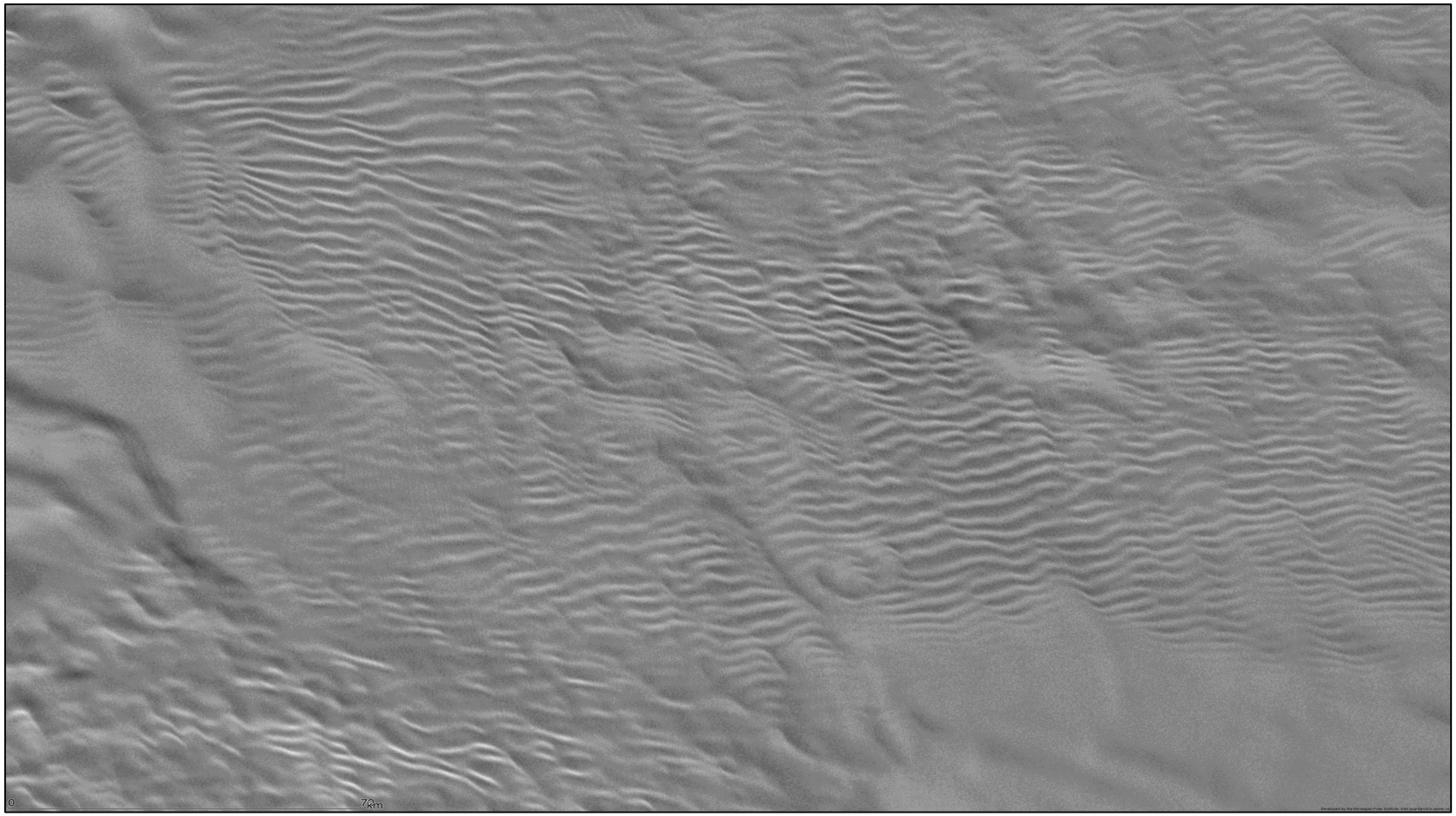
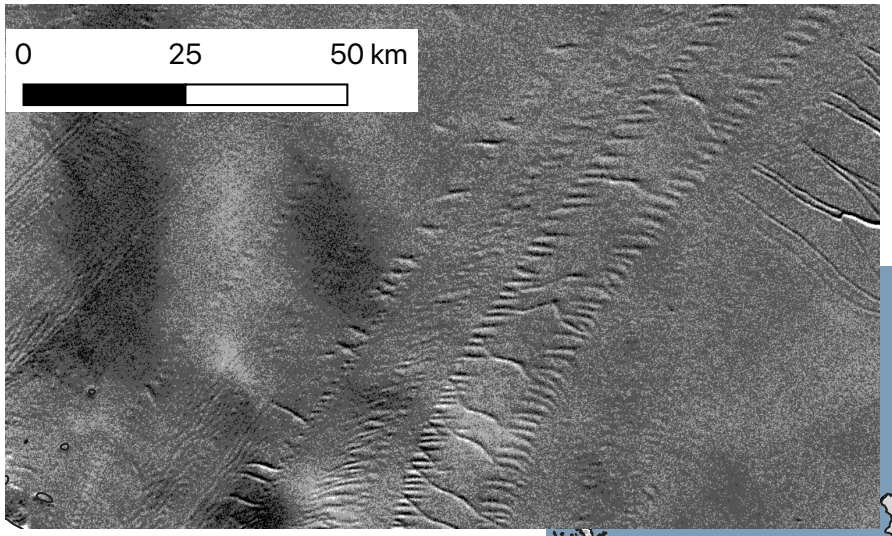
Towards a high-resolution SMB map of Antarctica using SNOWPACK



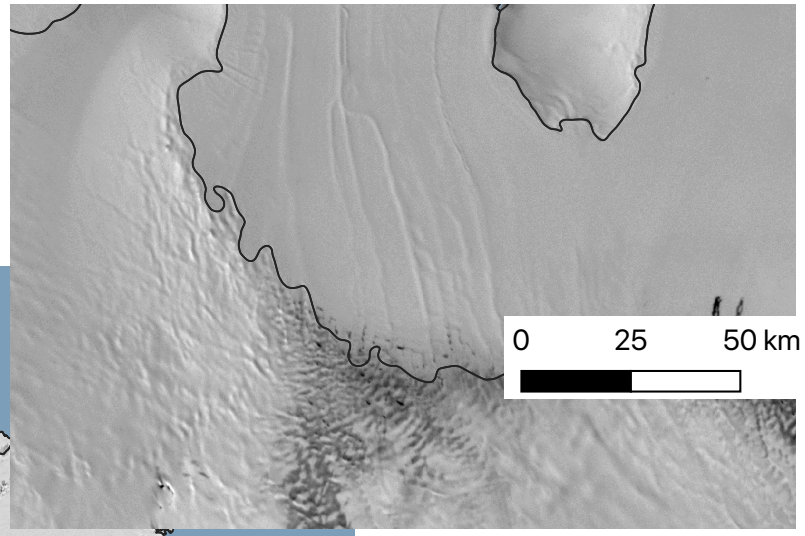
Jan Lenaerts[1]
Marissa Dattler[1]
Nander Wever[1]
Brooke Medley[2]
Richard Cullather[2]

[1] University of Colorado Boulder
[2] NASA GSFC

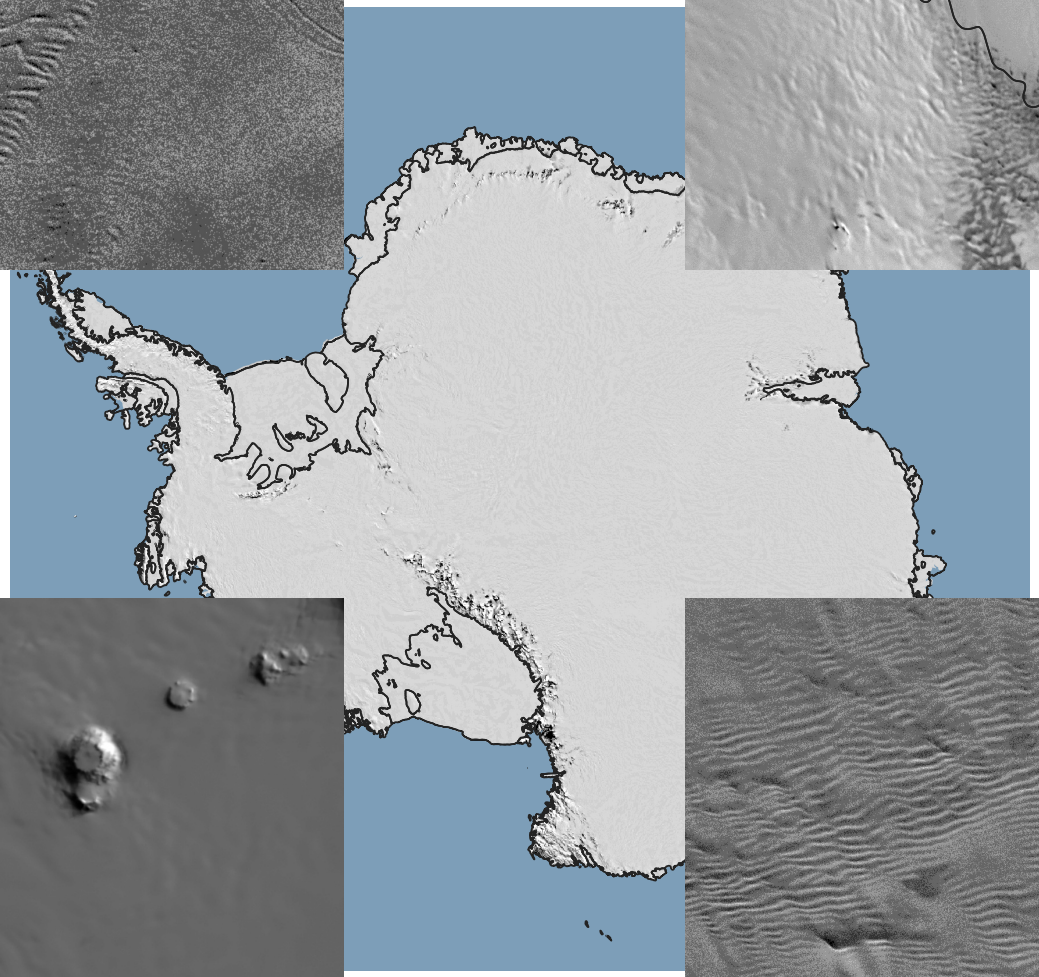
Falling and blowing snow at the poles and high mountains – SLF – 18 June 2018



