



Report of the Scientific Committee on Antarctic Research to the SCOR 2020 Meeting

Summary

This paper presents the annual report of the Scientific Committee on Antarctic Research (SCAR) to the 2020 meeting of the Scientific Committee on Oceanic Research. The Covid-19 pandemic has had a number of impacts on SCAR including the cancellation of its 2020 Open Science Conference and Delegates meeting in Hobart. However, key elements of the conference are being moved online during the original conference dates 3-7 August. SCAR's current Scientific Research Programs are drawing to a close in 2020 and SCAR is in the process of reviewing proposals for three new proposed Scientific Research Programmes, for consideration by the SCAR Delegates.

Background

The mission of SCAR is to advance research in, from and about Antarctica and the Southern Ocean, and to promote scientific knowledge, understanding and education on any aspect of the Antarctic and Southern Ocean regions. To this end, SCAR is charged with the initiation and international coordination of Antarctic and Southern Ocean research beneficial to global society. SCAR provides independent and objective scientific advice and information to the Antarctic Treaty System and other bodies, and acts as the main international exchange of Antarctic information within the scientific community. Descriptions of SCAR's activities, and the scientific outputs and outcomes facilitated by SCAR are available at:

<https://www.scar.org/>.

SCAR 2019 Highlights

Highlights from 2019 include the XIII International Symposium on Antarctic Earth Sciences (ISAES), held in July 2019 in Incheon, Korea. ISAES expanded its scope in 2019 to include new areas of research such as Antarctic volcanism, remote sensing and climate science. The symposium was attended by over 450 participants from 32 countries.

Also in July, at the Antarctic Treaty Consultative Meeting in Prague (ATCM XLII), SCAR submitted three lead Working Papers (WPs), three co-sponsored WPs, eight lead Information Papers (IPs), eight co-sponsored IPs and one Background Paper (BP). SCAR's contribution to the work of the Antarctic Treaty System was recognised in Resolution 7 of the ATCM XLII on "SCAR's Sixtieth Anniversary and the Role of SCAR in Providing Scientific Advice to Support the Work of the Antarctic Treaty System". SCAR's enduring and crucial role in providing objective and independent scientific advice to support and inform the work of the ATCM and the Committee for Environmental Protection (CEP) was recognised and acknowledged with gratitude. SCAR President Professor Steven L Chown delivered SCAR's 2019 lecture to the ATCM. The subject of the lecture was "*What does the Paris Climate Agreement Mean for Antarctic and Southern Ocean Environmental Protection?*" and was very well received.

Training, support and development of the Antarctic community continue to form a fundamental component of SCAR's work. In 2019, SCAR awarded [eight early-career Fellowships](#) and [three Visiting Scholar Awards](#). Fundraising efforts continued in 2019 to increase capacity for Antarctic research internationally.

Also in 2019, SCAR and the International Association of Antarctica Tour Operators (IAATO) commenced a collaborative project to develop a systematic conservation plan (SCP) for the Antarctic Peninsula, aimed at informing the Antarctic community on how to optimally manage biodiversity, science and tourism together in the region, and contribute to the sustainable management of IAATO activities into the future. The project will report in 2021 due to delays caused by the Covid-19 pandemic.

In August 2019 SCAR published a paper outlining progress made since its 2014 Horizon Scan, outlining the science most urgently needed from Antarctica and the Southern Ocean to forge new understanding of what the future holds for both the region and its effects on the planet (<https://doi.org/10.1016/j.oneear.2019.08.014>).

In September 2019, the SCAR Expert Group on Antarctic Biodiversity Informatics (EG-ABI) partnered with the rOpenSci project and Antarctic Biodiversity Portal to organise a short course on tools for Southern Ocean spatial analysis and modelling using R. The course taught participants how to retrieve, model and interpret species occurrence data from the Southern Ocean using R-tools developed through the Antarctic R community.

September 2019 also saw the release of the IPCC Special Report on Oceans and Cryosphere (SROCC), to which members of the SCAR community contributed significantly.

To mark the 60th anniversary of the Antarctic Treaty on 1 December 1959, SCAR released a series of fact sheets on "*60 Years of Treaty-Supported Antarctic Science*", including one on [fish speciation in the Southern Ocean](#) and another on [melting ice sheets and sea level rise](#). The full range of fact sheets is available from <https://www.scar.org/library/scar-publications/infographics/>.

