

# MOM6 Panan ice shelf meeting

16 July 2025

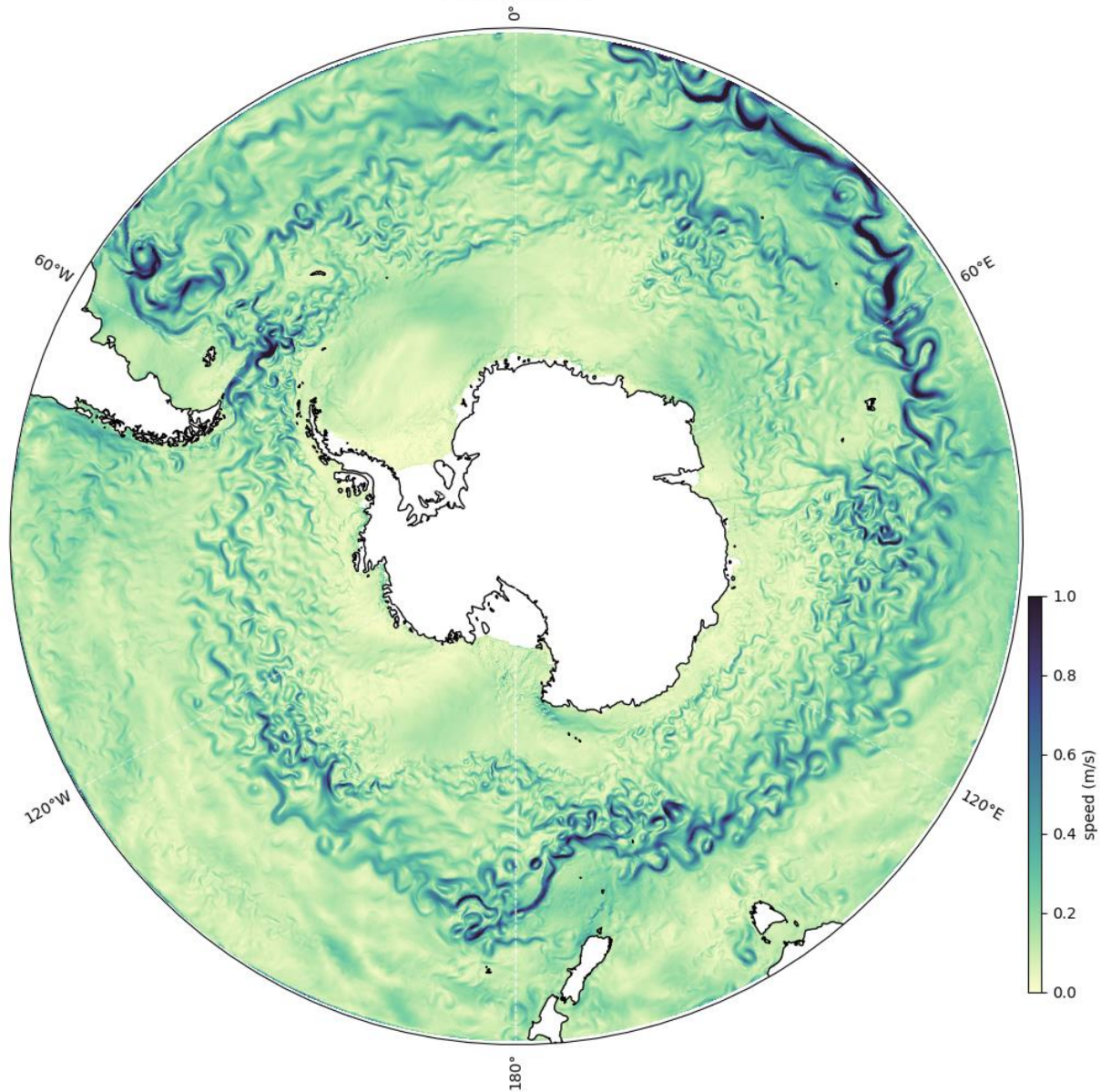
# contents

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  - EOS/ICs, evaluation, sss restoring file nan
  - Optimisation
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4. Melt crash in z coordinates – progress
5. Future to-dos
  - ALE mode initialisation
  - OM3, turning off runoff, getting tidal amp and roughness files in cavities

