

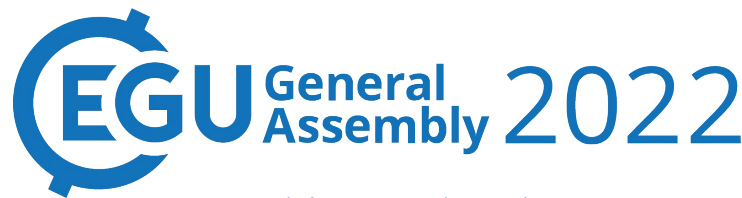
Assessment of the Antarctic ice-sheet response to ice-shelf collapse

Yelmo sensitivity to different methods and strategies using high melting scenarios (ABUMIP)

Sergio Pérez-Montero, Jorge Alvarez-Solas, Javier Blasco, Marisa Montoya and Alexander Robinson

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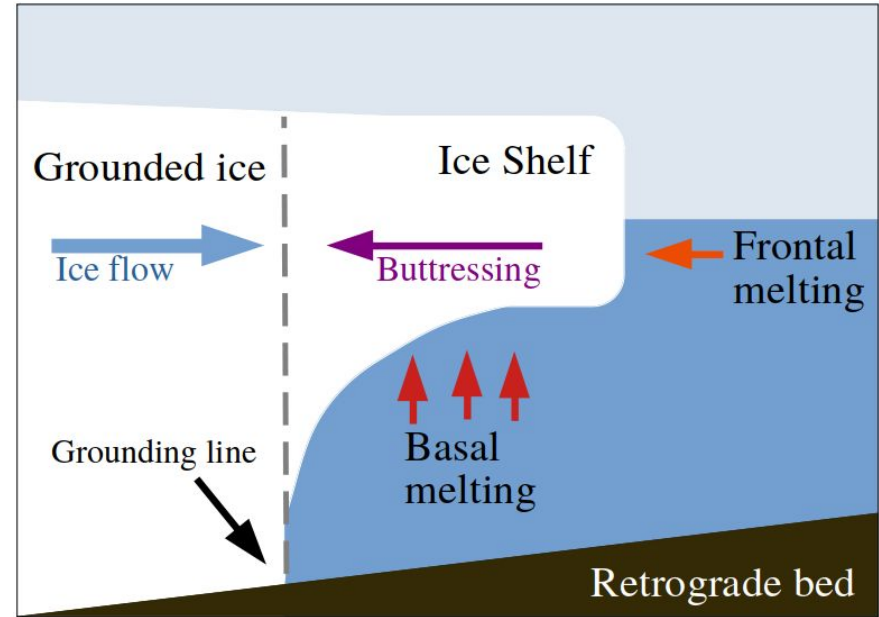
Context | Results | Conclusions

Aim:

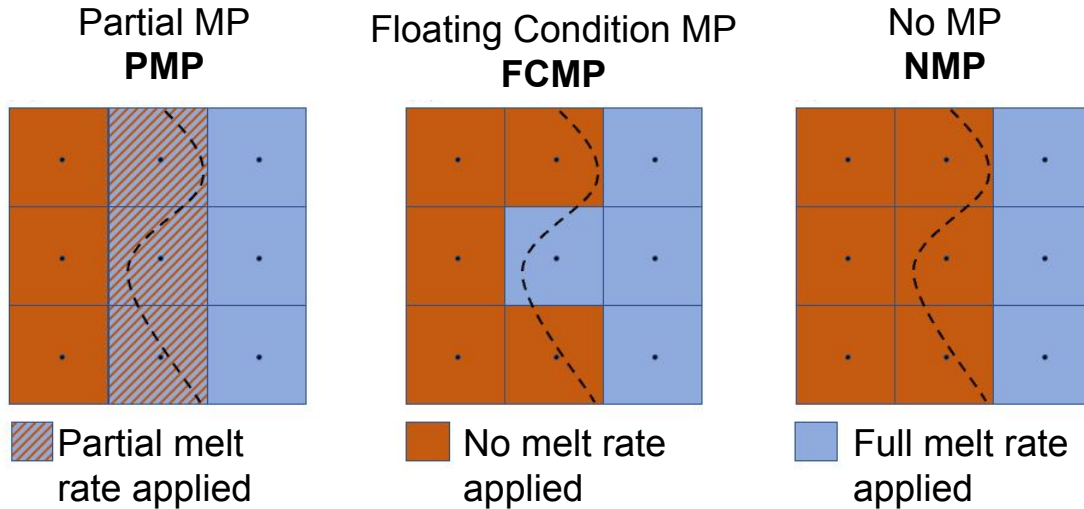
- Uncertainty in sea-level projections
- Ice shelves
 - ◆ Grounding line
 - ◆ Ice-shelves front

Experimental setup:

- ABUMIP → ABUM, -400 m/yr (Sun et al., 2020)
- Model Yelmo (Robinson et al., 2020)



Melting parameterizations (MP) at the Grounding Line



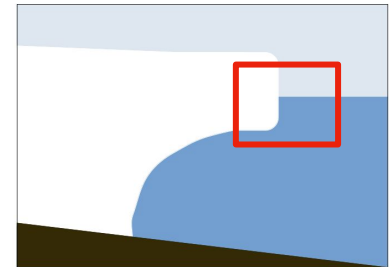
Adapted from: Leguy et al., 2021

Frontal mass balance

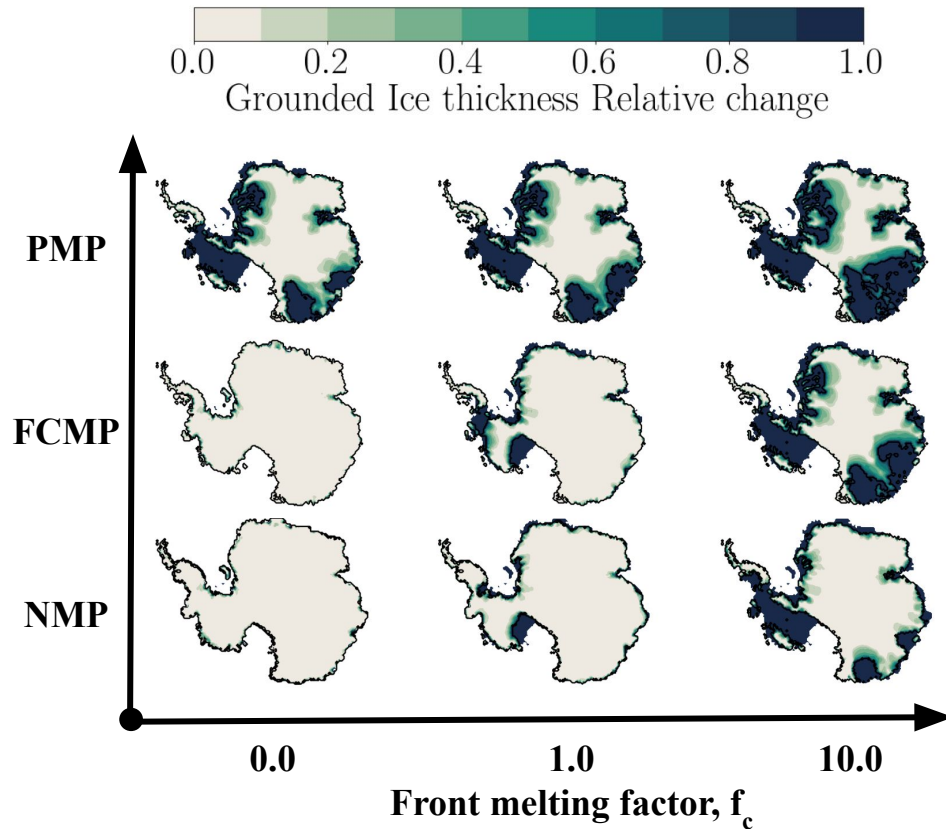
$$\dot{m}_f = \dot{b}_f \cdot \frac{A_f}{A_b} \cdot f_c$$

$$\mathbf{f}_c = [0.0, 1.0, 10.0]$$

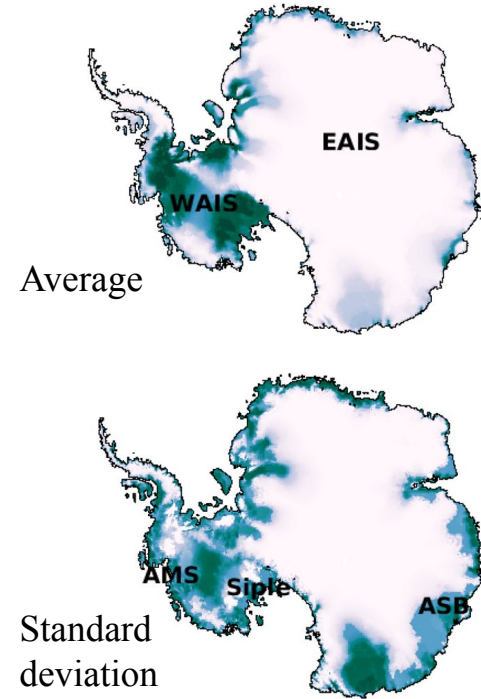
DeConto and Pollard (2016)



