

White Paper

For consideration at the Antarctic Roadmap Challenges (ARC) meeting in Tromsø, Norway

Prepared by the SCAR Humanities and Social Sciences EG and the SCAR History EG

Background

The first SCAR Antarctic and Southern Ocean Horizon Scan identified 80 high-priority Antarctic research questions that should be addressed by researchers in the next two decades and beyond (see Kennicutt et al., 2014a&b). Among those 80 questions, roughly 10% of which have/had been contributed by the Antarctic humanities and social sciences community, the questions listed below are particularly relevant to scholars in the humanities and social sciences. These questions cut across almost all of the seven clusters of questions originating from the Horizon scan and include all questions of the cluster “Human presence in Antarctica” (questions 74-90). The questions are presented below with the original question number (as per Kennicutt et al., 2014a&b) and are followed by a short commentary that briefly outlines important aspects from a humanities and social sciences perspective, or how humanities and social sciences scholars could contribute to addressing these questions¹.

10. Will there be release of greenhouse gases stored in Antarctic and Southern Ocean clathrates, sediments, soils, and permafrost as climate changes? (*Cross-cuts “Dynamic Earth”*)
[The implications of the release of greenhouse gases currently stored in the Antarctic would represent such a clear and present danger that it would impact all existing Antarctic governance norms. Humanities and social science scholars are able to analyse the geopolitical and societal implications and dimensions of this question.]
12. Will changes in the Southern Ocean result in feedbacks that accelerate or slow the pace of climate change?
[Aside from the physical and ecological aspects this questions addresses, judgements related to ecosystem stability or recoverability of stability underlay the entire rationale for ecosystem management under CCAMLR. Questions of governance and climate change cannot be separated.]
48. Which ecosystems and food webs are most vulnerable in the Antarctic and Southern Ocean, and which organisms are most likely to go extinct?
[This question has very clear implications for the management of marine harvesting as well as the sustainability of continued utilisation of the marine resources of the Southern Ocean. The

¹ It is worth noting that, aside from contributing to answering these questions, the humanities and social sciences also offer an opportunity to put these questions into a wider cultural context, which becomes important if we want to highlight the societal relevance and urgency to address the questions.

societal relevance of the vulnerability of marine ecosystems and food webs invites further assessment of the societal, political, cultural as well as environmental consequences, and to deeper questions related to the value humans place upon maintaining ecosystems as an end in itself.]

51. How will organisms and ecosystems respond to a changing soundscape in the Southern Ocean?" (*Cross-cuts "Human"*)

[This question builds on a solid understanding of the past, present and potential future patterns and scale of human activities in the Southern Ocean, which can be pieced together based on research undertaken by historians, human geographers, anthropologists, and science and technology scholars, just to name a few relevant disciplines.]

52. How will next-generation contaminants affect Antarctic and Southern Ocean biota and ecosystems?

[This question involves not only an appreciation of human behaviour in (and beyond) the Antarctic in relation to the utilisation of new technologies and novel substances but also an assessment of environmental management options available to address the use of novel substances (and potentially contaminants) in Antarctic. Is the Protocol on Environmental Protection to the Antarctic Treaty, especially Annexes III, IV, VI, sufficiently equipped to address these challenges?]

53. What is the exposure and response of Antarctic organisms and ecosystems to atmospheric contaminants (e.g. black carbon, mercury, sulphur, etc.), and are the sources and distributions of these contaminants changing? (*Cross-cuts "Antarctic Atmosphere" and "Human"*)

[This question, similar to question 55 below, requires an in-depth understanding of the development of human activities in the Antarctic now and in the future. Anticipatory methodologies, such as those applied by environmental anthropologists and human geographers, can be applied to obtain a better picture of potential future trajectories along which human activities in the Antarctic may develop.]

55. How will invasive species and range shifts of indigenous species change Antarctic and Southern Ocean ecosystems? (*Cross-cuts "Human"*)

[See question 53.]

