



# SAEF

## Securing Antarctica's Environmental Future

Australian Research Council Special Research Initiative

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## Let's stop issuing Antarctica an annual invitation to come into our homes

Something is happening in Antarctica that we had best understand. The frozen continent is coming to us. Not uninvited. We issued the invitation decades ago. And have renewed it annually, with growing insistence.

Every year that has seen substantial, and usually rising greenhouse gas emissions, has been one where we have invited Antarctica's ice sheets to come to our shorelines, and its climate system to change in ways that affect ours.

For the most part, the Antarctic region has diligently filed away these carbon-laced invitations through the ability of its surrounding Southern Ocean to absorb human-generated heat and CO<sub>2</sub>, a long-lasting and powerful greenhouse gas. Until now, our impacts have been suspected, but not readily distinguishable from the natural variability of the complex system that is Antarctic and the Southern Ocean.

Now, our impacts are fast becoming visible. Attribution to human causes of changes across the Antarctic region is sufficiently clear that conservative scientists, and even more conservative government-agreed international reports, are pointing to the consequences of our actions.

A succinct summary is provided by a new report from the pre-eminent international Antarctic science organisation – the Scientific Committee on Antarctic Research.

The ocean and atmosphere are warming, and the Antarctic ice sheet is melting. Depending on the extent of our greenhouse gas emissions, that melt could contribute to 44 cm of global sea level rise when today's toddlers are talking about their aged care, or 70 cm, if our emissions are not reduced, or potentially 2 m if ice sheets behave in ways that are not implausible.

Although sea level rise impacts will vary across the globe, even with a 40 cm rise, 1-in-100-year coastal flood events become annual. Hundreds of millions of people will be impacted and the economic consequences contagious.

Changing Antarctic climates also affect our weather patterns. Changes to climate patterns over the Antarctic and Southern Ocean (technically often called the Southern Annular Mode) affect droughts, heatwaves and their associated fires in south-eastern Australia. Just what we do to the Southern Annular Mode through our greenhouse gas emissions



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has a direct influence on our lives. And the changes are projected to continue.

Importantly, these sea level and extreme event impacts will just happen as the calendar turns over to 2100. They are already underway. Insurance costs are rising and for many electorates, projections are that significant proportions of properties will become uninsurable within the next decade.

It's not only our backyards that are at risk. Our imaginations and inspiration are too. The ecosystems of the Antarctic and Southern Ocean are changing, and will do so even more dramatically. Indomitable emperor penguins, raising their families in Antarctic winters, are projected, under current conditions, to be lost before the century is out. And those otherworldly, dramatic landscapes of rock and ice, transformed to boring suburban green because it's easier for our weeds to make the continent their home. The call of the wild is being silenced.

Now that we understand, what's to be done?

The reciprocity between Antarctica and our homes makes the answer much more straightforward than it might seem.

Look after our futures.

Taking care of ourselves and our kids will take care of Antarctica.

If we reduce flood and fire risk, by reducing emissions, we stop issuing such insistent invitations to Antarctica to come to our neighbourhoods. And we ensure that it remains the inspirational place it has always been.

Emissions reductions are not a simple challenge, but we already know the solutions and the path we have to walk. Of course we cannot travel it alone. We need all the help we can get – from government, from business, and from our neighbours. But in effect, that's helping ourselves, since we constitute our neighbourhoods and businesses, and our elected officials.

Perhaps most critical is to reject the notion that it's all too late and that we should give up any further effort. That's just rhetoric from the fearful and the greedy.

Everybody knows that momentum makes further momentum easier. A snowball effect that helps us keep our world as we know it, and Antarctica where it should be – in the Antarctic.