

Commission for the Conservation of Antarctic Marine Living Resources Commission pour la conservation de la faune et la flore marines de l'Antarctique Комиссия по сохранению морских живых ресурсов Антарктики Comisión para la Conservación de los Recursos Vivos Marinos Antárticos

CCAMLR-XXXVII/BG/26 21 September 2018 Original: English

CCAMLR and climate change: the need for urgent action

Submitted by ASOC



This paper is presented for consideration by CCAMLR and may contain unpublished data, analyses, and/or conclusions subject to change. Data in this paper shall not be cited or used for purposes other than the work of the CAMLR Commission, Scientific Committee or their subsidiary bodies without the permission of the originators and/or owners of the data.

CCAMLR and Climate Change: The Need for Urgent Action Submitted by ASOC¹

Abstract

CCAMLR Members have acknowledged that climate change poses a major threat to Southern Ocean ecosystems but have yet to adopt a comprehensive approach to responding to climate change in the Convention Area. In this paper, ASOC highlights two major scientific articles that were published this year in which scientists propose scenarios for the future of Antarctica and the planet in a changing climate. These papers demonstrate the dramatic consequences of not addressing climate change, but also emphasize that these consequences can be prevented if the right policies are implemented now. There is a rapidly closing window for the world to take action. Climate change requires a coordinated global response, and every governance body including CCAMLR must do its part, and seek to integrate its actions with other efforts.

ASOC therefore recommends that CCAMLR:

- Improves collaboration with other international organizations and institutions.
- Incorporates climate change considerations into decisions and actions.
- Implements an overarching climate change strategy and work program.
- Designates a network of marine protected areas (MPAs).

Background

Antarctica is experiencing dramatic impacts from climate change that are only expected to intensify in subsequent years. Yet CCAMLR has taken few concrete steps to either address climate change through conservation measures or to incorporate climate change information into CCAMLR decision making.

There is a disconnect between the global commitments CCAMLR Member countries have made through the Paris Agreement of the UN Framework Convention on Climate Change and their actions to address climate change in other fora such as CCAMLR. A good example of this is the recent failure to adopt a climate change response work program at the 2017 CCAMLR meeting.

Recent scientific analyses make it clear that there is a rapidly closing window to address climate change at the global and regional levels (such as managed by CCAMLR) before the climate crosses irreversible thresholds. Members must take immediate action.

A closing window – new research outlines need for urgent response

Two major pieces of research were published this year in which scientists proposed scenarios for the future of Antarctica and the planet in a changing climate. Although these are high-level predictions, they provide clear warnings for the consequences of inaction.

First, if we do not take additional decisive action to combat climate change as Steffen et al. (2018) outline in "Trajectories of the Earth System in the Anthropocene", we may "lock in a continuing rapid pathway toward much hotter conditions – Hothouse Earth". The authors describe a scenario in which warming temperatures create conditions in which biogeophysical feedbacks and tipping cascades generate impacts greater than those caused by greenhouse gases alone.

¹ Lead author Claire Christian with contributions from Chris Johnson, Ricardo Roura, Mike Walker, and Rodolfo Werner.

Among other major biosphere shifts, the East Antarctic Ice Sheet, often thought to be more stable than the West Antarctic Ice Sheet, could begin to lose mass more rapidly if the Greenland Ice Sheet disappears, altering the Atlantic Meridional Ocean Circulation (AMOC) and increasing sea-level and heat accumulation in the Southern Ocean (Steffen et al. 2018). This will have clear consequences for Antarctic ecosystems, and CCAMLR will likely face increasing management challenges as species and ecosystems undergo rapid change.

Another paper, "Choosing the future of Antarctica", which was published in *Nature* as part of a special edition focusing on Antarctica, Rintoul et al. (2018) offers a stark picture of the future of the continent and its surrounding ocean. Without the implementation of global emissions reductions policies and Antarctic-specific policies to build ecosystem resilience and limit human impacts, the authors predict that there will be massive changes to Antarctic ecosystems, including shifts in ecosystem structure, decline in fisheries, and increases in ocean acidification (See Appendix 1 for a figure from Rintoul et al. 2018).

Despite these sobering predictions, the authors of both papers stress that these outcomes are not inevitable and that we may prevent them with decisive and immediate action. Rintoul et al. (2018) also present an alternative future scenario in which, with "warming well below the 2°C target...CCAMLR embraced the reality that climate change and harvesting were simultaneously threatening the Antarctic ecosystems...[and] barriers to establishment of Marine Protected Areas were dismantled", among others, resulting in more stable Antarctic ecosystems and a cooler planet. Thus, to avoid more dramatic scenarios, action must be taken at the global as well as the regional level.

