



SCAR 2020

Antarctic Science -
Global Connections

SCAR OPEN SCIENCE CONFERENCE 2020

SESSION 44

**CONNECTING LEGAL AND POLICY NEEDS
WITH ANTARCTIC RESEARCH (INCLUDING
RELATED TECHNOLOGIES AND LOGISTICS)**



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ABSTRACTS SUBMITTED TO THE (CANCELLED) SCAR 2020 OSC IN HOBART

SONIC: Schirmacher Oasis Nippon (Japan) India Coring Expedition: an Indo-Japanese joint effort

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The ice-free regions along the 18,000 km Antarctic coastline are marked with hundreds of freshwater lakes which are source to sedimentary archives from which past-climate can be reconstructed. Of recent, countries are pooling in resources with shared logistics, technology and scientific objectives to carry out collaborative projects. A joint effort was initiated during early 2019 between India and Japan. The objective is to work in the ice-free regions of East Antarctica viz., Schirmacher Oasis, East Ongul Island and Larsemann Hills involving India, Japan, Belgium and United Kingdom. This will help us to access major ice-free regions to generate a holistic output from East Antarctica. Our project is based on two fundamental objectives (1) those related to global change, and (2) those related to fundamental discoveries. The first phase of the project has been completed during 2019 Antarctic Summer (November-December) between India and Japan under the joint coring expedition SONIC (Schirmacher Oasis Nippon India Coring expedition). During this expedition, we collected sediment cores ranging from 1 m to 8 m from Schirmacher Oasis using a piston-corer modified and improvised by one of our team members. These sediments archives, which form a crucial link between the ice-cores and the marine sedimentary archives, are crucial in understanding ice-sheet dynamics, evolution of the ice-free regions, relative sea level variation and the general Antarctic climate. Here, we present how this group evolved, what we envisage and the expected output for East Antarctica from this collaborative effort along with a brief review of our field outcome.

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The New Zealand Antarctic Science Platform - a novel approach to support collaborative, high priority research and large infrastructure

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The purpose of New Zealand's 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 is designed to enable research focus and collaboration with a dedicated, mandated funding structure that provides long-term, stable funding for the New Zealand research community. The intent of the ASP is to support New Zealand researcher to lead or significantly contribute to research campaigns that are addressing the most pressing research questions, connected nationally and internationally, effective in supporting policy initiatives, future-proofed in terms of capacity building, and responsive to evolving research priorities and opportunities.

The ASP supports a mandated research portfolio that aligns to defined research priorities. Unlike competitive proposal structures, this programme has been developed using a negotiated approach. The research priorities have collectively been identified by the New Zealand research community, government agencies, stakeholders and end users in several workshops.

Key characteristics of the ASP include the integration of interdisciplinary and diverse research teams, the facilitation of expert groups on science to policy interface and on policy-ready projections and the continued review by independent international experts.

Early successes of the ASP suggests that such an approach strengthens the national research community, provides a strong foundation for international collaboration, supports the development of major infrastructure, and allows for effective capability building and succession planning.

Norwegian interests and participation in the protection of the Southern Ocean

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Norway is an important player in Antarctic governance. As a claimant state with historic whaling interests, they have long held influence in decision-making. Today, Norway takes the largest catch in the Antarctic krill (*Euphasia superba*) fishery while also leading innovations in sustainable management. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) - a 26 member body (including Norway) which manages the Southern Ocean - has been moving towards adopting a network of marine protected areas (MPAs). Norway has been very influential in this effort – at times supporting and at other time opposing. Here, our research seeks to understand how Norwegian interests in Antarctica - including historic, political and economic - impact the adoption of MPAs. To complete this research, we performed a content analysis of Norwegian government documents and CCAMLR meeting reports combined with interviews with key informants. Norway has shown a complex combination of support and concern, many related to economic interests, the role of science, and Norway's positions in other global realms (e.g., the Arctic). A variety of themes emerged that help describe Norwegian positions and actions in the Southern Ocean MPA process: Norway as a leader in the Antarctic, and in global ocean sustainability; the importance of science which informs utilization and protection; Norway as a mediator in international cooperation; and the importance of The Law of the Sea Convention. Our research helps provide insight into Norway's positions and into understanding consensus in the CCAMLR MPA process.

