



Fifty Years of Peace and Science

April 6-17, 2009

IP 7

Agenda Item: ATCM 13, CEP
11
Presented by: SCAR
Original: English

SCAR's Role in the Antarctic Treaty System

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What is SCAR?

1. The Scientific Committee on Antarctic Research (SCAR) is an inter-disciplinary body of the International Council for Science (ICSU). Thirty-five of SCAR's 44 members are the national academies of individual countries, and 9 are ICSU scientific unions (see Appendix 1). All of the Contracting Parties and 4 of the Non-Contracting Parties to the Antarctic Treaty are, through their national academies, members of SCAR.
2. SCAR's primary mission is to coordinate, promote and facilitate the highest quality Antarctic science. SCAR's science is purposely focused on pan-Antarctic international and inter-and multi-disciplinary research of a scope that commonly cannot be accomplished by a single researcher, program or nation. Although SCAR is independent of governments, its second key mission is to provide high quality, objective and independent scientific advice to the Antarctic Treaty System (ATS). That mission is the focus of this paper.
3. Scientific representatives, nominated by national academies and committees, carry out SCAR's research and coordination activities. Some of these representatives are from academia and others are from government agencies. Regardless of whether they are employed by academia or by government agencies, SCAR Delegates are representatives of the diverse Antarctic science communities within their countries. SCAR's program scientists participate in Antarctic science that nations judge to be important and that is carried out through SCAR's portfolio of scientific programs and subsidiary bodies (Appendix 2). SCAR's selection of scientific directions is in turn proposed and led by its members. SCAR's science programs are facilitated by national operators, and are intended to add value to and to complement national science programs with international dimensions that might not otherwise be feasible.
4. The science fostered by SCAR generates new knowledge to improve our understanding of Antarctica and its surrounding oceans as an integrated system, both physical and living, and explores the Antarctic region's linkages with the rest of the Earth. New knowledge is created by surveying what is there, determining the processes that drive the system, understanding change in the past, and using that knowledge to better predict how the system may respond in future to natural and human induced change.
5. SCAR does not conduct routine monitoring and reporting for regulatory or compliance purposes, but encourages the collection of long-term observations of the environment for scientific reasons, such as establishing trends and variability, to enable better understanding of the underlying processes. SCAR strives to ensure that Antarctic science receives adequate representation in global programs, and to that end works in partnership with 20 or so other international organisations that have an Antarctic remit or that have a global remit with Antarctic relevance.
6. SCAR was established in 1958 to coordinate Antarctic research that began in the International Geophysical Year (IGY) of 1957–58. From March 2007 to March 2009, SCAR has been a major contributor to the International Polar Year (2007-2008), and will be a major player in preserving and building on the IPY legacy.

What is SCAR's mission?

7. SCAR's mission is "to be the leading independent organisation 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". To achieve its mission, SCAR aims to achieve the following five objectives:
- 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 students, and to promote the incorporation of Antarctic science in education at all levels; and
 - to communicate scientific information about the Antarctic region to the public.

What Research does SCAR do?

8. SCAR's scientific research programs are listed in Appendix 2. The wide range of expertise in the SCAR scientific community represented by these programmes enables SCAR to provide the Antarctic Treaty System with scientific advice on a wide range of topics. SCAR can assemble groups of experts to address topics even if they may not be a current focus of SCAR's portfolio of programs and subsidiary bodies.
9. Recent scientific achievements accomplished and facilitated by SCAR efforts to encourage international scientific collaboration are listed in Appendix 3.

What is SCAR's Approach to Advising the ATS?

