



ENG

Agenda Item:	CEP 7b
Presented by:	SCAR
Original:	English
Submitted:	22/4/2022

Mapping SCAR affiliated research to climate change related science needs identified by the CEP

Attachments:

Atcm44_att112_e.docx: Attachment A – SCAR affiliated research relevant to the science needs identified in the CEP 5-Year Work Plan, CEP Climate Change Response Work Programme, CEP Final Reports and other CEP Manuals

SCAR affiliated research aligned with the climate change related science needs identified by the CEP

Information Paper submitted by SCAR

Summary

In response to a request from the CEP's Subsidiary Group on Climate Change Response (SGCCR) in 2021, SCAR has conducted a review of recent, current and forthcoming research being undertaken by its subsidiary and affiliated groups that is of relevance to the climate change related science needs identified by the CEP. Research that will contribute to addressing most of these needs is being undertaken across a broad range of SCAR's physical, biological and humanities/social science groups. SCAR provides independent and objective scientific advice to the CEP and will continue to provide information on climate change in response to specific requests or needs, as well as highlighting other relevant research. Maintaining effective communication between the CEP and SCAR on science needs and objectives will help to ensure that relevant research outputs continue to be made available in support of the CEP's work on climate change.

Background

The CEP's Climate Change Response Work Programme (CCRWP) identifies science needs and knowledge gaps associated with each climate-related issue. The CEP also lists science needs related to its 5-Year Work Plan priorities, with further needs highlighted in CEP final reports and CEP manuals. In 2021, the CEP endorsed a combined list of science knowledge and information needs (ATCM XLIII WP14 *Report of the Subsidiary Group on Climate Change Response (SGCCR) 2019-21 Attachment B Draft Science Needs*; CEP XXIII, paragraph 41), which was developed by the SGCCR to facilitate communication of CEP science needs to researchers in a succinct and easily understood manner. The climate change related science needs considered here are extracted from this combined list.

A request for information on recent, current and forthcoming or developing research aligned with the climate change related science needs was sent to the leaders of all SCAR subsidiary and affiliated groups. SCAR group reports to the 2021 SCAR Delegates Meeting and the science and implementation plans for the three new Scientific Research Programmes (available at: <https://www.scar.org/library/scar-meeting-papers/xxxvi-scar-delegates-2021-online/>) also provide information on research objectives and future outputs.

The information provided in this paper is an update to the previous review of SCAR affiliated research relevant to the CCRWP, undertaken in 2017 in response to a request from CEP XIX (ATCM XL IP69 *Mapping SCAR affiliated research to the CEP's Climate Change Response Work Programme*).

A full list of the SCAR groups for which details are provided can be found in Table 1. Further information, including contacts, for all of these groups is available on the SCAR website (www.scar.org).

Results

SCAR affiliated research covers all of the priority topics identified in the CEP 5-Year Work Plan and the Climate Change Response Work Programme (CCRWP) and has direct relevance to almost all of the climate change related science needs identified by the CEP. Details of how this research is aligned to specific science needs is provided in Attachment A. This includes key

objectives from each group or project, together with upcoming outputs or developments (and a timeframe for these outputs if appropriate). Many groups have objectives and outputs that are relevant to several science needs, and individual science needs are in many cases being addressed by more than one group. Projects are often interdisciplinary and may also overlap with research being undertaken by National Antarctic Programmes.

SCAR's three new flagship Scientific Research Programmes (SRPs) were approved in 2020, and will focus research efforts on high priority topics, including questions identified as part of the SCAR Horizon Scan (Kennicutt et al., 2019). These programmes also have a central objective to highlight key results to the bodies responsible for governance and management of Antarctica.

- Integrated Science to Inform Antarctic and Southern Ocean Conservation (Ant-ICON) will answer fundamental science questions 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.
- INSTabilities and Thresholds in ANTarctica (INSTANT) is a cross-disciplinary programme looking at quantifying Antarctica's contribution to past and future global sea-level change, helping decision-makers to better anticipate, manage, and adapt to sea-level rise.
- Near-term Variability and Prediction of the Antarctic Climate System (AntClim^{now}) is investigating near-term Antarctic climate variability and trends, understanding contemporary climate change, and modelling future climate projections.

