on the Antarctic Treaty System
- Standing Committee on Finance
- Joint Committee on Antarctic Data Management

### **Delegates Committee on Outreach and Administration**

##### Action Groups on:

- Communications and Outreach
- Marine Geophysical Surveying
- Marine Acoustic Technology

##### Action Groups on:

- Bio-monitoring of Human Impacts
- Census of Antarctic Marine Life

##### Action Groups on:

- Reference Antarctic Data for Environmental Research
- Antarctic Troposphere Aerosols and their Role in Climate
- Plateau Astronomy Site Testing in Antarctica
- Modelling and Observational Studies of Antarctic Katabatics
- Scientific Coordination of King George Island

- Interhemispheric Effects in Solar-Terrestrial and Aeronomy Research
- Subglacial Antarctic Lake Environments

- Capacity Building
- International Polar Year
- History of Scientific Research in Antarctica

## Appendix 4

### The SCAR Scientific Research Programmes

#### Antarctic Climate Evolution (ACE)

ACE will use palaeoclimate and ice sheet modelling investigations, integrated with terrestrial and marine geological and geophysical evidence, to study the climate and glacial history of Antarctica. Over the past 34 million years changes in climate have led to considerable spatial and temporal fluctuations in ice volume that have driven significant changes in global sea-level. Determining the scale and rapidity of the response of ice masses and associated sea ice to climate forcing is essential to understand the processes of climate change in the region, and to underpin estimates of the likely magnitudes and directions of future change.

ACE will promote the exchange of data and ideas between research groups focusing on the evolution of Antarctica's climate system and ice sheet. It will encourage scientific exchange between modellers and data gatherers, facilitating the development of relevant projects and the testing of hypotheses. The main function of the programme is to acquire and compile "ground truth" geoscience data and to use these to develop a suite of palaeoclimate models for significant periods of climate change throughout Cenozoic times up to and including the Holocene. Data access and data sharing will be encouraged to facilitate the data syntheses needed for enhancing palaeoclimate models. Numerical modelling is an essential component, and will address:

1. ice sheet modelling;
2. coupled ice-sheet, climate and ocean modelling; and
3. coupled ice sheet and sediment modelling to address the interaction between ice sheets, water and deformable sediment at the interface between ice and bedrock.

The broad outcomes will be:

1. a quantitative assessment of the climate and glacial history of Antarctica;
2. identification of the processes that govern Antarctic climate change and those that feed back around the globe;
3. improvements in the ability to model past climate changes in Antarctica; and
4. documented case studies of past changes against which models of future change can be tested.

ACE will promote new drilling programmes to expand the necessary database. These will include the activities of the Integrated Program for Ocean Drilling (IPOD) in deep water, the shallow drilling (SHALDRIL) programme on land, and the ANDRILL programme on the ice shelves. Among other things the programme will examine the terrestrial record of landscape evolution; the influence of tectonics on the behaviour of the ice sheet; and the

influence of palaeo-seaways, such as the opening of the Drake Passage, on climate.

ACE and AGCS have complementary interests in Quaternary studies of Antarctica, so a joint Action Group manned by both programmes will be established to run a Quaternary sub-programme.

#### Antarctica and the Global Climate System (AGCS)

AGCS will investigate the nature of the atmospheric and oceanic linkages between the climate of the Antarctic and the rest of the Earth system. The linkages between the different elements of the Antarctic climate system are highly non-linear and it is necessary to understand the behaviour of and interactions between the atmospheric, oceanic and cryospheric elements of the system if past change is to be explained and we are to have confidence in future predictions. A study of this kind has only recently become feasible with the advent of sufficient high-resolution in-situ data and ice core records, and the development of numerical modeling tools to the point where they can represent realistically the closely coupled atmosphere-ocean processes that control long-term climate variability.

The work requires a combination of modern, instrumented records of atmospheric and oceanic conditions, and the climate signals held within ice cores, to understand fully past and future climate variability and change in the Antarctic as a result of natural and anthropogenic forcing. AGCS will focus on the last 6,000 years, since the mid-Holocene warm period, and will develop forecasts to 100 years in the future. Records that capture abrupt climate change over the past few glacial/interglacial cycles will also be studied, in association with the ACE programme (see below).

AGCS will use existing deep and shallow ice cores, satellite data, the output of global and regional coupled atmosphere-ocean climate models, and in-situ meteorological and oceanic data to understand how signals of tropical and mid-latitude climate variability reach the Antarctic, and high latitude climate signals are exported northwards. It will emphasize synthesis and integration of existing data sets and model outputs, although some new ice core and oceanographic data will be collected.