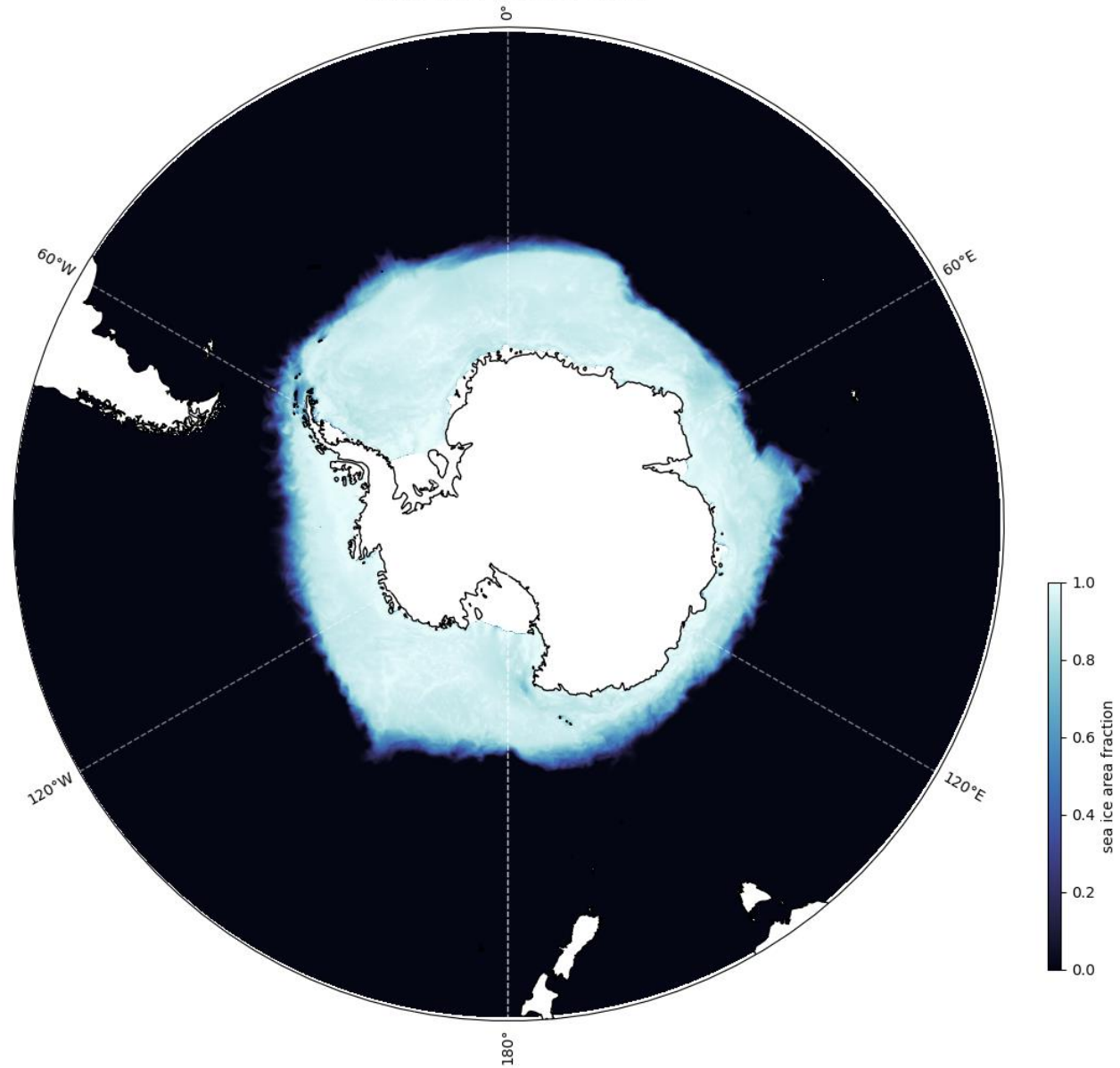
# 1. No ice shelf panan

- WRIGHT\_FULL EOS, initial conditions from OM2 to match boundary forcing – see <https://github.com/claireyung/mom6-panAn-iceshelf-tools/issues/13>
- Run for 8 years on cascade lake
  - Expensive, Edward Yang and Minghang Li have done a great job making this cheaper on sapphire rapids! Thank you!  
<https://github.com/claireyung/access-om3-configs/pull/1>
- New sim and parameters - need to evaluate  
<https://github.com/claireyung/mom6-panAn-iceshelf-tools/issues/15>