Context | Results | Conclusions

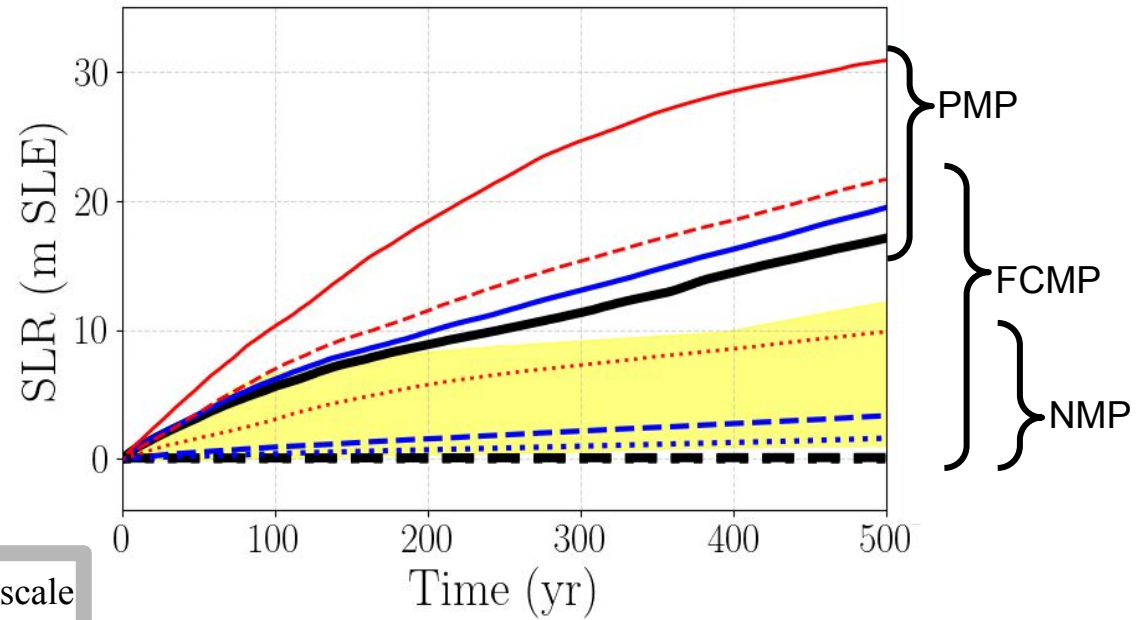


ABUMIP ensemble (From: Sun et al., 2020)



Context | Results | Conclusions

1. Great spread
2. Clustering



Melting method Front melting scale

— PMP
- - FCMP
... NMP

$f_c = 10.0$
 $f_c = 1.0$
 $f_c = 0.0$

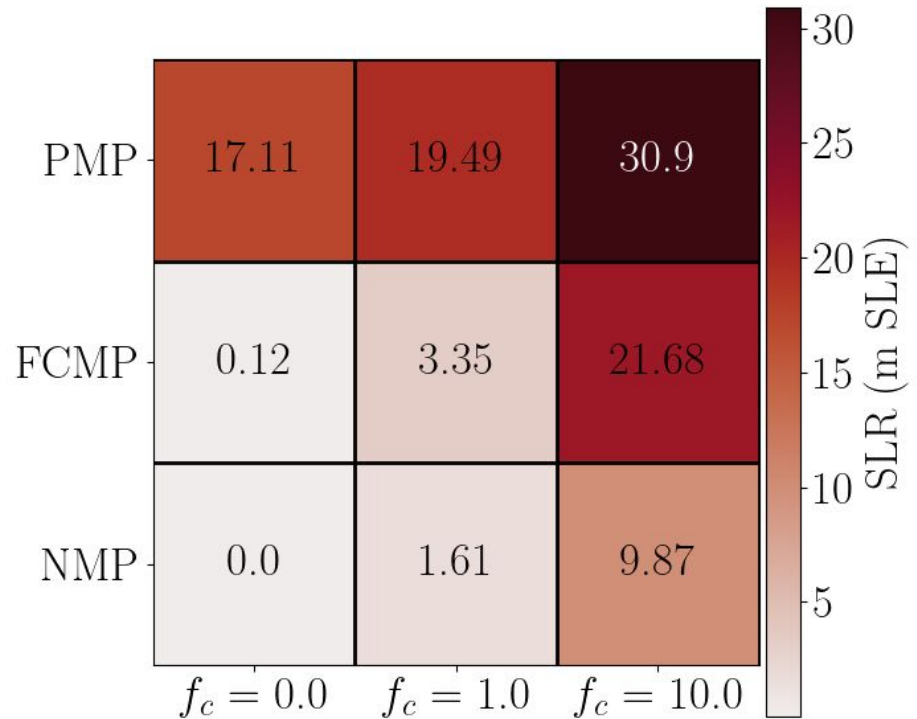
The shading represents ABUM results of Sun et al., 2020

1. Sources of uncertainty

- a. High sensitivity and spread

2. Further work to do

- a. Scenarios
- b. Best combination



Thank you!

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