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Person Responsible: SCAR President

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Antarctic Science and Policy Advice in a Changing World

SCAR Strategic Plan 2011-2016

(Rev. 5.1 23 July 2010)

Executive Summary

Title: SCAR Strategic Plan 2011-2016: Antarctic Science and Policy Advice in a Changing World

Authors: SCAR

Relevant URLs or references to other reports: not applicable

Introduction/ Background: The SCAR Strategic Plan aims to foster a sense of dedication and commitment in SCAR members to ensure realization of the organization's vision, mission and goals. Regular, consultative strategic planning is undertaken to guide the organization. This Plan is a roadmap for SCAR from 2011-2016.

Important Issues or Factors: SCAR's current strategic plan is from 2004-2010 and the new plan covers three biennial cycles from 2011-2016

Recommendations/Actions and Justification: Review, comment, and conditional approval of the Plan subject to revision.

Expected Benefits/Outcomes: The Plan provides a strategic roadmap for SCAR for the next 6 years. The Strategic Plan guides collective decision-making about priorities and resource allocation**.**

Partners: See the Plan section on Partnerships. The Plan will also be circulated for wide comment to SCAR partners.

Budget Implications: The Plan provides guidance for the allocation of resources in concert with organizational mission and goals.

Antarctic Science and Policy Advice in a Changing World

Scientific Committee on Antarctic Research

Strategic Plan 2011-2016

Revision 5-1
23 July 2010

Antarctic Science and Policy Advice in a Changing World

"If Antarctica were music it would be Mozart. Art, and it would be Michelangelo. Literature, and it would be Shakespeare. And yet it is something even greater; the only place on Earth that is still as it should be. May we never tame it."
Andrew Denton (1960 –present)

Preface

The strength of an organization can best be judged by the dedication and participation of its members. To ensure the highest level of contributions to an entity, the persons involved must feel genuine ownership of its vision, mission, and goals. This can only be attained through the early and continual involvement in developing plans for the future. This is especially important for an organization dependent on volunteers for its progress, such as the Scientific Committee on Antarctic Research (SCAR).

SCAR has one advantage over other organizations, in that its focus – Antarctica – has, since it was first discovered, invoked the best of human characteristics – wonder, awe, inspiration, and even joy! Since its inception, more than 50 years ago, SCAR has benefitted from a dedicated community of "true believers" in the uniqueness and grandeur of the southern Polar Regions. Most of us feel that it is a privilege and honor to be able to conduct science, work and learn in one of Earth's greatest remaining wildernesses. We also feel a deep and enduring responsibility to be environmental stewards of the last great under-explored continent on our planet.

The ever increasing complexity of the southern polar world brings with it great challenges but also great opportunities. The questions being asked by those with interests in Antarctica and the global environment are more complex and difficult to answer than ever before. The critical role of Antarctica in these debates has never been more important to the future of our planet.

Now is the time for Antarctic science to elevate its presence and importance in the global conversation. SCAR is uniquely positioned to lead these efforts. It is not just for the future of SCAR that we think and act in a more strategic manner, but for the greater good of the place we all cherish, the societies that we live in and the planet that we inhabit.

Mahlon "Chuck" Kennicutt II, President of SCAR 2008-2012

Summary

This Strategic Plan for the Scientific Committee on Antarctic Research (SCAR) covers three biennial cycles from 2011-2016. SCAR is a non-governmental, international, interdisciplinary body of the International Council for Science (ISCU) and a Charity registered in the United Kingdom. SCAR's mission is grounded in Antarctic science and the use of this science to formulate policy in the Antarctic region. SCAR's scientific interests include the study of Antarctica[1], understanding the linkages between Antarctica and the Earth system, and observations of and from the Antarctic region. Not only is Antarctic an amazing place, but it is also an unparalleled "natural laboratory" for vital scientific research activities which are important in their own right and impossible to carry out elsewhere on the planet. The study of Antarctica has never been more important as the region is experiencing dramatic changes that are of global importance.

SCAR's strategic vision is ***"for a world where the science of Antarctica is used for the benefit of all, excellence in science is valued, and scientific knowledge is effectively linked to policy making".*** SCAR plays a key role in leading the international Antarctic science community, implementing new scientific initiatives, discerning emerging scientific themes, promoting international cooperation and partnerships, and engaging with policy-makers and other sectors of society. As a Scientific Body of ICSU, SCAR contributes to the strategic vision and mission of ICSU.

SCAR's mission is two-fold. ***"SCAR's mission is to be the leading, independent, non-governmental facilitator, coordinator, and advocate of excellence in Antarctic research. Secondly, SCAR's mission is to provide independent, scientific advice to the Antarctic Treaty System and other policy makers. The advisory mission includes identifying emerging issues and bringing them to the attention of policy makers."*** SCAR re-dedicates itself to its vision and mission that have served the organization well for more than 50 years. In order to reach its vision; identified strategic goals for each aspect of SCAR's mission have been identified.

SCAR aims to sustain and encourage excellence in Antarctic research AND develop the next generation of innovative, international Antarctic science programs that address issues of regional and global importance. As a key component of our planet, there remain major gaps in understanding how Antarctic functions as a system and what role Antarctica plays in the larger Earth System. These vital scientific unknowns are best addressed through collaborative research efforts. To this end, SCAR initiates, develops, and coordinates international research activities that are conducted in and from the Antarctic region. SCAR provides forums for presenting knowledge about Antarctica and for debate of the most pressing issues being addressed by Antarctic research. SCAR promotes the establishment of advanced, scientific observatories in the region as essential contributors to modern Earth system science. Scientific frontiers often lie at the interfaces between disciplines; therefore SCAR encourages multi-disciplinary approaches and aims to diversify disciplinary involvement in Antarctic research. SCAR will sponsor a regular review of frontiers in Antarctic science by the world's leading scientists and encourage publication of scientific results in highly regarded periodicals to improve communication of the importance of Antarctic research to all audiences.

SCAR aims to provide objective and independent scientific advice to the Antarctic Treaty Parties and other organizations on issues affecting the conservation and management of Antarctica AND expand it advisory sphere of influence in non-Treaty venues. Historically SCAR has primarily advised the Antarctic Treaty Parties (ATP) and this remains unchanged. SCAR both initiates and responds to requests for information and advice. Scientific advice related to Antarctic climate change and its impacts has and will continue to receive attention and SCAR is committed to being the leading advisor on this issue. SCAR works with other advisory bodies within the Antarctic Treaty System (ATS) to ensure the widest possible consultation drawing on the best available expertise during the advisory process and this cooperation will be enhanced. SCAR will expand its sphere of influence by actively engaging in and influencing the initiatives of ICSU, the United Nations, other bodies; encourage the publication of Antarctic science in peer-reviewed journals and the popular press; and produce compendia of scientific knowledge on emerging issues.

SCAR aims to partner with organizations with complementary skills, technologies and interests to best address the complex, global issues of our time AND act as a leading organization with others in preserving the legacies of the IPY. SCAR partners with ICSU bodies, Antarctic Treaty System advisory bodies, organizations with a polar mission, and global programs with polar interests. SCAR will review all

[1] Antarctica is defined as including the continent, the adjacent islands, the Southern Ocean, and the dependent and associated ecosystems.

partnerships and enhance interactions with active partners, end relationships with inactive partners, and solicit new partners as warranted. SCAR is committed to assisting the community in preserving and building on key aspects of the legacy of the International Polar Year of 2007-2008. Preservation of the IPY legacy will be pursued in close cooperation with the International Arctic Science Committee to ensure a bipolar perspective.

SCAR aims to encourage free and unrestricted access to Antarctic scientific data and information AND improve its role as a portal to Antarctic data repositories. SCAR recognizes the critical importance of the stewardship of data and information within national and international programs and its accessibility to all. SCAR will implement a Data Policy based on it Data and Information Management Strategy and work with National Programs to implement the recommendations contained therein. The Data and Information management Strategy will be reviewed, assessed as to progress toward explicit objectives, and revised to improve SCAR performance in this area.

SCAR aims to foster and develop the capacity of all of its Members, especially students, early career scientists, underrepresented groups, and emerging programs to participate in Antarctic research AND to promote the incorporation of Antarctic science into education at all levels. SCAR will continue and expand its Fellowship Programs, awards and recognition activities, it partnerships, and create a Visiting Professors program. SCAR will enhance its partnership with the Association of Early Career Scientists to accomplish its goals in capacity building, education and training. The Capacity Building, Education and Implementation Plan will be reviewed, assessed as to progress toward explicit objectives, and revised to improve SCAR performance in this area.

SCAR is committed to effective internal and external communication and utilizes the latest electronic technologies to do so AND will review the effectiveness of and improve its communication tools. SCAR will explore mechanisms and technologies to improve communication of its mission, relevance and accomplishments. SCAR is committed to transparency in all of its actions. The SCAR Communication Plan will be reviewed, assessed as to progress toward explicit objectives and revised to improve SCAR performance in this area.

SCAR will review its organizational structure to ensure maximum effect and synergy AND align organizational structure with its mission, enhance interdisciplinary activities, and eliminate administrative barriers to success and cross-fertilization of ideas. SCAR is committed to continuous improvement of the effectiveness, efficiency and flexibility in all aspects of the organization and its management. SCAR encourages wide participation in the decision-making process and in its activities. SCAR accomplishes it works through subsidiary bodies and decision making is informed by meetings; workshops; symposia; standing scientific groups; committees and programs; it members and the scientific community. The administrative functions SCAR are administered by the Secretariat staff. SCAR will implement procedural changes to stream-line meetings, maximize time utilization, and encourage strategic thinking throughout the organization.

SCAR adheres to the highest accounting and ethical standards in all of its financial activities while ensuring balanced budgets and a reserve AND aligns financial allocations with SCAR's strategic goals. SCAR faces a challenge in matching available funding to demands on resources while maintaining a healthy and vibrant organization**.** SCAR's greatest resources have been, and will continue to be, the willingness of the community to volunteer time and the in-kind support provided by its Members, but these resources are not limitless. SCAR's core funding comes from membership fees and grants and contracts from external sources. External funds minimize increases in membership fees but often come with additional tasks. Yearly financial information is presented based on aspects of the mission and this information will be used to assess the alignment between allocation and organizational goals. Inflation and the increased costs of doing business will require an increase in membership fees or a reduction in activities**.**

SCAR aims to mentor and nurture the next generation to ensure continuity in leadership and build capacity AND engages in continuous improvement through review, assessment as to progress, and revision of plans as necessary. The Strategic Plan will be reviewed at the biennial SCAR Delegates meetings and revised as necessary. A Work Plan and budget will be presented to the Delegates at biennial meetings as components of an overall implementation plan. Strategic and implementation plans for Communications; Data and Information Management; Capacity Building, Education and Training; and other aspects of the SCAR's mission will regularly be reviewed, assessed as to progress toward explicit objectives, and revised to adjust to changing conditions.

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THE FOUNDATIONS

"The loftiest edifices need the deepest foundations."
George Santayana (1863-1952)

SCAR values the legacies of those that have gone before, applies lessons learnt from past experiences, and capitalizes on the foundations built over the organization's history.

