

Glacier Responses to the 2022 Larsen B Landfast Sea Ice Break-Up

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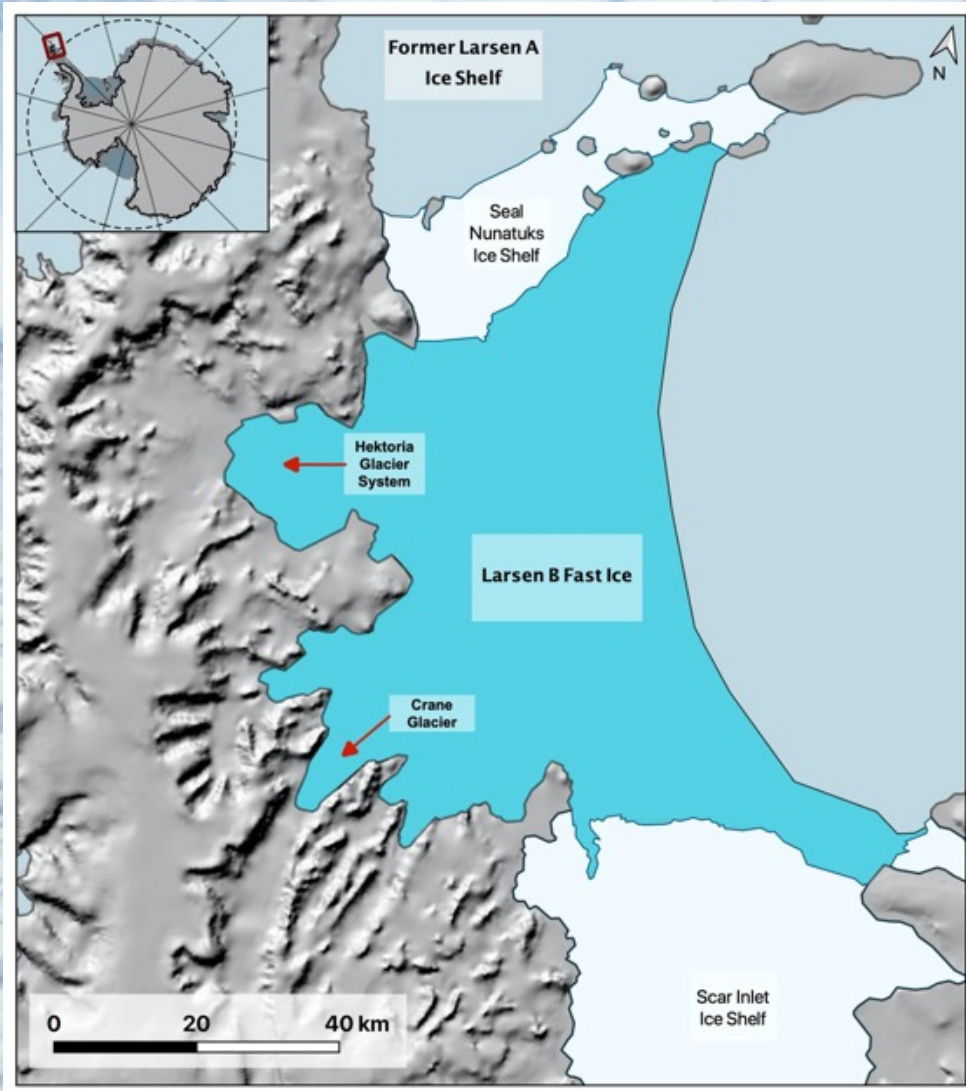
Ted Scambos, Sarah Child, Alison Banwell, Mike Willis, Robert S. Anderson, Chris Shuman, Mark Fahnestock