AGCS will contain four closely linked themes reflecting significant gaps in our knowledge:

1. Decadal time scale variability in the Antarctic climate system, to investigate ocean-atmosphere coupling and the role of the El Niño-Southern Oscillation in modulating the Antarctic climate;
2. Global and regional climate signals in shallow and deep ice cores, to establish better quantitative relationships

between ice core data and measures of tropical, mid- and high latitude climate variability;

3. Natural and anthropogenic forcing on the Antarctic climate system, including the production of regional-scale estimates of expected climate change over Antarctica during the next 100 years, to be able to distinguish natural variability from anthropogenic activity and to understand how global climate change will be expressed in the Antarctic; and
4. The export of Antarctic climate signals, to examine how climate changes in the Antarctic can influence conditions at more northerly latitudes

The research will be carried out in an interdisciplinary way through a close collaboration between meteorologists, climatologists, glaciologists, oceanographers and ice chemists, who will integrate observational and modelling activities.

A key deliverable will be the production of regional and Antarctic-wide climate predictions covering the next 100 years.

#### **Evolution and Biodiversity in the Antarctic (EBA): the response of life to change.**

A major challenge facing humankind is the management of the Earth System to ensure a sustainable human future. Managing the environment requires understanding the functioning of all parts of the Earth System in the context of both natural and anthropogenic change. That understanding must encompass Antarctica and the Southern Ocean and their biota, including knowledge of the way in which life has evolved in those environments, and the ways in which it is likely to change, which in turn demands an integrated, interdisciplinary investigation of the structure and functioning of living systems in the region.

EBA will provide a platform for the kinds of interactions amongst disciplines and researchers that are essential to understand the evolution of biodiversity in the region and the responses and contributions of that biodiversity to the Earth System. By doing so, it will fill a major void in understanding of the role of biodiversity in the Earth System.

The overall aims of EBA are to understand the evolution and diversity of life in the Antarctic, to determine how these have influenced the properties and dynamics of present Antarctic and Southern Ocean ecosystems, and to make predictions on how organisms and communities will respond to current and future environmental change. EBA will integrate work on marine, terrestrial and limnetic ecosystems in a manner never before attempted, covering an entire biome. By comparing the outcomes of parallel evolutionary processes over a range of Antarctic environments, fundamental insights can be obtained into evolution, and the ways in which life responds to change, from the molecular to the whole organism level and ultimately to biome level. EBA will be complementary to many ongoing national programmes that cannot attempt an ambitious study individually.

Antarctic ecosystems offer unique examples of how both structure and function have evolved, and the likely responses of species and ecosystems to change induced by a wide variety of natural and anthropogenic processes, as well as the ways in which their responses feed back to influence these processes.

EBA will use a range of modern techniques and a multidisciplinary approach to explore the evolutionary history of the modern Antarctic biota, examine how modern biological diversity in Antarctica influences how present-day ecosystems function, and attempt to predict how the biota may respond to future environmental change. It will integrate the major realms of Antarctic biology into a cohesive picture for the first time, and contribute to evolutionary theory and understanding of global ecology and biological diversity. More specifically, EBA will examine:

1. The evolutionary history of the Antarctic biota.
2. Evolutionary adaptations to the Antarctic environment.
3. Patterns of gene flow within, into and out from the Antarctic, and their consequences for population dynamics.
4. Patterns and diversity of organisms, ecosystems and habitats in Antarctica, together with the ecological and evolutionary processes that control these.
5. The impact of past, current and predicted environmental change on biodiversity and the consequences for Antarctic marine, freshwater and terrestrial ecosystem function.

The programme will integrate research across a wide variety of fields, from functional genomics and molecular systematics to ecosystem science and modelling, and will draw on and contribute information to a wide range of related fields, such as climate modelling and tectonics.

#### **Interhemispheric Conjugacy Effects in Solar-Terrestrial and Aeronomy Research (ICESTAR).**

ICESTAR will address some key questions about the interaction of the solar wind with the Earth's outer atmosphere, so as to quantify the key mechanisms of indirect coupling between the Sun and the Earth at high latitudes; to determine how solar variability is amplified through those couplings; and to determine the temporal evolution of atmospheric change caused by solar coupling. Much remains to be learned about how the solar forcing can affect the atmosphere, especially at high latitudes where the solar wind-driven processes are most influential.

ICESTAR will also investigate possible influences of the changing Sun (i.e., its irradiance and magnetic moment) and the geospace environment on polar climate and weather. ICESTAR addresses the fact that important gaps remain in our understanding of the solar wind-magnetosphere-ionosphere interaction. We do not know enough about the changes and dynamics of the Earth's



magnetosphere under extreme solar wind conditions, i.e., during strong geomagnetic storms and as a consequence of solar activity such as coronal mass ejections.

