Melting of the Antarctic ice sheet could cause multi-meter rise in sea levels by the end of the millennium

**Story Source:** [**Hokkaido University**](https://www.global.hokudai.ac.jp/).

<https://www.sciencedaily.com/releases/2021/12/211222100824.htm>

One of the many effects of global warming is sea-level rise due to the melting and **retreat of** the Earth's **ice sheets** and glaciers as well as other sources. As the sea level rises, large areas of densely populated coastal land could **ultimately** become uninhabitable without extensive coastal modification. It is therefore vital to understand the impact of different **pathways** of future climate change on changes in sea level caused by ice sheets and glaciers.

A team of researchers from Hokkaido University, The University of Tokyo and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) explored the long-term perspective for the Antarctic ice sheet beyond the 21st century under global-warming conditions, **assuming** late 21st-century climatic conditions remain constant.

The Ice Sheet Model Intercomparison Project was a major international effort that used the latest generation of models to estimate the impact of global warming on the ice sheets of Antarctica and Greenland. The **contribution** of the Antarctic ice sheet to sea-level rise by 2100 was assessed to be in the range between 7.8 and 30.0 centimetres under **unabated** warming and between 0 and 3 centimetres under reduced emissions of greenhouse gases. The team analysed the results of the simulations with respect to the total mass change of the ice sheet, regional changes in West Antarctica, East Antarctica and the Antarctic Peninsula, and also the different contributors to mass change.

The simulations of **mass loss** of the Antarctic ice sheet show that, by the year 3000, the unabated warming pathway produces a sea-level equivalent (SLE) of as much as 1.5 to 5.4 metres, while for the reduced emissions pathway the SLE would be only 0.13 to 0.32 metres. The main reason for the **decay** under the unabated warming pathway is the collapse of the West Antarctic ice sheet, made possible by the fact that the West Antarctic ice sheet is grounded on a bed that is mostly well below sea level.

"This study demonstrates clearly that the impact of 21st-century climate change on the Antarctic ice sheet extends well beyond the 21st century itself, and the most severe consequences – multi-meter contribution to sea-level rise – will likely only be seen later," says Dr. Christopher Chambers of Hokkaido University's Institute of Low Temperature Science. "Future work will include basing simulations on more realistic future climate scenarios, as well as using other ice-sheet models to model the **outcomes**."

**Questions**

1. What are the causes and effects of sea-level rise?
2. How did the team of Japanese researchers study the impact of global warming on the ice sheets?
3. Which two climate scenarios did the researchers predict?
4. Is it possible for people to take climate change under control?

**Vocabulary**

* retreat of the ice sheet – отступление ледового покрова
* ultimately – в конечном итоге
* pathways – путь
* to assume – принимать за основу, допускать
* contribution – вклад, доля
* unabated – неспадающий, с той же интенсивностью
* mass loss – потеря массы
* decay - убывание, разрушение
* outcome – результат

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