



OCEAN:ICE



**British
Antarctic Survey**
NATURAL ENVIRONMENT RESEARCH COUNCIL

Ocean-Cryosphere Exchanges in Antarctica: Impacts on the Climate and the Earth System

Andrew Meijers, British Antarctic Survey, Cambridge, UK

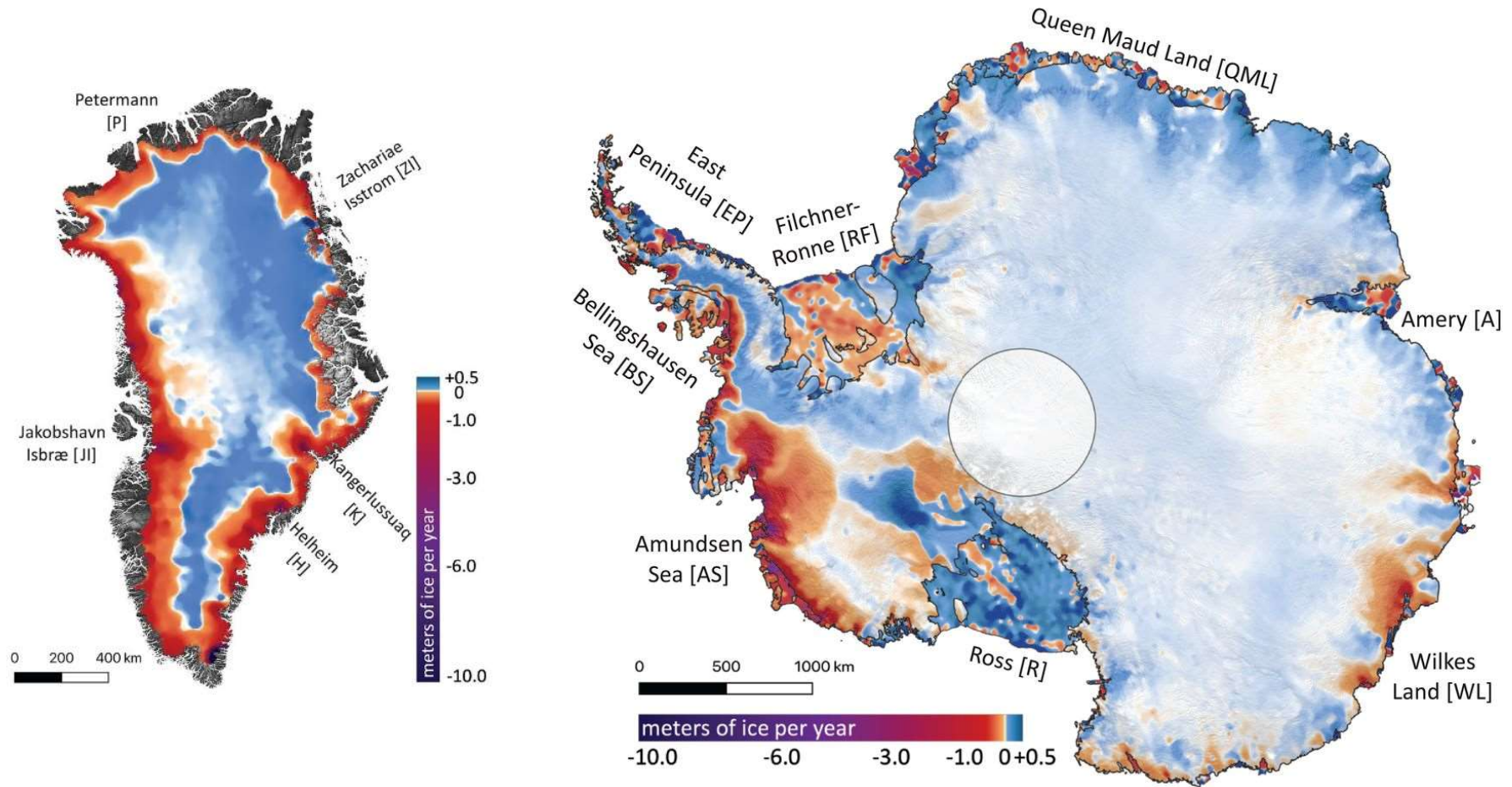
The OCEAN RACE 2022-23 – Genova Grand Finale

