



New Zealand Antarctic Science Platform

PhD Research Project – The effectiveness of the science – decision-maker nexus in an Antarctic context.

Context

In 2018 New Zealand's Ministry for Business, Innovation and Employment (MBIE) invested NZ\$49M in a programme of Antarctic research over seven years.

The purpose of the Antarctic Science Platform (ASP) is **to conduct excellent science to understand Antarctica's impact on the global earth system, and how this might change in a future world where global temperatures might be limited to the Paris Climate Agreement target of 2°C or continue to rise.**

The ASP supports a mandated research portfolio that aligns to four research priorities and their impact statements listed below. Unlike competitive proposal structures, this programme has been developed using a negotiated approach. The research priorities and associated impact statements have collectively been identified by the New Zealand research community, government agencies, stakeholders and end users. Jointly, the four core research projects are designed to address the following Impact Statements:

Research Priority 1: Understanding the stability of the West Antarctic Ice Sheet

- Impact statement 1.1 Uncertainty in sea-level rise predictions is reduced through improved understanding of the rate-determining processes and feedbacks on marine-based ice mass loss to inform sea-level rise adaptation options
- Impact statement 1.2 Thresholds identified for irreversible loss of marine-based ice sheets allow critical assessments of mitigation pathways (e.g. Paris Agreement) and inform international decision makers
- Impact statement 1.3 Understanding the far-reaching impacts of ice sheet melt on sea-ice, biological systems, global ocean circulation and climate informs adaptation options and critical assessment of mitigation pathways

Research Priority 2: Understanding the impacts of change in the Antarctic atmosphere and Southern Ocean

- Impact statement 2.1 The distinction of natural-and human-induced changes in the Antarctic atmosphere and the Southern Ocean provides a basis to build international commitment to climate change response strategies
- Impact statement 2.2 Uncertainty in future climate scenarios is reduced through improved understanding of how oceanic and atmospheric processes influence the cryosphere

- Impact statement 2.3 Management of the Antarctic and Southern Ocean environment is improved by greater understanding of the implications of regional climate change on biological systems

Research Priority 3: Understanding threats to ecosystem dynamics in the Ross Sea

- Impact statement 3.1 The structure and dynamics of the Ross Sea region ecosystem are sufficiently understood to forecast large scale biological responses to environmental change
- Impact statement 3.2 New Zealand’s Ross Sea Region Marine Protected Area monitoring strategy is capable of detecting changes in ecosystem components, and contributes to international efforts supporting informed decision making
- Impact statement 3.3 The conservation value and benefits of the Ross Sea Region Marine Protected Area (MPA) are described and used to inform the design of this MPA and others worldwide

Research Priority 4: Understanding change in terrestrial and nearshore Antarctic environments, and the connections between them

- Impact statement 4.1 Increased understanding of the sensitivity and vulnerability of ecosystems (marine and terrestrial) to climate change and human influences supports integrated management
- Impact statement 4.2 The importance, variability and vulnerability of processes that connect different Antarctic environments (aquatic, terrestrial and coastal) is understood

Expert Group on the Science – Policy Interface

Alongside the research projects, the ASP Leadership Group have established an “Expert Group on the science-policy interface”. In the context of the Antarctic Science Platform, the purpose of the Expert Group is to understand, facilitate and enhance science – decision-maker interactions.

The Expert Group will be focussed specifically on facilitating the delivery of research outputs to meet the identified *Impact Statements* and in measuring progress to that end throughout the lifetime of the ASP.

Expert Group activities are likely to include: identifying and liaising with decision-makers; clarifying, and to the extent possible, anticipating their knowledge requirements; and facilitating the dialogue between decision-makers and the ASP research groups.

Research

The Expert Group has secured funding to support a PhD research project that will examine the effectiveness of science – decision-maker interactions in an Antarctic context. The intent is to support a research project in its own right, but also to use the knowledge gained through the research to improve the effectiveness and positive impacts of science – decision-maker interactions through the ASP.

Proposed research on the effectiveness of the science / decision-maker nexus in an Antarctic context.

