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JOURNAL OF ANTARCTIC AFFAIRS



JOURNAL OF ANTARCTIC AFFAIRS

The Journal of Antarctic Affairs is the academic magazine of the Antarctic and Southern Ocean Coalition (ASOC) and Agenda Antártica, which aims to publish and disseminate the most prominent and influential research in relation to Antarctica. The Journal publishes articles, reviews and official documents in English and Spanish. The purpose of the journal is also to stimulate research that contributes to environmental protection of Antarctica and the Southern Ocean.

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The Antarctic and Southern Ocean Coalition (ASOC) was founded in 1978 by five environmental organizations in the US, UK, Australia and New Zealand, promoting a World Park vision for protecting Antarctica and the Southern Ocean. ASOC has worked since 1978 to ensure that the Antarctic Continent, its surrounding islands and the great Southern Ocean survive as the world's last unspoiled wilderness, a global commons for the heritage of future generations. ASOC is an invited observer to the meetings of the Antarctic Treaty and CCAMLR. The Secretariat of the ASOC, which includes 21 organizations in 11 countries, is based in Washington, D.C. For more information about ASOC, visit: www.asoc.org

Cover Photo *Photographer: Ron Dunbar - Title: Emperor Penguins (*Aptenodytes forsteri*) in wind near Cape Colbeck*

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MESSAGE FROM THE MANAGING EDITOR

Dear readers:

Welcome to the third volume of the Journal of Antarctic Affairs. This edition contains articles on the most important and urgent issues concerning Antarctica these days: climate change, whaling and Antarctic tourism, as well as papers that will deepen our understanding of the history of Antarctica. Moreover, this edition presents the recommendations submitted by ASOC to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) in order to advance the protection of the most pristine ocean of the world.

The first article in this volume addresses the challenges of climate change in Antarctica from a global environmental policy perspective. The COP21, which ended in the Paris Agreement, is without a doubt one of the most important international agreements ever designed to mitigate global warming. O'Reilly explains the place of Antarctica in this treaty and identify opportunities to include Antarctica in the climate decisions of the United Nations Framework Convention on Climate Change.

The second article focuses on Antarctic tourism, a growing area of study among Antarctic academics. The increase in visitors to the white continent, 36,702 in the 2014-2015 season, emphasizes the need to understand in detail tourists' experiences. Monika Schillat identifies the cognitive and affective components of the perceived image of Antarctica among visitors. To analyze the construction of the tourist imaginary Antarctica, Schillat studies the images constructed in fiction, travelogues and materials with which travelers are usually in contact before their trip.

The last article leads us to study the history of the early Antarctic exploration. Mary Tahan focuses on the role that dogs played in the exploration of Roald Amundsen, the first person to reach the South Pole. While there is extensive literature on the great Antarctic explorers, there is an information gap about the role that canines took as part of the exploration, their functions and sacrifices. Tahan tells us in detail about the importance that dogs played in helping Amundsen fulfill his goal.

Finally, this third volume publishes the documents submitted by the Coalition for Antarctica and the Southern Ocean in the XXXIV Meeting of the Commission for the Conservation of Antarctic Marine Living Resources. The XXXIV Meeting of CCAMLR was held in Hobart, Australia, from 19 to 30 October 2015. At this meeting, ASOC presented five documents to States Members with recommendations on how to preserve the Southern Ocean.

Finally, I would like to thank all the authors, donors, translators, the Editorial Committee and the scientific advisor of the Journal, Dr. Rodolfo Werner.

Juan José Lucci

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ASOC PROLOGUE

2016 marks an important anniversary for Antarctica. Twenty-five years ago, on October 4, 1991, the Protocol on Environmental Protection to the Antarctic Treaty was signed in Madrid. The signature of the Protocol was in many ways a surprise. Antarctic Treaty Parties had recently concluded over a decade of discussions and negotiations on the possibility of mining in Antarctica with the finalizing of the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA). CRAMRA would have allowed mining on the continent subject to various restrictions designed to protect the environment. Nevertheless, Australia and France decided not to sign, effectively killing CRAMRA, which could only enter into force once all Treaty Parties had signed it. The Environment Protocol was subsequently negotiated over the course of one short year, and was signed. It included a ban on mining, with a provision for review of any part of the Protocol fifty years after its entry into force (the year 2048).

This turnaround - from mining regulation to mining ban - is one of the most significant environmental achievements of the 20th century. Antarctic Treaty Parties are justifiably proud of their decision to put the environment before profit. That hasn't stopped the media and others from speculating that minerals extraction is inevitable for the continent and will commence shortly after 2048. While technically possible, the Protocol requires a series of conditions to be met prior to lifting the ban, including the ratification by 3/4 of Consultative Parties, and all of the Consultative Parties who signed the Protocol in 1991, of a binding legal regime. Those who study international agreements will know that this is no small feat for any group of countries. Thus the mining ban is not likely to disappear even if a Treaty Party or Parties do initiate a review process.

This year, the likelihood of the ban remaining in effect permanently increased. The Antarctic Treaty Consultative Meeting (23 May – 1 June) unanimously agreed a Resolution proclaiming their “ongoing commitment” to the ban and noting that the ban has benefited the Antarctic environment. While in some respects this is merely a confirmation of a well-established principle, in others it is a timely and revolutionary statement. In the rest of the world, we all too often allow environmentally damaging activities to occur as long as token environmental mitigation efforts are made. Antarctic Treaty Parties recognized that Antarctica was too special and valuable to put at risk in this way. Even when done “right”, mining permanently changes the environment. It is still, unfortunately, rare for humans to accept that sometimes the most reasonable path is to admit our limitations and leave the natural world alone.

So I hope that the occasion of the Protocol anniversary is an opportunity to think about the lessons of the Protocol and how we can use them to further protect Antarctica and our planet as a whole. Before the Protocol was signed, many thought that a total ban on mining was unrealistic and that the best outcome was a solid regulatory regime. Likewise, we often hear that it's unrealistic to stop environmentally destructive activities and that mitigation is our best hope. How fortunate that Antarctic Treaty Parties developed a different path for the continent and realized that their responsibility to protect Antarctica for all was greater than their responsibility to enrich the few. In an era of global environmental challenges that require global solutions, this is indeed a powerful lesson.

Claire Christian

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ANTARCTICA AND INTERNATIONAL CLIMATE POLICY: A REPORT FROM COP21

Jessica O'Reilly

ABSTRACT

This article reports on the 21st Conference of Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC), held 30 November-12 December, 2015, in Paris, France. After providing an overview of the primary outcome of COP21, the Paris Agreement, this report explores the intersection between the Antarctic Treaty System and the UNFCCC. There is little overlap between the two institutions, causing a climate policy gap between Antarctica and the rest of the world. This paper concludes with recommendations to narrow this gap.

KEYWORDS

Climate, governance, UNFCCC, policy, environmental management

INTRODUCTION

Antarctica, in many ways, is emblematic of anthropogenic climate change. From the ecological changes on the Antarctic Peninsula to the instability of the West Antarctic Ice Sheet, Antarctica is both a place where climate change is happening now as well as a place that, in a warming world, threatens our coastal cities and states. Antarctic researchers from dozens of countries produce cutting-edge, transformative climate science: many of these Antarctic scientists also speak in public about the changing Antarctic environment and anthropogenic climate change more broadly.

With significant ecological and environmental changes and climate scientists communicating widely about their Antarctic and global climate change research, it is puzzling that there is a policy disconnect between Antarctica and the rest of the world. In the international climate policy arena—especially the United Nations Framework Convention on Climate Change (UNFCCC)—Antarctica is present, but only minimally. In the Antarctic Treaty System (ATS), we might say the same thing about climate—climate change is present in policy discussions, but only minimally. Why might this be so?

A simple answer would be that the ATS is focused on continental-scale management, logistics, cooperation, and information sharing while the UNFCCC's domain is international climate policy. This, though, is not just a matter of two institutional bodies with separate missions: there is a history to the ATS' explicit refusal to participate in, or even engage substantially with, the United Nations (Beck 2006).

Therefore, this report tracks the UNFCCC meetings in Paris November 30- December 12, 2015, with particular attention to the moments where Antarctica shows up in these meetings, where it does not, and opportunities where Antarctic and UNFCCC matters of concern might overlap with some effort. Institutional arrangements should not omit the Antarctic from international climate agreements, nor should the ATS expect all Antarctic climate mitigation to be decided and acted upon elsewhere. Climate action that is meaningful to the Antarctic can take place in both the ATS and UNFCCC.

OVERVIEW OF UNFCCC, COP21, AND THE PARIS AGREEMENT

The UNFCCC convenes annually at their Conference of Parties (COP) to work toward international solutions to avoiding dangerous anthropogenic interference with the environment, particularly the atmosphere.

The Framework Convention on Climate Change was established in 1992 at the Rio Earth Summit. Every participating state, including the United States, is a party to this 1992 FCCC. The Parties attempted to create a binding, international carbon cap-and-trade policy in 1997 with the Kyoto Protocol. The United States Congress, representing the largest carbon emitters on Earth at the time, did not accede to the Kyoto Protocol¹. With the new Obama Administration in office, 2009's COP15 in Copenhagen began with high hopes but ended in failure due to, among other factors, intransigence between the Chinese and American negotiating parties. Instead of a binding

agreement, the last minute, voluntary Copenhagen Accord mapped out a path towards an agreement with a deadline of COP21 in 2015.

There was a tremendous amount of work done in the lead-up to the Paris meetings that had been put into motion in Copenhagen. The United States government successfully pursued a bilateral agreement with China and a more ambiguous “partnership” with India to reduce carbon emissions. The United States Environmental Protection Agency also implemented a national emissions reduction program called the Clean Power Plan in mid-2015. This plan is federalist, in that it requires each state to meet reductions targets by setting emissions reduction strategies with attention to each state’s individual energy mix and economy. The Clean Power Plan is being tested through the United States judicial system with the expectation that it will come before the United State Supreme Court².

On November 13, 2015, the Paris terror attacks occurred. For a few days, it was uncertain if COP21 would proceed in the wake of these attacks. However, with some security changes within the venue and to some civil society activities occurring outside the venue (such as the cancellation of marches), the meetings were maintained as were many of the civil society opportunities, especially those with educational or outreach components. Activists were highly visible within the venue of COP21 and many protested despite police orders to the contrary in several locations around Paris. Security was extremely tight at the conference venue, particularly on the first day when over 150 heads of state came to give opening remarks. Parisian highways were closed down, military guarded the venue’s perimeter, and helicopters circled overhead. Security remained serious throughout the meetings but those extraordinary measures ceased.

The venue at Le Bourget was a pop-up climate village with 40,000 credentialed participants. There were two Plenary Halls to house the formal procedures and dozens of breakout rooms of various sizes to accompany meetings among various factions and interest groups. One hall housed Party delegation offices. Another held a World Fair- type set of national displays where Parties could showcase their climate efforts, hold press conferences and educational events, and serve as a meeting point. Some of these displays were truly spectacular. For instance, India’s booth cost several million dollars to design, featuring a programmed “water curtain” that would spell out words and symbols like “PEACE” and “COP21.” The United States booth focused on scientific and policy presentations. The Gulf Alliance states had an opulent meeting space with reception areas, displays, and presentations. These were highly enjoyable to peruse, though the exercise begged the question of why so much time, money, and effort was being poured into such a limited-viewership endeavor. Another hall housed the press, with media offices and several press conference rooms available. Climate Action Now (CAN), in particular, held a concise daily briefing from an environmental NGO perspective. Not all press conferences were accessible to Observer delegates: often more high-level briefings were limited to media-badged delegates only³. A final hall housed Observer booths and a large series of rooms for Side Events, which tended to be organized by Observer parties to highlight particular actions, programs, or issues.

The Paris Agreement, the formal policy outcome of COP21, is structurally similar to the United States’ Clean Power Plan. While the Kyoto Protocol is a top-down, cap-and-trade scheme, the Paris Agreement is bottom-up, with states developing their own carbon emission reduction plans. These

plans are called Intended Nationally Determined Contributions (INDC) and most FCCC Parties submitted these ahead of the Paris meetings. The cumulative pledges of the INDC commit our planet to more than 3 degrees of warming Celsius and are therefore insufficient for mitigating anthropogenic climate change. However, governments plan to revisit INDCs in the UNFCCC every 5 years with more ambitious goals anticipated as energy systems transition and alternative energy solutions increase in efficiency and decrease in cost.

Major pieces of the Agreement remain to be operationalized. The Paris Agreement is ambitious and should be commended for its first-ever truly international climate agreement. However, financing and other implementation issues remain outstanding and will be taken up in future meetings of the UNFCCC, beginning with COP22 in Marrakech, Morocco, November 7-18, 2016.

ANTARCTICA AT COP21: PRESENT BUT PERIPHERAL

Antarctica was present in conversations at COP21, but it was rarely in the foreground. However, noting where Antarctic issues show up in relation to climate change illuminate a starting place from which to consider future Antarctic engagement in UNFCCC events and meetings.

First, the Antarctic was well represented by Antarctic scientists. Several formal side events featured Antarctic researchers. For example, the Scientific Committee on Antarctic Research (SCAR) and the International Cryosphere Initiative (ICCI) held side events on the West Antarctic Ice Sheet and black carbon. They also held press conferences to communicate their findings and ideas in media-friendly terms, while the side events were more nuanced and geared toward specialists. For COP21 participants seeking climate science, Antarctica was present as a site of cutting edge, high visibility climate research.

Second, the Antarctic was present—sort of—in conversations about sea level rise. Global sea level rise, already occurring and impacting communities, and projected to accelerate, is a major topic of concern among residents of low-lying communities and citizens of island states. Sea level rise promises to be one of the key contributors to human impacts from climate change, affecting displacement, drinking water, security, infrastructure, and cultural and national identity. Coping with sea level rise, through engineering or relocation planning, is a core matter of climate justice.

Where the increased sea level was coming from was not an explicit part of the sea level rise conversation. This is due in large part to the fact that discourse around sea level rise is now focused on justice and mitigation, instead of scientific cause. Similarly, Antarctic research on the ice sheet rarely focuses on the global societal impacts of ice sheet disintegration. The scientific research presentations and the mitigation planning for affected communities literally happened in different rooms at COP21. Future organizers might fill this communication gap by creating more intentional opportunities at the UNFCCC meetings to simultaneously engage with new research, human impacts, and potential solutions.

Third, the Antarctic was included in conversations about ocean conversation, but again, peripherally or anecdotally. Most visibly, former Vice President Al Gore, now with the Climate Reality Project,

spoke publically about protecting the Southern Ocean with Marine Protected Areas. The Southern Ocean was also highlighted in side events by ocean-focused NGOs, including Oceans Inc., High Seas Alliance, and Blue Climate Solutions. A Southern Ocean-focused side event at a future COP would increase visibility and interest in preserving Antarctica's marine environment.

Finally, the Antarctic showed up in several examples of performance art and activism, including some marching penguins, a funeral ceremony for ice, and a booth to get a fictional Antarctic passport stamp. Antarctica, especially its charismatic penguins, is appealing to people interested in environmental issues. Much more could be done to channel enthusiasm and support for Antarctica via Antarctic symbols like wilderness, science, glaciers, penguins and extreme environments, into the broader conversation about the future of our planet under anthropogenic climate change.

ANTARCTIC ABSENCES IN UNFCCC

The single most relevant absence for Antarctica at COP21 is simply that there is no seat at the formal negotiations for the Antarctic continent. People within the UNFCCC, I posit, assume that the Antarctic Treaty System and its signatory parties are leading Antarctica's climate mitigation efforts. The ATS, though, regularly punts any climate deliberations in their meetings to the UNFCCC, as international climate policy is not their charge. In short, this means that there is no meaningful climate policy, or agreed-up climate action for Antarctica. Even though parts of the Antarctic are among the most rapidly changing on Earth due to global warming, Antarctica is a climate policy no-go zone.

Scientists, Antarctic organizations, and environmental advocacy groups provide information to UNFCCC about Antarctica as a climate threat and an environment threatened by climate change. This engagement, though, is partial. And at an event with many vital messages, partial engagement translates to low interest and weak policy outcomes for the protection of Antarctica.

ANTARCTIC OPPORTUNITIES

As the UNFCCC moves into decisions on how to implement the Paris Agreement, there are opportunities for people who manage and care about the Antarctic to insure that the continent and its waters are included in climate decisions, including:

1. More clear linkages between scientific research and human impacts. Climate change is overwhelmingly presented to audiences with a singular discursive pattern: first, the scientific evidence, second, human impacts and third, proposed policy solutions. We see this pattern reified in the three working groups of the Intergovernmental Panel on Climate Change, and replicated elsewhere. These sides of the climate story are essential for decision-making, but this is not the only possible narrative strategy. How can we communicate the linkages between scientific knowledge, human impacts, and solutions in integrative ways?

The primary human activity in Antarctica is scientific research. International scientists working in Antarctica make tremendous contributions to our society's understanding of global climate science. Organizations supporting Antarctic research, such as national research foundations, national

Antarctic programs, and the Scientific Committee on Antarctic Research can coordinate scientific research to help audiences, including various publics and policy makers, make connections between climate science and its effects on people and the planet.

2. More Antarctic information at COPs, including science but not limited to it. Highlight sustainability innovations. Through side events, national pavilions, and NGO booths, Antarctic organizations have an opportunity to inform the world's most engaged climate actors. While Antarctic climate science is fairly well represented at the UNFCCC, there is more to tell the world about Antarctica. Despite the Antarctic being one of the most extreme environments on the planet, several national Antarctic programs have built zero- or low-emissions research stations using renewable energy sources. COP meetings, with their high aspirations and idealism, are excellent venues for showcasing these efforts: if it can be done in remote and harsh Antarctica, why can't it be done at home?

3. Link up the Antarctic to other international conservation areas. Antarctica is not the only international space devoted to environmental protection and cooperation. Other examples include transboundary protected areas such as Waterton-Glacier National Park (Canada and United States), Morokulien (Sweden and Norway), the European Green Belt (Europe), and the Great Limpopo Transfrontier Park (South Africa, Zimbabwe, Mozambique (Ali 2007)). However, the Antarctic Treaty System's Specially Managed and Protected Areas provided some of the most rigorous and innovative examples of environmental protection on Earth—and this is achieved through international cooperation. As other places put together management plans to cope with and mitigate their changing climate, Antarctic environmental managers can contribute expert knowledge on how to manage international conservation areas, as well as gain inspiration from other international cases.

Furthermore, environmental areas undergoing rapid climate change may need a new suite of management strategies, including more nimble decision making, enabling research in rapidly changing zones, and, possibly, new or transitional protected areas as species migrate. Robust cooperation between Antarctic environmental managers and their colleagues elsewhere can help conservation workers protect transitional areas with a high degree of competence.

4. Consideration of how national Antarctic programs and tour operators relate to their nation's INDC—and how Antarctic operations might contribute, even symbolically, to carbon emission reductions. Cumulatively, human activities in Antarctica contribute very little to global greenhouse gas emissions—it is simply the least populated part of the planet by far. However, all human activity in Antarctica is extremely carbon intensive. On top of that, Antarctic science is some of the most technologically advanced research on the planet, and some of the research stations are highly innovative in terms of sustainability and renewable energy. Antarctic program managers can work to make their programs and logistical efforts align with—or exceed—national goals. The symbolic value of a sustainable Antarctic cannot be overstated.

5. More participation and collaboration between the Antarctic Treaty System and the United Nations Framework Convention on Climate Change. Following the publication of SCAR's Review Report on Antarctic Climate Change and the Environment (ACCE), R. Tucker Scully, the Chair of the XXXII ATCM in Baltimore, Maryland, USA sent a letter to the executive secretary of the UNFCCC to highlight Antarctic climate science and climate-

related decisions made by the Antarctic Treaty System. Communication between these two organizations is rare, but this is easily remedied.

Intergovernmental organizations like the Antarctic Treaty can apply to be given status at UNFCCC meetings. With status, delegates from the Antarctic Treaty System (likely members of the Antarctic Treaty Secretariat) would have the opportunity to communicate about Antarctic climate impacts and efforts to the international climate community, liaise with other IGOs, and provide an official voice for Antarctica in the climate negotiating room. Note that IGOs would not be making policy decisions related to the Antarctic Treaty System—IGO do not make policy at all at the UNFCCC meetings—but informing policymakers on Antarctic climate topics. This, more than any other option, would make the Antarctic visible at UNFCCC.

CONCLUSION

The Antarctic Treaty System and the Framework Convention on Climate Change do not have much to do with each other, though the effects of anthropogenic climate change in the Antarctic will have severe consequences on the rest of the world. Therefore, this report summarizes the state of affairs at COP21 and Antarctica's representation there, and proposes strategies for improving the relationship between Antarctic science, management, and logistics and international climate policy. Even though there is a clear distinction in policy domains, the material effects of climate change do not mind these boundaries. Decisions about management, policy, science, and sustainability should be made in light of this serious environmental matter without exclusions to vast global regions.