In order to obtain a deep understanding of the mechanisms responsible for energy transfer from the solar wind into the geospace environment, simultaneous consideration is needed of various geophysical phenomena occurring over both the northern and southern Polar Regions. ICESTAR will both enable and conduct focused scientific research on the upper atmosphere above the Antarctic and on how that region of space ties in with the global system. The programme will strive for international coordination of interhemispheric research in the areas of solar-terrestrial physics and polar aeronomy, promoting exchange of research ideas, and sharing experimental data from various arrays of geophysical instrumentation deployed over the Polar Regions and in near-Earth space.

ICESTAR aims

1. to identify and quantify various mechanisms that control interhemispheric regional differences and commonalities in the electrodynamics and plasma dynamics of the Earth's magnetosphere-ionosphere coupling system, and in the aeronomy of the upper atmosphere over the Arctic and Antarctic; and
2. to create a data portal that will link together a large number of geophysical databases including both data serving applications and visualization tools, so as to enable a systems view of the polar upper atmosphere. Creation of the ICESTAR data portal to facilitate the sharing and interpretation of global geospace datasets will encourage the collaboration of researchers by sharing data and the interpretation of the results.

### **Subglacial Antarctic Lake Environments (SALE)**

SALE serves as the international focal point of SCAR's activities to promote, facilitate, and champion cooperation and collaboration in the exploration and study of subglacial environments in Antarctica.

The overarching scientific objectives of SALE are:

1. to understand the formation and evolution of subglacial lake processes and environments;
2. to determine the origins, evolution and maintenance of life in subglacial lake environments; and
3. to understand the limnology and palaeoclimate history recorded in subglacial lake sediments.

To explore the complex interplay of biological, geological, chemical, glaciological, and physical processes within subglacial lake environments an international, interdisciplinary plan for coordinated research and study is essential. The three objectives can only be accomplished by integrated and coordinated phases of discovery and hypotheses driven research over at least a ten-year period.

Major areas of research will be:

1. Functional Genomics and Phylogenetics (eg to determine the genetic diversity in the water columns and benthic sediments of subglacial lakes);
2. Limnology (eg to establish the geochemical and isotopic composition of selected lake water constituents to determine their role in biological processes, water column stability, and to establish the age of subglacial lake water);
3. Geophysics (eg to understand the tectonic and ice sheet setting of subglacial lakes through geological analysis of geophysical data);
4. Glaciology (eg to understand the interrelation between ice sheet processes and lake water circulation);
5. Geology and Cenozoic Palaeoclimate (eg to use palaeoenvironmental data to determine lake and ice sheet histories, and evaluate temporal changes in Cenozoic palaeoclimate relative to those histories determined from Antarctic marginal sequences and global Cenozoic proxy records).

The technological challenges and environmental stewardship issues of under ice drilling cannot be underestimated, so SALE will also advise the international community not only on scientific issues but also on technology issues relevant to subglacial lake exploration, including environmental concerns and safeguards.

## SCAR's Action and Expert Groups

### Geosciences SSG

Action Group on “Communication and Outreach” (COG): to provide information on Antarctic geoscientific research to the scientific and community and the wider public.

Action Group on “Acoustics in the Marine Environment”: to consider the effects on marine mammals of noise created by marine scientific activities (such as echo-sounding and airgun surveys).

Action Group (Cross-SSG) on “Antarctic Treaty and Committee for Environmental Protection (CEP)”: to communicate with SCAR representative at the CEP and ATCM to bring matters of concern to the CEP and Treaty to the SSG for advice and to identify areas of concern in geosciences and geospatial information, raise them in Antarctic Treaty System (ATS) fora, and provide scientific advice.

Action Group on “Marine Survey Coordination”: to develop mechanisms for improved communication about planned marine surveys within the Antarctic community.

Expert Group on “Geographical Information” (EGGI): to create an Antarctic Spatial Data Infrastructure (ANTSDI) by: providing Antarctic fundamental geographic information products and policies in support of all SCAR science programmes and operations management and the global user; integrating and coordinating Antarctic mapping and GIS programmes; promoting an open standards approach to support free and unrestricted data access; promoting capacity building towards sound Antarctic geographic data management within all SCAR nations; and promoting to COMNAP the data and products that the EGGI produces.

Expert Group on “Permafrost and Periglacial Environments” (EGPPE): to provide coordination, communication and exchange of data amongst Antarctic permafrost researchers within SCAR and IPA and promote interaction and collaboration with SCAR and IPA working groups; to collect and collate spatial data on permafrost and cryosols and contribute to databases for Antarctic soils, permafrost and ground ice conditions including the active layer; to develop and promote monitoring/ observation protocols and networks; to promote international cooperation and facilitate collaborative field research; and to address key science questions pertaining to permafrost.

