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Outcomes of the 1st SCAR Antarctic and Southern Ocean Science Horizon Scan

Attachments:

Acm38_att100_e.pdf: Annex 1. A roadmap for Antarctic and Southern Ocean science for the next two decades and beyond

Outcomes of the 1st SCAR Antarctic and Southern Ocean Science Horizon Scan

1. Background

At the XXXVII ATCM in 2014, SCAR informed Parties that it was carrying out the 1st SCAR Antarctic and Southern Ocean Science Horizon Scan to identify the most important scientific questions in and about the Antarctic that should be addressed over the next two decades and beyond (XXXVII ATCM, IP 13). More than 70 of the world's leading Antarctic scientists, policy makers and visionaries (including some early career scientists) gathered in Queenstown, New Zealand, in April 2014, the week prior to XXXVII ATCM in Brasilia, to identify the final list of questions. SCAR announced at XXXVII ATCM that a report of the outcomes would be presented at the following ATCM. SCAR does so here on behalf of the broader community involved in the Horizon Scan.

2. Introduction

In 2013, SCAR announced it would be undertaking a “horizon scanning” activity to support its roles of leadership, advice and promotion of international cooperation in Antarctic science.

Among the SCAR Horizon Scan aims was that the outcomes should assist in aligning international programmes, projects and resources to effectively facilitate Antarctic and Southern Ocean science in the coming years.

The Horizon Scan process has been a community-based effort to identify the most compelling and important scientific questions to be addressed over the next two decades and beyond in and from Antarctica and the Southern Ocean. An International Steering Committee was established and a formal horizon scanning process was implemented. The process provided an initial list of more than 850 unique scientific questions and the nomination of almost 500 leading scientists to participate in a final Retreat in which the most important scientific questions would be identified and agreed.

The Retreat was held in Queenstown, New Zealand from April 20 to 23, 2014. SCAR convened more than 70 scientists and policy-makers from 22 countries to agree on the priorities for Antarctic research for the next two decades and beyond.

The SCAR Science Horizon Scan Retreat attendees originated from 22 countries and included a diverse expertise base and assortment of career stages and profiles. The research area composition of attendees, based on SCAR classifications, was 22% GeoSciences, 32% Life Sciences, 33% Physical Sciences and 14% Social Sciences, Humanities and Policy.

This has been the first time the international Antarctic community has formulated a collective vision through debate and voting.

Comprehensive information on the SCAR Horizon Scan, including planning documents, various supporting resources and outcomes is available at www.scar.org/horizonsscanning/

3. Outcomes

The Horizon Scan identified 80 high-priority scientific questions (the number being an outcome of the process too), in six broad priority areas:

1. define the global reach of the Antarctic atmosphere and Southern Ocean;

2. understand how, where and why ice sheets lose mass;
3. reveal Antarctica's history;
4. learn how Antarctic life evolved and survived;
5. observe space and the Universe; and
6. recognize and mitigate human influences.

The assembled experts concluded that, to answer the 80 highest priority questions, it will be necessary to: provide long-term sustained and stable research funding; ensure access to Antarctica throughout the year; apply emerging technologies; strengthen protection of the region; grow international cooperation; and improve communication among all interested parties. Maximizing scientific return while minimizing the human footprint remains a key goal, while coordinated international efforts that engage diverse stakeholders are crucial for addressing the questions.

The first official outcomes of the 1st SCAR Antarctic and Southern Ocean Science Horizon Scan were published as a Comment in the journal *Nature* entitled "Six priorities for Antarctic science" in August 2014 (Kennicutt *et al.*, 2014). Supplementary material listed the 80 questions and the full author list.

A more detailed description of the process and the main outputs, including an expansion of the rationale for the list of the 80 most important Antarctic research questions identified by the community, was published in the journal *Antarctic Science* entitled "A roadmap for Antarctic and Southern Ocean science for the next two decades and beyond" (Kennicutt *et al.*, 2015). The paper is Open Access, which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited (it is available at Annex 1).

4. Further developments and final remarks

Among the aims of the SCAR Horizon Scan was that the outcomes assist in aligning international programmes, projects and resources to effectively facilitate Antarctic and Southern Ocean science in the coming years.

Many of the national Antarctic programmes are now considering the Horizon Scan outcomes in the context of their current and future science priorities and strategies. Further to support the global process that has been set in motion by the SCAR Horizon Scan, COMNAP is leading an important project to understand the logistic, technical and support challenges faced by national programmes in delivering research to address nationally relevant components of the Horizon Scan priorities, and to develop ways to address them, as well as to share innovations and access to appropriate technology. The Antarctic Roadmap Challenges (ARC) project is now underway (see <https://www.comnap.aq/Projects/SitePages/ARC.aspx>), and focuses on answering the question: "How will national Antarctic programmes meet the challenges of delivery of their Antarctic science in the next 20 to 30 years?" (see IP xxx in this ATCM). SCAR has promoted the participation of the community in the first survey of the ARC project and will continue cooperating with COMNAP for the success of this initiative.

The 1st SCAR Antarctic and Southern Ocean Science Horizon Scan was made possible through the leadership of Mahlon (Chuck) Kennicutt II, enthusiastic contribution of the Antarctic community, and through support from many international, national and private organizations (a full listing is provided in the Acknowledgements of the Antarctic Science paper), particularly the Tinker Foundation.

References

- Kennicutt, M.C. *et al.* 2014. Six priorities for Antarctic science. *Nature*, 512, 23-25, (07 August 2014). doi: 10.1038/512023a
- Kennicutt, M.C., *et al.* 2015. A roadmap for Antarctic and Southern Ocean science for the next two decades and beyond. *Antarctic Science*, 27, 3-18. doi: 10.1017/S0954102014000674.

Annex 1: A roadmap for Antarctic and Southern Ocean science for the next two decades and beyond (see pdf)