

On-ice Vibroseis: What lies beneath Ekström Ice Shelf, East Antarctica?

Emma C. SMITH¹

Reinhard DREWS², Todd EHLERS², Dieter FRANKE³, Christoph GAEDICKE³, Coen HOFSTEDÉ¹, Gerhard KUHN¹, Astrid LAMBRECHT⁴, Christoph MAYER⁴, Ralf TIEDEMANN^{1,5}, and Olaf EISEN^{1,5}

1. Motivation

2. Method:
Vibroseis on Ice

3. Location and
Data

¹Alfred-Wegener-Institut (AWI), Germany, ²Department of Geosciences, University of Tübingen, Germany

³BGR, Germany, ⁴Geodesy and Glaciology, Bavarian Academy of Sciences and Humanities, Germany,

⁵Department of Geosciences, University of Bremen, Germany

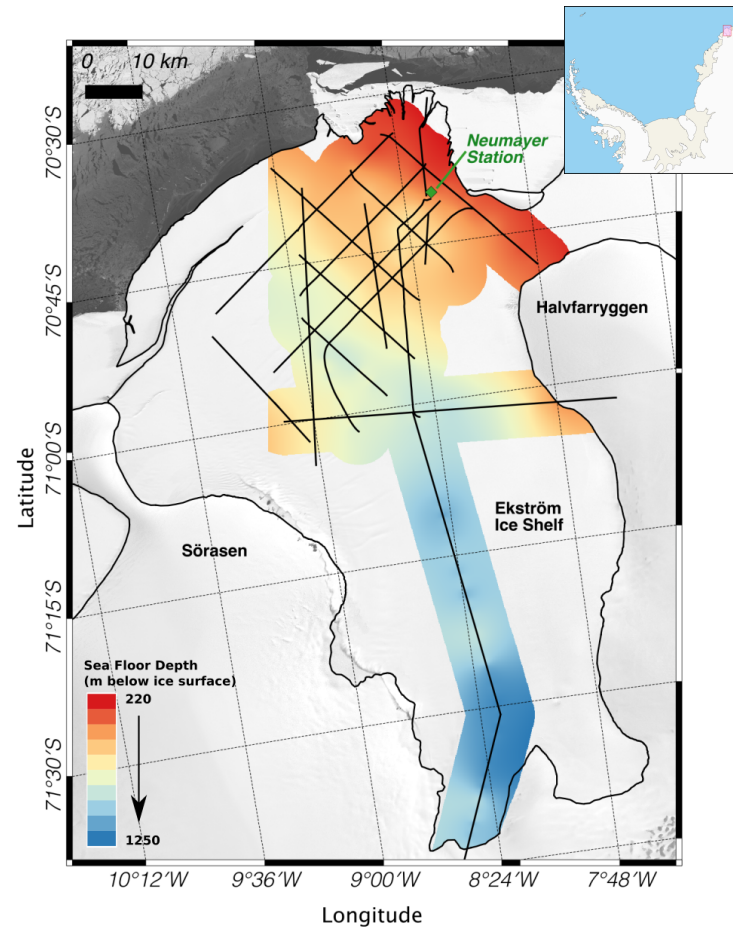
Sub-EIS-Obs: Vibroseis on ice

What?

- ~700 km of seismic vibroseis surveys

Why?

- Evidence of paleo-ice flow and retreat
- Geological history of region
- Ice-ocean interaction
- **Predictions of SLR contribution**