Expert Group on “Geodetic Infrastructure of Antarctica” (GIANT): to provide a common geodetic reference system for all Antarctic scientists and operators; to contribute to global geodesy for the study of the

physical processes of the earth and the maintenance of the precise terrestrial reference frame; to provide information for monitoring the horizontal and vertical motion of the Antarctic.

Expert Group on “Antarctic Neotectonics” (ANTEC): to promote and coordinate multidisciplinary, multinational research relevant to Antarctic neotectonics; to identify ‘target sites’ where there is a need for deployment of geodetic and seismic stations and arrays, and airborne, marine and field campaigns; to encourage and coordinate the installation of instruments at permanent sites and in regional networks (GPS, gravity, seismic) for focused studies in target areas; and to promote and coordinate sharing of instrumentation, logistics, and data.

Expert Group on “Antarctic Digital Magnetic Anomaly Project” (ADMAP): to produce a coordinated effort for: compiling the existing magnetic data acquired by various institutions; coordinating protocols for data distribution; serving as a reference for future survey planning; archiving and maintaining the magnetic anomaly data base of Antarctica.

Expert Group on “International Bathymetric Chart of the Southern Ocean” (IBCSO): to act as the steering group for production of a revised chart of the bathymetry of the Southern Ocean, in conjunction with the IHO and GEBCO.

### Life Sciences SSG

Action Group on “Global International Waters Assessment” (GIWA): to provide the information required for a Global Waters Assessment for Area 66: Antarctica.

Action Group on “Best Practices for Conservation”: to review and establish current best practices for conservation in an Antarctic context.

Action Group on Biological Monitoring: to organize a workshop on this topic, in order to produce a (set of) protocol(s) for biological monitoring activities for environmental management purposes.

Action Group for the “Census of Marine Life” (CoML): to act as a scientific steering committee for the Southern Ocean component of the global CoML programme.

Expert Group on: “Birds”: to provide long-term data on avian populations in the region; to encourage, coordinate and support research on seabirds; to contribute to their conservation; and to provide scientific advice to SCAR.

Expert Group on “Seals”: to provide information on the status of seal stocks as required by the Convention for the Conservation of Antarctic Seals (CCAS); to encourage research and information exchange on this group of animals; and to provide advice to SCAR.

Expert Group on “Human Biology and Medicine”: to provide a forum for medical, physiopathological, behavioural, clinical, and biological scientists; to promote high quality research in polar human biology in association with appropriate international scientific organizations; to encourage cooperation in the continued evolution of high quality healthcare and the prevention of injury and disease in the Antarctic; and to promote the full use of the unique environment of the Antarctic to allow understanding of major health problems in extreme environments in particular, and in mankind in general.

### **Physical Sciences SSG**

Action Group on: “Plateau Astronomy Site Testing in Antarctica” (PASTA): to coordinate the efforts to properly characterize the conditions available at various sites on the Antarctic plateau, delivering and compiling the required site testing data.

Action Group on “Modelling and Observational Studies of Antarctic Katabatic Winds” (MOSAK): to analyze, understand and model katabatic wind events, and to develop a new map of katabatic wind distribution and strength over the Antarctic ice sheet.

Action Group (Cross-SSG) on Coordination of Scientific Activities on King George Island: to encourage different national groups on King Gorge Island to share information about their research plans, so as to avoid unnecessary duplication of costly activities.

Expert Group on “SCAR and Oceanography”: - to facilitate coordination between the physical oceanographic research groups currently active and those planning research in the Southern Ocean; to encourage an

inter-disciplinary approach to Southern Ocean observations, modelling and research, recognizing the inter- dependence of physical, chemical and biological processes in the ocean at present and in the past; to identify historical and reference data set of value to researchers, focusing initially on physical oceanography data; to encourage the exchange of information with operational agencies.

Expert Group on “Antarctic and Astronomy and Astrophysics” (AAA): to coordinate efforts to explore the potential for astronomical observations in the Antarctic.

Expert Group on “Operational Meteorology in the Antarctic”: to liaise with WMO over observing standards, the use of new data/model fields and weather forecasting in the Antarctic; to maintain links with COMNAP/SCALOP; and to provide scientific advice to WMO on Antarctic meteorology.

Expert Group on “Ice Sheet Mass Balance and Sea Level” (ISMASS): to understand the relationship between Ice Sheet Mass Balance and Sea Level, by determining the present accumulation rate over the entire ice sheet and measuring ice thickness and velocities at the grounding zone of the ice sheet and glaciers.