In 1998, on the occasion of its 40th anniversary, the Scientific Committee on Antarctic Research (SCAR) members pledged to examine SCAR's mission, its science initiatives, its structure, its administrative and communication practices, and its advisory role. Based on the recommendations of a review group in 2000, SCAR restated its mission and reorganized at the constitutional, Delegate, Executive Committee, Secretariat, and subsidiary group levels [2]. In the ensuing 10 years, these changes were implemented. A recent external review aptly summarized SCAR's re-emergence: "…..the SCAR 2009 Review Group has been favorably impressed by the reform process that SCAR initiated in 2000 …… It is a record of change that few national or international voluntary science associations can equal …. SCAR has prepared itself well to address emerging challenges through the reforms undertaken during 2000□2009. By building on these developments …..SCAR can continue to play a central role in facilitating and coordinating science and advising governments working together in the Antarctic Treaty System…"[3].

SCAR aims to learn from the past to improve its performance and operations. Regular review, assessment, and consultation will be standard practice ensuring effective management and improved productivity while preserving organizational values. SCAR will capitalize on the momentum created by restructuring and the International Polar Year 2007-2008.

THE FOUNDATIONS FOR STRATEGIC PLANNING: SCAR ACCOMPLISHMENT 2000-2010

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Strategic Vision
SCAR's strategic vision is for a world where the science of Antarctica and associated systems is used for the benefit of all, excellence in science is valued, and scientific knowledge is effectively linked to policy making. SCAR has a key role to play in leading the international Antarctic science community, implementing new scientific initiatives, discerning emerging scientific themes, promoting international cooperation and partnerships, and engaging with policy-makers and other sectors of society to advance this vision. As an Interdisciplinary Scientific Body of ICSU, SCAR embraces and contributes to the strategic vision and mission of ICSU.
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Vision, Mission and Goals	Finances, Organization, Partnerships, and Communication	International Polar Year 2007-2008 (IPY)
Reassertion of international leadership in Antarctic science.	**Exercise of prudent financial management of SCAR's resources and improved transparency in reporting.**	**A critical participant in the International Polar Year 2007-2008.**
Reestablishment of pre-eminence as a scientific	**Streamlined and restructured administrative**	**Commitment to the preservation and**

[2] Ad Hoc Group Report and Recommendations (URL?).
[3] Scientific Committee On Antarctic Research: A Decade Of Progress; New Challenges Ahead: Report of the 2009 SCAR Review Group http://www.scar.org/communications/presidentsnotes/EXCOM09_WP05_Performance.pdf.

advisor to the Antarctic Treaty System.	**procedures and scientific portfolio.**	**perpetuation the legacies of the IPY.**
Establishment of plans for Capacity Building, Education, and Training; Communications; and Data and Information	**Improved participation of and communication with members, partner organizations, and other constituencies.**	**Enhanced capacity building through partnership with the Arctic community**
	Creation of the SCAR Open Science Conference	

THE STRATEGIC PLAN

"In strategy it is important to see distant things as if they were close and to take a distanced view of close things." - Unknown

This Strategic Plan aims to foster a sense of dedication and commitment in SCAR members to ensure realization of the organization's vision, mission and goals. The Strategic Plan guides collective decision-making about priorities and resource allocation.

This Plan is a roadmap for the six-year period from 2011-2016. SCAR is an international, interdisciplinary body of the International Council for Science (ISCU) and a Charity registered in the United Kingdom[4]. SCAR's interests include Antarctic science, the linkages between Antarctica and the rest of the Earth system, and observations of and from Antarctica[5]. Regular, consultative strategic planning is undertaken to guide the organization[6]. This present Strategic Plan takes into account: i) the previous Strategic Plan; ii) reviews, workshops, meetings, and planning activities; iii) changes in the environment that SCAR operates within; iv) changes in SCAR and the Antarctic Treaty System membership; v) developments in ICSU; and vii) in-depth consultations with the SCAR community[7].

The Strategic Plan will be reviewed at the SCAR Delegates meetings and revised as necessary. The Work Plan and budget approved by the Delegates are components of the implementation plan. Plans for Communications; Data and Information Management; Capacity Building, Education and Training; and other aspects of SCAR's mission will be regularly reviewed, assessed for progress toward explicit objectives and revised. The restructuring of SCAR has served the organization well. This Strategic Plan does not foresee major changes in direction or organizational structure, but more of a "fine-tuning" of the organization as it recommits to its long-term mission and goals and prepares for difficult financial times ahead.

Mission Statement

SCAR's mission is two-fold. First and foremost, SCAR's mission is to be the leading, independent, non-governmental facilitator, coordinator, and advocate of excellence in Antarctic[2] science and research. Secondly, SCAR's mission is to provide independent, sound, scientifically-based advice to the Antarctic Treaty System and other policy makers. The advisory mission also includes the use of science to identify emerging trends and bringing these issues to the attention of policy makers.

WHY A STRATEGIC PLAN?

INTERNAL	EXTERNAL
Ensures organizational discussion, consideration, and acceptance of the vision, mission, and goals of SCAR.	Provides an unambiguous statement of the strategic vision, mission, and goals of SCAR.
Provides direction for formulating SCAR biennial work programs and budgets.	Offers a framework for decision-making on Antarctic investments by member nations.
Guides the alignment of resources, human and financial, with strategic goals while optimizing leverage, return and impact.	Informs Members about managing national level activities that contribute to SCAR activities.
Presents an overview of activities, products, and future directions in Antarctic science for planning purposes.	Ensures transparency of the organization's activities, management, finances, procedures, and processes for

[4] For details on SCAR's charity status, see http://www.scar.org/about/constitution/.
[5] Antarctica is defined as including the continent, the adjacent islands, the Southern Ocean, and the dependent and associated ecosystems.
[6] SCAR Strategic Plan 2004-2010, see http://www.scar.org/about/introduction/strategicplan/strategicplandec04.pdf
[7] Appendix 1 –Cross-maps the main sections of the Strategic Plan with all relevant URLs, documents, etc.

	all stakeholders.
Assesses the impacts of scientific, technological, social and economic developments on the future of SCAR.	Ensures that SCAR is poised to maintain its leadership into the future (beyond the time limits of this strategic plan)
Provides the Secretariat and Executive Committee with metrics for monitoring SCAR's progress toward goals and overall performance.	
Guides the organizing and prioritization of the activities of SCAR's subsidiary bodies.	

LEADERSHIP IN ANTARCTIC RESEARCH

"Excellence encourages one about life generally;
it shows the spiritual wealth of the world."
T.S. Eliot (1888 – 1965)

The study of Antarctica and its role in the global earth system has never been more important as the region is experiencing dramatic changes that have global implications. Antarctic is a matchless "natural laboratory" for vital scientific research which is important in its own right and impossible to achieve elsewhere on the planet. SCAR encourages excellence in all aspects of Antarctic research. SCAR science activities address compelling and emerging frontiers in Antarctic science. SCAR initiates, develops, and coordinates international cooperation in scientific research conducted in and from the Antarctic region and on the role of Antarctica[5] in the Earth system.

SCAR's mission to be the leading, independent organization for facilitating and coordinating Antarctic research is met by initiating, developing, and coordinating high quality international scientific research in the Antarctic region. SCAR generates and coordinates innovative international science programs that address key issues of global importance. SCAR provides a forum for presenting Antarctic science and for debate on the most pressing issues addressed by Antarctic research. SCAR promotes the establishment of next generation regional observatories as essential components of modern Earth system science. SCAR encourages multi-disciplinary cooperation and aims to increase the involvement of the wider scientific community in SCAR's initiatives. SCAR does not fund Antarctic research, National Antarctic Programs do. Therefore, the directions taken by SCAR science in the coming years will be driven by ideas that well up from the Antarctic scientific community. However, to be effective, SCAR's leadership must have a clear vision of emerging science and scientific frontiers in Antarctic research. This is a challenge since Antarctic science has a geographic focus and therefore, the communities that conduct research in and from the region come from diverse scientific backgrounds. It is vital that SCAR develop a strategic vision of future directions in Antarctic science. The following provides a view of future research directions that are likely to dominate Antarctic research over the next decade.

EARTH SYSTEM SCIENCE - Understanding the Earth system, its components, connections and feedbacks is a major endeavor of contemporary Antarctic science and thus a focus of SCAR research. As a key component of the global system, there remain major gaps in understanding the Antarctic region's role in the Earth System. SCAR organizes its core scientific activities as life sciences, geosciences, and physical sciences. However, scientific frontiers often lie at the interfaces between disciplines requiring interdisciplinary approaches to advance knowledge and SCAR encourages these cross-linkages.

Life Sciences – Although thought of as a cold and isolated environment, Antarctica is undergoing significant change due to regional climate warming, ozone depletion, non-native species introductions, global transport of contaminants, increased scientific and tourist visits, and natural resource exploitation and extraction. Biologically, the Antarctic is a center of evolutionary divergence and adaptation to environmental extremes. Antarctic life sciences research focuses on understanding the impact of past, current and predicted environmental change on biodiversity, adaptation, organism functioning, ecosystem structure/function and the effects of cold, darkness, and isolation on organisms and ecosystems.

Geosciences -The Antarctic continent and surrounding oceans have been key elements of the Earth System throughout the history of the planet. The basement of Antarctica is built of a suite of crustal blocks that were parts of various supercontinents and contains outcrops that provide insight into Earth processes in the distant past. Sedimentary records on and around Antarctica provide glimpses of paleo-history and variations in the earth's environment over the eons harboring clues to the evolution of Antarctica. Geodetic and geophysical observatories document the geodynamics of the continent. Antarctic geosciences research focuses on continental crustal structure and composition, geodynamical processes, the record of life in a warmer Antarctica, the affects of geological processes on Antarctic biota, and understanding controls on ice sheet evolution and stability.

Physical Sciences - Processes at the interfaces between ice, ocean, land and atmosphere are key to understanding climate dynamics and predicting future climate. The nearly pole centered continent of

Antarctica, harboring 70% of the Earth's fresh water, and surrounded by a relatively warm ocean gives it a unique place in the global climate system. The role of, and the impact upon, the polar regions in these climate processes are a focus of Antarctic physical sciences research. This research aims to understand ice sheet dynamics, climate records from ice cores, changes in sea ice distributions and ocean circulation, atmospheric dynamics and chemistry, oceanic upwelling and melting ice shelves, and the impact of the ozone hole on Antarctic climate. The Antarctic continent is also a unique place for astronomical and solar-terrestrial observations of phenomena such as interactions between the Sun and the Earth.

EMERGING FRONTIERS IN ANTARCTIC SCIENCE - A review of on-going and emerging research activities provides a glimpse of possible directions in Antarctic science over the next few years. Several major themes are apparent that will, in all likelihood, be a continuing focus of Antarctic research: past, current and future climate change; the systematic response of Antarctica to change; understanding Antarctic biodiversity, evolution, and ecology; exploration and modeling of ice dynamics and sub-ice environments; ocean, ice, atmospheric and crysospheric observing and modeling; linkages and teleconnections between polar regions and the Earth system; and the poles as a vantage point to observe Earth, near-Earth space, the Solar System, and beyond.