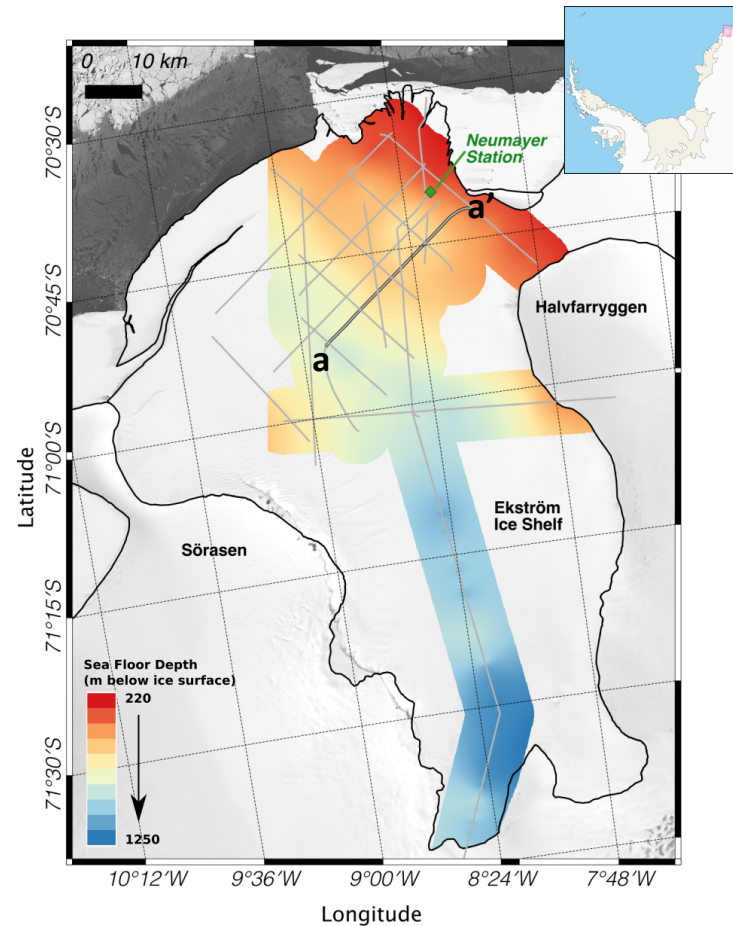
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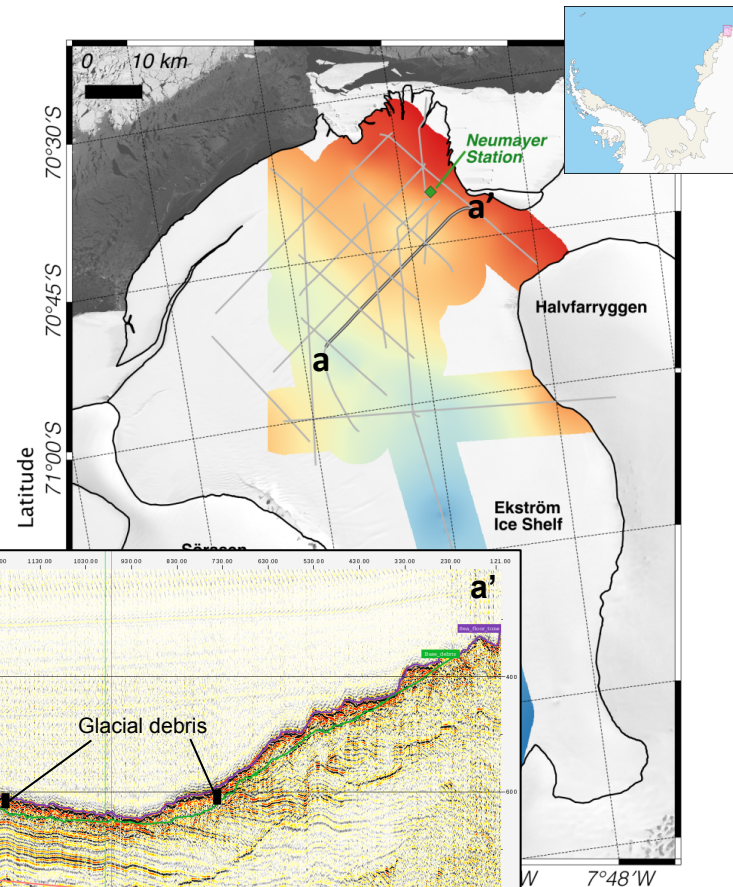
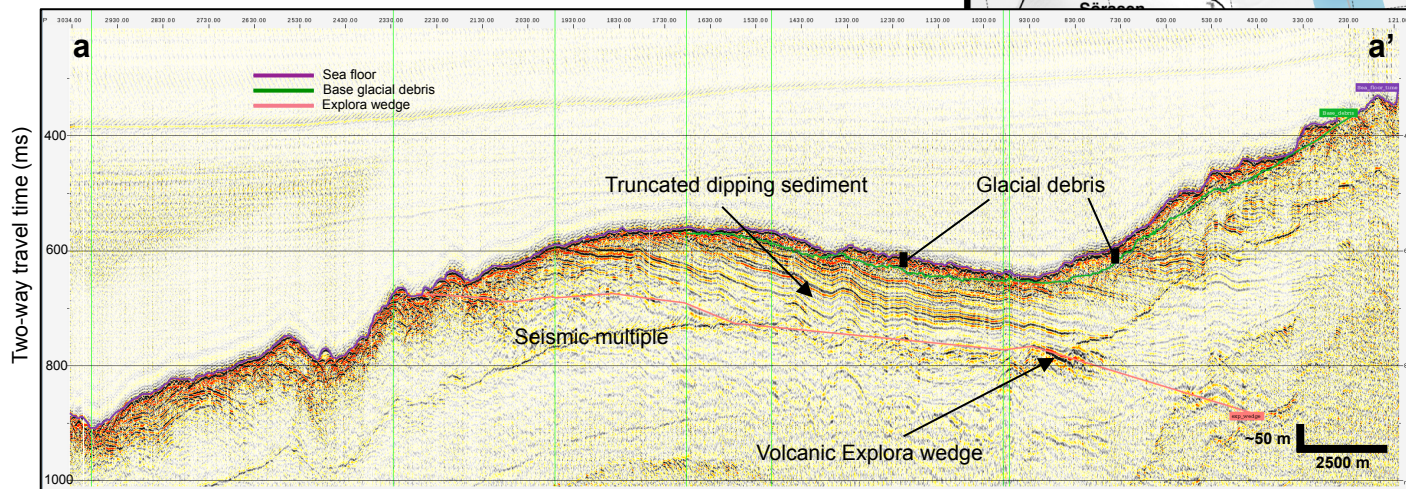
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- **Predictions of SLR contribution**



Sub-EIS-Obs: Vibroseis on ice

Key Findings:

- Sea-floor trough
- Glacial debris deposits 10-60 m thick
- Volcanic Explora wedge outcrop imaged
- Other features of ice flow and retreat





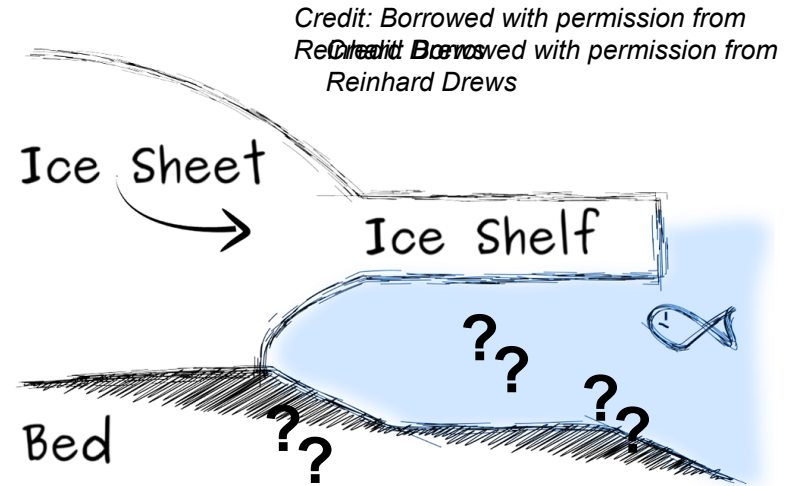
Motivation

The sea-floor and sub-sea floor topography beneath Antarctic ice shelves holds a wealth of information:

- Sea floor topography -> past ice dynamics
- Sub-sea floor -> geological history
- The shape of the cavity -> implications of ocean circulation and ice melt

So how do we „see“ beneath the ice shelf?