56. How will climate change affect the risk of spreading emerging infectious diseases in Antarctica? (*Cross-cuts "Human"*)

[Aside from an integration of the physical, biological and medical sciences to address this question, an understanding of the drivers behind and the characteristics of the future development of human activities, mobilities and technological advances, which humanities and social science scholars can provide, is necessary.]

57. How will increases in the ice-free Antarctic intertidal zone impact biodiversity and the likelihood of biological invasions?

[This question implicitly entails regulatory and managerial dimensions with regard to risk management under the Protocol on Environmental Protection to the Antarctic Treaty,

especially Annexes II and VI.]

58. How will climate change affect existing and future Southern Ocean fisheries, especially krill stocks? (*Cross-cuts "Human"*)

[This question requires a consideration of the consequences of climate-change related fluctuations in Southern Ocean fisheries for the livelihoods of actors currently directly involved in or indirectly linked to these fisheries, and their economic and political implications. How will the latter translate into CCAMLR's and the ATS's attempts to manage Antarctic and Southern Ocean resources?]

61. How will increased marine resource harvesting impact Southern Ocean biogeochemical cycles? (*Cross-cuts "Human"*)

[This question presumes an increase in marine resource harvesting in the future. While this development is currently anticipated, we do not have a full understanding of the scale and nature of future marine resource harvesting in the Southern Ocean and its economic, political and socio-cultural implications, aside from its environmental consequences. A look beyond the Antarctic realm is necessary if we wish to understand and anticipate the future character of marine resource harvesting in the Southern Ocean.]

66. How successful will Southern Ocean Marine Protected Areas be in meeting their protection objectives, and how will they affect ecosystem processes and resource extraction? (*Cross-cuts "Human"*)

[Successful Southern Ocean protection can be described as a subset of an effective Southern Ocean environmental regime that achieves the goals it set out to pursue. Humanities and social science scholars are well placed to measure, qualitatively and quantitatively, the success of environmental regulation and can investigate the societal consequences of different scenarios describing a range of possible futures related to marine resource production and extraction.]

67. What ex situ conservation measures, such as genetic repositories, are required for the Antarctic and Southern Ocean? (*Cross-cuts "Human"*)

[This is a broad and very complex question that requires investigation of conservation measures, and their effectiveness, beyond the Antarctic realm. Social psychologists, human geographers, environmental anthropologists, philosophers and political scientists can contribute to an in-depth analysis of existing and potential future conservation measures and their effectiveness in managing human behaviour.]

68. How effective are Antarctic and Southern Ocean conservation measures for preserving evolutionary potential? (*Cross-cuts "Human"*)

[Investigating the effectiveness of regulatory mechanisms has been the focus of the work of legal scholars, human geographers and political scientists studying regime theory and robustness, such as Stokke & Vidas (1996), Young (1998), Underdahl (2002) or Ostrom (2005). Essentially, this question demands an assessment of the effectiveness of the Antarctic and Southern Ocean environmental regime, which humanities and social science scholars can

provide the ontological and methodological framework for.]

74. How can natural and human-induced environmental changes be distinguished, and how will this knowledge affect Antarctic governance? (*Cross-cuts all other Clusters*)

[This question draws on an important body of work, for instance in environmental humanities, about the entanglement of the natural and cultural. Furthermore, the question entails a study of very different future models of Antarctic governance, given the fundamental importance presently attached to effectively demarcating the human from the natural in Antarctica.]

75. What will be the impacts of large-scale, direct human modification of the Antarctic environment? (*Cross-cuts "Antarctic Life"*)

[Aside from addressing the effects of global environmental change, which requires input by humanities and social science scholars to address the integrated and complex nature of systematic change, this question also touches on the recognition of certain regions of Antarctica as wilderness. The latter is a concept that the Committee on Environmental Protection (CEP) has been trying to come to terms with since at least ATCM XXXIII/CEP XIII (2010). If wilderness is defined as relating to the absence of human footprint, it is necessary to determine the totality of the human footprint on the Antarctic continent to understand the dimensions of the Antarctic wilderness and to monitor changes to the extent of Antarctic wilderness over time. Social scientists have already begun to undertake a census of Antarctic infrastructure from information available and have identified 620 objects (Summerson, 2012), but the actual number of objects is probably far greater.² Moreover, the impacts of human activity (including anthropogenic climate change) upon cultural heritage sites in Antarctica will need to be considered.]