Background

Science and policy – general

Governments (as well as other entities) rely to varying degrees on scientific knowledge to develop evidenced-based, effective, and enduring policy. Increasingly, research proposals need to demonstrate the outcomes that the research will have for identified decision-makers. But doing so can be challenging. Notions of policy ‘impact’, ‘engagement’ and ‘knowledge exchange’ are typically premised on simplistic, linear models of the policy process, according to which decision-makers are keen to ‘utilise’ expertise to produce more ‘effective’ policies (Boswell and Smith, 2017).

Yet the delivery and uptake of science knowledge in policy forums is far more complex and influenced by a myriad of factors which will determine the ultimate degree of ‘success’. In the context of research to support ecological policy in the UK, Lawton (2007) noted that the direct ‘linear’ model of science informing policy is far too simplistic and that the reality is a much more “*complex, messy, iterative, and untidy process*”.

Pielke (2007) identifies four idealised roles for science in policy and policy-making: the pure scientist (who engages in research with no consideration as to its utility); the science arbiter (who recognises that decision-makers have specific questions to be addressed as required); the issue advocate (who focuses on the implications of their research for a particular cause or agenda), and the honest broker (who seeks to provide alternatives and expand the scope of choice available to decision-makers).

The role played by scientists will depend upon a range of factors, including their experience, their research interests and topics, their personal values, the relationships they have within the policy / decision-maker community and the role and culture of the institutions that employ them.

Equally, the policy / decision-maker community may face challenges in articulating their science needs, in understanding and critiquing the scientific information they are provided with, in choosing where and to whom they turn for scientific advice, and in balancing the science advice they receive alongside other societal, fiscal and political considerations.

Science and Antarctica

Scientific research in Antarctica has provided the foundation for and continuing unity within the Antarctic Treaty System. The conditions for the negotiation and signing of the 1959 Antarctic Treaty¹ were established by the successful scientific cooperation among 12 nations during the 1957/58 International Geophysical Year (Bulkeley, 2010). The Antarctic Treaty prioritises freedom of scientific investigation in the region and promotes cooperation among Parties to that end.

The Scientific Committee on Antarctic Research (SCAR) was established in 1958 and has provided, independent and objective scientific advice to the various bodies of the Antarctic Treaty System ever since (<http://www.scar.org>). SCAR’s advice has been fundamental in the Antarctic Treaty Parties’ development of regulatory measures for the protection and management of biodiversity, special areas and of (largely marine) resources.

¹ United Nations Treaty Series, [vol. 402](#), p.71.

Science is often referred to as the ‘currency’ of Antarctic governance (Bray, 2016), and achieving consultative party status to Antarctic Treaty meetings requires a demonstrable commitment to ‘conducting substantial research activity’ in the region (Antarctic Treaty 1959, Article IX.2).

Scientific research in the region has had and continues to have a range of additional policy, management and societal benefits. Research in the region supports our understanding of whole-Earth atmospheric and oceanic systems and is crucial to understanding the implications of a changing climate, in particular the impacts of ice melt and sea-level rise. Antarctic science is also important for supporting the effective management of the region through the Antarctic Treaty System.

Long-term monitoring of atmospheric ozone concentrations from Antarctic stations contributed to the discovery of the annual ozone hole above Antarctica, which in turn led to the negotiation and adoption of the 1985 Vienna Convention for the Protection of the Ozone Layer² and its 1987 Montreal Protocol on Substances that Deplete the Ozone Layer³ (Chipperfield, 2015).

Countries active in Antarctica frequently develop Antarctic research strategies and set national Antarctic science objectives (often across a suite of research disciplines). These strategies vary significantly in scope, detail and time frame although many are relatively long-term (10-year plans are common).

Many countries establish their Antarctic science objectives in a ‘top down’ manner, with objectives determined at a national level through government and/or national programme planning. Other drivers of national objective setting include research priorities relevant to the forums of the Antarctic Treaty System as well as identified science needs of other international organisations, including the Intergovernmental Panel on Climate Change (IPCC).

