



Satellite image of Thwaites Glacier, one of the most rapidly thinning ice streams in West Antarctica.

How can models help predict sea level rise?

Our ability to reliably predict sea levels is crucial. If we don't adapt, sea level rise could be catastrophic, especially for coastal communities. But if forecasts are inaccurately pessimistic, we may over-adapt and waste important resources.

Dr Ieva Kazlauskaitė (Department of Statistics) is part of a team modelling the West Antarctic Ice Sheet. With enough ice to raise global mean sea levels by up to 5m, its fate will shape the future of our coastlines.

The team finds that higher resolutions of ice-sheet models – which produce more detailed simulations – give more accurate and less varied predictions of contributions to sea level rise than lower resolutions.

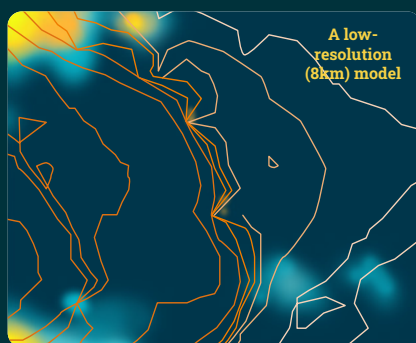
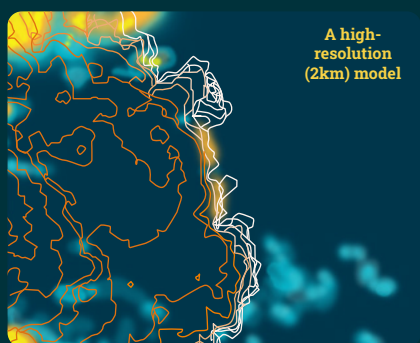
But the challenge is cost – you could potentially run 20 low-resolution simulations for the same cost as 3 high-resolution simulations. Lower-resolution models may be cheaper, but their variability makes planning for climate adaptation difficult.

The new IceDice project, running until 2028, aims to transform how we model the West Antarctic Ice Sheet. It will use advanced models that can explore far more scenarios than traditional simulations.

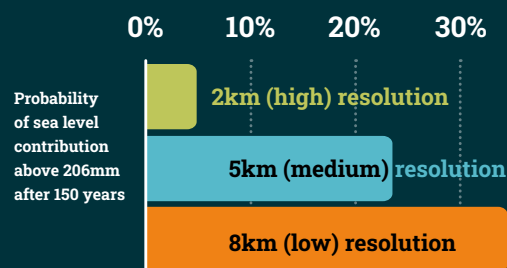
This ensures planners and policymakers can evaluate adaptation strategies under plausible futures, balancing risk and resources effectively to help safeguard communities and support coastal resilience planning.

1 trillion
Possible yearly flood-related costs by 2100 without adaptation

200 million
Global population currently exposed to sea level rise, set to double by 2060



These images show the differences between simulations at two model resolutions for the retreat of Thwaites Glacier over 150 years.



This table shows how ice-sheet models with different spatial resolutions project different probabilities of sea level contribution over time.