Expert Group on Ice Drilling Technology: to facilitate communication among international ice drilling communities; to create an international forum for strategic development of new ice drilling and borehole testing concepts and technologies and continued improvement of existing technologies; to provide a pool of expertise to address SCAR issues related to ice drilling and coring; and to enhance international cooperation and communication on large- and small-scale ice core recovery projects.

### List of Acronyms

AAA	Antarctic and Astronomy and Astrophysics	ICSU	International Council for Science
ACE	Antarctic Climate Evolution	IGOS	Integrated Global Observing Strategy
ADMAP	Antarctic Digital Magnetic Anomaly Project	IGU	International Geographical Union
AGCS	Antarctica in the Global Climate System	IGY	International Geophysical Year
AGU	American Geophysical Union	IPA	International Permafrost Association
ANDRILL	Antarctic Geological Drilling Project	IPOD	Integrated Program for Ocean Drilling
ANTEC	Antarctic Neotectonics	IPY	International Polar Year
ANTIME	Late Quaternary Sedimentary Record of Antarctic Ice Margin Evolution	ISMASS	Ice Sheet Mass Balance and Sea-Level
ANTSDI	Antarctic Spatial Data Infrastructure	ITASE	International Trans-Antarctic Scientific Expedition
APTIC	Antarctic Peninsula Tropospheric-Ionospheric Coupling	IUBS	International Union of Biological Sciences
ASPeCT	Antarctic Sea-Ice Processes and Climate	IUGG	International Union of Geodesy and Geophysics
ATAC	Antarctic Tropospheric Aerosols and their Role in Climate	IUGS	International Union of Geological Sciences
ATCM	Antarctic Treaty Consultative Meeting	IUPAC	International Union of Pure and Applied Chemistry
CAML	Census of Antarctic Marine Life	IUPS	International Union of Physiological Sciences
CEP	Committee for Environmental Protection	JCADM	Joint Committee on Antarctic Data Management
CliC	Climate and Cryosphere Programme	MADREP	Middle Atmosphere Dynamics and Relativistic Electron Precipitation
CMBR	Cosmic Microwave Background Radiation	MarBIN	Marine Biodiversity Information Network
COG	Communication and Outreach	MEDINET	Medical Network
CoML	Census of Marine Life	MOSAK	Modelling and Observational Studies of Antarctic Katabatic Winds
COMNAP	Council of Managers of National Antarctic Programmes	OBIS	Ocean Biodiversity Information System
EASIZ	Ecology of the Antarctic Sea-Ice Zone	PASTA	Plateau Astronomy Site Testing in Antarctica
EBA	Evolution and Biodiversity in the Antarctic	PPE	Permafrost and Periglacial Environments
EGGI	Expert Group on Geographical Information	READER	Reference Antarctic Data for Environmental Research
EGGPE	Expert Group on Permafrost and Periglacial Environments	RiSCC	Regional Sensitivity to Climate Change in Antarctic Terrestrial and Limnetic Ecosystems
EGU	European Geophysical Union	SALE	Subglacial Antarctic Lake Environments
EoI	Expression of Interest	SALEGOS	Subglacial Antarctic Lake Exploration Group of Specialists
EVOLANTA	Evolutionary Biology of Antarctic Organisms	SCALOP	Standing Committee on Antarctic Logistics and Operations
GIANT	Geodetic Infrastructure for Antarctica	SCAR	Scientific Committee on Antarctic Research
GIS	Geographic Information Systems	SCOR	Scientific Committee on Oceanic Research
GIWA	Global International Waters Assessment	SHALDRIL	Shallow Drilling
GLOBEC	Global Ocean Ecosystems Dynamics	SRP	Scientific Research Programme
GLOCHANT	Group of Specialists on Global Change and the Antarctic	SSG	Standing Scientific Group
GPS	Global Positioning System	SSG-G	SSG on Geosciences
IABO	International Association of Biological Oceanography	SSG-LS	SSG on Life Sciences
IAG	International Association of Geodesy	SSG-PS	SSG on Physical Sciences
IAnZone	International (Coordination of Oceanographic Research within the) Antarctic Zone	UN	United Nations
IAPSO	International Association for the Physical Sciences of the Ocean	UNESCO	United Nations Educational, Scientific and Cultural Organization
IBCSO	International Bathymetric Chart of the Southern Ocean	URSI	Union Radio Scientifique Internationale
ICESTAR	Inter-hemispheric Conjugacy Effects in Solar-Terrestrial and Aeronomy Research	WMO	World Meteorological Organization



## Report from ATS Standing Committee on ATCM XXVIII

### Introduction

ATCM XXVIII took place in Stockholm from -17 June 2005. J.Thiede, DWH Walton, C Summerhayes, PD Clarkson and M Kaczmarek attended on behalf of SCAR. The SCAR delegation also hosted D Carlson, Executive Director of the IPY Programme Office during the second week. Prof Steven Chown came for three days in the first week to deliver the SCAR Lecture.

