

Guest editorial

Climate change and integrated continent-wide ecosystem studies

The XXIX SCAR Open Science Conference in Hobart in July was the largest ever gathering of Antarctic scientists at a Southern Hemisphere venue, and the first occasion to show the early results of the new five SCAR research programmes. It came at a time of unprecedented interest in the polar regions in influencing and indicating global climate variability and provided a springboard for new interdisciplinary science ideas for the future at a continent-wide scale. The predictions of some of the world's best global climate models suggest that Antarctica will change rapidly in the next 30 years, and that this change will be unevenly spread across the continent. Indeed, one prediction is that while the Antarctic Peninsula and Weddell Sea will continue to warm, with significant losses of sea ice and glacier ice and marked alterations to coastlines, the Ross Sea area will not change, and may even slightly cool.

Thus it seems that continental scale changes to ecosystems, over timescales that fall within the working span of environmental scientists, are now in sight and could provide a platform for hypothesis driven research that may firstly, allow for predictions of change and secondly, the confirmation of those predictions. Change can be studied at local scales by individual researchers carrying out experiments supported by their own national programmes, and/or these can be integrated into a wide set of studies that looks at change at regional and continental scales simultaneously. Surely the latter is preferable. The SCAR research programmes Antarctica and the Global Climate System (AGCS) and Evolution and Biodiversity in Antarctica (EBA) now have a significant opportunity to combine so that the former provides predictions of change and the latter measures the corresponding ecosystem responses.

In the Ross Sea area there are already two major research initiatives that look at regional-scale change, the US-led Dry Valleys Long Term Ecological Research (LTER) project, now in its 14th year, and the linked New Zealand-US-Italian Latitudinal Gradient Project (LGP) that covers coastal and inland ecosystems from 72°–86°S. Some studies from the LGP are reported in this Issue. These projects are planned to continue to investigate the responses to change in Victoria Land. In the Peninsula area there are the US-led Palmer Station LTER project, the extraordinary long-term environmental data set of the British Antarctic Survey at Signy Island, and several other national projects that are currently investigating ecosystem change (such as those of Argentina, Chile, Spain and The Netherlands).

The time is ripe, under SCAR's auspices and within EBA and AGCS, to consider a continent-wide international "experiment" to contrast rates of, types of and extent of ecosystem variability and change on regions that have contrasting predictions for the physical environment. What we need next is to develop a SCAR-driven set of hypotheses that cover the change scenarios, and then a set of environmental observations for the next 20 years at various (defined) sites linked to agreed scenario predictions of physical changes and ecosystem changes delivered from AGCS and EBA.

Antarctica is the only continent where the global science community is sufficiently well aligned (through SCAR), and where large and small nations can link and have a voice in science, so that an internationally co-ordinated long-term observations and predictive science proposal could be established under a hypothesis-driven framework to study the current changes. After all, as one climate scientist at the SCAR conference in Hobart put it to us: "Why wouldn't you do this?"

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Message from the Editors

The standards of any peer reviewed journal rest on three pillars - the interest and importance of the submissions, the value and efforts of the reviewers and the quality of the editing. Antarctic Science has been fortunate over the past 18 years to build up a wide range of enthusiastic and critical reviewers, many of whom are also regular contributors to the journal.

The Editors would like to thank all those who undertook the important and time consuming task of reviewing papers for us during this last year. Your efforts are greatly appreciated. We see reviewing as a community task where all active scientists should be as ready to take part as they are to submit papers for review. It is on such a basis of corporate interest and responsibility that we can all contribute to maintaining the independence and quality of the science published.

Since moving to electronic submission and management of manuscripts the number of papers submitted has increased. As one approach to managing this and reducing delays in publication the journal will move in 2007 to immediate on-line publication of papers once accepted and edited, although the printed version will remain on a quarterly basis.

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