Antarctica and Global Climate **-** Antarctica is a critically important part of the earth system. The climate and physical and biological properties of the continent and the surrounding ocean are closely coupled to other parts of the global environment by the ocean and the atmosphere. For example, the Antarctic ozone hole was one of the most significant scientific discoveries of the last century. For the last 30 years the ozone hole has shielded the bulk of Antarctica from some of the effects of global warming[8]. However, the Southern Ocean is warming and the ecosystems are responding[8]. There has been a rapid expansion of plant communities across the Antarctic Peninsula[8]. Parts of Antarctica are losing ice at a rapid rate and paleoclimate studies in Antarctica show the current changes in global climate are unusual[8]. Assuming a doubling of greenhouse gas concentrations over the next century, Antarctica might be expected to warm by as much as 3°C[8]. Although new data are being collected and analyzed on an almost daily basis, major gaps in knowledge remain and additional instrumental data gathering is needed to improve models[9]. Antarctic and global climate will remain an area of intense interest for the foreseeable future and continue to be a major component of the SCAR science. Understanding of the dynamics of polar climate systems is rudimentary at best and a lack of fundamental knowledge limits our ability to predict future change with confidence. Much remains to be done to produce a truly integrated view of the planet's climate system and the role of Antarctica in it. SCAR programs will continue to address these issues for the foreseeable future.

Antarctica contains 90% of the world's ice and 70% of its fresh water, enough to raise sea level by more than fifty meters[10]. Some regions of Antarctica, particularly the Peninsula, have warmed rapidly in recent years, contributing to the disintegration of ice shelves and accelerating the retreat of glaciers[11]. There is growing consensus that the Antarctic ice sheet is experiencing a net mass loss[12]. Loss of ice from the West Antarctic ice sheet may possibly contribute to global sea level by 2100 causing a rise in sea level of up to 1.9 meters[13]. Satellite observations support a wide range of research efforts as a component of observing systems[14]. The Southern Ocean plays unique and critical roles in the Earth system by driving global weather and climate. For example, Antarctic Bottom Water, formed along the Antarctic coast, sinks to ventilate the global ocean. Meanwhile, Antarctic Intermediate Waters supplies the world ocean with 75% of the nutrients that sustain ocean productivity. The ocean absorbs 40% of anthropogenic atmospheric emissions of CO_2 of which 40% is absorbed by the Southern Ocean[15]. This uptake is making the oceans slightly more acidic which may be

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[8] Antarctic Climate Change and the Environment (ACCE) report. Editors J.Turner, R. Bindschadler,P. Convey, G. di Prisco, E. Fahrbach, J. Gutt, D. Hodgson, P. Mayewski, C. Sommerhayes. ISBN 978-0-948277-22-1. 2009

[9] Examples of on-going SCAR programs that focus on climate issues include the Antarctica and the Global Climate System (AGCS) program and the Prediction of Changes in the Physical and Biological Environment of the Antarctic (PCBEA) group

[10] IPCC (2007), Chapter 4 , see URL to be added.

[11] Cook, A., Fox, A., Vaughan, D. and Ferrigno, J, Retreating glacier fronts on the Antarctic Peninsula over the past half-century, Science, 308, 541-544. 2005

[12] Rignot, E., J.L. Bamber, M.R. van den Broeke, C. Davis, L. Yonghong, W.J. van deBerg and E. van Meijgaard,. Recent Antarctic ice mass loss from radar interferometry and regional climate modeling, Nature Geoscience, 13 January 2008; doi:10.1038/ngeo102. 2008 (more recent reference?)

[13] Vermeer, M. and Rahmstorf, S. Global sea level linked to global temperature. Proc. Natl. Acad. Sci., 106, 21527-32. 2009.

[14] Such as the Cryosphere Observing System (CryOS) and the Southern Ocean Observing System (SOOS). Examples of on-going SCAR programs that observe and model the cryosphere include the Permafrost and Periglacial Environments (PPE) and Ice Sheet Mass Balance and Sea Level (ISMASS) programs.

[15] Sabine, CL; Feely, RA; Gruber, N, et al. The oceanic sink for anthropogenic CO2, SCIENCE Volume: 305 Issue: 5682 Pages: 367-371. 2004.

deleterious to marine organisms and ecosystems[16]. It has been documented that the Southern Ocean is changing but observations to confirm and monitor this change are sparse. Integrated, multi-disciplinary observations are needed to understand and predict the response of biota to changes in Southern Ocean chemistry, temperatures, and circulation[17].

Deciphering Paleoclimate - To more completely understand climate variability and the forcings that control future change and responses to change, a detailed understanding of past climate is essential. As a remote continent, Antarctica is an ideal location to study local-to-global scale climate change. There is no other approach or experiment that can provide perspectives across a range of time scales other than deciphering past climate change through proxies archived in ice and sedimentary records. Records on timescale of thousands, hundreds of thousands, and millions of years stored in Antarctica have yet to be retrieved and analyzed. To fill gaps in records of past climate, retrieval of ice and sedimentary records continues to be a high priority. A major objectives for the geosciences community is to obtain geological records of past Antarctic ice sheet dynamics and integration of this knowledge into coupled ice sheet-climate models. Improved models are critical to constraining and improving the accuracy and precision of predictions of future changes in global and regional temperatures, ocean acidification, and sea level[18]. Much remains to be accomplished in deciphering paleoclimate records and improving integrated Earth system models and these topics are a high priority for Antarctic geoscientists.

Organisms, Ecosystems and Biodiversity - While significant advances have been made in recent years, Antarctica's biological and ecological domains remain, to a large extent, unexplored. Antarctic life scientists strive to understand the evolution and diversity of life in Antarctica to determine how these processes have produced unique Antarctic ecosystems. One of the most important developments in life sciences in Antarctica in recent years is the increased knowledge of Antarctic marine and terrestrial biodiversity. There is a growing body of evidence that Antarctic organisms, ecosystems and biodiversity are responding to climate change[19]. Comparable surveys are not available in the terrestrial environment and remain a high priority for Antarctic life scientists. Life sciences research in the Antarctic has a long history of studying adaptations, ecosystem functioning and structure, and the physiology of the unique organisms that inhabit the region. Research on these topics is expected to continue to address basic questions about life in the cold and dark, in and under the ice, and at environmental extremes. Long term studies and winter research will be essential to understanding the functional roles of Antarctic biology. Extension of observations beyond the traditional summer season and application of contemporary methods (such as molecular genomics and proteomics) to better understand biological structure and function in Antarctica are needed. While the inventory and description of extant species in Antarctica remains a high priority, there is an emerging interest in the paleoecology of Antarctica that requires close integration with geological and glaciological studies. Antarctica today is more than 99% covered by permanent ice and snow and evidence suggests that as recently as the last glacial maximum ice sheets were both thicker and more extensive than they are now. Most if not all of the currently ice-free ground would have been over-ridden by ice during previous glaciations suggesting that Antarctic pre-glacial terrestrial life (other than microbiota) was wiped out by successive glacial events. This in turn suggests that most, possibly all, contemporary terrestrial life colonized the continent during subsequent periods of glacial retreat. However, recent results are challenging this paradigm and suggest greater regionalization and evolutionary isolation than previously thought. Based on these results a new biological paradigm is emerging that challenges current understanding of Antarctic glacial history and its interplay with the biosphere. In the coming years, the life sciences community will continue to focus its efforts on describing and understanding the unique organisms that live and function in marine and terrestrial Antarctic habitats and use the perspective of geological time to provide a glimpse of the response of biology and ecology to environmental change over the millennia.

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[16] Orr JC, Fabry VJ, Aumont O, Bopp L, Doney SC, Feely RA, Gnanadesikan A, Gruber N, Ishida A, Joos F, Key RM, Lindsay K, Maier-Reimer E, Matear R, Monfray P, Mouchet A, Najjar RG, Plattner GK, Rodgers KB, Sabine CL, Sarmiento JL, Schlitzer R, Slater RD, Totterdell IJ, Weirig MF, Yamanaka Y, Yool A. Anthropogenic ocean acidification over the twenty-first century and its impact on calcifying organisms. Nature 437:681-686. 2005

[17] SCAR partners with organizations such as the Scientific Committee on Ocean Research (SCOR) on the design of the Southern Ocean Observing System (SOOS http://www.scor-int.org/). The SCAR/SCOR Oceanography Expert Group is leading the design of SOOS in partnership with the World Climate Research Program's Climate Variability and Predictability (CLIVAR) and Climate and Cryosphere (CliC) projects, the Census of Antarctic Marine Life (CAML), the Global Ocean Observing System (GOOS) and the Partnership for Observation of the Global Ocean (POGO). These efforts will be a continuing focus for an interdisciplinary group of Antarctic scientists and SCAR science for years to come.

[18] An example of a SCAR programs that focuses on paleoclimate is the Antarctic Climate Evolution (ACE) program.

[19] The Census of Antarctic Marine Life (CAML) was invaluable in providing a baseline for the marine environment that can be used to recognize future change www.caml.aq.

Ice Sheet Dynamics and Sub-ice Environments - Several international, field intensive programs are aimed at understanding the dynamics of Antarctica's ice sheets, ice shelves, glaciers, and sea ice as well the Antarctic continent hidden beneath kilometers of ice. These studies use a range of exploration technologies and are providing a view above and below the Antarctic ice sheet that has never before been seen. These studies aim to answer fundamental questions such as: i) what role does topography play in the nucleation of continental ice sheets?; ii) how are major elevated continental massifs formed within intra-plate settings but without a straightforward plate tectonic mechanism; iii) where is the oldest climate record in the Antarctic ice sheet; iv) how do tectonic processes control the formation, distribution, and stability of subglacial lakes?; (v) what is the role of subglacial water on ice flow to the sea?; and vi) to what extent are subglacial lakes interconnected to form networks of waterways and what does this infer about microbial residents?

Subglacial aquatic environment research is fundamentally changing our view of Antarctica. New frontiers in the study and exploration of these environments will address fundamental processes including providing clues to the tectonic evolution and history of the continent, the importance of subglacial hydrology in ice sheet and ice stream dynamics, and the adaptation of microbial life to extreme environments[20]. Major subglacial aquatic environment exploration programs are continuing and will accomplish first entry and sampling of these environments in the next few years. It can be expected that once these sites are entered and observatories are established, a network of study sites across Antarctica will transform our understanding of subglacial aquatic environments and their importance in a range of fundamental Earth processes. SCAR's science portfolio will continue to include research that studies one of Earth's latest frontiers – sub-ice environments.

The Poles as a Vantage Point **-** Near-Earth space is an integral part of the Earth system providing the link between the Sun and Earth primarily through the Polar Regions. An integrated, quantitative description of the upper atmosphere over Antarctica and its coupling to the geo-space environment is needed[21]. Antarctica also has unique characteristics that make it a highly desirable vantage point for upper atmospheric, solar, astrophysical and astronomical observations. Antarctic astronomy and astrophysics researchers address fundamental questions including: locating first stars, first galaxies, and re-ionization tomography; defining the nature of the dark universe; detecting gravity waves; and identifying exo-planets and the formation of exo-solar systems. The interests of this community will continue to evolve as major new infrastructure and instruments come on-line enhancing an already impressive array of instruments in the Polar Regions. The SCAR Astronomy and Astrophysics in Antarctica (AAA) program began in 2010 providing a focus for this community[22].