Surface Speed

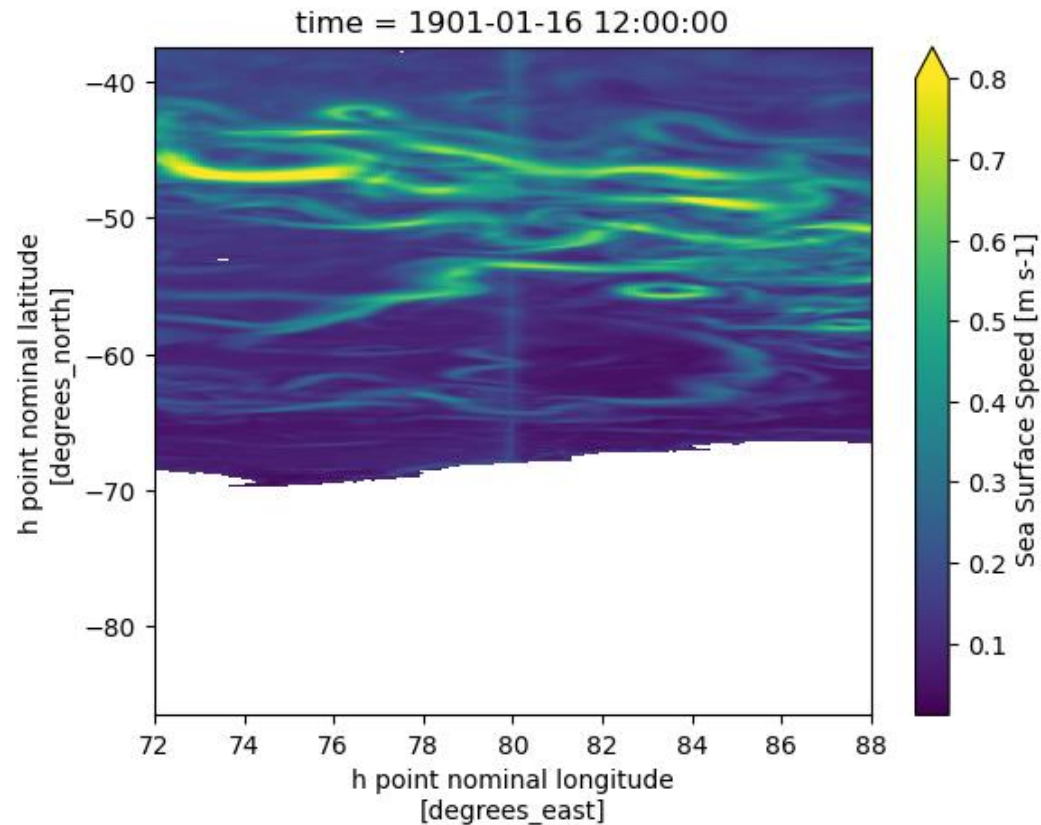


September Sea Ice Cover

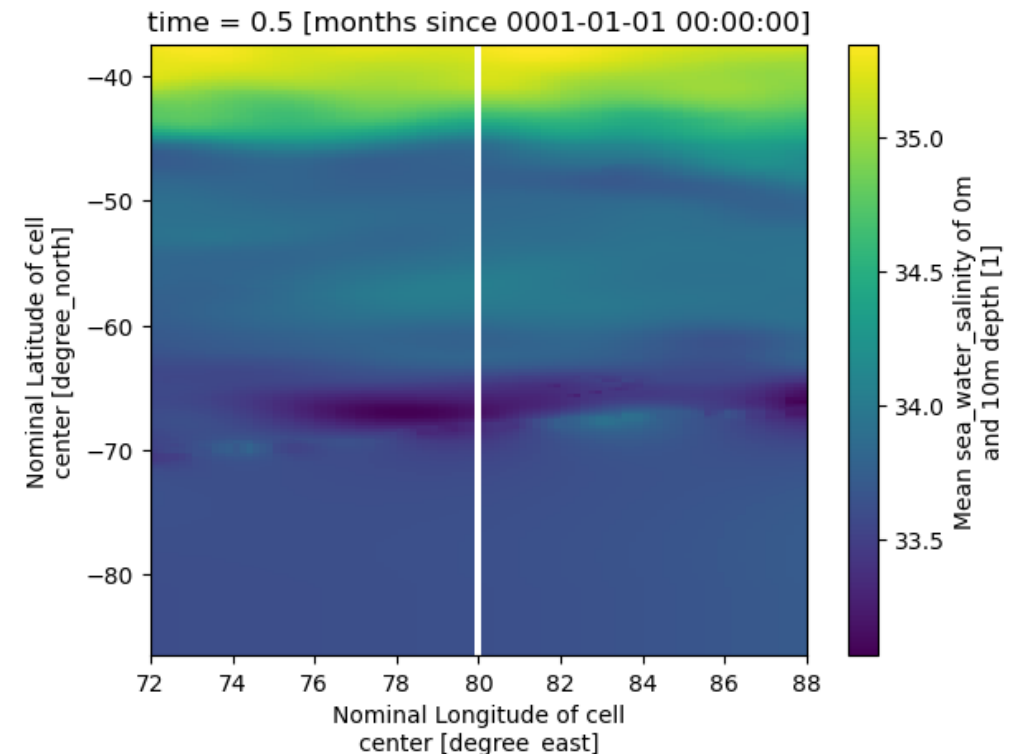


# One problem found already yesterday....

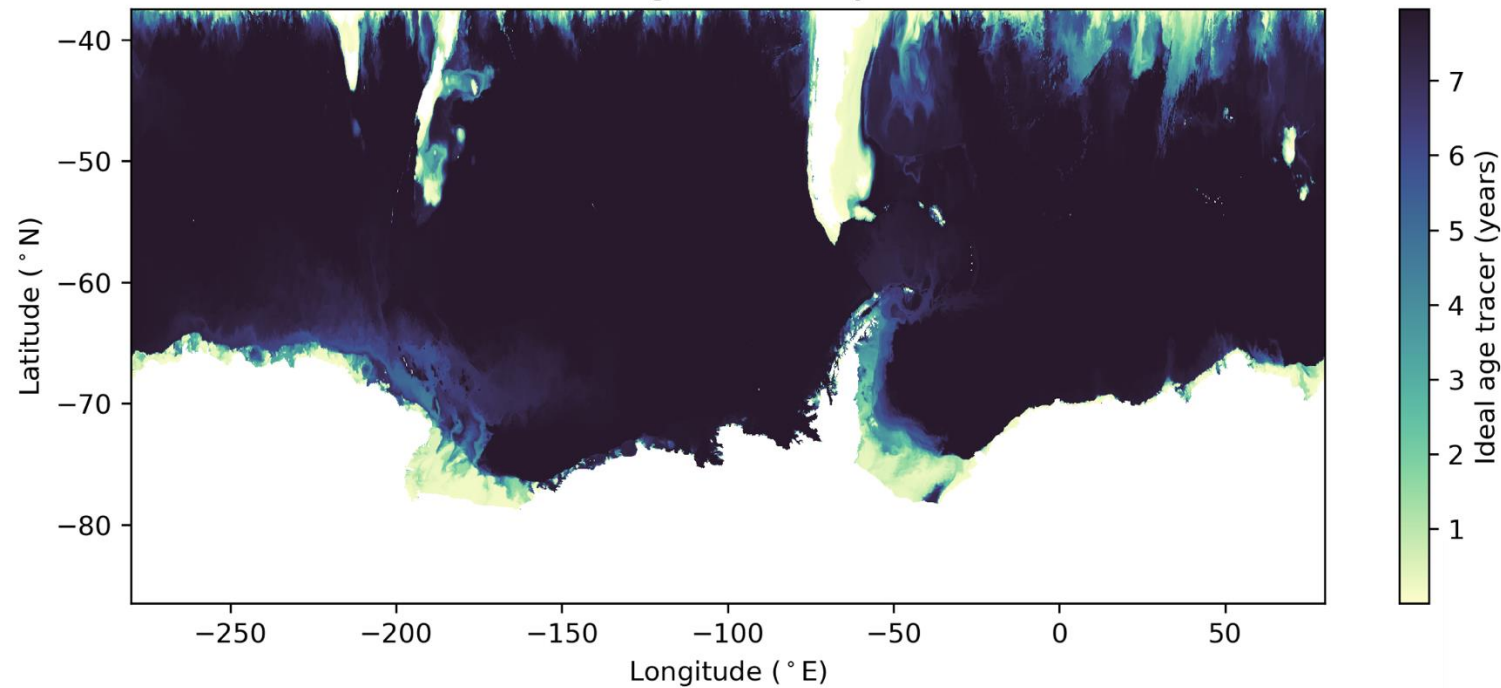
- Surface speed at x=-280,80 boundary has E-W boundary imprint



