

## The SCAR long-term concept - Horizon Scan

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Antarctic and Southern Ocean science has been carried out to understanding natural variability, the processes that govern change and the role of humans in the Earth system. The international Antarctic community tried to scan the horizon to identify the highest priority scientific questions that Antarctic researchers should aspire to answer in the next two decades and beyond. The Horizon Scan identified the 80 important scientific questions through debate, discussion, revision and elimination by voting. Related questions were assembled into seven topical clusters: (i) Antarctic atmosphere and global connections, (ii) The southern ocean and sea ice in a warming world, (iii) The ice sheet and sea level, (iv) The dynamic earth beneath Antarctic ice, (v) Life on the precipice, (vi) Near-earth space and beyond - eyes on the sky, and (vii) Human presence in Antarctica.

Answering these questions will require innovative experimental designs, new applications of technology, invention of next generation field and laboratory methodologies and development of innovative observing systems and networks. Improved models are needed that realistically represent Antarctica and the Southern Ocean as an integral part of the Earth system, and provide predictions at spatial and temporal resolutions. Not only the scientific innovation, sustained year-round, access to Antarctica and the Southern Ocean will be essential. A coordinated, portfolio of cross-disciplinary and bipolar science, based on new models of international collaboration and funding, will be essential as no one scientist, program or nation can realize these aspirations alone.

Keywords: Antarctica, Horizon scan, Long-term concept