In order to maintain a position of leadership in Antarctic science, SCAR must maintain a continually evolving vision of frontiers and emerging directions in Antarctic science. To this end, SCAR will sponsor an assessment of frontiers in Antarctic science every four years. The objective of this event will be to bring together the world's leading experts on Antarctic science to scan the horizons for emerging frontiers in Antarctic science and identify gaps in knowledge. This gathering will draw on data and information from the SCAR symposia on Antarctic biology, the earth sciences, and glaciology; workshops, meetings, and other scientific gatherings; the outcomes of SCAR's Action, Expert, and Program Planning Groups; National Antarctic Program planning and strategic documents; outcomes of SCAR's Scientific Research Programs; the Cross-linkages Meetings; and a network of international Antarctic scientists. The assessment will produce a 5- to 10- year vision of directions and grand challenges in Antarctic science. The assessment will inform SCAR leadership as it evaluates its scientific portfolio, concludes programs, and approves new ones.

ENSURING EXCELLENCE IN ANTARCTIC RESEARCH - *SCAR aims to be a leader by supporting and encouraging excellence in all aspects of Antarctic research through international cooperation and ensure an orderly transition to the next set of Scientific Research Programs. As a matter of policy, SCAR will continue to encourage members to appoint high-quality, scientifically active and engaged Delegates and representatives to the Standing Committees and Scientific Groups. SCAR's Standing Scientific Groups will be tasked with providing overviews of current, emerging, and potentially exciting future science directions on a regular basis. SCAR will continue to focus its efforts on a limited number of major Scientific Research Programs addressing significant topical issues designed to make significant advances in understanding how the Antarctic region works and its role in the global system. SCAR will balance it choice of Research*

[20] SCAR programs such as the Subglacial Antarctic Lake Environments (SALE) have fostered significant advances in understanding SAE SALE URL

[21] SCAR's Inter-hemispheric Conjugacy Effects in Solar-Terrestrial and Aeronomy Research (ICESTAR) program has been a leading contributor to this effort. http://scar-icestar.org/

[22] For a description of AAA, see http://www.phys.unsw.edu.au/JACARA/AAA_SRP_webpage/working_groups.html.

programs to accurately reflect the interests of the Antarctic science community. SCAR will continue to support a range of other scientific activities in which value is added to national efforts through international cooperation that are described elsewhere. SCAR will continue to identify and produce authoritative compendia of the state-of-the science on issues of global importance)i.e., The Antarctic Climate Change and the Environment). SCAR will schedule presentations at Delegates meeting on scientific frontiers and emerging issue to encourage strategic thinking and inform decision making. SCAR will sponsor a regular review of frontiers in science by the world's leading Antarctic scientists and encourage publication of scientific results in the widely disseminated periodical literature and the popular press.

SCIENTIFIC ADVICE

"Wise people listen to advice."- Proverbs 12:15

SCAR provides objective and independent scientific advice to the Antarctic Treaty Consultative Meetings and other organizations on issues affecting the conservation and management of Antarctica. SCAR identifies issues emerging from greater scientific understanding of the region and brings them to the attention of policy makers.

SCAR provides scientific advice to governments; promotes productive linkages between scientists and decision-makers; and ensures that science contributes to international, legal instruments of import. SCAR both initiates advice and responds to requests for information. In recent times, advice has been primarily in regard to the conservation, protection, and management of Antarctica. Scientific advice related to climate change and its impacts has received increasing attention in the last few years. Over the last decade, SCAR has made significant improvements in delivering policy advice to the Antarctic Treaty Consultative Meetings(ATCM)[23]. SCAR has established guiding principles to govern its advisory activities[24]. SCAR has most interactions at the Antarctic Treaty's with the Committee on Environmental Protection (CEP)[25]. Recent efforts to better manage interactions with the CEP have met with success and these efforts will continue including regular intersessional contact and communication. The initiative by the CEP to develop a long-range work plan is a welcome development that will assist SCAR in planning its advisory work. SCAR provides advice to the Treaty Parties through its Standing Committee on the Antarctic Treaty System (SCATS)[26]. SCAR often prepares papers for the ATCM in partnership with other entities (e.g., COMNAP

[23] The numbers of papers submitted to the ATCM have dramatically risen in recent years. It is expected that the demand for scientific advice will increase in the coming years and that central issues will continue to be environmental stewardship, conservation and protection; the impact of climate change; and the response of Antarctic systems to climate change. Emerging issues before the Antarctic Treaty parties that will most likely require scientific advice include the impacts of tourism; bioprospecting activities; introduction of non-native species; global contaminant transport; environmental monitoring; and 21st century conservation practices regarding species and area protection, bioregionalization models, ecosystem based management practices, and delineation of human-induced change against a background of natural variability.

[24] SCAR is committed to giving the best, most accurate and up-to-date advice to the ATPs. SCAR's goal is a "best effort" within time constraints, but not at the sacrifice of quality. SCAR primarily, if not exclusively, relies on peer-reviewed, publicly available science and information as a quality control/quality assurance mechanism. SCAR does not try to judge the quality of "grey literature" or unpublished data. SCAR encourages all data producers to make information publicly available and accessible in a timely manner utilizing accepted scientific practices. All sources of information are disclosed and attributed as to their 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. Accepted, proven and peer-reviewed methodologies are utilized when analyses of data are required and these methodologies are fully disclosed. ATCM Information Paper on SCAR's Role in the ATCM (citation to be added).

[25] For a description of Committee on Environmental Protection, see www.cep.aq.

[26] Broad, inclusive, and open consultation is the basis for producing SCAR advisory documents. The mechanisms for this consultation varies (e.g., emails, workshops, open forums, and others) but an effort is made to solicit advice, within realistic timeframes, to allow for full consultation and feedback. 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 provided. 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.

and IUCN) and individual Antarctic Treaty Parties. However, SCAR's status as an independent and objective advisor is maintained at all times. In the coming years, SCATS leadership will continue to improve the delivery of advice to Treaty Parties. As an educational initiative, SCAR will continue to provide the SCAR Science Lecture as an ATCM agenda item to inform Treaty Parties of the latest developments in Antarctic sciences and emerging issues. SCAR is committed to working with all advisory bodies within the ATS in a cooperative and collaborative manner to increase efficiency, share workloads, and ensure the widest possible consultation drawing on the best available expertise during the advisory process[27]. The Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) is an important observer at the ATCM. Many SCAR scientists are directly involved in providing data to the CCAMLR Scientific Committee through their national delegations. SCAR is initiating actions to improve consultation with CCAMLR recognizing that there are substantive differences between governmental and non-governmental activities that affect the mode of operation of each organization. Efforts are being made to engage CCAMLR in a dialogue aimed at strengthening the relationships between the two organizations. The Council of Managers of Antarctic Programs (COMNAP) is another important observer at the ATCM. SCAR consults with Agreement on The Conservations of Albatrosses and Petrels (ACAP) as needed and the two organizations exchange observers for meetings. SCAR also provides scientific advice on the role of the Antarctic and associated systems in global climate change to the Intergovernmental Panel on Climate Change (IPCC) and the UN Framework Convention on Climate Change[28].

SCIENTIFIC ADVICE FOR POLICY MAKERS IN A CHANGING WORLD - *SCAR aims to provide objective and independent scientific advice to the Antarctic Treaty Parties and other organizations on issues affecting the conservation and management of Antarctica AND expand it advisory sphere of influence in non-Treaty venues. It is expected that SCAR will continue to be the primary scientific advisor to the Antarctic Treaty System for the foreseeable future. It is also expected that the demand for advice will increase over time requiring close attention to the structure, membership, and resourcing of the Standing Committee on the Antarctic Treaty System. SCAR will develop a multi-year advisory work plan in consultation with the Committee on Environmental Protection to more efficiently manage the topics being considered and thus the demand for advice from SCAR. SCAR will continue to work closely with other Treaty advisory bodies (i.e., COMNAP, CCAMLR, ACAP) to develop closer cooperation on topics of mutual interest and to leverage resources. Volunteer time and funds are not limitless, so SCAR will set priorities and work with other entities to better manage the advisory workload including soliciting funding of advisory activities by the end-users. SCAR will on occasion find it necessary to decline requests for advice if it is beyond available capacity. SCAR will carefully assess the balance between "reactive" advice, based on request, and "precautionary" advice, based on emerging scientific understanding, within a framework that ensures that all advisory activities support SCAR's mission. SCAR will work to improve communication of its science policy inputs to the Treaty to SCAR National Committees and National Antarctic Program to ensure they are fully informed about SCAR's advisory activities. SCAR will expand its sphere of influence by more actively engaging in and influencing the initiatives of ICSU, sending representatives to the United Nations' activities (UNFCC and IPCC), encouraging the publication of Antarctic science in peer-reviewed journals, and producing compendiums of scientific knowledge on emerging issues.*

PARTNERSHIPS

"Friendship is essentially a partnership."
Aristotle (384-322 BC)

[27] Convention on the Conservation of Antarctic Marine Living Resourceswww.ccamlr.org - The Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) is one of the other important advisory entities within the ATS. CCAMLR came into force in 1982, as part of the Antarctic Treaty System, in pursuance of the provisions of Article IX of the Treaty. The aim of the Convention is to conserve marine life in the Southern Ocean. The Convention established a Commission to manage the marine living resources of the area. SCAR is an Observer to the Scientific Committee of CCAMLR and SCAR invites observer from CCAMLR to its meetings.

[28] For details, see www.ipcc.ch and http://unfccc.int

Complex scientific issues are best addressed through partnerships with organizations with complementary skills, technologies and interests. SCAR partners with advisory bodies in the Antarctic Treaty System, organizations with a polar mission, and global programs with polar interests. SCAR sees partnerships and cooperation as important leverage of limited resources for causes shared with others.

SCAR forms partnerships to achieve its goals and objectives. SCAR's partners include other ICSU bodies, entities of the Antarctic Treaty System, organizations with a polar focus, and organizations with a polar interest. The type of partnerships SCAR forms vary considerably since each is tailored to best accomplish shared objectives. In some instances, formal co-sponsorship of an activity is warranted entailing shared responsibility for program management and resourcing. SCAR is always open to, and looking for ways, to strengthen existing partnerships and establish new ones. SCAR actively pursues strong links with other International Council of Science bodies[29]. To strengthen its involvement in climate studies, SCAR has signed a Memorandum of Understanding with the World Climate Research Program[30]. SCAR's partners with ICSU's Scientific Committee on Ocean research in several programs[31]. SCAR contributes to the Grand Challenges in Global Sustainability identified by ICSU[32],

One of the most important partnerships for SCAR is the linkage between science and logistics, which comes about through a close relationship with the Council of Managers of Antarctic Programs (COMNAP). SCAR will continue to coordinate its activities with COMNAP through: (i) joint meetings of the SCAR and COMNAP Executives; (ii) joint meetings of the full memberships of both organizations in even-numbered years; and (iii) liaison in the margins of the ATCMs. SCAR is committed to working bi-laterally and multi-laterally with National Antarctic Programs and collectively through COMNAP in mutually beneficial ways.

