

OCEAN:ICE interactions - Ice sheet impacts on ocean circulation and climate feedbacks

Speakers

Dr. Wilma Huneke (Australian National University)

Antarctic coastal circulation and heat/freshwater transport

Prof. H el ene Seroussi (Dartmouth)

Modelling ice sheet-ocean interactions

Prof. Sophie Nowicki (U. Buffalo)

Ice sheets in models and observations

Dr. Ariaan Purich (Monash U.)

Large scale ocean-ice sheet interaction and climate impacts

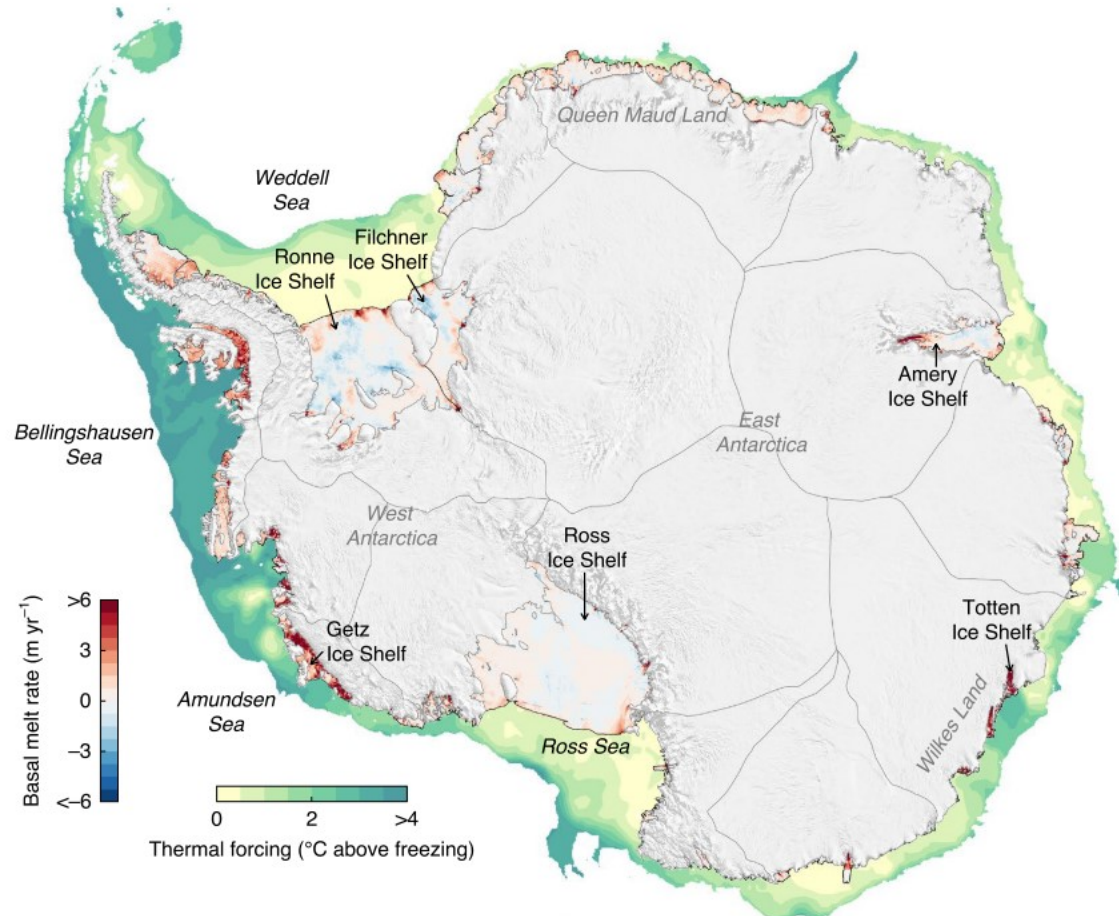
Prof. Ric Williams (U. Liverpool)