EGU General Assembly 2022

24 May 2022

Setting the Stage

Locator map, 01 January 2022 conditions

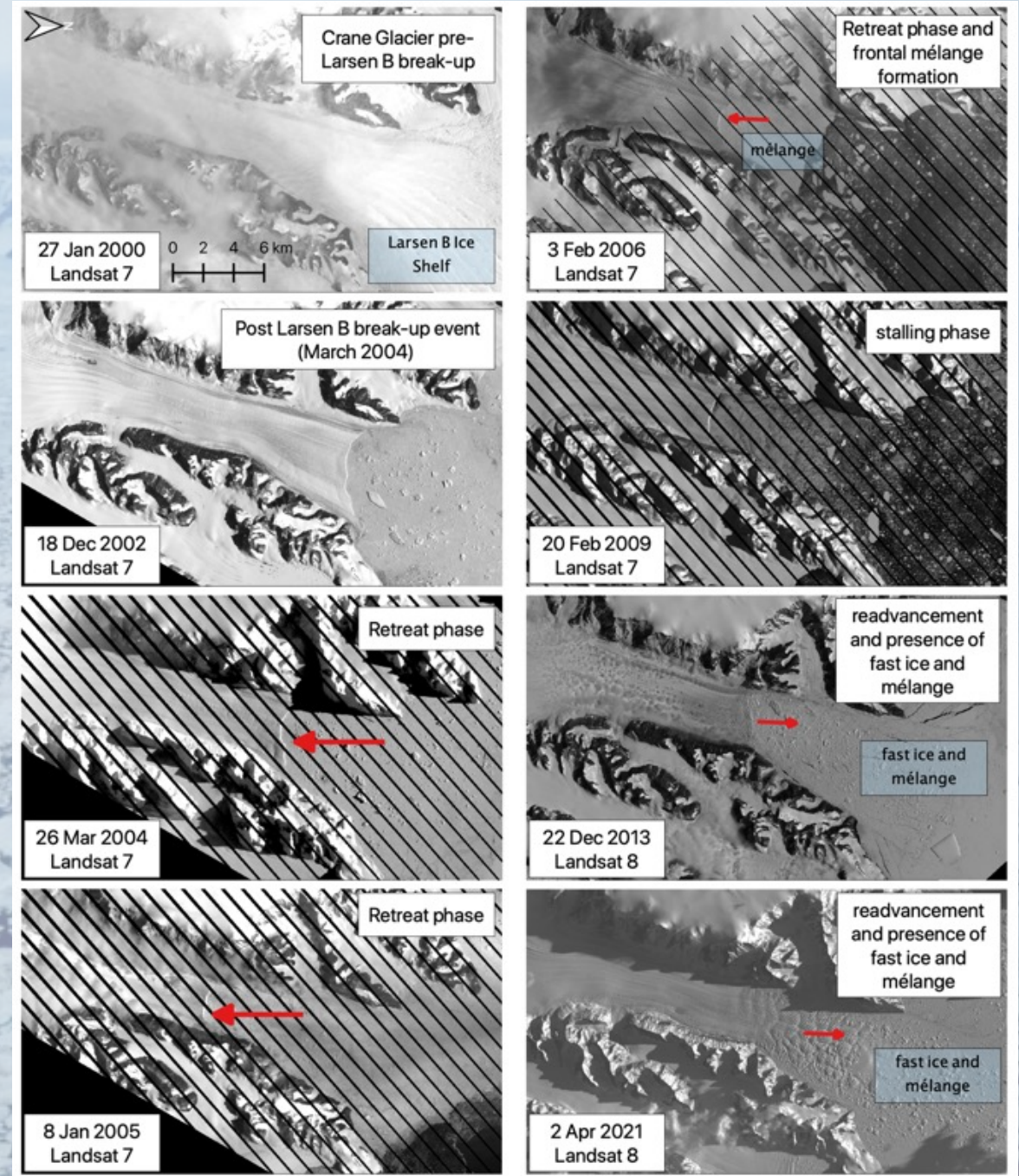
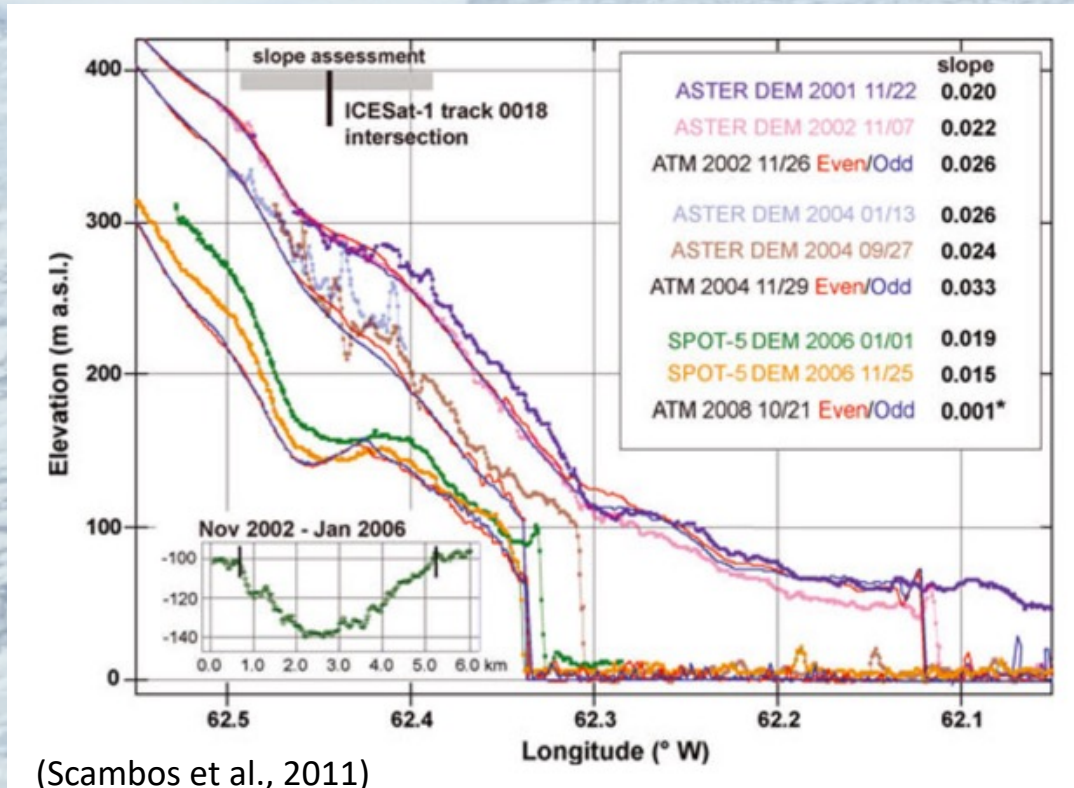