The SCAR Life Sciences group coordinates research on understanding the impacts of past, current and predicted environmental change on biodiversity and the consequences of adaptation and function. Through multidisciplinary collaborations, it is focused on understanding the complexities of the Antarctic environment and predicting the consequences of change. The objectives of the Antarctic Nearshore and Terrestrial Observation System Expert Group (ANTOS), the Birds and Marine Mammals Expert Group (EG-BAMM) and the SCAR Krill Action Group (SKAG) are closely aligned with CEP science needs related to monitoring change in the terrestrial and marine environments, and understanding the effects of change on species and habitats.

The SCAR Physical Sciences group coordinates research on the role of the Antarctic continent and the Southern Ocean in global climate change, processes at the interfaces between ice, ocean, land and atmosphere, predictions of global and local change, improved understanding of the cryosphere and ice sheet dynamics, and understanding of past climate.

Research being undertaken by Humanities and Social Science Action Groups is focused on human engagement with the Antarctic, including on heritage, tourism, protected areas, human impacts and environmental governance, all of which are impacted by, and need to respond to, climate change. Researchers in the Standing Committee on the Humanities and Social Sciences (SC-HASS) are exploring public and stakeholder understanding of climate change and its impacts, and how the communication of information on these topics can impact understanding, uptake and action.

SCAR meetings, including the [2022 SCAR Open Science Conference](#), provide an opportunity for the dissemination of climate change related research, as well as an opportunity for CEP representatives to promote important issues, including those related to climate change science needs.

The Antarctic Environments Portal aims to support the work of the CEP by providing up-to-date information on relevant issues, including the science needs identified in the CEP 5-year Work Plan. New Information Summaries on sea ice, ocean warming, and the impact of ocean acidification are in development and will be particularly relevant in supporting the delivery of the CCRWP (ATCM XLIV WP10 *Antarctic Environments Portal*).

Finally, the Antarctic Climate Change and the Environment decadal synopsis report (ATCM XLIV IP72) makes recommendations on the most significant and urgent research required for

the Antarctic region (ATCM XLIV WP31 *Antarctic Climate Change and the Environment: A Decadal Synopsis. Research Imperatives*). These are based on the SCAR Horizon Scan and Scientific Research Programmes, and are closely aligned with, and complementary to, those listed in the 5-Year Work Plan and the CCRWP.

Conclusion

This research mapping exercise demonstrates that research aligned with almost all of the climate change related science needs identified by the CEP is being undertaken across a broad range of SCAR's physical, biological and social science groups. SCAR groups are therefore well placed to contribute to the delivery of the CCRWP and to continue addressing the science needs identified by the CEP. SCAR will continue to communicate details of the CEP's climate change related science needs to its subsidiary and affiliated groups, and to make relevant research outcomes from these groups available to the CEP.

References

Kennicutt, M. C. et al. Sustained Antarctic research: A 21st Century imperative. *One Earth* 1, 95-113 (2019).

Table 1: SCAR subsidiary and affiliated groups

Group/programme	
Action Group on Intrinsic Value in Antarctica	AGIVA
Near-term Variability and Prediction of the Antarctic Climate System (SRP)	AntClim ^{now}
Integrated Science to Inform Antarctic and Southern Ocean Conservation (SRP)	Ant-ICON
Antarctic Tourism Action Group	Ant-TAG
Antarctic Near-Shore and Terrestrial Observation System Expert Group	ANTOS
Antarctic Sea-ice Processes and Climate Expert Group	ASPeCt
Ice Thickness and Subglacial Topographic Model of Antarctica	Bedmap
Biogeochemical Exchange Processes at the Sea-Ice Interfaces Expert Group	BEPSII
Earth Observation Action Group	EOAG
Expert Group on Birds and Marine Mammals	EG-BAMM
International Bathymetric Chart of the Southern Ocean	IBCSO
Integrating Climate and Ecosystem Dynamics in the Southern Ocean (ICED) programme (<i>in conjunction with the Scientific Committee on Oceanic Research (SCOR) and the International Geosphere-Biosphere Programme (IGBP)</i>)	ICED
INStabilities and Thresholds in ANTArctica (SRP)	INSTANT
International Partnerships in Ice Core Science Expert Group	IPICS
Plastic in Polar Environments Action Group	Plastic-AG
Southern Ocean Observing System (<i>in conjunction with SCOR</i>)	SOOS
Standing Committee on the Antarctic Treaty System	SC-ATS
Standing Committee on the Humanities and Social Sciences	SC-HASS
SCAR Krill Action Group	SKAG