REFERENCES

1. *This narrative is US-focused due to their historical record of low- or non-engagement on international climate policy as well as the location of the author.*

2. *At the time of writing, the Supreme Court of the United States put a stay on states' requirement to implement the Clean Power Plan, a grave indicator that the high court expected to overturn the decision. The death of Justice Antonin Scalia one week after this decision, though, shifts the ideological distribution of the Supreme Court. His replacement is a matter of intense debate during the 2016 election year with members of the Senate Republican majority vowing to stall any of President Obama's nominees until the next president is elected. Due to these contingencies, the decision reverts to the previous court, which is expected to uphold the Clean Power Plan.*

3. *The author attended COP21 as a credentialed NGO Observer on behalf of the Antarctic and Southern Ocean Coalition (ASOC). There are several tiers of credentials, including Parties to the Convention, Observer States, NGO/ IGO/ civil society Observers, and Media. Type of credential influences access to parts of the conference venue and some events, such as bilateral negotiations or press briefings expected to reach capacity.*

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IMAGES OF ANTARCTICA IN LITERATURE: FICTION AND TRAVEL WRITING

Monika Schillat

ABSTRACT

Our study deals with Antarctica in the tourist's imagination. Before engaging in a voyage the destination is intangible. There is an ephemeral image, which is usually formed through the consumption of different sources of information such as documentaries, pictures and other visual representations of the White Continent. Imagining Antarctica becomes a mental construction, a process of evaluation, which includes a unique set of beliefs about the destination, beliefs that are equally emotional and rational. The following study intends to identify cognitive and affective components of the perceived image of Antarctica as a tourism destination. Recent studies have shown, that this construed geography isn't a mere product of ocular experience. Zuev and Picard (2013), in an attempt to develop an anthropological study of Antarctic tourism culture, explained that tourists would find themselves immersed in multisensory experiences, which would rapidly lead to strong emotions towards Antarctica, and often even have a transformative effects on them. Their tendency to anthropomorphize nature induces them to perceive penguins as little men and moving icebergs as castles. Things are never just what they seem. The White Continent lacks native inhabitants and in consequence a myth of the origin, is swiftly compensated by the traveller. The traces of human presence in Antarctica remind them of the heroic history of early explorers and then there are also some vague ideas about the possible presence of beings not yet discovered. Antarctica seems to be a highly theatrical place that dramatizes a grand historical narrative about time, nature and mythical conceptions of nature. It seems possible, that these strong emotions triggered by a visit in Antarctica might be related to a repertoire of previous interior images, which have been formed a long time before the actual voyage would have started, and probably even before the traveller has planned to travel. Now, immersed in an austere beautiful icescape this imagination would find an echo and bring back emotions, which were already there. We propose to analyse the imagery of Antarctica as construed in fictional and travel narrative, focusing on literature the traveller might have come in contact with prior to the actual voyage to Antarctica, even a long time before even thinking of going there. To this end an extensive body of novels and travel books, which have been commercially successful in an Anglo-Saxon context, have been consulted accordingly. 54% of all tourists going to Antarctica are of Anglo-Saxon background (IAATO 2015), which justifies the reduction to literature published in English for this first approach. Part of our study retraces the genealogy of mental images, which are passed on in the analysed texts. Another one is dedicated to identify different discursive lines in Antarctic literature. At the end of our "journey" we find a certain appetite for the frozen beauty of a world apart, which seems to invite the traveller to also take an inward journey by offering a white canvas for mental projections. At the same time he is driven to follow in the footsteps of polar heroes, who braved "this pure and intact landscape" risking life and limb. And by doing so, he has to live up to his own expectations reaching physical and psychological limits outlined in adventure tourism excursions.

KEYWORDS

Antarctica, Narrative, tourism imagery, intertextuality

INTERTEXTUALITY IN ANTARCTIC NARRATIVE

We understand that the creation of a literary space can't be reduced to isolated works, but should rather be understood as a result of complex relations which unfold in between several texts. Most of the travel writings and fictional narratives of Antarctica are in constant dialogue with the history and literature of past decades and even centuries. Intertextuality is the shaping of a text's meaning by another text. We are looking at a literary device that creates an interrelationship between different texts and even genres and also generates related understanding in separate works. These references are made to influence readers and add layers of depth to a text, based on the readers' prior knowledge and understanding. Authors borrow and transform a prior text and readers reference one of them while reading another one.

Literary spaces are also intertextual spaces in this sense. Setting the scene in literature tends to integrate prior descriptions of the space and at the same time unfold a complex relationship with the imagery present in the representations of this same space. This seems to work surprisingly for literature, which is produced by the so-called "armchair travellers" as well as for writers, who have actually been in Antarctica. Both are influenced profoundly by the texts they have come across previously. Even the perception of the writer in situ is affected by this imagery. Previous texts seem to interact in a creative way in the writer's mind up to the degree where the writer asks himself, "Who has actually invented this, what I am writing?"

We propose to analyse how this net of texts and quotes, which do cross and overlap, fortify each other, or do at times even contradict each other. The reconstruction of the intertextual structure of novels, travel writing, log books and other narratives could help to understand the imagery about the White Continent, which readers are introduced to.

Basically, we are dealing with three strings of narration, each of them at the same time presenting its own discursive rules. The first one might be defined as the scientific discourse, such as presented in expedition reports and log books with its specific style, reduced to facts and details. The second one includes the literature of Proto-Science Fiction and Science Fiction, presenting a mix of the fantastic and scientific as well as horror stories and utopian visions of Antarctica as the place for a better future. The third one is searching for a different way of communicating the special qualities of Antarctica, a world "almost pristine" and of sublime beauty. This romantic way of looking at Antarctica is characteristic for the literature created during the Heroic Age of Antarctic Exploration, but did by no means end there.

Considering the historic context of the production of this kind of literature, the generally sportive and competitive attitude of the early Anglo-Saxon explorers and the surprisingly superb landscape they encountered, it isn't surprising that they would have chosen a romantic language to describe the sublime White Continent. However, its perseverance in this discourse is astonishing. The "sublime" is kept alive in clichés about this "pristine and peculiar" landscape for centuries without fissures. The significance of Antarctica for humankind derives from the fact, that there "man is confronted with a world, which has developed in his absence" (Mickleburgh 1988). This is how he learns his place in this unique landscape, which not only shows how insignificant he is but also stays indifferent

to him. As an example of a humbled traveller, we come across the thought of the main character of the novel “The White Darkness”. Gazing at the Queen Maude mountain range, she reflects on the purpose of the beauty of Antarctica and humanizes the entire continent, convinced of its evil character.

“Mirages of things far beyond the horizon hung in the sky, as though by levitation, coloured gold by the sun. It churned up such foaming, fuming feelings. Antarctica doesn’t need anyone’s admiration, so why should it go to the trouble of being so beautiful? Of riming ice caves with emerald green and turquoise? Or pumping vuggy ice full of rhinestones? Why moon dogs and cornices of snow like freeze-frame waves? ... I know this whole continent would kill us if it could sink its teeth into us... And yet I’ve never seen anywhere so beautiful, so marvellous”. (McCaughrean, 2011)

STATE OF THE ART

We got our initial clues from literature studies carried out by Leane at the University of Tasmania. Her analysis of a broad variety of Antarctic narrative stretching over three centuries of literary production has set the tone, when it comes to understanding Antarctic imagery (2011, 2012). Trying to understand a general attitude towards the White Continent, her studies include all kind of different types of literature. Francis Spufford’s (1997), “I May be Some Time” has been another inspiring source. Focussing on sociological aspects as well as representations of Antarctica, - both mental and real -, Spufford retraces the almost amorous relationship Anglo-Saxons maintain with the White Continent. Trying to understand, why the stories of the heroic age of Antarctic exploration are still appealing to broad audiences, Spufford attempts an archaeology of the myths related to the first Antarctic explorers and gives surprising insights in how these very myths have changed over the years, but never lost their grip. The stories of human endurance at the ends of the earth still move audiences today.

When dealing with discursive lines presented in Proto-Science Fiction and Science Fiction, we consulted several sources, the most promising one being a thesis presented by Pablo Wainschenker (2013). The author presents interesting points of view about the representation of Antarctica in movies and literature, where the silence and stillness of Antarctica becomes threatening.

The documents analysed in the present essay are novels, historic and modern travel books, and some few log books. All of them share the same criteria, they have been commercially successful, and most of them have been translated into several European languages, which make it even more likely that Antarctic travellers might have been in contact with them some time before starting their actual voyage. This might have occurred in the form of a theatre play, television series or even a movie, all based on the original literature selected.

As already mentioned, our analysis will keep in mind that a literary production of a geographical space is usually a product of complex relationships and interactions of a broad variety of texts. We follow Gérard Genette (1993) in his original suggestion to understand the intertextuality between different works as a metaphor of a “cultural palimpsest”. When we think about a palimpsest, an old parchment comes to mind, which has been scraped clean in order to use it again and again over a length of time. Traces of previous texts will still remain on our parchment. And just as

contemplating a palimpsest, when analysing cultural spaces, we will be able to recognize ideas and images of previous texts, myths and even flavours of times gone by. The Antarctic landscape, perceived as an enigmatic continent, hostile with a dangerous horizon, can be understood as a construction of uncountable comments. Previous texts are reshaped by new readings and now form a web, which is open to new contributions.

ANALYSIS OF INTRODUCTIONS AND PREFACES

Starting our study analysing prefaces and introductions of the selected works, we paid special attention to the personal motivation of the authors in respect of their imagined or carried out voyages to Antarctica. The main question was: Why did they go there, and what did they expect to find?

The introduction to Jenny Diski's novel "Skating to Antarctica" (1997) might serve as an example. Her book is based on her personal life experiences and a voyage, which she took on board an expedition cruise ship to the Antarctic Peninsula. The main reason for going south seems to be an inner search, the idea to find herself in the process. Diski projects her interior onto the white spaces of Antarctica, building a mental landscape seemingly free of painful memories, a place possibly able to transform and heal her.

"I am not entirely content with the degree of whiteness in my life. My bedroom is white: white walls, icy mirrors, white sheets and pillowcases, white slatted blinds. It's the best I could do. Some lack of courage – I wouldn't want to be thought extreme – has prevented me from having a white bedstead and side-tables. Opposite my bed, in the very small room, a wall of mirrored cupboards reflects the whiteness back at itself, making it twice the size it thought it was" (Diski, 1997).

The author admits, that it would have been much easier to travel north to the Arctic starting from her home in England. Just like a sexual compulsion, somewhat annoying and inconvenient, but not to be ignored, the wish to go to Antarctica was suddenly there.

"Still, the thought was there. Antarctica... I have not always longed to go to Antarctica, or even ever wanted to especially, but the thought was as powerful as if it had been a lifelong dream. Perhaps it's possible to have lifelong dreams in retrospect" (Diski, 1997).

Diski needed a place, which only could exist in her mind, a place where there would be no thought, no pain, nor stimulating colours; a place, which reminded her on previous stays in psychiatric facilities; a place where she could find the same kind of solace, but without the annoying presence of the nurses:

"I wanted white and ice for as far as the eye could see, and I wanted it in the one place in the world that was uninhabited (never mind the penguins, seals and base camp personnel for the time being). I wanted a place where Sister Winniki couldn't exist. I wanted my white bedroom extended beyond reason. That was Antarctica, and only Antarctica" (Diski, 1997).

And while Thomas Keneally (2001) understands his obsession with the open white spaces as a metaphysical experience:

"This is the icy Eden many modern readers consider their favourite mental landscape on earth...the South Pole, a place where all is north, where the world can be circled in four steps, a point as absolute as some mystic's conception of

the Deity" Keneally (2001).

Other authors, who place themselves in the tradition of the polar heroes from a hundred years ago, try to follow in their footsteps, such as the skipper and writer Hernán Alvarez Forn (1991), who sailed on board the sailing vessel "Pequod" to Antarctica.

"It was in April 1987, when a subconscious idea broke to the surface, which must have formed quite a while ago, when we came back from our voyage to Cape Horn. It was suddenly there, I had to go to Antarctica, without much further ado or measuring the consequences, I just knew that I had to sail south. I wasn't competing with anybody, but it seemed to be an additional bonus, that the first sailing yachts, which had wanted to go in the years 82 and 83, had not succeeded." (Forn, 1991).

ANALYSING SEMANTIC FIELDS

When trying to understand how a cultural space is rated and valued, it is usually helpful to analyse semantic fields, which have been construed. Word groups, which are related by their significance are the clue, we have to follow to understand how they share common characteristics and references. Each language has its own way to divide reality into smaller portions. This is achieved by grouping objects, which share semantic features and hence are understood as part of belonging to the same environment, idea or experience. Each language chooses those relevant features as a result of their culture and history. In this context, we focus on how the relevance of certain objects changes and how their alliance to one or another semantic field changes in a process of valuations.

As an example, one might use the terms "cold" and "white". A hundred years ago the term "cold" would have been found allied to the terms "hostile", "hunger", "danger" and possibly also "death". This seems to have changed lately, especially keeping in mind that the recent debate about "Climate Change" and "Global Warming" has somewhat redeemed the concept of "cold" in contraposition to "heat", which is being blamed for the devastating effects on glaciers in the polar regions. At the same time we are confronted with an increase in literary production about polar topics. In Europe publishing houses speak about a "freezing frenzy". Broad audiences are well informed about the interaction between the climate and the state of the ice and snow. In fact, these three elements do form a tight semantic field, when we think about polar areas. (Hansson and Norberg, 2009)

This of course has been quite different in early texts about Antarctic exploration. Not only have the terms "cold", "ice" and "snow" been considered to be hostile, but sometimes they even turned directly into the enemy. This enemy had to be conquered and should present itself in the context of "fight" and "war", up to a point when it was actually possible to beat the "snow" in a moral sense: *"Idealists who followed polar expeditions from home were informed by a sense that such a thing as a moral triumph over the snow was possible."* (Spufford, 1997)

We were also interested in analysing the colours represented in the semantic fields related to Antarctica in the narrative in question. The most significant colour of course is "white", and it was surprising to find out, that "white" was not only used in relation to snow and ice, but in occasions also to the fauna of the area. In his novel "Moby Dick the White Whale", Herman Melville presents the colour "white" in all its symbolic ambiguity. He dedicates an entire chapter

to the “whiteness of the whale”, explores the esoteric character of the colour and the emotions it provokes in humans. He shares his fears of white creatures with science-fiction authors Poe and Lovecraft. “What bothered me most was the whiteness of the whale”, he starts his reflections, and gives other examples of scary white animals, such as the polar bear and the albatross, whose “none-colour” made the blood freeze in the sailor’s veins. But how could it be possible that “white”, the colour, which represents spirituality and even the “very veil of the Christian deity”, would at the same time be a sign of something so terrible? Could it be, that white, which represents the absence of colour, springs on us unexpectedly touching our deepest fears? “White” in Melville’s writing is representing this duality, the mystery itself. This might be the clue to understand, why the colour “white” provokes such fear. We find ourselves defenceless confronted with a veil, which might hide other mysteries even more dangerous.

ANALYSIS OF METAPHORS

A good number of authors take advantage of the poetic force, which lies in the use of metaphors, when wanting to multiply the significance of words and concepts. This way they can describe the unknown, such as death, fear, loneliness and others, which would escape us otherwise.

Diski’s autobiographic text “Skating to Antarctica” (Diski, 1997) also offers a good example for the use of metaphors, when writing about Antarctica. To her, the White Continent is not just a physical place but also a mental space. What traditionally has been portrayed as a hostile and inhumane environment becomes a region of her mind. She provides it with a quite complex system of images and symbols. The description of her voyage – which is actually based on a real life experience – serves in the first place as a metaphor of her personal quest. Diski seeks a place in her own interior, which might help her to heal a profound sense of alienation of herself and she is certain to find it in Antarctica.

Vivid descriptions of her difficult childhood alternate with descriptions of her cabin on board a Russian expedition ship and her bedroom at home. Using several metaphors describing the ice, the cold and ice-skating, she reveals how her emotions seemed to be frozen solidly inside her. To her, Antarctica becomes a gateway to the inner self, a spiritual terrain, or as she would word it:

“We explore ideas as readily as we do the physical geography of the planet and neither kind of exploration is untainted by the other” (Diski, 1997).

And hence Antarctica becomes a space that she configures according to her own deepest preoccupations.

PRELIMINARY RESULTS

Surprisingly, the first novel ever published about Antarctica, was written before the continent was actually discovered, in the year 1820. The author was a firm believer in the “Hollow-Earth-Theory” and this first book belongs hence to the proto-Science-Fiction line of Antarctic literary production. John Cleves Symmes, a believer in the hollow earth theory, proposed in 1820 an idea about the inside of our terrestrial globe, which includes concentric spheres and a hollow interior, which allows people to live on the inside. The inner world, illuminated by a different sun, could be accessed via

both poles. His idea would inspire a long line of Science-Fiction authors dealing with Antarctica, such as Edgar Allan Poe, “Manuscript in found in a bottle” (1833) and “The Narrative of Arthur Gordon Pym” (1838), Jules Verne, who would finish the story which Poe had left inconclusive in 1897, under the title “The sphinx of the ice fields”. In 1931 H.P. Lovecraft would revive the sombre ideas presented in both books in his novel “At the mountains of madness”.

Antarctica was still being described as a fantastical place with a challenging mythological geography. In her studies Elizabeth Leane (2012) identified the main ideas, which would turn into a leitmotiv in literature for almost two hundred years. Both poles are considered to be the portals towards the inside of a hollow earth. A great whirlpool drags the ships into the interior of the planet, as presented by Poe in both his works, “Manuscript found in a bottle” and “the Narration of Arthur Gordon Pym”.

An unnamed narrator, estranged from his family and country, sets sail as a passenger aboard a cargo ship from Batavia. Some days into the voyage, the ship is first becalmed then hit by a sand storm with hurricane force that capsizes the ship and sends everyone except the narrator and an old Swede overboard. Driven southward by this magical wind towards the South Pole, the narrator’s ship eventually collides with a gigantic black galleon, and only the narrator manages to scramble aboard. Once the new ship arrives, the narrator finds out-dated maps and useless navigational tools throughout the ship. Also, he finds it to be manned by elderly crewmen who are unable to see him; he steals writing materials from the captain’s cabin to keep a journal (the “manuscript” of the title), which he resolves to cast into the sea.

This ship too continues to be driven southward, and he notices the crew appears to show signs of hope at the prospect of their destruction as it reaches Antarctica. The ship enters a clearing in the ice where it is caught in a vast whirlpool and begins to sink into the sea.

“Oh, horror upon horror! The ice opens suddenly to the right, and to the left, and we are whirling dizzily, in immense concentric circles, round and round the borders of a gigantic amphitheatre, the summit of whose walls is lost in the darkness and the distance. But little time will be left me to ponder upon my destiny – the circles rapidly grow small – we are plunging madly within the grasp of the whirlpool – and amid a roaring, and bellowing, and shrieking of ocean and of tempest, the ship is quivering. Oh God! And – going down.”(Poe, 1833)

Only the message in the bottle will make it back to civilization, the author remains missing. Antarctica turns into a continent of dark secrets. Poe and his followers will repeat their warning messages. The White Continent should not be visited. This last frontier should not be conquered; the dangers lurking there should not be disturbed and awakened. Running alongside and sometimes entwining with the myth of the polar abyss is another set of legends, in which the geographic poles are not marked by absence but by the presence of other phenomena, such as the large lodestone of medieval legend; the magnetic mountain sitting above a whirlpool in Renaissance maps, as first featured by Gerhard Mercator on his map “Septentrionalium Terrarum” in 1595. The lodestone with its mighty power attracts all kinds of metal objects, loosens the nails in the ship’s hulls and disintegrates them. Jules Verne used this concept in “the Sphinx of the ice fields”.

Other geographical ideas, such as the idea of a warm polar region hidden by walls of ice drew support from some explorers' accounts and scientific reasoning. In 1823, James Weddell led a British sealing voyage into the far southern latitudes, meeting severe cold weather and seas littered with ice. Pushing south, however, he encountered changed conditions. Whales surrounded the ship, petrels covered the ocean and no ice at all could be seen. The ships reached 74°S in what is now the Weddell Sea, a record southern latitude that held for the next eighteen years. Weddell's experience gave credence to the idea of a temperate South Polar sea. The knowledge of the earth's flattening at the poles suggested to some that both the Antarctic and the Arctic might draw warmth from their closer proximity to the earth's core. An open sea at the South Pole appears frequently in nineteenth-century and early twentieth-century Antarctic speculative fiction. As other regions of the planet were increasingly explored, this hybrid Antarctica – part fact and part mythology, ice-bound but temperate – continued to flourish as a setting for novels and short stories. Edgar Allan Poe and Jules Verne in "Manuscript found in a bottle" (1833), "The Narration of Arthur Gordon Pym of Nantucket" (1838) and "the Sphinx of the Ice Fields" were both inspired by his observations. At the same time, sea captains drew from the ideas and imagery of literature, when compiling their logbooks. James Weddell surprisingly included the fantastic observations made by one of his sailors in his account:

"The sailor had gone to bed, and about four o'clock he heard a noise resembling human cries and as day-light, in these latitudes, never disappears at this season, he rose, and looked around, but on seeing no person, he returned to bed; presently he heard the noise again, and rose a second time, but still saw nothing. Conceiving, however, the possibility of a boat being upset, and that some of the crew might be clinging to some detached rocks, he walked along the beach a few steps, and heard the noise more distinctly but in a musical strain. On searching around he saw an object lying on a rock, a dozen yards from the shore, at which he was somewhat frightened. The face and shoulders appeared of human form, and of a reddish colour; over the shoulders hung long green hair; the tail resembled that of the seal, but the extremities of the arms he could not see distinctly. The creature continued to make a musical noise while he gazed about two minutes, and on perceiving him it disappeared in an instant." (Weddell, 1825)

Another captain who inspired writers of their time were the adventurer Morrell, who published his experiences in "Narratives of Four Voyages to the South Sea, ... and Antarctic Ocean", (Morrell, 1832). His wife Abby Jane Wood did accompany him on board the Antarctic and in their fourth voyage (1829-31) Morrell was the first to disembark on Bouvet Island, then went to the South Shetland and South Sandwich Islands, where he neither found fire wood nor would he encounter any wildlife and barely managed to survive. Penetrating the Weddell Sea, according to his account, they reached the latitude of 70°S and Morrell declared to have passed the South Polar Circle several times. But as the rest of details provided are quite fantastic – he describes cities in the ice, which he could make out in a distance and establishes his position several times quite mistakenly a 124 miles inland [200 km]. Most readers didn't take his accounts seriously. This, however, didn't stop writers such as Poe and Verne to draw heavily from his experiences. Another real-life account, which would influence them, was Jeremiah N. Reynolds "Address on the Subject of a Surveying and Exploring Expedition to the Pacific Ocean and the South Seas" (1836). The first one had based the 16th chapter of "The Adventures of Arthur Gordon Pym" on these publications, whereas the second referenced Morrell and Reynolds throughout his work "A voyage to Antarctica".