1968 Larsen B Northeast View, US Navy TMA Photography

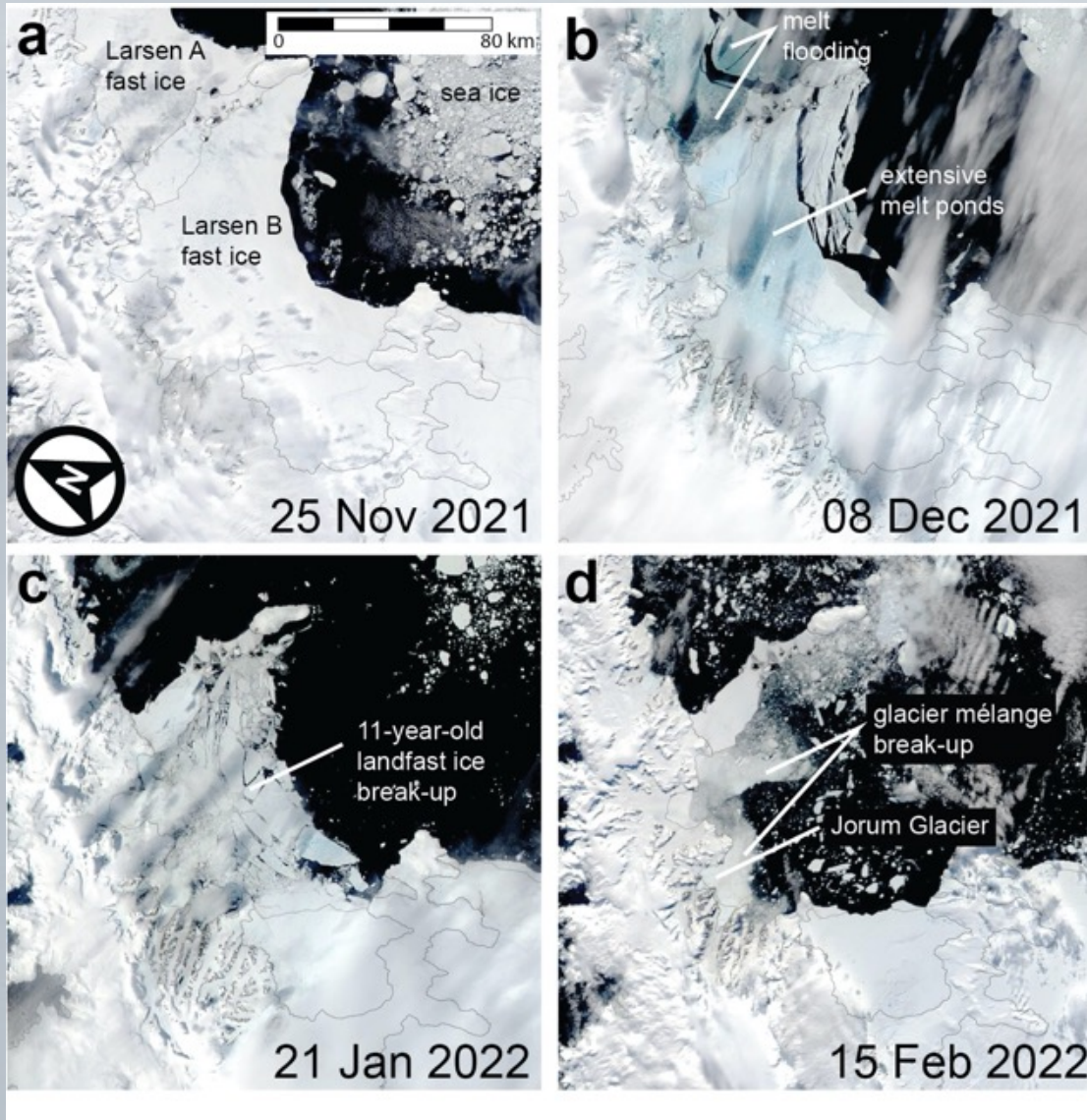


Crane Glacier

Evolution of the ice front and profile elevation since 2000



Fast ice breakout, 2021-2022 summer



Fast ice had been present continuously since late 2011;
Break-up began on 19 January of 2022