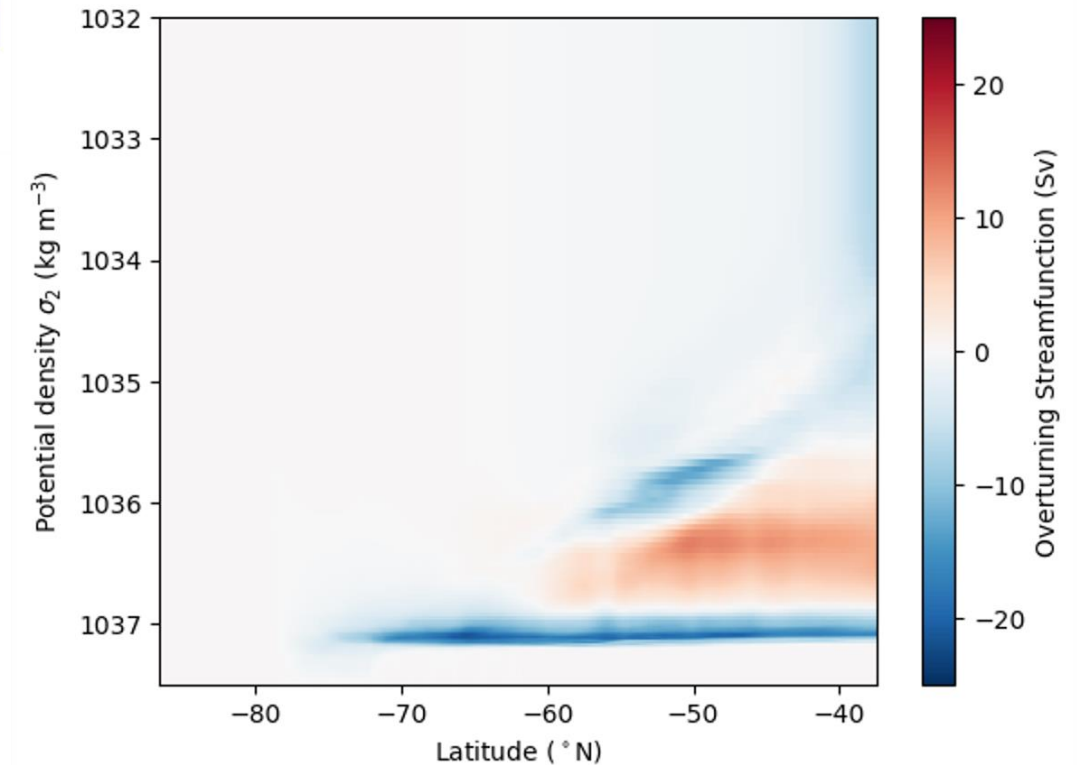
Caused by NaN in surface salinity restoring file ☹



Bottom age at end of year 8



- Evaluation hackathon coming
- Do I rerun with the fixed SSS restoring before then or leave it?
- Am I missing any diagnostics needed for evaluation?





## 2. Initialising ice shelf in ACCESS-OM3

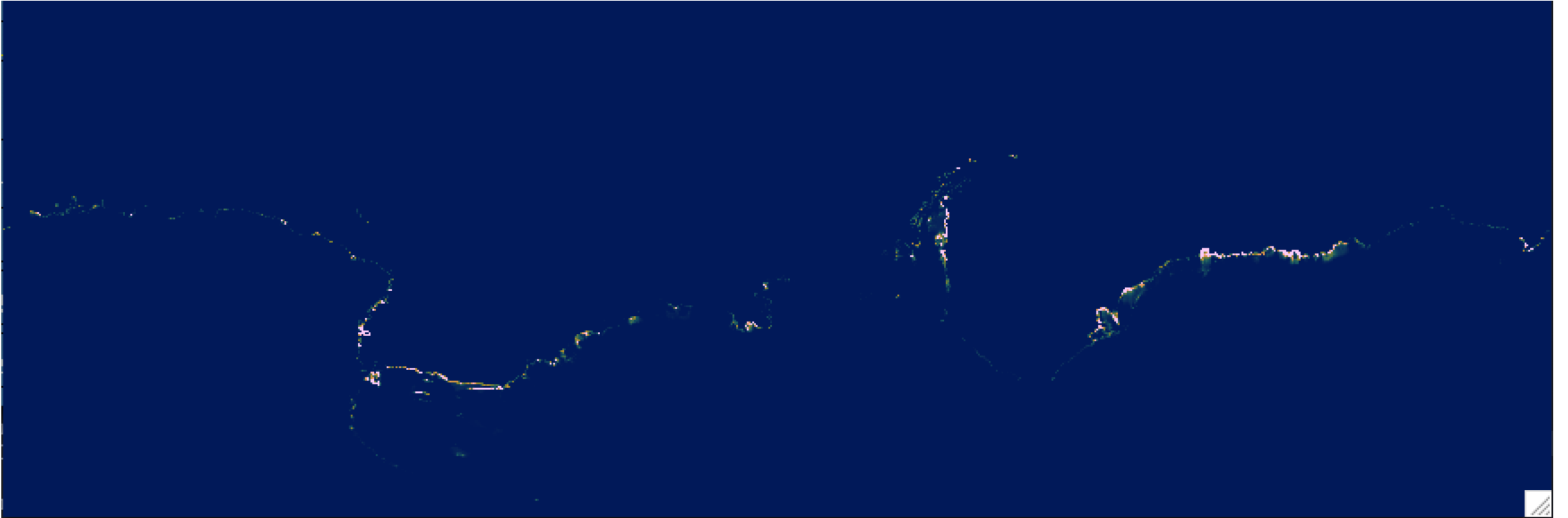
- Debugged it to find a parameter was missing in input.nml that ice shelf initialisation needs (`input_filename = 'n'`)
- In the process – Dougie and others created a new spack OM3 executable with updated MOM6 codebase
- After this: segfaults and bus errors and cryptic esmf errors ☹
  - -> set up a MOM6-SIS2 config where MOM errors won't be masked.

