



CCAMLR

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The IPCC Special Report on the Ocean and Cryosphere in a Changing Climate: CCAMLR's duty to respond

Submitted by ASOC



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Abstract

The latest Intergovernmental Panel on Climate Change (IPCC) report is a Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC). The report compiles scientific evidence to make clear the devastating impacts that climate change are having on the oceans and polar regions. In this paper, ASOC provides a short overview of some of the report's key findings and recommends that CCAMLR take collective responsibility to address the growing environmental crises of climate change and biodiversity loss with decisive action including:

1. Complete the planned representative system of MPAs as an immediate response, including areas designed to enhance climate resilience.
2. Complete and agree to a climate change response plan which includes climate change information when setting catch limits and approving conservation measures and implication statements in all working papers and fisheries reports.
3. Commit to research on climate-related changes to the Antarctic ecosystem, including ocean heat uptake, ocean acidification, and ecosystem and species changes, and incorporate this information into precautionary conservation measures.

Introduction

"All people on Earth depend directly or indirectly on the ocean and cryosphere."¹

The Intergovernmental Panel on Climate Change (IPCC) Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) "highlights the urgency of prioritizing timely, ambitious and coordinated action to address unprecedented and enduring changes in the ocean and cryosphere."² Thus far, world leaders and international organizations largely have not responded with bold, comprehensive policy solutions that would lead to such action. In the Antarctic context, this includes the ATCM and CCAMLR, where climate change is discussed and sometimes plans are developed, but policy responses are not implemented on a significant scale. The SROCC makes clear that this dynamic is failing to match the scale of the crises. For example, some CCAMLR initiatives that would address climate change, such as the establishment of MPAs, are being frustrated by a failure by Members to reach consensus. This failure is shared by those who block consensus, but also by those who do not invest sufficiently in securing intersessional support.

In a previous paper, ASOC described the predicted major consequences of climate inaction for the Southern Ocean (CCAMLR-XXXVII/BG/26). However, these consequences are not inevitable if CCAMLR Members act decisively. This includes increased consideration of climate change impacts in the Southern Ocean into its management decisions, in accordance with Resolution 30/XXVII.

In this paper, ASOC follows up on CCAMLR-XXXVII/BG/26 by reporting on major findings from the recently released SROCC to provide further urgency to CCAMLR's work to incorporate climate change information into its decisions. The conclusions of the SROCC are sobering, but as the report repeatedly emphasizes, ***the world can make decisions now that will drastically reduce the negative impacts of climate change.*** CCAMLR does have a number of policy options to promote resilience in the Southern

¹ IPCC, 2019a: Summary for Policymakers. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. Weyer (eds.)]. In press.

² IPCC. 2019. IPCC Press Release. 25 September 2019.

https://www.ipcc.ch/site/assets/uploads/sites/3/2019/09/SROCC_PressRelease_EN.pdf.

Ocean. ASOC urges CCAMLR to take the opportunities available to the Convention to minimize the risk to Antarctic marine ecosystems.

Key findings from the SROCC

*“The polar regions are losing ice, and their oceans are changing rapidly. The consequences of this polar transition extend to the whole planet, and are affecting people in multiple ways”.*³

The SROCC^{4,5} provides compelling evidence that climate change has induced changes to Antarctica that will have global effects, primarily in terms of sea level rise. The report notes that (all bulleted text in this paper is directly quoted from the IPCC unless otherwise noted):

- Global mean sea level (GMSL) is rising, with acceleration in recent decades due to increasing rates of ice loss from the Greenland and Antarctic ice sheets (*very high confidence*). ...Acceleration of ice flow and retreat in Antarctica, which has the potential to lead to sea-level rise of several metres within a few centuries, is observed in the Amundsen Sea Embayment of West Antarctica and in Wilkes Land, East Antarctica (*very high confidence*). These changes may be the onset of an irreversible ice sheet instability.⁶
- In 2006–2015, the Antarctic Ice Sheet lost mass at an average rate of $155 \pm 19 \text{ Gt yr}^{-1}$ ([equivalent to sea level rise of] $0.43 \pm 0.05 \text{ mm yr}^{-1}$), mostly due to rapid thinning and retreat of major outlet glaciers draining the West Antarctic Ice Sheet (*very high confidence*). ...In 2100, the Antarctic Ice Sheet is projected to contribute 0.04 m (0.01–0.11 m, *likely* range) under RCP2.6, and 0.12 m (0.03–0.28 m, *likely* range) under RCP8.5.⁷
- The Southern Ocean that surrounds Antarctica is the main region globally where waters at depth rise to the surface. Here, they become transformed into cold, dense waters that sink back to the deep ocean, storing significant amounts of human-produced heat and dissolved carbon for decades to centuries or longer, and helping to slow the rate of global warming in the atmosphere. Future changes in the strength of this ocean circulation can so far only be projected with limited certainty.⁸

Although CCAMLR has limited ability to counteract the global trends that drive changes to Antarctic ice sheets and Southern Ocean deepwater upwelling, CCAMLR Members includes the largest emitters of greenhouse gases⁹ and the most influential states in international fora (e.g. all permanent members

³IPCC. 2019b. Chapter 3: Polar Regions. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate, M. Meredith and M. Summerkorn, lead authors.