BAS Twin Otter overflight on 31 January 2022



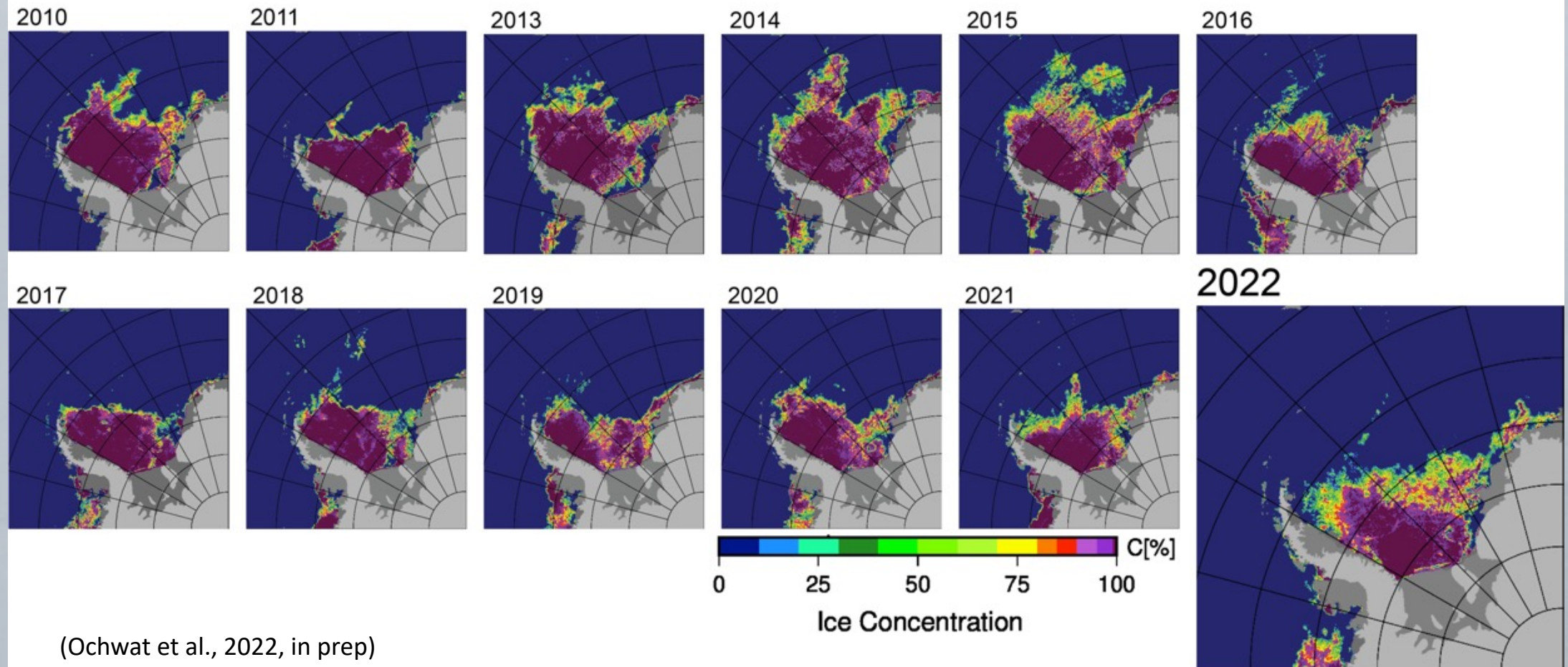
Jorum Glacier



What triggered the fastice break-out on 19-20 January 2022?