Seismic reflection vibroseis data collected between (2010 -2018) on Ekström ice shelf used to map the sea-floor bathymetry and sub-sea floor structures.

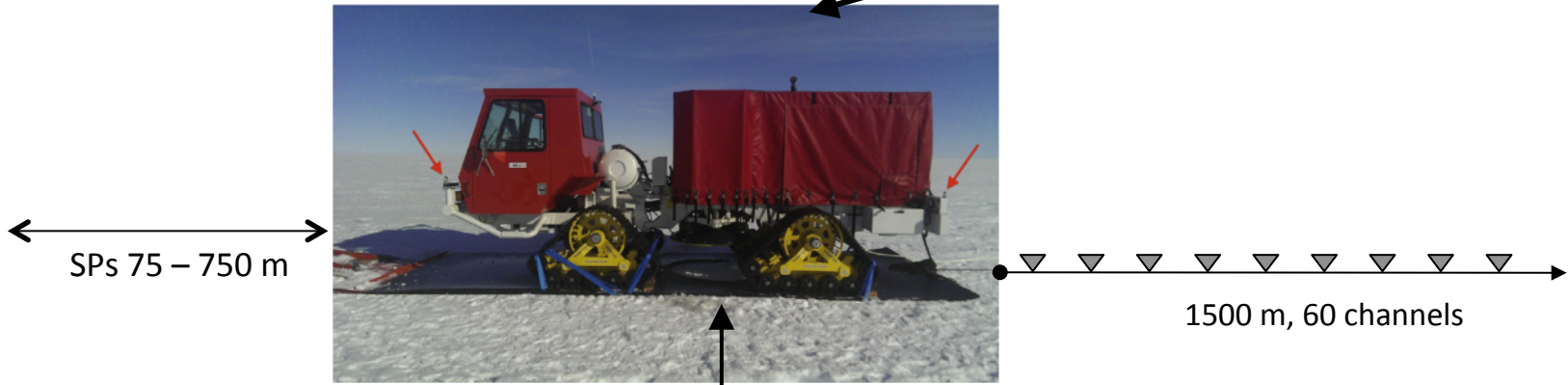




Vibroseis on ice!



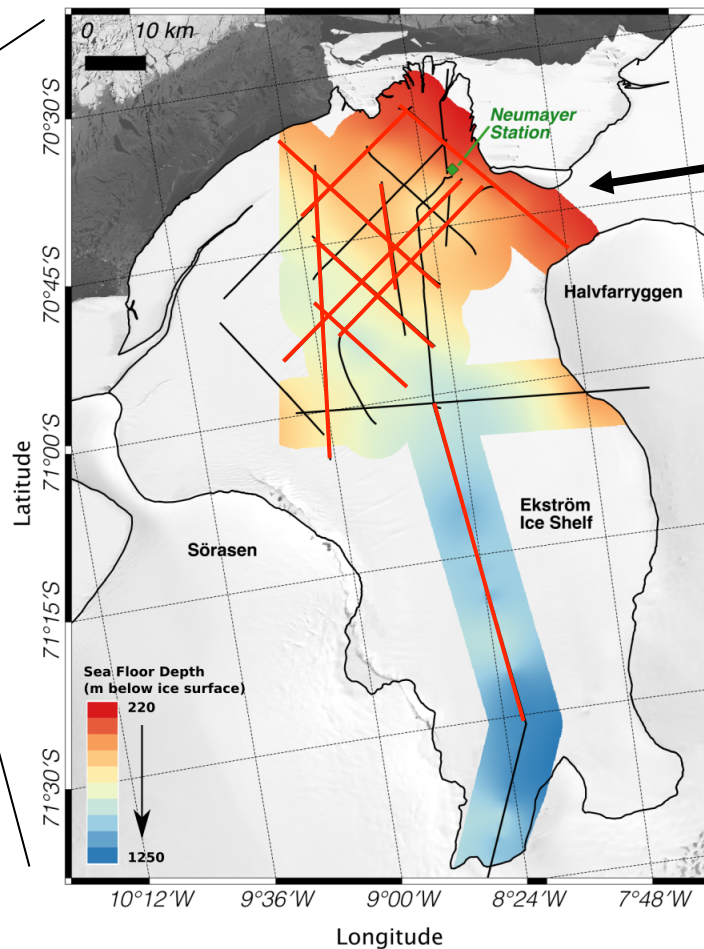
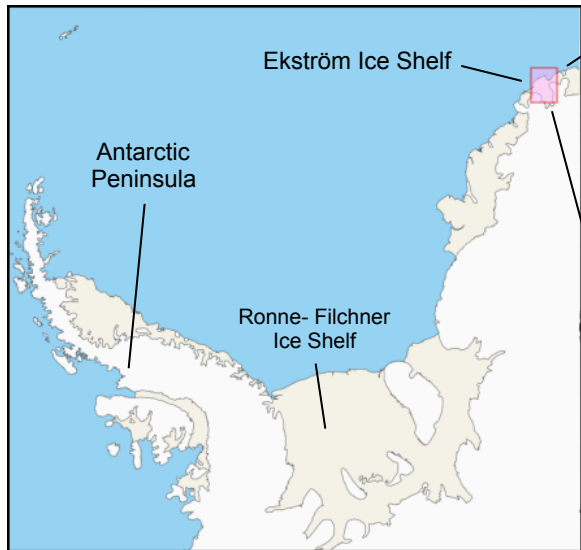
Eisen et al., *Polar Sci.*, 2015