SCAR recognizes and values the many interests that the Antarctic and Arctic research communities have in common. Areas of current and future collaboration include studies related to the cryosphere and to the roles of polar region roles in the climate system. SCAR has signed an agreement with the International Arctic Science Committee (IASC)[33]. SCAR has been making and will continue to make special efforts to increase bipolar cooperation and coordination with IASC in areas of common interest. A Bipolar Action Group (BiPAG) has been charged with identifying areas for bipolar scientific cooperation. SCAR and IASC are

[29] Examples include joint support of the SCAR/SCOR Oceanography Expert Group and the design of a Southern Ocean Observing System (SOOS). SOOS is managed through partnerships with the World Climate Research Program (WCRP), the Global Ocean Observing System (GOOS) and with the Partnership for Observation of the Global Ocean (POGO) http://www.wmo.ch/pages/prog/wcrp/wcrp-index.html, www.ioc-goos.org, and www.ocean-partners.org. The international Antarctic Zone program (iAnZone) is affiliated with both SCOR and the SCAR/SCOR Oceanography Group http://www.ldeo.columbia.edu/res/fac/physocean/ianzone/.Strong links will continue with ICSU's Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) and its Climate and Weather of the Sun (CAWSES) program in support of SCAR's solar-terrestrial physics program http://www.scostep.ucar.edu/, www.cawses.org .In other activities, SCAR is assisting ICSU with the redesign of the World Data Centers (WDC) and is contributing to the development of the Polar Information Commons (PIC) www.polarcommons.org.

[30] SCAR co-sponsors several WCRP activities including: (i) the Climate and Cryosphere Program (CliC); (ii) the Southern Ocean Implementation Panel shared by CliC and the WCRP's Climate Variability Program (CLIVAR); (iii) the International Program on Antarctic Buoys (IPAB); and (iv0 the SOOS program mentioned above. www.clic.npolar.no, www.clivar.org and www.ipab.aq

[31] Including co-sponsoring the new IGBP Integrated Analyses of Circumpolar Climate Interactions and Ecosystem Dynamics in the Southern Ocean (ICED) program www.iced.ac.uk. SCAR has a Memorandum of Agreement with IGBP's Past Climate Change program (PAGES) and Global Ecosystems Dynamics (GLOBEC) program and has established linkages with ICSU's International Association for Cryosphere Sciences (IACS) www.pages-igbp.org, www.cryosphericsciences.org/, www.arcticportal.org/iasc, http://apecs.is/.

[32] In particular: Challenge #1: Improve the usefulness of forecasts of future environmental conditions and their consequences for people; Challenge #2: Develop the observation systems needed to manage global and regional environmental change; and Challenge #3: Determine how to anticipate, avoid and cope with dangerous global environmental change.

[33] For a description of IASC, see.

jointly considering the best ways to preserve and perpetuate the legacies of the International Polar Year 2007-2008 in observing systems, data and information management, long term monitoring, and support of students and early career scientists. Mentoring of the next generation of polar researchers is being pursued in collaboration with the Association of Polar Early Career Scientists (APECS)[34]. SCAR and IASC have signed Memoranda of Understanding with APECS. SCAR's partnership with APECS has been especially productive and new ways to strengthen this relationship in the future will be explored (see the "Capacity Building, Education and Training" section).

STRENGTH THROUGH PARTNERSHIPS *- SCAR aims to leverage its resources through partnerships with other ICSU bodies, Antarctic Treaty System advisory bodies, organizations with a polar mission, and global programs with polar interests AND assist the community in partnership with IASC in preserving the legacies of the IPY 2007-2008. SCAR will review all partnerships, increase interactions with active partners, end relationships with inactive partners, and solicit new partners as warranted. SCAR will work to continue to develop closer relationships with COMNAP, CCAML, IASC, APECS, and the CEP in areas of mutual interest. SCAR is committed to assisting the community in the implementation of key aspects of the legacy of the International Polar Year of 2007-2008. Preservation of the IPY legacy will be pursued in close cooperation with IASC to ensure a bipolar perspective.*

SCAR PARTNERS IN 2010[35]

ICSU Bodies	Antarctic Treaty System	Organizations with a Polar Focus	Programs with a Polar Interest
International Association of Cryospheric Sciences (IACS)	**Agreement on the Conservation of Albatrosses and Petrels (ACAP)**	**Southern Ocean component Global Ocean Ecosystem Dynamics Program (SO-GLOBEC)**	**Global Biodiversity Information Facility (GBIF)**
International Astronomical Union (IAU)	**Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)**	**International Antarctic Zone program (iAnZONE)**	**Integrated Global Observing Strategy Partnership (IGOS-P)**
International Arctic Science Committee (IASC)	**Council of Managers of National Antarctic Programs (COMNAP)**	**Integrating Climate and Ecosystem Dynamics in the Southern Ocean Program (ICED)**	**International Whaling Commission (IWC)**
Scientific Committee on Oceanic Research (SCOR)	**Committee on Environmental Protection (CEP)**	**International Permafrost Association (IPA)**	**Past Climate Changes (PAGES)**
Scientific Committee on Solar Terrestrial Physics (SCOSTEP)		**International Partnerships in Ice Core Sciences (IPICS)**	
World Climate Research Program (WCRP)		**Association of Early Career Scientists (APECS)**	
The Committee on Data for Science and Technology (CODATA)			

[34] For a description of APECS, see.

[35] For details go to: http://www.scar.org/about/partnerships/.

DATA AND INFORMATION MANAGEMENT

"It is a capital mistake to theorize before one has data."
Arthur Conan Doyle (1859-1930)

SCAR promotes free and unrestricted access to Antarctic scientific data and information by promoting open and accessible archiving of data and information. SCAR serves as a portal to data repositories of Antarctic scientific data and information.

Data and information are valuable and irreplaceable resources. In the pursuit of various scientific objectives, it is often necessary to use data and information collected by scientists from many countries. SCAR recognizes the critical and essential importance of the stewardship of data and information within national and international programs and its accessibility to all. Proper management of data and information is not an "add-on" or an additional task; it is a fundamental aspect of modern science. SCAR encourages: maximum use of all data; the development and operation of mechanisms to facilitate the collection, storage, retrieval and dissemination of data and information for the common good; and the community to ensure that these mechanisms are effective. SCAR has adopted a Data and Information Management Strategy (DIMS) to ensure that the scientific user community has adequate access to data and information[36]. Prepared by SCAR's Standing Committee on Antarctic Data Management (SCADM), DIMS was approved by the SCAR Executive Committee in 2009. The next steps involve production of an Implementation Plan outlining resource implications and the adoption of a SCAR Data Policy. For the DIMS to be effective, it will need to be implemented in consultation with the scientific community that it is meant to benefit. To meet the requirements of DIMS, SCAR will build an Antarctic Data Management System (ADMS) capable of supporting interdisciplinary Antarctic science. The ADMS is viewed as a science enabler. SCAR is making progress towards achieving the vision of DIMS but much more can be achieved. Strategic foundations must be put in place to enable better coordination of individual, and often disconnected, efforts. Better articulated governance arrangements and strong leadership will be necessary to develop a distributed, loosely federated shared infrastructure. The Data Policy stipulates the norms that should be adopted with respect to data sharing and access, data management planning, and the establishment of National Antarctic Data Centers (NADCs).

SCAR uses its systems, capabilities, and resources to assist those with less developed data and information infrastructures. The objective is to create a network of permanent data archives capable of the long-term management and publication of all types of Antarctic data. The number of NADCs is low relative to the number of national SCAR Members. SCAR promotes implementation of standards that support the interoperation of technology platforms and data transport protocols. Education, outreach and guidance on all facets of system operations, protocols, and functions are essential as well. Increasing the number of NADCs and improving the capabilities of those that exist can only be achieved through training and mentoring. These activities are supportive of SCAR's larger mission in capacity building (see the "Capacity Building, Education, and Training" section). Science in Antarctica relies on a consistent geographic framework. SCAR's Standing Committee on Antarctic Geographic Information (SCAGI) manages and enhances the geographic framework for Antarctic scientific research, operations, environmental management, and tourism. SCAGI works closely with SCADM often meeting in parallel with joint sessions of relevance to both Committees[37].

UNIVERSAL ACCESS TO DATA AND INFORMATION - *SCAR aims to encourage free and unrestricted access to Antarctic scientific data and information AND improve its role as a portal to data repositories of Antarctic scientific data and information. Through SCADM and SCAGI SCAR will work to encourage national committees to assist these groups with financial assistance and occasional seconded staff. SCAR will reopen discussions with COMNAP about jointly assisting in the management of Antarctic scientific data*

[36] For details, see http://scadm.scar.org/.

[37] SCAGI delivers a range of up-to-date geographic information products through its various projects. These products include the Composite Gazetteer of Antarctica, the Antarctic Digital Database (ADD), the King George Island GIS Database, and Map and Feature Catalogues. SCAGI promotes an open standards approach to support free and unrestricted data access. http://www.scar.org/researchgroups/.

recognizing the crucial role of National Antarctic Programs in encouraging timely entry of data into archive systems. SCAR, through SCADM and SGAGI, will pro-actively promote the availability of Antarctic data sets as "products" to increase their use. SCAR recognizes that it has many useful data products and applications that would be of great utility for a range of end-users. SCAR is committed to greater collaboration with the user-community to transform data into products that increase utilization.

SCAR PRODUCTS[38]

Antarctic Data Directory System (ADD)	**Antarctic Digital Magnetic Anomaly Project**	**Antarctic Biodiversity Database**	**Antarctic Map Catalogue**	**Antarctic Bedrock Mapping (BEDMAP)**	**Composite Gazetteer of Antarctica (CGA)**
Continuous Plankton Recorder Database (CPR)	**Geodetic Data**	**International Bathymetric Chart of the Southern Ocean**	**Reference Antarctic Data for Environmental Research**	**Seismic Data Library System**	**Tide Gauge Data**

[38] For details go to: http://www.scar.org/researchgroups/productsandservices/.

CAPACITY BUILDING, EDUCATION AND TRAINING

"The turning point… was when I really realized that you can do it yourself."
Timothy Blixseth (1950- present)

SCAR is committed to developing scientific capacity in all SCAR Members, assisting students, early career scientists, underrepresented groups, and emerging programs to participate in Antarctic research. SCAR promotes and facilitates the incorporation of Antarctic science into all levels of education.

SCAR aims to build human and institutional capacity for Antarctic science and society in general by promoting the education of the public and students to increase the awareness of the value of Antarctic science and is importance. SCAR is dedicated to developing the capacity of all of its members to ensure that each has the ability to achieve his or her potential. SCAR has a special interest in assisting students, early career scientists, underrepresented groups in polar science and new or emerging national Antarctic programs. The national Antarctic programs 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/or new Antarctic science communities that are developing. To enable all in the SCAR family to participate in, contribute to and benefit from SCAR's activities, SCAR works to enhance the research capacity of all of its members. This mission has become more important as SCAR membership has increased in recent years.