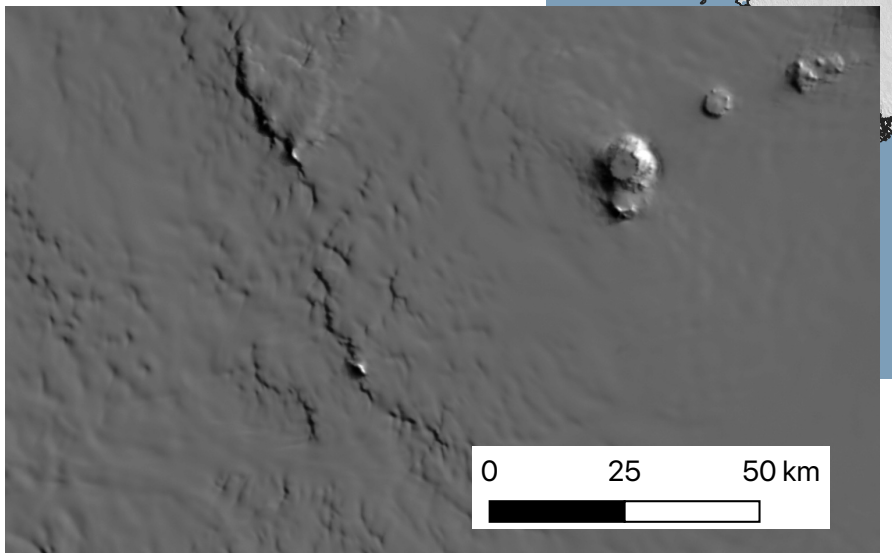
Larsen C ice shelf



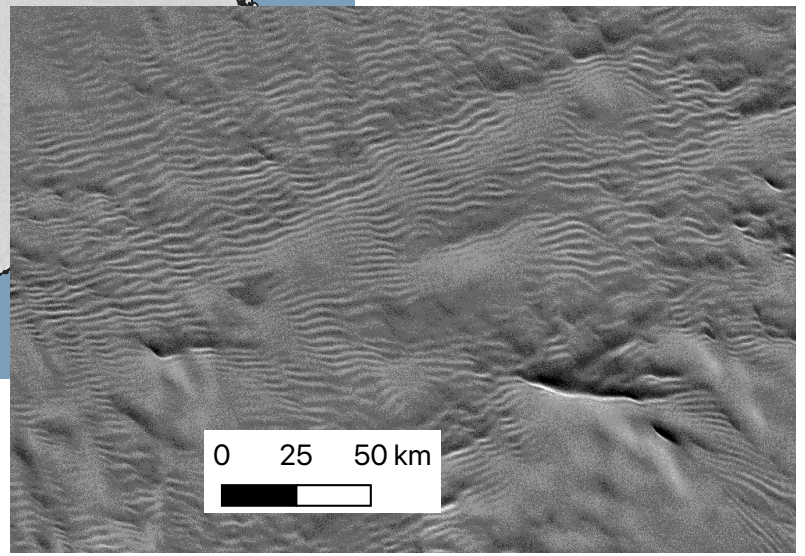
Roi Baudouin ice shelf



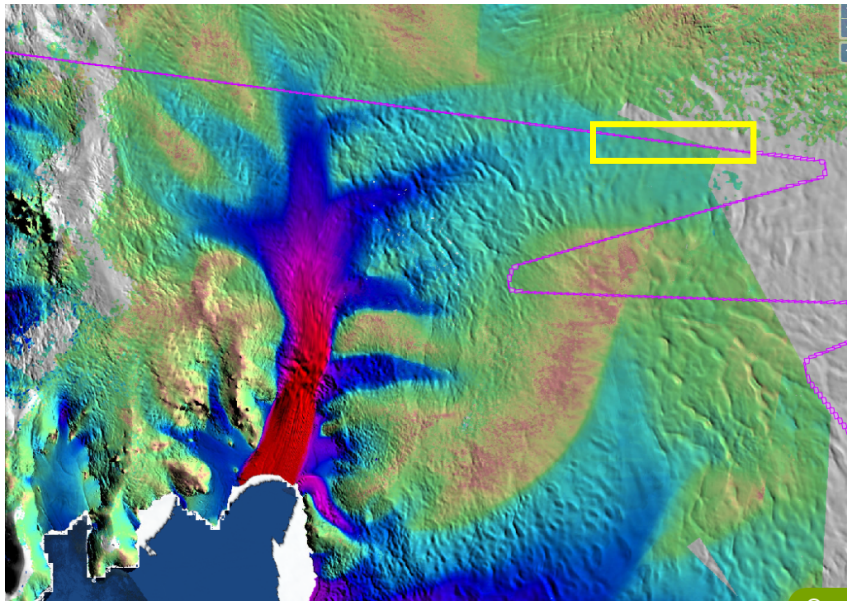
Marie Byrd Land

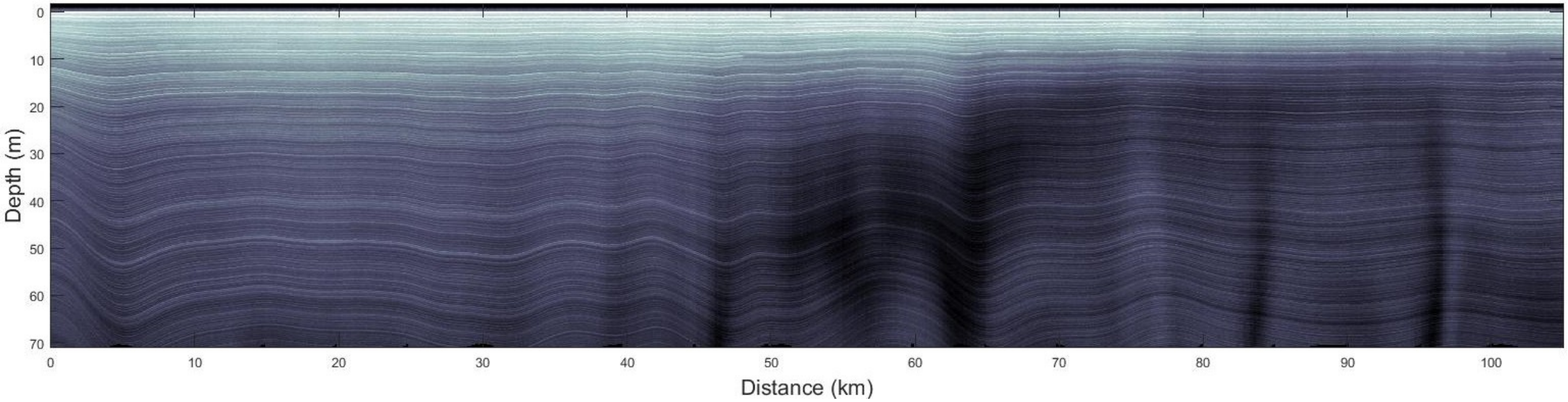


Interior Wilkes Land

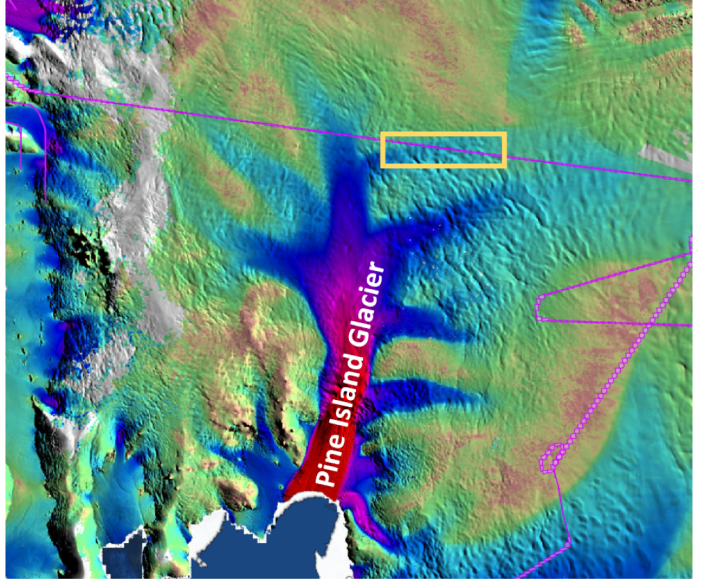


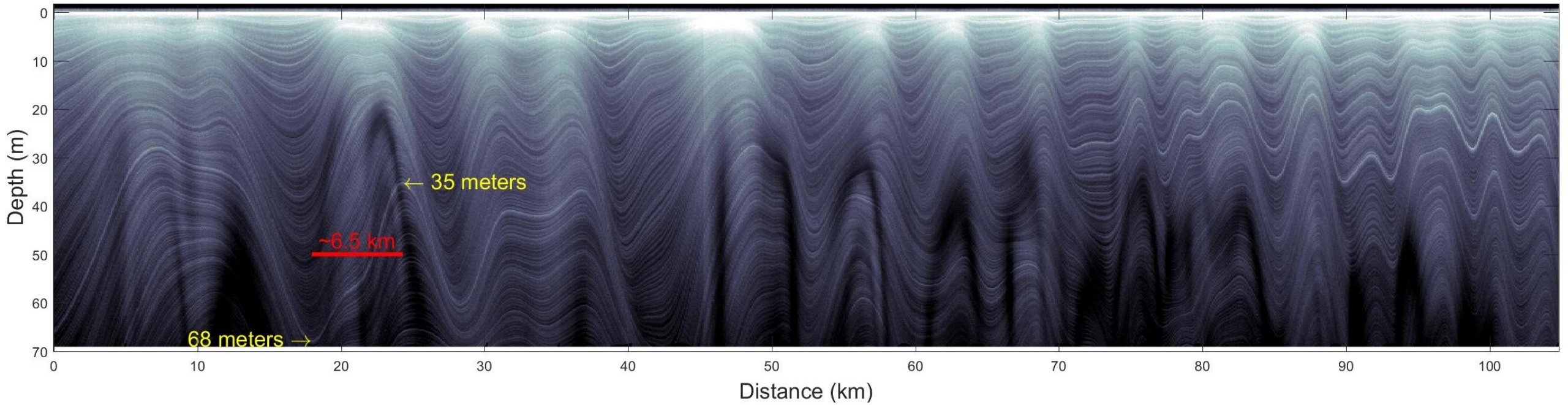