Ekström Ice Shelf

LOCATION & DATA



Please click to view seismic data



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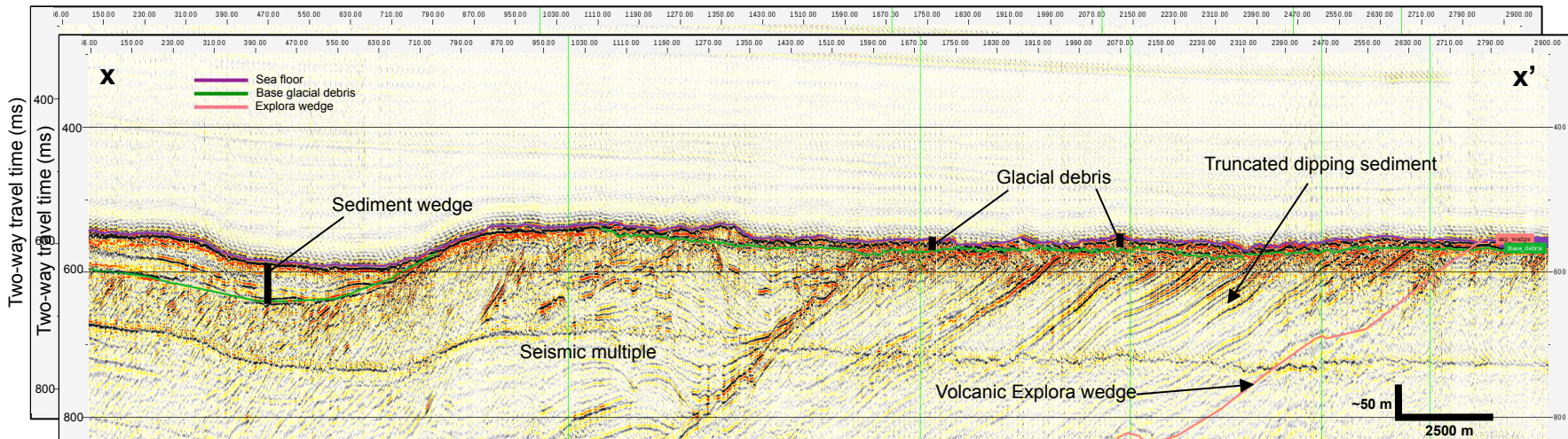
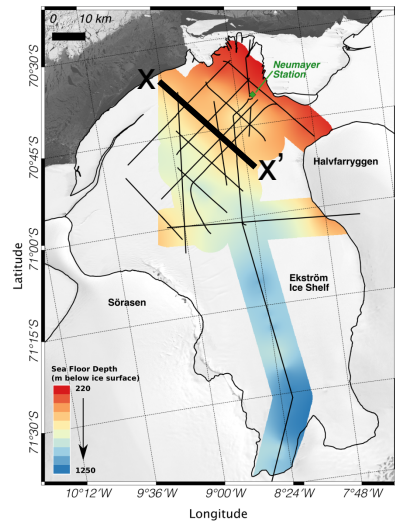
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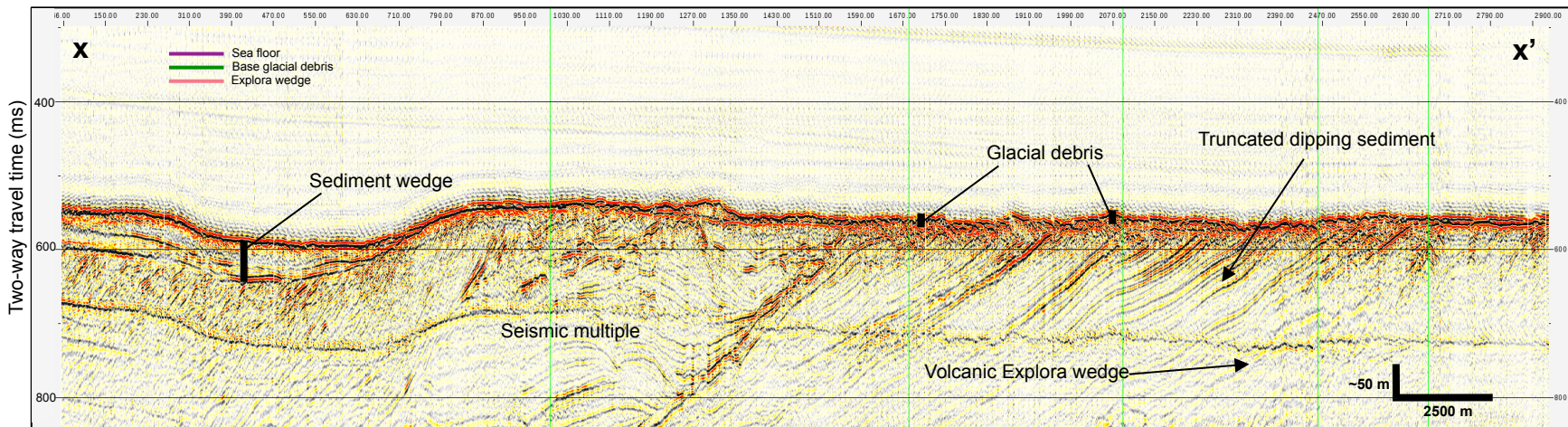