The carbonate system response to Southern Ocean and ice sheet changes

Conveners: Dr. Andrew Meijers (BAS), Dr. Felicity McCormack (Monash U.), Dr. Ruth Mottram (DMI), Dr. Adele Morrison (ANU), Dr. Donald Slater (U. Edinburgh), Yoshihiro Nakayama (Hokkaido U.), Prof. Tony Payne (U. Bristol) & Prof. Joellen Russell (U. Arizona)



Antarctic coastal circulation and heat transport



Adusumilli et al. 2020

Why the ocean matters

- Source of heat

Challenges

- 2 barriers: shelf break & ice shelf front
- Small spatial scales
- Large spatial/temporal variability
- Affects observations & modelling

Were we are headed

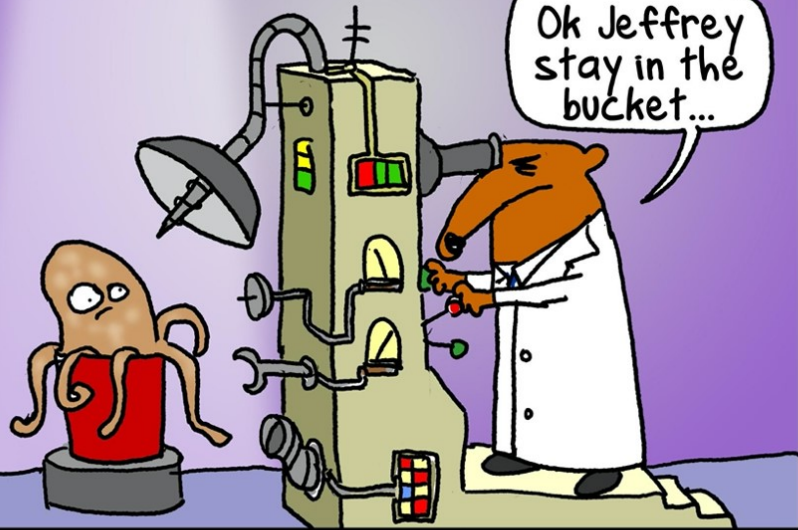
- Able to make projections?
- Which processes need to be considered?



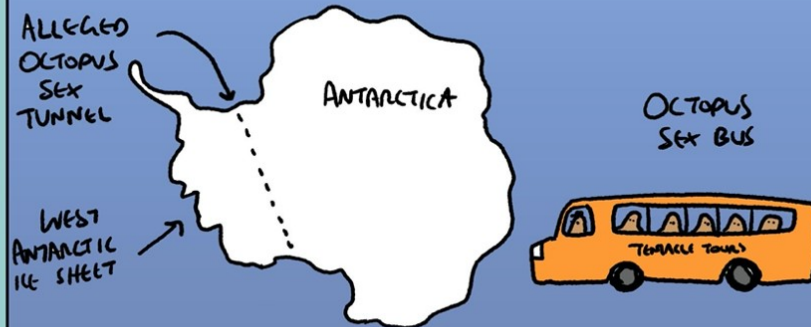
Genomic evidence for West Antarctic Ice Sheet collapse during the Last Interglacial Period...

Using their powerful octopus DNA science machines, scientists can now tell exactly when it was that these different octopopulations started hanging out together and "exchanging genetic material"

Ok Jeffrey stay in the bucket...



It seems the only way octopus populations on opposite sides of the West Antarctic Ice Sheet could hook up was by travelling in a 1km deep sea tunnel 2km below the ice (or maybe chartering some weird octopus sex bus but that doesn't bear thinking about)



The only way this sea tunnel could exist 125,000 years ago was if the West Antarctic Ice Sheet had melted...

What else was happening 125,000 years ago? Global temperatures were as high as 2 degrees warmer than they are now. Did that cause the ice sheet to collapse? Science wants to know!

I don't think anyone is going to be surprised at the answer



And when the oceans rise by 3 to 4 metres the 670 million or so people living near the beach will probably be keen to know as well.

Cartoon by First Dog on the Moon

<https://www.theguardian.com/commentisfree/2023/feb/06/exclusive-the-octopus-sex-scandal-that-rocked-the-antarctic>

Based on scientific article: Lau et al., under review

<https://www.biorxiv.org/content/10.1101/2023.01.29.525778v1.full.pdf>