The meeting took place in the Technical Museum and was very well organised by the Swedish Ministry of Foreign Affairs. It proved to be a very busy meeting with 72 Working papers and 125 Information Papers, the bulk of which were taken by the Committee for Environmental Protection.

### SCAR Papers

SCAR submitted two working papers, and three information papers. These were prepared in advance and almost all circulated to National Committees, Chief Officers and the SCAR Executive for comment before submission. The Expert Group on Birds and the Expert Group on Seals both played a major part in preparing material for the two working papers.

This year there were record numbers of papers for consideration at the CEP. Of the 98 papers listed for the CEP there were 37 Working Papers. To ensure that all these were adequately dealt with the Chair only exceptionally allowed discussion of Information Papers.

The most significant papers were those on Specially Protected Species. SCAR had been asked to provide an example of how an endangered species could be described for listing in the Appendix to Annex 2, and had also been asked to examine the case for the continued listing of Fur Seals and the Ross Seal.

The discussion on listing was very positive with respect to SCAR recommendations and developed a breakout group, led by New Zealand, that designed a process for submission of a case, its progress through the ATS, and the way in which a final decision on listing could be taken. This group also recommended the SCAR requirement that every SPS must have an Action Plan for recovery of the population. The CEP endorsed the use of the IUCN criteria for assessing endangerment, agreed that any species assessed as Vulnerable or above should be assessed for listing and accepted the new submission process and the guidelines for the Action Plan. SCAR was requested to submit cases for the Southern Giant Petrel and the Macaroni Penguin for consideration at the next meeting. Parties seem to be determined to go ahead with listing a species once a case is suggested and arguing out the acceptable Action Plan in later years.

The paper on delisting of Fur Seals fared less well. It

was clear from the discussions that some Parties were unhappy about the principle of delisting species once the populations had recovered. There were several helpful interventions accepting the data that SCAR had submitted, agreeing that this was a conservation success and accepting that the species should be delisted. However, there were interventions from other Parties who suggested that the Expert Group on Seals had not used all the available data, that the threats to the species were not adequately documented, that *Arctocephalus tropicalis* had not returned to its pre-hunting levels and that there were some inconsistencies in the text. ASOC also circulated a suggestion in ECO that the UK had plans for culling the seals which was why SCAR was recommending delisting. This last suggestion brought a very strong comment from the UK. The result of all this was that SCAR was asked to resubmit the case next meeting using the newly agreed process and taking into account the range of comments. SCAR also agreed that as it expected that the analysis of the APIS data would have been completed and it would by then be in a position to comment on the status of the Ross Seal.

The SCAR Report took a new form this year with both details of the re-organised structure, the science plans for the five new programmes and a selection of science highlights from each discipline. Since this was presented by the President as an introduction to the SCAR lecture there was no possibility of questions or discussion on the content.

The Information Paper on Biodiversity, provided in support of the SCAR Lecture, was taken in the Operational Working Group. It attracted considerable interest and SCAR was asked to revise it to include comments on microbial introductions and resubmit it next year as a Working Paper for the CEP for more substantive discussion.

David Carlson introduced the IPY report before any other papers on IPY. The following discussion indicated that the ATCM would like a paper/presentation from the IPY Programme Office next year on the extent of the programmes endorsed by the Joint Committee. The CEP has also requested a paper dealing more specifically with the potential environmental impacts associated with the increased activities whilst the Tourism Working Group is likely to become concerned over an increase in tourists stimulated by the IPY. At the behest of the UK the ATCM is intending to send a formal invitation to the IPY Joint Committee for the Edinburgh ATCM and so SCAR will not be required to provide for IPY on its delegation.

### SCAR Lecture

The lecture this year was by Steven Chown on Biodiversity. It was scheduled on the Wednesday morning as a Plenary



and was attended by the King. The lecture was outstanding and was very well received and the reception afterwards provided an excellent opportunity to talk about SCAR work. However, despite the excellent scheduling there were two problems: the lecture theatre could only hold 200 so quite a number of participants could not be admitted, and the Liability Working Group decided to continue with their discussions thus ensuring that none of the lawyers attended. SCAR was specifically thanked for both its presentations by the Chairman in his concluding remarks.