SCAR's Capacity Building, Education and Training (CBET) Committee, is lead by a SCAR Vice President and supported by the SCAR Secretariat[39]. The Committee is tasked with initiating, planning, and overseeing the implementation of SCAR's capacity building, education and training strategy. SCAR manages a range of programs in support of its capacity building, education, and training efforts, including the Fellowship Program[40], the Martha T. Muse Prize for Science and Technology and Policy in Antarctica[41], the SCAR web site and social networking groups[42], and partnerships with the Association of Polar Early Career Scientists[43]. The Committee promotes educational activities highlighting the importance and value of Antarctic science. SCAR relies upon its CBET Implementation Plan as a strategy [44]. The CBET Committee manages SCAR's awards and recognition activities as part of its responsibilities. These include named lectures, fellowships, certificates of appreciation, and the award of the SCAR Medals. The Committee is also charged with evaluating the performance and mix of SCAR activities in this area and suggesting changes or new directions. The members of the Committee are chosen for their interests in capacity building, education and training. These activities will be a high priority for the SCAR Development Council and the CBET Committee is tasked with identifying sources of external funding for these activities. SCAR collaborates with other groups and organizations that are pursuing similar goals (see the "Partnerships" section). SCAR supports a range of organization-wide activities under the umbrella capacity building, education and training and will continue to explore other mechanism to achieve its strategic goals in this area. Subsidiary bodies

[39] CBET URL to be added.

[40] The SCAR Fellowship Program allows PhD students or post-doctoral researchers from within SCAR Member countries to undertake research at an institute or program in another SCAR country. Since the inception of the fellowships in 2003, there has been a steady increase in applications. The Program is given core funding by SCAR supplemented by voluntary contributions by SCAR Members.

[41] The "Martha T. Muse Prize for Science and Policy in Antarctica" is a US$ 100,000 unrestricted cash prize presented to an individual in the fields of Antarctic science or policy who has demonstrated potential for sustained and significant contributions that will enhance the understanding and/or preservation of Antarctica41. The Muse Prize is a prestigious award that recognizes excellence in Antarctic research by honouring someone in the early to mid-stage of their career. The Prize is a legacy of the International Polar Year 2007-2008 sponsored by the Tinker Foundation and administered by SCAR until at least 2013.

[42] Much of SCAR's contact with the general public, educators, and others is via the SCAR website and various social networking groups (FaceBook, LinkedIn etc.). The website now includes links to a large number of Antarctic education websites sorted by audience and language (see the "Communications" section).

[43] SCAR is actively working with the Association of Early Career Polar Researchers (APECS) to engage and promote the careers of the next generation of polar scientists This has proven to be highly beneficial to both organizations. SCAR works closely with APECS to involve early career scientists in all of its activities including, but not limited to, conferences, meetings, symposia, business meetings and scientific subsidiary bodies and programs. http://apecs.is/

[44] For details see http://www.scar.org/publications/reports/27/Report_27.pdf.

within SCAR are also required to carry out their own CBET activities. For example, SCADM holds data workshops to train national data managers (see the "Data and Information Management" section).

TOWARD AN EXPANDED COMMUNITY *- SCAR aims to foster and develop the capacity of all of its Members, especially assisting students, early career scientists, underrepresented groups, and emerging programs to participate in Antarctic research AND promote incorporation of Antarctic science in all levels of education. SCAR will enhance its partnership with the Association of Early Career Scientists and in particular explore how the two organizations can enhance their mentoring activities. SCAR will remind it members of opportunities for secondment to the Secretariat as a learning experience. The Capacity Building, Education and Implementation Plan will be reviewed, assessed as to progress and revised on necessary to improve SCAR performance in this area. SCAR will investigate various avenues to increase its capacity building, education and training activities, including: partnerships with COMNAP, CCMALR, IASC; proposals to philanthropic foundations; identification of funds to expand the Fellowship Program, and awards and recognition activities; create a Visiting Professors program; encourage members to mentor and support early career polar scientists in countries with smaller Antarctic communities; solicit ICSU and other external sources for funds to expand these activities*[45]*; partner with other organizations with a capacity building mission*[46]*; and explore ways to increase the attendance of early career scientists at the Open Science Conferences including travel grants.*

[45] the Ice Summer School for Ice Sheet Models in the 21st Century in 2009 and Education and Outreach Lessons from IPY in 2010.

[46] SCAR is an Associate Member of the International Antarctic Institute (IAI). The IAI offers international opportunities in Antarctic undergraduate and postgraduate multi-disciplinary education by sharing teaching resources between international partner universities www.iai.utas.edu.au. SCAR has also partnered with the International Polar Foundation in supporting the 6th Continent Initiative Fellowships during the International Polar Year (2007-2008).

COMMUNICATIONS

"Communication works for those who work at it."
John Powell (1960 – present))

Effective communication with those that have an interest in SCAR is essential. SCAR utilizes a range of tools to ensure timely and frequent contact with various communities and entities.

SCAR aims to improve knowledge of the benefits of Antarctic science that affect the wider community in member countries; promote better understanding by governments, the media, academia and others of Antarctic scientific issues; and improve communication with funding institutions about key Antarctic research initiatives and future directions . SCAR aims to effectively communicate its mission, relevance and accomplishments to a wide variety of audiences and does so based on a Communications Plan[47]. Through communication, SCAR increases the visibility of the organization and its activities; develop cooperation with partners; mobilize resources; effectively link the Secretariat staff with SCAR's Executive Committee, scientific activities, and other Antarctic organizations; ensure that all SCAR members are aware of opportunities to participate in SCAR; and establish SCAR as the preferred source of scientific information for policy makers, scientists and journalists looking for information with respect to scientific issues in the Antarctic region. SCAR National Committees are an important channel to communicate to national communities that are otherwise difficult to reach. SCAR encourages each national member to establish a web site and communication protocols and to regularly disseminate news about SCAR activities. The Communications Plan will be reviewed, assessed for progress toward objectives and goals and revised as necessary.

SCAR has transformed itself from a paper-driven institution into one that conducts virtually all of its administrative work, communications and outreach electronically on-line. SCAR uses electronic means to communicate, publish and distribute news and materials of interest. All materials are also made available on-line for ease of access[48]. SCAR aims for transparency in all of its actions and accomplishes this by making information easily accessible by national committees, scientists working in Antarctica, and the interested public on its web site. Openness and transparency in declaring annual expenditure is important as a Charity. SCAR will continue to limit material posted to the "Members Only" section of the web site. Only sensitive internal communications will be kept password protected.

While SCAR has made great progress utilizing communication tools during intercessional period between biennial Delegates meetings[49]. Strategic partnerships with other organizations also raise SCAR's profile and help to disseminate the SCAR message to an even wider range of audiences (see the "Partnerships" section)[50]. SCAR makes use of organizations such as the Science Media Centre to disseminate news about Antarctic science[51]. The SCAR web site is the major outlet for the organization to communicate with its

[47] The SCAR Communication Plan identifies target communities each of which requires messages tailored in a different way. Because many of these communities are at the national level, the task of communicating SCAR's message is shared between the SCAR Secretariat acting internationally and SCAR National Committees acting within countries. http://www.scar.org/publications/reports/25/Report25.pdf.

[48] A recent innovation, "Notes from the President", is a monthly email written by the SCAR President directly to the SCAR Delegates focusing on issues of importance to SCAR Members. SCAR Delegates are encouraged to share these Notes, which are made available on the SCAR web site, with their in-country communities. These Notes have proven to be popular and will be continued as a means of keeping Members aware of key developments regarding SCAR and for soliciting input and assistance. SCAR has developed a brochure that is regularly updated and made available in an electronic, downloadable format. Posters have been developed as well that highlight SCAR's activities, science programs, and data products and they are available in electronic, downloadable format. SCAR merchandise will be updated and expanded to further establish the SCAR brand and image.Additional information about SCAR activities is available at numerous Standing Scientific Group and Scientific Research Program web sites.

[49] SCAR's goal is near "real time" transmission of documents that support decision making. Preparation for the biennial meetings is now provided far in advance of the meetings. SCAR has adopted a procedure of posting Working and Information Papers in support of the annotated agendas for the biennial Delegates and Business Meetings and these posting to the web site occur in advance of the meetings to allow for adequate preparation. SCAR is committed to streamlining its meetings by preparing documents in standard formats with page limits, providing all presentations as slide shows with simplified text for non-native English speakers, and producing a guide to the Delegates Meeting that contains an annotated agenda and one-page, standardized summaries of the contents of all papers.

[50] For example, SCAR's partnership with APECS allows SCAR to target early career scientists as well as schools and other education institutions.

[51] For further details see www.sciencemediacentre.org.

members, the general public and scientists interested in SCAR's work[52]. The next generation SCAR website will be designed to appeal to a wider audience including the general public, educators, policy makers, and journalists. The content will be made more alluring to attract visitors' attention including highlights that address the key issues of the day. SCAR will explore techniques used for marking-up the content and fostering cross-linkages between the SCAR site and others to improve search engine rankings. The updated SCAR web site will include dynamic features within, or as an adjunct to, the static web pages (e.g. use of drop-down menus, RSS feeds, and inclusion of multimedia material). SCAR will explore how to make its web site a collaborative work-space. The web site will be designed to allow management and administration of SCAR meetings and conferences.

Communication within and amongst the scientific community is in large part driven by the publication, wide dissemination, and presentation of research findings in the peer-reviewed literature. The value of Antarctic science is highly dependent on the communities' ability to communicate and share data, knowledge and information with peers, the wider scientific audience beyond Antarctica, and the public and lay communities. SCAR is committed to ensuring that research results, scientific findings, and data syntheses are published in the highest quality and most widely cited scientific periodicals. To optimize and improve the process of "getting the message out", SCAR will encourage Antarctic journals that are not ISI-listed to meet the criteria for listing to increase the visibility and recognition of published work. Publication in non-Antarctic journals is also crucial for widening the influence and impact of Antarctic science. SCAR aims to ensure that Antarctic science and research results have maximum visibility in the wider scientific community and especially in citation indices, an accepted measure of impact. SCAR is committed to improving the visibility of the science that its programs and members produce.

SCAR communicates it message through a variety of meetings that include business meetings, conferences, symposia, workshop, and other meetings[53]. In addition, individual SCAR groups commonly arrange workshops or seminars that may be held in association with other major events. The SCAR Open Science Conferences have been well attended and most importantly, draw together an interdisciplinary community including early career researchers. For some early career researchers this may be their first large polar science conference. SCAR will closely monitor the Open Science Conferences and assess whether the present schedule should be maintained or whether a four-year cycle might be more effective. Improvements in planning efficiency to reduce costs and perhaps creating a revenue stream to assist in sustaining the Conferences activity are being considered. The SCAR Secretariat will investigate the feasibility of managing an in-house system for at least part of the conference process, for example abstract submissions and science program assembly, in order to reduce costs, increase efficiency, improve standardization, and brand the events.