Enabling policy-makers to participate in and frame the science inputs to policy: the role of dialogue to inform simulation modelling used to evaluate the efficacy of risk management systems for Antarctic krill

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The approach to manage the localised effects of the krill fishery on krill predators being developed in the Scientific Committee for the Conservation of Antarctic Marine Living Resources aims to spread the local risks of the fishery across a region. This approach was first proposed in 2016, is considered to be a precautionary approach to managing localised effects of fishing, and provides opportunities to focus research and assessments in areas considered to be of higher risk to the ecosystem and/or of greater interest to the fishery. While this approach seems to be wholly scientific in providing advice to policy makers, there are opportunities, using qualitative as well as dynamic modelling, for involving stakeholders in deciding how best to spatially structure the fishery while spreading the risk. This presentation will detail the logic of the approach to spreading the risk of localised effects of a regional krill fishery, simulation methods to evaluate the efficacy of the approach under conditions of inter-annual variability and long-term ecosystem change, and a process for engaging with stakeholders on designing spatial fishing strategies that satisfy the requirement to spread risk.

Antarctic Science from Political Realism: Why some countries have more robust Antarctic Program than others without consideration of their geopolitical size?

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The people involved in Antarctic scientific research, as in general terms the professional scientists do, make significant efforts to show themselves as a non-political and only-science-aims-interested community. The Scientific Committee on Antarctic Research (SCAR) is very concern about this independence. On the other hand, some States – with some relative independence of their geopolitical size– put a significant amount of money and all kind of resources to reach and maintain a relevant position on Antarctic affairs. In this sense, they use their National Antarctic Program as a diplomatic and political tool in their international relations. Which is true? The objectivity of the scientific personal or the political-oriented attitude of the States? Probably there is not a unique answer. Of course, scientific research needs some methodologies and procedures that must be not political-influenced to be able to make valuable contributions. However, that happens in a very political environment, as international Antarctic issues are. In the presentation, some aspects of the Antarctic Treaty System history will be analysed as well as the performance of some selected States in relation with their scientific programs, their investments in Antarctic equipment and facilities, and their influence in the Antarctic Treaty Meetings. What can tell us this complex performance in a time of geopolitical challenges?

The effectiveness of the science – decision-maker nexus in an Antarctic context

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The interface between science and policy has been examined across a diverse spectrum of global issues, yet in the context of Antarctica, empirical research on this nexus is scarce. The continent and surrounding ocean hosts a range of human activities now increasing in scale, and the region is experiencing significant environmental change. The need for local, national and international policy action and collaborative global solutions has never been more pressing, and Antarctic science holds the answers to important questions related to global environmental change.

This paper closely examines and critiques the science - decision-maker nexus and assesses the 'effectiveness' of knowledge transfer within an Antarctic context. Drawing on a number of case studies, we further unpack what 'effective' science-policy engagement truly means. We explore stakeholder perceptions regarding the Antarctic science-policy interface, how research objectives are co-produced across scientific and policy communities, and whether models such as horizon scanning science and policy may contribute to a more effective knowledge transfer across a complex social boundary.

Findings from our internet survey carried out within the Antarctic community in 2016 suggest that distrust and miscommunication are present at the Antarctic science-policy interface. Based on this data and findings extrapolated from the case studies, including a critical analysis of the 'effectiveness' of the 2014 Scientific Committee on Antarctic Research (SCAR) Antarctic and Southern Ocean Science Horizon Scan's impact on policy outcomes, we argue that science becomes increasingly 'actionable' when co-produced by science and policy communities through an iterative, credible, salient and legitimate process.

Assessing the policy impact of the Antarctic Environments Portal

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The Antarctic Environments Portal was launched in 2015. Its aim was to provide succinct knowledge summaries on issues of direct relevance to Antarctic managers and policy-makers. It was intended to provide a meaningful link between the ever-growing depth of academic literature and the lengthening list of issues facing the Antarctic management and policy communities, and provide support to policy discussions and (potentially) decision-making.

Five years after its launch and following the transfer of the Portal to SCAR in January 2020, it is timely to ask how successful the Portal has been in achieving its objective and what, if any, impact it has had within the Antarctic Treaty System.