### 3. Layer mode crash

- Managed to run layer mode panan ice shelf with MOM6-SIS2 for ~2 hours model time
- Instability forms – NaNs - crash
- Required: small timestep (espec. barotropic timestep needed to be updated), some of Olga's params e.g. harmonic viscosity

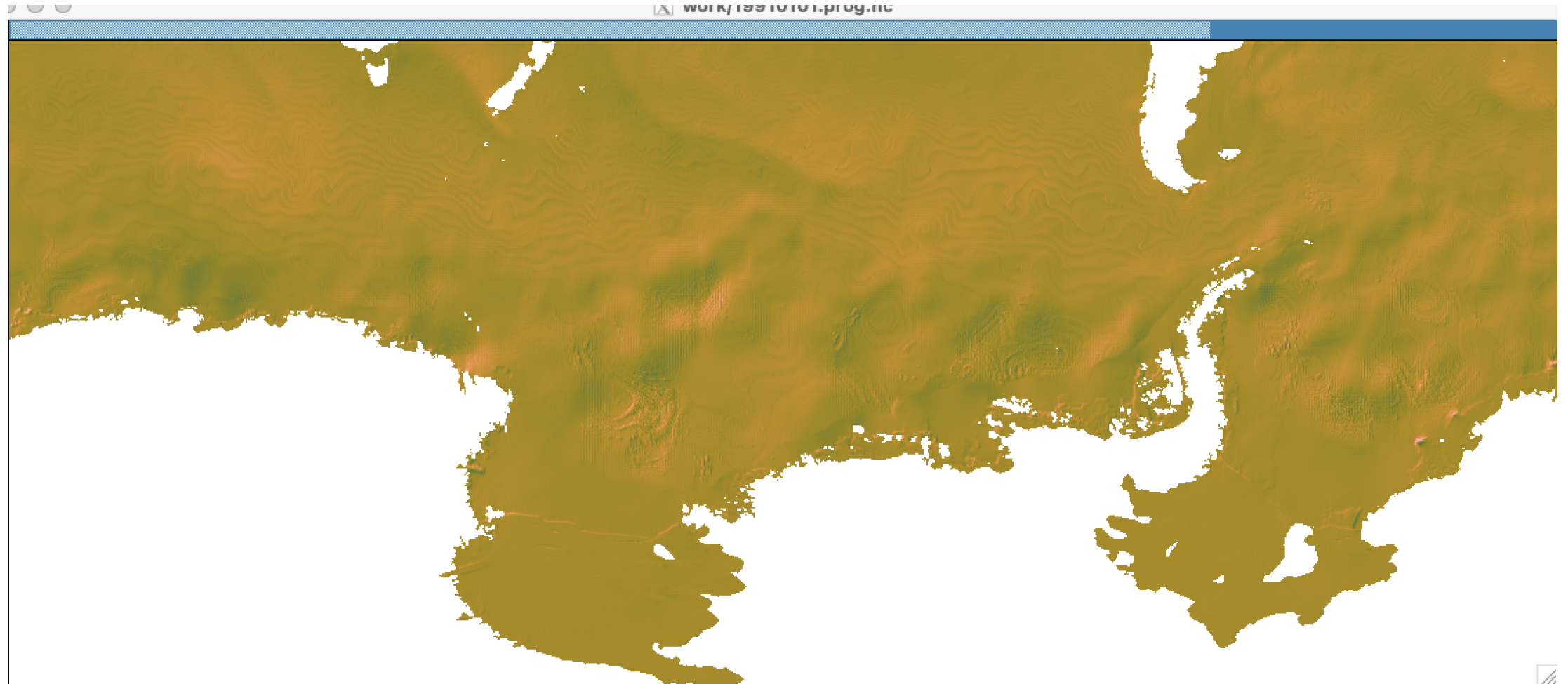


# Melt rate at $t=2h$

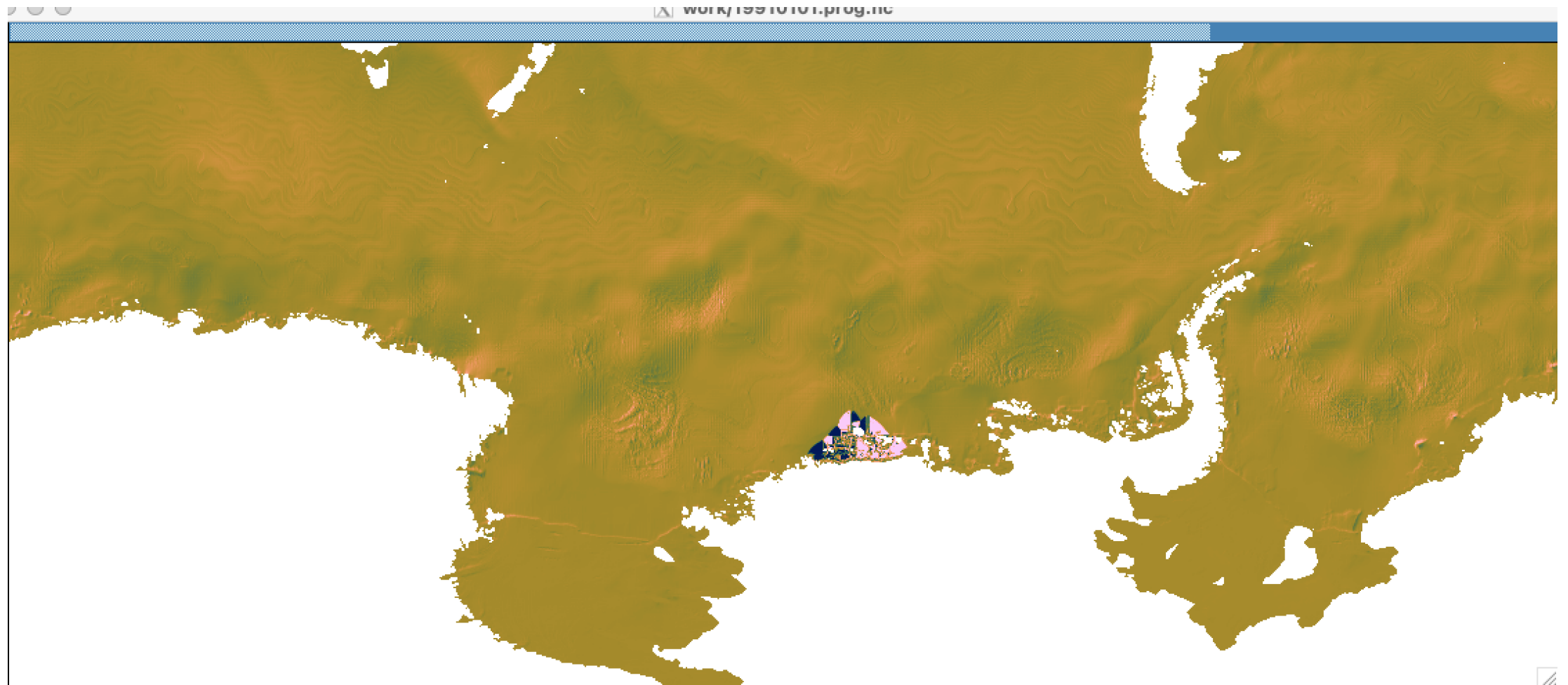


- Melt rate at ice fronts where there are velocities

