



**ACEAS**

Australian Centre for Excellence in Antarctic Science

A Special Research Initiative of the Australian Research Council

12 October 2022

**Senate Standing Committees on Environment and Communications**  
**Environment Protection and Biodiversity Conservation Amendment (Climate Trigger) Bill 2022**

The Australian Centre for Excellence in Antarctic Science (ACEAS) welcomes the opportunity to provide a submission on *the Environment Protection and Biodiversity Conservation Amendment (Climate Trigger) Bill 2022*.

ACEAS supports efforts to amend the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to introduce a climate trigger to contribute to Australia fulfilling its obligations under the United Nations Climate Change Conventions through thorough assessment of emission-intensive activities.

ACEAS is funded (2021-2025) by the Australian Research Council to understand climate risks emerging from Antarctica and the Southern Ocean. The Antarctic Ice Sheet and the Southern Ocean are vulnerable to further planetary warming, with consequent effects on global sea levels, coastal erosion and inundation, changes to ecosystems and fisheries, and weather, including in Australia.

ACEAS researchers have recently shown that the Southern Ocean has been heavily absorbing excess heat in the atmosphere, slowing the pace of global climate change<sup>1</sup>. However, this increased ocean heat impacts on local ocean ecosystems and, as it reaches the land ice, causes increased melt of the Antarctic Ice Sheet - raising sea levels globally, freshening the ocean, and altering ocean circulation. These changes each further impact ecosystems in the Southern Ocean and, via driving changes along remote coastlines, coastal ecosystems globally. Further planetary warming will produce further melting, sea-level rise, freshwater, and global climate effects.

Climate warming is an issue impacting the future of many Antarctic and Southern Ocean species. The Intergovernmental Panel on Climate Change 6<sup>th</sup> Assessment Report (IPCC AR6) highlights that extreme weather events are beginning to emerge in Antarctica, consistent with a warming climate. For example, in 2022, Australian Antarctic Territory experienced a heatwave that produced temperatures 40 degrees warmer than normal. As highlighted in the Australian State of the Environment Report 2021, Antarctic and Southern Ocean ecosystems are at risk from the combined poleward expansion of ecosystems, especially by invasive species and the narrow thermal windows of tolerance that characterise Antarctic species. These changes are projected to be irreversible in the highest emissions scenarios. Unlike other regions influenced by the threats of climate change, species seeking an escape route from warming cannot migrate further south than Antarctica.

Further ACEAS research has shown that decisions made now regarding limiting climate emissions will have consequent effects on Antarctica that will continue over decades and centuries.<sup>2</sup> Our analysis suggests that if the Paris Agreement to limit warming to well below two degrees is satisfied, then the East Antarctic Ice Sheet contribution to sea level should remain below 0.5 metres, even five centuries from now. However, IPCC AR6 indicated that even with 1.5 degrees warming, effects on sea-ice dependent ecosystems and krill fisheries will be at least moderate, with higher impacts with further warming.<sup>3</sup>

---

<sup>1</sup> Huguenin, M.F., Holmes, R.M. & England, M.H. Drivers and distribution of global ocean heat uptake over the last half century. *Nat Commun* 13, 4921 (2022). <https://doi.org/10.1038/s41467-022-32540-5>

<sup>2</sup> Stokes, C.R., Abram, N.J., Bentley, M.J. et al. Response of the East Antarctic Ice Sheet to past and future climate change. *Nature* 608, 275–286 (2022). <https://doi.org/10.1038/s41586-022-04946-0>

<sup>3</sup> Bindoff, N.L., Boyd, P.W., Constable, A.J., King, M.A., McGee, J., and Pecl, G., 2022, [Antarctica and the Southern Ocean: insights from the IPCC WGII report](#)

ACEAS will further refine scientific understanding of the sensitivity of this complex region to future warming, to improve projections of its consequent impact on Australia, our regional neighbours, and globally.

ACEAS thanks the Committee for the opportunity to contribute to this issue.

Best Regards,

**Matt King**

Director of the ARC Centre for Excellence in Antarctic Science