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II

Future Directions in Antarctic and Southern Ocean Science: Horizon Scanning

Executive Summary

Title: Future Directions in Antarctic and Southern Ocean Science: Horizon Scanning

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Introduction/ Background: The SCAR Strategic Plan 2011-2016 calls for a “Horizon Scanning” activity every 4 or 5 years to support SCAR’s leadership role in Antarctic science and to assist the organization in planning future directions and resource allocations.

Important Issues or Factors: The Horizon Scanning effort must be coordinated with the Antarctic Conservation Strategy process and scheduled to inform preparation of the next Strategic Plan for SCAR.

Recommendations/Actions: Form an Action Group to begin planning and fund raising for a “Horizon Scanning” activity to be tentatively held in 2014 coinciding with the SCAR biennial meetings in New Zealand.

Expected Benefits/Outcomes: The activity will enhance SCAR’s position as a leader in international Antarctic and Southern Ocean science. The outcomes from this process will support development of SCAR’s next Strategic Plan.

Partners: Organizations with a polar mission and/or a global mission with a polar aspect should be engaged in the activity. Experts in strategic planning and “futures” predictions outside the polar community should be engaged.

Budget Implications: The AG requests \$5,000 each year in 2013/2014 for preparations for the activity and planning meetings. Funds for the activity itself will be raised from external organizations and is expected to be in the range of \$200,000 to \$250,000.

Future Directions in Antarctic and Southern Ocean Science: Horizon Scanning

Background

The SCAR 2011-2016 Strategic Plan calls for initiation of a “Horizon Scanning” activity every 4 or 5 years. In order for SCAR to accomplish its mission of leadership in Antarctic and Southern Ocean science, there is a need for a mechanism to poll the best available experts in a formal way to discern trends, future directions, and frontiers in Antarctic and Southern Ocean science.

From SCAR’s Strategic Plan:

“To sustain a position of leadership, SCAR must maintain a continually evolving vision of frontiers and emerging directions in Antarctic and Southern Ocean science. To this end, SCAR will sponsor a regular assessment of scientific frontiers. The objective will be to assemble the world’s leading experts to scan the horizons for emerging frontiers in Antarctic and Southern Ocean science and identify gaps in knowledge. This gathering will draw on data and information from SCAR conferences, symposia, workshops, meetings and other scientific gatherings; the outcomes of SCAR’s Action, Expert and Programme Planning Groups; National Antarctic Programme planning and strategic documents; outcomes of SCAR’s Scientific Research Programmes; and reports of SCAR’s Cross-linkages Meetings. The assessment will produce a 5- and 10-year vision of future directions and grand challenges in Antarctic science. These assessments will inform SCAR leadership and members as it evaluates its scientific portfolio, concludes programmes and approves new ones.”

A similar activity is already underway in regard to SCAR’s scientific advisory mission under the auspices of the Antarctic Conservation Strategy and the activity envisioned complements the conservation effort focusing on future directions and frontiers in science.

It is recommended that an Action Group be formed to develop plans for a “Horizon Scanning” activity to occur in 2014 in conjunction with SCAR’s biennial meetings in New Zealand.

Horizon Scanning

Horizon scanning is a generic technique for early detection of important developments, trends, and opportunities in regard to a defined set of topics/issues. The process systematically examines future directions and the knowledge that will be needed to inform decisions regarding the topics/issues being addressed. The technique determines current status, discerns future trends (including critical gaps in knowledge), cross-maps future directions with critical supporting technologies, and recommends a plan to ensure optimal impact, influence, and relevance for an organisation’s work. The time horizon is generally years to decades into the future. Horizon scanning explores novel and unexpected issues/directions as well as long-term trends including matters at the frontiers of current thinking that challenge past assumptions with the potential to change accepted paradigms.

As outlined in the SCAR Strategic Plan 2011-2016, the proposed horizon scanning activity is intended to discern future directions, trends, new frontiers, opportunities and challenges in Antarctic and Southern Ocean science over the next 5 to 15 years. The outcomes will guide SCAR’s decision making and resource allocations in the coming years as well as inform the strategic planning process. The overarching objective of this activity is to position SCAR in future years as THE international leader and facilitator of Antarctic science and provider of authoritative, independent scientific advice to decision and policy makers.

The Action Group will consider the experiences of others in “horizon scanning” and decide how this process can be customized to the vision, mission, and objectives of SCAR. In most cases, horizon scanning is policy oriented. For this activity the on-going Antarctic Conservation Strategy will dovetail with the science horizon scanning activity providing policy related inputs to the process.