OIB Snow Radar





OIB Snow Radar





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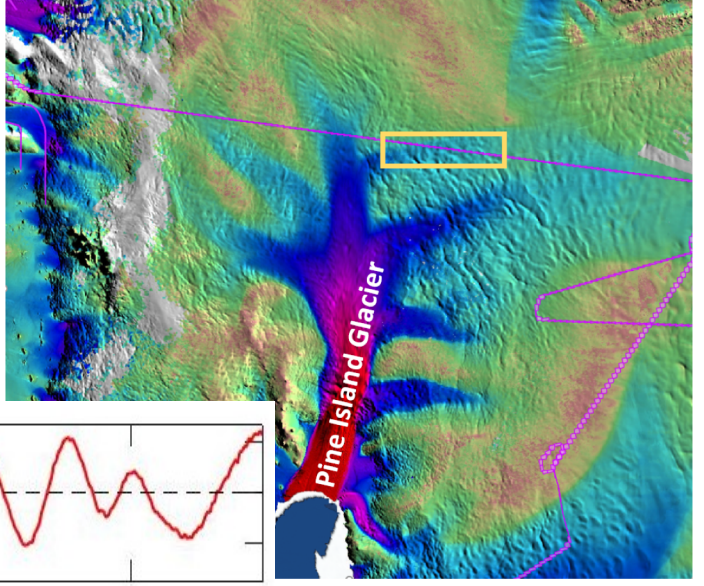
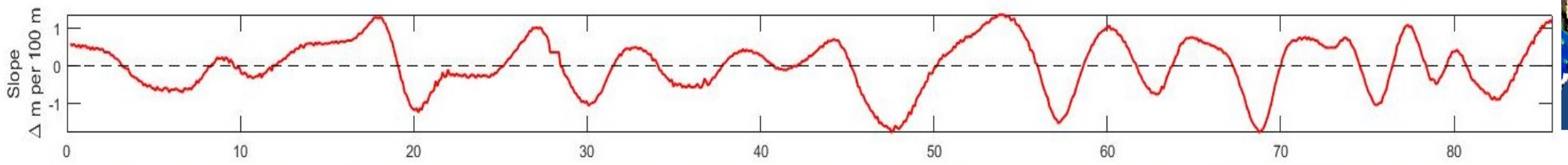
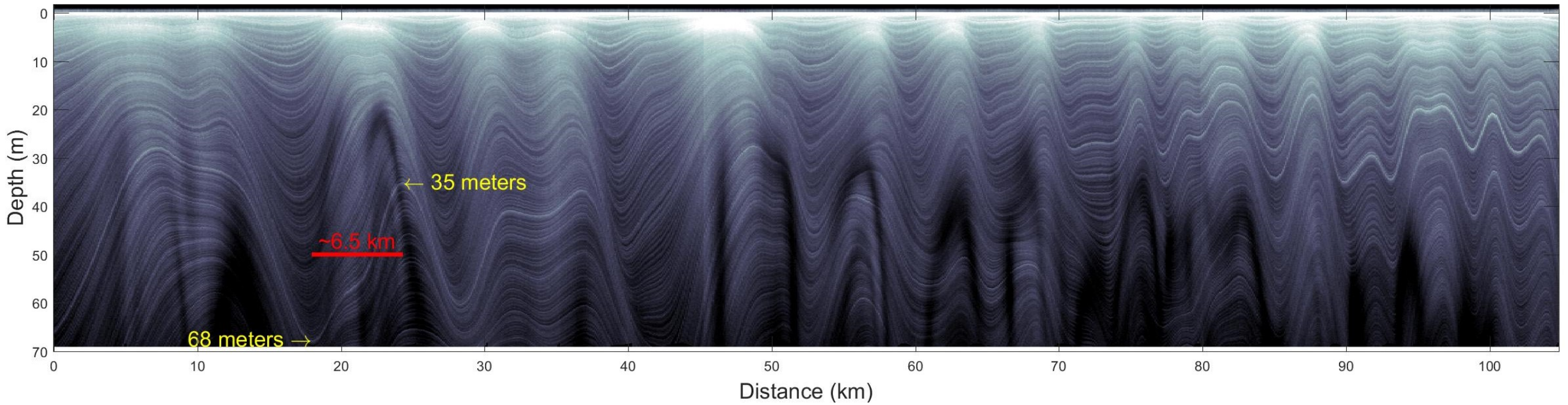
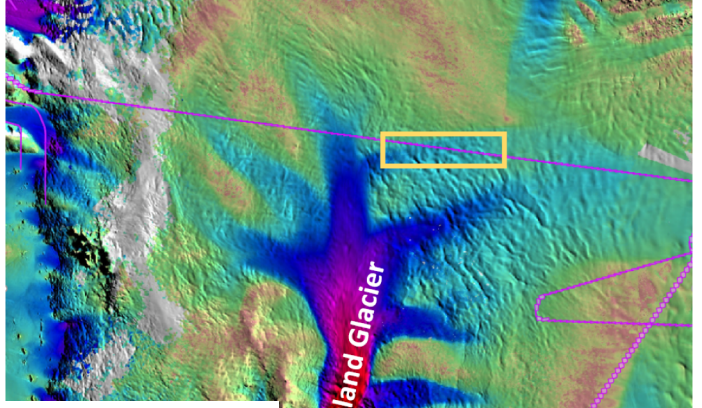
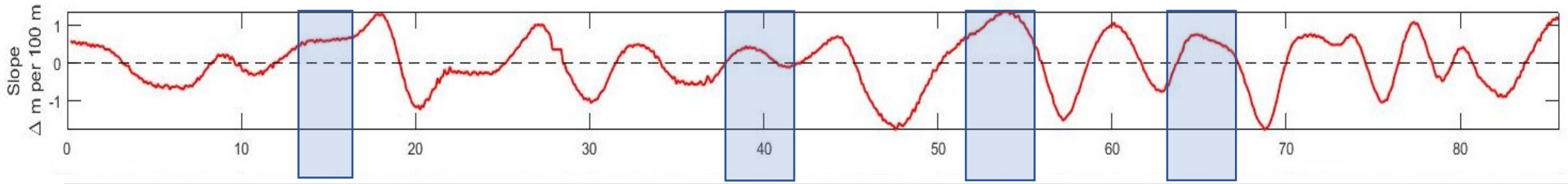