76. How will external pressures and changes in the geopolitical configurations of power affect Antarctic governance and science?

[One of the key concepts in political science is the notion of power: who has it, who lacks it, and how power and information asymmetries drive the action of states, organisations and individuals. This question also entertains notions of possible futures that take into consideration potential changes in humankind's valuation of Antarctica, technological advances, geopolitical and economic pressures, and the effects of climate change. A narrow focus on economic and geophysical "drivers" of change must be complemented by a deeper understanding of how values and ideologies shape geopolitics. These are all aspects that humanities and social science scholars can contribute to advancing our understanding of.]

77. How will the use of Antarctica for peaceful purposes and science be maintained as barriers to access change?

[With more states participating in the Antarctic Treaty System and a wider range of cultures and interests partaking in Antarctic operations and decision-making, the Antarctic geopolitical

² There would be considerable benefits from auditing the totality of objects in Antarctica for wilderness and footprint reasons, not the least of which would be the removal of unwanted material as required by the Madrid Protocol, but also as a component of a thorough evaluation of Antarctic cultural heritage. Results of significance for the management of human activities in Antarctica, including policy-relevant recommendations, may be expected from such a project.

landscape is changing. At the same time, some areas of Antarctica are being made more accessible – be it as a result of changing ice conditions or due to technological advancement. Humanities and social science scholars are well placed to address the entanglement of human interests and modes of engagement in Antarctica and in Antarctic affairs with changing environmental and technological parameters.]

78. How will regulatory mechanisms evolve to keep pace with Antarctic tourism?

[So far, the regulation of Antarctic tourism through the Antarctic Treaty System has been reactive rather than proactive, with heavy reliance on the tour operators themselves for a responsible management of Antarctic tourism. It is well-established that Antarctic tourism has diversified considerably over the last couple of decades, including an increase in yacht and fly-cruise operations (Liggett & Stewart, in press), but a more nuanced understanding of alternative future scenarios of tourism development, the characteristics of tourism operations and drivers of human behaviour, aside from intimate knowledge of the regulatory environment for Antarctic tourism, are essential to answer question #78. It is also necessary to place Antarctica in the context of the globe as a whole in order to understand how changing cultural and political dynamics drive demand for Antarctic tourism. This will also benefit from fostering closer cooperation with existing bodies such as the International Polar Heritage Committee.]

79. What is the current and potential value of Antarctic ecosystem services?

[This question draws on concepts in environmental economics related to the valuation of goods and services and the consideration of intrinsic value. These concepts underpin all human engagement with Antarctica and the governance of Antarctica, and can be analysed by environmental economists in collaboration with human geographers, sociologists and environmental philosophers].

80. How will humans, diseases and pathogens change, impact and adapt to the extreme Antarctic environment? (*Cross-cuts “Antarctic Life”*)

[Taking into consideration an array of possible futures of human activities in Antarctica, viewed against the effects of climate change, this question requires the close collaboration of social and biological scientists.]

From a humanities and social science³ perspective, the questions above require (1) a meaningful and in-depth understanding of past, present and future human engagement with the Antarctic, and (2) global and regional contextualisation, both of which humanities and social science scholars are well placed to contribute. They cannot be satisfactorily answered without thorough knowledge about the development of human interest in, activities on, and the governance of the

³ Humanities and social sciences covers a wide range of disciplines, including anthropology, communication studies, economics, education, geography, history, law, linguistics, literature, political sciences, philosophy, psychology, sociology, and visual arts.

For the purposes of this White Paper, we include history as a discipline that sits within the wider academic disciplinary groupings of the humanities and the social sciences, combining aspects of both in its methodologies (See Launius, Fleming and Devorkin, 2010). The inclusion of history as a discipline in this wider category should not in any way diminish its importance in SCAR-relevant Antarctic research.