Sea exploration was a popular literature genre at the time, but Poe was also influenced by Daniel Defoe's "Robinson Crusoe" (1719) and Samuel Taylor Coleridge's poem "The Rime of the Ancient

Mariner" (1798), who himself had been influenced by Captain James Cook's voyages of discovery in the years 1768 to 1779. And as already mentioned, the chasms opening up in the sea at the end of the novel were inspired by the popular Hollow Earth theory of Poe's day. Pym's voyage covers similar geographical and psychic territory.

The stowaway protagonist experiences a series of grim events – claustrophobic imprisonment, mutiny, an encounter with a ship full of corpses, cannibalism, shipwreck and a narrow escape from a treacherous Antarctic tribe – before running up against the limits of the world and his sanity. In the last few pages his boat is pulled towards a terrifying cataract pouring into the earth from the heavens. Before it, its pathway is blocked by a giant white human figure.

"The summit of the cataract was utterly lost in the dimness and the distance. Yet we were evidently approaching it with a hideous velocity. At intervals there were visible in it wide, yawning, but momentary rents, and from out these rents, within which was a chaos of flitting and indistinct images, there came rushing and mighty, but soundless winds, tearing up the enkindled ocean in their course... March 22nd. The darkness had materially increased, relieved only by the glare of the water thrown back from the white curtain before us. Many gigantic and pallidly white birds flew continuously now from beyond the veil, and their scream was the eternal Tekeli-li! As they retreated from our vision... And now we rushed into the embraces of the cataract, where a chasm threw itself open to receive us. But there arose in our pathway a shrouded human figure, very far larger in its proportions than any dweller among men. And the hue of the skin of the figure was of the perfect whiteness of the snow."(Poe, 1988)

The novel remains inconclusive. A note of a so-called "editor" towards the end leaves room for speculation:

"The loss of two or three final chapters (for there were but two or three) is the more deeply to be regretted, as it cannot be doubted they contained matter relative to the Pole itself, or at least to regions in its very near proximity; and as, too, the statements of the author in relation to these regions may shortly be verified or contradicted by means of the governmental expedition now preparing for the Southern Ocean."

Poe and Coleridge turned the White Continent into a gothic locale, with their dark romantic novels. The region had set in train the ghastly experiences of Coleridge's "ancient mariner", produced the culminating horrors of Poe's "Narrative of Arthur Gordon Pym" and spawned the hideous amorphous aliens of H.P. Lovecraft's "At the Mountains of Madness" (1936). The narrative centres on an Antarctic scientific expedition, which uncovers preserved alien life forms. These creatures are the "Old Ones" – "star headed beings" who originally came to earth in its very early history. These come back to life, when the scientists start to dissect them and these slaughter some of the team. When journeying into nearby caves, the narrator and his companions are attacked by yet another life form, the "shoggoths", violent and shapeless beings. The gothic novel exploits US Antarctic explorer Richard Byrd's language describing a land "beyond the pole" and the many "lost race" fantasies set in the Antarctic to invent a scientific expedition that discovers the hideous true creators of the human race dormant under the ice. Ignorantly penetrating the polar abyss, the scientific team is ejected from the ice itself by a volcanic eruption. Lovecraft's apocalypse through the extra scientific discovery of what is the hopelessly inferior and belated position of humans and scientific knowing incarnates the problems of hard limits as one of repressed or unknown origins as well. The narrator insist in warning us that *"It is absolutely necessary, for the peace and safety of mankind, that some of earth's dark, dead corners and unplumbed depths be let alone; lest sleeping abnormalities wake to resurgent life,*

and blasphemously surviving nightmares squirm and splash out of their black lairs to newer and wider conquests.” (Lovecraft, 1931)

The idea of disturbing dormant alien life forms in Antarctica is taken up again a few years later by John W. Campbell in his short story “Who Goes There” (1938). In the Science Fiction novella, a group of scientific researchers, isolated in Antarctica by the nearly ended winter, discover an alien spaceship buried in the ice, where it crashed twenty million years before. They try to thaw the inside of the spacecraft with a thermite charge, but end up accidentally destroying it. However, they do recover the alien pilot from the ancient ice, which the researchers believe was searching for heat when it was frozen. Thawing revives the alien, a being that can assume the shape, memories, and personality, of any living thing it devours, while maintaining its original body mass for further reproduction. Unknown to them, the alien immediately kills and then imitates the crew’s physicist, with some 90 pounds of its matter left over it tries to become a sled dog. The crew discovers the dog-Thing and kills it in the process of transformation. Pathologist Blair, who had lobbied for thawing the Thing, goes insane with paranoia and guilt, vowing to kill everyone at the base in order to save mankind; he is isolated within a locked cabin at their outpost. The crew realizes they must isolate themselves and therefore disable their airplanes and vehicles, while pretending things are normal over their radio transmissions to prevent any rescue attempt from civilization. The researchers try to figure out who may have been replaced by the alien (simply referred to as “the Thing”), in order to destroy the imitations before they can escape and take over the world. The task is almost impossibly difficult when they realize that the Thing is also telepathic, able to read minds and project thoughts. The novella has been adapted four times as a motion picture: the first in 1951 as “The Thing from Another World”; the second in 1972 as “Horror Express”; the third in 1982 as “The Thing” directed by John Carpenter; and most recently as a prequel to the Carpenter version, also titled “The Thing”, released in 2011.

“Even ignoring Poe’s considerable contribution to Antarctica’s literary heritage, the continent’s qualifications as a gothic setting are manifold. As a wilderness – and the most extensive and far-flung of wildernesses – it provides a site remote from civilization, on the edge of established social conventions, ...As a sublime landscape, it brings the rational mind up against its limits. As a literal underworld, it suggests the monstrous, the infernal, the Satanic. Polar mythological concern with fearful, dark spaces.” (Leane, 2012)

Antarctica is a more than fitting scenario for horror films. The South Pole is simply put, more remote than the North Pole from the inhabited world.

“The Western worldview in which the Arctic rests on the top of the planet and the Antarctic clings, spider-like, to its bottom brings an asymmetry to polar psychotopography” (Leane, 2012).

This means, that the metaphorical southern journey is not simply a journey inwards but also downwards, a journey that penetrates the darkest, deepest regions of the unconscious. To Antarctica’s remoteness and its negative polarity can be added another factor central to its unique combination of spatial qualities – the ice itself. As land depressed under the weight of kilometres of ice, Antarctica is a continent of buried secrets. It is no coincidence that many far southern horror stories involve a journey not only to the ice but also under it, through fissures, crevasses and tunnels to subterranean caverns. There is something that lies there, something hostile and deeply threatening to human reason. Wainschenker (2013) relates this necessity to keep Antarctica isolated

to the notion of timelessness.

"Not only is Antarctica isolated from the rest of the world, but also from time itself. Time seems to freeze here".
(Wainschenker, 2013)

Forever unchanging, Antarctica seems to be untouched by time, an idea, which is still present in modern day novels, as we will see later.

Following our palimpsest of Science Fiction works, we consulted the most successful modern day novels of the genre. Jeremy Robinson, "Antarktos Rising" (2009), John Calvin Batchelor, "The Birth of the People's Republic of Antarctica" (1981) and Kim Stanley Robinson, "Antarctica" (1997), conjure up an apocalyptic world, which races to claim a new continent, Antarctica, as the only possibility to survive. In the novel, "Antarktos Rising" (2009), they will have to face the fact that Antarctica is already taken. A phenomenon known as crustal displacement shifts the Earth's crust, repositioning continents and causing countless deaths. In the wake of the global catastrophe, the world struggles to take care of its displaced billions. But Antarctica, freshly thawed and blooming, has emerged as a new hope. Rather than wage a world war no nation can endure, the leading nations devise a competition, a race to the centre of Antarctica, with the three victors dividing the continent. It is within this race that Mirabelle Whitney, one of the few surviving experts on the continent, grouped with an American Special Forces unit, finds herself. But the dangers awaiting the team are far worse than feared; beyond the sour history of a torn family, beyond the nefarious intentions of their human enemies, beyond the ancient creatures reborn through anhydrobiosis—there are the Nephilim, descendants of extra-terrestrials and humans.

M.E. Morris in "The Icemen" (1988) and Felipe Botaya in "Antártida 1947" (2010), convert the Antarctic into a space, where German Nazis have found their sanctuary in a secret military base. Once again the danger emerges from the White Continent.

John Calvin Batchelor on the other hand positions himself openly in the tradition of the works of Edgar Allan Poe, "The Narrative of Arthur Gordon Pym" and Melville's "Moby-Dick", recreating an epic adventure under the title "The Birth of the People's Republic of Antarctica" (1981). As civilization teeters on collapse and national boundaries are closed with governments doing nothing more than announcing "Trespassers Will Be Shot!", a group of disaffected malcontents who had lived on the fringe even in the good times undertake a voyage to escape a glorious socialism that excludes all but a select few from benefits. What begins as a voyage of salvation rapidly becomes a journey rivalling Dante's descent into Hell. The group - idealistic anarchists who are joined by extended family members and an egomaniac opportunist in the guise of "the clear thinker," sail from Sweden's west and south, eventually arriving in Antarctica. They find it has become the dumping ground for the perceived riff-raff of the world. It is nothing less than a vast concentration camp administered by presumably earnest charities and aggressively pragmatic governments operating under the notion that liberal and progressive words can mask what is really underway. It is here that Grim Fiddle - the leader of the group - moves into the forefront of a rebellion that is more a response to certain death than political motivation.

Kim Stanley Robinson returns to the idea of a utopic society on the White Continent in her novel

“Antarctica” (1997) and at the same time her text dialogues with Roald Amundsen’s and Robert Falcon Scott’s writings. Robinson takes us to a harsh, alien landscape covered by a sheet of ice two miles deep. A stark and inhospitable place, its landscape poses a challenge to survival; yet its strange, silent beauty has long fascinated scientists and adventurers. Now Antarctica faces an uncertain future. The international treaty that protects the continent is about to dissolve, clearing the way for Antarctica’s resources and eerie beauty to be plundered. As politicians and corporations move to determine its fate from half a world away, radical environmentalists carry out a covert campaign of sabotage to reclaim the land. The winner of this critical battle will determine the future for this last great wilderness.

In the twentieth century, new images would be added to those of an impossible and improbable landscape. It’s the images of sufferings and heroism of Antarctica’s explorers and scientists, in their majority of Anglo-Saxon extraction. Their time of exploration is also called the “Heroic Age of Antarctic Exploration” bearing in mind, that a lot of human endurance and suffering was involved. The most important ones in this context being: Robert Falcon Scott’s voyage on board the *Discovery*, 1901-04; Ernest Shackleton’s on board *Nimrod*, 1907-09; Scott’s following voyage on board *Terra Nova*, 1910-13; the Austral-Asian Expedition under the command of Douglas Mawson on board the *Aurora* and Shackleton’s Imperial Trans-Antarctic Expedition on board the *Endurance*, 1914-16. From their books, men with frozen beards are staring right back at us. Not even the yellow stains on the photos and their frames can take away this sensation: they still seem to be amongst us.

The prolific work of writers have made sure that their myth will not be forgotten, Scott reportedly has become the “iconic British hero”. The story of Scott’s men has taken on a mythic meaning in its hundred years of evolution. The same is true, to a lesser extent, of other Heroic-Era epics: Amundsen’s assault on the pole, mythologized in a very different way to Scott’s; the “Winter Journey” of Cherry-Garrard, Wilson and Bowers – a quixotic quest in search of penguin eggs that has come close to supplanting the polar journey as the classic Antarctic narrative; the crushing of Shackleton’s ship the *Endurance* and the trials and triumphs that followed; Mawson’s solo trek – “the ultimate Antarctic saga” – following the shocking deaths of his two companions, Ninnis and Mertz. These are the origin stories of a continent bereft of indigenous inhabitants and corresponding creation myths. Like all origin stories, they are re-told and re-interpreted by each generation, mocked and venerated alike, but never lose their grip on the popular imagination. The stories of the Heroic Era are repeated in many forms: in popular histories; in television documentaries and dramatized mini-series; in expeditions and tourist cruises that promise to follow “in the footsteps of” the early explorers; and in imaginative works. They are re-told with admiration and nostalgia; re-enacted in imitation and homage; re-imagined from new perspectives; re-evaluated in the light of new knowledge about the circumstances; and re-thought from different political viewpoints. As Francis Spufford notes, “Like any successful myth, [Scott’s story] provides a skeleton ready to be dressed over and over in the different flesh different decades feel to be appropriate”. Literary responses to the polar tragedy date from the time it was first reported in February 1913 and might testify to the British admiration for their polar heroes as well as for their romantic relationship with the cold and the wide Polar Regions. Grace Scott, the explorer’s sister, tried to explain her brother’s motivation and what had driven him to attempt to conquer the South Pole:

“He felt in himself keenly the call of the vast empty spaces; silence; the beauty of untrodden snow; liberty of thought

and action; the wonder of the snow and seeming infinitude of its uninhabited regions whose secrets man had not then pierced, and the hoped-for conquest of raging elements.” (Spufford, 1997)

Surprisingly, his motivations don't seem to be very different from those of modern explorers.

The most successful contemporary writers (Diski, 1997; Campbell, 1992; Wheeler, 1996; Keneally, 2001; Bainbridge, 1993) still do follow the clues their polar heroes left, when they risked everything in this “pure” and “still intact” landscape. A first glimpse at their introductions reveals their veneration of the ferocious icescape of Antarctica as the last frontier on earth.

“My name is Morgan Lamont. As I begin at last to tell this story, I am dwelling in a place where few of you who read it will ever have been; it is a harsh place, and a beautiful one.” (Arthur, 1999).

Thus begins the novel “Antarctic Navigation”, with the narrator introducing herself. Since childhood, Antarctica has been the Morgan Lamont's passion. A strong fascination for Robert Falcon Scott turns finally into the necessity to follow in his footsteps. Morgan is a woman driven by a wildly heroic obsession... Barring a trip to the continent itself, there may be no better way for her to experience the perilous and endangered majesty of Antarctica. At the same time, she is not driven to its conquer but to understand and preserve it.

Other authors establishing a dialogue with their historical heroes, such as Beryl Bainbridge, who gives each expedition member their own distinctive voice to the story of Scott's ill-fated expeditions in “The Birthday Boys” (1993), offers a fresh account of the horribly familiar story, evoking an unendurable landscape without and the chilling interior landscapes of damaged souls. Crispin Kitto, in the “Antarctica cookbook” (1983) manages to merge the tradition of Antarctic Science-Fiction writing with the historical dramas of exploration. His main character succeeds in time travelling and decides to offer a hot beverage to Shackleton's marooned men on Elephant Island in 1916. But the men decide that this generous offer can't be real and prefer to think of it as a “mirage”, better to be ignored. They prefer to go hungry instead.

In amongst the works analysed there also was a good number of modern travel writing. Travel books range in style from the documentary to the evocative, from literary to journalistic, and they are often associated with tourism, meant to educate the reader about the destination and inspire readers to travel. Travel literature sometimes intersects with essay writing, when a trip becomes the occasion for extended observations. A writer might settle into a locality for an extended period, absorbing a sense of place while continuing to observe with a travel writers' sensibility. As a genre, this literature escapes most definitions and hence allows opening a new discourse, to propose interdisciplinary gazes, letting historical, anthropological and geographical points of view to intermingle. That seems to be the reason why travel novels gain such importance when it comes to look for new ideological and cultural horizons. At the same time, it makes the genre ideal for our search of the touristic imagination of Antarctica.

One of the main characteristics of travel narrative is the necessity to maintain a relationship with experiences, one can actually accept as being true. This is achieved by giving credit to the narrator as witness in situ. The narrator has to be trustworthy, to make the text believable. The genre presents

itself with a very specific relation amongst the categories of author, narrator and character. Each of them could be a lazy, curious, cheating, vain, melancholic or sentimental traveller, as long as he or she can be related to. (Diski, 2007; Wheeler, 1996; Matthiesen, 2004)

Lately, the idea that the hostile and dangerous Antarctic Continent should be closed to human visitation for his or her own good, or their visitation should be reduced to armchair travelling only: *“For the first time since getting to Antarctica, I was afraid. ... Mine was a nameless, shapeless fear. The singing, raging happiness inside me - at the vicious beauty of this place - had drained away, and I liked myself better when I was the one person not afraid. At home, I could have shut the book and put it back on the shelf. Now somehow Antarctica had overspilled the binding, overrun the bounds of safety.”* (McCaughrean, 2011),

Has been broadened to the idea, that it is the rest of the world, which poses threats to Antarctica and its environment. In representation of others, we'd like to mention the German bestseller by Ilja Trojanov (2011), *“Eistau”*. A glaciologist, who loves his field of work and especially glaciers, despairs when he understands, that he can't save the glaciers of the Alps from melting away. He signs up to be a lecturer on board a cruise ship to Antarctica. On board he tries to persuade the passengers of the importance to save the Ice of the White Continent, but only encounters indifference and lack of interest. This leads him to take desperate measures. The concern about the Antarctic environment often turns into the demand to ban tourism from the White Continent, but this demand of course can have a contrary effect in the future traveller. Just like tourists hurrying their voyage to Venice assuming that it will be buried under the water of the lagoon soon, the traveller is lured towards Antarctica the more hostile and forbidding it is presented. Operators do react to this demand by offering extreme adventures on the polar ice. Car races over the plateau, skiing expeditions and even traverses on foot to reach the last frontier of our planet, are organized every year with increasing tourist numbers. In the austral summer 2011/2012 alone, 250 tourists were expected to reach South Pole Station on foot or with skies. Their aim was to follow in the footsteps of their heroes: Amundsen and Scott. The sense of Antarctica as a place apart means that it could also be considered a time apart, where the stories freeze, as well as men and animals. They remain forever suspended in the ice. Time stands still in a frozen world. The main character of the *“The White Darkness”*, dialogues with an imaginary Titus Oates, who keeps her safe and guides her through a severe whiteout:

“It might be the twenty-first century it might be 1912. Minutes or whole years might be passing, but he is carrying Time, too, inside his useless, frost-bitten fists” (McCaughrean, 2011).

This timeless quality of Antarctica leads to the illusion that one could actually retrace the steps of Antarctic heroes and repeat their hardships and endurance. An ever-growing number of touristic expeditions try to recreate epic voyages of the past, such as Douglas Mawson's expeditions on the White Continent or Ernest Shackleton's open boat voyage from Elephant Island to South Georgia. The latter even includes the traverse of the densely glaciated interior of the island.

In the year 2013 new ingredients were added to the commemorative expeditions. All of a sudden it wasn't enough to use the replica of Shackleton's open boat the *“James Caird”* to re-enact the crossing from Elephant Island to South Georgia. In addition the members of the expedition had to use historic clothing and the same inadequate food their heroes consumed a hundred years ago. Tom Jarvis for instance, led an expedition where pemmican was the only food source for the participants, together with a couple of cups of hot chocolate per day (Jarvis, 2014). It seems that there might be

more extreme voyages being offered by tour operators in the near future, which might replace more traditional expedition cruises focusing on educational and contemplative aspects. Passengers seeking to test their own limits, physical and psychological, in extreme adventures, demand excursions, which do include kayaks, diving, mountain and ice-climbing, as well as overnight stays in tents. To them it seems the only way to measure up to their heroes.

Others – based on the idea implanted by literature, that Antarctica is a place where time itself seems to be frozen – suspect, that there are lost civilizations hidden under the ice. Groups of spiritualists come to Antarctica in search of esoteric entities, which might give them answers to pressing questions about the past and future of our planet or look for the long lost Atlantis. This search for real and unreal sensorial experiences seems also to be triggered by the presence of meteorological phenomena, which are not easy to be understood, such as the reflection of the sun in very cold air. *“Quite suddenly the fog changed substance over our heads. In a matter of moments, the fleshy grey mist resolved itself into frozen dew, a precipitation of crystals, a burden of ice particles that fell twinkling out of the air like rice at a wedding, sunlight splitting them in to all the colours of the rainbow. We were bombarded with rainbows falling from infinite heights, dazzling us with iridescent spears and darts and cataracts of cascading colour... The fog was gone – a magician’s cloth deftly whipped off a table of marvels. In the sky, the sun was a hub of dull aluminium spoked with strands of light, and at the end of each spoke – another sun. Cloned suns”* (McCaughrean, 2011).