### Other Papers

After years of negotiation the ATCM finally agreed Annex VI on Liability. This already has some importance for SCAR as there were attempts to introduce a resolution dealing with the potential for repair of environmental damage, requesting SCAR and COMNAP to provide a scientific and technical report as soon as practicable. Although this was finally reduced to report language it is likely to appear again next year as a formal resolution.

A very large number of ASPA Management Plans (principally revisions of plans for existing areas) were agreed as was the ASMA Management Plan for Deception Island. New ASMA proposals were tabled for the Larsemann Hills and South Pole, and it was agreed that the ASMA Plan for Admiralty Bay (which preceded the formation of the CEP) should be reconsidered in the light of significant changes. At this point India announced it would be building a new station in the Larsemann Hills. Ukraine put forward its first ASPA proposal for Peterman Island. The CEP has now decided that it can only deal with the management plans by establishing a standing committee that will attempt to do what SCAR originally did with such plans!

Work by Germany and Chile on an ASMA for Fildes Peninsula will be taken forward by two workshops organised by Germany in late 2005 and early 2006 to which Observers are specifically invited. The ATCM also revised the criteria under which it would be decided when a protected area had a sufficient marine component for it to be referred to CCAMLR for comment.

There was extensive discussion of the latest stage of the environmental domain analysis being developed by New Zealand as an independent tool for identifying the range of habitats throughout the continent and SCAR was asked to help with improving it. New Zealand also tabled an interesting analysis of the objectives of existing ASPA management plans that provided a further indication of the lack of any strategic planning for the selection of areas.

The report from the ICG on environmental monitoring together with other papers on monitoring initiated a discussion about the proliferation of ICGs and the problems of contributing. The result was to extend the life of the present ICG by another year and revise its terms of reference to include those of the State of the Environment

Reporting ICG. SCAR seems to have acquired a continuing responsibility for providing temperature data for the SAER. The brief SCAR report on the Texas workshop passed unremarked but that was probably because interested Parties already knew that a full report on relevant aspects would be provided next year. COMNAP provided a paper on practical guidelines for environmental monitoring which was endorsed by the ATCM.

Papers on quarantine and introductions through ballast water exchange stimulated a more general discussion on introductions to the Antarctic that linked well to the SCAR lecture. The scientific basis for any future recommendations needs critical examination and New Zealand offered to host a scientific workshop on this topic next year. They requested that SCAR be involved in planning this.

A novelty this year was the discussion of a strategic plan for the CEP. Breakout discussions provided both a list of future objectives and one of core deliverables. This has so enthused Parties that the UK is to hold a pre-CEP workshop on strategic planning next year. To progress this a CEP Steering Committee has been established.

ASOC provided two papers of note. The first attempted to draw together recent key papers on climate change from the primary literature, principally using the original summaries to indicate their relevance. This had been done with the assistance of some US scientists and was a new way of drawing attention to progress in this field. A second paper dealt with marine acoustics and drew attention to a number of recent publications, many of which were either posters or in the grey literature but did include some important recent peer reviewed papers that are potentially relevant to the Southern Ocean. Neither drew substantive discussion.

Considerable time was spent on presentations and discussions of the draft CEEs for the redevelopment of Halley and Neumayer, and there were major inspection reports from Australia of Ross Island facilities and UK, Peru and Australia of Antarctic Peninsula facilities. Of the recommendations from the UK there were two that concerned SCAR. The first was that Parties should co-operate better on scientific research, ensure scientific priorities were addressed in an effective manner and that duplication of work is minimised. In addition it was suggested that SCAR should undertake an in-situ audit of scientific research in order to comment on this. Several Parties expressed concern about such an audit and SCAR noted that any consideration of these would be undertaken by the Executive.

In the Working Group on Operational Affairs there were few Working Papers but some interesting IPs. Details were provided on the development of new stations for Belgium and India as well as the announcement that Rumania has signed an agreement with Australia to use Law Base for the next 10 years. Argentina suggested that it would be expanding work in the Dallman Laboratory at Jubany.

After a brief introduction to the SCAR Biodiversity paper there were several interventions by Parties commenting on the quality of the lecture. UK and Chile requested that it be revised to include some mention of microbial introductions and resubmitted next year to the CEP as a Working paper. In response to questions SCAR outlined why it had embarked with IUCN on a revision of the Antarctic Conservation Strategy and noted that it would provide information on progress to the CEP when appropriate.

Bioprospecting was an agenda item but was taken in the Legal & Institutional Working Group and the Parties indicated that they intend to treat this primarily as a legal matter in future.