10. The Standing Committee on the Antarctic Treaty System (SC-ATS) is the body tasked with developing SCAR's scientific advice to the Antarctic Treaty Consultative Meeting (ATCM) and its Committee on Environmental Protection (CEP), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the Convention for the Conservation of Antarctic Seals (CCAS), and the Advisory Committee to the Agreement on the Conservation of Albatrosses and Petrels (ACAP). The SC-ATS budget is approximately \$35,000/yr (including the cost of the SCAR Delegation to attend the ATCM) or about 8% of SCAR's annual core budget.
11. The SC-ATS reports directly to the SCAR Executive Committee, and all of its products are reviewed by SCAR management for content, responsiveness to the charge before them, and compliance with the guiding principles outlined below. The Chief Officer (CO) of SC-ATS, the SCAR Executive Director and the SCAR President comprise the SCAR Delegation to the ATCM. On occasion the Delegation may be supplemented with additional expertise, administrative support, and appointed replacements as the need arises. The CO of SC-ATS presents the papers approved by SCAR to the CEP; the SCAR President delivers the SCAR Report; and the Executive Director presents other reports. The CO of SC-ATS and the Executive Director are empowered to answer questions that may arise concerning submissions by SCAR, and are authorized to comment for SCAR in its role as an observer to the ATCM. The CO of SC-ATS and the Executive Director are empowered to accept or decline requests of SCAR that may be made during the ATCM and CEP meetings, and to negotiate the terms for any such requests. The SCAR Delegation is available as needed for consultation during the ATCM and CEP meetings. It has often been the case that additional members of SC-ATS attend the ATCM and CEP meetings as part of National Delegations and they are also available for

consultation or to make presentations as needed. The SCAR Delegation also includes the annual SCAR Lecturer.

12. SCAR's scientific advisory functions are guided by the following principles:

- SCAR is committed to giving the best, most accurate and up-to-date advice to the ATPs. This precept is pre-eminent in all SCAR actions and fundamental to SCAR's role as a scientific advisor.
- Assessments of scientific data and information are works in progress and any and all conclusions are tempered and qualified as being to the "best of our knowledge" at the time they are issued. New information comes to light on a regular basis, and assessments are revised accordingly. Incontrovertible conclusions are avoided (as few absolutes are discernable) and all conclusions are explicitly linked to any assumptions that were the basis for any derivative interpretations of available data and information.
- SCAR has a yearly obligation to the ATCM/CEP to provide new or updated advice. Deadlines are inevitable and may be beyond the control of SCAR so a "best effort" is the goal within time constraints, but not at the sacrifice of quality. Knowing that incomplete or insufficient knowledge is available to arrive at sound conclusions is grounds for delaying a report.
- SCAR has elected to rely primarily, if not exclusively, on peer-reviewed, publicly available science and information as a quality control/quality assurance mechanism. It is beyond SCAR's capabilities and remit to judge "grey literature" or unpublished data. SCAR encourages all data producers to make information publicly available and accessible in a timely manner, in the spirit of the AT, utilizing accepted and standard scientific practices. All sources of information are disclosed and attributed to origins, and the use of proprietary or undisclosed information is counter to this policy. Individual opinions or positions based on less than rigorous scientific principles are not considered. If further analysis of data by SC-ATS is required, then to the extent possible accepted, proven, and peer-reviewed methodologies are utilized and these methodologies are fully disclosed in the report.
- Broad, inclusive, and open consultation is the basis for producing SCAR advisory documents. The mechanisms for this consultation vary (emails, workshops, open forums, etc.) but an effort is made to solicit advice, within realistic timeframes, to allow for full consultation and feedback. The goal is to bring to bear the best advice no matter where it resides, but SCAR is often dependent to some degree on others outside of SCAR to respond in a timely manner. The effort is made but timely response by others cannot be guaranteed by SCAR. Consultation occurs as early in the process as deemed necessary to achieve the best outcomes. Whenever consultation is requested and comments received, documents are revised accordingly or an explanation of why not is required.
- SCAR has ultimate responsibility for the quality and accuracy of its advice, accepts this responsibility, and highly values its reputation as an objective, authoritative and independent source of advice, as this is fundamental to what SCAR is as an organization.