On 2-3 December 2019, SCAR took part in the first Antarctic Parliamentarians Assembly, involving parliamentarians from 13 of the 54 signatory countries of the Antarctic Treaty. SCAR President Professor Steven Chown presented on "*How will life in the Antarctic survive a changing world?*" showing how invasive species will thrive in a warmer Antarctic. Professor Tim Naish, leader of SCAR's research programme studying the effects of climate change on ice sheets and sea level, presented on "*How is climate change affecting Antarctica and what does it mean for us?*" which focused on the global consequences of future sea level rise from loss of Antarctic ice.

SCAR assisted the International Cryosphere Climate Initiative (ICCI) in organising the first dedicated Cryosphere Pavilion at the UNFCCC meetings at the Convention on Climate Change (COP25) in Madrid in December 2019. As part of the opening ceremony, SCAR Delegates Jerónimo López-Martínez (Spain) and Marcelo Leppe (Chile) presented on the topic of "*Antarctica Past, Present and Future: Sea Level Rise*".

Science Priorities

SCAR's Scientific Research Programs (SRPs) are the main vehicles through which SCAR facilitates and coordinates science in, from and about Antarctica and the Southern Ocean. The current SRPs come to an end this year and the new suite of proposed programs is under review. The results of the review will be considered by the SCAR Delegates. The proposed programs are:

Near-term Variability and Prediction of the Antarctic Climate System (AntClimNow)

AntClimNow will investigate the prediction of near-term conditions in the Antarctic climate system on timescales of years to multiple decades. They will take an integrated approach, looking beyond climate projections of the physical system to consider the Antarctic environment as a whole. A key objective will be to quantify and understand atmospheric and oceanic linkages between Antarctic climate variability and the rest of the planet, with a focus on links with the tropics.

Integrated Science to Support Antarctic and Southern Ocean Conservation (Ant-ICON)

Ant-ICON will answer fundamental science questions (as identified by the SCAR Horizon Scan), relating to the conservation and management of Antarctica and the Southern Ocean, and focus on research to drive and inform international decision-making and policy change. Research themes will broadly cover integrated forecasting of future change, environmental sustainability of human activities in Antarctica, Antarctic conservation in a global context, and socio-ecological approaches to the management and conservation of the Antarctic.

INStabilities & Thresholds in ANTArctica (INSTANT)

INSTANT will address a first-order question about Antarctica's contribution to sea level. It encompasses geosciences, physical sciences and biological sciences, of the way in which interactions between the ocean, atmosphere and cryosphere have influenced ice-sheets in the past, and what expectations will be in the future with a special focus on quantifying the contributions to global sea level change. The programme aims to provide greater understanding to decision-makers, enabling them to anticipate and assess the risk in order to manage and adapt to sea-level rise and evaluate mitigation pathways. One of the programme's themes is ocean-ice interactions, to improve understanding of ocean forcing processes of marine-based ice sheet dynamics.

Recent Developments

- SCAR notes the excellent relationship with SCOR in delivery of the Southern Ocean Observing System (SOOS) and looks forward to collaborating with SCOR to support both communities' engagement with SOOS over the coming year.
- From January 2020, SCAR took over the operation of the Antarctic Environments Portal from the University of Canterbury, New Zealand. The Portal aims to provide easy access to reliable, science-based information on a range of issues relevant to the management of the Antarctic environment. All scientifically-based information available through the Portal is prepared by Antarctic experts and is thoroughly peer-reviewed before being published. The primary objective is to make the best scientific information available to Antarctic policy makers.
- In February 2020, prior to the 2020 Ocean Sciences Meeting in San Diego, CA, SCAR co-organised a workshop on the Southern Ocean contribution to the UN Decade of Ocean Science. The 30 participants representing 11 countries included representatives with expertise in ocean sciences, policy, governance and science communication, from all career stages.
- SCAR's Open Science Conference and Delegates meeting, which were due to be held in Hobart, Australia in August 2020, have been cancelled due to the pandemic. However, key elements of the OSC will still take place through 'SCAR 2020 Online' (see scar2020.org). The planned plenary presentations will go ahead, as well as highlights of SCAR's concluding scientific research programs and proposed future programs. This will be done through a combination of live-streaming during the week of the original OSC (3rd-7th August 2020) and recorded presentations.

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