And just like other travellers, the narrator of this novel is having trouble to accept, that she isn’t in the presence of the supernatural, when contemplating mirages over the horizon, produced by layers of air with different temperatures.

“It’s a mirage,” said Titus. “Mountains a hundred miles away.” But I didn’t want it to be mountains a hundred miles away. I wanted there to be people, sentries, Martians in a flying palace of a ship; a secret US establishment we had stumbled upon by chance. I wanted it to be Aeolus, brass-walled home of the King-of-Winds, shipwrecked here in the days of myth. I wanted so much for it to be real. In a place where ‘real’ puts five suns in the sky and slices rainbows into sushi, why shouldn’t there be a palace adrift on the Ice?” (McCaughrean, 2011).

Dreams of a more primitive nature come to mind. In Antarctica, it seems, the world is still young, almost untouched by human intervention. A certain appetite for the frozen beauty of a world apart is awakened. The hostile landscape with its forbidding horizon poses a challenge at the same time. And the authors insist of sending warning messages. This continent should not be visited. But there it is, this ultimate frontier, which seems to be dangerous and hence is very attractive at the same time. The voyage today, as it was for the early explorers in their days, is always twofold: facing adversities on the outside and engaging in a voyage towards the deepest layers of our own unconsciousness, towards the dark spots, where dreams, fears and old traumas lurk. It is in this context, that the traveller seeks his own limits: physical and psychological. In an Antarctica where time stands still, it seems to be possible that a modern day traveller manages to measure himself with his childhood heroes, the great Antarctic explorers, and might experience their very same suffering. Others see it as an icy Eden, where they can engage in their own metaphysical quest or simply project their own unconsciousness onto the white canvass in front of them. Antarctica is a space that we tend to configure according to our own deepest preoccupations whether we have been there or not.

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THE CANINE EXPLORERS – THE SLED DOGS WHO HELPED ROALD AMUNDSEN REACH THE SOUTH POLE

Mary R. Tahan

ABSTRACT

One hundred Greenland dogs were purchased by Roald Amundsen from the Royal Greenland Trading Company in September 1909 ostensibly for a North Pole expedition, but secretly to use to reach the South Pole. Amundsen considered the dogs “equipment”. He was a complicated character in a very different time. And he compulsively pursued his mission. His actions perhaps are seen differently from the 21st century perspective and in light of our evolving attitude toward animals, especially dogs. This paper presents the facts of what happened concerning the sled dogs, using Amundsen’s own statements in his books, diaries, and letters, as well as the expedition members’ journal entries and personal letters. It focuses on the dogs who made Amundsen’s exploration possible, and who helped humankind discover the final undiscovered part of our world.

Amundsen began his Norwegian expedition with 97 sturdy canine souls, who were taken on board the Fram near the coast of Kristiansand in August 1910. Through births and deaths on the ship during their five-month journey south, the dogs’ number swelled to 116 upon arrival in Antarctica. Adults and puppies alike withstood the roller-coaster ride of the Fram on the ocean waters, the heat of the tropics near the equator, and the freezing winter of Antarctica. Taking into account the birth of puppies on the ship and at their Antarctic home Framheim, the actual number of dogs involved in this significant moment in history doubles to over two hundred. But, after initially nurturing and protecting the dogs, Amundsen proceeded to cull them throughout the expedition, slaughtering those he deemed unnecessary or weak, and destroying those who had served their purpose. Amundsen began his South Pole trek in October 1911 with 52 brave canines, and returned with 11, as a result of unnatural, forced attrition. The dogs were nearly starved; at times when they were fed, it was the flesh of their fallen comrades they were given to line their empty stomachs. And yet the dogs all performed their roles brilliantly, even when death was their reward. The sled dogs were the heart and power of the South Pole expedition. The intent of this article is to shine a light on the dogs’ population, accomplishments, and sacrifices, and to give them their due recognition and place in history.

KEYWORDS

Sled dogs, sledge dogs, Roald Amundsen, South Pole, Antarctica

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INTRODUCTION

The sledge dogs are the unsung heroes of Roald Amundsen's South Pole expedition. They, as Amundsen himself stated, were the key to his success and to the achievements of the Norwegian Antarctic Expedition of 1910-1912 (Amundsen 1912). Without these canine explorers, Amundsen probably would not have reached the South Pole prior to Robert Falcon Scott – perhaps he would not have reached the Pole at all.

Amundsen charged his men with making the dogs their priority, as the fate of the entire expedition rested on their canine shoulders (Amundsen 1912; Johansen 2011; Gjertsen 2011). He professed supreme knowledge of the Polar dog. And he praised the dogs as the best means of transportation (Amundsen 1912). But Amundsen did not always understand or handle his dogs well. Indeed, many times the dogs were quite misunderstood by the great explorer. The sometimes questionable and many times ruthless treatment extended from the ship's voyage to the work in Antarctica. At one point he carried out a mass killing of 24 dogs who had helped bring him to the Polar plateau – a truly astounding feat for which they received no other acknowledgement but a pull of the trigger. As the Pole grew ever nearer, with the dogs diligently pulling the men toward their goal, Amundsen destroyed the loyal animals who had brought him there.

Although it is generally understood that the dogs were the one significant point of difference between the Norwegian expedition and the English expedition, precious few writings have focused on the dogs themselves – just how crucial they were to Amundsen's progress, how extensive and intricate their canine community was within the expedition, and how deeply they were penalized for being in the unfortunate position of existing as Polar dogs during the early twentieth century. The contention that most of them were killed out of necessity is not accurate. Moreover, their loyalty, courage, and endurance in the face of the harshest conditions dealt by nature – and the harshest treatment dealt by humans – have not been thoroughly documented and analyzed before now.

This article is intended to shine a light on the dogs, to present a comprehensive record of their population, and to offer accurate information in the face of some of the myths. It highlights some of the lesser-known facts, some of the individual dogs, their feats that enabled the humans to reach their goal, and their relationships with one another, with Amundsen, and with the expedition members. It is based on information featured in the author's book *The Sled Dogs Chronicles*, which names, tracks, identifies, and documents all 116 dogs using the expedition members' diaries and documents, and provides their detailed biographical information. The source material used includes all the crew's journals, relevant personal letters, business correspondence, ship's logs, and expedition reports. Here we take a closer look at the dogs who made Amundsen's attainment of the South Pole possible, and give credit to their sacrifices and their achievements.

GOOD GREENLAND DOGS

When cool, methodical Roald Amundsen impulsively turned the world upside down, deciding to secretly sail to Antarctica in quest of the South Pole whilst all the world thought he was heading to the North Pole, he knew he had to have dogs to help him successfully carry out his plan. And so

in September of 1909, one day after making his decision, Amundsen was en route to Copenhagen, Denmark to purchase the best dogs possible for his expedition. He acquired them from the very reliable and reputable Royal Greenland Trading Company, represented by its equally respected Inspector Jens Daugaard-Jensen (Amundsen 1912). Obtaining dogs was the primary issue for Amundsen, for in this crucial journey to the south, there was no greater advantage, nor any more important factor, than the speed, ease, and trustworthiness of good Greenland dogs.

While 100 is the number normally associated with the Amundsen expedition, originally Amundsen had ordered only 50 dogs from the Greenland Inspector, but quickly doubled that amount to 100 (J. Daugaard-Jensen, personal communication, 17 September 1909). His decision was probably an effort to increase his chances for victory – to establish a system of built-in redundancy wherein a backup element would replace a working element in the event of the latter's demise or malfunction. Here Amundsen's magic number of 100 dogs provided a security blanket – a skilled labour pool, a trained understudy dog standing in the wings for each active dog. This redundancy was instrumental to Amundsen's method, and its brutal effectiveness was seen later during the preparations and the actual trek to the South Pole.

SEX, SECRETS, AND KIBBLES

To the Greenland Trading Company, Amundsen's endeavour was still a planned excursion to the North Pole. The true destination of the Norwegian expedition – the South Pole – was known only to Amundsen and his brother Leon at this time. It was a fine balancing act for Amundsen to make the necessary preparations for a real expedition under the guise of an imaginary one. For his part, the good Inspector Daugaard-Jensen was very polite and accommodating, precisely listing the descriptions, ages, sexes, costs, and qualities of the dogs, and itemizing the proportionate number of harnesses, whips, and food necessary (J. Daugaard-Jensen, personal communication, 17 September 1909).

The dogs would all be two to three years of age; they would come from the west coast of Greenland, from the three districts of "Egedesminde, Govhavn, and Jakobshavn" (Aasiaat, Godhavn, and Jakobshavn Glacier); and they would be hand selected by the Inspector himself, who promised he would purchase only "good, big animals" and would choose the very best (J. Daugaard-Jensen, personal communication, 17 September 1909). Five of the original 50, and later 10 of the amended order for 100 dogs, would be female – indicating a ten-percent rate for breeding. The price for the dogs was 12 kroner for each male and 10 kroner for each female. Evidently a lower value was placed on working dogs who could also give life to additional working dogs.

Food was a concern – 10 tons of "lodde" fish was a large order to catch and dry by June of the following year (J. Daugaard-Jensen, personal communication, 14 September 1909). And so the inspector suggested preparing the fish as a paste, mixed with fat. This is indeed what Amundsen ultimately did, providing fish pemmican (dried fish with lard, dried milk, and middlings) and daenge (a fish-and-butter mixture) as well as dried fish and meat pemmican for the dogs (Amundsen 1912).

By the end of September, Amundsen was given official approval to bring the dogs from Greenland

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to Norway. He received a confirmation that they would be shipped the following June-July with the steamer Hans Egede to be put on shore near Kristiansand (C. Ryberg, personal communication, 20 September 1909). But negotiations continued for another three months. Finally, on 30 December, an official letter from the Inspector confirmed the costs and purchase of the dogs Amundsen so ardently needed (J. Daugaard-Jensen, personal communication, 30 December 1909). On the last page of this letter, at the very bottom, underneath Daugaard-Jensen's flourished signature, Amundsen added an urgent note, scrawled in large handwriting across the full width of the page: "Naar kommer Hundene?" – "When are the dogs coming?" He was impatient, as he had placed a priority on the dogs and was quite desperate to know when his 100 good Greenland dogs would arrive – the dogs who would take him to the South Pole and to that place in history which he so fervently sought.

TWO "ESKIMOS" TO CARE FOR HIS DOGS

It is known that Amundsen professed an intimate knowledge of working with Polar dogs, and included in his crew two members who were expert dog-drivers with previous experience in sledging expeditions – Sverre Hassel and Helmer Hanssen. But a less-publicized fact is that, initially, the great explorer and reputed dog expert had attempted to hire two young Inuit males from Greenland to care for his 100 dogs during the voyage from Norway to Antarctica, and possibly during the South Pole expedition itself. The fact comes to light in a series of letters between Amundsen and the Greenland Trading inspector, sent once the purchase of the dogs had been secured. Amundsen first broached the subject in a letter dated 7 February 1910, in which he mentioned in passing a request for two "Eskimos" from Greenland to be provided as part of his expedition (R. Amundsen, personal communication, 7 February 1910). This new inquiry for two people to be brought with the dogs unleashed a whole new series of letters, requirements, and complications that Amundsen probably did not foresee, and that brought new headaches to Daugaard-Jensen. The inspector questioned Amundsen regarding the length of time for the expedition and how these two people would be returned home (J. Daugaard-Jensen, personal communication, 10 February 1910). Amundsen's reply was not very specific. Regarding the route, he said the plans were to sail around South America, up to San Francisco, and across the Bering Strait, then to the Polar Ocean – but he did not mention anything about stopping in Antarctica (R. Amundsen, personal communication, 12 February 1910). After further questioning by Daugaard-Jensen (J. Daugaard-Jensen, personal communication, 15 February, 1910), Amundsen finally replied forthrightly: "The main purpose for me is to have people who are fully accustomed to dogs during the first part of the trip round to San Francisco. I'm willing to arrange for them to come back home safely from San Francisco" (R. Amundsen, personal communication, 17 February 1910). It was important for him that there be two Greenland individuals to take care of the dogs, and that they be "in their best age" (R. Amundsen, personal communication, 25 February 1910).

So here we gain the full measure of Amundsen's priority and concern for this expedition: first and foremost he wanted the dogs to be well taken care of – and perhaps trained – by those who were most knowledgeable and experienced with sled dogs – the Inuit.

The request, however, brings into question Amundsen's own confidence about transporting the

dogs from north to south. Perhaps he was not so certain that he would be able to keep the dogs healthy and alive as they crossed the equator. And perhaps he suspected that he would need help handling his dog team once in Antarctica.

His request also meant bending or withholding the truth about the two dog handlers' true destination and duration of employment.

Amundsen did receive an approval from Dagaard-Jensen, who asked the explorer to send an official request to the Department of Foreign Affairs (J. Dagaard-Jensen, personal communication, 6 March 1910). To this Amundsen replied that he would write to the official government in Greenland and that he was "grateful to read that you are going to get me skilled people" (R. Amundsen, personal communication, 9 March 1910).

He ultimately abandoned the request, no doubt realizing that there was too much government scrutiny involved, which he was not prepared to undergo.

Amundsen's attempt to secure two Inuit implies a lack of confidence in his ability to take care of his dogs during the long voyage south – and possibly even during the time on the Antarctic ice. It most definitely reflects the importance he placed on the dogs.

DOGS AND PUPPIES ON THE HIGH SEAS

One hundred dogs were loaded onto the ship in Greenland, but three died in transit to Norway – two on the ship, and one during an attempted escape on shore – leaving 97 to board the *Fram* at Kristiansand in August 1910 (Amundsen 1912; Wisting 1930). They were situated along the deck and on the bridge (Fig. 1). Dagaard-Jensen had promised that 10 dogs would be female – in actuality there were 15 females on board. Despite all the dogs being chained to the deck, they went to work rather quickly. In short, they were fruitful and multiplied, to the tune of over 60 new puppies born en route to Antarctica (Author's research). But the happy events were marred by crass deeds. Many touching moments of bliss ended with a nonchalant throwing of the newborn puppies overboard. This was done whenever the puppies born were female. Woman was not welcome on board, and Amundsen reiterated this many times, quoting Fridtjof's Saga, the romantic-heroic poem by Esaias Tegner: "Woman is protected ashore, must not come on board, was it Freia, betray you she will'. All of them end up in the sea" (Amundsen 2010: 47.) The killings began with the first births that took place on 29 August to mother Camilla (also spelled Kamilla) (Amundsen 2010). Her caretaker, veteran Arctic explorer Hjalmar Johansen, agreed with the practice, rationalizing that "there are enough bitches on board and we have enough breeding animals with those we already have," and complaining of the "terrible racket" that those who were in heat made "both day and night" (Johansen 2011: 24). But he later described the practice as merciless although he did not disagree with it (Johansen 2011). The female puppies' forced exits from life were also accompanied by disparaging remarks reflecting Amundsen's morbid humor: they were "the weaker sex" who were "offered to the albatrosses" who "certainly found the new born puppies very tasty" (Amundsen 2010: 59). In the end, only one female puppy was allowed to live aboard the *Fram* on the way to Antarctica (Amundsen 2010) – she was born to the last mother to have puppies on board.

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In all, at least 33 female puppies were killed – thrown overboard to become fish food or bird food or flotsam floating on the sea of life (Author's research).

All the male puppies were allowed to live, but several of them died owing to sickness, illness of the mother, or – in rare instances – being preyed upon by an adult. There was one “cannibal” on board named Jakob who helped himself to a few unsuspecting puppies on the ship (Amundsen 2010: 75).

The month of October particularly saw many births taking place among the violent swells of the sea. Hjalmar Fredrik Gjertsen, a flamboyant young first mate with a performer's sense of humor, many times described the scene as the ship dancing in the storms and the contents dancing across the deck, narrowly missing the dogs (Gjertsen 2011).

The net number of puppies added was 22 males and one female. These furry small creatures were lovingly looked after by the crew, especially by Lieutenant Thorvald Nilsen (soon-to-be captain of the *Fram*), who played foster parent to the young, and tended to the nursery built next to the bridge (Amundsen 2010). Many of the puppies are seen cradled in the crewmembers' arms in photographs taken on board the ship. Several of the crew's diaries express how much the puppies – and the dogs – provided important companionship and entertainment during the long lonely voyage (for example, Gjertsen 2011).

As for the adults, all but four of them survived the ship's voyage. One sweet and docile female died nursing her four puppies, one male died of sickness, and two – a female and a male – tragically died from being swept overboard. Amundsen's remorse for the latter two resulted in the crew's securing the sides of the deck so as to prevent any further accidents (Amundsen 2010).

A week before they reached Antarctica, Amundsen breathed a deep sigh of relief. He had successfully transported the dogs – without the help of the two Inuit. He positively gushed to his diary: “Now, that all danger of illness seems to be over, I must admit that our transport of these dogs over a distance of 16,000 km in all kinds of weather and practically all temperatures, is not just a complete success, but also evidence of special and thoughtful care. A reminder to the many who thought that the expedition would involve animal cruelty from first to last. Good grief! How I wish I had these sensitive people under my treatment. They are hypocrites. Good God! I can safely say that the dogs love us” (Amundsen 2010: 81).

The final number of dogs who arrived in the Antarctic was 116 (93 adults and 23 puppies), but another puppy died upon arrival, and so 115 dogs stepped foot onto the Antarctic continent in mid January-early February 1911 when the *Fram* anchored in the Bay of Whales (Author's research based on all diaries and R. Amundsen, report, 9 February 1911).

WORKING IN ANTARCTICA

After a few comic episodes wherein the dogs became acclimated to the new icy perch and their new harnesses, the dogs immediately went to work on the Antarctic continent, hauling sledge-loads of supplies from the ship to the base camp Framheim, which was built on the sea ice shelf below the

Great Ice Barrier (Fig. 2). Framheim was a compound containing a pre-fabricated house with room extensions tunneled beneath the ice, surrounded by large tents for the food, supplies, and – very importantly – spacious 16-man tents for the dogs. Nearly 90 dogs pulled 900 cases plus building supplies and equipment from the ship (Amundsen 2010).

The dogs made a successful first depot run in February, hauling food and provisions to 80° South. Four men with three sledges of six dogs each made the steep climb from the bay ice shelf to the Ice Barrier, and traveled for five days. They pulled 200 kilograms per sledge (Amundsen 2010), and Amundsen was elated with their performance. “The dogs pull wonderfully and the surface here on the barrier is ideal,” he wrote in his diary. “Can’t understand what the Englishmen are thinking of when they say that dogs are useless here. No better sledge animals can be found under these circumstances” (Amundsen 2010: 136.) But according to Johansen, the loose, deep snow made the going heavy for the dogs, and they all had to be beaten in order to go forward. Amundsen’s team specifically showed the weakest performance, and Amundsen himself had extreme difficulty working his dogs, throwing off articles of his clothing as he became overheated (Johansen 2011). Johansen had previously professed that a good dog-driver understands the high intelligence, sense of fairness, and infinite loyalty of dogs (Johansen 2011.) Could it be that Amundsen, the Polar dog expert, was exhibiting flawed dog-driving tactics? Yet even with the experienced dog-drivers, the dogs were being whipped severely to work. Unfortunately, this would be the norm for the dogs during their time in Antarctica.

THE DISASTROUS DEPOT TOUR

The first deaths on the ice occurred during the second depot tour in February-March 1911, when eight men with 42 dogs and seven sledges laid depots at 81° s and 82° s in preparation for the South Pole trek. Eight dogs died while pulling unendurably heavy weights and being driven to fatal exhaustion. Five of them were from Amundsen’s team and died from mishandling and being pushed too hard and too far by Amundsen. One was from right-hand-man Oscar Wisting’s team, and two from carpenter-turned-explorer Jørgen Stubberud’s team (Amundsen 2010; Bjaaland 2011; Johansen 2011). Amundsen’s dogs in particular died slow, painful, gruesome deaths. And his inability to handle them was witnessed and documented by some of the other men.

Johansen watched and critiqued Amundsen’s team: “The Chief’s dogs are the worst” (Johansen 2011: 61). Ski-champion Olav Bjaaland, whose observational skills were exceptional, wrote in his diary, “The boss and his dogs are struggling worse than bad” (Bjaaland 2011: 49). Even Amundsen admitted to his diary, “My dogs were difficult to drive forward today” (Amundsen 2010: 141). Pulling 300 kilograms per six-dog sledge (Johansen 2011) in what would average to be a frigid -40° Celsius, and encountering a gradual incline along the way, Amundsen’s dogs were becoming difficult to move along. “They are fed up and it seems that they do not get enough food with their ½ kilo pemmican per day” (Amundsen 2010: 142). And yet he merely noted the deficiency in his diary and did not later increase the quantity of food for the dogs (Amundsen 2010). Bjaaland had to take onto his sledge 50 kilos of weight from Amundsen’s sledge, and consequently struggled with the heavier load, noting that Amundsen could not handle his dogs even though he beat them with astounding force (Bjaaland 2011). Amundsen’s cold, hungry, and sore-footed dogs were forced to march at the

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end of a whip, and his inability to work with them was felt by the other teams.