Sea Ice

20 Jan, 2010-2022
AMSRE and AMSR-2 daily Sea Ice concentration, Weddell Sea

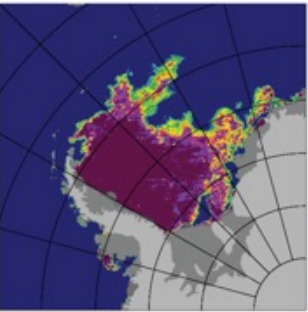


Sea Ice

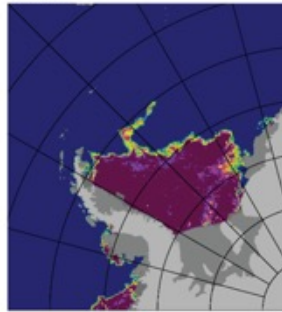
2022

20 Jan, 2010-2022
AMSRE and AMSR-2 daily

2010



2011



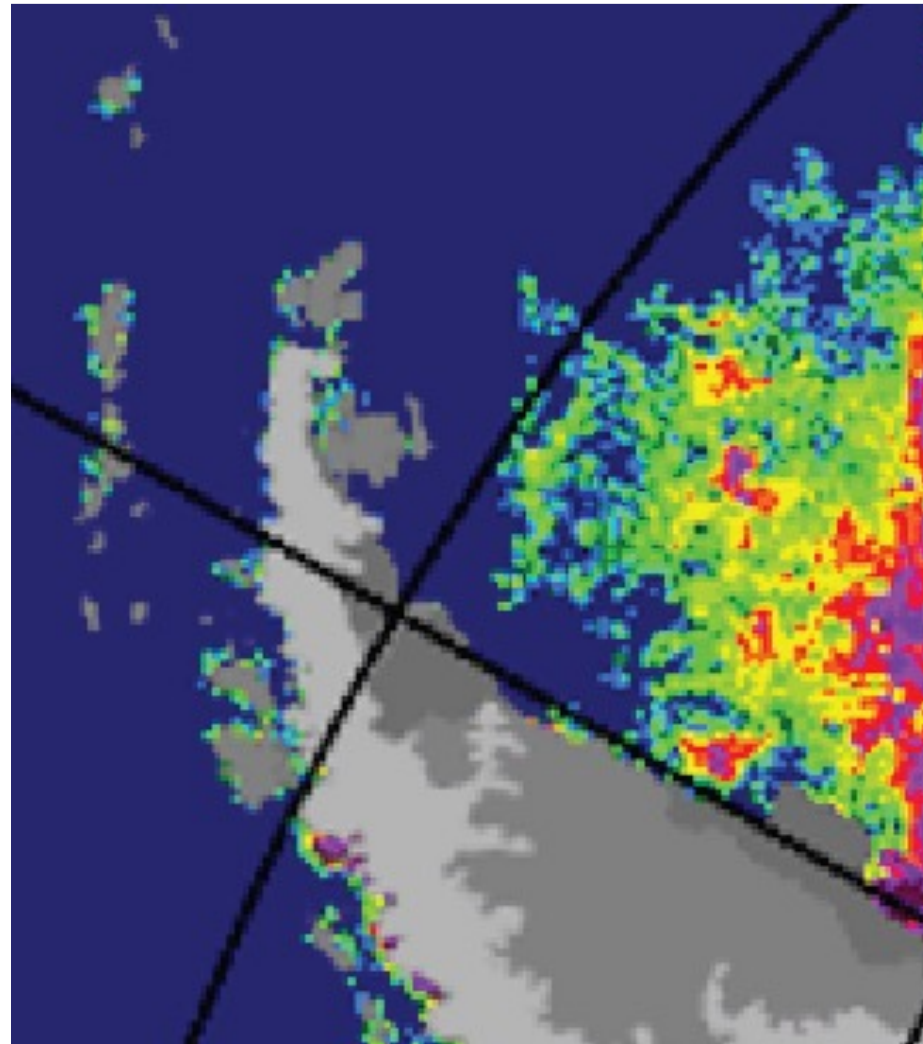
2017



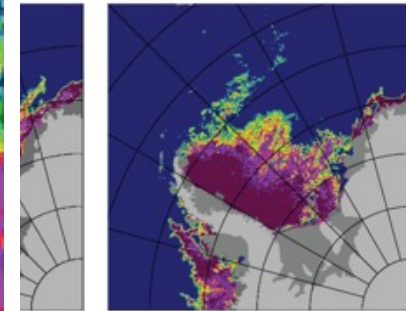
2018



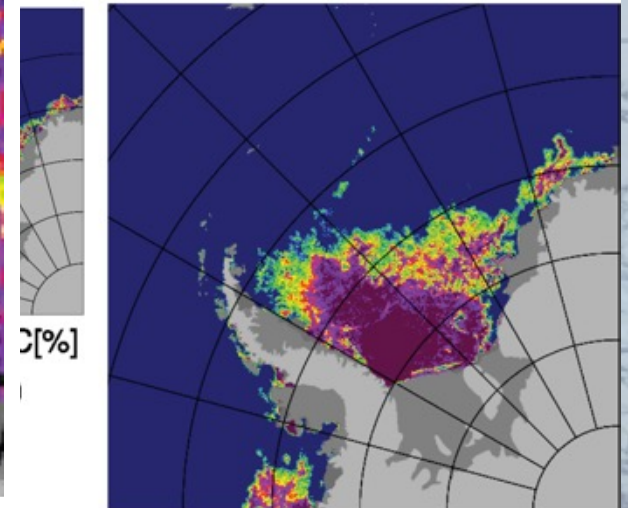
(Ochwat et al., 2022, in prep)