If properly done, horizon scanning is more than forecasting or predicting. It charts an integrated and comprehensive map of future opportunities and obstacles to progress, matches evolving or emerging

technologies with scientific questions, and leads to conduct of research that produces societal relevant information. Horizon scanning consists of multiple steps including pre-activity planning, staging and managing the activity itself, and post-meeting production of utilitarian products for multiple audiences.

Pre-meeting planning may include, but not be limited to, literature studies, creation of resource databases (i.e., strategic plans, workshop reports, symposia, conference proceedings, etc.), initial identification of opportunities and future directions through national and international consultation, and preliminary evaluations of opportunities and future directions. Literature studies might be accomplished by commissioning individual experts or teams of experts to provide overview documents of high priority scientific directions including initial identification of critical gaps in knowledge. These overviews should be concise and comprehensive. An Executive Summary of a few pages would be useful to communicate the most important messages and conclusions to non-experts that may be attending the activity. Initial lists of research directions and opportunities should be comprehensive and inclusive and developed through wide electronic consultation leading up to the activity. Information might be gathered through questionnaires or other survey instruments to determine consensus opinions and trends in thinking in the community-at-large.

The design and procedures for the conduct of the activity itself should be decided by the AG based on experiences from similar activities conducted by other communities. Guiding principles for the activity should include, but not be limited to: enlisting participation of leaders and visionaries from the diverse international community served by SCAR; complementing content experts with strategic planning/futurist experts outside of Antarctic science; developing clusters of related and dependent issues and topics (distilling long lists into shorter lists – called clusters); employing interactive, inclusive, consultative, and consensus building processes; and capitalizing on interconnections between and integration of related topics and issues.

The outputs to be produced should be explicitly defined based on the audiences and goals for communication. Multiple products may be needed. Products might include, but not be limited to: descriptions of the activity-generated clusters (topics/issues); essays that embellish important aspects of broader themed clusters; development of strategic questions based on state of the knowledge for each cluster; identification of critical gaps in knowledge and information; identification of limiting technologies and/or technological opportunities; and/or a comprehensive final report detailing the methods used, documenting the conduct of the activity itself, summarizing the most important outcomes/recommendations for each topics/issues; and creation of long lasting reference resources that can be widely accessible (such as on-line libraries or literature surveys, wiki's, etc.). An additional output should be recommended revisions to the process for future horizon scanning efforts, identifying what worked and what didn't work.

To keep the activity manageable and ensure full engagement of attendees, attendance should be restricted to about 40 to 50. It is also important to include representatives from the leadership of the Antarctic Conservation Strategy efforts. It is estimated that the activity can be accomplished in 2 to 3 days. Substantial pre- and post-meeting work by a Steering Committee will be required. The Chair and the membership of the Steering Committee will be critical to the success of the activity and should include people known for forward-looking thinking, organizational and public speaking skills, and consensus building capabilities. Scientists, technologists, funders of Antarctic science, and experts in logistics should be included in the participants. The inclusion of those that think about future directions in general, outside of the Antarctic community, should be considered for invitation.

The optimal model for financing would be that the entire cost of all participants is paid. Roughly it is estimated that this will cost on the order of \$200,000 to \$250,000 depending on the location, the length of the meeting, and the number of invitees. The AG should explore if the costs of holding and staging the meeting might be assumed by an interested host.

Terms of Reference

The Action group for Horizon Scanning (AGHS) should include 4 to 6 members familiar with the processes of strategic planning and be representative of/familiar with the diverse fields of science that are included in modern Antarctic and Southern Ocean science.

The draft Terms of Reference are:

- 1) Develop a clear vision of the intended audiences, objectives and outcomes for the horizon scanning activity.
- 2) Identify the steps necessary for the activity to be successful and define these steps within a framework of pre-activity planning and preparation, the process to be followed during the activity itself, post-activity consultation procedures and report drafting, and production of final deliverables.
- 3) Define the processes/mechanism to be utilized before and during the activity to ensure that the participants are fully engaged and time is effectively managed.
- 4) Develop a list of preliminary resources that should be assembled to support the activity (i.e., data and information from SCAR conferences, symposia, workshops, meetings and other scientific gatherings; the outcomes of SCAR's Action, Expert and Programme Planning Groups; National Antarctic Programme planning and strategic documents; outcomes of SCAR's Scientific Research Programmes; and reports of SCAR's Cross-linkages Meetings).
- 5) Estimate a budget for the activity.
- 6) Suggest a strategy for fund raising to support the activity.
- 7) Assemble a list of the types of people that should be invited and begin to gather a shortlist of invitees.
- 8) Develop a list of partner organizations that should be asked to send representatives.

Summary

It is important that the AG develop an explicit and detailed plan for the activity, how it will be managed (including leadership), how much the activity will cost, and what the outputs will be in order to solicit funds to support the activity.