### **Conclusions**

This was another very successful year for SCAR at the ATCM. The major papers we prepared were submitted on

time and well received by the Parties. It is not surprising that the proposal to delist the fur seals did not succeed immediately given that there was no established process for doing this. The lecture and reception were judged an outstanding success, although the lack of interest from the lawyers is depressing. The delivery of the IPY report stimulated considerable informal discussion for David Carlson and allowed him to make many useful contacts. We have been tasked in a variety of ways to deliver papers for the next meeting – a clear indication of the value placed on SCAR's independent advice.

Finally, SCAR have been formally invited to provide another lecture on relevant scientific issues to XXIX ATCM.

DWH Walton

21 June 2005

## **Annex 1**

### **SCAR papers submitted to XXVIII ATCM**

IP Biological monitoring of human impacts in the Antarctic

IP Biodiversity in the Antarctic

IP SCAR Report to XXVIII ATCM

WP Proposal to List a Species as a Specially Protected Species under Annex II

WP De-listing Antarctic Specially Protected Species

IP Report on the International Polar Year (for IPY)

## Report on SCAR Fellowship Scheme 2005-06

The SCAR Fellowship Programme was launched in 2002 with the Prince of Asturias Award of US\$50,000, which paid for 5 Fellowships for 2003-2004, and will be sustained by contributions from SCAR Members and from other sources of revenue as they become available. The programme is designed to encourage the active involvement of young scientists and engineers in Antarctic scientific research, and to strengthen international capacity and cooperation in Antarctic research.

The award is for postgraduate and/or post-doctoral researchers from within the 32 SCAR Member countries, and will be limited to scientists younger than 35 on the day of the deadline for applications.

The Fellowships are intended to allow researchers from one SCAR Member country to undertake short term visits to major international laboratories, field facilities, and/or home institutions in or operated by other SCAR Member countries, so as to become acquainted with recent advances in research and/or to develop long-term scientific links and partnerships. The work shall be carried out in a research group of a SCAR nation different from that of the applicant's origin.

Topics for support should make a contribution to the objectives of one or more of the five Scientific Research Programmes endorsed by SCAR (for details see <http://www.scar.org/researchgroups/>).

Awards will be up to US\$10,000, providing, as needed, an economy class round trip airfare and a modest subsistence allowance for the fellowship period. The Fellow's home institute will bear all expenses incurred in his or her own nation (domestic travel, visa costs, etc.), and the host institute will waive any bench fees that they might normally charge trainees. The number of awards will depend on the budget available and the quality of the applications.

For the 2005-2006 season, proposals were requested using a template on the SCAR web page (<http://www.scar.org/awards/fellowships/index.html>), with a deadline of May 31, 2005, for submission to the SCAR Secretariat.

Proposals were judged by a review panel comprising: two members of the SCAR Executive; the Chief Officers of the three Standing Scientific Groups; and the Executive

Director. The Panel evaluated proposals on the basis of the scientific excellence of the proposed research. They gave weight also to such factors as: its importance and timeliness; its achievability within the time frame allotted; the extent to which links had already been established with the proposed host institution; the extent to which the work would strengthen the scientific capacity of nations with smaller or less well-developed Antarctic research programmes; and to its 'fit' with SCAR's place in science and with SCAR's scientific directions.

Eleven proposals were received from the nationals of 8 countries. Seven of the proposals were from women scientists. Seven were from PhD students, 3 from post-docs, and one from an MSc student. After due consideration the successful candidates selected by the review panel, and approved by the Executive Committee at its meeting in Sofia, Bulgaria (July 11-13, 2005) were:

1. David Schneider (USA) to go from the University of Washington to the Australian Antarctic Division to work on ice cores to determine proxies for the Southern Annular Mode, as a contribution to SCAR's Antarctica in the Global Climate System (AGCS) programme.
2. Narelle Baker (NZ) to go from Victoria University of Wellington to Bristol University, UK, to work on the evolution of the Ross Ice Shelf as a contribution to SCAR's Antarctic Climate Evolution (ACE) programme.
3. Veronia Fuentes (Argentina) to go from the University of Buenos Aires to the Institute Sciences de la Mer at Rimouski, Canada, to work on nutrients and the ecosystem as a contribution to SCAR's programmes on Evolution and Biodiversity in the Antarctic (EBA) and AGCS.
4. Simone Brandao (Brazil) to go from the University of Hamburg in Germany to the Royal Belgian Institute for Natural Science to work on a molecular study of Antarctic ostracods as a contribution to SCAR's EBA programme.

Final reports are now available on the SCAR web site at <http://www.scar.org/awards/fellowships/asturias.html> from the Prince of Asturias Fellows supported by SCAR with the Prince of Asturias Prize during 2004-2005.