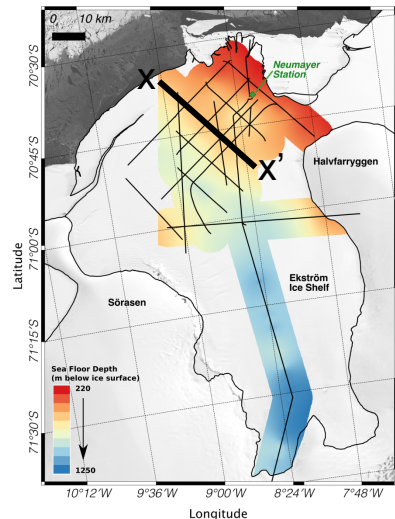
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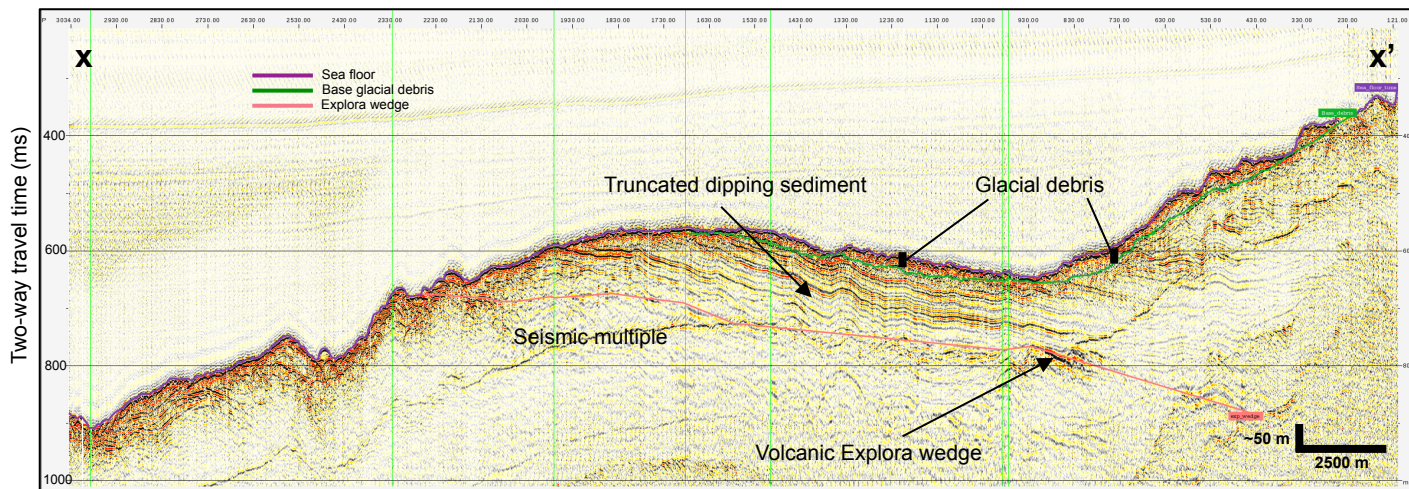
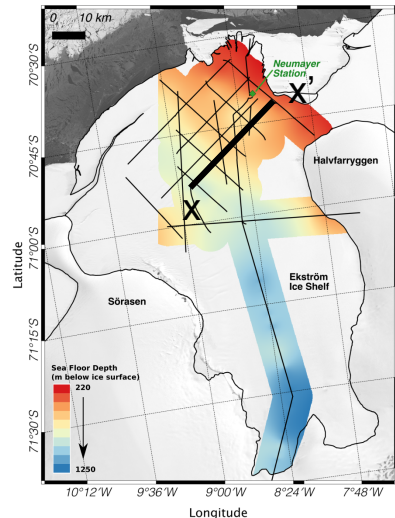
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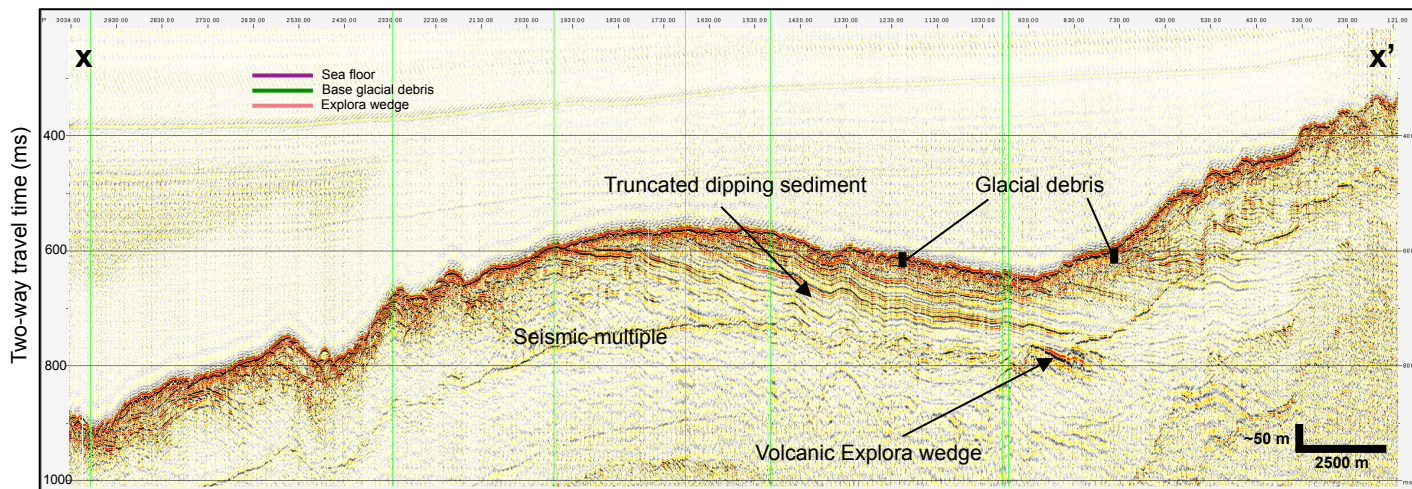
