



ENG

Agenda Item: ATCM 15a

Presented by: COMNAP, SCAR

Original: English

Submitted: 05/04/2017

The SCAR Antarctic Science Horizon Scan & the COMNAP Antarctic Roadmap Challenges projects

The SCAR Antarctic Science Horizon Scan & the COMNAP Antarctic Roadmap Challenges projects

Background

In recognition of the global importance of Antarctic research, the international community came together in an unprecedented effort to define the highest-priority scientific questions that can be uniquely addressed by studying the Antarctic Treaty region. In addition, the community assessed what it would take to enable the research necessary to realise the promise of Antarctic science at the dawn of the twenty-first century. The initial step was the first SCAR Antarctic and Southern Ocean Science Horizon Scan, which identified the 80 highest-priority scientific questions that researchers aspire to answer (see SCAR ATCM XXXVIII (2015) IP020). The 80 resulting research questions were called “A roadmap for Antarctic science” for the next two decades and beyond. The SCAR Horizon Scan project was followed by the COMNAP Antarctic Roadmap Challenges (ARC) project which was a community effort to determine the steps necessary to enable the science “roadmap”, that is, to answer those 80 critical questions. The ARC project reported on the technology, access, infrastructure, logistics, costs and levels of international collaboration that would be required (see COMNAP ATCM XXXIX (2016) IP051). Together, the outcomes of the two projects explicitly identify both the research priorities for the Antarctic region, and the requirements for delivering them.

Important Outcomes

Six scientific priorities were identified from the SCAR Horizon Scan, into which its 80 questions are clustered. The six priorities are:

- Define the global reach of the Antarctic atmosphere and Southern Ocean
- Understand how, where and why ice sheets lose mass
- Reveal Antarctica’s history
- Learn how Antarctic life evolved and survived
- Observe space and the Universe
- Recognize and mitigate human influences

Important links exist between these priorities, recognized in the way that several of the questions span more than a single priority. Rich opportunities for globally significant insights nonetheless exist by joint consideration of priorities. For example, how, where and why ice sheets lose mass requires understanding of the global reach of the Antarctic Atmosphere and Southern Ocean, benefits enormously from explicit comprehension of Antarctic history, and can be fruitfully informed through modelling of constraints which take into consideration where life survived in the past and how it was genetically connected.

The SCAR Horizon Scan’s research priorities and 80 critical questions are the current, consensus statement from the community on research priorities in, from and about Antarctica and the Southern Ocean, recognizing both the region and the research’s global contexts.

From the COMNAP ARC

Several “easy wins” were identified by the ARC project in terms of technology requirements. For example, the ARC identified that approximately 1/3 of the required technologies currently exist, but that they were available to only a select set of scientists. Identifying where these technologies are, whether they could be used by the international community on an agreed basis, and how this might be achieved, would be an easy-win. A second example, also related to technology, was in the context of being better connected to organisations traditionally external to the Antarctic, that are developing technologies for applications not specifically for the Antarctic area. Such external communities may be in a position to modify their technologies to suit also Antarctic applications, and thus make deployment of those technologies more readily available and better integrated across Antarctic and non-Antarctic applications. Finally, in regards to

access, three of the seven science topics noted the importance of access to, and understanding of, the area of West Antarctica. This may provide the international Antarctic community with a focus area for undertaking a collaborative multidisciplinary research project.

Recommendations

Given the broad consensus on the research priorities for the region and the community identified requirements for delivering them that the SCAR Horizon Scan and COMNAP ARC project outcomes present, COMNAP and SCAR recommend that the ATCM:

- Draws on the outcomes of these projects as a basis for its deliberations about Future Antarctic Science Challenges;
- Makes use of these outcomes to demonstrate and communicate the global importance of Antarctic research and its support, to decision-makers and to the public, especially given competing demands for national funding;
- Considers that, ultimately, success will be dependent on national investment in science, investment in science support technologies, and the availability and sharing of logistics and infrastructure, in the Antarctic and in facilities outside of the Antarctic region. Such investment and support will ensure that Antarctic research can deliver the knowledge and evidence required from and about the region to help ensure a sustainable and successful future.

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.
- Kennicutt, M.C., Kim, Y., Rogan-Finnemore, M. 2016. Antarctic Roadmap Challenges. COMNAP. ISBN 978-0-473-35672-9.
- Kennicutt, M.C., et al. 2016. Delivering 21st century Antarctic and Southern Ocean science. *Antarctic Science*, 28, 6, 407–423. doi: 10.1017/S0954102016000481.