27 June 2023



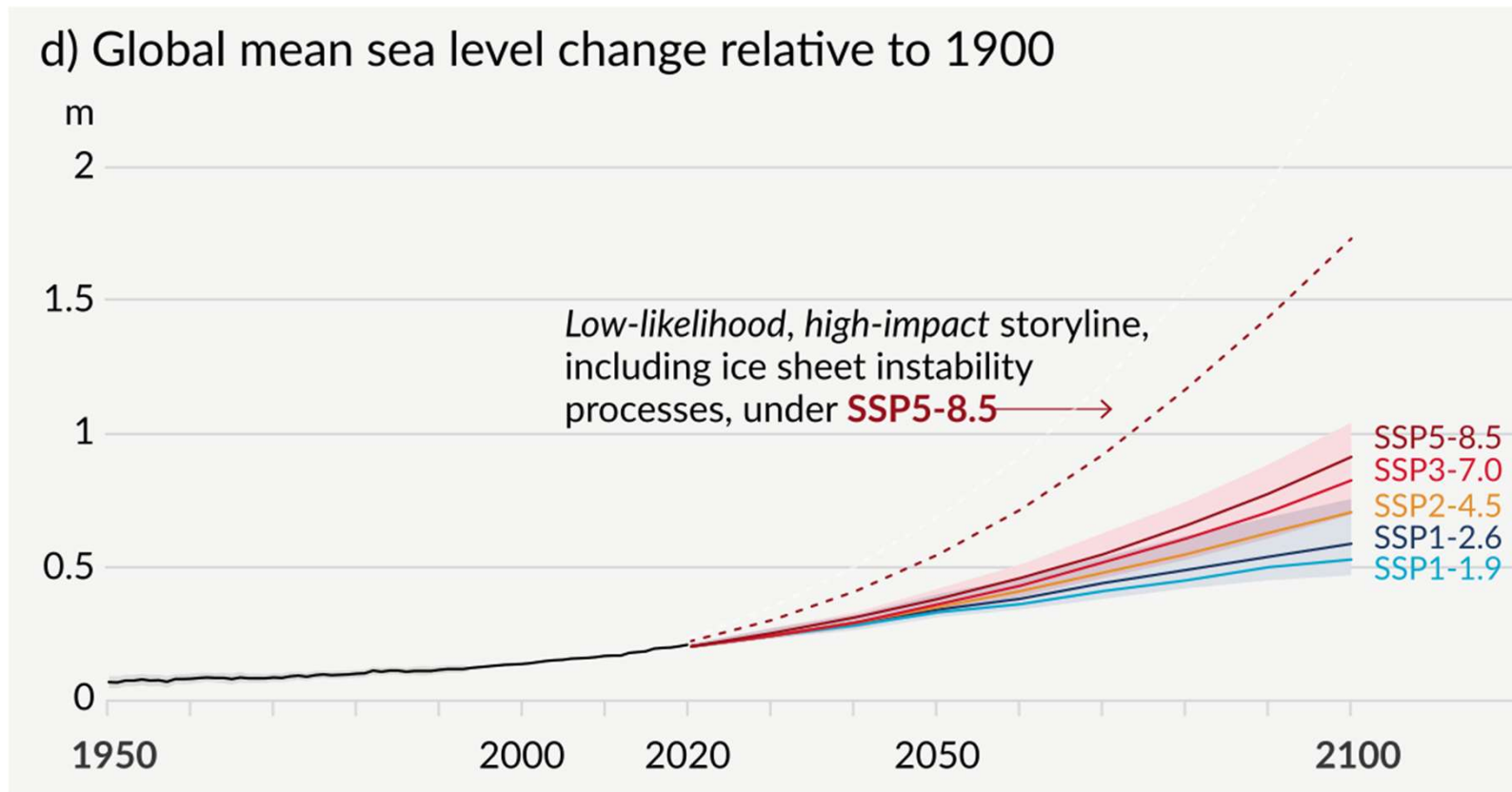
OCEAN:ICE is co-funded by the European Union, Horizon Europe Funding Programme for research and innovation under grant agreement Nr. 101060452 and by UK Research and Innovation

Ice sheets are losing mass due to ocean driven melting



IceSat(-2) thickness change (2003-19)
Smith et al., 2020, Science

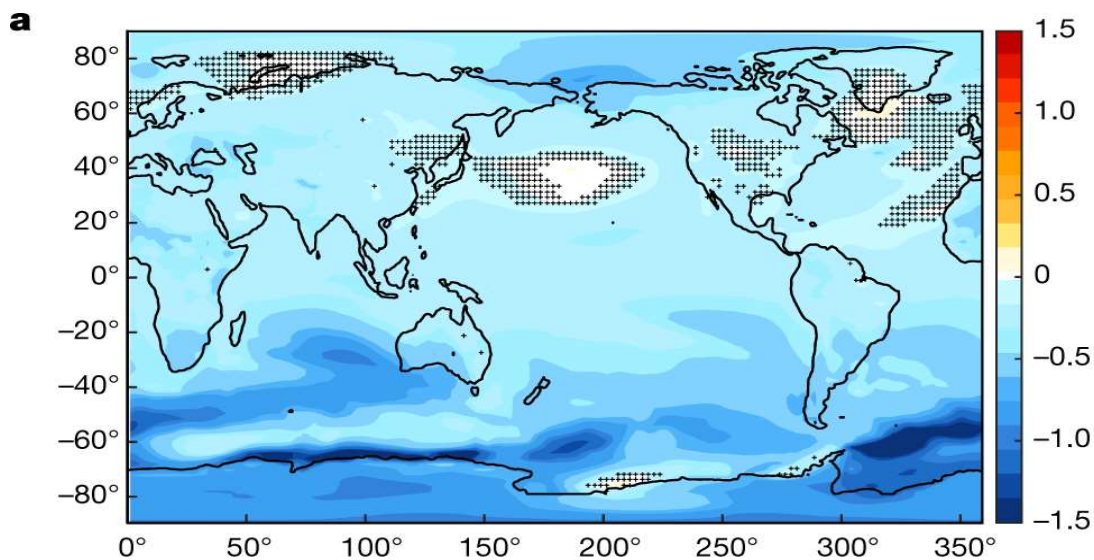
Future ice sheet mass loss is one of the greatest climate uncertainties



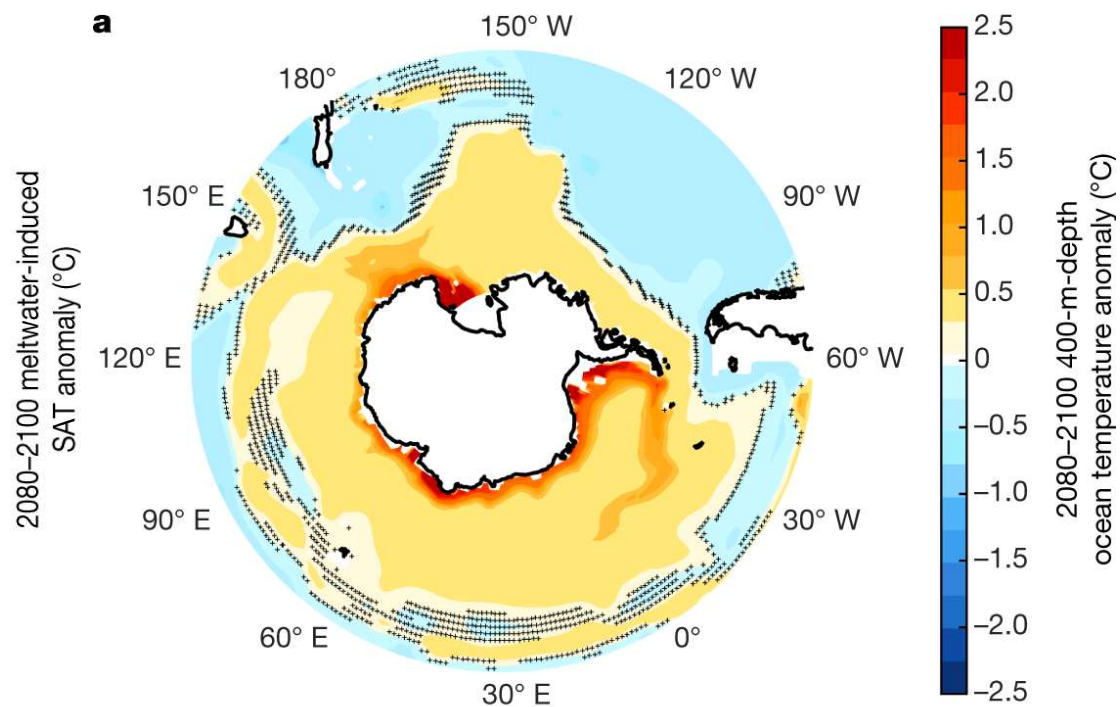
IPCC AR6 (2021), Summary for policy makers high impact storyline from an expert survey and structured expert judgement (i.e. not modelled)