South Polar region, questions for which the humanities and social sciences have the necessary expertise. A thorough understanding of the historic and present drivers behind human decision-making and activities (see Barr and Lüdecke, 2010), as well as the ability to anticipate human activities in the near future, is a necessary prerequisite for addressing the complex physical, biological, sociocultural, or political issues that face Antarctica (see Steel, 2015). Without a nuanced appreciation of the ways that Antarctica and Antarctic science are viewed, communicated and (re)created in civil society, the vital connection between the activities and purposes of SCAR and how those activities and purposes are represented in the wider social and political spheres will remain inadequate. These important issues, along with crucial concepts such as “ecosystem services” or “cultural heritage,” are matters that humanities and social science scholars are trained to study and interpret. In a time when technological advances, growing resource demands and diminishing powers of the nation state turn alternative resource exploration and exploitation into feasible alternatives (see e.g. Chown et al., 2012; Talalay, 2013), natural and social scientists and humanities researchers must work together in addressing some of the most pressing and complex Antarctic research questions.

Logistics, Technological and Financial Requirements

Just like our colleagues in the physical and biological sciences, Antarctic humanities and social science scholars require logistical and financial support to be able to undertake their research. For the last few decades, humanities and social science scholars have had to either undertake their Antarctic research with little resourcing, or focus on non-Antarctic research questions for which they could obtain funding and logistical support, resulting in certain areas of humanities and social science inquiry not being extended to Antarctica⁴. However, considering the intensive and complex research required to respond to the SCAR Horizon Scan questions, this is no longer feasible or appropriate.

The fields of Antarctic humanities and social sciences research are complex and ontologically, epistemologically and methodologically diverse. While many historians consider archival research as central to their work, human geographers, cultural anthropologists, social psychologists, international relations, critical geopolitics and public international law specialists rely on interviews⁵ or other kinds of face-to-face contact with research participants. To give an example: to assess how scientific research fits into environmental policy and management in terms of practice in the field, social scientists must observe and participate in activities related to environmental governance in Antarctica on a real-time, long-duration and face-to-face basis⁶. For some humanities and social science scholars, for instance anthropologists, long-term fieldwork to enable long and consistent periods of observation of certain phenomena is essential.

⁴ Science and technology studies in an Antarctic context or Antarctic ethnographies are two examples.

⁵ Interviews, especially those of a qualitative nature, can offer significant narrative and analytical depth, which can supplement other methods of inquiry (e.g. participant observation or document analysis). Open-ended interviews that are conducted in person and might even be undertaken over multiple sessions give a researcher the opportunity to analyse the different ways in which participants may choose to frame and narrate their experiences.

⁶ Ethnographic participant observation and interviews permit a unique insider/outsider research perspective that provides close-up, richly detailed analysis of particular cultural practices in what is usually described in the literature as a rather impersonal set of science/policy interfaces.

Just like our colleagues in the natural sciences, we require financial support to undertake our research. Furthermore, ex-situ research can only be undertaken to a certain extent, and humanities and social science scholars will need access to the continent to understand the peculiarities of the Antarctic environment and the human engagement with this environment.

Overall, our logistical, technological and financial requirements fall into the following categories:

- access to the continent for in-situ research: this includes (but is not limited to) comparative research in areas where different national stations are located such as King George Island, the Larsemann Hills and Ross Island⁷; and research at historic places and tourist sites, *inter alia*, to undertake ethnographic studies or to assess how well regulatory mechanisms keep pace with changing visitation patterns, to document and interpret elements of Antarctica's built environment, or to study the behaviour and impact of human activities on these sites⁸;
- access to vessels (tourist vessels and research vessels) travelling to Antarctica to examine the changing character of human interaction with the continent, study the human impact on landing sites or understand the behaviour of human visitors to the Southern Ocean and the continent itself;
- access to various national and international archives, including National Antarctic Programme libraries and archives⁹;
- access to meetings (ATCM) and Antarctic stakeholders (e.g. for interviews and oral histories);
- access to databases and the global IT infrastructure to share information effectively and organise online conferences and e-seminars¹⁰;

⁷ In this regard, difficulties often arise due to (a) the reluctance of national programmes to facilitate any enquiry which they might deem 'political' (which would cover anything around legal arrangements, governance, examinations of territorial sovereignty manifestations, etc), and (b) the structural impediment that, if access is granted, access is being facilitated through a single National Antarctic Programme making it challenging to justify the study of the activities of other National Antarctic Programmes.