Both papers outline that a commitment to a change in values and our approach to the environment are essential to prevent severe consequences from climate change. It is not enough to simply acknowledge the threat of climate change and think about ways to reduce emissions. We cannot make minor changes around the edges of a global economy based on "high-carbon economic growth and exploitative resource use" and expect to avoid climate disaster (Steffen et al. 2018).

Likewise, the very strong stewardship principles of the Antarctic Treaty System, including the CAMLR Convention, must be used to enact strong policies to limit human impacts on the Antarctic environment and to enhance collaboration with other international organizations, recognizing that Antarctica is part of a larger Earth system (Rintoul et al. 2018). Some Members have stated their belief that conservation should be "balanced" with rational use. But what could be less rational than neglecting an opportunity to respond to the most serious threat to the health of Southern Ocean ecosystems?

Additionally, within the Antarctic Treaty System, some Consultative Parties have expressed that as climate change is a global phenomenon, there isn't much that the ATCM or CCAMLR can do in response beyond staying abreast of climate change information. On the contrary, there are a number of actions ASOC recommends that can be implemented immediately to complement global climate change reduction policies. While it is not possible for CCAMLR alone to influence the entire planet, climate change requires a coordinated global response, and every governance body must do its part, and seek to integrate its actions with other efforts. CCAMLR recognized this, in part, in CCAMLR's Resolution 30/XXVIII (2009).²

²In Resolution 20/XXXVIII (2009) CCAMLR recognised that "...global climate change is one of the greatest challenges facing the Southern Ocean" and expressed concern "...about the effects of climate change in Antarctica, on Antarctic marine living resources." For this CCAMLR urged "...increased consideration of climate change impacts in the Southern Ocean to better inform CCAMLR management decisions", together with other discrete actions.

Conclusion and recommendations

CCAMLR has access to a wealth of scientific information that can be incorporated into management rules. Also CCAMLR can apply existing research on current and past climate trends to predict future climate conditions and their potential impacts on the environment and Southern Ocean ecosystems.

The CAMLR Convention was enacted to respond to an urgent situation – unmanaged fishing that could destabilize Southern Ocean ecosystems. CCAMLR must once again respond to the urgent situation of climate change.

In recent years, initiatives within CCAMLR to address climate change have failed to achieve consensus even as the same nations came together on the Paris Agreement. CCAMLR must end its inaction on the most important environmental issue of our time. If it does so, in fifty years' time, the CAMLR Commission would be able to congratulate itself for fulfilling its conservation obligations under the Convention and doing its part in the global response to climate change. If it does not, CCAMLR will need to accept responsibility for failing to protect a critical region of the planet.

ASOC therefore recommends that CCAMLR immediately:

- Implement an overarching climate change strategy and work program. The proposed CCRWP represented an important initial step towards a comprehensive CCAMLR approach to climate change. A new plan should be adopted this year (see CCAMLR XXXVII/23 for the proposed plan). To be successful, ASOC believes that the plan must have specific, measurable, achievable, relevant, and time-bound (SMART) objectives. That is, planned actions and reviews of information must lead to decisions, or else the program will create extra work while having little impact.
- Incorporate climate change considerations into decisions and actions. CCAMLR cannot merely note the importance of climate change research, or passively hear reports on new scientific findings and confirm that climate change is having an effect on Southern Ocean ecosystems. It must take latest climate change information explicitly into account, starting at the level of its working groups and use it to implement precautionary conservation measures. Both WG-EMM-18 and WS-SM-18 considered climate change and how to coordinate with other bodies such as SOOS, ICED and MEASO.³ These steps are encouraging, but require further expansion. For example, CCAMLR-XXXVII/01 submitted to this meeting suggests the inclusion of climate change implications statements in working papers and fishery reports. CCAMLR should also increase its coordination and cooperation on areas of common interest with the ATCM and CEP.
- Improve collaboration with other international organizations and institutions. Antarctica plays a key role in the global environment and global emissions and processes influence this region. With this in mind, governing bodies must coordinate their actions to ensure effective and consistent conservation of the environment and management of human activities and impacts (Rintoul et al. 2018). CCAMLR Members additionally should act as the voice for the Antarctic internationally, highlighting important scientific findings and reinforcing the consequences of climate-induced changes to the Antarctic environment.