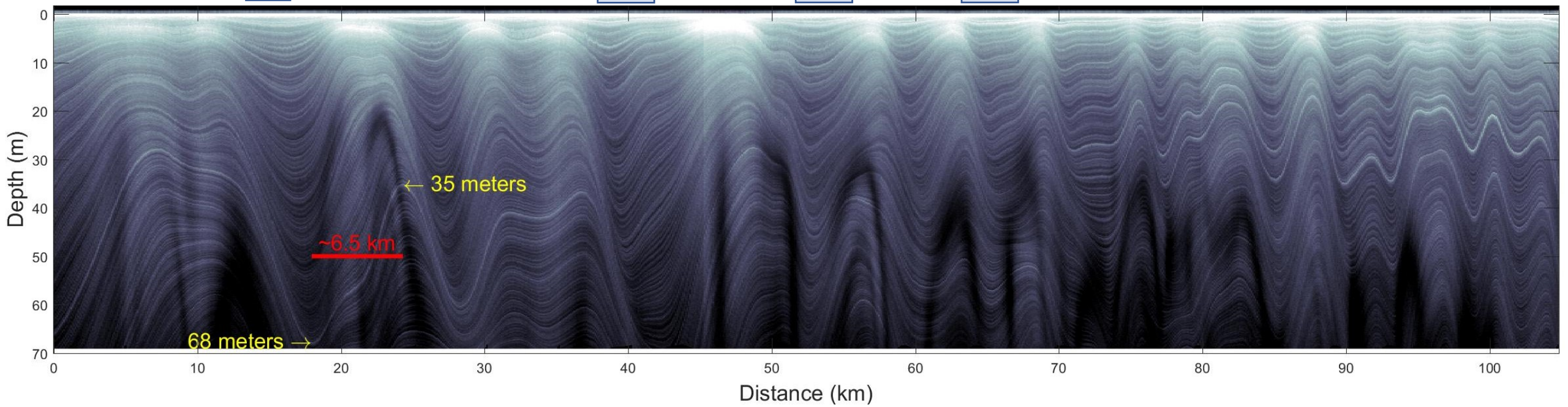




OIB Snow Radar







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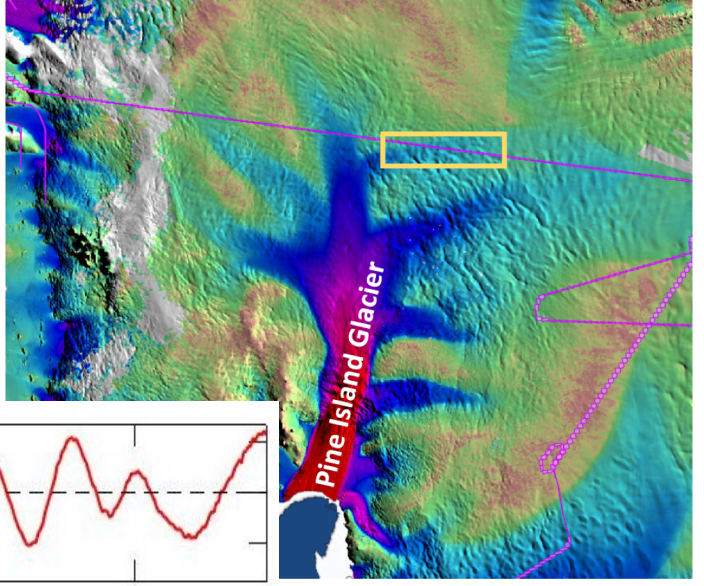
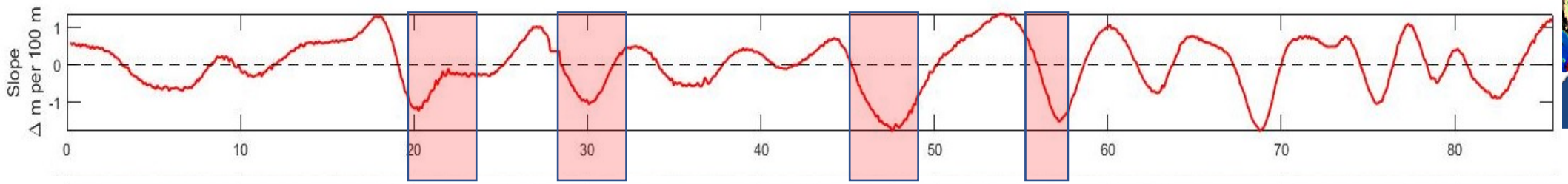
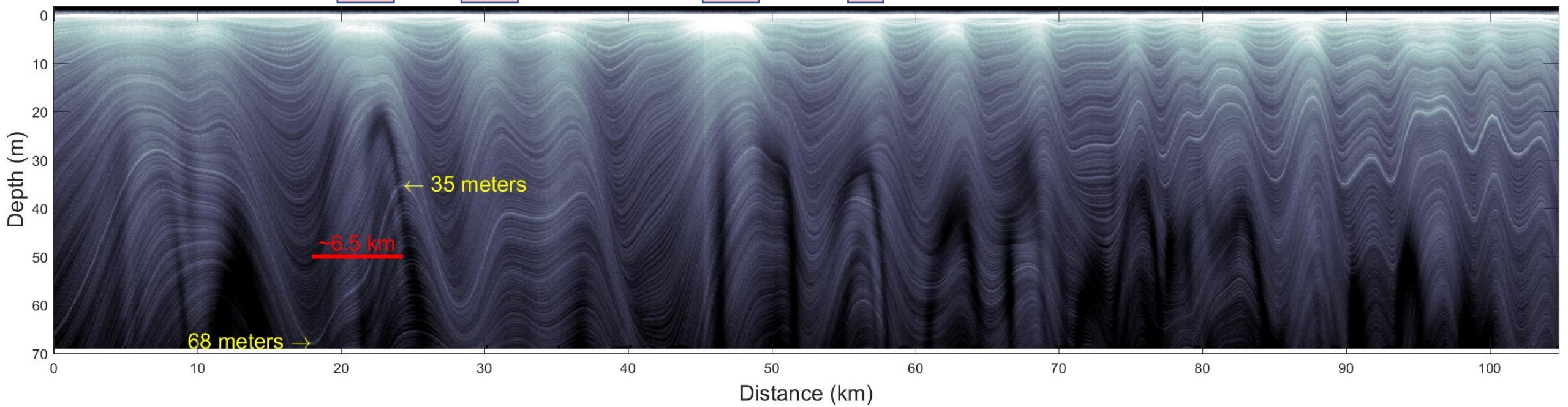
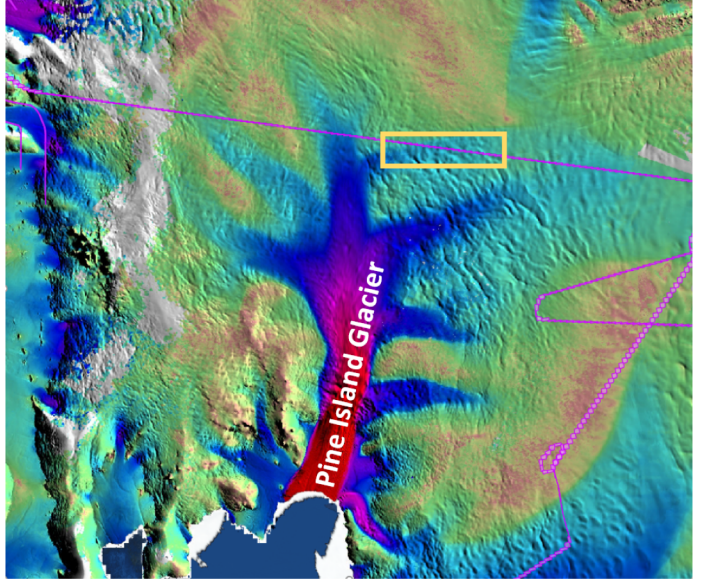