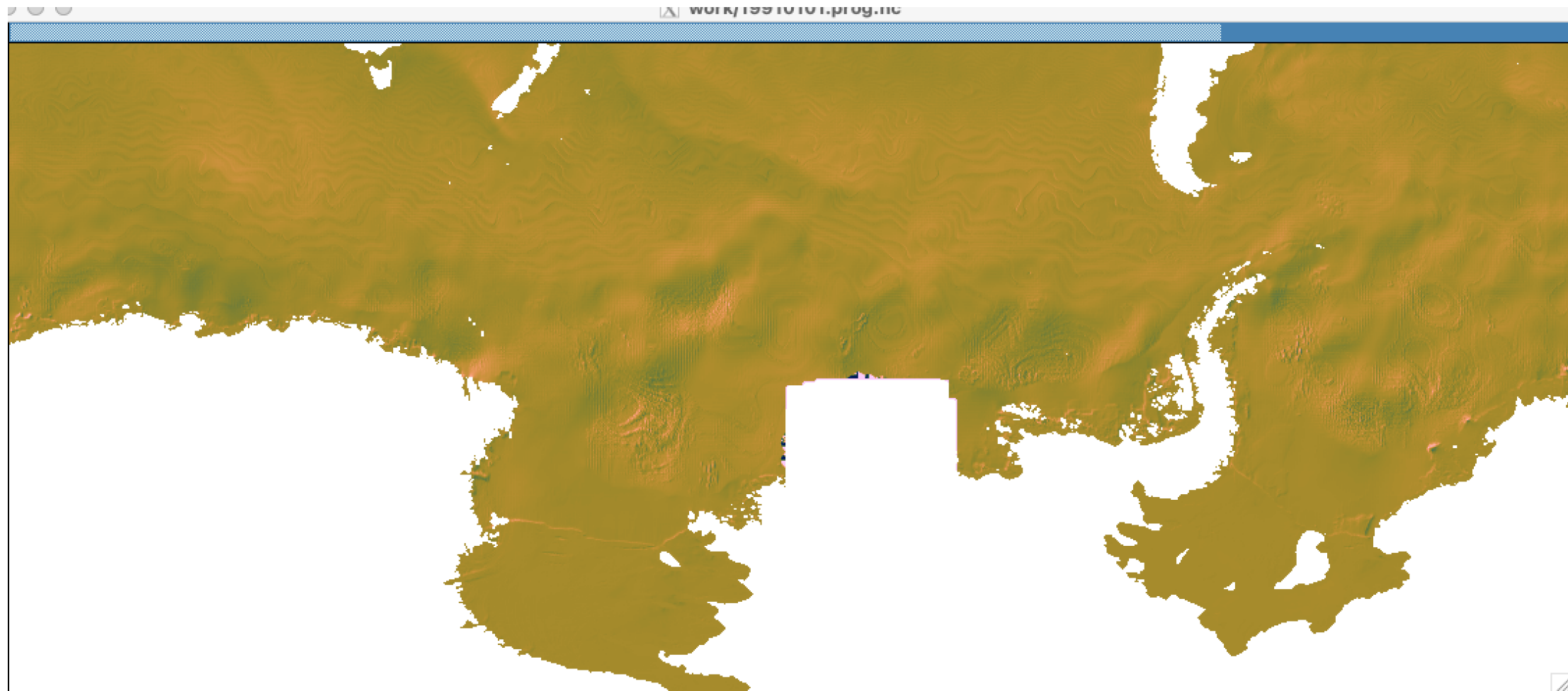
# Surface u velocity t=39



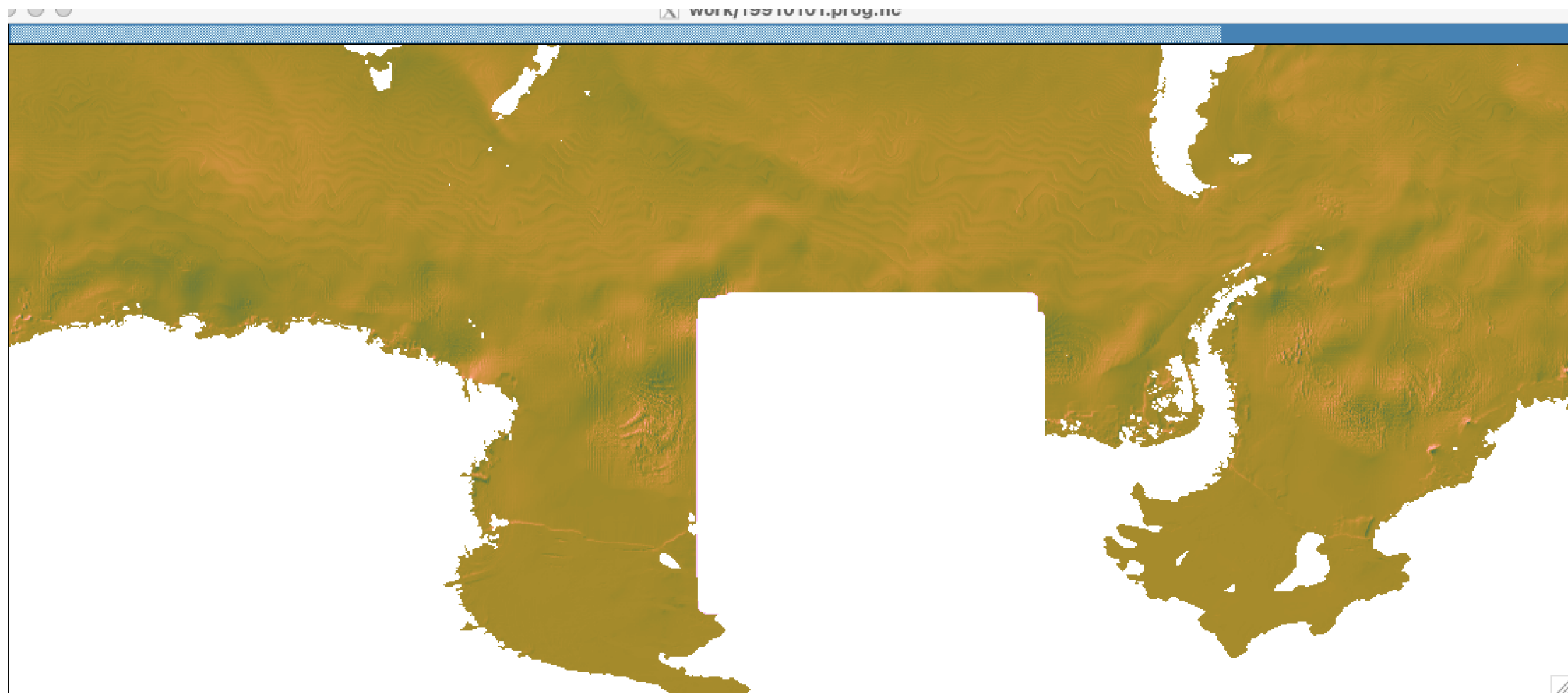
# Surface u velocity t=40



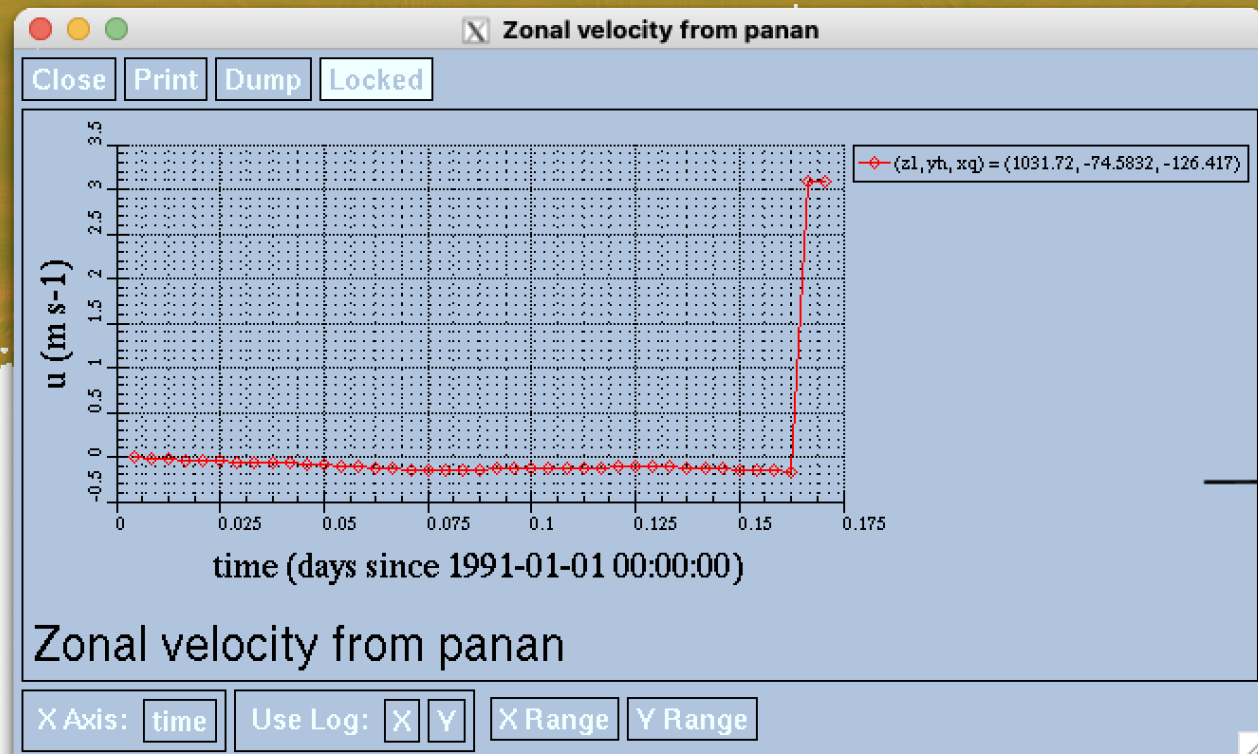
# Surface u velocity t=41



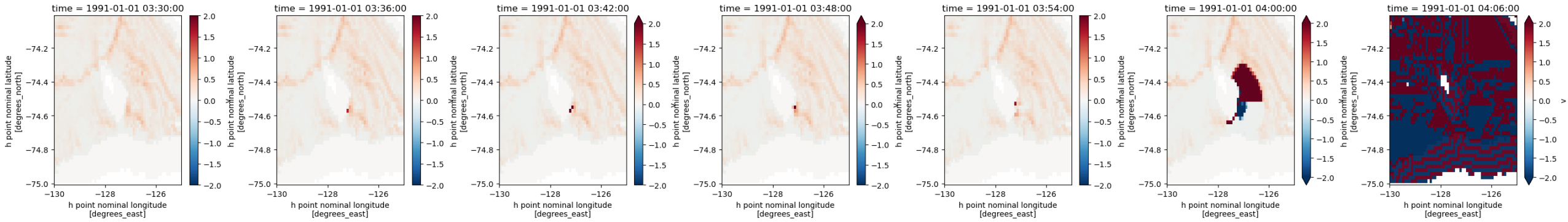
# Surface u velocity t=42







# Flow into vanished layer -> instability



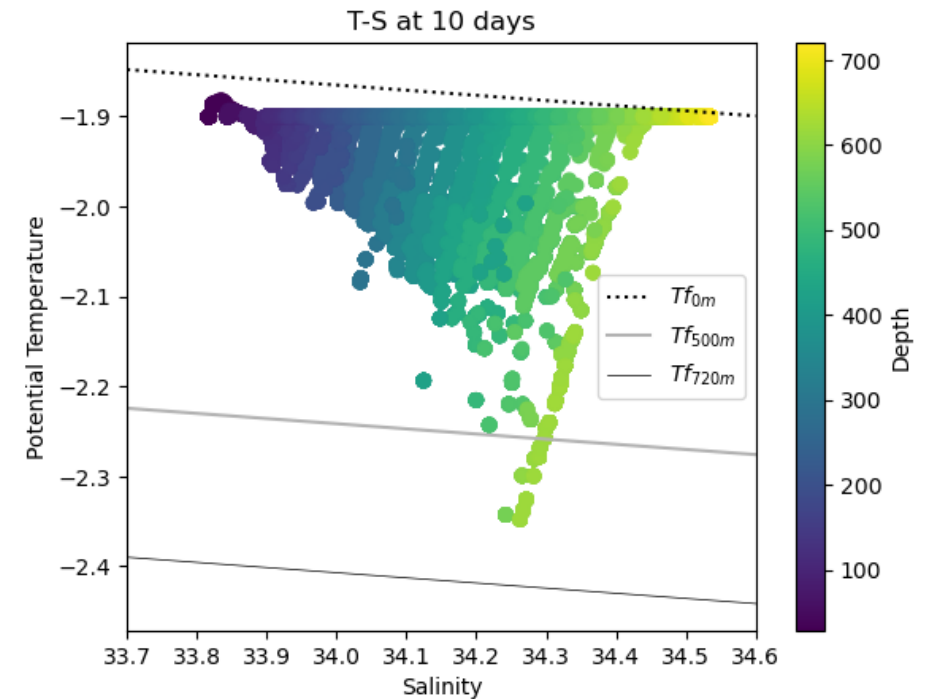


# Remove grounding line

- Removed grounding line so that minimum ocean thickness is 5m
- This runs slightly longer but still crashes after ~6h.

## 4. Melt crash in z coords (flux through vanished layers)

- <https://github.com/claireyung/mom6-panAn-iceshelf-tools/issues/5>
- KD important plus pressure gradient fixes
- ISOMIP+ z coords runs for 22 days now...



## 5. Future

1. Fix E-W boundary salt restoring, run again (?), evaluation of no ice shelf model

3. Find source of instability in layer mode

(e.g. compare to working config, get rid of grounding line (finite ocean thickness), momentum budget)

4. z coordinate melt crash beyond 22 days....

5. To-dos

- ALE mode initialisation – working with Angus – also solved if no GL
- Turn off runoff in OM3
- Getting tidal amp and roughness files in cavities