EFFECTIVE COMMUNICATION - *SCAR is committed to effective communication and utilizes the latest electronic technologies to do so AND will review the effectiveness of its communication tools. SCAR will explore means to further develop its web site for use by members and committees as a collaborative workspace for the scientific community working in Antarctica and for the interested public. SCAR will explore additional mechanisms to improve communication of its mission, relevance and accomplishments to a variety of audiences. SCAR is committed to transparency in all of its actions and will continue to reduce web page content restricted from public access. The SCAR Communication Plan will be the subject of review, assessment of progress, and revision as necessary. SCAR will encourage publication of scientific results in widely disseminated periodical literature. SCAR will examine how it organizes and schedules the biennial meetings, especially the Open Science Conferences; the role of the Secretariat in managing these major events; and possible mechanisms to create a revenue stream that would sustain these activities.*

ORGANIZATION AND MANAGEMENT

"The achievements of an organization are the results

[52]Press Releases and News Items are posted on a regular basis. A newsletter is issued quarterly and several SCAR programs issue their own newsletters. In addition SCAR responds to a wide range of requests for information received at info@scar.org. SCAR also has groups on social networking sites such as 'Facebook', a resource used extensively by younger scientists and the general public, and 'LinkedIn', which is aimed at the business community. See the SCAR web site at htpp://scar.org

[53] SCAR's major set of meetings occur biennially and include: (i) an Open Science Conference, (ii) Business Meetings of the Standing Scientific Groups, and (iii) the Delegates Meeting. Thematic symposia are held every 4 years in the Earth Sciences, Antarctic Biology, and Glaciology.

of the combined effort of each individual."
Vince Lombardi (1913 – 1970)

SCAR is committed to continuous improvement in the effectiveness, efficiency and flexibility in the structure, procedural rules and practices of the organization. SCAR encourages the widest possible participation in the decision-making process and its activities.

SCAR is first and foremost, an organization of members[54]. As a Charity, SCAR operations are directed by a Memorandum of Association, Articles of Association, and Rules of Procedure that are in compliance with UK law. The SCAR Executive Committee serves as the Board of Directors of the Charity[55]. SCAR accomplishes it works through a number of subsidiary bodies including Action, Expert, and Program Planning Groups; Standing Scientific Groups and Committees; Scientific Research Programs; Delegates Committees, and an Executive Committee[56],[57]. Final decision making authority rests with the Delegates by unanimous consent and the Executive Committee is empowered to act on behalf of the Delegates. The business of SCAR is conducted at biennial meetings that include subsidiary body meetings, scientific group business meetings, an Open Science Conference, and the Delegates meeting. SCAR science is proposed and planned by Program Planning groups, managed by the Standing Scientific Groups, and organized as Scientific Research Programs[58]. Scientific quality is maintained through regular, rigorous internal and

[54] The national members of SCAR are the national organizations adhering to ICSU, a national organization nominated by the national organization adhering to ICSU, or by some other means if a country has no national organization adhering to ICSU and are, or plan to be, active in Antarctic research. In addition, relevant scientific Unions of ICSU are also eligible for membership. There are three categories of membership: Full Members, ICSU Scientific Union Members and Associate Members. Full Members are those countries with active scientific research program in Antarctica, Union Members are those ICSU scientific unions that have an interest in Antarctic research, and Associate Members are those countries without an independent research program as yet or those that are planning a research program in the future.

[55] The Delegates elect an Executive Committee that is responsible for carrying out business intersessionally and for overseeing the day-to-day administration of SCAR through the Secretariat. The Executive Committee (EXCOM) comprises the President and four Vice-Presidents, along with the Past President in the first two years following a presidential election. Each Vice-President has responsibility for an element of the SCAR mission, i.e. Science; Capacity Building, Education and Outreach; Data and Information Management; Finance; and Administrative and Constitutional Affairs. The Executive Committee meets immediately prior to and after the Delegate's Meetings and in the years the Delegates do not meet. The EXCOM has authority to act on behalf of the Delegates. Since SCAR is also a charity, the Officers of EXCOM serve as the Trustees of the Charity.

[56] SCAR conducts its administration, management, advisory, and outreach activities through subsidiary bodies. The Delegates Committee on Outreach and Administration is chaired by the Vice President for Administration and recommends strategic directions for SCAR's advisory roles; capacity building, education and training activities; finances and budgets; reviewing the Secretariat's performance; interactions with external organizations; and adjusting SCAR's administrative procedures and structures as needed. The Standing Committees on the Antarctic Treaty System (SCATS) and Finance, and the Capacity Building, Education and Training Committee; the History Action Group; Social Sciences Action Group and the Joint SCAR/IASC Bipolar Action Group (BipAG) jointly report to the DCOA and the Secretariat. The DCOA convenes during the biennial Delegates meetings so the joint reporting structure maintains continuity during the intercessional period. The DCOA creates efficiency by separately considering those agenda items in its areas during the Delegates Meetings.

[57] SCAR conducts and manages its scientific affairs through a variety of subsidiary bodies including the Delegates Committee on Scientific Affairs (DCSA). The DCSA, chaired by the Vice President for Scientific Affairs, recommends strategic scientific research directions, reviews performance against stated program objectives and goals, and proposes adjustments in SCAR's major research efforts to reflect changing themes and issues. The Standing Committee on Antarctic Data Management (SCDAM) and Antarctic Geographic Information (SCAGI) report jointly to the DCSA and the Secretariat. The DCSA convenes during the biennial Delegates meetings so the joint reporting structure maintains continuity during the intercessional. The DCSA creates efficiency by separately considering those agenda items in its areas of responsibility during the biennial Delegates Meetings.

[58] SCAR plans, conducts and manages its science activities through its Standing Scientific Groups (SSGs for Life Sciences, Physical Sciences and Geosciences). The SSGs interface between the Antarctic scientific community, develop new scientific activities, and bring perspectives from the scientific communities. SSG subsidiary Expert Groups, Action Groups, and Program Planning Groups serve differing functions. Expert Groups address matters that require an on-going capability and/or expertise and are expected to continue until that need no longer exists. Action Groups address specific terms of reference that need immediate attention and will normally complete their activities in 2-3 years. Program Planning Groups (PPG) serve areas where communities of scientists come together to develop plans for major, international and integrative Scientific Research programs. Planning is expected to take 1 to 2

external review. Scientific decision making is informed by workshops, symposia, standing scientific groups and programs, and the scientific community. SCAR subsidiary body leadership is selected by a combination of elections and appointments. The administrative functions of SCAR are administered by the Secretariat staff and Standing Committees organized around each facet of SCAR's mission (i.e, advice, finances, education and outreach, etc.)[59]. The organizational structure adopted in response to the review of SCAR has proven beneficial and no major structural or procedural changes are expected while minor adjustments will be made to improve efficiency, inclusiveness, and responsiveness as necessary. Independent, external review of the organization is conducted at regular intervals.

A critical responsibility of the SSGs is incubation of new scientific initiatives[60]. SRPs are renewed on a regular basis to ensure that important, emerging Antarctic science topics receive appropriate attention in SCAR's portfolio of activities. The SSGs are tasked with operating strategically based on an understanding of current, emerging and potentially exciting future Antarctic science. SCAR employs a "bottom-up" approach to developing SRPs ensuring that the SRPs have the scientific leadership needed for success. It is critical that the Standing Scientific Groups, the Delegates Committee on Scientific Affairs and Delegates ensure balance amongst disciplines and communities when promoting or approving scientific activities.

As described above, ideas for scientific programs are nurtured and incubated by one or more of the Standing Scientific Groups. Proposals for new scientific programs undergo a rigorous vetting procedure including external peer-review before being approved by the Delegates. It is SCAR's policy that scientific programs have a finite life-time to ensure regular renewal and updating of the SCAR portfolio. Ensuring that the SCAR scientific programs continue to represent emerging Antarctic science is critical to the reputation and health of SCAR. A major task over the next few years is to transition to a complete new set of scientific programs on issues of regional and global importance. Rigorous application of the procedures for developing, reviewing, assessing, and approving scientific programs is required to assure a successful transition..

FORM FOLLOWS FUNCTION *- SCAR will review its organizational structure to ensure maximum effect and synergy AND align the organizational structure with mission, enhance interdisciplinary activities, and eliminate administrative barriers to success and cross-fertilization of ideas. SCAR aims for continuous improvement of the effectiveness, efficiency and flexibility in all aspects of the organization and its management. SCAR encourages wide participation in the decision-making process and in its activities. SCAR will continue to accomplish it works through its subsidiary bodies and decision making will continue to be informed by reports of meetings; workshops; symposia; the standing scientific groups, committees and programs; SCAR members and the scientific community. The administrative functions SCAR will continue to be administered by the Secretariat staff. SCAR will implement procedural changes to stream-line meetings, maximize time utilization, and encourage strategic thinking throughout the organization. During this time*

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years and result in a proposal for a Scientific Research Program or other appropriate mechanism that best fulfills the objectives of the Planning Group.

[59] Central administration of all of SCAR activities is carried out by a full-time Secretariat. The SCAR Secretariat is staffed by an Executive Director, an Executive Officer and a part-time Administrative Assistant. The Executive Director helps guide and implement SCAR's vision and objectives; coordinates with the Executive Committee in the development and implementation of SCAR activities; assists in raising external funds for SCAR's scientific activities; oversees SCAR's communications; represents SCAR at international meetings; and manages the SCAR Secretariat. The Executive Officer and the Administrative Assistant support the Executive Director and take on responsibilities as assigned. The SCAR Secretariat is housed at the Scott Polar Research Institute (SPRI) in Cambridge, UK.

[60] SCAR science activity is lead by the flagship Scientific Research Programs (SRPs) that are broad in scope and international in participation. The current SRPs represent important science areas and are widely perceived to be of the highest quality60. SRPs are developed through a rigorous proposal and review process; they are regularly evaluated for progress and accomplishments, and have a defined lifetime. SRPs are expected to pose the next generation of scientific questions as one of their concluding acts. SRPs focus on complex, integrative scientific questions that address emerging scientific themes in Antarctic science and often bridge traditional disciplinary boundaries. The SRPs are intended to cross-cut disciplines, be integrative, timely, and international in participation. SRPs are expected to make significant and fundamental advances in understanding Antarctica. SRPs are SCAR's longest duration scientific activities lasting 6 to 8 years.

frame of this Strategic Plan, SCAR will transition to a new set of scientific programs that address issues of regional and global importance.

RESOURCES

""Literature was formerly an art and finance a trade; today it is the reverse"
Joseph Roux (1725-1793)

SCAR faces a challenge in matching available funding to demand on resources while maintaining a healthy and vibrant organization. SCAR manages its financial and budgetary responsibilities by adherence to the highest accounting and ethical standards. SCAR's greatest resources are the willingness of the Antarctic scientific community to volunteer time and the in-kind support provided by its Members.

SCAR's ability to effectively carry out its mission depends critically on its financial capacity. SCAR adheres to the highest accounting and ethical standards in all of its financial activities. SCAR's financial management principles include balancing the annual budgets, cost-effective management of resources to accomplish organizational goals, active solicitation of external funds, allocate resources in concert with the organizational goals, maintain a reserve, and fairly and equitably compensate employees. SCAR's financial statements and budget are presented so they are easy to understand[61]. An annual audit is carried out by an independent auditor to ensure that SCAR conforms to accounting practices for Charities. SCAR budgets are approved for a biennium[62]. SCAR's core funding comes from membership fees and is supplemented by grants and contracts from external sources[63]. A reserve is maintained to cover one year of administrative costs. Member countries occasionally make additional voluntary contributions to the Secretariat to support specific activities. SCAR members also host or financially support conferences, workshops, summer schools and other meetings.

In order to keep pace with inflation, escalation of salaries and wages, and increased operating costs; membership fees are increased on a regular basis. Fees can be increased either by yearly cost of living increases or approved as larger increases accumulated over a number of years. In the past, the latter alternative has been employed but a yearly incremental increase in fees will be reconsidered. Cost savings measures will be a part of proposed membership fee increases, but increases are inevitable if all activities are to be maintained. When economic conditions preclude increases in membership fees a reduction in the scope of SCAR's mission and activities must be enacted.

