



ESA – EC Collaboration on Ice-Ocean Interactions

Prof Anna E. Hogg

ESA Polar Science Week – Sept 2024



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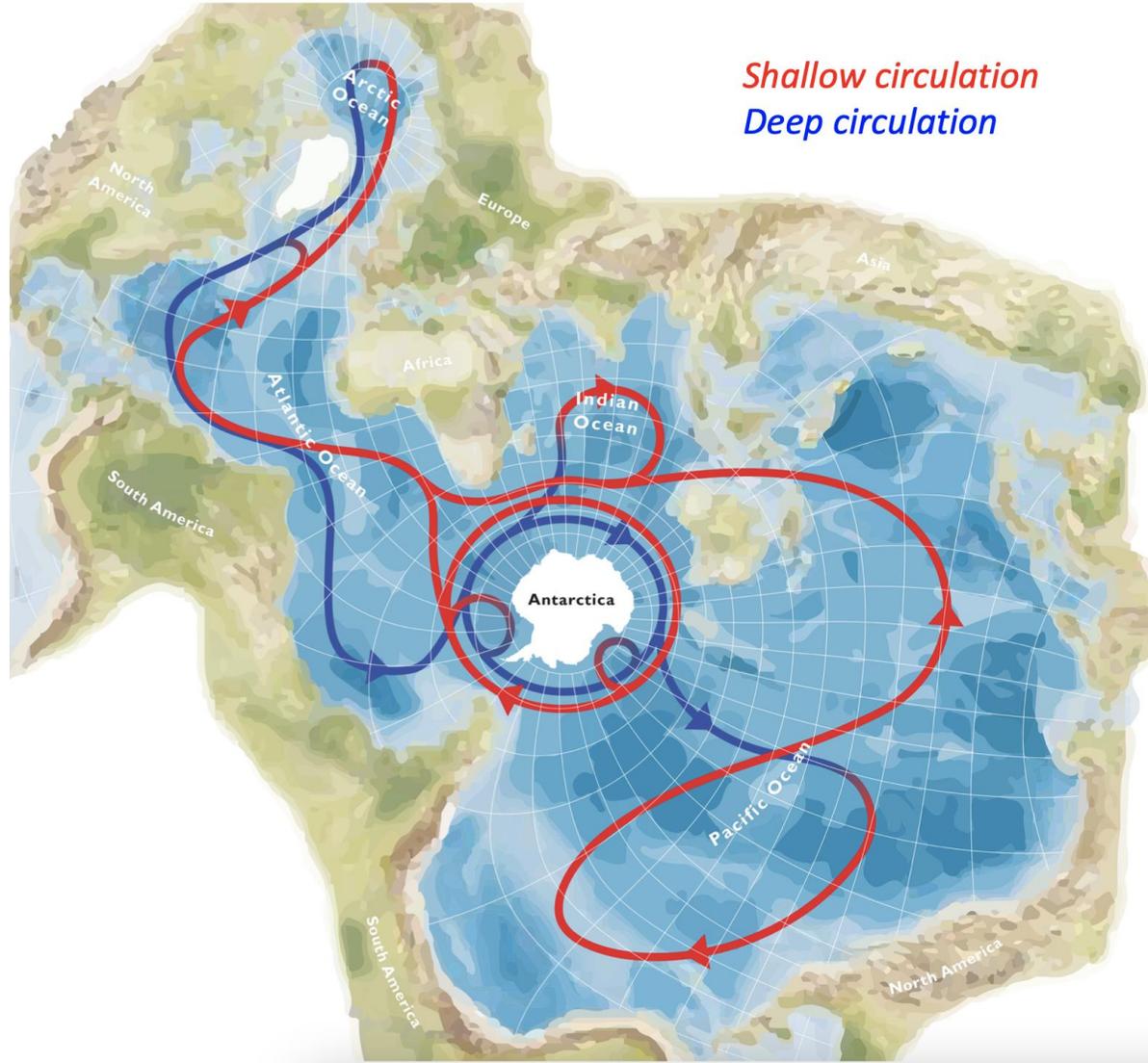
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Importance of the Southern Ocean



- Centre of the global ocean
- Connectivity of the ocean gives the remotest regions a global reach
- The circumpolar flow of the Southern Ocean is key for enabling this connectivity
- Most aspects of the mean circulation and structure are well described
- **Variability is much less well characterised**

IPCC AR6, 2021: “The surface Southern Ocean has warmed more slowly than the global average, or slightly cooled (*very high confidence*)”





Ocean Drives Ice Loss in Antarctica





Collaboration between ESA and EC projects



Producing a comprehensive set of observational data products over all Antarctic Ice Shelves



Studying heat and carbon cycling in the Southern Ocean



Brought glaciology and oceanography communities together to understand how freshwater export from ice sheet and shelves is impacting on the southern ocean