The journey was difficult for all the dogs, but it was Amundsen's dogs who suffered the most. One dog, Odin, was sent home with some of the men, where he died. Upon reaching the depot at 82°, Amundsen stored his sledge and divided his remaining five dogs among lead dog-driver Helmer Hanssen and Oscar Wisting. Lasse, Tor, Ola, Jens, and Rasmus rallied as best they could, but soon all but Lasse died on the return (Amundsen 2010; Bjaaland 2011, Johansen 2011). "Have now only 'Lasse' left," wrote Amundsen of his favourite dog Lassesen (Amundsen 2010: 145). But the handsome black dog had now disappeared and the men feared the worst (Johansen 2011). Fortunately for Amundsen Lasse reappeared and pulled the rest of the way home (Amundsen 1912).

Upon returning to Framheim on 22 March, Amundsen assessed the deaths of the dogs in terms of gains for the depot trip – a currency to be paid for preparation for the Pole. "The outcome of this depot tour is magnificent," he wrote in his diary. "Total weight of these depots [at 80°, 81°, and 82°] = 620 kilos. But this tour has unfortunately cost the lives of eight of our best dogs. It was probably due to the unusual cold, together with hard work. It was my team in particular that was affected. I had only 'Lasse' left when we arrived home. It cannot be denied that it is good to be home again" (Amundsen 2010: 146).

Amundsen had shown an alarming lack of ability to work with his dogs. He had relinquished his team to the two better-suited professionals who could – relatively speaking – more humanely drive his dogs. But all the dogs had suffered.

NO FURTHER SLEDGE-DRIVING FOR AMUNDSEN

The disastrous depot run caused Amundsen to lay aside his sledge and disperse his remaining dogs among the rest of the men, who would work with them on their own sledge teams. He sent Johansen to lead the third depot tour without him, while Amundsen stayed at Framheim nursing an anal sore that had bothered him during the month-long second depot tour (Amundsen 2010; Johansen 2011). Amundsen decided during the winter months that he would not drive his dogs himself to the South Pole, "as I don't dare do this myself yet", but would instead ski at the head of the caravan as forerunner (Amundsen 2010: 197). It must be that he recognized some limitations to his ability to drive the dogs, combined with the negative effects of his continued suffering from his painful ailment.

Three more dogs perished during the third depot tour. They were Johansen's dogs, and he was devastated by their loss. Two – Emil and Hellik – fell down a bottomless crevasse, and one – Cook – fell behind from a leg injury and probably froze to death (Johansen 2011). Emil and Hellik had been nursed back to health on the ship by Johansen and had been stalwart teammates. He would write of all three dogs in his diary repeatedly throughout the winter months, mourning their deaths.

Over the course of the winter at Framheim, while the house became buried under the snow, another nine adult dogs died by falling down crevasses, falling ill, or being ordered shot by Amundsen (Author's research based on all diaries).

But the winter months also saw new life on the frozen continent. Several litters of puppies were born, totaling to over 35 newborns. Sadly, despite their tenacity and their mothers' attempts to tend to them, most succumbed to the continent's harshness, freezing to death. (Author's research). Female puppies were not welcome on land as well, and Amundsen took devilish delight in describing how he devised their demise. Six of them were intentionally fed to their mother's suitors (Amundsen 2010). Only four hearty puppies survived – they were Camilla's sons. Johansen doted on them (Johansen 2011).

THE PREMATURE START

Amundsen's life was saved on 5 September 1911 when, while on a test run, the sledge dogs suddenly swerved away from the Barrier's steep edge toward which the men had been blindly driving them as they could not differentiate between the ice and the white sky. Led by Mikkel, who ran on expert dog-driver Sverre Hassel's team, all the dogs acted quickly and on their own initiative, narrowly missing a 75-foot drop despite the fact that the men were whipping them to go toward it (Amundsen 2010; Johansen 2011).

Three days later, an impatient Amundsen began his rushed false start for the Pole – the ill-fated journey which ended in a hasty retreat and resulted in injured dogs, frostbitten men, and a near death experience for Johansen and second lieutenant Kristian Prestrud, and which subsequently sowed discord among the men.

The premature start claimed the lives of a total of seven of the dogs – some were intentionally shot as nuisances, and others froze to death on the ice in the severe weather (Amundsen 2010; Hassel 2011; Johansen 2011).

Those who were killed included three of the four hearty puppies born to Camilla during the winter. These three strong puppies innocently and eagerly trailed the caravan on its journey, and were killed as a consequence. Luckily the fourth one ran home to Framheim (Johansen 2011).

Another casualty was Kaisa, a large, gregarious female dog with whom Amundsen had an especially contentious relationship. She had the temerity to come into heat during the premature start and cavorted with male dogs all night, causing Amundsen to catch nary a wink of sleep. Grumpy and furious in the morning, he had her shot, exclaiming "I think we'll have peace tonight" (Amundsen 2010: 281.) Although several of the men, including Amundsen, recorded this incident in their diaries, Amundsen did not write of it in his *The South Pole* book. Also not mentioned in the book is the fact that after the expedition had moved on, Kaisa's son, Kaisagutten, remained behind to lie down beside his mother's body. Bjaaland and Prestrud had to return to collect him (Amundsen 2010; Bjaaland 2011; Johansen 2011; Hassel 2011). Johansen later lamented the loss of Kaisa (Johansen 2011), and Amundsen stated that of all the dogs who had been sacrificed during the premature start, Kaisa was "The only one of these worth anything" (Amundsen 2010: 284).

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THE SOUTH POLE TREK

Of the 103 dogs at Framheim in October 1911, 52 went on the South Pole trek. The few dogs formerly on Amundsen's team now pulled Wisting's sledge. The journey began with sudden exhaustion by some of the dogs, who were set free to follow the sledges. One of these – Neptune – remained behind and never caught up to the party – he was never seen again. Another – Peary – returned northward and was later found alive and well at the 80° depot by the Eastern Expedition of Johansen, Prestrud, and Stubberud on their way to King Edward VII Land.

After the initial stumble, all the dogs demonstrated fine form and served Amundsen well. But he immediately began discarding dogs who showed any signs of slowing. Ten dogs were killed on the way to and from the Pole because they had become sick with exhaustion, were pregnant, were female, or had just rubbed Amundsen the wrong way. Five of these were killed on the way to the Pole, and five on the return. Only one of these – Frithjof – was a mercy killing.

Forty-two dogs made the arduous climb to the Polar plateau, bringing Amundsen and his men safely to the gateway to the Pole. Tragically 24 of the dogs were slaughtered at Butcher's Shop to rid Amundsen of excess dogs once they had valiantly delivered him to the door of victory.

Four dogs ran away: Three going back to be with their fallen friend whom Amundsen had ordered shot because she was in heat, and one walking away because he could take no more – it was his ultimate critique of the entire enterprise. His departure on 8 December surprised the men and upended Amundsen's plan to have 18 dogs to take him to the Pole. Consequently, 17 dogs reached the South Pole (Fig. 3). One dog was sacrificed at the very Pole itself, marking the attainment of the Pole with the loss of life. His name, Helge, was written by Amundsen in his diary on the same page upon which the explorer announced reaching his goal (Amundsen 1910-1912, 15 December 1911). Sixteen dogs, then, departed from the South Pole. Frithjof's mercy killing took place during the return – the men were forced to euthanise him as his lungs had ceased to work. This altered Amundsen's plan to return home with 12 dogs. And so 11 dogs ultimately returned from the South Pole journey (Amundsen 2010; Bjaaland 2011; Hassel 2011; Wisting 2011; Johansen 2011).

THE ETHICS OF THE KILLINGS

Amundsen planned the South Pole journey to the nth degree. Early on he had pre-ordained the fate of the dogs. And yet he professed his initial discomfort in his diary during the winter prior to the South Pole trek: "Faithful they are indeed, faithful to death. It often cuts me to the heart when I think that these our faithful companions, our so very dear friends, will all probably be paid for their faithful service with death. Luckily, it is unlikely our feelings will be quite so tender when we will have done more of our journey" (Amundsen 2010: 229). Amundsen steeled himself against sentiment; he was counting on the dogs' loyalty to see him through to his goal, and he knew that it in turn would bring them to their end.

In his book *The South Pole*, Amundsen states that the decision to kill all but 12 of the dogs was made collectively by the men on the eve of the ascension to the Polar plateau, which, according to

the diaries, was 17 November (Amundsen 1912). But in actuality, Amundsen had already made this decision as early as 10 November, on which date the men laid a depot containing enough food for only 12 dogs on the return trip (Amundsen 2010; Bjaaland 2011; Wisting 2011; Amundsen 1912). Even earlier, on 6 November, Amundsen, Hassel, and Bjaaland all reported that there was not enough food for the dogs past 86° (Amundsen 2010; Bjaaland 2011), with Hassel specifying that at that point they would “slaughter the poorest dogs, so that one starts from there with 12 dogs” (Hassel 2011: 131).

On 17 November 1911, a substantial quantity of food was deposited at the main depot at 85.5°, and more would be stored at each degree thereafter. Amundsen had computed the distance and orchestrated the numbers so that the dog food carried on the sledges was only enough to keep all the dogs alive through the steep climb up the mountain (Amundsen 2010).

The dogs began their most difficult work on 18 November, exceeding Amundsen’s expectations (Amundsen 2010). They drove for 3.5 hours before being double-teamed to pull the sledges up the steep, rough incline (Hassel 2011). And in one day they climbed 5,900 feet, according to Wisting, who marveled “it is just about incredible that a few dogs can manage to pull so much” (Wisting 2011: 140).

Amundsen writes in his book that on the night before the final leg of the climb, he took great satisfaction in knowing that the dogs had brought him to this vaulted point six days prior to schedule, and that on the next day, upon reaching the summit, he would be able to slaughter the unnecessary animals early and so enjoy for himself “fresh dog cutlets” which made the men’s “mouths water” (Amundsen 2002: 219). But no such gaiety and mouthwatering anticipation is recorded in the expedition diaries – only admiration for what the dogs had accomplished. Was a cooked dog steak really foremost in the men’s minds on this night, as Amundsen claims?

On 21 November the dogs made the climb of their lives, lying flat on their bellies as they clawed the steep ice to bring the men up to nearly 11,000 feet. It was as if they had sensed the importance of this endeavour to the men, and had made it happen (Amundsen 1912).

“So we succeeded in finding our way forward,” wrote Amundsen in his diary that night. “We are now lying on the plateau at 10,600 ft. It has been a really strenuous day, mostly for the dogs. But they have also, 24 of our best comrades, been given the best reward: death. On arriving at 8 pm, they were shot and their intestines removed. They will be skinned tomorrow. We now have 18 of the best left. These we share between three teams, six in each. It was wonderful work the dogs performed today. 17 km with a climb of 5,000 ft. Come and say that dogs are useless here. In four days we have come from the coast to the plateau 44 km, 10,600 ft. It is marvelous work” (Amundsen 2010: 304). Amundsen admitted their worth and sacrifice, but had no qualms about killing them.

The only expedition member to express remorse in his diary was Hassel, saying he had “undertook the sad and unpleasant shooting” of some of the dogs (Hassel 2011: 135). Wisting was looking at the bright side of things – that these slaughtered dogs would provide much needed nourishment for the remaining dogs: “they will be fed to the others and then we will have a soup of them” (Wisting 2011: 141).

THE MEAT OF THE MATTER

The dog meat that was fed to the men was only for a change of diet, and for variety, as the men had full provisions on the sledges, including pemmican for protein. Wisting wrote of the butchered dogs: “we have free dog food, we feed them [the 18 surviving dogs] dog meat only now and eat it ourselves as well. We do not need to do this as we have more food than we are able to eat on this trip, but we do it for the sake of health and because it tastes good” (Wisting 2011: 142).

Amundsen turned to meat in times of relief following severe anxiety. Immediately after completing the Northwest Passage he had wolfed down raw meat which he grabbed in handfuls and pulled off the rigging of the *Gjoa* (Amundsen 2008). On the Belgica expedition, during the nightmarish dark and madness-filled months in Antarctica, he and Dr. Frederick Cook had maintained their health and sanity by eating seal and penguin meat (Amundsen 2008). So here, too, in the South Pole expedition, Amundsen approached the journey with meat on his mind – he would have enough meat to stave off scurvy and to instill a sense of calmness. And hence Butcher’s Shop became a crimson and white meat haven where Amundsen watched his man Wisting cook up fillets of their dead canine comrades that were displayed in rows upon rows of red raw meat spread over the pristine ice (Amundsen 1912). “We have had the most delicious dog cutlets for dinner. I ate five myself, but had to stop, as there weren’t any more left” (Amundsen 2010: 305). Of the 24 dogs butchered, 10 were skinned and prepared for eating (two of which were eaten by the men) while 14 were stored in a depot, three of which were fed to the dogs on the return trip (Amundsen 2010). Eleven carcasses, then, were untouched – dogs who had been killed needlessly.

Amundsen did not flinch from telling the world about Butcher’s Shop. Even when the Royal Geographical Society’s esteemed secretary John Scott Keltie pleaded that Amundsen avoid mentioning anything about the butchering of the sled dogs when delivering his anticipated speech to the RGS (J.S. Keltie, personal correspondence, 7 October 1912), Leon answered that Roald “asks me to thank you for your kindness but he regrets he can make no more alterations in his lecture” (L. Amundsen, personal correspondence, 19 October 1912).

Newspaper reports following the expedition, which devoted a lot of favourable ink to the dogs, reflected the impression that the killing and eating of the dogs was necessary for the men’s survival. One headline boldly proclaimed that Amundsen was “forced to kill and eat his dogs” (The New York Times 11 March 1912). Amundsen encouraged this perception. In The New York Times he is quoted as saying: “I think what touched us most keenly on the whole journey was the unavoidable killing of dogs which had shared our dangers and done such splendid work. The killing of them went to the heart of every one” (The New York Times 12 March 1912).

But Amundsen also gave the dogs their due. The Daily Chronicle quoted him as saying: “I attribute my success to my splendid comrades and to the magnificent work of the dogs, and, next to them, to our skis and to the splendid condition of the dogs on landing in the Antarctic, due mainly to the precautions taken on the *Fram*” (The Daily Chronicle (London) 11 March 1912). Dogs and skis, in that order, had helped Amundsen win his race. Amundsen’s relief that he was able to transport the dogs safely to Antarctica – without the help of two Inuit – is quite palpable. He could now assume

the position of victor.

The dogs had worked hard to bring Amundsen to the South Pole. They paid the price for his victory and for this episode of human achievement.

THEIR FINAL DESTINATIONS

While the 52 dogs had been on the South Pole journey, 17 dogs traveled on the Eastern Expedition to King Edward VII Land with Johansen, Prestrud, and Stubberud (Johansen 1910-1912). No dogs were harmed on that trip (Johansen 2011). Approximately 11 remained at Framheim with cook extraordinaire Adolph Lindström. The remaining 22 dogs simply ran wild on the ice and became unwitting inhabitants of Antarctica. They were left behind (Amundsen 1912).

The 11 South Pole survivors, 17 Eastern Expedition veterans, and 11 Framheim residents all boarded the Fram in January 1912. And so 39 dogs left the Antarctic continent (Amundsen 1912).

Of these, 21 dogs were presented to the Douglas Mawson Australasian Antarctic Expedition upon the Fram's arrival in Hobart. They were offloaded on 13 March 1912 and taken by rowboat to the Nubeena Quarantine Station (Hassel 2011), located in windswept Tarooma along the Tasmanian coast. Here the dogs waited nine months before boarding the Aurora the day after Christmas, arriving in Antarctica in January 1913 for a second tour of duty. Shortly after their arrival at Main Base in Adelie Land, 11 of the dogs regrettably were shot by Mawson's men, who were concerned about keeping the dogs over the winter. They were buried in the sea. They had come so far, only to be deemed dispensable. Ten were kept alive to spend the winter with the Aussies and their remaining three young pups, and were cared for by Cecil Madigan. Of those 10 dogs, sadly two died in Antarctica, but not before one of them had given birth to a puppy (Madigan 2012.) The eight survivors and one puppy, along with the expedition's three pups, left with the expedition back to Australia, where the newspapers reported only 11 rather than 12 dogs had arrived in February 1914 (The Mail (Adelaide, SA) 28 February 1914). There is the possibility, then, that one of the eight dogs or the puppy may have died on the ship. The dogs were housed temporarily in the Adelaide Zoological Gardens in quarantine, and most of them were adopted by the expedition members (The Register (Adelaide, SA) 2 March 1914). Two remaining dogs, however, were given by Mawson as a gift to the Zoo in April 1914, and were accepted by the Royal Zoological Society of South Australia so that the dogs would not be killed (Rix 1978; South Australian Zoological and Acclimatization Society 1915).

The 18 dogs who remained with Amundsen on the Fram in Hobart in March 1912 went on with the Norwegian expedition to Buenos Aires. They were joined by another four puppies – two male and two female – who were born to Snappesen en route to Argentina in March/April and who were allowed to live (their four siblings were not). A total of 22 dogs arrived in Buenos Aires in May. There two of them – Uroa and Rotta – were presented as gifts to Amundsen's benefactor Don Pedro Christophersen to be kept as pets by his son Peter. These two caused such a disturbance that they were promptly given back. Peter Christophersen traded the two dynamic dogs for one of Snappesen's puppies born on the journey to Buenos Aires. His sister Carmen took another

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puppy. Unfortunately these two puppies died soon after. This left 20 dogs remaining. All 20 dogs were placed in the Buenos Aires Zoo in late May, as Amundsen wished to put them on display. There, tragically, over a few months, most of them died from a disease unknown at the time whose symptoms resemble canine distemper. The dogs probably were infected by other animals at the Zoo. It was a terrible consequence of imprisoning and placing on public exhibition these social, active beings who had crossed the oceans and bravely traversed the Antarctic continent. Only seven remained, just barely clinging to life, and they were taken back to the Fram in August by Nilsen in an effort to keep them alive. But most of them suffered greatly and either died an excruciating death or had to be shot in order to end their extreme agony. The last of them were Hai and Rap – both of whom died of physical and mental anguish in October and December respectively. Only three survivors recovered and sailed back to Norway in January/February 1913 – Obersten, Lussi, and Storm. They came home to a heroes' welcome. Obersten was exhibited by Amundsen's brother Leon on the dog show circuit and won medals and trophies. Lucy and Storm went on to take part in a heroic rescue mission that saved many human lives (Author's research and biographical compilation using original sources including: Nilsen 2011; Hassel 2011; T. Nilsen, personal communications, 8 October 1912 and 15 October 1912; C. Doxrud, personal communications, 29 August 1912 and 4 January 1913; L. Amundsen, personal communications, 6 February 1913 and 28 May 1913.)

HUMAN-ANIMAL NATURE

When taking into account all the births during the ship voyages and the winter in Antarctica, the total number of dogs involved in Amundsen's South Pole expedition more than doubles to over 200. Over 100 of these dogs provided companionship, guidance, and crucial mobility to the Norwegian Antarctic expedition. The dogs who helped Amundsen gave their all – and gave their lives. These sled dogs are a significant part of our history.

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Fig. 1. *Dogs on the bridge: The dogs curl up under the pilot wheel. Note the high seas. (Photo courtesy of Nasjonalbiblioteket [National Library of Norway], Oslo, Norway.)*

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Fig. 2. *A team of dogs and Helmer Hanssen go out on the Ice Barrier. Note the large whip in his hand.*
(Photo courtesy of Nasjonalbiblioteket [National Library of Norway], Oslo, Norway.)



Fig. 3. *One of the sledge dog teams at the South Pole, with Oscar Wisting and loaded sledge. (Photo courtesy of Nasjonalbiblioteket [National Library of Norway], Oslo, Norway.)*

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THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS: STEP 2 ADDRESSING FISHING VESSELS

ASOC

ABSTRACT

This paper reports on progress at the International Maritime Organization (IMO) on the adoption of a Polar Code for shipping in polar waters, and sets out the initial steps for a second phase on work that will address fishing vessels and other vessels not currently covered by the Code. The paper identifies the relevance for fishing vessels of various safety matters addressed in the Polar Code, on the basis of recent incidents in the Southern Ocean. Finally, it proposes measures on ice strengthening of fishing vessels and training of fishing vessel crews, which should be introduced by CCAMLR in the interim.

KEYWORDS

Polar Code, pollution, security, ships

1. UPDATE ON THE POLAR CODE

In February 2010, the International Maritime Organization (IMO) started a major new initiative – the development of a legally binding Code to cover shipping in both Arctic and Antarctic waters. The work was complex covering many aspects of international shipping in polar waters. Late in 2014, the IMO adopted Part I of the new International Code for Ships Operating in Polar Waters or “Polar Code” which focuses on the safety of shipping in Polar Waters. Adoption of Part II of the Code, which focuses on pollution prevention, followed in May 2015, and now both Part I and Part II will take effect from January 2017. Polar waters are, for Antarctica, defined according to the existing IMO definition of the Antarctic Area¹, i.e. the sea area south of latitude 60oS.

In addressing the safety of passenger ships and cargo vessels in polar regions, Part I of the Polar Code includes a comprehensive range of provisions covering:

- requirements for a polar certificate
- preparation of a polar water operational manual
- ship structure
- subdivision and stability
- watertight and weathertight integrity
- machinery installations
- fire safety / protection
- life-saving appliances and arrangements
- safety of navigation
- communication
- voyage planning
- crewing and training.