External funds are actively sought to support SCAR activities[64]. It should be noted that, while SCAR charges a modest management fee to manage projects, additional tasks are assumed by the Secretariat in most instances. External funds are usually only available for a restricted set of activities such as capacity building,

[61] Income includes membership fees, other income, and external income. Expenditures include scientific activities; scientific advice; capacity building, education and training; routine business meetings; and publications.

[62] The Standing Committee on Finance is chaired by a SCAR Vice President. During the Delegates meetings the committee considers all requests for funds and assesses organizational income. With the guidance of the Secretariat, the Committee develops a recommended two-year budget for Delegate approval or revision. The Secretariat and EXCOM jointly review the budgets at least every six months and budgets are revised at the EXCOM meeting in the years the Delegates do not meet. All budget considerations are based on the principles outlined at the beginning of this section and the over-riding principles are that yearly budgets must be balanced and reserves maintained. Cost savings and budget reductions are the major tool in balancing the organization's budget.

[63] In 2008, SCAR income of ~$1 million USD was derived 50/50 from membership fees and external sources; however, external source funds are often "pass through" or directly associated with additional tasks. SCAR "spendable" funds (~500,000 USD) expenditure were ~42 % for scientific activities, 9% for scientific advice, 6.5% CBET, 4% for meetings, 1.2% for publications and 38% for administrative

[64] Examples include: management of the Census of Antarctic Marine Life finances supported by the Sloan Foundation and Memorial University; administration of the Martha T. Muse Prize for Science and Policy in Antarctica supported by the Tinker Foundation; support for continuance of the SCAR Marine Biodiversity Network (SCAR MarBIN) by the Total Foundation, and a travel grant program for attendance at the IPY Oslo conference supported by the Tinker Foundation.

education, training and public outreach. A Development Council will be formed to assist the Secretariat and EXCOM in identifying potential sources of income. SCAR will work to its best advantage as a Charity..

NAVIGATING DIFFICULT FINANICAL TIMES *- SCAR adheres to the highest accounting and ethical standards in all of its financial activities while ensuring balanced budgets and a reserve AND aligns financial allocations with SCAR's strategic goals. SCAR faces a challenge in matching available funding to demand on resources while maintaining a healthy and vibrant organization. SCAR's greatest resources have been, and will continue to be, the willingness of the community to volunteer time and the in-kind support provided by its members, but these resources are not limitless. SCAR's core funding comes from membership fees supplemented by grants and contracts from external sources. External funds can offset increases in membership fees but often come with additional tasks. SCAR will form an advisory body) a Development Council) to identify fund-raising opportunities and develop a plan to engage the organization in these efforts. Yearly financial information is presented based on aspects of the mission and this information will be used to assess the consistency between allocations and organizational goals. Inflation and the increased costs of doing business will require an increase in membership fees or a reduction in activities.*

MOMENTUM AND CONTINUITY

""(SCAR) acquires momentum as (SCAR) advances."
modified from Virgil (70BC-19BC)

The SCAR recruits, mentors and nurtures the next generation to ensure continuity in leadership and build human capacity.

This strategic plan sets SCAR on an ambitious path for the next six years. The mission and goals will only be accomplished if SCAR various constituencies are dedicated to the success of this plan. For SCAR to continue as the pre-eminent scientific and advisory organization for Antarctic science and policy in the coming years the work of many will be required. The next decade will be critical as voluntary enterprises and organizations, such as SCAR face significant cost pressures. SCAR must carefully choose its priorities in the context of budgetary constraints. Solicitation of external sources of funding beyond membership fees will be a partial solution, but it is inevitable that membership fees will increase if the current level of activity is to be maintained. SCAR has generated significant momentum over the past decade through its re-invention and these successes have been amplified by the International Polar Year but continuing and building on this momentum will be closely tied to organizational leadership, a continued spirit of volunteerism on by SCAR supporters and participants, wise management of limited resources, and careful consideration of priorities. Succession planning must be deliberate by nurturing the next generation of leadership. To sustain that excellent progress and to continue to fulfill the vision and mission of SCAR, the next generation must be prepared to assume leadership. There is no shortage of talent or dedication within the Antarctic community and the leaders of tomorrow are amongst us today.

CONTINUOUS IMPROVEMENT AND ADAPTATION *- SCAR aims to mentor and nurture the next generation to ensure continuity in leadership and build capacity AND engage in continuous improvement through regular review, assessment as to progress, and revision of plans as necessary. The Strategic Plan will be reviewed at the biennial SCAR Delegates meetings and revised as necessary. A work plan and budget will be components of an implementation plan. Strategic and implementation plans for Communications; Data and Information Management; Capacity Building, Education and Training; and other aspects of the SCAR's mission will regularly be reviewed, assessed as to progress toward explicit objectives, and revised to adjust to changing conditions.*

Guiding Questions for Review of the draft SCAR Strategic Plan 2011-2016 "Antarctic Science and Policy Advice in a Changing World"

The following provides a summary of guiding questions that were widely circulated to encourage broad review and critique of the draft SCAR Strategic Plan 20011-2016. This summary if provided as an aid in directing discussions of ht Plan during the SCAR biennial Meetings. While questions are provided by major section in the Plan, it is highly recommended that the document be considered as a whole for continuity, logic, and completeness. Summaries of comments should be provided to the SCAR President and Executive Director. (Note: the latest draft under consideration is Rev. 5.1, 23 July 2010.)

SCAR's VISION, MISSION, AND GOALS

1) Does the Strategic Vision adequately reflect your vision for SCAR?
2) Are there other facets of SCAR that should be highlighted in the Vision statement?
3) Are the facets of the Strategic Vision given appropriate weight and importance?
4) Does the Mission Statement reflect your view of SCAR's goals?
5) Are there other aspects of the mission that should be highlighted in the mission statement?
6) Are the facets of the SCAR mission given appropriate weight and importance?
7) Does the Foundations section accurately portray past events, should others be recognized?
8) Are the reasons for a developing a strategic plan clear and inclusive?
9) Should other SCAR accomplishments in the last decade be highlighted?
10) Do the first sections set the right tone for the rest of the document? Is the order most effective?

LEADERSHIP IN ANTARCTIC RESEARCH

11) Does this section adequately describe SCAR's scientific mission given that it is a core value of the organization?
12) Do the Earth System and Emerging Frontiers sections capture the essence of where Antarctic science is going in the next 5 to 10 years?
13) Is there equal and fair treatment of the diverse scientific interests that make up Antarctic science? Is the description accurate and complete?
14) Are there any evolving frontiers, emerging issues, and/or grand challenges that have been overlooked?
15) Do you concur with creating an assessment of frontiers process as described?
16) Are there other mechanisms or other processes that might be engaged to achieve the goals of this aspect of SCAR's mission?

SCIENTIFIC ADVICE

1) Is SCAR's advisory role given adequate attention in respect to its scientific mission and what should this balance be?
2) Are adequate resources being allocated given the importance of SCAR's advisory role?
3) Is SCATs structured to accomplish the wished for outcomes (including membership), what changes if any should we consider?
4) Is the balance between responding to requests for advice properly balanced with SCAR's role of advancing emerging issues?
5) Are there additional mechanisms or processes that could be implemented to enhance the advisory role and what are they?
6) What it the advisory role of SCAR beyond the ATS and how does SCAR best influence and have impact on other venues to achieve greatest impact (IPCC, UNFCCC, etc.)?

PARTNERSHIPS

1) How does SCAR more effectively engage ICSU and its other subsidiary bodies (i.e., Unions) and ensure polar science is a more explicit and important aspect of ICSU's agenda?

2) How close should SCAR's partnerships with other ATS advisory bodies be and what level of consultation is warranted for SCAR actions?
3) Are there other partners that we should consider engaging?
4) Are there other actions we should take to enhance existing partnerships and solicit new ones?

DATA AND INFORMATION MANAGEMENT

1) Given that SCAR is not, nor should it be, a data management organization, how do we best encourage open and free access to data?
2) Is SCAR adequately serving as a window onto Antarctic science and the associated data holdings, if not how can this be improved?
3) Are SCADM and SCAGI effectively structured (including membership) to accomplish SCAR goals for data sharing, how to we improve participation?
4) How does SCAR more effectively engage National Programs and scientists that are the repositories of most data?
5) As data issues are universal in science, how do we best have impact and how do we effectively engage with ICSU and others in its efforts in this area?

CAPACITY BUILDING, EDUCATION, AND TRAINING

1. Is this aspect of the SCAR mission given adequate attention? How important do you see this aspect of the SCA mission?
2. Are the funds provided adequate to accomplish the goals and in concert with the importance of these activities?
3. Are the current activities in this area effective? How might they be made more effective?
4. Is the mix of activities appropriate? What other activities, programs, or efforts might be implemented
5. Should external funds be pursued to support these efforts? Do you know potential sources of external funds for CBET?
6. Are there more effective ways to partner with APECS?

COMMUNICATIONS

1. Is current SCAR communication adequate and effective? If not, how can this be improved?
2. Are their technologies SCAR is not making good use of? What are they?
3. Is the current mix of communication tools – newsletters, emails, website, etc. adequate? What aspects could be improved?
4. Is the SCAR web site useful to you? If not how can it be improved?
5. How can SCAR improve communication with and thus participation by National Committees?
6. What additional things can SCAR do to facilitate your communication internal in your country?
7. Does SCAR effectively communicate its science to a broad and non-scientific audience? How can that be improved?

ORGANIZATION AND MANAGEMENT

1) Is the current overall structure of SCAR operating efficiently? If not how could it be improved?
2) Is the SCAR sub subsidiary body structure effective? Are the Rules of Procedure clear and workable? Does it need restructuring?
3) Are there better models for organizational structure? If so, what are they?
4) Are the SSGs functioning well? Is the disciplinary umbrella for each SSG appropriate?
5) Do SCAR subsidiary bodies cove all important aspects of Antarctic science? Which are not covered, and should they be?
6) Are t he SRPs function well? How might they be improved?
7) Is the Secretariat and Ex Com properly exercising their authority?

8) Are there ways to invigorate and involve the Delegates level committees? If so, what are they?
9) Can efficiencies be realized by reducing the number of groups and committees,? If so which ones could be eliminated or combined?
10) Is the process adequate to ensure turn-over and renewal of programs and activities on a regular basis?

RESOURCES

1. Are there other sources of revenue SCAR should be pursuing? What are they?
2. What should the balance be between membership fees and external funds, given that most external funds include additional work?
3. What efforts should be made to enlarge the pool of SCAR volunteers?
4. Is the financial reporting understandable and efficient? How could it be improved?
5. Are there better ways to set priorities? If so, what are they?
6. Do allocations match the mission and goals of the organization? If not, how should allocations be changed?

MOMENTUM AND CONTINUITY

1. Are mentoring and nurturing activities adequate? What other tools might SCAR implement?
2. Are the reviews cycles frequent enough? How often should they be?
3. Are there other actions that should be taken to ensure smooth transitions in leadership?
4. Are we effectively reaching Antarctic communities in your country and in not, how can communication be improved?
5. Do you have other ideas about how to build on the momentum of the last decade?