In responding to a recent survey, many countries recorded that they aim to prioritise their research efforts to support the implementation of the 1991 Protocol on Environmental Protection to the Antarctic Treaty, particularly in areas such as the impact of human activities, biodiversity conservation and change, and area protection. Research groups often refer to their scientific objectives supporting decision making within the Committee for Environmental Protection (Australia, 2019). The extent to which such research has influenced the behaviours, policies and actions of National Antarctic Programmes and Antarctic policy makers remains unclear, however.

To date, little attention has been paid to analysing the effectiveness of the science / decision-maker nexus in an Antarctic context, nor to understanding how successful Antarctic science has been in meeting decision-maker expectations and influencing policy or management outcomes.

Proposed research

The aim of the research will be to closely examine and critique the effectiveness of the science / decision-maker nexus through the lens of Antarctic science.

We anticipate that the research will be transdisciplinary in nature, drawing on a number of research disciplines and involving a range of Antarctic stakeholders in research as well as policy, and in both a national and international setting, in order to critically examine the interactions at play between the two communities.

² United Nations Treaty Series, [vol. 1513](#), p.293.

³ United Nations Treaty Series, [vol. 1522](#), p.3

In the first instance this may involve developing a clearer understanding of the science and policy communities, the actors involved and their perspectives on the value and functions of Antarctic science.

The research will explore the types of interactions that exist between decision-makers and Antarctic researchers at various stages of research development, planning, conduct and publication.

We anticipate a critical assessment of how well Antarctic research objectives and needs are communicated, understood and co-produced across both the scientific and policy communities.

Perhaps through a series of case studies the research will critically examine the factors that contribute to successful or impactful research outcomes and, conversely, the factors that contribute to less impactful outcomes. The research may also examine how success is perceived among the science and policy communities and whether expectations and outcomes are commonly understood and even co-produced.

The research will examine methods of communicating scientific knowledge and how different approaches to communication influence the uptake and impact of the science among decision-makers. It will also be of interest to examine how policy makers make use of research knowledge in the development of policy plans or in the management of human activities. Is scientific knowledge the main factor in developing Antarctic-related policy and management outcomes, or are other drivers more influential?

The research may develop new models, processes or procedures for stakeholder engagement that may have application beyond Antarctic research.

We also anticipate that the findings of the research will be used to inform the work of the Expert Group and that the student will have some involvement in the work of the Expert Group.

Student expectations

We anticipate that the successful student will:

- have an Honours or Master's degree in a physical or social science subject;
- have undertaken some psychology papers as part of their undergraduate courses;
- be able to demonstrate a strong interest in understanding the science / policy discourse;
- be able to articulate a basic understanding of Antarctica and Antarctic science;
- be disciplined in their research and capable of carefully managing their time and priorities;
- be able to demonstrate a high standard of critical thinking and analysis and be able to clearly articulate and justify their approach to the research; and
- fulfil all requirements for admission for a PhD at the University of Canterbury (*ad eundum statum*).

Research milestones

In the first six months of the research programme we expect the student to have: developed research objectives / questions; completed a thorough literature review on the science-policy nexus; identified the methodology for conducting the research and refined the research plan. A detailed research proposal will also have been developed within the first six months, which will set out a series of milestones to be achieved over the course of the research programme.

Throughout the research period we will anticipate the student producing at least two research publications and at least one conference presentation.

Practicalities

The student will be based at Gateway Antarctica, University of Canterbury, Christchurch and will be provided with a desk and a computer.

The fees and an annual stipend of approximately NZ\$27,500 (with a slight annual increase) will be made available for the student for three years of full-time PhD research.

The student's co-supervisors will be Dr Neil Gilbert (Constantia Consulting Ltd.) and Dr Daniela Liggett (Gateway Antarctica) – see below.

Ideally, we would like the student to start in late 2019 / early 2020, with an expected PhD submission date during 2023.

Applications

Interested students should send their expression of interest to Neil Gilbert: neil@constantiaconsulting.net

The expression of interest should include:

- an up-to-date version of your curriculum vitae,
- academic transcripts and proof of completing undergraduate and postgraduate study (at least at "Honours" level), and
- a covering letter explaining (in no more than 500 words) why you are interested in this avenue of research.