An end-user survey conducted in 2019 generated 196 responses. Among respondents:

- 60% were first-time users
- 86% visited the Portal a few times a year
- 79% said that the clarity of content was good or excellent
- >80% agreed that the Portal articles were useful and reliable

38% of respondents recorded that they use the material to prepare for Antarctic Treaty-related meetings. Whilst these responses provide a strong sense of interest in the Portal, it is more challenging to assess the policy impact.

This presentation will review the outcomes to the end-user survey, outline some of the foreseen and unforeseen challenges that were encountered in securing policy support for the initiative, and outline future plans under SCAR's oversight including how the Portal can better support the work of the Committee for Environmental Protection, as well as other Antarctic policy stakeholders.

A carbon neutral Antarctica should begin with science

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Given that the establishment of SCAR led to the Antarctic Treaty and the associated Protocol on Environmental Protection, science has driven many activities on the continent. The SCAR community, therefore, has an obligation to lead in all dimensions of environmental stewardship, including reduction of greenhouse gas (GHG) emissions generated by scientific and other activities in Antarctica. Here we present three recommendations for consideration by SCAR's Members and Delegates. First, solicitations for scientific funding (and associated annual and final reports) should require answers to the following questions from principal investigators: (a) Was the avoidance of nonessential GHG emissions considered in the development of the project? And (b) Are there technologies on the market, and/or synergies with other programs, that could reduce expected GHG emissions if they were available? Responses could be monitored by national operators and compiled by SCAR, to understand how fieldwork can be undertaken with net zero GHG emissions within the timeframes recommended by the IPCC. SCAR could report this information to the International Science Council, Antarctic Treaty meetings, and COMNAP. Second, funds solicited from conventional government programs, private foundations, and corporate philanthropy should be available to scientists and inventors with substantive, innovative proposals for platforms and approaches to minimize GHG emissions in Antarctica. Third, the scientific community must promote and incentivize environmental stewardship by selecting vendors and collaborators committed to carbon neutrality and climate justice. Antarctic science has contributed substantially to our comprehension of anthropogenic climate warming and its consequences, and we must be part of the solutions.

Planning for Societal Impact: developing a system to ensure the Australian Integrated Marine Observing System delivers observations relevant to national and international Antarctic science priorities

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Australia's Integrated Marine Observing System (IMOS) is a national marine research infrastructure which has been collecting sustained ocean observations since 2006. Approximately 20% of that investment is made in the Southern Ocean region

Being a government-funded infrastructure, it is critical that the datasets collected ultimately deliver societal benefit. IMOS has a strategic approach to ensure that the ocean observations it invests in have a 'pathway to impact', i.e. that the science is linked to policies and legal frameworks that deliver benefits to society.

The strategic approach has included developing a systematic approach to surveying the social and cultural, economic, legal, political and policy environments; ensuring that national research partnerships, modelling communities, and operational partnerships are engaged in the process of investment and activity planning; that the broad and multi-disciplinary IMOS community are enabled to drive the use and impact of the datasets; and that the impact of the research derived from IMOS data are communicated across various platforms.

This talk will outline IMOS activities in the Southern Ocean, address the methods used, challenges faced, outcomes achieved, and reflections upon the strategic approach to planning for environmental, societal and cultural, and economic impact. IMOS will welcome the views of the SCAR and COMNAP communities as to how the approaches to planning for the greatest impact of ocean observations can be achieved, improved and/or enriched for the benefit of Australia's research-based ocean observing infrastructures in a Southern Ocean context.

Enhancing science-policy communication to deliver the Committee for Environmental Protection's Climate Change Response Work Programme

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Climate change is one of the most important factors influencing the state of the Antarctic environment. Impacts on marine and terrestrial environments, and their biota, are becoming increasingly evident. A sound understanding of the climate challenges facing Antarctica, informed by high-quality science, is essential to enable appropriate environmental management actions.