⁸ Not all fieldwork linked to Antarctic research projects will take place in Antarctica. Projects focussing on Antarctic gateway cities, museum exhibits or theatre performances, just to name a few, all play an important role in revealing ways people imagine Antarctica and interact with the idea of Antarctica as a place. The latter is significant as it influences attitudes towards science and the significance of scientific programmes.

⁹ It is worth noting that these archives are not necessarily in Antarctic gateways or the traditional hubs of Antarctic-related activity. Some of the material, e.g. on Antarctic exploration, is held in smaller national archives or private hands.

¹⁰ We note that the EU-PolarNet Project (2015-2020) (see <http://www.eu-polarnet.eu>) is already working on improving the co-ordination between EU member polar research institutions by building on existing networks to create a resource-orientated infrastructure access and usage plan. This plan would allow for the coordination of data and infrastructure between all the partner organizations. EU-PolarNet will also develop an integrated EU polar research programme by identifying short and long-term scientific needs and optimizing the use of coordinated polar infrastructure for multi-platform science missions whilst fostering trans-disciplinary collaboration on polar research. SCAR is one of the 16 international partners of the project, and almost all of the most influential polar research institutions in Europe are members.

- financial support for travel, accommodation, research assistance and document copying¹¹;
- financial support to organise and participate in conferences and workshops (e.g. the SCAR OSC or the biennial conferences of the History EG and HASSEG).

Ideally, logistics support research for Antarctic social sciences and humanities research would be embedded into the strategic plans of National Antarctic Programs in the same manner as physical and biological research¹². SCAR should encourage funding agencies to examine their research lines to ensure that humanities and social science scholars have an appropriate category to situate their research in funding applications.

We also note that “artists and writers in residence” programmes create important opportunities for new creative works and interpretations of the continent, which often reach out to different sectors of society than science outreach programmes do. However, current “writers and artists in residence” national programmes, while excellent for promoting artistic engagements with the Antarctic region, do not meet the needs of (and are rarely aimed at) research scholars in the humanities and social sciences, who are neither artists nor creative writers in the strict sense of these terms. As members of the scholarly community, humanities and social science researchers can offer a nuanced analysis of cultural, political and environmental framings, within which, for instance, the work of artists and writers in residence can be positioned or interpreted, but humanities and social science research does not normally itself comprise such creative works.

Recommendations

The effectiveness of humanities and social science scholars working on the Antarctic would be greatly increased if SCAR advocated for National Programs to recognize researchers’ financial and access needs in their research strategies. In particular, it would be helpful to see SCAR facilitate access for research investigating the interactions between scientists and personnel associated with different national programmes in Antarctica, thereby showing support for this sort of enquiry.

National Antarctic Programmes should maintain their libraries and archives, especially materials that might not be held in other collections (log books, photographs, newsletters, grey literature, advertising material, ephemera, etc.). As these libraries and records are important for humanities and social sciences research (as well as for physical and biological scientists), some resources need to be dedicated to maintaining and building them. If those libraries are not open to the public or external researchers, National Antarctic Programmes should consider opening them. National Antarctic Programmes in countries with strict Freedom of Information laws and archiving laws (e.g. Australia, Britain, NZ and the USA) should be conscious of being expedient when considering requests to access information held in their archives or libraries.

¹¹ This could be achieved through dedicated scholarships.

¹² If possible, research funding for Antarctic social sciences and humanities should also be included in national Antarctic research funding schemes and agencies, although we realise that this is not in the remit of COMNAP or the Antarctic Roadmap Challenges workshop.

Antarctic artists and writers residencies should be maintained where they exist and encouraged where they do not, as they represent a unique opportunity for artists and writers to travel to Antarctica in the context of a National Program. These creative opportunities should not be conflated, however, with support for humanities and social science *researchers* to access the continent.

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