Part II of the Code includes provisions for prevention of pollution by ships focused on oil, noxious liquid substances, sewage and garbage discharges.

The provisions of Part I (safety) of the Code apply only to passenger vessels and cargo vessels over 500 gross tonnes (GT). Some states² felt that there was a need, if not an urgency, to consider provisions for other vessels not addressed through the Safety of Life at Sea (SOLAS) Convention, including fishing vessels. During an IMO Working Group meeting in 2010, it was proposed, and subsequently approved by the relevant sub-committee and Maritime Safety Committee, that the work on the Polar Code be split into two steps – the first step would address passenger vessels and the larger cargo ships covered by the SOLAS Convention, and the second step would consider the requirements for so-called non-SOLAS ships which include fishing vessels, private yachts and smaller cargo vessels.

Part II of the Code, addressing pollution prevention, is implemented through amendment of Annexes I, II, IV and V of the International Convention for the Prevention of Pollution from Ships (MARPOL) and as a result the provisions will apply also to non-SOLAS vessels, including fishing boats. Part II introduces few new pollution prevention measures for application in the Antarctic

Area, though it does clarify discharge provisions for sewage and garbage in relation to the vicinity of ice including ice shelves, fast ice and ice exceeding 1/10 (10%) ice cover.

2. NEXT STEPS FOR THE POLAR CODE

At the current time, the work on Step 2 of the Polar Code, as agreed in 2010, has yet to be timetabled, however following a proposal to the IMO's Maritime Safety Committee 95th session from Iceland, South Africa and New Zealand in June 2015, IMO Members have agreed that information on incidents involving non-SOLAS ships in polar waters should be submitted to the next meeting of the Maritime Safety Committee (MSC). The MSC 95th Session Report³ records that the Committee encouraged governments and international organizations to provide information on incidents in polar waters to the next session of the Committee, to assist in assessing the potential scope of the Polar Code to non-Convention vessels operating in polar waters. It is proposed that the information provided should include the numbers of non-SOLAS ships, including fishing vessels, operating in polar waters (types, sizes, etc), reports of accidents and incidents, including those requiring search and rescue interventions, and any other relevant information.

The 96th session of MSC is to be held from 11th – 20th May 2016, and the deadline for submitting information is 9th February 2016.

3. SAFETY OF FISHING VESSELS FOR CONSIDERATION DURING STEP 2

In the past ASOC has highlighted the importance of full reporting on all incidents, including thorough investigation into the causes of incidents, monitoring of any associated pollution and environmental response and restoration actions⁴. ASOC believes that it is vital that lessons are learnt from previous incidents and accidents in polar waters and that implementation of recommendations that arise from each investigation is monitored to ensure that maritime activities become safer for everyone. To this end, ASOC strongly supports the proposal that IMO Members and international organisations provide information on incidents in polar waters, and proposes that the CCAMLR Secretariat provides information on incidents in polar waters involving fishing vessels. Furthermore, ASOC encourages Commission Members to make available to the MSC any national reports into incidents and accidents involving fishing vessels.

On reviewing reports involving fishing vessels in the Antarctic area, ASOC believes that all the chapters of Part I of the Polar Code should be considered to be potentially relevant for fishing vessels, although it is recognised that the specific provisions may not always be directly transferable. Table 1 summarises a range of fishing vessel incidents in the Antarctic area and identifies a lack of attention to safety in the design and operation of fishing vessels in the Antarctic as well as a need for improvement in vessel safety and operation. In particular ice strengthening, watertight and weathertight integrity, machinery installations, fire safety and protection, safety of navigation, communication, voyage planning, and crew training are readily identifiable as areas in need of consideration. ASOC also believes that a requirement for fishing vessels to be issued with a polar certificate and to prepare a polar water operational manual would be valuable to ensure that appropriate structural and operational standards are met. The purpose of a polar certificate would

Date / Location	Ship name	Flag	Incident	Casualties	Spill status	Other
February 2015, Ross Sea	Antarctic Chieftain (fishing vessel)	Australia	Vessel trapped in pack ice(thick multiyear ice) with 26 people on board. Damage to 3 of 4 blades of propeller. No ice movement for 5 days.	0	No spill	Two-fold rescue required – ice breaker to release vessel and escort vessel to back to port. Total rescue 2.5 weeks. (2.5 days for ice breaker to reach ship and once clear 2 weeks to return to port)
March 2014, East Antarctica	Tiantai (IUU fishing vessel)	Tanzania	Ship lost – cause unknown, poor weather conditions at time of incident	Unknown	Fuel on board would have been lost	The Tiantai was an illegal fishing vessel presumed lost in the Southern Ocean
February 2014,	Kwang Ja Ho(fishing vessel)	Korea	Grounding 450m off the Antarctic coast	0	No spill	Damage to a freshwater tank
April 2013, Scotia Sea	Kai Xin (fishing vessel)	China	Fire on board, loss of vessel	0	Fuel lost but possibly all consumed by fire	Carrying heavy fuel oil
January 2012, Ross Sea	Jeong Woo 2 (fishing vessel)	Korea	Fire on board, loss of vessel	3	Fuel oil lost - possibly consumed by fire	
December 2011, Ross Sea	Sparta (fishing vessel)	Russia	Holed in ice	0		International rescue effort
December 2010, north of Ross Sea	Insung No1 (fishing vessel)	Korea	Sank	21	Fuel oil loss	
December 2007, Ross Sea	Argos Georgia (fishing vessel)	UK	Loss of power	0		Spare parts air-lifted to vessel
February 2007,	Nisshin Maru (whaling vessel)	Japan	Explosion and fire	1		

Table 1. Summary table showing fishing vessel incidents in the Antarctic area

be to ensure that the ship complied with the relevant requirements, while a polar water operational manual would provide information regarding the ship's operational capabilities and limitations in order to support the on-board decision-making process.

From this list of incidents it is possible to identify the relevance of the various chapters of the Polar Code Part I that should be considered in more detail during Step 2 in relation to fishing vessels. For example, a chapter of the Polar Code addresses fire safety and protection.

Three of the nine incidents listed involve a ship-board fire and in two cases, the Jeong Woo II and the Kai Xin, the fire resulted in the loss of the vessel. A number of incidents, including the loss of the Insung No 1 and the Tiantai, suggest that further investigation of the watertight and weathertight integrity of fishing vessels would be of relevance in developing a Polar Code for fishing vessels. Reports of the sinking of the Insung No 1 indicate that better provision of and training in the use of life-saving appliances and arrangements is required, while the incidents involving the Argos Georgia, Sparta and Antarctic Chieftain indicate that requirements relating to the vessel structure and/or machinery are also likely to be of importance to improving the safety of operation on fishing vessels in polar waters. Finally, voyage planning and safety of navigation are important for all vessels, but particularly in Antarctica where some fishing vessels are frequently operating close to the ice.

4. CCAMLR ACTION NEEDED AHEAD OF DEVELOPMENT OF A POLAR CODE FOR FISHING VESSELS

As the timescale for the development of a Polar Code for fishing vessels has yet to be proposed and agreed, ASOC believes that there are important priority measures that CCAMLR could introduce sooner to improve the safety of vessels operating in the Antarctic Area, including requirements for ice strengthening, training and environmental response⁵.

At CCAMLR XXXIV, ASOC⁶ proposes that Members address ice strengthening of fishing vessels, and urges Members to adopt a conservation measure (CM) which would reaffirm and strengthen CCAMLR Resolution 20/XXII requiring Members only license vessels with a minimum ice classification standard of ICE-1C or more. A CM should address the overall minimum requirement for ice class for all vessels as well as a requirement for Members to notify the CCAMLR Secretariat of each registered fishing vessels' ice class and for their information to be included in CCAMLR's list of licensed vessels.

A further area in need of attention is the ratification and implementation of the IMO Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F) that entered into force in September 2012. The Convention, which has only been ratified by six CCAMLR Members, establishes basic requirements and minimum standards on training, certification and watchkeeping for fishing vessel personnel on an international level, but it doesn't address additional training for personnel operating in polar waters. As a result, ASOC proposes that Commission Members ratify the STCW-F and also adopt a conservation measure which would introduce a two-tier level of training for the Masters and crews of fishing vessel operating in waters south of 60°S.

This would be similar to measures introduced in the Polar Code for Masters and crews of other vessels, and would require training for all personnel on vessels operating in polar waters and would strengthen standards for training of Masters and officers in charge of the navigational watch.

RECOMMENDATIONS

In brief, ASOC submits that CCAMLR Members should agree to:

- provide information on incidents in Antarctic waters involving fishing vessels to the IMO's Maritime Safety Committee's 96th session;
- upgrade CCAMLR Resolution 20/XXII on ice strengthening standards to a binding conservation measure that sets a minimum standard of ICE-1C for all fishing vessels;
- ratify the IMO Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessels and introduce a two-tier level of training for fishing vessel crews in the CCAMLR area via a new conservation measure.

REFERENCES

- 1 SOLAS regulation XIV/1.2, MARPOL Annex I regulation 1.1.11.7, Annex II regulation 5.13.8.1, Annex IV regulation 7.17.2 and Annex V regulation 1.14.7.
- 2 DE 54/13/5 Fishing vessels operating in polar waters. Submitted by New Zealand. DE 56/10/4 Safety and environmental requirements for fishing vessels when operating in polar waters. Submitted by Iceland.
- 3 MSC 95-22 Report of the Maritime Safety Committee on its Ninety-fifth session (paragraph 21.22).
- 4 CCAMLR XXXIII/BG/22 Proposals on improving the governance and control of fishing vessels operating in the Southern Ocean.
- 5 CCAMLR XXXIII/BG/22 Proposals on improving the governance and control of fishing vessels operating in the Southern Ocean.
- 6 CCAMLR XXXIII/BG/22 Proposals on improving the governance and control of fishing vessels operating in the Southern Ocean.

ASOC DOCUMENTS

IMPLEMENTING ARTICLE II OF THE CAMLR CONVENTION

ASOC

ABSTRACT

This paper presents a document written by Dr. Robert (Bob) Hofman¹ and submitted to the 2015 CCAMLR Symposium in Santiago, Chile. Dr. Hofman was a member of the United States delegation during the negotiation of the CAMLR Convention. ASOC has provided some additional background for CCAMLR's consideration. As a participant in the Convention negotiations, Dr. Hofman has an in-depth understanding of the reasoning behind Article II and other aspects of the Convention. Dr. Hofman notes that that Convention explicitly requires that any harvesting activities only take place if the conditions specified in Article II, paragraph 3 of the Convention are met. Further, the language of Article IX(2)(g) makes clear that area protection is one of the measures that may be used to implement the ecosystem conservation approach. Consequently, the need to "balance" the ecosystem approach and area protection with the management of CCAMLR fisheries did not - and does not - arise. They are in fact integral parts of that management. ASOC emphasizes that to resolve the uncertainties about whether fisheries are being managed in accordance with Article II, CCAMLR should assess how MPAs or other measures could be used as reference areas. This would support a more effective implementation of Article II(3).

KEYWORDS

CCAMLR, fisheries, Marine Protected Areas

IMPLEMENTING ARTICLE II OF THE CAMLR CONVENTION

BACKGROUND²

ASOC is resubmitting Dr. Hofman's paper from the 2015 CCAMLR Symposium to CCAMLR XXXIV because it provides a clear explanation of the intent of Article II of the CAMLR Convention that CCAMLR Members may find informative and useful. One of the paper's key conclusions is that closing areas to fishing is necessary to differentiate between the effects of fishing and climate change on harvested species, and to eliminate uncertainty over whether fishing is being managed in accordance with Article II. Although some subareas and SSRUs are closed for fishery management purposes, and MPAs have been proposed and designated, CCAMLR has not yet explicitly linked the management of fisheries to unfished reference areas.

The participants in the Symposium discussed ways that CCAMLR may better fulfill the mandate of Article II,³ and some Members have indicated they want to continue these discussions on this important issue. ASOC believes that a key outcome of these discussions should be an assessment to determine what should be done to better address Article II(3) of the Convention. ASOC urges CCAMLR to move forward on the designation of a representative system of MPAs, which should include an assessment as to how MPAs or other measures can be used as reference areas to support the effective implementation of Article II(3) and the ecosystem approach to each CCAMLR fishery's management.

INTRODUCTION

In recent years, interpretations of Article II of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) have at times apparently differed between Commission Members. Thus, the discussion topics⁴ for the CCAMLR Symposium to mark the 35th anniversary of the signing of the Convention call, among other things, for exchanging views and seeking a shared understanding regarding:

- balancing the implementation of the ecosystem approach and area protection with the management of CCAMLR fisheries; and
- Article II of the Convention where the definition of conservation includes rational use.

For the reasons set forth below, these two subjects for discussion appear to reflect a misunderstanding or misinterpretation of the intent and some of the provisions of the Convention. With respect to the second of the referenced discussion topics, the meaning of the words "including rational use" was clearly understood when the Convention was concluded and therefore should be understood in the same way today. That is, "rational use" of living resources in the Convention Area is that, and only that which meets the principles of conservation provided in subsections a, b. and c of paragraph 3 of Article II.

The first of the above referenced discussion topics also appears to reflect a misunderstanding or misinterpretation of the Convention's intent and associated obligations. As Article II indicates clearly, the ecosystem approach is the required basis for management of fisheries and associated activities in the Convention Area, and area protection is a tool for that purpose specifically identified

in Article IX(2)(g) of the Convention.

BACKGROUND REGARDING THE INTENT AND WORDING OF ARTICLE II

The decision to negotiate the Convention had two principal precursors: (1) concern that, without appropriate regulation, the expected growth of the Antarctic krill fishery begun in the 1960s would jeopardize the recovery of depleted stocks of krill-eating whales, and adversely impact the structure and dynamics of the Southern Ocean ecosystems in which Antarctic krill is a keystone species; and (2) the growing recognition that the single-species concept of maximum sustainable yield (MSY) was an ineffective basis for managing harvesting of wild living resources.⁵

Thus, the Convention was intended to be an ecosystem conservation regime, not a regional MSY fishery management regime. The clearly stated objective of the Convention is to conserve the structure and dynamics of the Antarctic marine ecosystem(s) by ensuring that harvesting and associated activities do not have long-term or irreversible adverse effects on either the harvested species and population, or on dependent and ecologically associated species and populations. In other words, the objective of the Convention is to ensure that harvesting and associated activities do not adversely affect the ecological relationships among all biological components of the Antarctic marine ecosystem(s) – i.e., fish, crustaceans, birds, marine mammals, benthic species, etc.

This ecosystem approach now embodied in Articles I and II of the Convention was agreed in principle during the first round of negotiations in Canberra in early 1978. During the second round of negotiations in Buenos Aires in July 1978, several Antarctic Treaty Parties pointed out that in their countries the word “conservation” in paragraph 1 of Article II would be translated to mean “preservation” so that the wording formulated in Canberra could be interpreted in their countries to mean that commercial fisheries would be prohibited in the Convention Area. The intent, however, was not to prohibit fisheries, but to ensure that they do not have effects contrary to the principles of conservation that (at the time) were listed in paragraph 2 of Article II.

To clarify that commercial fishing would be allowed under certain circumstances, it was proposed and agreed to insert an additional paragraph – new paragraph 2 - in Article II stating that “For the purpose of this Convention, the term ‘conservation’ includes rational use.” There were not then, and should not be now, differing views concerning the intended meaning of the words “including rational use” in the new paragraph 2 of Article II. It therefore follows that there is no justification in the Convention for the apparent later determination that there should somehow be a ‘balance’ between ecosystem conservation and fishery and area management.

Therefore, any uses of living resources in the Convention Area that do not comply with the principles of conservation articulated in Article II would constitute ‘irrational use’ and be contrary to the intent of the Convention.

On a related matter, during the second round of negotiations in July 1978, several Parties also pointed out that the wording of what was then paragraph 2 of Article II (formulated in Canberra) failed to recognize that available information was not likely to always be sufficient to determine in

IMPLEMENTING ARTICLE II OF THE CAMLR CONVENTION

advance the maximum net productivity levels of the target, dependent, and associated species and populations, or to identify measures necessary to prevent changes that are not potentially reversible in time to ensure maintenance of the fullest possible range of management options for future generations. Recognizing the validity of this point, it was proposed and agreed to change the original wording of what became Article II(3)(a) from –

“prevent any harvested population from declining below its maximum net productivity level” to “prevention of decrease in the size of any harvested population to below those which insures its stable recruitment. For this purpose it should not be allowed to fall below a level close to that which ensures the greatest annual increment”.

Similarly, it was proposed and agreed to change the original wording of what became Article II(3)(c) from:

“prevent changes in the marine ecosystem that are not potentially reversible in a human generation” to “prevention of changes or the minimization of the risk of changes in the marine ecosystem which are not potentially reversible over two or three decades [the negotiated approximation of a human generation], taking into account the state of available knowledge of the direct and indirect impacts of harvesting, the effects of the introduction of alien species, the effects of associated activities on the marine ecosystem and of the effects of environmental change, with the aim of making possible the sustained conservation [i.e., not yield] of Antarctic marine living resources.” [Text in brackets added by author.]

No changes were proposed or made to what became subparagraph (b) of Article II(3). Consequently, the prevention of declines in the sizes of harvested populations applies as well to populations of dependent and associated species which may have maximum net productivity levels substantially higher than those of the target fishery populations.

If there were no uncertainties whether fisheries and associated activities are having effects inconsistent with the objective and principles of conservation established in Article II of the Convention, there would be no need for special area management. That is, there would be no risk that fisheries or associated activities could be affecting the biodiversity or ecological processes in the Convention Area. However, it seems highly likely that there are significant uncertainties concerning the effects of at least some fisheries on the target, dependent and/or ecologically associated species and populations. It also seems likely that at least some of those uncertainties could be resolved by special area management as envisioned in Article IX(2)(g) of the Convention. For example, the effects of harvesting on the long-term sustainability of at least some fisheries likely could be enhanced by closing spawning areas to fishing during the spawning seasons.

Also, the potential for overfishing could be reduced by establishing fishery or research reserves to assess, monitor and compare the status of the stocks in open fishery areas with those in unfished areas where only controlled research fishing would be allowed. Further, it seems highly unlikely that it will ever be possible to differentiate the effects of fisheries from those of climate change unless representative areas where fisheries have occurred or are likely to occur are closed to all but controlled experimental fishing and ecosystem research designed and conducted to differentiate the effects.

SUMMARY⁶

When the Convention was concluded and signed in 1980, there was a common understanding that the inclusion of paragraph 2 in Article II of the Convention was to make it clear that the Convention was not intended to prohibit fisheries and associated activities provided they are designed and conducted to meet the principles of conservation set forth in paragraph 3 of Article II. The language of Article II is unambiguous in this regard. The language of Article II also makes clear that management of fisheries and associated activities in the Convention Area are to be based on an ecosystem conservation approach. Further, the language of Article IX(2)(g) makes clear that area protection is one of the measures that may be used to implement the ecosystem conservation approach. Consequently, the need to “balance” the ecosystem approach and area protection with the management of CCAMLR fisheries did not - and does not - arise. That is, area management and fishery management are intended to be integral and complementary means for meeting the ecosystem conservation approach as mandated by Articles I and II of the Convention.

REFERENCES

- 1 From 1975 until 2000, Dr. Hofman was the Scientific Program Director for the U.S. Marine Mammal Commission.
- 2 This section was written by ASOC and does not necessarily represent Dr. Hofman's views.
- 3 For more information on the Article II discussions at the Symposium, see CCAMLR XXXIV/28, pgs. 15-26 on Symposium Sessions 2 and 3.
- 4 These discussion topics refer to those distributed in Commission Circular 15/01 by the CCAMLR Secretariat on 5 January 2015.
- 5 See Holt and Talbot 1978. *New Principles for the Conservation of Wild Living Resources*. Wildlife Monographs No. 59.
- 6 This section has been slightly edited by Dr. Hofman from its original version.

ASOC DOCUMENTS

REVISITING CCAMLR'S APPROACH TO MANAGEMENT – A COMPENDIUM OF PAPERS THAT EXPLORES THE IMPLEMENTATION OF THE CAMLR CONVENTION

ASOC

ABSTRACT

The adoption of the 1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and the establishment and workings of its Commission and supporting bodies represents best practice amongst efforts to manage human activities in international spaces. Since the CAMLR Convention's entry into force in 1982, several papers have reviewed the application and implementation of the Commission's pioneering approach to management. This document presents a compendium of papers that, in ASOC's view, are the key to the implementation of the CAMLR Convention.

KEYWORDS

CAMLR Convention

REVISITING CCAMLR'S APPROACH TO MANAGEMENT

The adoption of the 1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and the establishment and workings of its Commission and supporting bodies represents best practice amongst efforts to manage human activities in international spaces. CCAMLR is a key component of the body of instruments developed from the 1959 Antarctic Treaty known as the Antarctic Treaty System.

Since the CAMLR Convention's entry into force in 1982, several papers have reviewed the application and implementation of the Commission's pioneering approach to management. The enclosed compendium contains the full version of a selection of these papers as published in the English language scholarly and scientific literature. The following introductory section includes a summary of what, in ASOC's view, are the key points of each of the papers. Throughout these papers a number of recurring topics and themes are covered. The purpose of this compendium is to remind CCAMLR Members of the core concepts and practices at the heart of the implementation of the CAMLR Convention as clearly discussed and applied over the past three plus decades.