2016

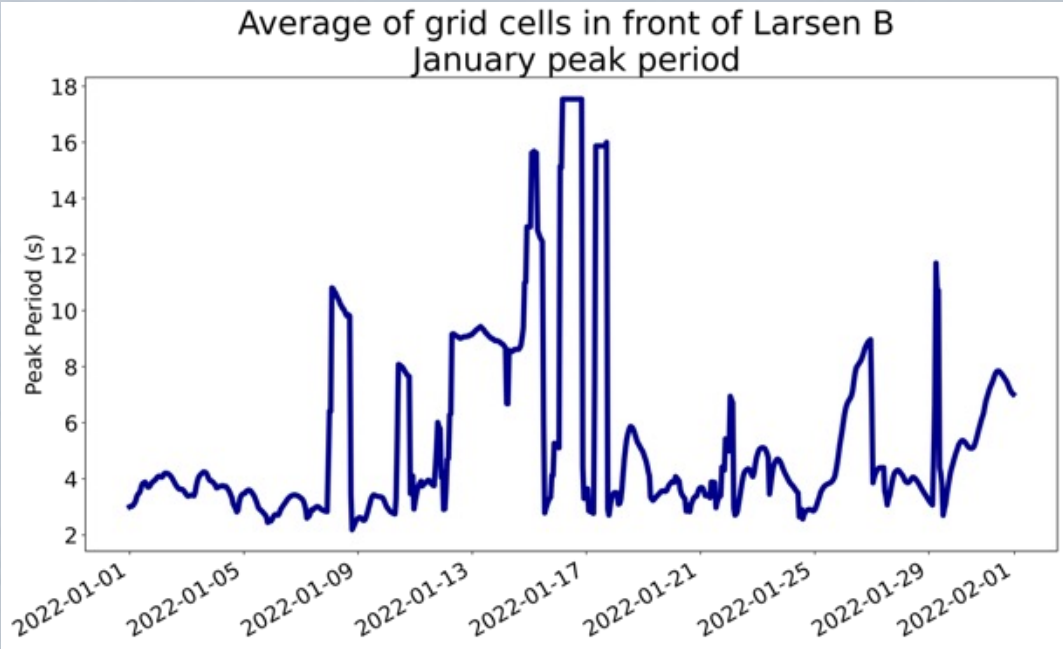
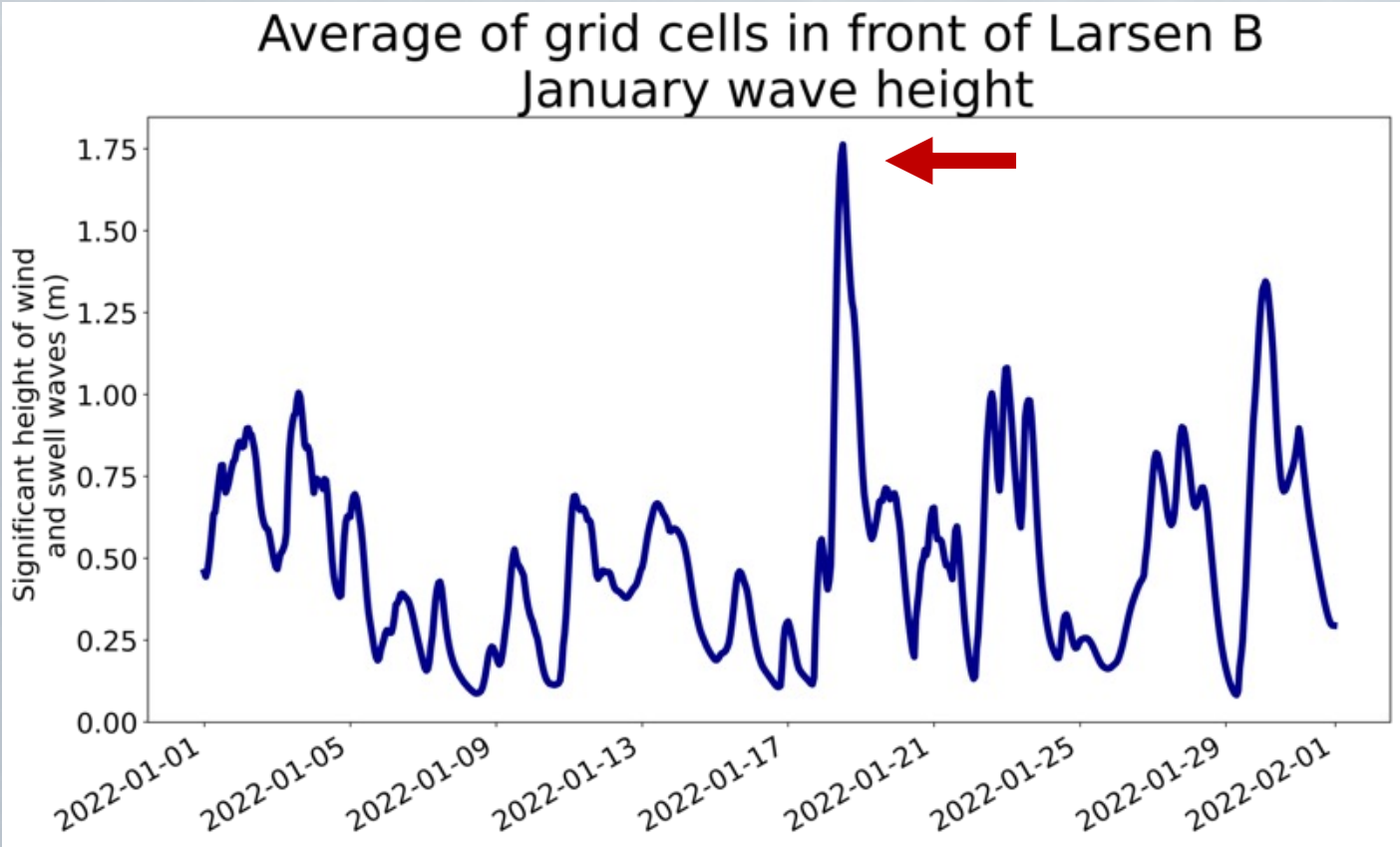


2022



2022

Wave Action from WaveWatch III



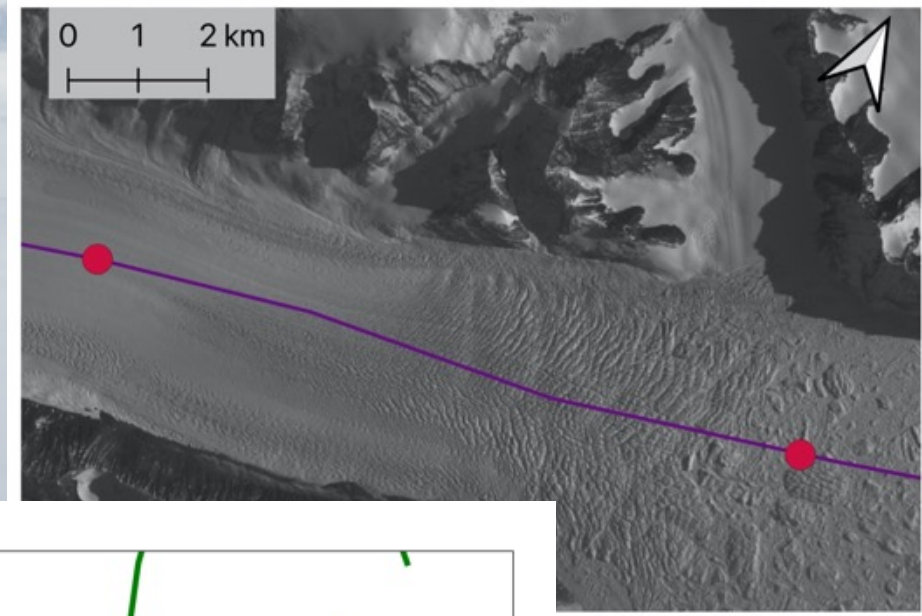
(Ochwat et al., 2022, in prep)