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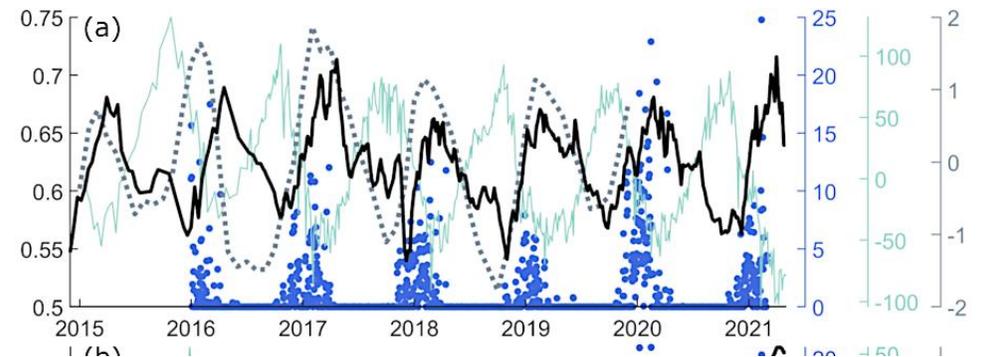
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Article | [Published: 27 February 2023](#)

Widespread seasonal speed-up of west Antarctic Peninsula glaciers from 2014 to 2021

[Benjamin J. Wallis](#) , [Anna E. Hogg](#), [J. Melchior van Wessem](#), [Benjamin J. Davison](#) & [Michiel R. van den Broeke](#)

Measuring New Modes of Antarctic Variability





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Improve critical ice-ocean processes in numerical models

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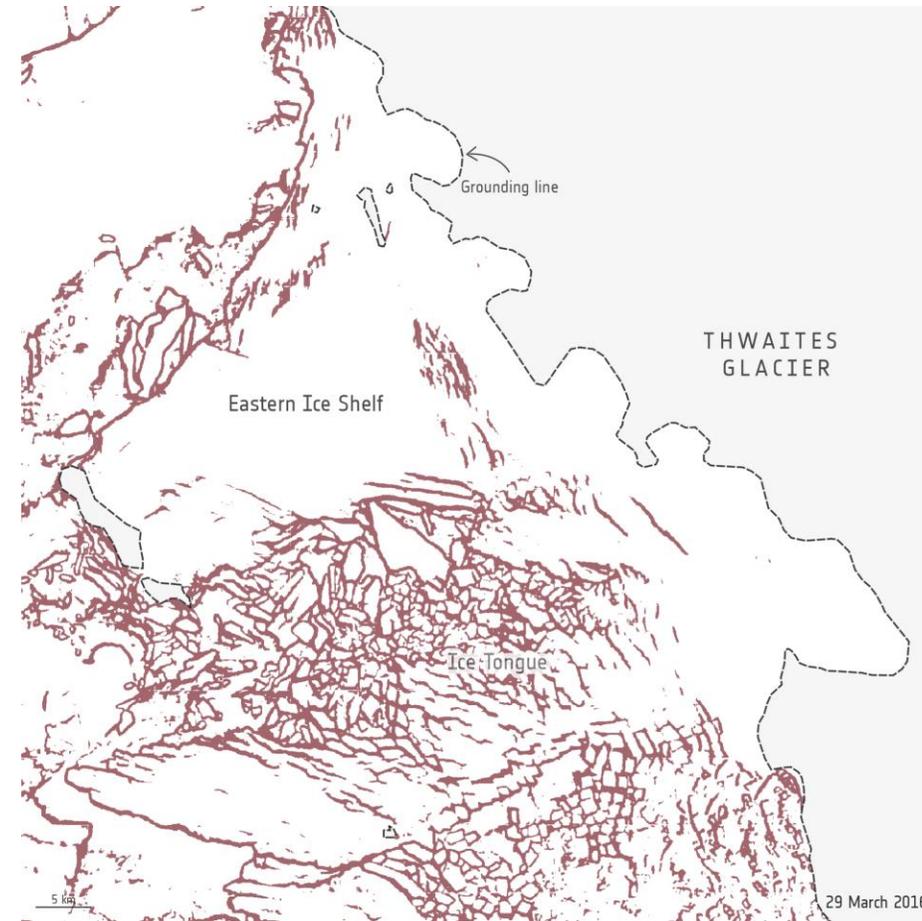
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Episodic dynamic change linked to damage on the Thwaites Glacier Ice Tongue

[Trystan Surawy-Stepney](#) ✉, [Anna E. Hogg](#), [Stephen L. Cornford](#) & [Benjamin J. Davison](#)