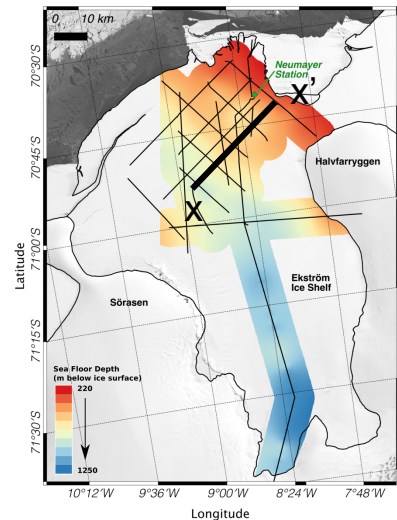
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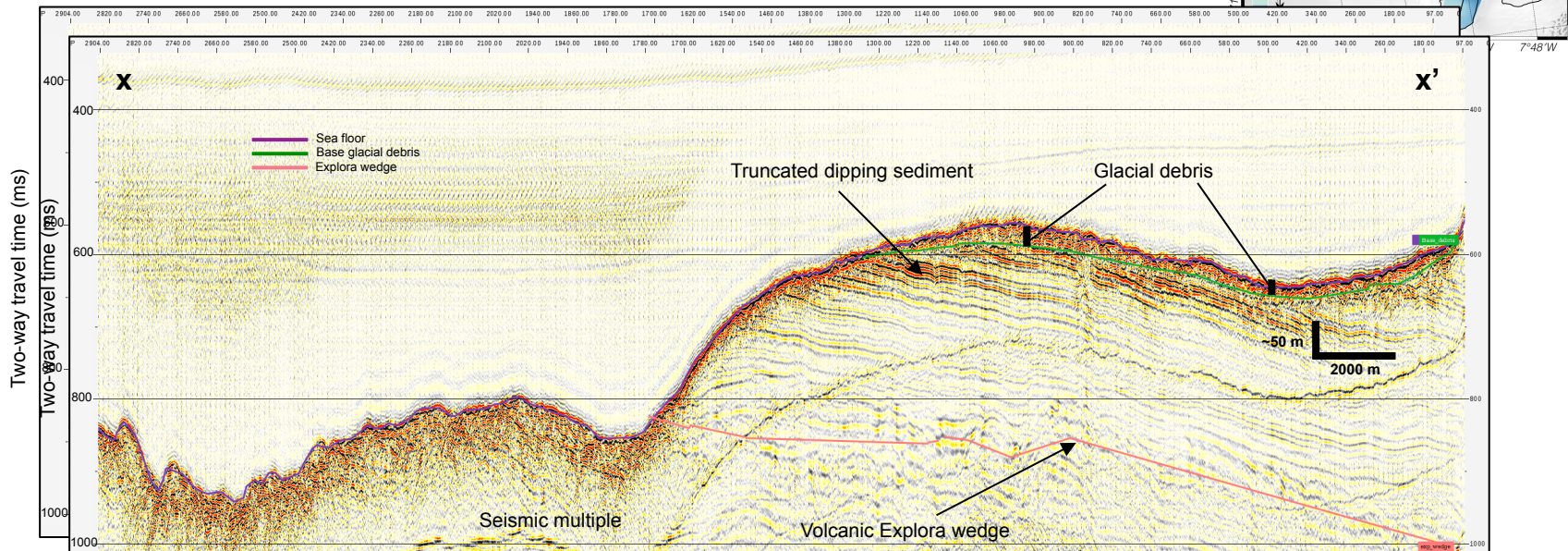
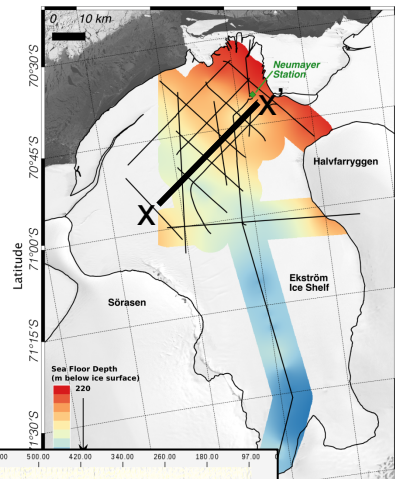
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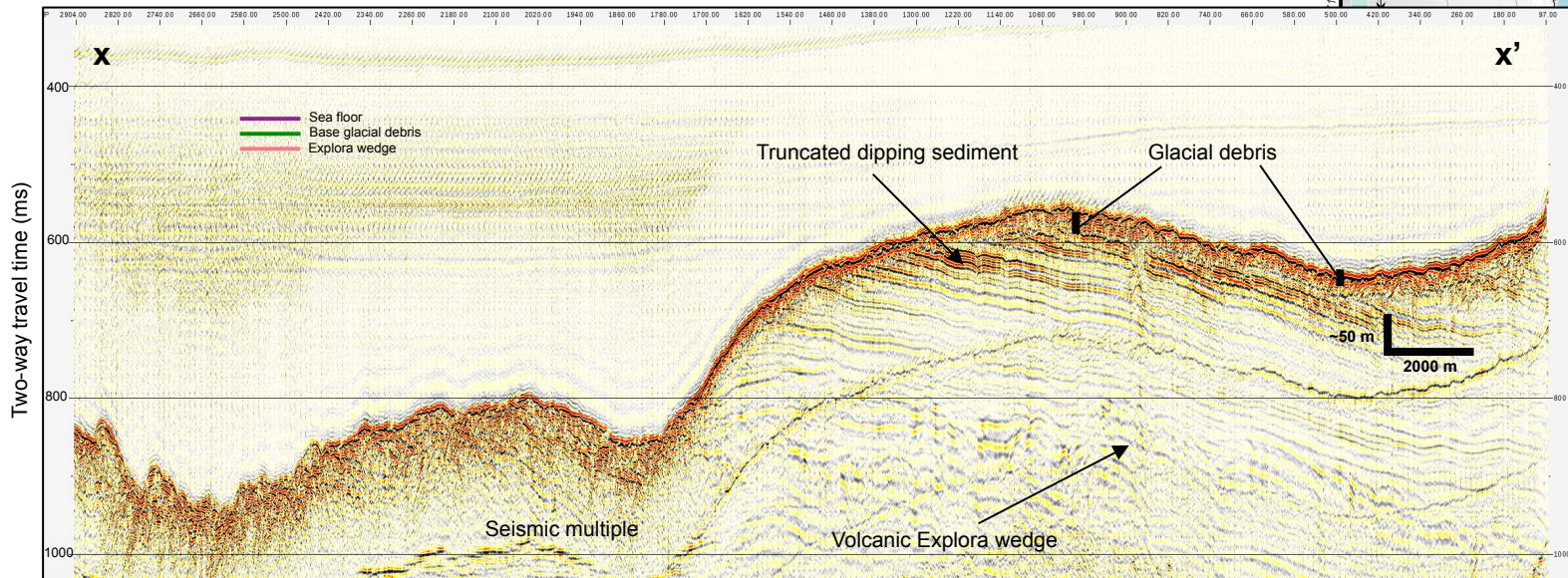