In 2015, the Antarctic Treaty Consultative Meeting (ATCM) agreed the Climate Change Response Work Programme (CCRWP). The CCRWP identifies actions for the Committee for Environmental Protection (CEP) to support efforts within the Antarctic Treaty System to prepare for (i) the environmental impacts of a changing climate and (ii) the associated implications for the governance and management of Antarctica. To help with the efficient implementation of the CCRWP, the CEP established the Subsidiary Group on Climate Change Response (SGCCR) in 2017. This group is tasked with:

- facilitating the communication of the CCRWP, including identified science needs, to the Antarctic science community; and
- helping communicate relevant scientific research back to the policymakers within the Antarctic Treaty System.

This presentation will set out the key issues within the CCRWP, including climate change impacts on terrestrial, freshwater, marine and human (built) environments, key species vulnerable to climate change, and the effect of climate change on non-native species establishment and invasion. It will highlight specific research needed to help address environmental management issues, and encourage robust cooperation between policy makers and the Antarctic science community.

Experience in investigating quantitative characteristics of the State Target Scientific-Technical Program (STSTP) execution efficiency for Ukraine's Antarctic Research for 2011-2020

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Nowadays the main quantitative characteristics of STSTP execution efficiency (e.g. samples number collected in Antarctic; developed mathematical models; scientific publications) are incomplete and insufficient to characterize STSTP for both stakeholders and the public.

The investigation proposes the methodology for the estimating of STSTP execution efficiency using the application experience, in particular, the Dow-Jones Industrial Average.

Instead of the shares value of most efficient companies, 25 quantitative characteristics of STSTP tasks and activities are offered, based on the application experience and practice of Antarctic Treaty System Institutions (ATSI) - SCAR, COMNAP and others.

Proposed characteristics are available on ATSI's and Ukraine's sites and characterize mainly Ukraine's cooperation with ATSI (e.g. amount of:

- Scientific-Technical Programs, Groups of ATSI with the Ukraine's representatives;
- Scientific-Technical Projects submitted by Ukraine's representatives to ISDA Work Programs;
- Scientific-Technical Products developed during STSTP realization and implemented in ATSI).

The methodology uses the normalized weight of the non-zero characteristics number at the analyzed year end as the STSTP Execution Efficiency Index (EEI). For example, if all 25 characteristics are non-zero, then the maximum value of the normalized weight of these characteristics - the STSTP EEI will be 1.

In practice, the STSTP EEI for 2016 is $3/25 = 0.12$, for 2018 - $5/25 = 0.2$.

The methodology is proposed for the new STSTP development for Ukraine's Antarctic Research for 2021-2025 and for consideration of the development possibility by SCAR the unified evaluation of the Antarctic Treaty Parties Research Programs execution efficiency.

The important role of science in international efforts to protect the Antarctic environment

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Science and environmental protection are intimately linked in the Antarctic, as reflected by the region's international designation as a natural reserve, devoted to peace and science. The objective of the Protocol on Environmental Protection to the Antarctic Treaty (Environmental Protocol) is to comprehensively protect the Antarctic, including its globally-significant scientific values. Explicit in the Environmental Protocol is a recognition of the need to draw on the best available scientific advice to understand the state of the Antarctic environment, how it is changing and is predicted to change, what is driving those changes, and what can and should be done to address them. The Environmental Protocol established the Committee for Environmental Protection (CEP) to provide Antarctic nations with expert advice on how best to address ongoing, new and emerging environmental challenges facing the Antarctic. The CEP relies on the best available and up-to-date knowledge in delivering such advice. The Scientific Committee on Antarctic Research (SCAR) is a significant and valued participant in producing and making relevant knowledge available to the CEP. This presentation will outline the CEP's priorities, detailed in a rolling five-year work plan that also identifies associated science, knowledge and information needs. It will also highlight the importance of continued close collaboration between the CEP and the science community, and the various avenues for science to inform international efforts to ensure the wise management and protection of Antarctica.