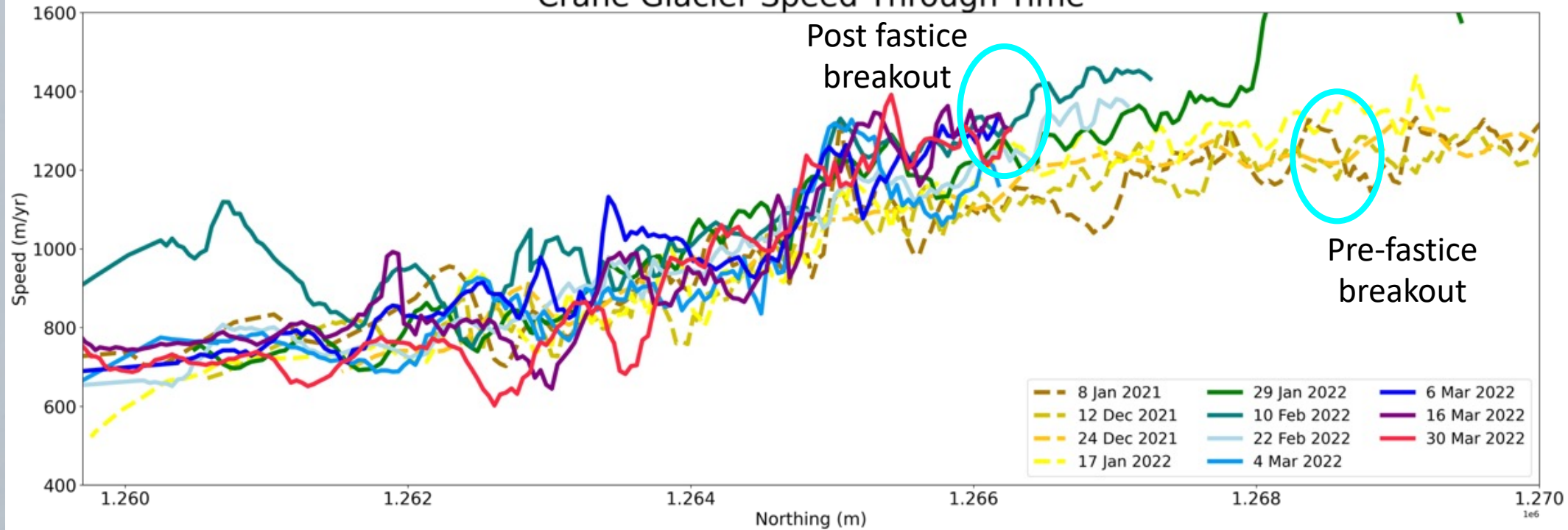
How do the tributary glaciers respond in the immediate aftermath?

