

Antarctic experts offer two possible views of continent's future

June 13 2018



The late summer sun sets over mountains and icebergs around Adelaide Island, Antarctic Peninsula, as twenty-four hour daylight gives way to the long polar night of winter. Credit: Hamish Pritchard, BAS

The next 10 years will be critical for the future of Antarctica, and choices made will have long-lasting consequences, says an international

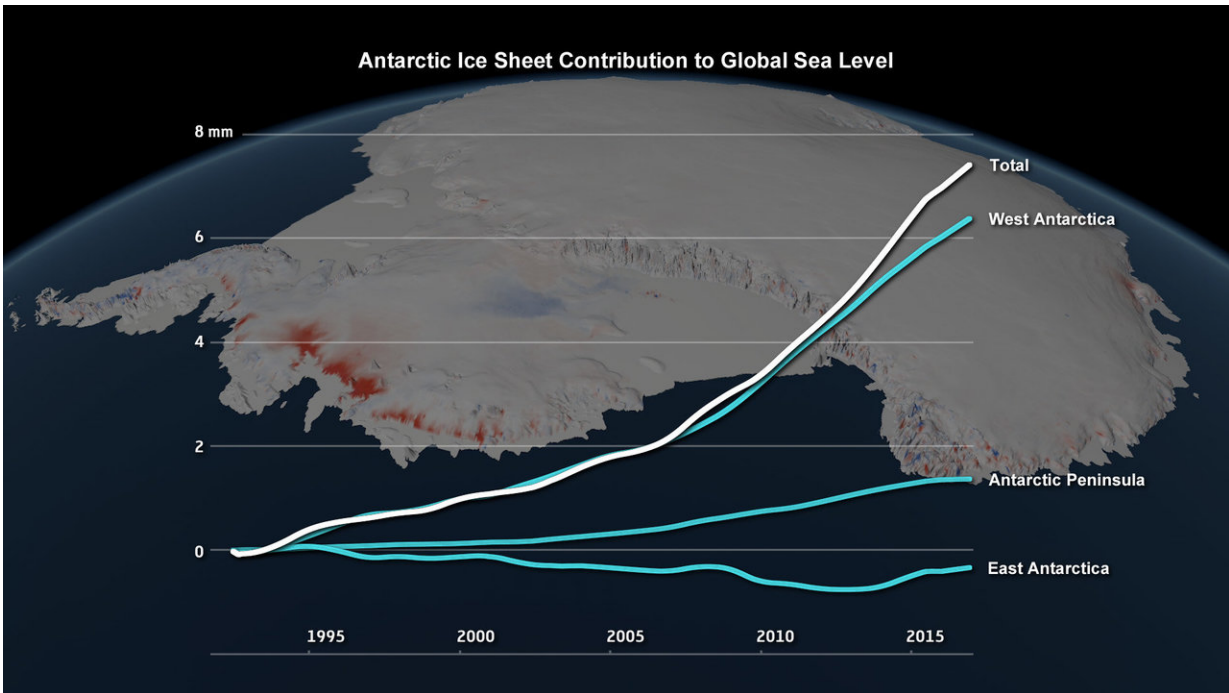
group of award-winning Antarctic research scientists in a paper released today. It lays out two different plausible future scenarios for the continent and its Southern Ocean over the next 50 years.

Writing in *Nature*, the authors are all winners of the Tinker-Muse Prize for Science and Policy in Antarctica and experts in such disciplines as biology, oceanography, glaciology, geophysics, climate science and policy.

Recent work by Rob DeConto, the 2016 winner of the Tinker prize and professor of geosciences at the University of Massachusetts Amherst, includes findings in a 2016 paper also in *Nature* that highlights the potential for Antarctica to contribute much more sea level rise to the world's oceans than previously considered.

That work also highlights how reduced [greenhouse gas emission](#) can reduce the exposure of low-lying coastlines and cities to rising seas, including Boston.

DeConto says, "Emerging science is pointing to more extreme worst-case scenarios with regards to sea level rise from Antarctica, but the good news is that a reduction in emissions, in line with the aspirations of the Paris Climate Agreement, dramatically reduces the risk of flooding our coastlines in future decades and centuries."



Sea level contribution due to the Antarctic ice sheet between 1992 and 2017.
Credit: imbie/Planetary Visions

He and his eight co-authors offer two alternative narratives on the future of Antarctica and surrounding [ocean](#) from the perspective of an observer looking back from 2070. The scenarios are "highly speculative," they stress, not forecasts but intended as starting points for discussion. The narratives touch on long-term consequences of decisions made today for such variables as [ice shelves](#), invasive species, sea ice, ocean and land ecosystems, mining and other human uses.

In the first scenario, "greenhouse gas emissions remained unchecked, the climate continued to warm," and the policy responses are ineffective, with large ramifications in Antarctica and the Southern Ocean and "worldwide impacts." In this narrative, Antarctica and the Southern Ocean would see dramatic loss of major ice shelves by 2070 leading to

increased loss of grounded ice from the Antarctic Ice Sheet and an acceleration in [global sea level](#) rise. Further, "unrestricted growth in human use" will have degraded the environment and introduced invasive pests.

In the second scenario, "ambitious action" has been taken to limit greenhouse gas emissions and to establish policies that reduce human pressure on the environment, slowing the rate of change and enhancing Antarctica's resilience. This might allow the continent in 2070 to look "much like it did in the early decades of the century," the authors suggest, with ice shelves intact, slower loss from the ice sheet and reduced threat of sea level rise.

Further, in the second scenario, ocean acidification has not worsened and Antarctic ecosystems have remained intact, human pressures have been managed by a collaborative and effective governing plan.

Lead author Steve Rintoul of the Centre for Southern Hemisphere Oceans Research and Antarctic Climate and Ecosystems Cooperative Research Centre in Hobart, Australia, says, "The trajectory that will play out over the next 50 years depends on choices made today. Greenhouse gas emissions must start decreasing in the coming decade to have a realistic prospect of following the low emissions narrative and so avoid global impacts associated with change in Antarctica, such as substantial [sea level rise](#)."

He adds, "The future of Antarctica is tied to that of the rest of the planet and human society. Actions can be taken now that will slow the rate of environmental change, increase the resilience of Antarctica, and reduce the risk that we commit to irreversible changes with widespread impact."

The researchers conclude, "Despite the challenges, actions can be taken now that will slow the rate of environmental change, increase the

resilience of Antarctica, and reduce the risk of out-of-control consequences. An effective response to the challenges of a changing Antarctica can serve as an example of the power of peaceful international collaboration, as well as demonstrate how integration of physical, biological and social sciences can enable decision-making that is informed by the past and takes account of the long-term consequences of today's choices."

Provided by University of Massachusetts Amherst

Citation: Antarctic experts offer two possible views of continent's future (2018, June 13)
retrieved 26 June 2024 from <https://phys.org/news/2018-06-antarctic-experts-views-continent-future.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.