Stakeholder engagement in decision making and pathways of influence for Southern Ocean ecosystem services

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Southern Ocean ecosystem management is characterised by a unique ‘transactional landscape’, relating to the globally significant services that these ecosystems support. This transactional landscape spans stakeholders from industry (fishing and tourism), governments, science, conservation non government organisations, civil society and international decision-making forums. We used a stakeholder mapping approach to provide the first description of the transactional landscape for Southern Ocean ecosystem management – both in terms of the connections between stakeholders and ecosystem services, and directly between stakeholder groups. We considered 65 stakeholders and their relationships to 12 provisioning, regulating, supporting and cultural ecosystem services. An analysis of the connections within this landscape reveals differences in the degree of connectivity between stakeholders and ecosystem services. Notably, ecosystem science facilitates high connectivity between stakeholders and provisioning services, but there is little connectivity between stakeholders and supporting services. We then applied a formal ‘values-rules-knowledge’ framework to a set of case studies to analyse the decision-making process in relation to Southern Ocean ecosystem services, as well as the relative importance of different stakeholder groups which were considered in the network analysis. Our analyses suggest that emphases for decision making have been on knowledge and rules, but that wider consideration of values across the broader stakeholder landscape – together with science (knowledge) and governance (rules) – might better support decision making for Southern Ocean ecosystem conservation and management, and provide a stronger foundation for sustainable provision of ecosystem services into the future.

Antarctic Data Analysis: Supporting the environmental management of Antarctica

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Providing the Antarctic policy community, the tools and knowledge to support environmental management is critical for both the health of the Antarctic environment but also the Antarctic Treaty itself. Manaaki Whenua has developed the Antarctic Data Analysis (ADA) tool to provide context to, and assist, the Antarctic Policy community in the planning, permitting, and implementation of Antarctic activities.

ADA eliminates the need for desktop geographic information system software or advanced technical expertise, by processing and presenting data in an easy to use way using analysis of spatially explicit data, such as: facilities, environmental management, biogeography, human activity, climate, and geology. A query-based approach to the tool, enables users to discover, query and visualise spatial and temporal data about how Antarctica is changing.

ADA, which has been developed with input from the Antarctic Policy community, was primarily built for environmental managers, and parties to the Antarctic Treaty and the Committee for Environmental Protection, but is expected to also be used by the science community and the general public. We expect that this tool will be utilised to enable the conservation of the Antarctic continent, and hope that new data will be included in the tool from the wider Antarctic science community to continue to close the gap between Antarctic science and policy.

Celebrating the first 25 years of the European Polar Board, 1995-2020

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Throughout 2020 the European Polar Board (EPB) is celebrating its 25th Anniversary.

Established in 1995, the EPB currently includes 27 Member organisations from 19 countries, providing a combined authoritative voice for the European Polar research, logistics and policy communities, and the wealth of knowledge and expertise they represent. Current EPB Members include research institutes, government ministries, funding agencies, scientific academies, and polar operators from across Europe working at the nexus of Polar science, logistics and policy. Together, EPB Members focus on major strategic priorities in the Arctic and the Antarctic. The EPB's strong and independent voice comes from its Members, with and for whom it endeavours to coordinate, promote and advance European Polar research, supporting work to address Polar issues of global significance.

The EPB's major achievements at the confluence of Polar research, logistics and policy are numerous. They include coordination of joint Polar climate research calls, serving as the forum for the development of several large European projects, developing the European Polar Infrastructure Database and Catalogue, promoting greater coordination of Polar research with international partners, participating in major international projects such as the EU-funded SO-CHIC, and CHOICEe a collaborative project between the EPB and the European Space Agency.

The EPB celebrates the achievements of its first 25 years while going from strength to strength, looking ahead to many more successful years coordinating, promoting and advancing the European Polar research community.

For more information on the EPB and its 25th Anniversary celebrations, visit www.europeanpolarboard.org.

New Zealand's Antarctic Science Platform: A collaborative approach

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Antarctica New Zealand hosts a government-funded "Antarctic Science Platform" - a long-term (7-year) strategic investment in Antarctic research. This investment in New Zealand's Antarctic research programme has provided a more co-ordinated approach to addressing science priorities and builds on New Zealand's existing Antarctic research strengths. The Platform specifically aims to facilitate enduring international collaborations, align research effort with policy needs, foster innovation through multidisciplinary collaborations and technology development, incorporate indigenous (Māori) knowledge, and integrate planning for science and logistics needs.

Research priorities focus on understanding Antarctica's impact on the global Earth system and how this will change in a warming world. This paper highlights the aims of the Platform, outlines the planned research programmes, and describes opportunities to develop science and logistics collaborations with other national Antarctic programmes. It illustrates how expert groups focused on the science-policy interface and future projections are integrated across the programme, and how Research Fellows, in a centralised Modelling Hub, contribute their expertise across a broad range of research areas.