⁴SROCC description of probability terms: “Each finding is grounded in an evaluation of underlying evidence and agreement. A level of confidence is expressed using five qualifiers: very low, low, medium, high and very high, and typeset in italics, e.g., medium confidence. The following terms have been used to indicate the assessed likelihood of an outcome or a result: virtually certain 99–100% probability, very likely 90–100%, likely 66–100%, about as likely as not 33–66%, unlikely 0–33%, very unlikely 0–10%, exceptionally unlikely 0–1%. Assessed likelihood is typeset in italics, e.g., very likely. This is consistent with AR5 and the other AR6 Special Reports. Additional terms (extremely likely 95–100%, more likely than not >50–100%, more unlikely than likely 0–<50%, extremely unlikely 0–5%) are used when appropriate. This Report also uses the term ‘likely range’ or ‘very likely range’ to indicate that the assessed likelihood of an outcome lies within the 17–83% or 5–95% probability range.” SROCC Summary For Policymakers, footnote 6.

⁵ The quotes used in this paper will refer to RCP2.6 and RCP8.5, which are low and high future emissions scenarios, respectively. The report states “RCP2.6 represents a low greenhouse gas emission, high mitigation future, that in CMIP5 simulations gives a two in three chance of limiting global warming to below 2°C by 2100. By contrast, RCP8.5 is a high greenhouse gas emission scenario in the absence of policies to combat climate change, leading to continued and sustained growth in atmospheric greenhouse gas concentrations.” SROCC Summary for Policymakers, Box SPM.1.

⁶ IPCC 2019a. Paragraphs A3 and A3.3.

⁷ IPCC 2019a. Paragraphs A1.1 and B1.2.

⁸ IPCC 2019b. FAQ 3.1: How do changes in the Polar Regions affect other parts of the world?

⁹ <https://www.wri.org/blog/2017/04/interactive-chart-explains-worlds-top-10-emitters-and-how-theyve-changed>.

of the UN Security Council and six of the G7) and therefore have a disproportionate responsibility to act on the risk of climate change to Antarctica, and the ocean globally.

In addition to global effects, there will be regional consequences from climate change for the Southern Ocean, including:

- In both polar regions, climate-induced changes in ocean and sea ice, together with human introduction of non-native species, have expanded the range of temperate species and contracted the range of polar fish and-ice associated species (*high confidence*)... There has been a southward shift in the distribution of Antarctic krill in the South Atlantic, the main area for the krill fishery (*medium confidence*). These changes are altering biodiversity in polar marine ecosystems (*medium confidence*).¹⁰
- Cascading effects of multiple climate-related drivers on polar zooplankton have affected food web structure and function, biodiversity, as well as fisheries (*high confidence*).¹¹
- For the RCP8.5 scenario, the entire Arctic and Southern Ocean surface waters will very likely be typified by year-around conditions corrosive for aragonite minerals [minerals used by marine species to form shells] for 2090-2100... whilst under RCP2.6 the extent of undersaturated waters are reduced markedly.¹²
- For the RCP8.5 there are elevated risks for keystone aragonite shell-forming species due to crossing an aragonite stability threshold year-round in the Polar and sub-Polar Oceans by 2081–2100 (*very likely*).^{13,14}

Thus, climate-related changes have already affected Antarctic foodwebs and will have widespread impacts in the short term if global emissions are not significantly reduced. CCAMLR must anticipate this and act now to support the resilience of ecosystems. This should include research and monitoring efforts, particularly to make sure that there is a robust model that can predict the potential ecosystem consequences of aragonite undersaturation and continued acidification. CCAMLR conservation measures must take into account the changing ranges of species, whether those species are targeted by fisheries or not. The Report further discusses the potential of existing governance structures and policy/response options to address climate-related challenges, finding that:

- Governance arrangements (e.g., marine protected areas, spatial plans and water management systems) are, in many contexts, too fragmented across administrative boundaries to provide integrated responses to the increasing and cascading risks from climate-related changes in the ocean and/or cryosphere (*high confidence*). The capacity of governance systems in polar and ocean regions to respond to climate change impacts has strengthened recently, but this development is not sufficiently rapid or robust to adequately address the scale of increasing projected risks (*high confidence*).¹⁵
- The far-reaching services and options provided by ocean and cryosphere-related ecosystems can be supported by protection, restoration, precautionary ecosystem-based management of renewable resource use, and the reduction of pollution and other stressors (*high confidence*).¹⁶
- Networks of protected areas help maintain ecosystem service, including carbon uptake and storage, and enable future ecosystem-based adaptation options by facilitating the poleward and

¹⁰ IPCC 2019b. Executive Summary, Page 3-4.

