



Report of the Scientific Committee on Antarctic Research to the SCOR 2021 Meeting

Summary

This paper presents the annual report of the Scientific Committee on Antarctic Research (SCAR) to the 2021 meeting of the Scientific Committee on Oceanic Research. The Covid-19 pandemic has continued to severely impact SCAR activities. Although SCAR's biennial Open Science Conference in Hobart in August 2020 had to be cancelled, SCAR hosted SCAR 2020 Online, which attracted 2712 participants from 60 countries. In March 2021, the first virtual meeting of the SCAR Delegates took place, welcoming a new member country as well as a new SCAR President and Vice President. Three new Scientific Research Programmes were approved in late 2020, representing the Antarctic research community response to the key current science questions of global relevance.

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 2020 Highlights

Although the physical 2020 Open Science Conference (OSC) and XXXVI SCAR Meetings, due to be held in Hobart, Australia, in August 2020 had to be cancelled, key elements of the OSC took place via SCAR 2020 Online. Registration for the conference and access to the platform was free and open to all. In total, 24 key events – an opening ceremony, four plenary events, one panel discussion, three mini-symposia (with a repeat slot for two), four workshops (one repeat event) and a closing ceremony – were broadcast on the platform from 3rd to 7th August 2020. This was done through a combination of live streaming during the week of the original OSC and recorded presentations. Several convenors of the parallel sessions self-organised virtual events for their online session, with a total of 21 side events. Recordings of these meetings were later made available on the SCAR 2020 Online website and via [a dedicated YouTube channel](#). In all, 2,712 participants from 60 countries attended, 584 virtual displays were created, and 89 videos uploaded.

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. The outcomes informed efforts in 2021, as described in “recent developments” below.

Training, support, and development of the Antarctic community continue to form a fundamental component of SCAR’s work. In 2020, SCAR awarded [four early-career Fellowships](#) and [two Visiting Scholar Awards](#). Fundraising efforts continued to increase international capacity for Antarctic research.

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.

June 2020 saw the publication of the *Crustacean guide for predator studies in the Southern Ocean*. Under an international effort of SCAR’s life science programmes, and expert and action groups, the guide gathers information on more than 100 species from 53 families of the most relevant crustaceans in the diet of sub-Antarctic and Antarctic meso- and top predators. It is intended to support scientists in identifying crustaceans in diet studies of predators from the Southern Ocean while promoting interdisciplinary research.

The SCAR Southern Ocean Continuous Plankton Recorder (SO-CPR) Survey produced a major report on the Status and Trends of Southern Ocean Zooplankton. The report collated current knowledge of the status of zooplankton (e.g., what species are known, community structure, biogeography), based on the analysis of the SO-CPR dataset, and 69 publications in peer-reviewed research papers, chapters, atlases, and reviews. The report contributed to the efforts of SCAR’s research programmes AntEco and AnT-ERA.

In July 2020, a new paper "The evolving paleobathymetry of the circum-Antarctic Southern Ocean since 34 Ma – a key to understanding past cryosphere-ocean developments" was published in *Geochemistry, Geophysics, Geosystems*. The project contributed to SCAR’s PAIS research programme. The group subsequently published newly-combined palaeotopographic and bathymetric models, providing complete grids of the Southern Ocean and Antarctic continent, available from <https://doi.pangaea.de/10.1594/PANGAEA.923109>.

Science Priorities

SCAR’s Scientific Research Programs (SRPs) are the main mechanism through which SCAR facilitates and coordinates science in, from and about Antarctica and the Southern Ocean. The previous series of SRPs closed in 2020 and the new suite of proposed SRPs was approved by the SCAR Executive Committee in late 2020, to begin in 2021. These flagship 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

- In March 2021, the first virtual meeting of the SCAR Delegates took place. At the meeting, the Czech Republic and Turkey were upgraded from Associate to Full Membership of SCAR, and Mexico was admitted as an Associate Member. In addition, two new Executive Committee members were elected by the Delegates: Dr Yeandong Kim (Republic of Korea) was elected as SCAR President, and Prof Deneb Karentz (USA) was elected as Vice President and takes on responsibility for Science. Prof Jefferson Simoes (Brazil) was re-elected for a second term as Vice President and retains responsibility for Finance. Two Vice Presidents remain in position: Dr M. Ravichandran (India) as Vice President for Capacity Building, Education and Training, and Dr Gary Wilson (New Zealand) as Vice President for Administration. Prof Steven Chown remains on the Executive Committee for two years as immediate Past President.
- SCAR, through its Antarctic Biodiversity Portal, is coordinating a community effort to contribute to the UN Decade of Ocean Science for Sustainable Development (2021-2030) through the development of a Southern Ocean Action Plan. This is a partnership with the Southern Ocean Observing System (SOOS) and many other groups and organisations, including SCOR, collectively termed the Southern Ocean Task Force. A website has recently been launched (<https://www.sodecade.org>) to share information about the process.
- The 2021 Antarctic Treaty Consultative Meetings (ATCM) and Committee for Environmental Protection (CEP) was held as a virtual meeting in June 2021, hosted by France. SCAR attended in its capacity as an Observer and submitted 8 Working Papers and 10 Information Papers across a range of topics. The ATCM endorsed the recommendations proposed by SCAR in its paper on Antarctic and Southern Ocean Climate Change in a Global Context and welcomed its overview paper on the state of Ocean Acidification. These papers also provided scientific background in support of a Resolution on Antarctica in a Changing Climate agreed by the Parties.
- Based on recommendations from a SCAR expert group on the conservation status of emperor penguins, the CEP agreed to establish an Intersessional Contact Group to develop an Action Plan for designation of the emperor penguin as a Specially Protected

Species. The CEP also endorsed the SCAR Environmental Code of Conduct for Geosciences Field Research Activities and encouraged the continuation of work to identify globally important geological sites in Antarctica. The Antarctic Environments Portal (managed by SCAR) was acknowledged as a high-quality source of the best available science to support decision-making.

- The Paris Declaration was adopted by the Parties to mark the 60th Anniversary of the entry into force of the Antarctic Treaty and the 30th Anniversary of the signing of the Madrid Protocol. The Declaration specifically highlights the value of the engagement of SCAR in providing scientific advice to the ATCM.
- SCAR has applied for a side event, highlighting the Antarctic contribution to future sea level rise and its societal impacts, at the upcoming COP26 UNFCCC Meeting in Glasgow, November 2021. SCAR will also work with partners to provide the Antarctic context for the [Cryosphere Pavilion at COP26](#), including the Polar Oceans Days.
- 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.