Antarctic feedbacks contribute to global impacts



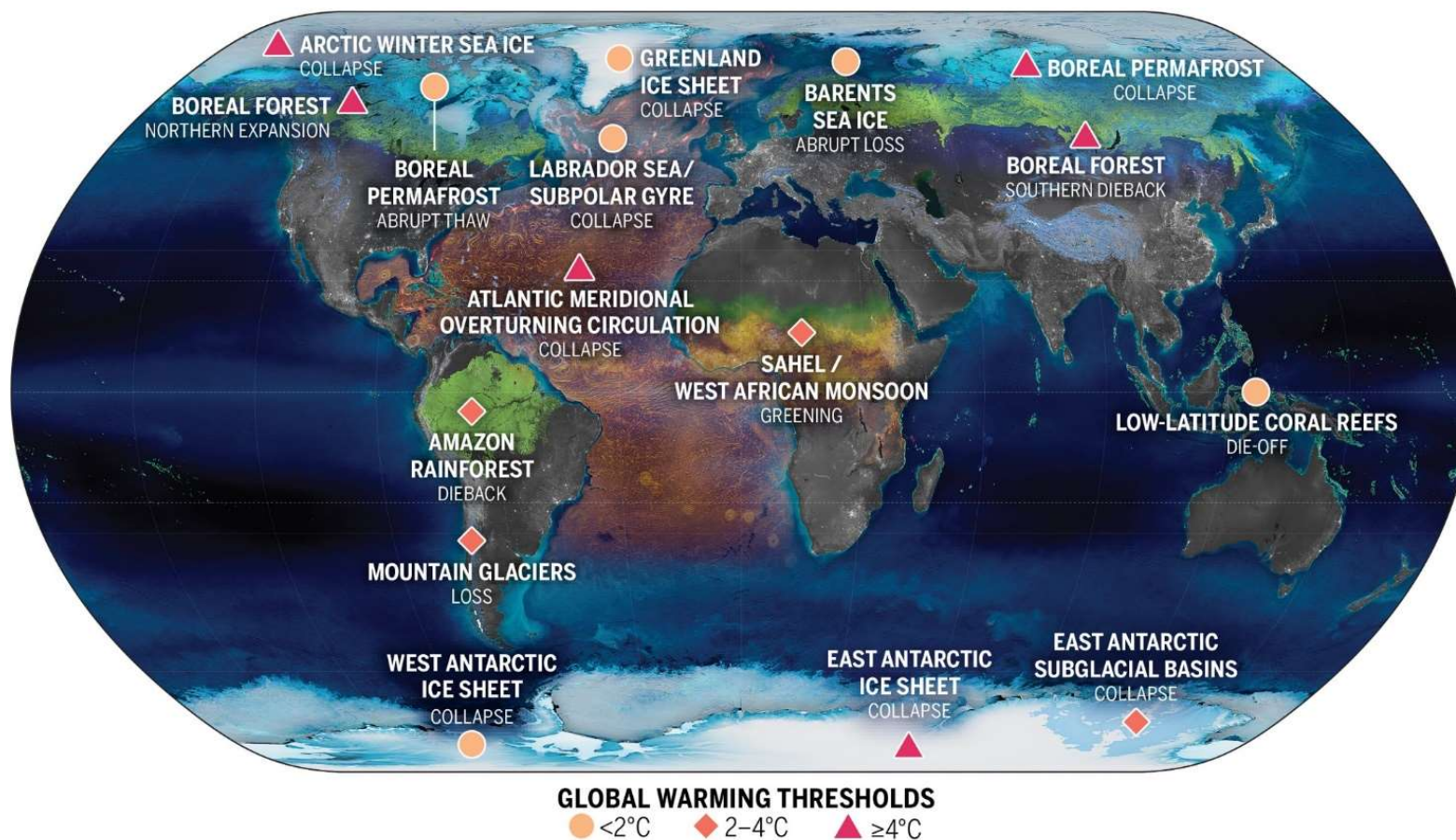
Future climate is slightly cooler
with melting ice sheets



...but the warmer subsurface has the
potential to accelerate melt
(Bronselaer et al., 2018)



Climate tipping points add even more uncertainty, and many are polar



Potential tipping point thresholds
(McKay et al., 2022)



Combines expertise in ice sheets, instability, ocean circulation and model development



*Tipping Points in Antarctic
Climate Components*



H2020



H2020



OCEAN:ICE



Horizon Europe

Proteet
CRYOSPHERE & SEA LEVEL



H2020



UKESM





OCEAN:ICE

8 MEURO project, co-funded by Horizon Europe (with 4.9 MEURO) and United Kingdom Research and Innovation

4 years, starting in November 2022

17 partners from the EU and UK

Many participating

international supporting organisations

Coordination team:

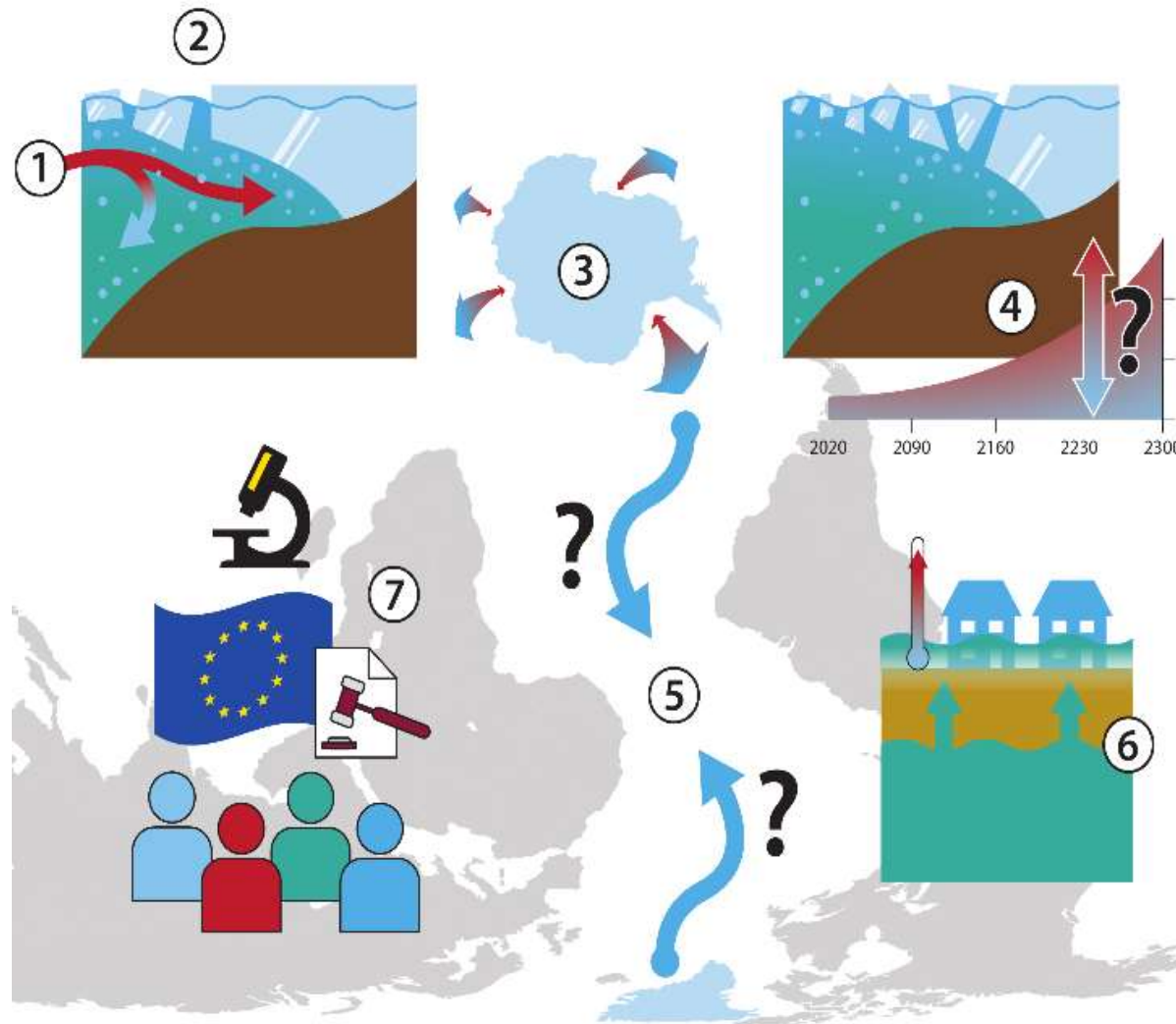
- Horizon Europe Project coordinator: Danish Meteorological Institute, Ruth Mottram (rum@dmi.dk)
- UKRI coordinator at UKRI-BAS: Andrew Meijers (andmei@bas.ac.uk)
- EU grant project manager: Chiara Bearzotti