CCAMLR's primary focus is the conservation of Antarctic marine living resources. Rational use, often interpreted as fishing, is subsequently but explicitly included as part of CCAMLR's conservation mandate. Any harvesting and associated activities in the Convention area must be conducted in accordance with the three principles of conservation included in the Convention's core objective that give rise to CCAMLR's application of ecosystem and precautionary approaches. This structure of the core objective of the Convention makes it clear that conservation is the focus of CCAMLR with fishing accommodated as a secondary activity where consistent with the Convention.

CCAMLR's ecosystem approach endeavours to ensure fishing activity does not negatively impact the wider ecosystem including species and habitats that are related to, or dependent on, the target species, or significant adverse effects on the ecosystems of which they are part, that are not reversible in 20–30 years. Through its application CCAMLR seeks to account for and maintain the delicate and complex relationships between the organisms and physical processes that constitute Antarctic marine ecosystems.

To support an ecosystem approach, CCAMLR has applied the precautionary approach to progress proactive management decisions that aim to minimize the risk of long-term adverse effects based on the best available science whilst accounting for uncertainty. This means that CCAMLR does not wait until it has all the information possible before taking a decision, but acts using the information that is available in a precautionary manner to prevent or minimise negative impacts.

Application of ecosystem and precautionary approaches has included:

- The development and use of modeling supported by decision rules and trigger levels;
- Data collection through a range of sources including fishing activities, scientific observers on fishing vessels and research carried out by CCAMLR Member research and fishing vessels;
- The implementation of the CCAMLR Ecosystem Monitoring Program (CEMP) designed to detect and record significant changes to selected indicator species and distinguish between changes arising directly from fishing from those which occur from broader environmental variability;
- Adoption of measures to nearly eliminate seabird bycatch during fishing operations; and

- Developing mechanisms to identify and protect vulnerable marine ecosystems. Despite these successes CCAMLR still has significant work to do to achieve full application of the ecosystem approach. Future challenges include:
- Sustainable practices to guide an orderly expansion of the krill fishery;
- Application of measures to adapt to the impacts of human-induced ocean acidification and climate change (including sea-ice changes);
- Implementing a representative system of marine protected areas; and
- Ensuring effective implementation and compliance of conservation measures.

This will require CCAMLR Members to regularly apply the precautionary and ecosystem approaches as embodied in their obligations under the Convention. Further, CCAMLR Members will need to cooperate and collaborate with external bodies due to the global nature of many current and future challenges, particularly climate change.

Additionally, consensus decision-making is both a strength and weakness within CCAMLR with measures aimed to advance fuller implementation of the precautionary and ecosystem approaches often taking a long time to achieve adoption. Success in meeting future challenges will require the continued commitment of CCAMLR Members to cooperate consistent with the principles embedded in the Convention, the Antarctic Treaty, and other Antarctic Treaty System instruments. ASOC originally compiled this compendium to assist discussions at the recent 2nd CCAMLR Symposium. We note that at last year's meeting CCAMLR agreed to maintain MPA papers in one place on the web site for ongoing reference. ASOC recommends that CCAMLR also place key reference documents and papers on topics of importance relevant to CCAMLR's broader work such as those included in this compendium in one place on the CCAMLR website for ongoing use and easy reference. This will assist in the maintenance of a readily accessible record of CCAMLR's history, progress and discussions across the fuller range of its work and ensure that earlier discussions are always available. ASOC hopes that this compendium may be a useful contribution to such a compilation and a useful resource for CCAMLR delegates at the current and future CCAMLR meetings, supporting valuable discussions to help CCAMLR meet its objectives and continue its leading role in the conservation of marine living resources through the application of the precautionary and ecosystem approaches.

COMPENDIUM PAPERS

1. DJ Agnew, Review —The CCAMLR Ecosystem Monitoring Programme. *Antarctic Science*. 9 (3), 235-242 (1997)
2. Understanding CCAMLR's Approach to Management. edited by Karl-Hermann Kock. Published by the CCAMLR Secretariat (2000)
3. AJ Constable, WK de la Mare, DJ Agnew, I Everson & DGM Miller, Managing fisheries to conserve the Antarctic marine ecosystem: practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). *ICES Journal of Marine Science*. 57, 778–791 (2000) doi:10.1006/jmsc.2000.0725
4. CCAMLR's Management of the Antarctic, CCAMLR 2001 ISBN 0-947300-06-6
5. JP Croxall & S Nicol, Management of Southern Ocean fisheries: global forces and future sustainability. *Antarctic Science*. 16 (04), 569 – 584 (2004)

6. KH Kock, K Reid, JP Croxall & S Nicol, Fisheries in the Southern Ocean: An ecosystem approach. *Philosophical Transaction of the Royal Society*. 362, 2333-2349 (2007)
7. K Reid, Monitoring and management in the Antarctic - making the link between science and policy. *Antarctic Science*. 19 (2), 267–270 (2007)
8. PN Trathan & D Agnew, Climate change and the Antarctic marine ecosystem: an essay on management implications. *Antarctic Science*. 22 (04), 387 – 398 (2010)
9. A Constable, Lessons from CCAMLR on the implementation of the ecosystem approach to managing fisheries. *Fish and Fisheries*. 12, 138–151 (2011) DOI: 10.1111/j.1467- 2979.2011.00410.x
10. DGM Miller & NM Slicer, CCAMLR and Antarctic Conservation: The Leader to Follow. In: *Governance for Fisheries and Marine Conservation*, SM Garcia, J Rice & AT Charles (eds). New York: Wiley. 253-270 (2014)
11. S Hanchet, K Sainsbury, D Butterworth, C Darby, V Bizikov, O Rune Godø, T Ichii, KH Kock, L López Abellán & M Vacchi, CCAMLR's precautionary approach to management focusing on Ross Sea toothfish fishery. *Antarctic Science*. FirstView, 1-8 (2015)

1. DJ Agnew, Review —The CCAMLR Ecosystem Monitoring Programme. *Antarctic Science*. 9 (3), 235-242 (1997)

Key points:

- In order to meet its objectives, in particular the application of the ecosystem approach, CCAMLR established the CCAMLR Ecosystem Monitoring Programme (CEMP)
- The central aim of CEMP is the detection of changes in environmental indicators of ecosystem performance and the interpretation as to whether these changes are due to natural events or the harvesting of marine living resources
- The core of CEMP is the acquisition, centralised storage and analysis of standardised monitoring data combined with a strong emphasis on empirical and modelling based research to provide a sound scientific background against which to test the effects of management options on components of the Antarctic ecosystem
- The development of procedures for translating monitoring results into management advice is a critical part of the programme
- CCAMLR applies the ecosystem approach through a range of conservation measures such as catch limits calculated for krill incorporating allowances for predator demands however direct operational application of CEMP monitoring to fisheries management has yet to be achieved

2. Understanding CCAMLR's Approach to Management. edited by Karl-Hermann Kock. Published by the CCAMLR Secretariat (2000)

Key points:

- Recognising the complexity of marine ecosystems and uncertainty associated with managing activities in the region, CCAMLR's approach to management sought to ensure past human impacts on Antarctic ecosystem did not occur again
- CCAMLR's objective as stated in Article II of the CAMLR Convention embodies the precautionary approach that accounts for uncertainty when making management decisions to ensure there is a low risk of long term negative impacts. Article II also embodies the ecosystem approach that seeks to

avoid impacts to dependent and related species

- The precautionary and ecosystem approaches are applied through:
 - o Data collection, monitoring and scientific research efforts
 - o Scientific modeling complemented by decision rules and target reference points
 - o Protective measures for non-target species and habitats
 - o A rigorous approach to managing new and exploratory fisheries including precautionary catch limits that aim to ensure that the effect of fishing on prey abundance is limited to a level that is unlikely to have an impact on predators
- At the time of writing the authors acknowledged that CCAMLR's leading work on the implementation of precautionary and ecosystem approaches to management was at an early stage in its development

3. AJ Constable, WK de la Mare, DJ Agnew, I Everson & DGM Miller, Managing fisheries to conserve the Antarctic marine ecosystem: practical implementation of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). ICES Journal of Marine Science. 57, 778–791 (2000) doi:10.1006/jmsc.2000.0725

Key points:

- Human activity in the Southern Ocean related to the exploitation of marine living resources has historically followed a pattern of over-harvesting followed by collapse
- To address past over-harvesting the CCAMLR experience provides two important lessons:
 - 1) Conservation objectives can only be achieved by implementing management measures, even when very little is known;
 - 2) Methods were found for achieving scientific consensus despite the uncertainties surrounding estimates of parameters and the behaviour of the system.
- Implementation of important conservation measures to progress ecosystem and precautionary management approaches has often met resistance within the CCAMLR Commission from its earliest days. Progress on measures have often lagged behind the advice of the CCAMLR Scientific Committee by one to two years
- The Commission has agreed that reactive management – the practice of taking management action when the need for it has become apparent – is not a viable long-term strategy for the krill fishery, thus favouring a precautionary approach to management
- The precautionary and ecosystem approaches were furthered by the adoption of decision rules that specified the objectives of CCAMLR in scientifically interpretable and measurable terms
- The development of any fishery should not occur at a rate faster than the Commission is able to evaluate its potential consequences and whether the objectives in Article II would be met
- Monitoring independent of, and as part of, fishing operations as well as of environmental parameters is crucial to the proper application of ecosystem and precautionary approaches
- Effective monitoring must:
 - o identify any effects from fishing in sufficient time for management decisions to be made before impacts are irreversible;
 - o identify environmental changes that may require changes to management; and
 - o be able to differentiate between fishery impacts, environmental impacts or other types of human impacts.
- While the precautionary approach is now entrenched within CCAMLR, essential work is still

REVISITING CCAMLR'S APPROACH TO MANAGEMENT

required to develop management procedures, inclusive of monitoring, that avoid localized effects on the ecosystem, provide effective feedbacks on the effects of fishing and are robust in the face of unknown and uncertain changes to Antarctic ecosystems

4. CCAMLR's Management of the Antarctic, CCAMLR 2001 ISBN 0-947300-06-6

Key points:

- CCAMLR has been recognised as a pioneer in the development of the 'ecosystem approach' to the management of marine living resources
- CCAMLR strives to follow a 'precautionary' approach', collecting the data it can, then weighing up the extent and effect of uncertainties and gaps in such data before making a management decision
- This approach attempts to balance not having all the information desired to develop a sustainable and scientifically defensible management regime prior to the commencement of a fishery. It takes a conservative approach to setting limits, requiring data collection on target and dependent species and clearly defined experimental fishing plans
- CCAMLR also follows an 'ecosystem approach' that strives to take into account all the delicate and complex relationships between the organisms and physical processes that constitute Antarctic marine ecosystems, aiming to ensure that fishing does not adversely impact other species that are related to, or dependent on, the target species
- With science underpinning the application of precautionary and ecosystem approaches, the CCAMLR Scientific Committee and its working groups use data collected by:
 - o Members fishing activity including catch and effort data and biological information;
 - o Scientific observers on Members' vessels (who collect data on the fishing operations, the catch and biological information, report on compliance and advise operators and owners);
 - o Scientific surveys carried out by Members' research and fishing vessels
 - o Monitoring selected species that depend on, or are related to, commercial target species and fisheries through the CCAMLR Ecosystem Monitoring Program (CEMP)
- CCAMLR uses data collected to develop management advice through analysis and models
- CCAMLR scientists have taken a global lead developing models that incorporate some of the key effects of uncertainty into their analyses and into the subsequent management advice
- CCAMLR uses decision rules associated with models and analyses to facilitate decision making

5. JP Croxall & S Nicol, Management of Southern Ocean fisheries: global forces and future sustainability. Antarctic Science. 16 (04), 569 – 584 (2004)

Key points:

- The CAMLR Convention was visionary, foreshadowing by at least a decade the wider adoption of the precautionary and ecosystem-based approaches to management of marine systems
- Nevertheless, initially CCAMLR's management was reactive. The application of these principles began slowly with the institution of ecosystem monitoring and groundwork to develop precautionary models to support management
- Precaution is incorporated into management through models with decision rules and accounting for information such as natural mortality of target species including as food for predators, the requirements of predators of target species, biology of species, estimations of inter-annual

variability in recruitment, updating of models as new information becomes available and accounting for uncertainty from several sources

- Efforts to apply precautionary and ecosystem approaches were also supported by extensive monitoring through the CCAMLR Ecosystem Monitoring Programme (CEMP) aimed at detecting and recording changes in the ecosystem and distinguishing between changes due to fisheries and those resulting from physical and biological environmental variability
- CCAMLR has had success applying conservative yield models for toothfish and krill stocks and in establishing strict rules for undertaking new and exploratory fisheries
- Despite these efforts CCAMLR still has significant progress to make to implement a full ecosystem approach
- To further progress the precautionary and ecosystem approaches CCAMLR will need to account for:
 - o Technological and scientific changes that can result in changes to demand for Antarctic marine living resources;
 - o Industry, economic and market forces;
 - o Inadequate management in areas adjacent to the CCAMLR area;
 - o Political decisions; and
 - o Most importantly for global and regional environmental changes

6. KH Kock, K Reid, JP Croxall & S Nicol, Fisheries in the Southern Ocean: An ecosystem approach. *Philosophical Transactions of the Royal Society*. 362, 2333-2349 (2007)

Key points:

- The objective of the CAMLR Convention requires the application of an ecosystem approach to the management of Antarctic marine living resources (Article II, 3)
- CCAMLR's efforts to apply an ecosystem approach have extended to the application of a precautionary approach to management
- To assist the Commission in meeting its objectives, as set out in Article II, 3, the Scientific Committee established the CCAMLR Ecosystem Monitoring Programme to detect possible effects of krill fishing on the performance of top-level predators, such as albatrosses, penguins, petrels and fur seals
- While CCAMLR has demonstrated clear leadership in the application of ecosystem and precautionary approaches amongst international organisations, there is still significant progress that could be made
- The adoption of marine protected areas and the ability to assess ecosystem dynamics across large scales in the absence and presence of fishing offer opportunities to better understand the impacts of fishing and natural variability

7. K Reid, Monitoring and management in the Antarctic - making the link between science and policy. *Antarctic Science*. 19 (2), 267-270 (2007)

Key points:

- Managing human impacts in the Antarctic requires an effective monitoring system to provide information about the process being managed and effectiveness of management actions.
- A number of monitoring programmes have been established in both terrestrial and marine systems to measure impacts that arise as a result of fishing, tourism and research. However, most of this monitoring is surveillance monitoring, which is not linked to a specific management objective, and

does not produce quantitative metrics that can be assessed and compared to agreed targets.

- Defining quantitative measures, with agreed trigger levels for the Antarctic, where the aim is to minimise human impacts, is a complex process.
- Although potential analogues for target setting exist in other parts of the world these are generally insufficiently precautionary to be applied in the Antarctic.
- Measures and agreed trigger levels based on quantifiable management objectives need to be appropriately precautionary to ensure application of an ecosystem approach (as embodied in Article II, 3 of the CCAMLR Convention)

8. PN Trathan & D Agnew, Climate change and the Antarctic marine ecosystem: an essay on management implications. *Antarctic Science*. 22 (04), 387 – 398 (2010)

Key points:

- Climate change is one of the most important threats to Antarctic marine ecosystems
- CCAMLR's responsibilities extend beyond the management of harvesting, encompassing ecosystem and species conservation and related issues
- Application of CCAMLR's conservative and precautionary ecological management framework can and should prevent the exacerbation of climate change impacts from harvesting
- Ecosystem and fisheries management in the Antarctic must be fully integrated with an understanding of the ecological consequences of climate change
- CCAMLR also applies a precautionary approach that takes into account the state of currently available knowledge, yet accounts for uncertainty in facilitating management decisions that aim to prevent changes or minimize the risk of changes to the marine ecosystem
- CCAMLR will need to re-examine its approach to precaution to account for the potential of major "natural" climate induced changes combining with the effects of harvesting that would prevent CCAMLR from achieving its objectives
- To progress precautionary and ecosystem approaches in the context of climate change CCAMLR will need to consider use of Marine Protected Area (MPA) networks, additional climate focused monitoring, data collection and research including changes to the CCAMLR Ecosystem Monitoring Program (CEMP), changes to stock assessment processes, additional restrictions on fishery development and activities (e.g. transshipment), and increased action against IUU vessels
- Risk assessments using current knowledge are now feasible and should be pursued to determine relative risks (uncertainties), impacts and timescales, of various processes consequent on climate change

9. A Constable, Lessons from CCAMLR on the implementation of the ecosystem approach to managing fisheries. *Fish and Fisheries*. 12, 138–151 (2011) DOI: 10.1111/j.1467-2979.2011.00410.x

Key points:

- CCAMLR is widely recognized as a leading international organization in developing best practice in the ecosystem approach to managing fisheries
- CCAMLR is demonstrating that
 - i. Ecosystem-based fisheries management does not need to be complex; and
 - ii. Methods can be developed to decide on spatial management strategies for fisheries so that

predators of target species are not disproportionately affected.

- CCAMLR has instituted management for target species, but not yet fully operationalized effective management for species dependent on target species or the wider ecosystem
- The application of the precautionary approach to account for uncertainty is now well established in CCAMLR with lower catches allowed when there is less certainty about population and food web dynamics and catches only increasing with improved information
- Efforts to reduce uncertainty through greater investments in monitoring may or may not be cost effective in terms of opportunities for higher catches. More precautionary catch limits with lower monitoring investment may be more desirable than the requirement to invest more in monitoring to obtain higher catch limits
- The costs of reducing uncertainty should be shared not only amongst CCAMLR Members but also with fishers
- CCAMLR must continue to make decisions based on the best available science, and not waiting for the best scientific (irrefutable) evidence possible before taking action, but seeking and applying new information as it becomes available

10. DGM Miller & NM Slicer, CCAMLR and Antarctic Conservation: The Leader to Follow. In: Governance for Fisheries and Marine Conservation, SM Garcia, J Rice & AT Charles (eds). New York: Wiley. 253-270 (2014)

Key points:

- CCAMLR was the first international agreement to explicitly and distinctly account for specific 'principles of conservation' whilst managing marine living resources
- CCAMLR is seen as delivering ecosystem and precautionary approaches essential for strong fisheries and ecosystems outcomes.
- CCAMLR aims to ensure that fishing for a specific target species does not compromise other species or harm the environment. This is distinguished from more traditional fisheries management practices based on maximum sustainable yield principles and single stock management
- Due to the explicit links and relationship between the CAMLR Convention and the Antarctic Treaty all Convention Contracting Parties are bound to further the Treaty's objectives regarding 'preservation and conservation of living resources' in the Treaty Area.
- CCAMLR pursues four key actions to address Article II conservation principles:
 - (1) Determining the management status for relevant species and/or ecosystem qualities;
 - (2) Assessing ecosystem status in terms of perceived 'health';
 - (3) Implementing harvest controls to address differences between the assessed status of exploited stocks and agreed conservation objectives; and
 - (4) Striving to reach scientific consensus on advice to the Commission
- CCAMLR further addresses conservation principles through 'operationalized' essential management requirements including:
 - (1) Minimizing the risk(s) of irreversible ecosystem change(s);
 - (2) Monitoring harvest controls to ensure sustainable exploitation;
 - (3) Minimizing potential direct or indirect fishing impacts on dependent and related species; and
 - (4) Refining assessments to account for uncertainties in available information and/or concerning stock status including potential responses of non-harvested species and ecosystem function(s).

- CCAMLR's management approach seeks to directly integrate science into management decisions in order to:

- (1) apply correct/timely decisions consistent with Article II conservation principles;
- (2) carry out sufficient monitoring to ensure that dependent predators are not affected by fishing;
- (3) allow sufficient time to detect/rectify ecosystem changes from fishing within two to three decades; and
- (4) refine precautionary assessment of harvested stock yield to revise key demographic parameter estimates

11. S Hanchet, K Sainsbury, D Butterworth, C Darby, V Bizikov, O Rune Godø, T Ichii, KH Kock, L López Abellán & M Vacchi, CCAMLR's precautionary approach to management focusing on Ross Sea toothfish fishery. Antarctic Science. FirstView, 1-8 (2015) DOI: <http://dx.doi.org/10.1017/S095410201400087X>

Key points:

- The application of the precautionary and ecosystem approaches in the context of the Ross Sea toothfish fishery includes:

- o Use of decision rules and limit reference points in assessment and setting catch limits, accounting for ecosystem impacts - in particular the needs of predators, uncertainty, biology and ecosystem status of target species;
- o Various “move on” rules with respect to seabird and fish bycatch as well as vulnerable marine ecosystems;
- o Technical innovations to reduce or eliminate ecosystem impacts;
- o Ongoing monitoring and data collection on target species and the broader ecosystem;
- o Spatial and temporal closures

- Recognising that scientists and managers can never have complete scientific knowledge or certainty CCAMLR accounts for uncertainty through a precautionary decision rule framework which is updated and modified as new information becomes available allowing the fishery to further develop

- CCAMLR's management also allows for adaptive feedback to account for new information and adjust management to ensure the objectives of the Convention are achieved

- Further work is required to more fully implement the ecosystem approach

ASOC DOCUMENTS

THE ROSS SEA REGION MARINE PROTECTED AREA: CURRENT PROPOSAL AND LOOKING FORWARD

ASOC

ABSTRACT

MPAs are an important tool for biodiversity conservation with benefits for fisheries management. Since MPA planning commenced, CCAMLR has identified the Ross Sea as a key region in a representative system of Southern Ocean MPAs due to its scientific and biological value. The original joint US-NZ MPA proposed in 2012 was designed to meet an array of ecological and scientific objectives while also allowing for an economically viable toothfish fishery in the Ross Sea. Since 2012, Ross Sea region MPA proponents have continued to negotiate with all CCAMLR Members, taking into account their concerns, which are reflected in the current proposal. Through this document, ASOC highlights the revisions made to the current Ross Sea region MPA proposal, emphasizing that any further concessions will seriously undermine the ability of the MPA to meet its objectives. We also comment on the opportunities for research fishing throughout the Ross Sea, including in currently closed SSRUs and potentially in the Ross Sea region MPA. We further emphasize that a long duration for the MPA is of critical importance. ASOC encourages CCAMLR Members to adopt the Ross Sea region MPA proposal in its current 2015 revision.

