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Australian Academy of Science submission on the
Algal Blooms in South Australia

The Australian Academy of Science welcomes the opportunity to comment on the *Algal Blooms in South Australia inquiry.*

It is vital to acknowledge the role of anthropogenic climate change in creating the conditions that led to the South Australian algal bloom.

The Academy recommends:

- That Australia accelerates decarbonisation efforts and strengthens its emissions targets.
- The Australian Government improves mechanisms to anticipate, prepare for and respond to marine disasters.

Australia must accelerate its decarbonisation efforts to prevent harmful algal blooms

The algal bloom in South Australia has been caused by the combination of warm ocean temperatures driven by climate change and excess nutrients.

South Australia has experienced significant drought and is prone to rapid switching between extreme dry and wet conditions,[1] increasing in length and intensity. Previously, the state has seen larger rainfalls in cooler months, while spring and summer sees clearer and dryer weather. This pattern has changed due to various factors including large-scale atmospheric circulation changes, driven by anthropogenic global warming.

The algal bloom has been caused and exacerbated by this change in weather events and by several natural events including the flooding of the River Murray in 2022-23 bringing extra nutrients into the sea, cold water upwelling in summer 2023-24 lifting more nutrients to the surface, and a marine heatwave raising temperatures by 2.5 degrees Celsius since September 2024.[2]

The scope and scale of destruction caused by this marine disaster and ocean warming are analogous to an "underwater bushfire". The algal bloom has had a serious and wide-ranging impact on marine species and ecosystems. Citizen science logs across South Australian marine waters have shown 29,000 observations of at least 465 impacted species including threatened or at-risk species such as the coastal stingaree (*Urolophus orarius*) only found in South Australia, the pygmy thornback skate (*Dentiraja flindersi*) and the great white shark (*Carcharodon carcharias*).[3]

Minimising ocean warming is the most important factor to prevent future harmful algal blooms and reduce the risk of future marine disasters along Australia's coastline. This requires rapid emissions reduction and accelerating decarbonisation efforts. Australia's next Nationally Determined Contribution under the Paris Agreement is due this year and is an opportunity for evidence-based targets to drive more ambitious climate policies and action.

In the first three months of 2025, the cost of lost economic activity from natural disasters has been estimated at $2.2 billion[4] (March 2025). Australia can expect to see a loss of $13 billion each year, with projections to escalate to as high as $39 billion each year by 2050[5] as the frequency and intensity of these hazards increase due to climate change.

Australia has capabilities and comparative advantage to become a global leader in decarbonisation, energy storage, green metals, rare and critical minerals, and hydrogen. Reducing emissions and rapid decarbonisation of Australia will reduce the impacts of climate change but will also open new opportunities in jobs and industries, aligning with the government policy of Future Made in Australia and protecting our nation and futures.

Improve mechanisms to anticipate, prepare for and respond to future marine disasters to rapidly mobilise research capability

The South Australian algal bloom was anticipated due to various factors such as excess nutrients, poor return movement of water and warming shallow waters in the gulfs off South Australia.[6]

Short term appropriations of funds will eventually be insufficient to tackle the ongoing and cumulative problem of anthropogenic climate change, which compounds the risk of future natural disasters. Future events are expected across the expanse of Australia's coastline and will have significant impacts on biodiversity and communities, as experienced with the present algal bloom.

Mechanisms are needed to improve our ability to anticipate, prepare for and respond to these events. Such mechanisms must establish coordination between jurisdictions, deploy funding for research and rapidly mobilise Australia's research capability. Further support and monitoring will be needed to conserve biodiversity – identifying affected species, supporting interventions and monitoring recovery. This incident is not isolated, and the current absence of whole of government assistance and national coordination and management limits our ability to mitigate impacts of this and future algal blooms.

A national emergency declaration would send a national signal of the importance of the algal bloom and its impact on Australia's biodiversity, and would unlock additional support and mobilise research capability. Consideration should be given to how marine disasters fit into existing national crisis and disaster frameworks.

To discuss or clarify any aspect of this submission, please contact Lauren Sullivan, Manager Policy at science.policy@science.org.au.

References

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