Danmarks Meteorologiske Institut

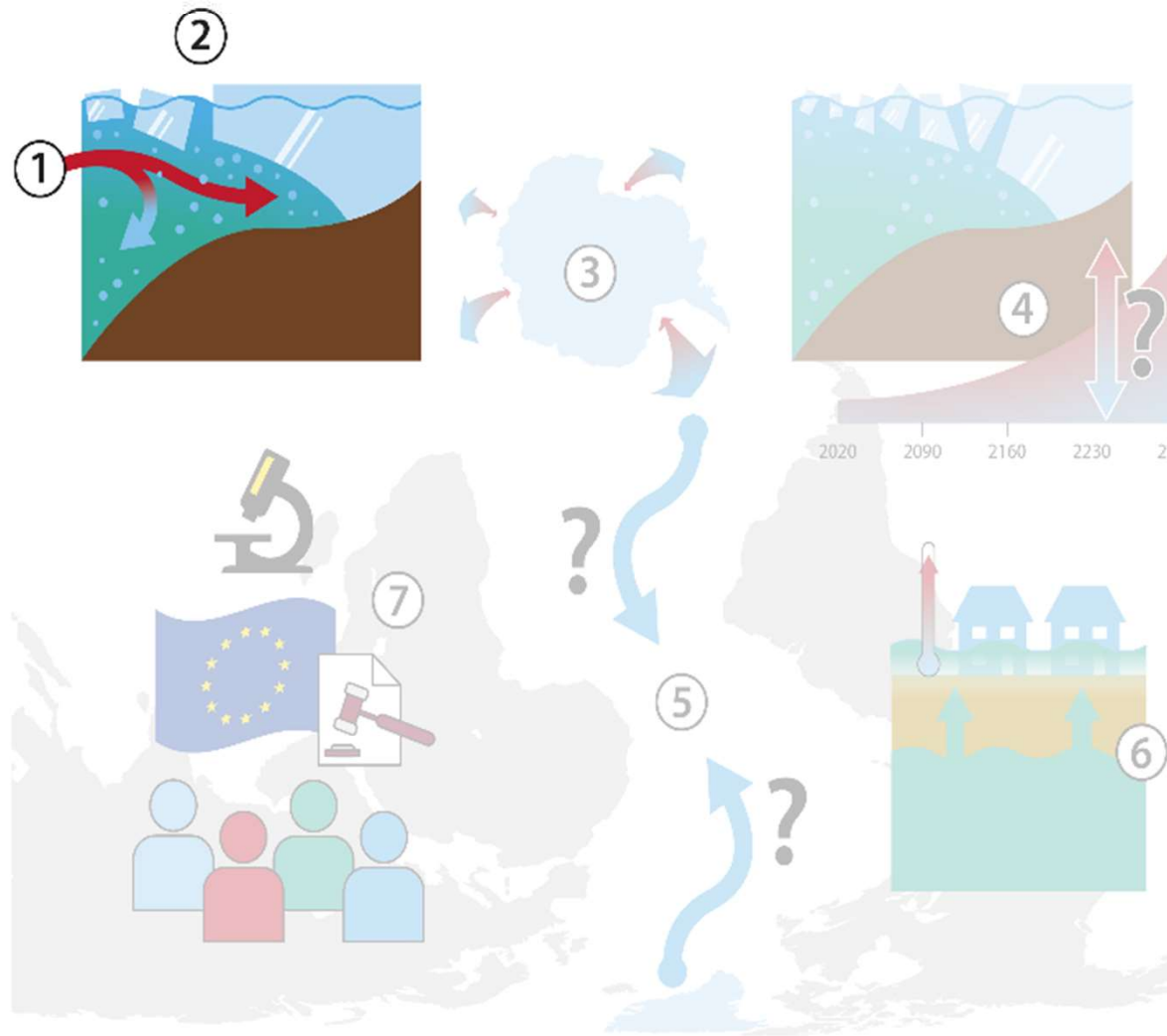


Impact of Antarctic and Southern Ocean processes and feedbacks on planet Earth



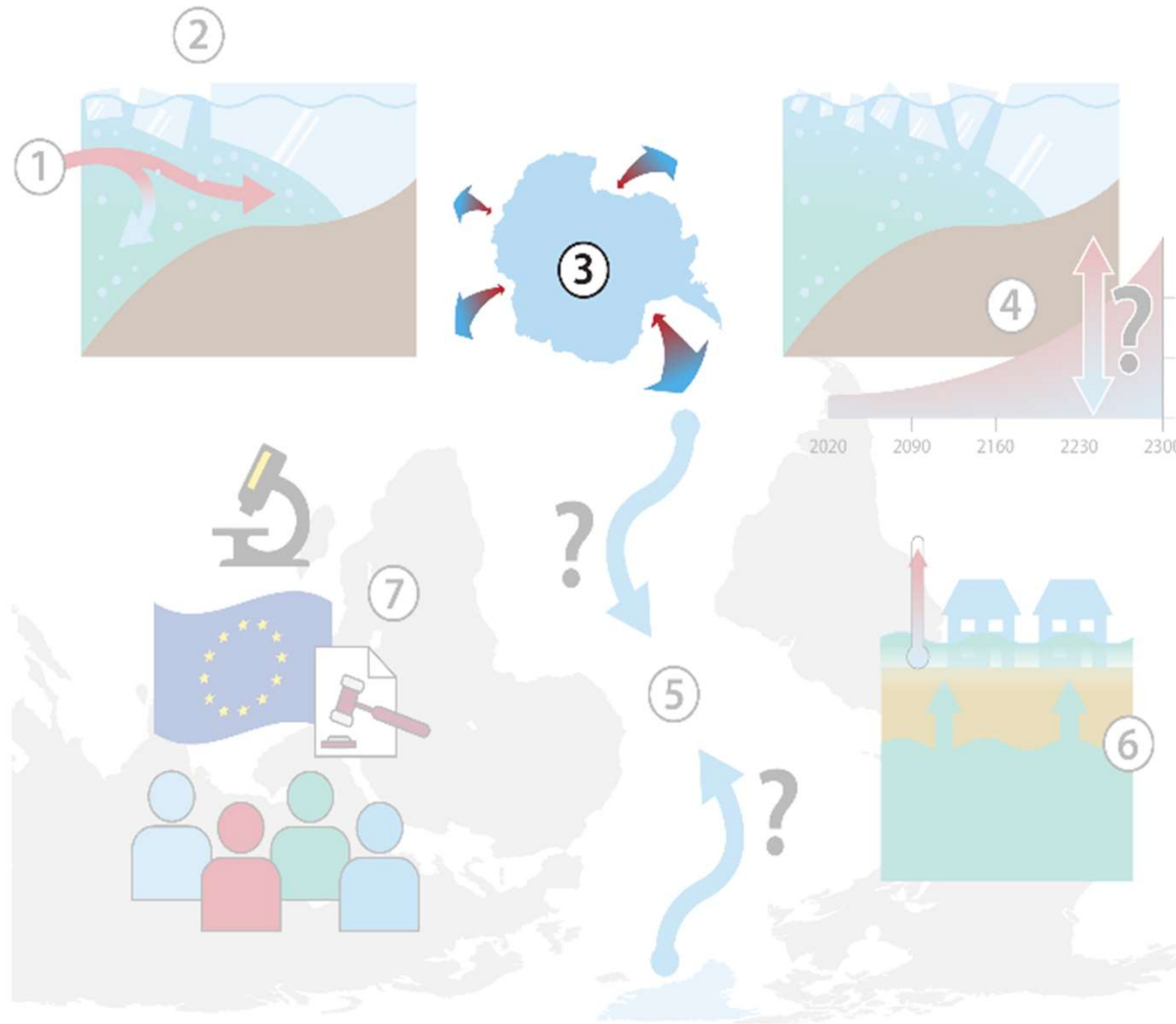
- ① Ocean processes around Antarctica (WP1)
- ② Antarctic ice sheet-ocean interactions (WP2)
- ③ Antarctic ice sheet modelling and freshwater fluxes (WP3)
- ④ Future fluxes and stability of Antarctic ice sheet (WP4)
- ⑤ Ice sheet impact on global ocean circulation (WP5)
- ⑥ Ice sheet-ocean-climate impacts and tipping points (WP6)
- ⑦ Scientifically and socially relevant impacts and dissemination (WP7-9)

