

Scientific Committee on Antarctic Research

Mahlon 'Chuck' Kennicutt II, President of SCAR, highlights the increasing role played by polar research as a measure of our changing climate, and sets out the importance of a political consensus in managing this challenging area

Could you offer an insight into the background of the Scientific Committee on Antarctic Research, as well as SCAR's advisory role in Antarctic Treaty Consultative Meetings?

SCAR was formed in 1958 to continue coordination of international scientific research and partnerships begun during the International Geophysical Year (IGY) 1957-58. The IGY marked the establishment of permanent national stations in Antarctica and the beginnings of modern Antarctic science. The Antarctic Treaty, signed in 1959, established SCAR as an Observer to the Treaty Meetings and its primary source of independent and objective scientific advice. SCAR's advice over the years has been the basis for the Antarctic Treaty Parties to modify the way in which they operate in Antarctica and how they carry out their conservation and protection responsibilities.

SCAR is an interdisciplinary committee connected to the International Council for Science (ICSU). How important is this collaborative approach in such a demanding environment?

SCAR is an Interdisciplinary Scientific Body of ICSU and has 35 Member Nations and nine ICSU Scientific Union Members. Interdisciplinarity is fundamental, as SCAR initiates, promotes, and facilitates science across all disciplines with a geographic focus on Antarctica and the Southern Ocean. SCAR offers nations the ability to participate in research of a scale and scope impossible for any one nation, single programme or lone researcher to achieve. SCAR's portfolio of scientific activities is interdisciplinary at its core, addressing such timely scientific topics as past, present and future Antarctic climate change; cryospheric observation; Southern Ocean oceanography; biodiversity and adaptations in terrestrial and marine biota; exploration of subglacial aquatic environments; and near-Earth space science.

How important are the climatic processes of the Antarctic on a global level? Do they have a significant impact on the rest of the world?

Antarctica is a critical link in global climate, acting as the thermostat for the planet and the location where most of the fresh water on the planet



MAHLON 'CHUCK' KENNICUTT II is second from left in back row of photo of SCAR Executive Committee meeting in Punta Arenas last August

is stored as ice. Antarctica receives and exports climate signals mainly through couplings amongst global oceanic and atmospheric circulation systems. Ice core studies suggest that rapid warming and cooling observed in Greenland ice cores were preceded by gentler warming of the Southern Ocean, suggesting that the Antarctic climate signal is amplified as it moves northward. Global warming in Antarctica has been moderated by the strong winds associated with the ozone hole. Nevertheless, parts of the Southern Ocean are warming faster than any other ocean on Earth. Upwelling of warm water is melting the underside of ice shelves and accelerating ice stream transport of ice to the oceans. West Antarctica is now losing as much ice to the ocean as Greenland, making it a significant contributor to global sea level rise.

If the hole in the ozone layer above the Antarctic closes over, as predicted, what would be the effects at a local and global scale? Would the biodiversity of the Antarctic be significantly affected?

The predicted closing of the ozone hole in ~2070 will diminish the winds that currently shield Antarctic from global warming. As a consequence, the atmosphere over the continent is expected to warm (not enough to melt the ice), snowfall may increase, sea ice may diminish, and the ocean may warm. The ocean warming is not expected to be enough to severely affect marine organisms but geographic ranges and distribution patterns

may be altered. Reduced sea ice diminishes the habitat for some penguins and krill adversely affecting food webs and higher predators. However, reduced sea ice also leads to the opening of oceanic areas that may become more productive.

SCAR meets every two years; do you share information more regularly through your website and other means?

SCAR has its National Delegates meeting every two years; however, in the interim, SCAR has a full-time, staffed Secretariat in Cambridge, England and an Executive Committee that is empowered to act between biennium meetings. SCAR also has an elected President that interacts on a regular basis with the Secretariat, and a committee that manages its interactions and advisory function with the Treaty, sending a delegation each year to the Antarctic Treaty Consultative Meetings. Electronic communication, a website, newsletters, and other communication tools facilitate interactions between Delegate meetings. We have also begun to use social networking sites such as Facebook and LinkedIn. The Executive Committee meets in the year between Delegates' Meetings and has been expanded to include SCAR's scientific leadership.

What is the nature of the SCAR organised events, such as the Delegates Meeting and meetings of the Standing Scientific Groups?

The Delegates meeting is an important opportunity to build consensus on future directions and approve budgets.

SCAR's three Standing Scientific Groups (Life Sciences, Geosciences, and Physical Sciences) review the state of the science, propose new programmes and terminate completed ones. The SSG meetings are attended by up to 100 individuals who are national representatives. SSGs are empowered to form and manage subsidiary groups such as Action Groups, Expert Groups, and Programme Planning Groups to accomplish their work.

SCAR also has six marquee Scientific Research Programmes that were proposed and are managed by the scientific communities involved. These programmes are six to eight years in duration, focusing on a major interdisciplinary scientific objective, and are rotated on a regular basis. The current set of SCAR programmes focus on past, present, and future climate change: subglacial aquatic environment; evolution, biodiversity and adaptations; and solar-terrestrial interactions in the upper atmosphere.

SCAR also supports and sponsors workshops, symposia (on four year cycles), training activities, and a major Open Science Conference every two years.

A new implementation plan started in 2009 (SCAR's current Strategic Plan is covers 2004-2010 and the next one will be 2011-2016); what were the main objectives and what have been the most significant findings so far? Are you expecting more significant results towards the conclusion of this plan later in 2010?

Under the current plan SCAR: (i) initiated five major scientific research programmes (described above); (ii) ensured the provision of timely and relevant advice to the ATCM; (iii) developed a capacity building, education and training programme; (iv) developed a communications strategy; and (v) adopted a data and information management strategy to encourage free and open exchange of Antarctic data and information. The climate programmes produced a review of Antarctic Climate Change and the Environment. Subglacial environment research is now funded through three major programmes and entry into the subglacial environments is predicted in the next three to four years. Capacity building is primarily accomplished through a fellowship programme that allows the exchange of nationals between Antarctic programmes. SCAR awards biennial medals to top scientists and manages the Martha T Muse award for the Tinker Foundation.

SCAR has been in existence for over half a century. How do you see the framework evolving over the next 50 years?

The changes we are witnessing today in the polar regions suggest that Antarctica will continue to play a major role in the planet's climate system. For this reason, polar research will continue to play a significant role in the future. SCAR has reasserted itself as **the** international, interdisciplinary facilitator and promoter of Antarctic science. With its re-emergence as an authoritative source of science in Antarctica and the Southern Oceans, SCAR's role as a scientific leader and advisor on scientific matters, especially those related to conservation and protection, will only grow in future years. To remain relevant and effective, SCAR will have to adapt to not only a changing physical environment but also a changing political and international environment, in order to stay relevant, timely, and responsive to ever more complex questions about our planet's future.



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