13. These guiding principles ensure accurate, robust and defensible advice. SCAR strives to adhere to these principles, even if sometimes it falls short of the ideal. Appendix 5 shows some of the ways in which SCAR's advice has been used by the Parties to evolve the stewardship of Antarctica.

14. SCAR also provides a number of products and services potentially of interest to Treaty Parties. The Standing Committee on Antarctic Data Management (SCADM) assists members to develop and manage National Antarctic Data Centres and to make data available through the Antarctic Master Directory (AMD). The Standing Committee on Antarctic Geographic Information (SC-AGI) manages the Antarctic Digital Database (ADD), the Composite Gazetteer of Antarctica, the Antarctic Map Catalogue and the King George Island GIS project. SCAR Education and Outreach programs include the SCAR Fellowships, which encourage the active involvement of early career scientists

and engineers in Antarctic scientific research to strengthen international capacity and cooperation. SCAR provides biennial medals to reward top quality Antarctic scientific research.

What Governs SCAR's Role in the ATCM and CEP

15. SCAR's relationship to the ATS is guided by Treaty documents (see Appendix 4). SCAR's role in the ATCM and CEP includes provision of Working Papers and Information Papers on:
 - Emerging policy-relevant issues;
 - Reviews of the state of knowledge; and
 - Scientific and technical advice.
16. SCAR's presence as an Observer provides the interface for advice to Parties on important emerging scientific issues and on the scientific implications of issues under debate at Treaty meetings.
17. The SCAR Lecture to the ATCM provides one means of highlighting advances in key areas of Antarctic science. As logistics by National Programs are essential to the conduct of Antarctic science, SCAR consults with the Council of Managers of National Antarctic Programs (COMNAP) as the topic demands and time allows, to ensure that the "SCAR Science Lecture" highlights and recognizes this important partnership.

What is SCAR's vision for its advisory role to the ATS?

18. SCAR is deeply committed as an organization to its scientific advisory role, building on more than 50 years of historical precedent and the critical need for ensuring that sound scientific advice forms the foundation for the wise and informed stewardship of Antarctica for science and the world community as a whole. There is a great and growing need for the very best scientific advice and SCAR is committed to playing a central role in these efforts. The Antarctic region holds secrets to forecasting future outcomes that allow a more refined view of the Earth system and how it responds that is critical to stewardship efforts. The Antarctic context has grown in complexity, national participation, and instruments of governance over the past half-century. Perception of the relevance of Antarctic science to the larger world audience is at an all time high, elevated by the International Polar Year 2007-2009. With these transformational changes the international Antarctic community has a heightened responsibility to provide the best, unbiased scientific advice to policy makers. This advice must be based on the latest knowledge and understanding of Earth's systems. Science is advancing at an unparalleled pace, testing our assumptions, interpretations and forecasts in near real-time. However, science may not always keep pace with the demands for its usage, making it imperative that realistic expectations of what science can deliver be communicated to its users. Sound, timely, and practical scientific advice is vital as society grapples with some of the greatest challenges of our time. SCAR is ready, willing and able, in close partnership and cooperation with other ATS advisory entities, to rise to the challenges we all face together in the 21st century.

APPENDIX 1. LIST OF SCAR MEMBERS (*1 = consultative party; *2 = non-consultative party).

Argentina *1	Australia *1	Belgium *1
Brazil *1	Bulgaria *1	Canada *2
Chile *1	China *1	Denmark *2
Ecuador *1	Finland *1	France *1
Germany *1	India *1	Italy *1
Japan *1	Korea *1	Malaysia
Netherlands *1	New Zealand *1	Norway *1
Pakistan	Peru *1	Poland *1
Portugal	Romania *2	Russia *1
South Africa *1	Spain *1	Sweden *1
Switzerland *2	Ukraine *1	United Kingdom *1
United States *1	Uruguay *1	
IGU	IUBS	IUGG
IUGS	IUPAC	IUPS
URSI	INQUA	IAU