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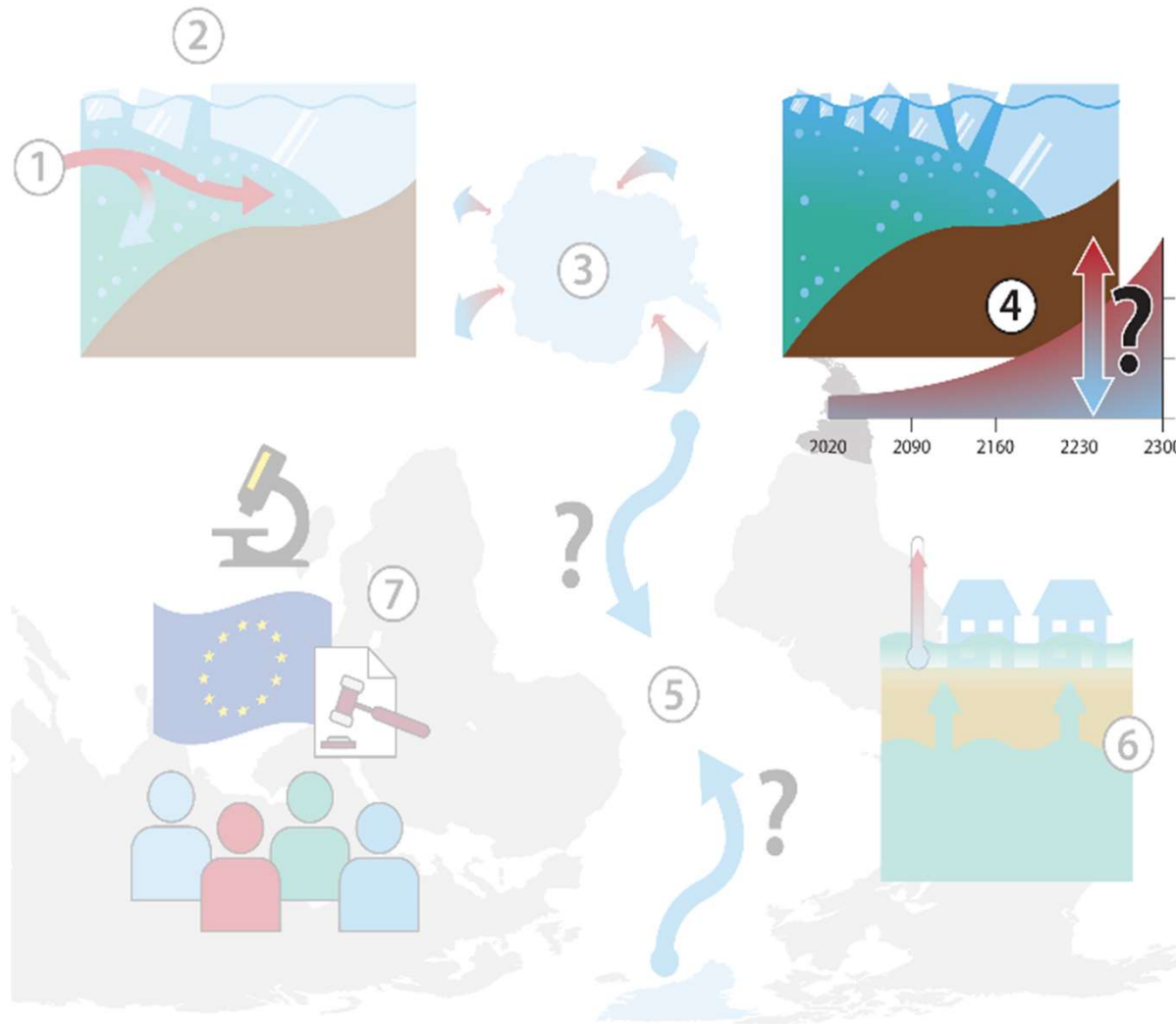
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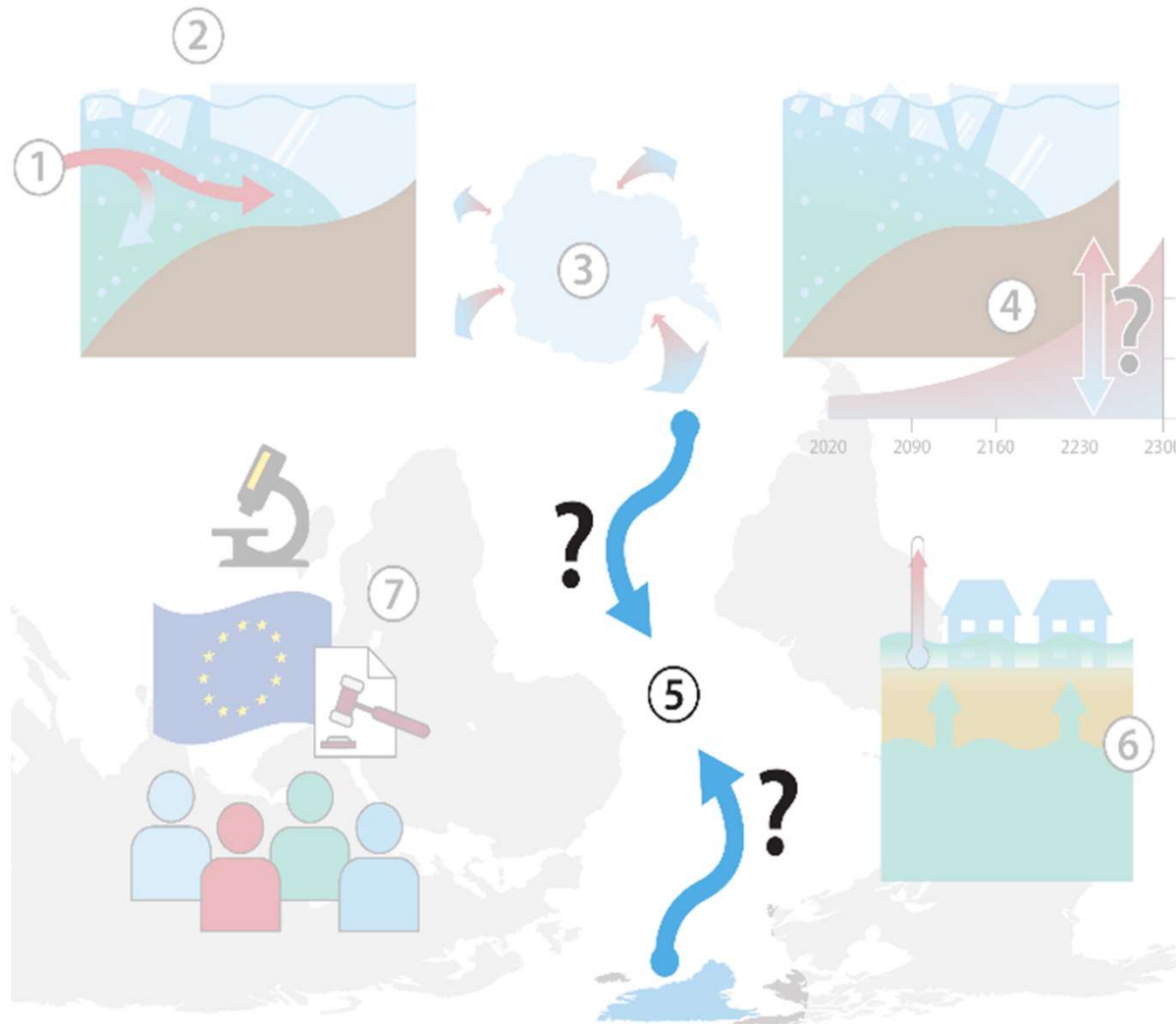
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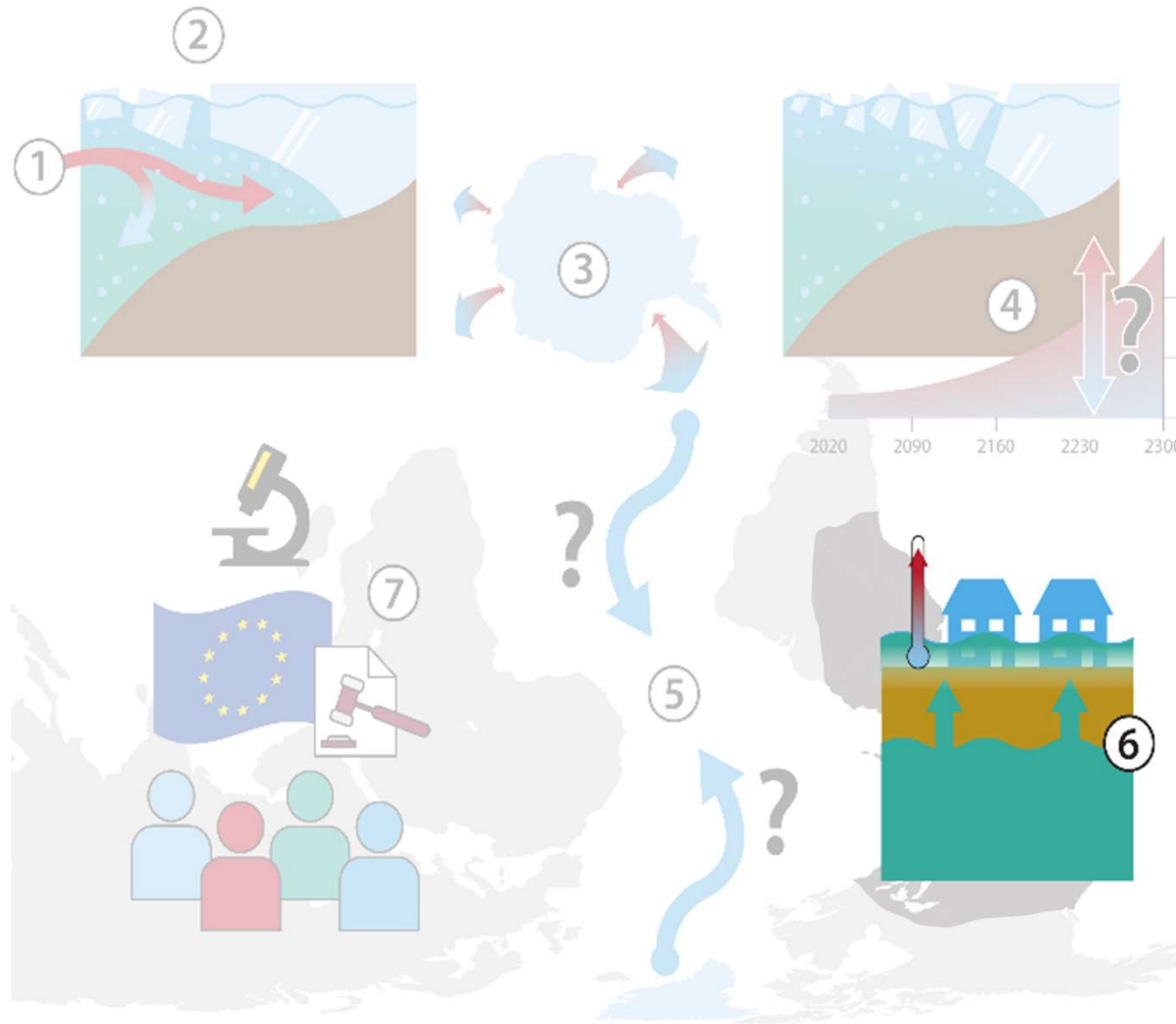
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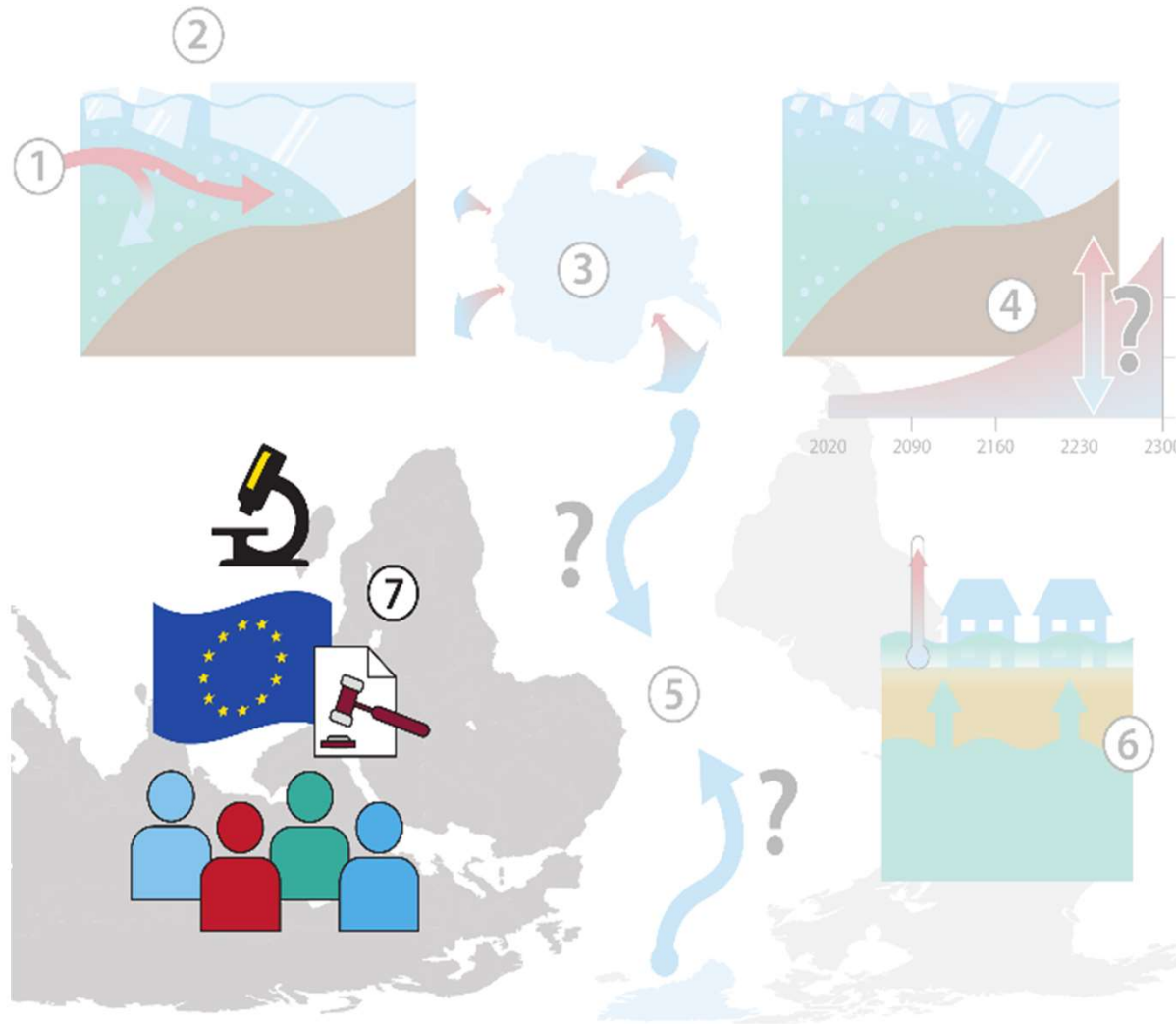