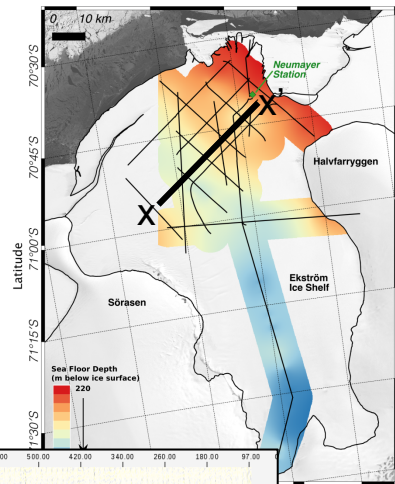
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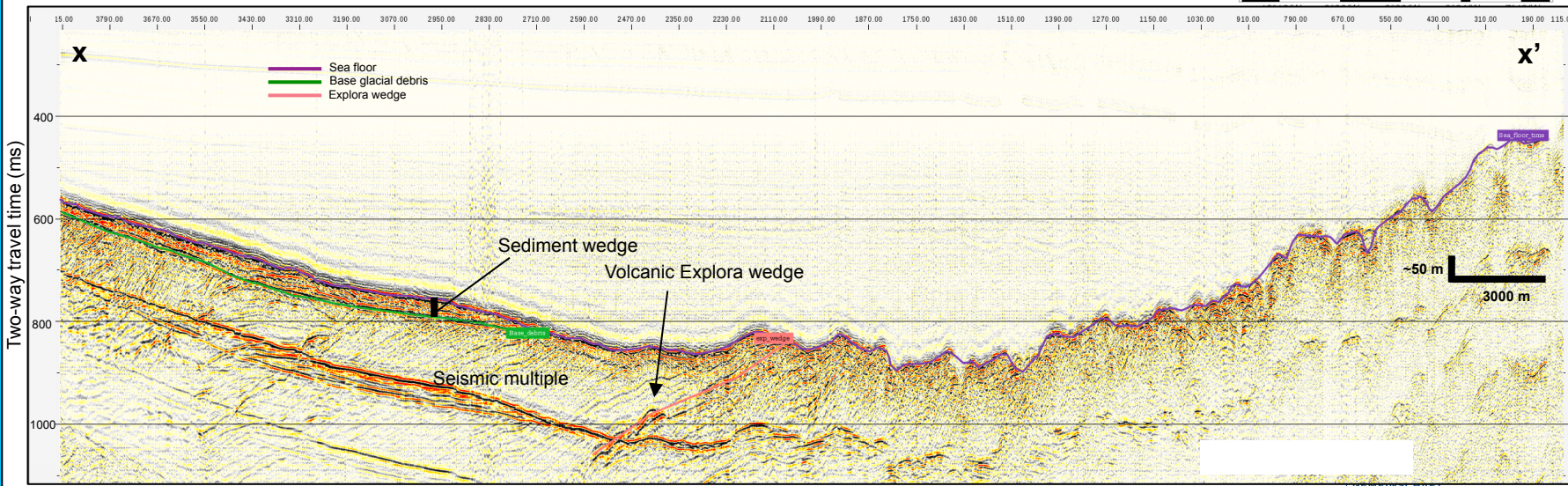
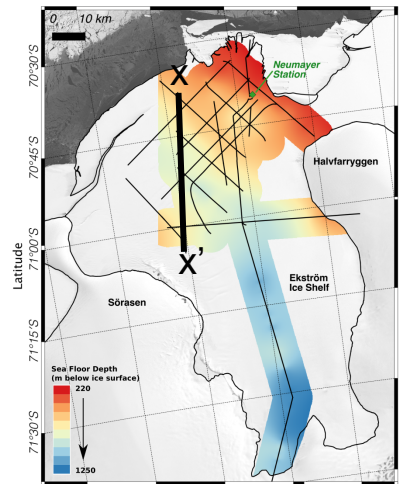
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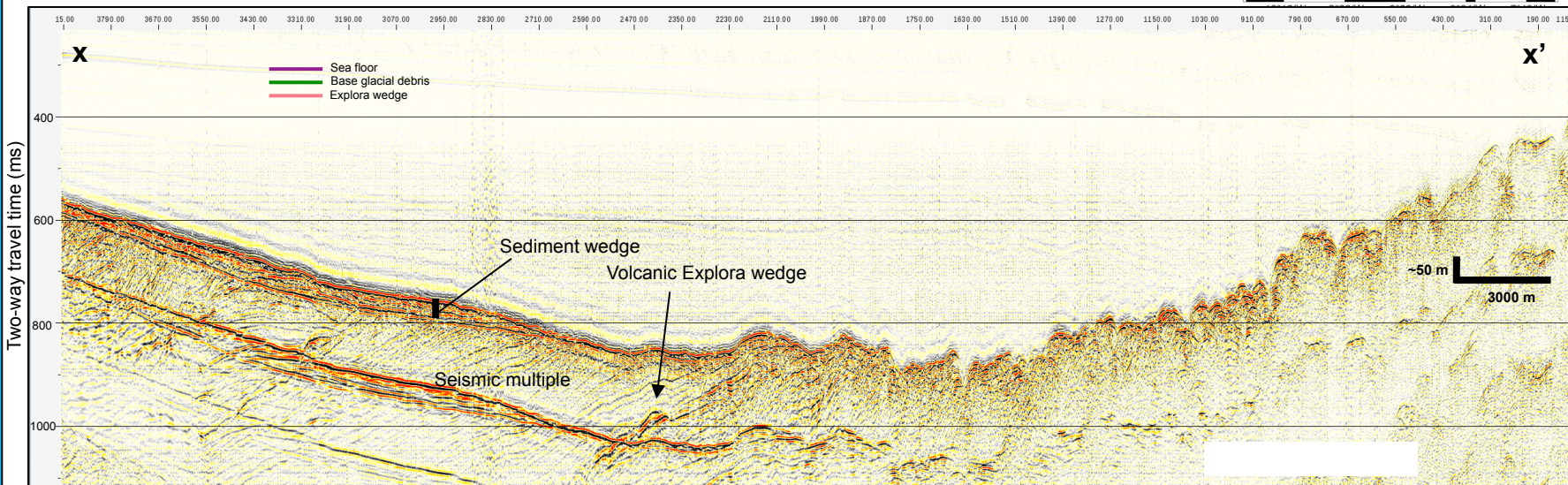
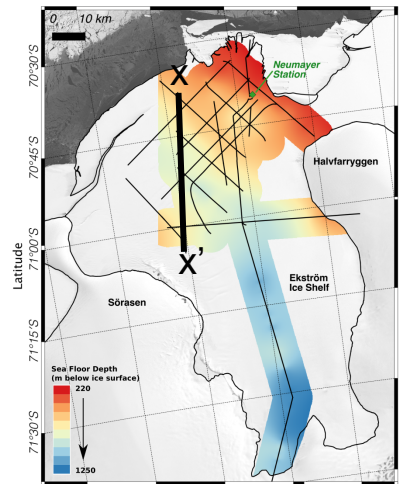