APPENDIX 2. SCAR's RESEARCH PROGRAMMES

A2.1 Major Research Programmes

Topic	Activity
PAST CLIMATE: ANTARCTIC CLIMATE EVOLUTION (ACE)	uses geological and palaeoclimate data and ice sheet models to study Antarctic climate and glacial history
MODERN CLIMATE: ANTARCTICA IN THE GLOBAL CLIMATE SYSTEM (AGCS)	studies the nature of the atmospheric and oceanic linkages between the climate of the Antarctic and the rest of the Earth
BIOLOGICAL RESPONSES: EVOLUTION AND BIODIVERSITY IN THE	explores the evolutionary history of Antarctic biota, the influence of diversity on

ANTARCTIC (EBA)	ecosystems, and the biota's response to change
UNDER THE ICE: SUBGLACIAL ANTARCTIC LAKE ENVIRONMENTS (SALE)	studies the mysterious world of fresh water lakes and rivers under the Antarctic ice sheet.
SUN-EARTH INTERACTIONS: (ICESTAR)	examines the effects of Sun-Earth interactions at both Poles, and the connections between upper and lower atmosphere

A2.2 Other Research Areas

BIOLOGICAL ENVIRONMENT AND MONITORING	<p>Biological monitoring</p> <p>Birds & seals</p> <p>Human biology & medicine</p> <p>Census of Antarctic marine life</p> <p>Continuous plankton recorder</p> <p>Marine biodiversity information network</p>
PHYSICAL/CHEMICAL ENVIRONMENT AND MONITORING	<p>Environmental contamination</p> <p>Pan-Antarctic observing network</p> <p>King George Island science coordination</p> <p>Antarctic astronomy & astrophysics</p>
OCEAN AND ATMOSPHERE	<p>Acoustics in the marine environment</p> <p>Oceanography</p> <p>International bathymetric chart of the Southern Ocean</p> <p>Operational meteorology</p>

APPENDIX 3. RECENT SCAR ACHIEVEMENTS (COMPILED END 2007)

- Determining the functional ecosystem processes of the Southern Ocean ecosystem and documenting the distribution, abundance and long-term trends in Antarctic and Subantarctic seabird populations.
- Understanding the diversity, ecology and population dynamics of the organisms beneath the Antarctic sea ice, and their sensitivity to change.
- Establishing how Antarctic land, lake and pond life respond to climate change.
- Discovering a major warming of the Antarctic winter troposphere that is larger than any other tropospheric warming on Earth.

- Confirming that, while the Antarctic Peninsula has warmed significantly (3°C on average and 5°C in winter on the west coast over the past 50 years), air temperatures in East Antarctica have remained steady or cooled.
- Determining that the Larsen-B Ice Shelf collapsed because prevailing westerly winds brought more warm air across the Antarctic Peninsula as the planet warmed.
- Providing the basis for determining the mass balance of the Antarctic Ice Sheet.
- Generating plans and guiding principles for the exploration and environmental stewardship of unique, pristine, sub-glacial lakes.
- Providing a wide range of geographic and scientific maps, databases and related products for a wide variety of users.
- Providing scientific advice on conservation and environmental management issues to the Antarctic Treaty System.

APPENDIX 4. ATCM AND CEP REQUIREMENTS FOR INDEPENDENT SCIENTIFIC ADVICE

SCAR's formal relationship to the ATCM and the CEP, and the Treaty requirements of SCAR are detailed below (extracted from ATS documents).

A4.1 The Treaty, and ATCM

The Treaty itself says nothing about SCAR. However, the Rules of Procedure of the Antarctic Treaty Consultative Meetings (ATCM XXI: Decision 1 (1997) Revised Rules of Procedure (1997)) make the following statements:

Rule 2: "The Representatives of the Commission for the Conservation of Antarctic Marine Living Resources, the **Scientific Committee on Antarctic Research** and the Council of Managers of National Antarctic Programs, invited to attend those meetings in accordance with Rule 30, shall be referred to as "observers"."