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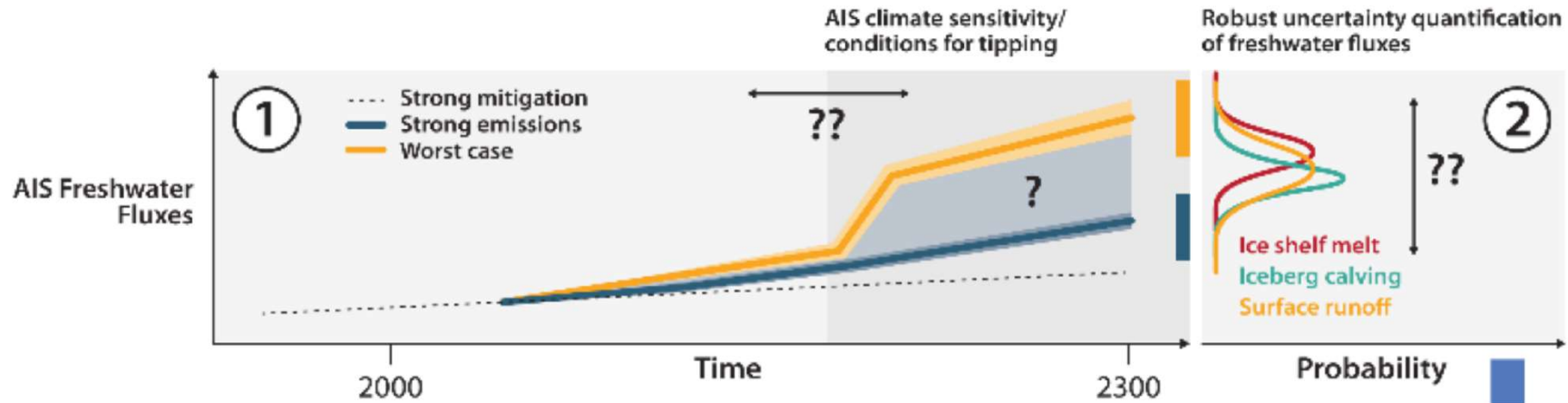
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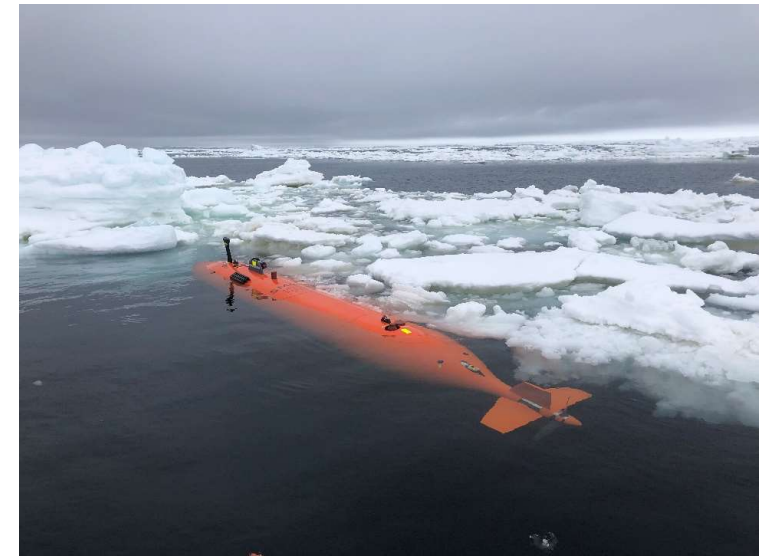
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- 6: Modelling of ocean-ice feedbacks and impact on climate; which informs;
- 7: Climate assessments and advice to policymakers and public



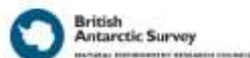
What OCEAN:ICE will produce



- New projections of sea level rise
- New assessments polar tipping point risk
- New observations under different types of ice shelves
- Improvements to global climate models
- The first projections of global climate indicators with active ice sheets
- Direct collaboration with regional modellers and policy makers for long term planning



OCEAN:ICE Partners





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