The Platform's intent will be fully realised when New Zealand researchers are leading campaigns that address the most pressing research questions, are better connected nationally and internationally, are effective in supporting policy initiatives, are future-proofed in terms of capacity building, and are responsive to changing research priorities and opportunities.

Pogo-sticking across Antarctica: why celebrity 'science' is not the answer

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There is a complex nexus between science and policy. Good policy needs to be based on a solid foundation of fact, analysis and critical thinking. Good policy also requires a clear and achievable path to implementation. Matching science with aspirational policy, and informing the critical path to achievement, is often fraught - and sometimes vexed.

The outline of SCAR session 44 states (in part) "Perhaps, we ought to think of more innovative means [to link science and policy], including strategies drawing on the concepts of advocacy and ambassadorship in relation to Antarctic issues and possibly involving high-profile scientists and famous celebrities".

This presentation will explore the role of activism, policy populism, celebrity intervention, and environmental outcomes in the Antarctic from the Minerals Convention to the current day.

Towards an effective reciprocal communication between the Antarctic science community and policy-makers

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Globally, the science-policy interface is perceived as very complex. The social processes that take place between scientists, policy-makers and other relevant actors to develop effective policy are often misunderstood, and the slow and lengthy progress may discourage those involved. In the Antarctic context, the Antarctic Treaty System (ATS) and the Scientific Committee on Antarctic Research (SCAR) represent the main science-policy collaboration. Yet, amid the growing threats to Antarctica's environments from global and local anthropogenic impact, further engagement and stronger ties across the science and policy-making community are needed to keep pace with the management challenges faced by the ATS.

Currently, little is understood about (a) the two-way interaction between Antarctic scientists and policy-makers, (b) the extent of efforts by Antarctic researchers to engage in the policy-making process, and (c) how policy-makers seek input from polar science experts. In this paper, we address the main issues Antarctic stakeholders face in maintaining effective reciprocal communication between the science community and policy-makers. We present a preliminary analysis of twenty-four interviews that were conducted in 2016 with leading Antarctic scientists, managers of Antarctic agencies and senior advisors to those responsible for polar governance. Finally, we highlight the lesser-known constraints of the Antarctic science-policy interface, and elucidate ways to improve effective communication between actors. Reaching an effective reciprocal level of communication between the science and policy-making stakeholders will enhance and encourage mutual collaboration to best support an informed, effective decision-making process to manage Antarctica.

Antarctic governance and conservation: Global lessons in the Anthropocene

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In the age of the Anthropocene, Antarctica is a model system for understanding climate change, human impacts and the potential of conservation science. Recent research and large-scale social activism highlight that climate anxiety, and general anxiety about the future of the planet, are increasing. Amidst narratives about the failures of global leadership (e.g., COP25) Antarctica provides a beacon of global diplomacy, scientific collaboration and environmental stewardship. In short, Antarctica offers lessons and hope for the future.

We present a case study of how an in situ program featuring Antarctic conservation and governance can inspire an international multi-disciplinary STEMM audience to become leaders in the Anthropocene. The project is a year-long women's global leadership initiative, culminating in a three week Antarctic expedition. Thus far we have trained more than 400 women from 38 different countries. Combining Antarctic conservation and governance lectures, round table discussions and experiential site visits enable women to learn in Antarctica. We highlight Antarctica as the global early warning system for climate change. Women experience Antarctica, being humbled and inspired by its scale, beauty and extremes. We explore governance and policy challenges to global sustainability. Antarctic governance and policy is presented as novel paradigm for successful conservation and science diplomacy. As a core group of Antarctic scientists we showcase outwardly the global significance of Antarctica, to ensure continued protection, and promote greater support for Antarctic science resourcing.

Our innovative in situ classroom has empowered 400+ new advocates for Antarctica conservation and promoted a new inclusive model for governance.