Rule 3 "The Commission for the Conservation of Antarctic Marine Living Resources, the **Scientific Committee on Antarctic Research** and the Council of Managers of National Antarctic Programs shall be represented by their respective Chairman or President, or other persons appointed to this end. The names of members of delegations and of the observers shall be communicated to the Host Government prior to the opening of the meeting."

Rule 30: The observers referred to in Rule 2 shall attend the Meetings for the specific purpose of reporting on:

- b) in the case of the Scientific Committee on Antarctic Research:
 - (i) the general proceedings of SCAR;
 - (ii) matters within the competence of SCAR under the Convention for the Conservation of Antarctic Seals;
 - (iii) such publications and reports as may have been published or prepared in accordance with Recommendations IX-19 and VI-9 respectively.

Rule 31: Observers may be present at:

- (a) the plenary sessions of the Meeting at which the respective Report is considered;
- (b) formal committees or working groups, comprising all Contracting Parties at which the respective Report is considered, unless a Representative of a Consultative Party requests otherwise in any particular case.

Rule 32: Following the presentation of the pertinent Report, the relevant Chairman may invite the observer to address the Meeting at which it is being considered once again, unless a Representative of a Consultative Party requests otherwise.

Rule 33: Observers are not entitled to participate in the taking of decisions.

Rule 34. Observers may submit their Report and/or documents relevant to matters contained therein to the Secretariat, for distribution to the Meeting as working papers.

Note that these rules differentiate SCAR, CCAMLR and COMNAP (the “official” observers) from other scientific and technical bodies, which are invited to attend ATCMs on an *ad hoc* basis, and which can only present information papers and not working papers; SCAR can present both.

A4.2 The CEP

Article 11 of the Treaty’s Protocol on Environmental Protection established the CEP, and required the CEP to invite the **President of SCAR** to participate as an observer at its sessions.

The CEP was set up to provide advice, formulate recommendations, and perform other functions as needed. Under Article 12, the CEP shall provide advice (in consultation with **SCAR**, the Scientific Committee for CCAMLR and other relevant scientific, environmental and technical organizations) on:

- (a) the effectiveness of measures taken pursuant to this Protocol;
- (b) the need to update, strengthen or otherwise improve such measures;
- (c) the need for additional measures, including the need for additional Annexes, where appropriate;
- (d) the application and implementation of the environmental impact assessment procedures set out in Article 8 and Annex I;
- (e) means of minimising or mitigating environmental impacts of activities in the Antarctic Treaty area;
- (f) procedures for situations requiring urgent action, including response action in environmental emergencies;
- (g) the operation and further elaboration of the Antarctic Protected Area system;
- (h) inspection procedures, including formats for inspection reports and checklists for the conduct of inspections;
- (i) the collection, archiving, exchange and evaluation of information related to environmental protection;
- (j) the state of the Antarctic environment; and
- (k) the need for scientific research, including environmental monitoring, related to the implementation of this Protocol.

SCAR would be expected to provide advice to the CEP on (i), (j), and (k), but in the interests of the application of good science should also be prepared to comment on (a), where appropriate.

Article 3 (1) of Annex II to the Protocol notes that “Any emission standards and equipment guidelines which may be recommended by, inter alia, the Committee and the **Scientific Committee on Antarctic Research** shall be taken into account”, which implies that SCAR may be expected to make such recommendations.

Article 5 (1) of Annex V to the Protocol notes “the **Scientific Committee for Antarctic Research** or the Commission for the Conservation of Antarctic Marine Living Resources may propose an area for designation as an Antarctic Specially Protected Area or an Antarctic Specially Managed Area by submitting a proposed Management Plan to the Antarctic Treaty Consultative Meeting”.