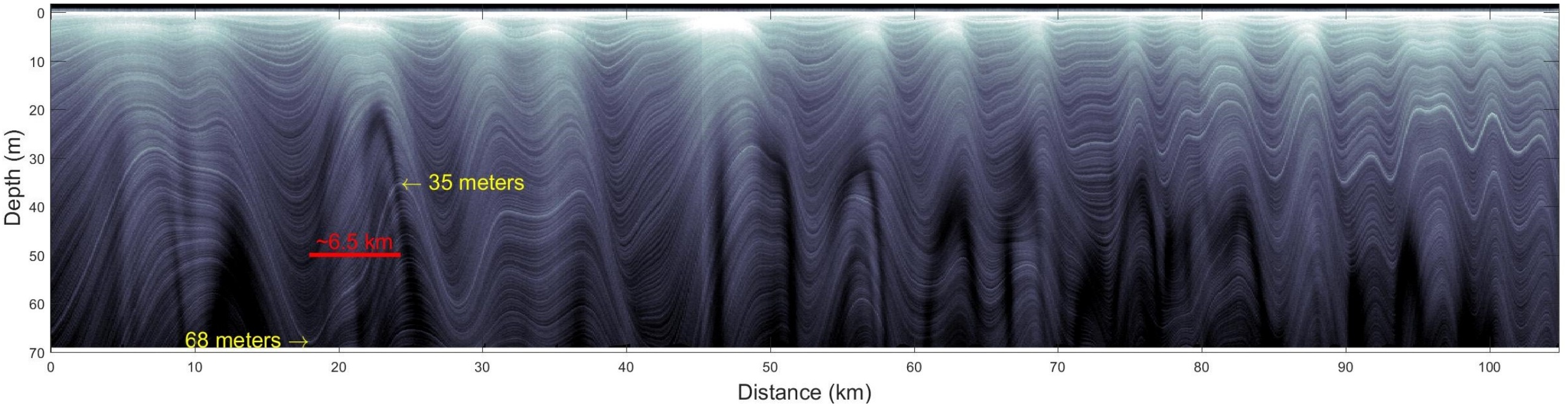




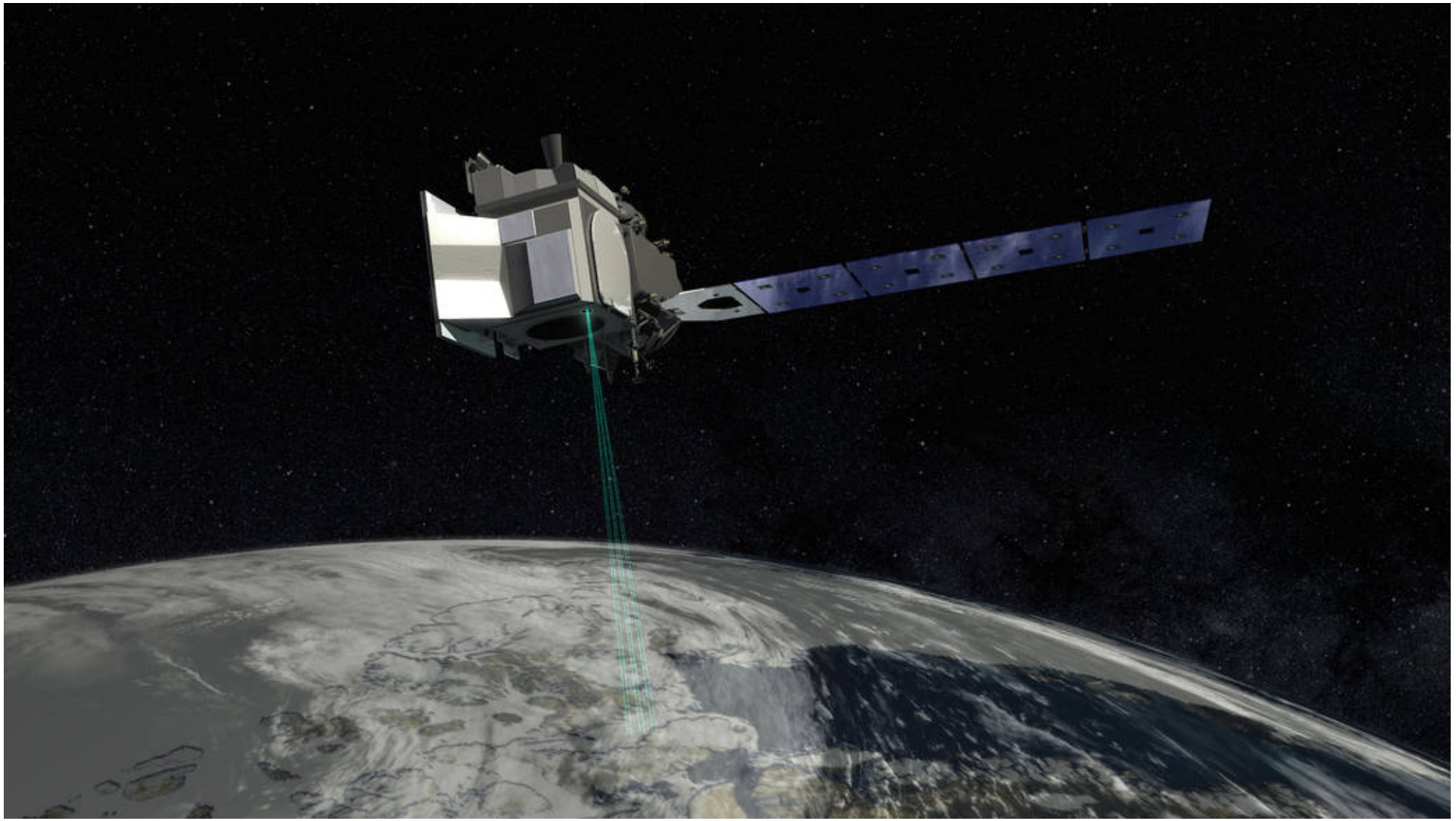
OIB Snow Radar



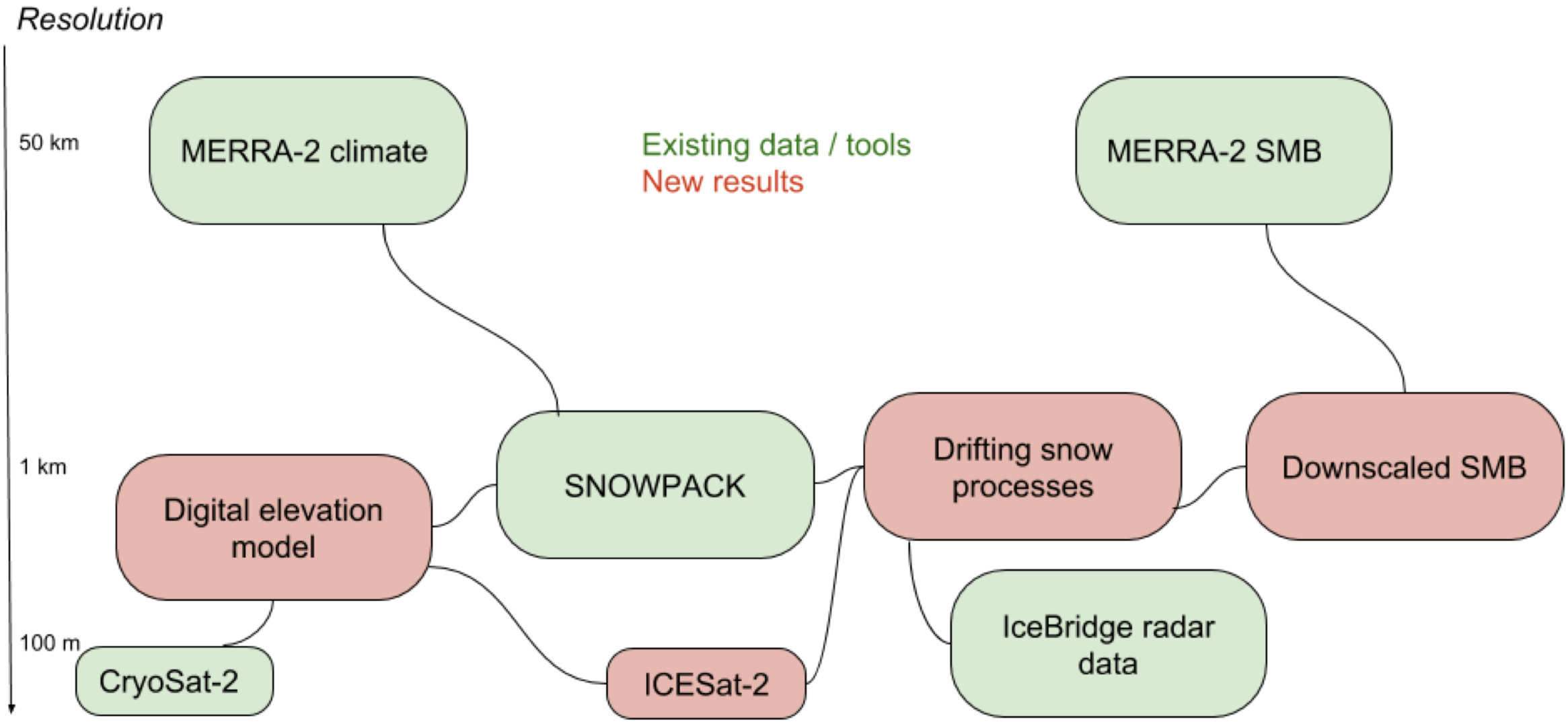
0.5°



ICESat-2: launch in September

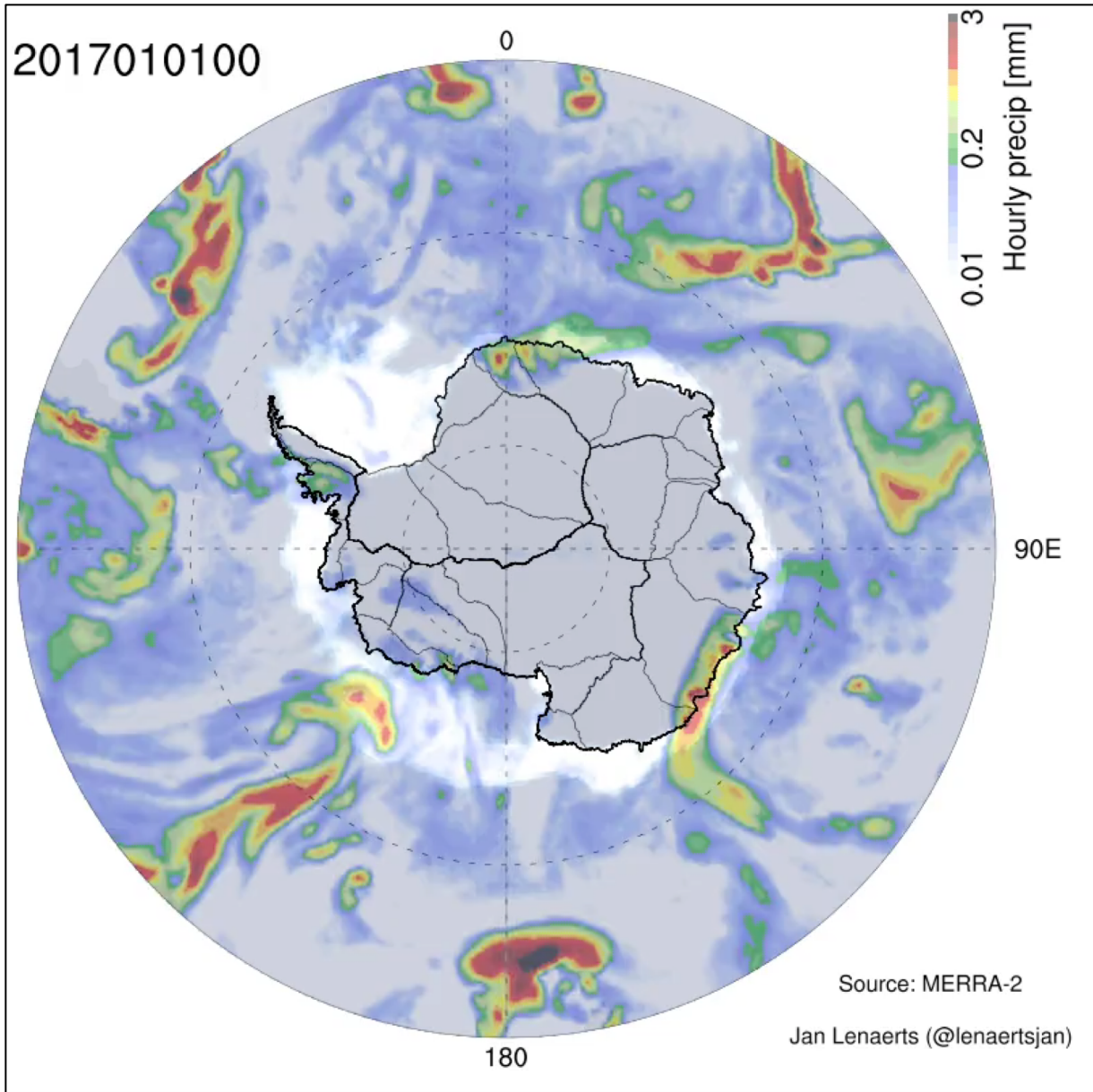


Methodology



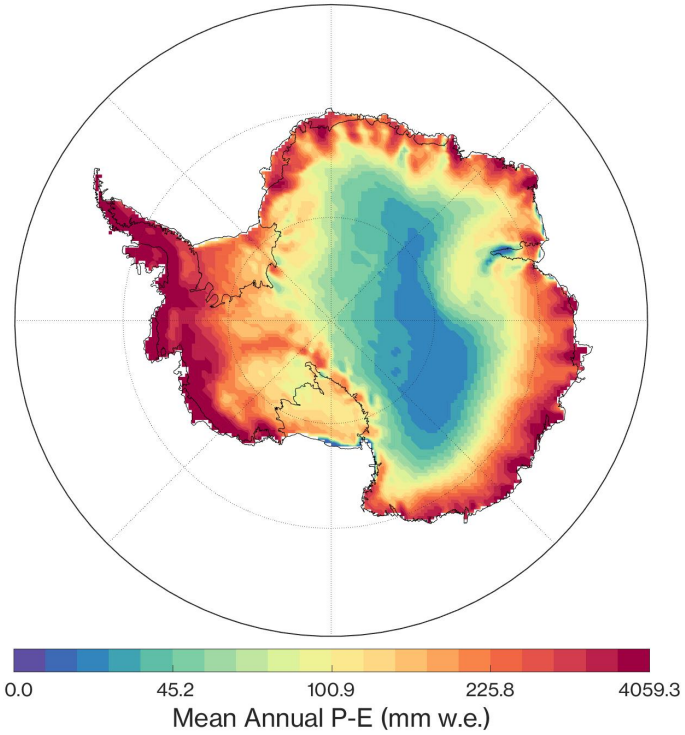
Input 1: MERRA-2 SMB

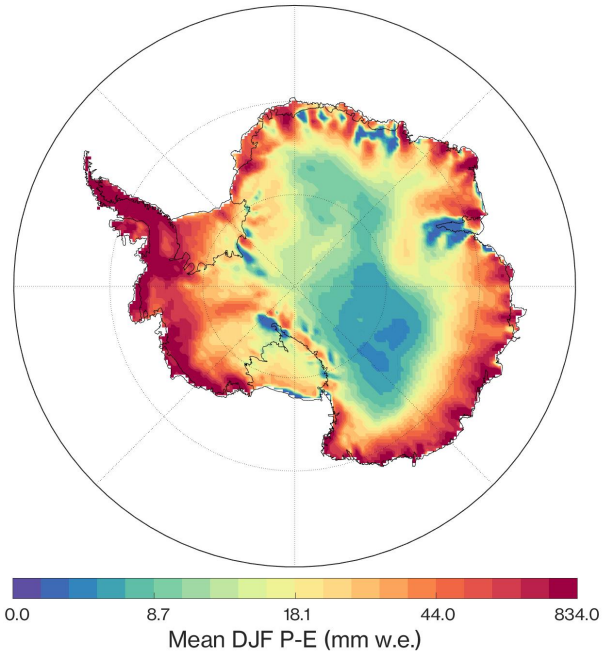
Time

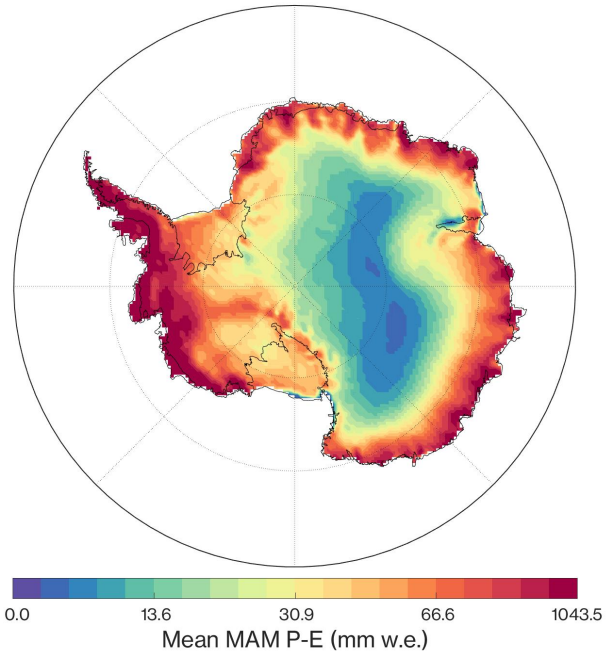