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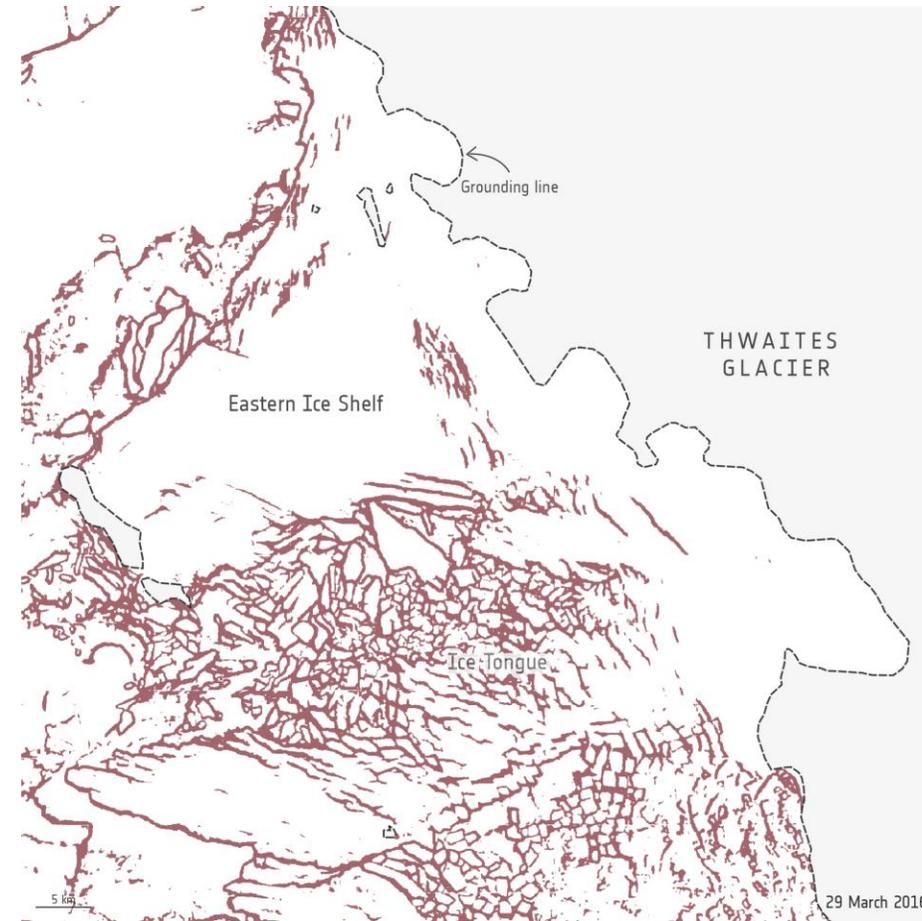




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RESEARCH ARTICLE

Annual mass loss from West Antarctic ice sheet to 2021

Sea level rise from West Antarctic mass loss significantly modified by large snowfall anomalies

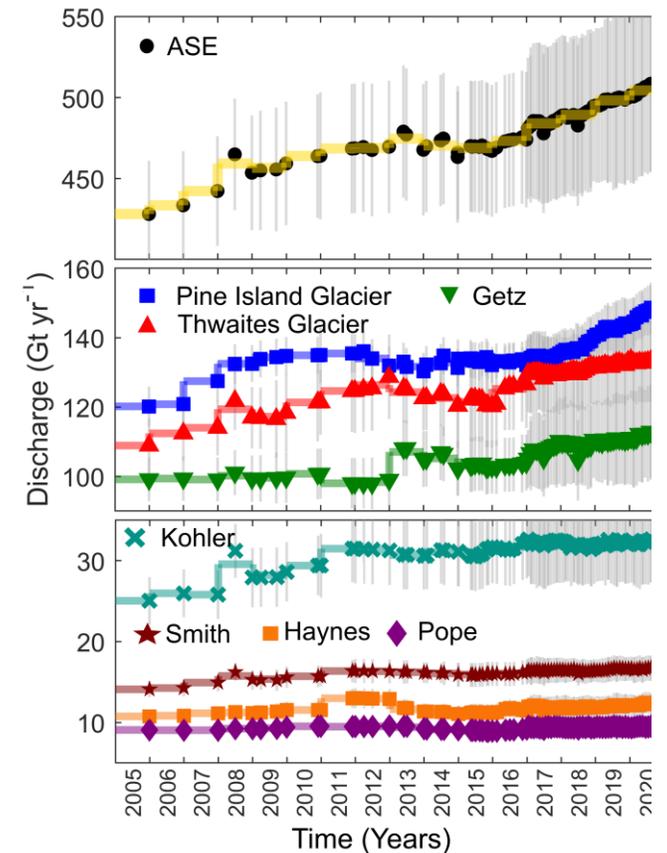
Benjamin J. Davison, Anna E. Hogg, Richard Rigby, Sanne Veldhuijsen, Jan Melchior van Wessem, Michiel R. van den Broeke, Paul R. Holland, Heather L. Selley & Pierre Dutrioux

Published: 17 March 2023

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14, Article number: 1479 (2023) | Cite this article

Reducing uncertainty in sea level budget





ESA-EC Collaboration Benefits

- Invited to reciprocal project meetings, broadening science discussions
- Increased community awareness of quality and range of ESA funded EO data products, especially amongst in situ and modelling communities
- Improved project governance and steering by inviting members of ESA and EC projects to sit on respective scientific advisory committees
- Ultimately delivered better, higher impact science that advances knowledge of physical processes driving change

- But, we can achieve even more if there is further investment
 - Mismatch in funding duration, timing of calls, and size of project budgets makes it harder to coordinate projects
 - Longer-term support and continued coordination, (eg through Polar Science Week!) will underpin these collaborations in the future