KEYWORDS:

Marine Protected Areas, Ross Sea, CCAMLR

THE ROSS SEA REGION MARINE PROTECTED AREA

INTRODUCTION

Marine protected areas (MPAs) that conserve biodiversity can lead to more and larger fish, bolstering fisheries.¹ To be effective, and especially in cases of high uncertainty or risk (as in the case of the Southern Ocean), MPAs must be large enough to protect key ecological processes and the life histories of the animals that live there.² Further, they must include no-take areas and be in place for long periods of time.³

Throughout MPA planning, CCAMLR identified the Ross Sea as a key region in a representative system of Southern Ocean MPAs due to its unique scientific and ecological value.⁴ As one of the most-studied ocean ecosystems in Antarctica, the Ross Sea is globally significant as a living laboratory and has been critically important for long-term research.⁵ Ecologically, the Ross Sea is one of the most productive stretches of the Southern Ocean,⁶ and supports large populations of mammals and birds, including more than one-third of all Adélie penguins and one-quarter of all emperor penguins.⁷

Having been designed with fisheries management as a key consideration within the MPA's objectives, and in line with the MPA principles outlined above, the Ross Sea region MPA proposal includes large no-take areas. While MPAs are generally considered to be permanent (see below), the duration in the 2015 proposal matches the scale and timeframe of the ecological and life history processes of the wildlife that live in the Ross Sea. The MPA proposal's objectives are to conserve marine living resources, maintain ecosystem structure and function, and protect vital ecosystem processes and areas of ecological significance while promoting scientific research and allowing for a commercially viable toothfish fishery. To meet these multiple objectives, and as an attempt to meet the concerns of many CCAMLR Member States, the original combined US-NZ Ross Sea region MPA proposed in 2012 contained many concessions. For example, the main fishing grounds on and around Iselin Bank were left out of the Ross Sea region MPA proposal, despite the ecological importance of the area.⁸

Over the course of CCAMLR discussions since 2012, the proposed area for protection has been reduced by more than 40%. Ross Sea MPA proponents have continued negotiating and making concessions since 2012 to meet the needs and desires of CCAMLR Members. ASOC is disappointed that reductions to the MPA proposal included the removal of large areas proposed for protection in the northern Ross Sea. A large portion of the originally proposed no-take area (General Protection Zone) on the Ross Sea shelf and slope has now been changed to a "Special Research Zone (SRZ)," where research fishing would be allowed, but on a limited basis, and where greater tagging rates would be required. We recognize, as described below, that the inclusion of an SRZ should facilitate sustainable management for toothfish while still meeting the goals of the Ross Sea region MPA. However, the SRZ should not be expanded further. To maintain the strength of the Ross Sea region MPA, the remaining Ross Sea shelf and slope and Balleny Islands must remain as a no-take General Protection Zone.

SPECIAL RESEARCH ZONE

ASOC has advocated for full protection of the Ross Sea shelf and slope due to its importance to an

array of predators, including toothfish, seals, whales, and penguins.⁹ However, we recognize that, in accordance with advice from the Scientific Committee, the SRZ was deemed critical in ensuring the integrity of the toothfish tagging program.¹⁰ Given that the tagging program forms the foundation of the Ross Sea toothfish population model and stock assessment,¹¹ the sustainability of the fishery depends upon it. The SRZ aimed to achieve a fishery reference site that halves the past catch in this area by having less (rather than zero catch) fishing while requiring increased tagging efforts.¹² Increased tagging efforts in this region would then provide information that could directly inform more sustainable management of the Ross Sea toothfish fishery. In doing so, the SRZ meets the larger Ross Sea region MPA objective of protecting the ecological structure and function of the ecosystem. Further, the SRZ can still provide a lowfished reference area that can be compared to the heavily fished slope areas including Iselin Bank.¹³

The 2015 version of the MPA includes an expanded SRZ, which would allow fishing in part of the southern area of Subarea 88.2A, an area that under current management measures has a zero allowable catch.¹⁴ This area was included in the Ross Sea region MPA no-take zone because much of it contains persistent pack ice, which is heavily utilized by penguins, seals, whales and toothfish (besides also being a safety threat to fishing vessels).¹⁵ Extending the Ross Sea SRZ into the eastern Ross Sea was a direct concession to meet some CCAMLR Member's desires for some fishing in this area while addressing the objectives of the MPA. While ASOC does not endorse expanding the SRZ, we acknowledge the scientific justification provided in the 2015 proposal. Based on the proposed revisions, research fishing within an expanded SRZ may provide information on toothfish distribution and movements on the Ross Sea slope that could lead to improved stock assessments and understanding of ecosystem interactions.¹⁶ However, to ensure meeting the overall ecological objectives of the Ross Sea region MPA, fishing within the SRZ should be designed to not interfere with the protection of the species and ecological processes that the MPA was designed to protect. Expanding the SRZ any further (beyond what is already in the revised 2015 Ross Sea region MPA proposal) risks reducing the no-take area on the slope and in the eastern Ross Sea, undermining the integrity of the Ross Sea region MPA as a conservation tool, both for fisheries and the broader Ross Sea ecosystem.

OPPORTUNITIES FOR RESEARCH FISHING

Under CCAMLR's current fishery conservation measures for Ross Sea toothfish, some of the Ross Sea has a zero catch limit, or is "closed" on a year-to-year basis to exploratory toothfish fishing (*Figure 1*).¹⁷ However, while SSRUs 88.2A and B have a zero catch limit, 200 tonnes were approved for removal via research fishing in the northern seamounts (North of 70°S) by a joint proposal by New Zealand, Norway, Russia and the UK for the 2014/15 and 2015/16 season.¹⁸ Similarly the toothfish pre-recruit survey conducted by New Zealand under CM 24-01 was approved in the 2014/15 season to catch fish from SSRUs J, L and M, which also have catch limits of zero. These examples demonstrate that despite a zero TAC in SSRUs, Members can propose research fishing in any given year or over several years and, if approved by the Commission, can fish even in "closed" SSRUs in accordance to CM 24-01, a point stressed by the Scientific Committee during discussions over zero TAC SSRUs in the Ross Sea.¹⁹ Further, while ASOC does not advocate any fishing in the no-take General Protection Zone, the Ross Sea region MPA allows for it. The draft Ross Sea

THE ROSS SEA REGION MARINE PROTECTED AREA

region MPA CM specifically provides that “Members may conduct scientific research that does not undermine the scientific objectives in paragraph 3 and is in accordance with Conservation Measure 24-01.”²⁰ This again refutes the argument that an MPA that closes areas to fishing would impede data gathering or research,²¹ a point that has also been reiterated by the Scientific Committee.²²

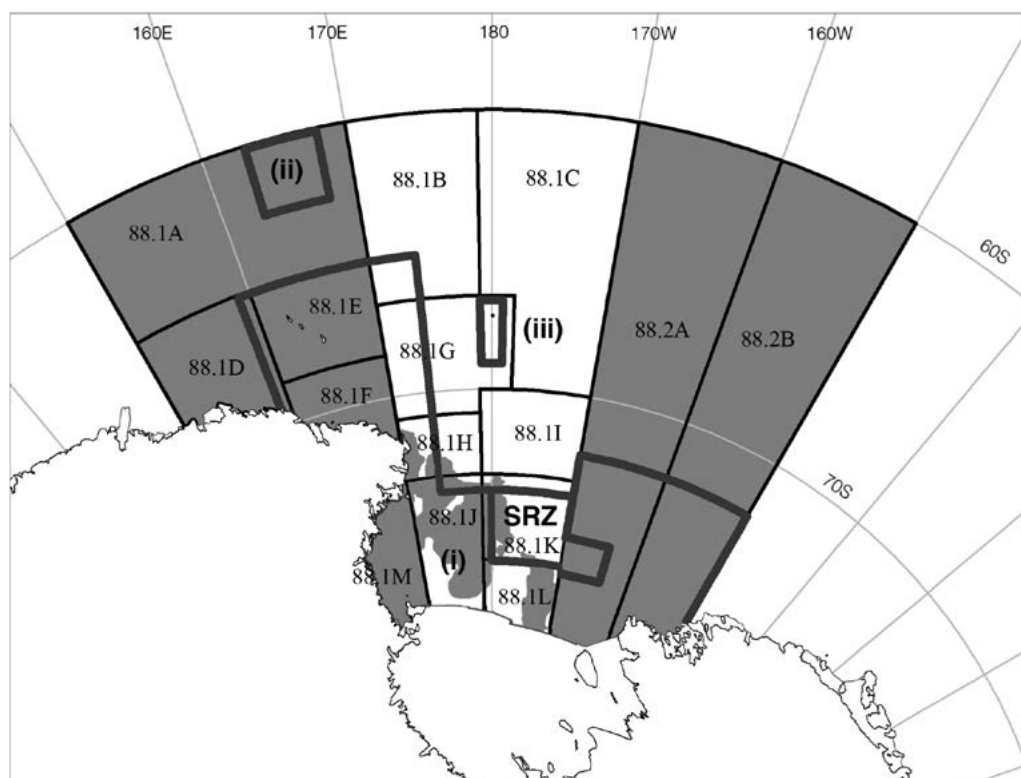


Fig. 1. CCAMLR SSRUs labeled and outlined in black. Areas colored in pink represent Ross Sea SSRUs with a zero catch limit for toothfish. Areas shaded in pink on the Ross Sea shelf that are shallower than 550m are also closed to fishing (per CM 22-08). The 2015 proposed Ross Sea Region Marine Protected Area is outlined in Blue. Notwithstanding the zero TAC, research fishing was conducted in the northern area of 88.2A and B in the 2014/15 season, and also in the shelf region (for the prerecruit survey).

DURATION

The IUCN has declared that MPAs should be permanent.²³ Scientific literature suggests that duration of an MPA is directly linked to positive outcomes, such that the longer an MPA is in place, the greater benefit it has on the ecosystem, including leading to more and larger fish inside the MPA, as well as spillover effects outside the MPA.²⁴ Currently, the Ross Sea region MPA has a proposed

50-year period of designation, with a ten-year review period.

This proposed 50-year duration is linked to the objectives of the MPA, which include having reference areas for fishing and climate change. This period of designation reflects the relatively long life spans of many of the species the Ross Sea region MPA aims to protect. This includes Antarctic toothfish which live up to 40 years,²⁵ minke whales which live up to 50 years,²⁶ killer whales which may live 50 years or more,²⁷ crabeater and Weddell seals which live on the order of 20-40 years,²⁸ Adélie penguins which live 15-20 years²⁹ and emperor penguins which live an average of 20 years, but potentially up to 50 years.³⁰ Being able to detect the changes in these species' populations will take decades, especially given the variability and unpredictability of climate change. Seeing the effects of fishing on toothfish as well as potential propagations throughout the food web will take a similarly long time. Moreover, a 50-year duration is in line with Article II.3 of the CCAMLR Convention, which states that “(c) prevention of changes or minimisation of the risk of changes in the marine ecosystem which are not potentially reversible over two or three decades, taking into account the state of available knowledge of the direct and indirect impact of harvesting..”

ASOC strongly supports a permanent duration of the Ross Sea region MPA proposal, and feels that a 50-year duration clause should be the minimum acceptable period based on the precautionary principle on which CCAMLR was founded. Along with this duration, CCAMLR should incorporate designated review periods allowing the opportunity for Members to review the efficacy of the MPA in light of its original values and objectives, and to consider new science that may inform the future management of the MPA. Further, in line with international standards and with the CCAMLR rules of procedure, the decision to change the MPA after 50-years time should be based on consensus.

CONCLUSION AND RECOMMENDATIONS

The current proposed Ross Sea region MPA (2015) is supported by science that has been repeatedly endorsed by the Scientific Committee.³¹ Over the recent years of negotiation, considerable political concessions have been made, resulting in a reduction of over 40% from the original proposal. This MPA proposal still leaves areas open for a commercially viable toothfish fishery, and allows for research fishing within the Special Research Zone.

ASOC supports the designation of a large, no-take marine protected area in the Ross Sea and believes the science supports this goal. As such, ASOC has been disappointed to see continued concessions in the Ross Sea region MPA proposal. Despite our disappointment with reduced ambitions in the Ross Sea, the current proposal still includes the core elements of the original MPA. While much of the northern area originally proposed for seasonal protection has been removed, much of the ecologically rich Ross Sea shelf and slope along with the Balleny Islands (zone i) remains proposed for protection, as well as the northwestern seamounts (zone ii), and Scott Seamount (zone iii). The MPA collectively still comprises many areas important for the life history of birds and mammals, as well as reference areas aimed at improving current understanding of the potential impacts from climate change and fishing.

As such, the Ross Sea region MPA continues to provide a true opportunity for ecosystem-based

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management in the Ross Sea and can meet its objectives and those of the Convention. ASOC appreciates the efforts of all CCAMLR Members in participating in ongoing negotiations for a Ross Sea region MPA. The current design and boundaries, which accommodate fishing interests as well as meeting conservation goals, reflect a collaborative process with the end result being a CCAMLR MPA rather than one belonging to any specific Member State. We stress that any further concessions will severely undermine the ability of the Ross Sea region MPA to meet its conservation objectives and urge CCAMLR Members to adopt the current (2015) version of the Ross Sea region MPA.

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STRENGTHENING THE JOINT WORK OF THE CEP AND SC-CAMLR ON CLIMATE CHANGE

ASOC

ABSTRACT

ASOC strongly supports the decision of ATCM XXXVIII to hold a second joint workshop between the CEP and SC-CAMLR on climate change. In this paper, we suggest some ways to ensure successful outcomes for the workshop, including: agreeing on a scientific baseline; compiling overviews of existing efforts; basing the joint work programme on the CEP's Climate Change Response Work Programme; determining a process for information updates and exchange; considering mechanisms for temporary protection of areas affected by rapid climate events such as the collapse of an ice shelf; considering possible measures and decisions where climate change information would be required by the ATCM and CCAMLR; and facilitating the contribution of relevant observers and experts to the workshop. Coordination on this important issue is the only way that the ATS will develop an organized, responsive approach to addressing the impacts of climate change on the Antarctic environment.

KEYWORDS

Climate Change, CCAMLR, Antarctic Treaty System

INTRODUCTION

Climate change has already resulted in significant changes in the Antarctic environment. The Antarctic Treaty System has recognized this and recently has added climate change to the agendas of both ATCMs and CCAMLR meetings. However, it is only beginning the process of slowly incorporating of climate change information into its decision-making processes. The ATCM has recently initiated this process by adopting a Climate Change Response Work Programme (CCRWP) at ATCM XXXVIII.

The wide-ranging effects of climate change in the region will require a coordinated approach both within each organisation and between the ATCM and CCAMLR. ASOC therefore strongly supports the decision of ATCM XXXVIII to hold a second joint workshop between the CEP and SC-CAMLR on climate change. Coordination between the ATCM and CCAMLR with respect to climate change is essential, and such joint workshops are necessary to ensure coordination. It should be noted, however, that the importance of cooperation between the ATCM and CCAMLR and their respective technical bodies extends beyond climate change, as demonstrated by the successful first joint workshop between the CEP and SC-CAMLR on environmental monitoring in 2009.

RECOMMENDATIONS

In this paper, we suggest some ways the second joint workshop could fulfill two of the terms of reference from ATCM XXXVIII WP 6, Proposed Joint CEP/SC-CAMLR Workshop (2016) on climate change and monitoring from the United Kingdom and the United States:

- (ii) Reviewing existing monitoring programs to determine whether the data is sufficient to assess climate change impacts or whether new approaches are needed; and
 - (iii) Defining mechanisms for practical cooperation, including the sharing of data and information.
- ASOC suggests the following ways to implement these terms of reference either during or in advance of the workshop:

Agree on a scientific baseline for Antarctic climate change. A potentially useful approach for the workshop would be for participants to agree on a common information baseline for Antarctic climate change science. Although climate change information is continually being refined and updated, it would be helpful to determine an agreed starting point. There are reports already available that could guide the general direction of future work, such as the SCAR Antarctic Climate Change and the Environment report or the most recent Intergovernmental Panel on Climate Change (IPCC) report (AR5).

These reports are extensively peer-reviewed and reflect a general and broad scientific consensus on climate change. They could serve as a reference point for the future joint work of the CEP and SC-CAMLR.

2. Compile an overview of all existing monitoring efforts in advance of the workshop. This could be accomplished by conducting surveys directed to members of the CEP and SC-CAMLR about their current national programs related to each of the issues identified in the CEP's CCRWP1, with modifications as necessary because the broader scope of SC-CAMLR's work will also be included.

During the workshop, participants can determine if there any gaps and if so how to address them.

3. Base the planned joint CEP/SC-CAMLR work programme on the existing CCRWP of the CEP, and ensure adequate time for discussion during the workshop. The terms of reference for the workshop clearly indicate that concrete outcomes are desired, and a joint workplan has been suggested as one way to accomplish that. ASOC believes that the existing CCRWP instituted by the CEP offers a logical starting point and template for a joint workplan, and is a way to both focus and avoid duplication of effort².

It would be useful to designate members of the CEP and SC-CAMLR who can work together on a draft for discussion. Additionally, sufficient time must be set aside for discussion during the workshop to discuss and finalize the workplan for presentation to the next meetings of the CEP and SC-CAMLR.

4. Determine a process for producing annual summaries of the current status of various monitoring programs (both national programs as well as initiatives such as Integrating Climate and Ecosystem Dynamics (ICED), the Southern Ocean Observing System (SOOS), SCAR working groups, etc.). This is to fulfil TOR (iii) as listed above. ASOC thinks that one straightforward mechanism that would enhance cooperation would be to establish a plan for exchanging information, likely at CCAMLR meetings and ATCMs. This could take the form of a paper compiled by the chairs of the CEP and SC-CAMLR (or by volunteers from each committee) and submitted to both bodies on annual basis. There is a tremendous amount of information each year and it is difficult to keep abreast of it all. The range of expertise available in each of these bodies would allow for integrating relevant knowledge from different disciplines. It would therefore be useful for each group to have a summary document providing an overview of recent developments so that these can be discussed and addressed as needed during their regular annual meetings. This might also be considered during review of progress on the joint work programme, which we expect would also be carried out on an annual basis.

5. Consider mechanisms for protecting marine and terrestrial areas in the case of events likely related to climate change. The EU has proposed a conservation measure this year to establish time-limited Special Areas for Scientific Study in newly exposed marine areas following ice shelf retreat or collapse in Subarea 48.1, Subarea 48.5 and Subarea 88.3 (CCAMLR XXXIV/21). Disentangling climate change impacts from other impacts on the Antarctic environment is one of the key challenges for Antarctic scientists. ASOC supports adoption of this conservation measure. However, whether or not it is adopted at CCAMLR XXXIV, the workshop could discuss how research in such areas might proceed after ice shelf retreat, ice sheet collapse, sea ice changes, the rapid expansion of marine non-native species, or other changes that may be attributed in full or in part to climate change. A logical starting point would be a review of existing management frameworks that could be used on a temporary, short-term basis to 1) enable rapid and urgent research in the case of sudden climate change impacts, and 2) provide interim spatial protection to support resilience of Antarctic biological communities.

6. Consider the types of measures and decisions where climate information might most logically

be required. Anticipating areas where scientific advice would be needed to make decisions or create conservation measures would further assist in prioritizing work to support the ATCM and CCAMLR.

7. Facilitate, to the maximum extent possible, the contribution and active participation of relevant experts and observers to the workshop. Observers and experts have been invited to participate in the workshop, but it would be useful to identify in advance what contributions from experts and observers would be most beneficial. Experts and observers would then also be better prepared for the workshop.

CONCLUSION

ASOC hopes that the joint workshop is the first step in developing closer links between the ATCM and CCAMLR with respect to climate change. Coordination and where required, integration, on this important issue is the only way that the ATS will develop an organized, responsive approach to addressing the impacts of climate change on the Antarctic environment.

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2. The CCRWP's vision could be used to guide cooperation between both bodies: Taking into account the conclusions and recommendations from the ATME on Climate Change in 2010, the CCRWP provides a mechanism for identifying and revising goals and specific actions by the CEP to support efforts within the Antarctic Treaty System to prepare for, and build resilience to, the environmental impacts of a changing climate and the associated implications for the governance and management of Antarctica. (Appendix II, Report of the Eighteenth Meeting of the Committee for Environmental Protection (CEP XVIII) 2015).

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