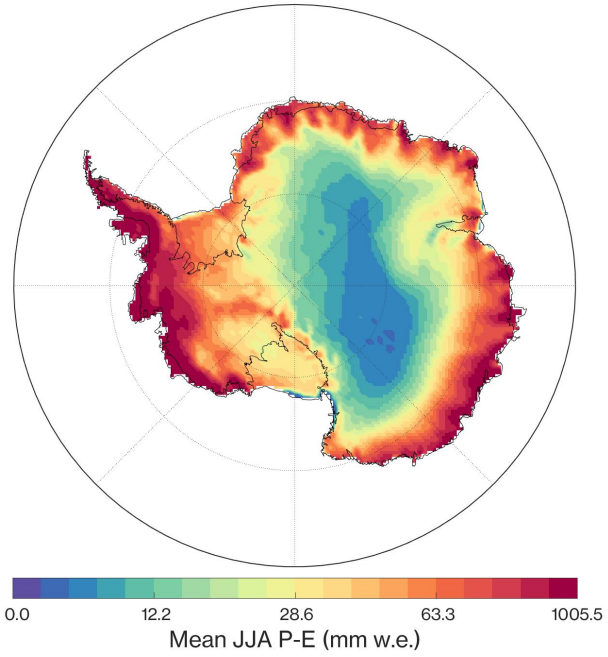
https://vimeo.com/262487927

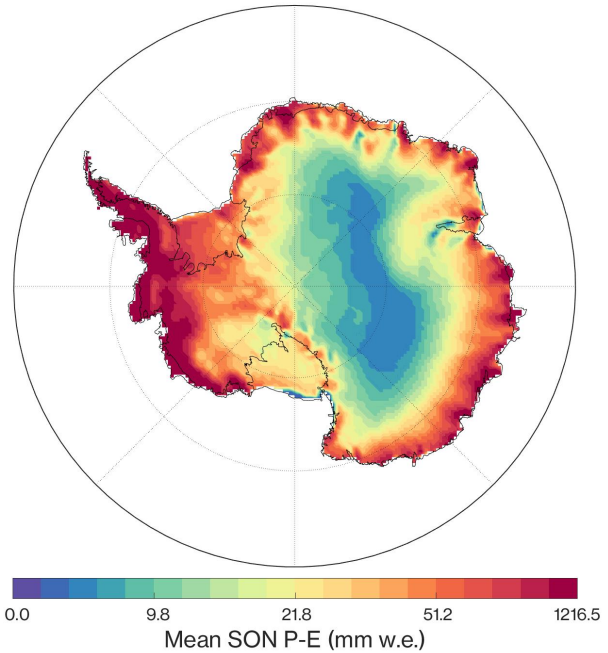
MEAN *P-E*
MERRA-2



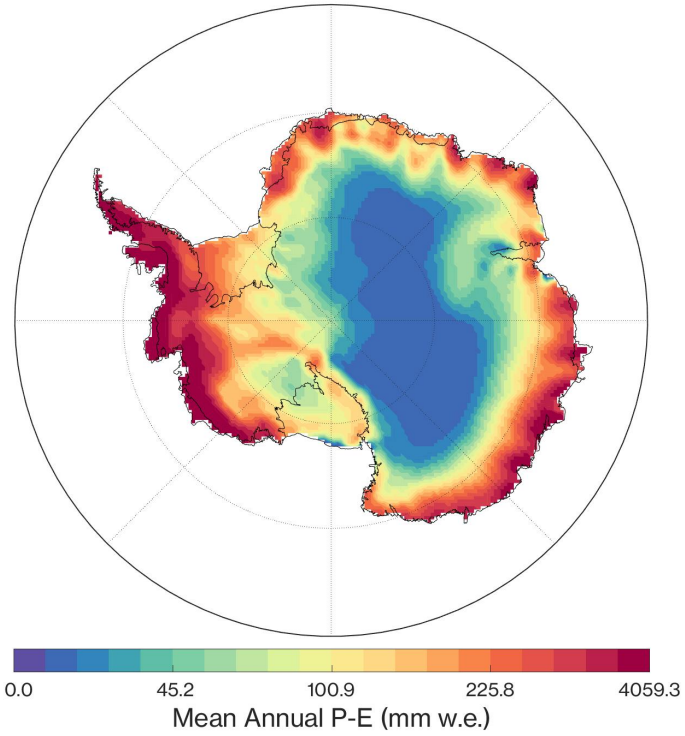


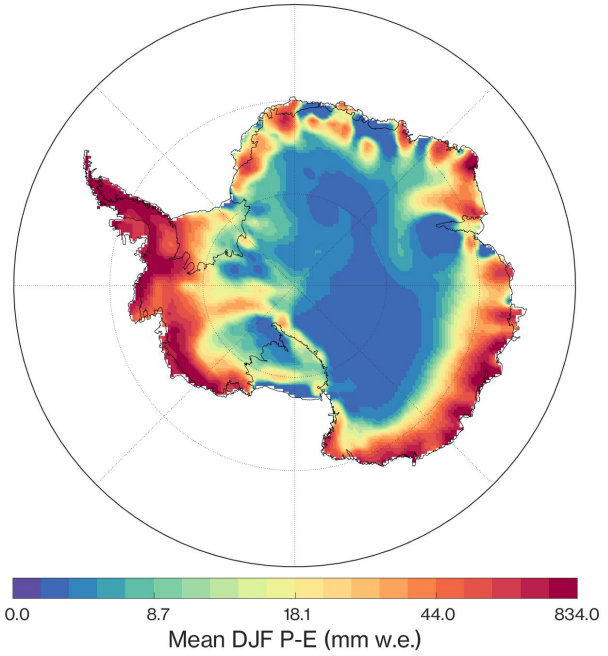


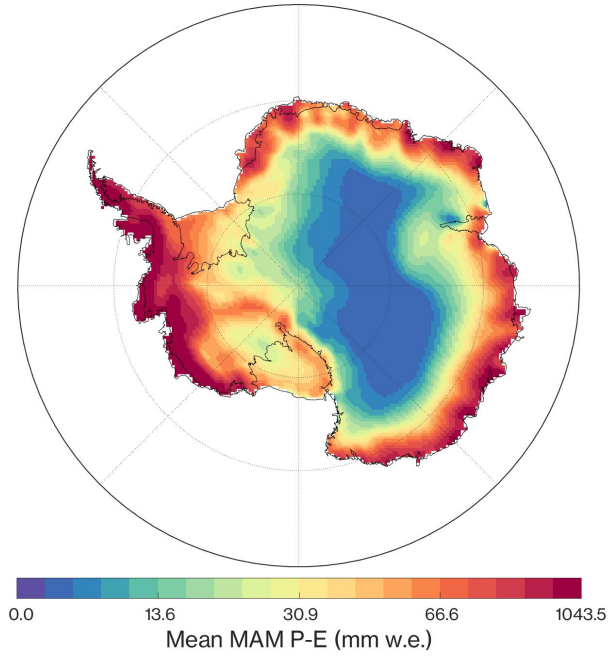


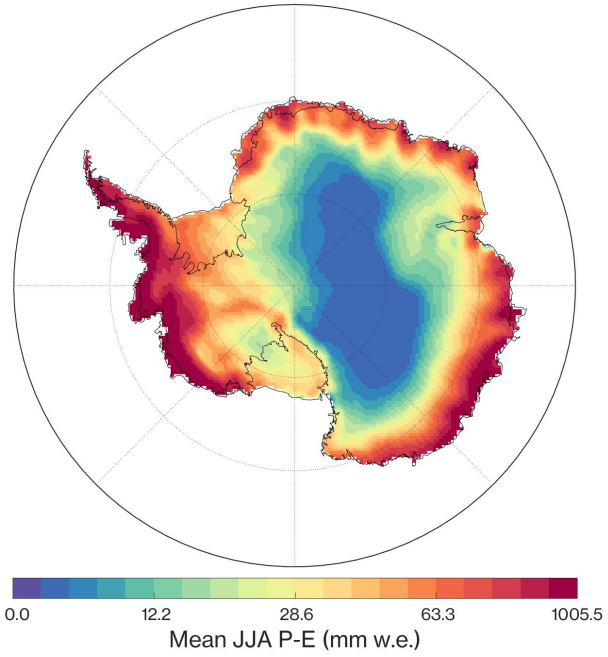


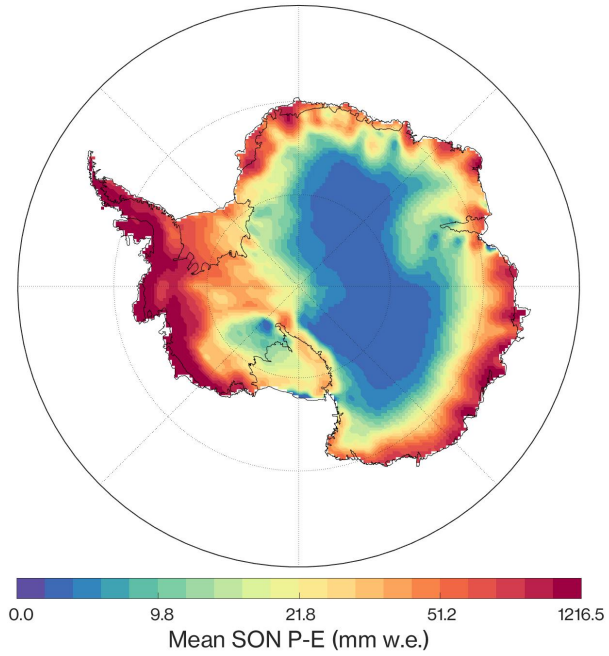
MEAN *P-E*
ERA-Interim