Article 6 (1) of Annex V to the Protocol notes that “Proposed Management Plans shall be forwarded to the Committee, the **Scientific Committee on Antarctic Research** and, as appropriate, to the Commission for the Conservation of Antarctic Marine Living Resources. In formulating its advice to the Antarctic Treaty Consultative Meeting, the Committee shall take into account any comments provided by the **Scientific Committee on Antarctic Research** and, as appropriate, by the Commission for the Conservation of Antarctic Marine Living Resources”, which implies that SCAR is expected to examine the scientific implications of management plans – something GOSEAC did, but SC-ATS has not done.

The Rules of Procedure for the Committee for Environmental Protection (Decision 2 (1998)) state:

Rule 1: “Where not otherwise specified the Rules of Procedure for the Antarctic Treaty Consultative Meeting shall be applicable.”

Rule 4: Observer status in the Committee shall be open to:

(e) the **President of the Scientific Committee on Antarctic Research**, the Chairman of the Scientific Committee for the Conservation of Antarctic Marine Living Resources, and the Chairman of the Council of Managers of National Antarctic Programmes, or their nominated Representatives.

(f) subject to the specific approval of the Antarctic Treaty Consultative Meeting, other relevant scientific, environmental and technical organisations which can contribute to the work of the Committee.

Rule 6: Observers may submit documents to the Host Government of the meeting for distribution to members of the Committee. Observers may participate in the discussions, but shall not participate in the taking of decisions.

Rule 7: In carrying out its functions the Committee shall, as appropriate, consult with the **Scientific Committee on Antarctic Research**, the Chairman of the Scientific Committee for the Conservation of Antarctic Marine Living Resources, and the Chairman of the Council of Managers of National Antarctic Programmes and other relevant scientific, environmental and technical organisations.

APPENDIX 5. SCAR CONTRIBUTIONS TO THE DEVELOPMENT OF THE ANTARCTIC TREATY SYSTEM (BASED ON SCAR REPORT 29).

1. In 1964, SCAR’s scientific advice led to the adoption by the Antarctic Treaty of the Agreed Measures for the Conservation of Flora and Fauna.
2. In 1991, these Measures formed the core of a more comprehensive environmental agreement - the Protocol of Environmental Protection to the Antarctic Treaty – which also swept up many other aspects of environmental management on which SCAR had provided advice.
3. SCAR developed the original concepts of Sites of Special Scientific Interest and Specially Protected Areas for Antarctica, as well as an exemplar framework for management plans for Antarctic Specially Protected Areas (ASPAs) based on Moe Island.
4. In addition SCAR provided a Management Plan Handbook and a Visit Report Form, as well as the scientific advice to modify and edit plans for these sites when submitted by governments, prior to their adoption.
5. SCAR has been instrumental in recommending the procedures adopted for cleaning up the Antarctic environment: (i) SCAR designed the Checklist for Environmental Inspections under the Antarctic Treaty; (ii) together with COMNAP, SCAR developed the Environmental Impact Assessment (EIA) Guidelines and

good practice; and (iii) also along with COMNAP, SCAR developed the Environmental Monitoring Handbooks.

6. Subsequently SCAR organized the workshop with IUCN that put environmental education onto the ATCM agenda.

7. SCAR provided key advice that led to the Treaty Parties adopting the IUCN criteria for listing and delisting species, and on the basis of that adoption, SCAR provided the advice that led to the delisting of Fur Seals.

8. The work done by SCAR's BIOMASS programme (Biological Investigations of Marine Antarctic Systems and Stocks) formed the foundation for the creation of the Scientific Committee of CCAMLR.

9. The SCAR BIOMASS database was adopted by CCAMLR as the basis for its initial work programme.

10. SCAR has provided CCAMLR with data on higher predators.

11. SCAR was deeply involved in initiating and developing the Convention for the Conservation of Antarctic Seals.

12. SCAR published several reports containing advice for the negotiation of the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), which was eventually abandoned.