³ Southern Ocean Observing System, Integrating Climate and Ecosystem Dynamics in the Southern Ocean, Marine Ecosystem Assessment for the Southern Ocean.

• **Designate a network of marine protected areas (MPAs).** In CM 91-04 (2011), CCAMLR committed to establishing CCAMLR MPAs which shall contribute, among other objectives, to achieve "the protection of areas to maintain resilience or the ability to adapt to the effects of climate change" (CM 91-04 (2) (vi)). CCAMLR must make its commitment to MPAs a reality and achieve the marine protection, research and climate change objectives of CM 91-04.⁴ As noted by the IUCN, MPAs where human activity is limited have demonstrated to provide long-term resilience to climate change (Marzin et al. 2016). They also serve as valuable scientific reference areas to disentangle the impacts of climate change from those of other human activities. Research from MPAs will improve CCAMLR's ability to make appropriate decisions and achieve Convention objectives. Warming is already affecting Southern Ocean ecosystems, and CCAMLR can improve the prospects for climate-sensitive Antarctic species by providing them with additional protection in MPAs.

References

Marzin, C, D Benzaken, M del Mar Otero, F Quemmerais, A Bates, M Brown, S Hutto, and R Brock. 2016 Marine Protected Areas and adaptation to climate change: How can MPAs increase climate resilience? In *Marine Protected Areas and climate change: Adaptation and mitigation synergies, opportunities and challenges*. F Simard, D Laffoley, and JM Baxter, eds. Gland: International Union for the Conservation of Nature.

Rintoul, SR, SL Chown, RM DeConto, MH England, HA Fricker, V Masson-Delmotte, TR Naish, MJ Siegert and JC Xavier (2018) Choosing the future of Antarctica. *Nature* 558: 233-241.

Steffen, W, JRockström, KRichardson, TM. Lenton, C Folke, D Liverman, CP Summerhayes, AD Barnosky, SE Cornell, M Crucifix, JF Donges, I Fetzer, SJ Lade, M Scheffer, R Winkelmann, HJJoachim Schellnhuber (2018) Trajectories of the Earth System in the Anthropocene. *Proceedings of the National Academy of Sciences*2018. 115 (33) 8252-8259.

⁴See also ASOC BP on Marine Protected Areas submitted to the Thirty-seventh meeting of the Commission (2018).

Appendix 1. Antarctica and the Southern Ocean under low and high emissions scenarios. Reprinted by permission from Nature Publishing: Rintoul, SR, SL Chown, RM DeConto, MH England, HA Fricker, V Masson-Delmotte, TR Naish, MJ Siegert and JC Xavier (2018) Choosing the future of Antarctica. *Nature* 558: 233-241.



Fig. 2 | Antarctica and the Southern Ocean in 2070, under 'low emissions/high action' (left) and 'high emissions/low action' (right) scenarios. Differences are relative to a 1986–2005 reference period. Differences (1) to (6) are atmosphere-ocean-ice differences, taken from model projections following low- and high-emissions scenarios, respectively. Data for differences (1), (3), (4) and (5) are from ref.¹. Data for differences (2) and (6) are from ref.³³ Differences (7) to (11) are differences in ecosystem states and pressures, with ecosystem structure changing from the current situation to one characterized by new species and interactions. Data for difference (7) is from refs ¹ and ²²; for (8) from refs ⁸² and ⁸³; for (9) from refs 57,78 and 113 ; for (10) from ref. 6 and for (11) from ref. 5 The low-emissions scenario sees greenhouse gas mitigation adhered to, limiting global warming by 2070 to 0.9 °C above the 1986-2005 mean. The high-emissions scenario, in which no mitigation takes place, leads to 2.9 °C of global warming by 2070 relative to the 1986-2005 mean, or 3.5 °C relative to 1850-1900. The systems assessed are: (1) global average air temperature; (2) Antarctic contribution to global sea level; (3) Antarctic surface air temperature; (4) Southern Ocean surface temperature; (5) summer (February) sea ice extent; (6) Antarctic ice shelf volume; (7) ocean acidification (illustrated by a pteropod, a marine snail, with an aragonite shell subject to dissolution under acidic conditions); (8) level of alien species invasion; (9) ecosystem structure (under the low-emissions scenario the present ecosystem continues; under the high-emissions scenario some species, such as crabs, become established and other species shifts occur, such as from krill to salps, as the climate warms and sea ice retreats); (10) human presence; and (11) resource use. Each of these systems will continue to change after 2070, with the magnitude of the change to which we are committed being generally much larger than the change realized by 2070.