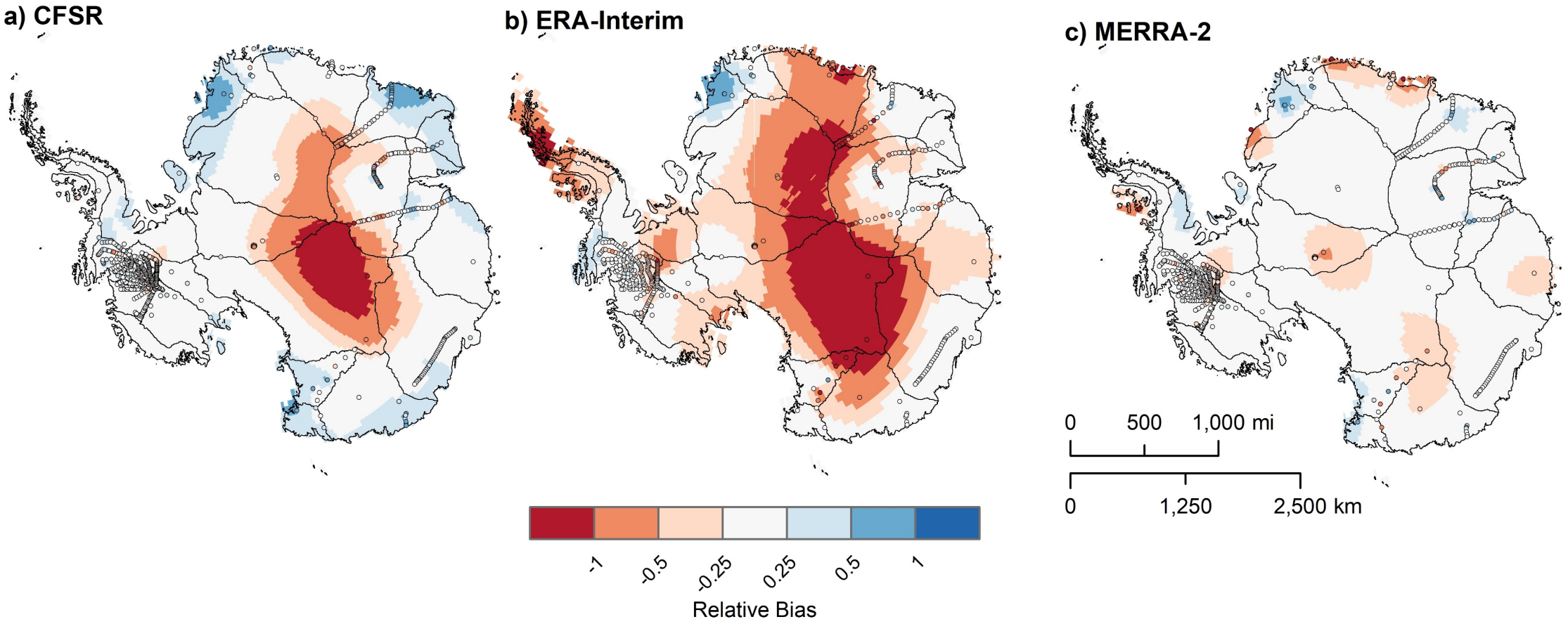




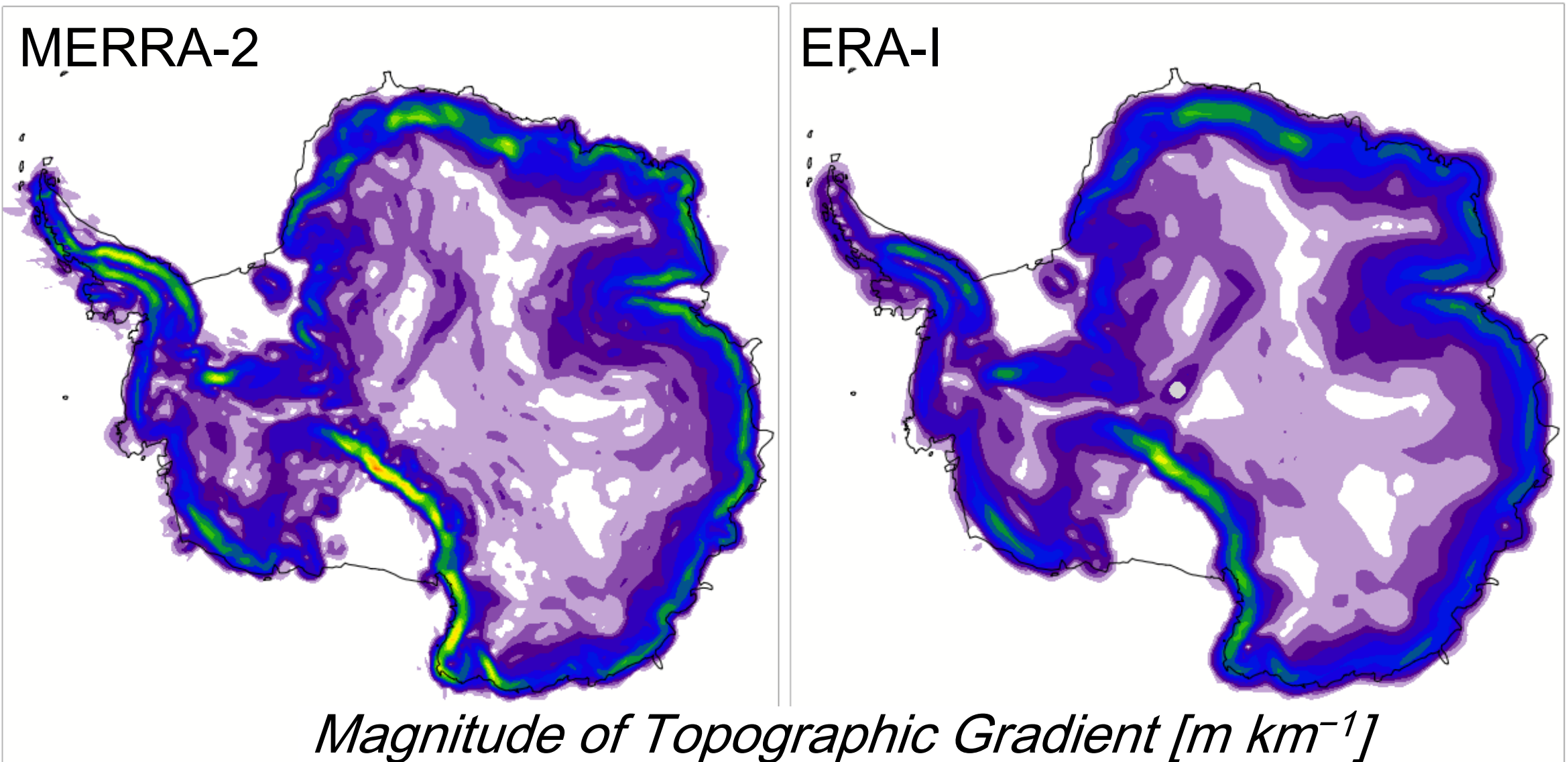


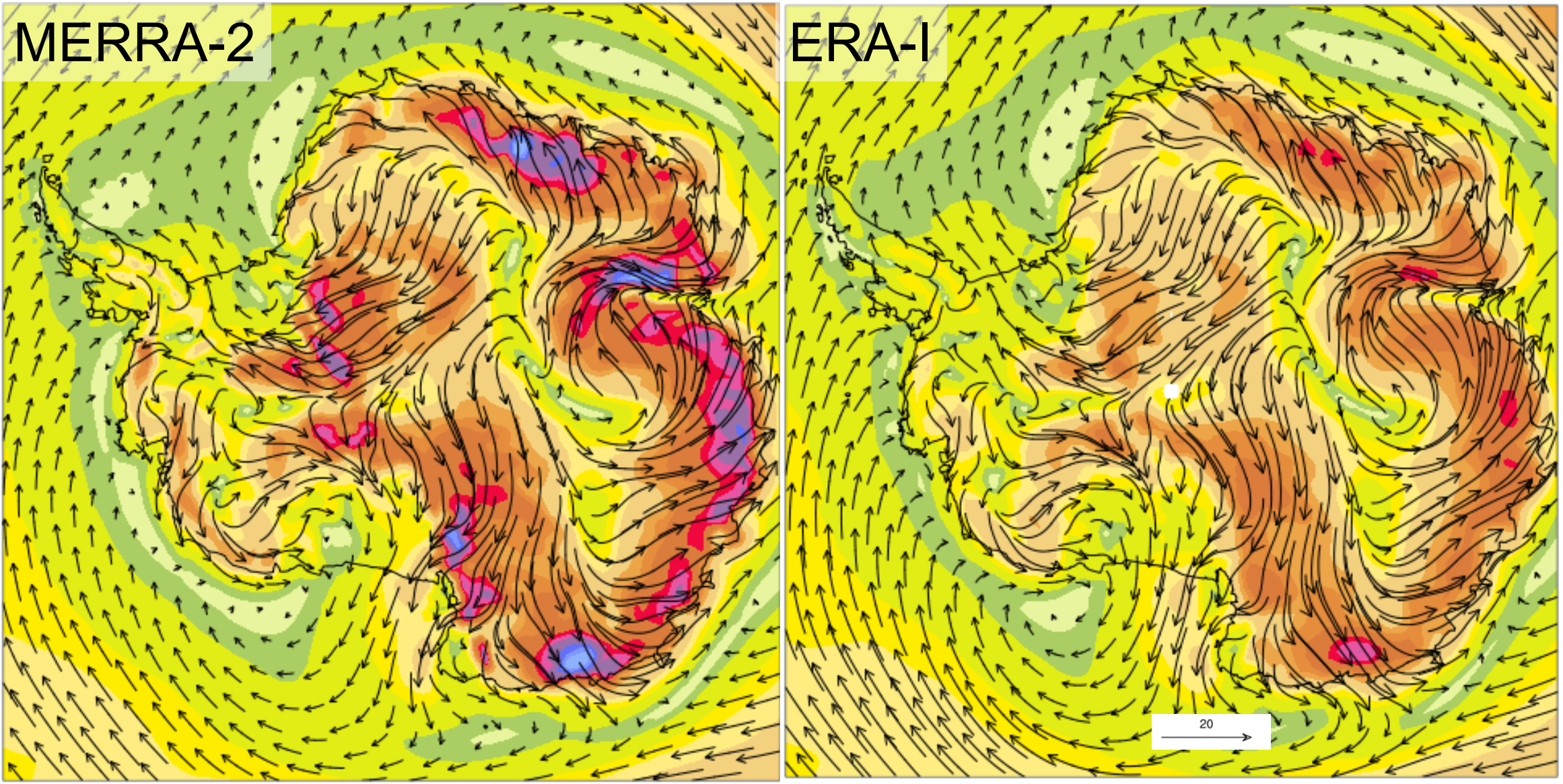


Comparison to ice core database



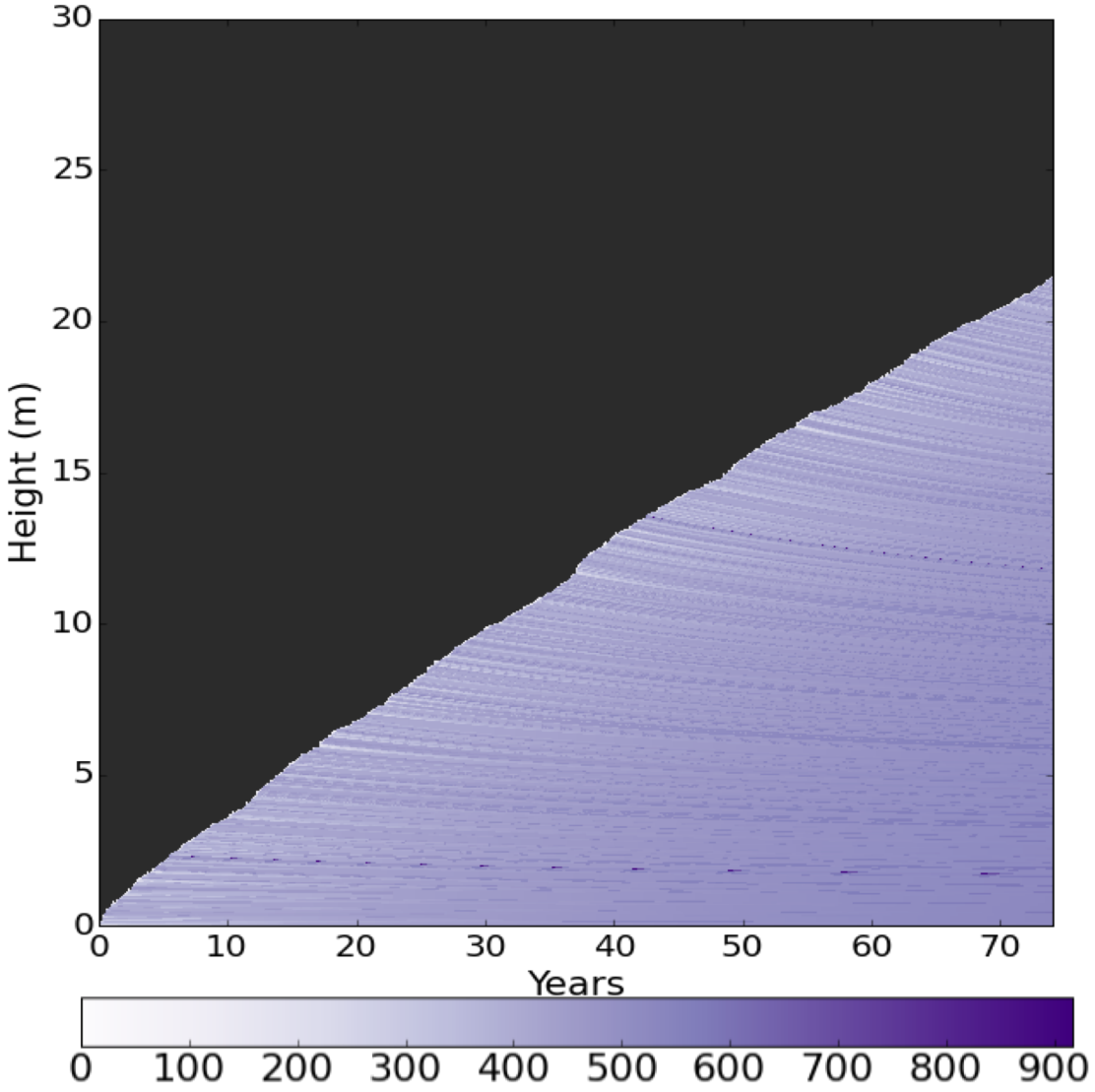
Input 2: MERRA-2 surface winds

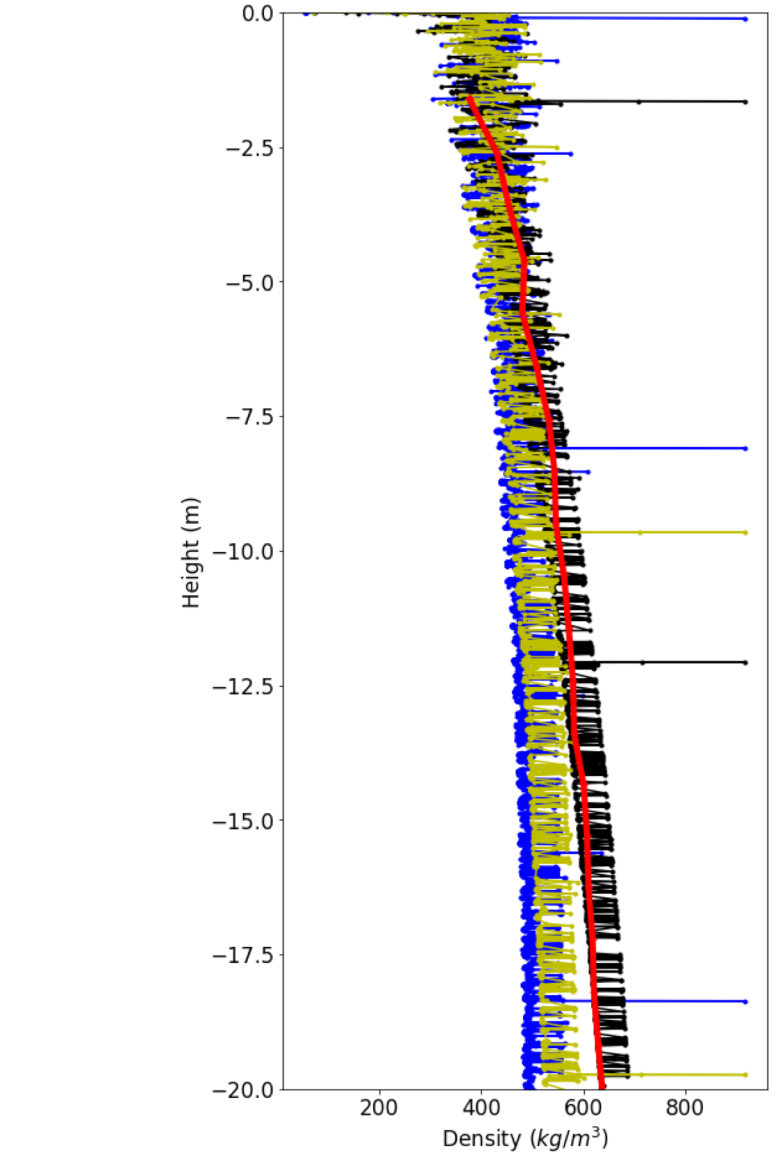




July Vector-Averaged 10m Wind Speed and Vectors [m s^{-1}]

SNOWPACK Antarctica





Future work

Continue MERRA-2 SMB and wind evaluation

Run SNOWPACK for IMAU weather stations, comparing to snow height measurements

Prepare 3D distributed SNOWPACK (Alpine-3D), accounting for snow transport and erosion. First: Thwaites glacier catchment, compare/improve results with OIB Snow Radar

Connected to *Mass2Ant* project (with Stef Lhermitte, TU Delft)
Impacts of ice rises on climate and SMB