¹¹ IPCC 2019a. Paragraph A5.2.

¹² IPCC 2019b. Section 3.2.2.3. Carbon and Ocean Acidification, paragraph 3.2.2.3.

¹³ IPCC 2019a Paragraph B2.3.

¹⁴ Aragonite is a form of calcium carbonate used by many marine animals (e.g. [tropical corals](#), [cold-water corals](#), [pteropods](#) and some molluscs) to make shells and skeletons. Ocean acidification results in the dissolution of aragonite, resulting in an “undersaturated” state where sufficient aragonite is not available for these species, with the consequence that shells are more difficult to form and existing shells begin to dissolve.

¹⁵ IPCC 2019a. Paragraph C1.2.

¹⁶ IPCC 2019a. Paragraph C2.

altitudinal movements of species, populations, and ecosystems that occur in response to warming and sea level rise (*medium confidence*).¹⁷

- This assessment of the ocean and cryosphere in a changing climate reveals the benefits of ambitious mitigation and effective adaptation for sustainable development and, conversely, the escalating costs and risks of delayed action. The potential to chart Climate Resilient Development Pathways varies within and among ocean, high mountain and polar land regions. Realising this potential depends on transformative change. This highlights the urgency of prioritising timely, ambitious, coordinated and enduring action (*very high confidence*).¹⁸

Antarctic Treaty System bodies and CCAMLR in particular have earned praise over the years for their forward-thinking policies. However, CCAMLR's recent failures to agree a climate response work plan or even to agree to the mandatory inclusion of climate change implications statements, call into question the credibility of the Commission. Some Members have proposed climate-related measures, have voluntarily included implications statements, and have expressed a commitment to CCAMLR acting on this key issue. ASOC is grateful for their leadership.

Given the clear scientific evidence that CCAMLR has been receiving for some time, it is puzzling that other CCAMLR Members have not supported these initiatives. The failure of CCAMLR to implement a meaningful and comprehensive approach to climate change confirms that the SROCC's conclusion was right to conclude that polar governance is not sufficient with respect to climate change.

Nevertheless, ASOC hopes that CCAMLR Members will heed the SROCC's call for "timely, ambitious, coordinated and enduring" action. (ASOC notes that Russia ratified the Paris Agreement on September 23rd). This report follows other reports such as last year's IPCC report on 1.5°C and this year's IPBES report on biodiversity, which detail and confirm the environmental crisis of climate change and biodiversity loss. The public has responded to these threats and are demanding their leaders take the kinds of actions that would arrest this planetary crisis. For the Southern Ocean, the SROCC is clear that networks of marine protected areas, ecosystem-based management, and reduced disturbance represent strong policy options.

Conclusion and Recommendations

In recent years, CCAMLR has spent more time debating how to address climate change than taking action. This must stop. Now is the time to act on the urgency of the problem at hand and focus on implementation of solutions. Everyone is responsible for responding to this crisis, and there is no one magical action that will solve the problem. Rather, a range of "transformative" policy options exist that must be implemented in virtually every aspect of human life, including in the conservation of Antarctic marine ecosystems. If CCAMLR continues to fail in its response to climate change it will be failing to deliver on its responsibility. The IPCC and IPBES are inter-governmental bodies, and therefore the Members of CCAMLR have signed off on the text we have reproduced above. It is time to listen to the science and to the millions of people, many of whom live in CCAMLR countries, who have demanded action on climate change.¹⁹

CCAMLR has particular responsibilities as the international body responsible for the conservation of marine life in 10% of the world's oceans and should act accordingly. Climate change is not a new issue, and the actions needed from international decision-making bodies should not come as a surprise. It is time for CCAMLR Members to assume individual and collective responsibility to address the growing environmental crises of climate change and biodiversity loss. It is time to focus on decisive actions and the full implementation of policies known to effectively address the growing environmental crises of climate change and biodiversity loss, while avoiding further deliberation and delay.

¹⁷ IPCC 2019a. Paragraph C2.1.

¹⁸ IPCC 2019a. Paragraph C4.7.

¹⁹ Taylor, M., Watts, J. and Bartlett, J. 27 September 2019. Climate crisis: 6 million people join latest wave of global protests. The Guardian. <https://www.theguardian.com/environment/2019/sep/27/climate-crisis-6-million-people-join-latest-wave-of-worldwide-protests>.

To uphold its conservation obligations under the CAMLR Convention, CCAMLR must do its part. Therefore, ASOC recommends that CCAMLR, and its Members:

1. Complete the planned representative system of MPAs as an immediate response, including areas designed to enhance climate resilience.
2. Complete and agree to a climate change response plan which includes climate change information when setting catch limits and approving conservation measures and implication statements in all working papers and fisheries reports.
3. Commit to research on climate-related changes to the Antarctic ecosystem, including ocean heat uptake, ocean acidification, and ecosystem and species changes, and incorporate this information into precautionary conservation measures.