The deadline for receiving expressions of interest is **8 November 2019**.

The successful applicant for this PhD scholarship will also have to satisfy the University of Canterbury's requirements for admission into a PhD *ad eundem statum* based on proof of the successful completion of a Master's or Honour's degree with a First-Class or Second-Class Division I level (or equivalent) (see <https://www.canterbury.ac.nz/postgraduate/phd-and-doctoral-study/>) and must meet the University of Canterbury's English-language requirements (see <https://www.canterbury.ac.nz/enrol/international/english/>).

Supervisors

Dr Neil Gilbert

Director

Constantia Consulting Ltd.



Neil has spent his entire career working on polar issues. In 1985 he joined the British Antarctic Survey to undertake a programme of work on Antarctic near-shore marine ecology, completing his PhD in 1991. Between 1991 and 1994 Neil continued his association with Antarctica in the role of permanent Base Commander, overseeing an array of operational issues for one of the UK's Antarctic research stations.

Neil joined the Polar Regions Section of the UK's Foreign and Commonwealth Office (FCO) in 1997. In that capacity Neil worked on a wide range of Polar policy issues and represented the UK at meetings of the Antarctic Treaty and its Committee for Environmental Protection (CEP) as well as meetings of the Scientific Committee and Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). He also represented the UK at numerous Arctic Council Senior Arctic Official and Ministerial meetings.

In 2003 Neil joined Antarctica New Zealand as Manager: Health, Safety and Environment and continued to attend meetings of the CEP as New Zealand's representative to the Committee. Between 2006 and 2010 Neil served as Chair of the (then) 35-country Committee. During his tenure as Chair Neil took a proactive approach to ensure that the Committee's discussions were as informed as possible by relevant research.

In 2014 Neil established his own consultancy company and has worked on a raft of Antarctic initiatives for New Zealand as well as other governments and private organisations. He continues to attend international Antarctic meetings for the New Zealand Government. Neil is the Convenor of the Expert Group on the science-policy nexus for the recently funded New Zealand Antarctic Science Platform.

Neil is an adjunct fellow of Gateway Antarctica at the University of Canterbury.

Dr Daniela Liggett

Senior Lecturer

Gateway Antarctica

University of Canterbury

Daniela is a social scientist with a background in environmental management, Antarctic governance and tourism. She has a BSc in Management from Otto-von-Guericke University Magdeburg in Germany, an MSc in Environment and Development from the University of Manchester, UK, and a PhD from the University of Canterbury. Having conducted her doctoral research in the field of Antarctic tourism governance between 2005 and 2008, her research interests have since broadened to encompass the wider aspects of human engagement with the Antarctic, with a particular focus on regulating and managing human activity in polar environments.

She is currently involved in collaborative research on the topics of Antarctic futures, Antarctic gateway cities, the production of scientific knowledge in Antarctic, the use and provision of polar environmental forecasts, and Antarctic science-policy interactions. She is interested in inter- and trans-disciplinary research and has been able to nurture this interest as a contributor to the Scientific Committee on Antarctic Research's first *Antarctic and Southern Ocean Horizon Scan* in 2014 as well as a recent comprehensive progress review of Horizon Scan goals in 2019.

Daniela has been actively involved in the Association of Polar Early Career Scientists (APECS) – as a President for one term, as a member of the Executive Committee for two terms, and as a member of the Advisory Committee since 2012. She is currently a Chief Officer of the Scientific Committee of Antarctic Research's (SCAR) *Standing Committee on the Humanities and Social Sciences* and a member of both

SCAR's *Standing Committee on the Antarctic Treaty System (SC-ATS)* and its *Capacity Building, Education and Training Committee (CBET)*.

Since 2014, Daniela has been one of the co-chairs of the *Societal and Economic Research and Applications (SERA)* subcommittee of the World Meteorological Organization's (WMO) Polar Prediction Project (PPP) and also serves on the PPP Steering Group. Daniela is a member of the Expert Group on the science-policy nexus for the recently funded New Zealand Antarctic Science Platform. She is on the editorial boards of *Polar Geography*, *The Polar Journal* and *Advances in Polar Science*.

References

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