Using the best available science to inform policy and management decisions in Australia

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The importance of scientific cooperation was recognised in the negotiations of the Antarctic Treaty, and has been central to the success of the Antarctic Treaty system over the past 60 years. While science alone cannot provide the answers, policy and management decisions are more robust when they are informed by the best available science. In a place as harsh and remote as Antarctica, the concept of the best available science is critical. Equally important is the need for scientists, policy advisors and decision makers to bring their expertise together to work collaboratively to uphold the principles of the Antarctic Treaty system, including protecting and conserving the Antarctic and Southern Ocean environments. In this presentation, examples will be provided on how scientific research has been used to inform policy and management decisions in Australia, contributing to our engagement in the Antarctic Treaty system, and in our domestic implementation of our obligations arising from the system. It will also discuss the challenges currently facing policy advisors and decision makers and the role that scientists can play.

The policy relevance of Southern Ocean food web structure: Implications of food web change for fisheries, conservation and carbon sequestration

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Southern Ocean food webs provide ecosystem services with significant global value including carbon sequestration, fisheries and the existence of iconic wildlife. These services are underpinned by different energetic pathways including those dominated by Antarctic krill, fishes and squids, or gelatinous zooplankton (salps). Climate change is likely to impact Southern Ocean food webs by affecting their foundations — both primary producer communities and ice habitats. However, the implications of these changes for ecosystem services — including wildlife populations, fisheries and carbon sequestration — are unclear, as are the implications for policy and management. We used a generalised representation of Southern Ocean food webs and qualitative network modelling to investigate the consequences of five simple but plausible scenarios of future change for ecosystem services and the conservation of important taxa: (i) a shift in primary producer communities with decreasing large diatoms and increasing small flagellates; (ii) increasing salps; (iii) increase (recovery) of the Great whales; and unregulated and unsustainable fisheries for (iv) krill or (v) toothfish. Strikingly, our results suggest that increases in salps might not have negative consequences for ecosystem services and could enhance carbon export potential. Simulated increases in unregulated krill and toothfish fisheries affect predatory wildlife and could also reduce carbon export potential. Our results emphasise the important policy implications of understanding the structure and change of whole food webs, and highlight that improved quantitative understanding and modelling of the relative importance of different energy pathways will be important for developing robust management responses to climate change impacts.

Coordination among decision-making processes within the ATS

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The purpose is to analyze how domestic and international decision-making articulate, both politically and legally, within the framework of the ATS.

This analysis is pivotal to forecast the capability of response of the ATS, at the level of its parts and the system, before any given issues concerning it, specially considering the global effects of Climate Change, both in the planetary and human systems, in the decades to come.

We'll analyze the concept of resilience from a systemic perspective, with the objective of defining the processes, dimensions and known results. This will allow us to project into the future new scenarios based on expected results.

This first analysis will be developed from three different approaches:

1. Leading cases of proven violations of the regulations of the ATS, focusing the processes that triggered conflicts and the interagency and international frameworks that guided its resolution.
2. Marine protected areas (MPAs), focusing on how domestic or bilateral issues are then presented on the ATS multilateral level.
3. The policy and decision making in of the operational tasks of the Joint Antarctic Naval Patrol of Argentina and Chile; and the use of the military forces in Antarctica.

This paper does not aim to arrive at definitive conclusions, but to carry out an inductive work that will result on a matrix of analysis, in order to gather institutional memory and jurisprudence that can be applicable in the future.

Bringing Māori knowledge and philosophy to Antarctic science, policy and governance.

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Indigenous worldviews and knowledges offer alternative ways to think about the human relationship with the earth and can help to develop novel solutions to climate change and the global environmental crisis. They can also highlight assumptions and blind spots inherent in contemporary approaches to environmental management that may limit our ability to mount effective responses to the crisis. Our research focusses on how Māori worldviews and mātauranga Māori (Māori knowledges and philosophies) could be brought into New Zealand's Antarctic science, policy and governance. Our research approach sought to engage Māori communities across New Zealand in conversations about their aspirations for representation in Antarctica, how they could approach achieving those aspirations, and the research that needs to be done to inform those approaches. To support our conversations, we examined existing national and international models in which Indigenous voices, knowledges and worldviews are represented in contemporary environmental management around the world. We identified strengths and weaknesses in implementation as well as in the process of their development and negotiation. Our research seeks to bring equitable Māori representation into New Zealand's Antarctic science, policy and governance, and to raise the standard to ensure Indigenous peoples are equitable partners in research projects designed to support their representation in environmental management.

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