Velocity Changes

Sentinel 1 – 12 day pairs, Alaska Satellite Facility HyP3 Pipeline

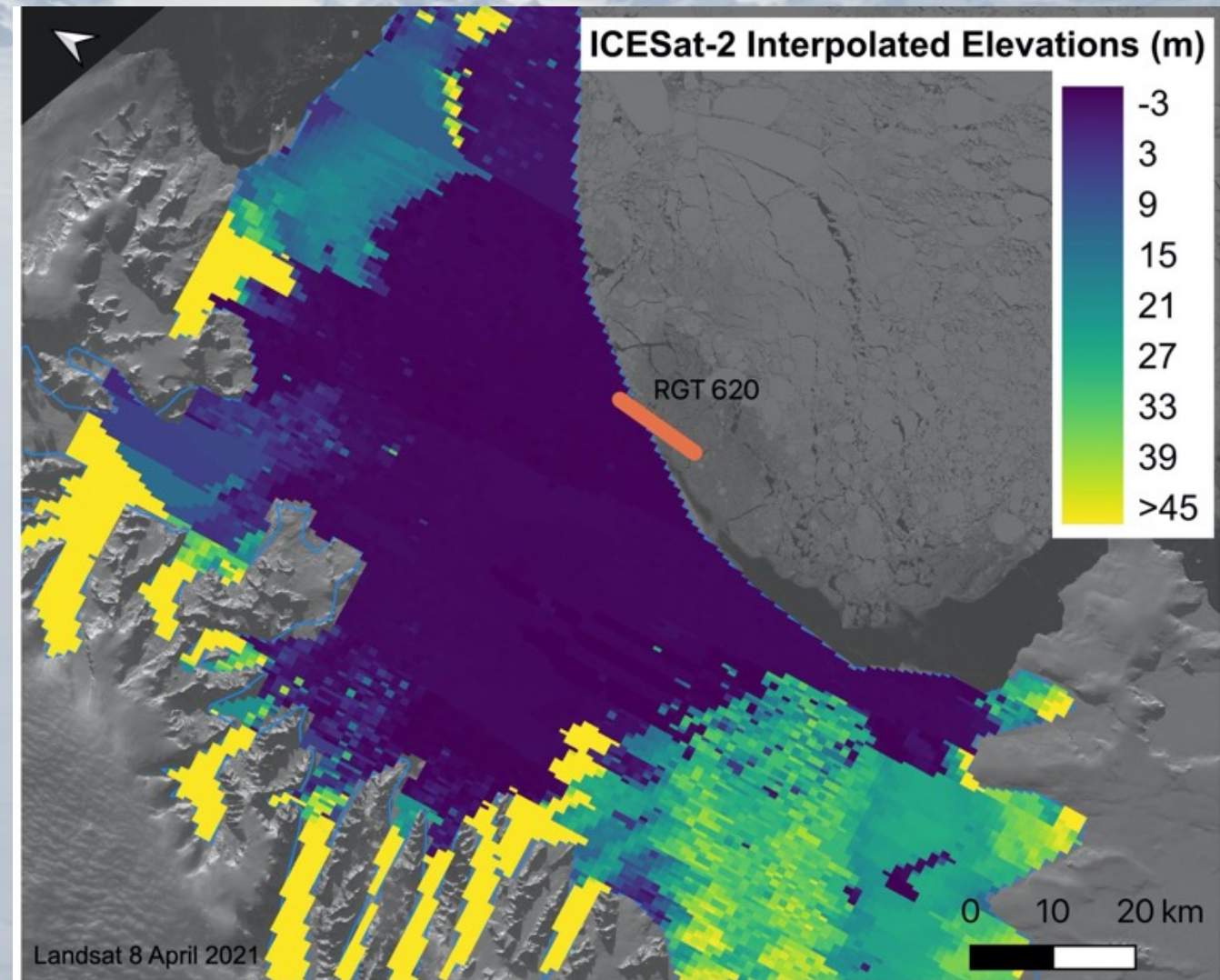
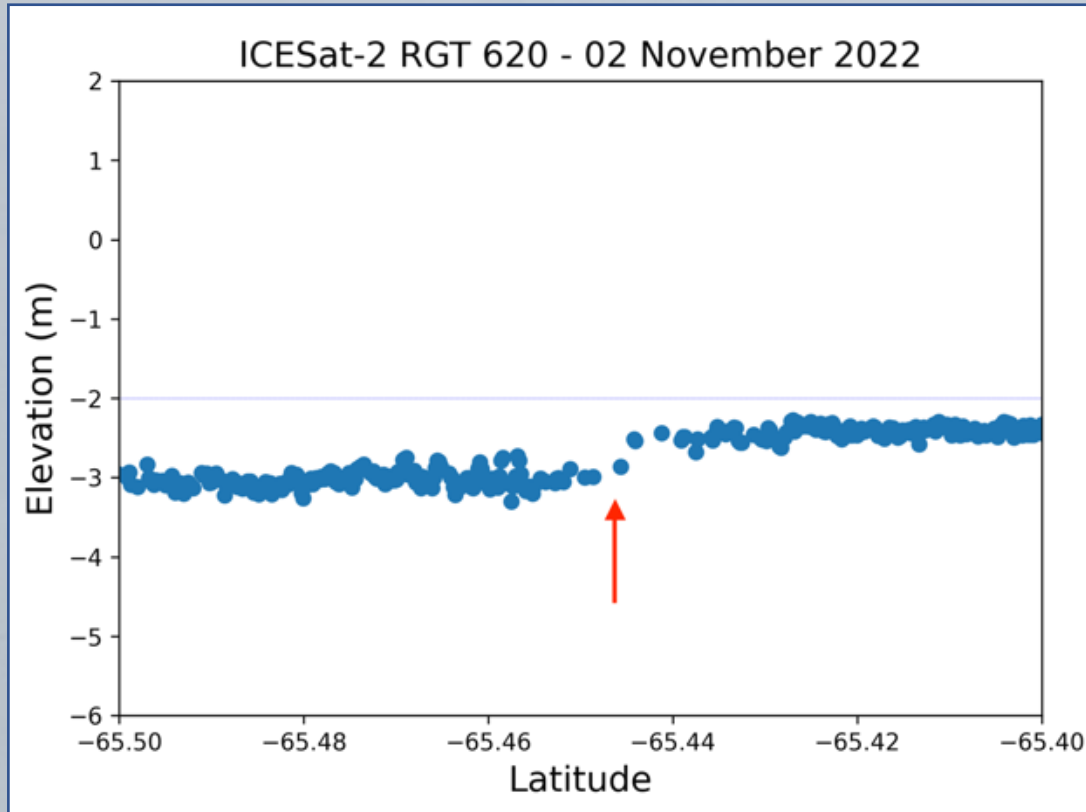


Crane Glacier Speed Through Time



Elevation Changes

- ICESat-2!
- ASTER DEMs
- Worldview-3 DEMs



(Ochwat et al., 2022, in prep)

Thank you!

Questions?

Please reach out!
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Sentinel 1 image used for determining open water area used in slide 10