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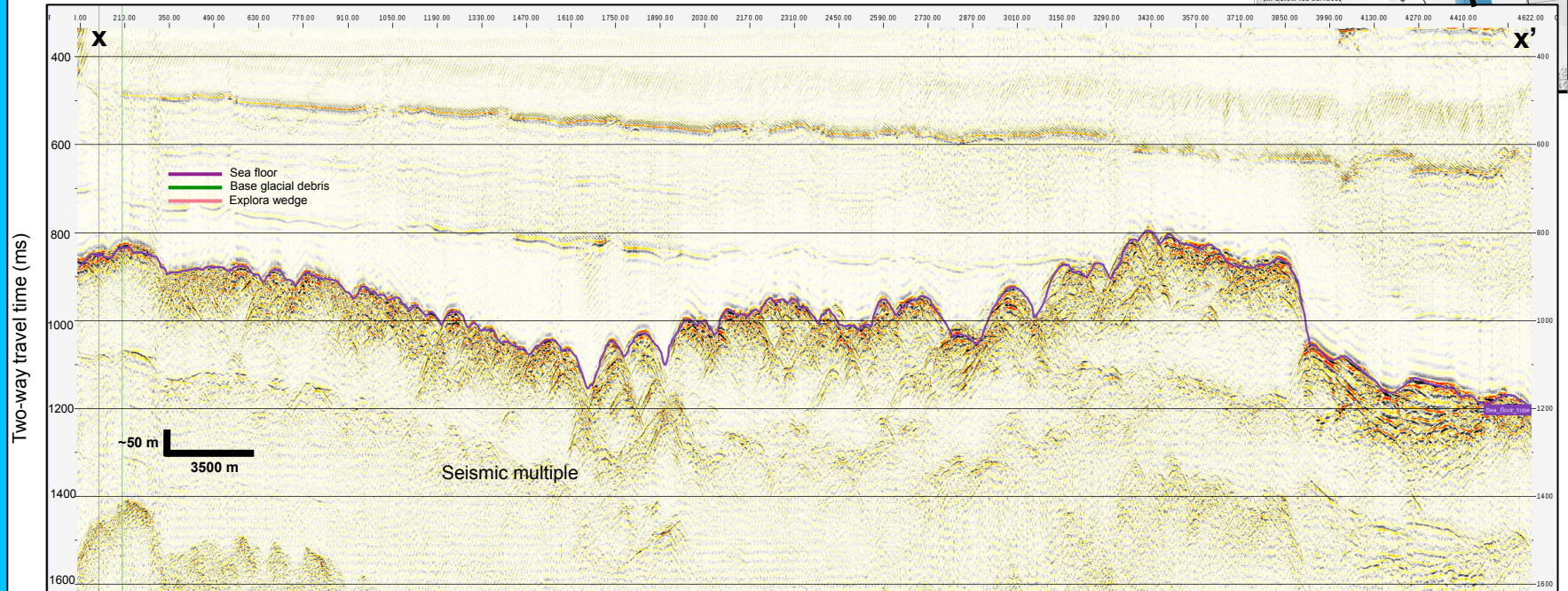
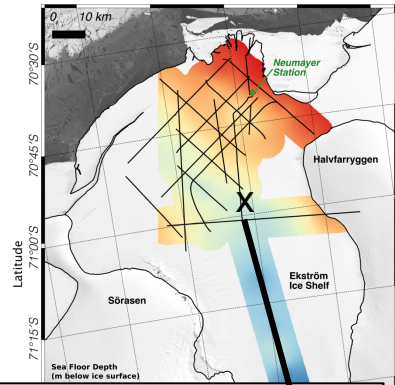
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2014 – SP 750 m (1 fold)

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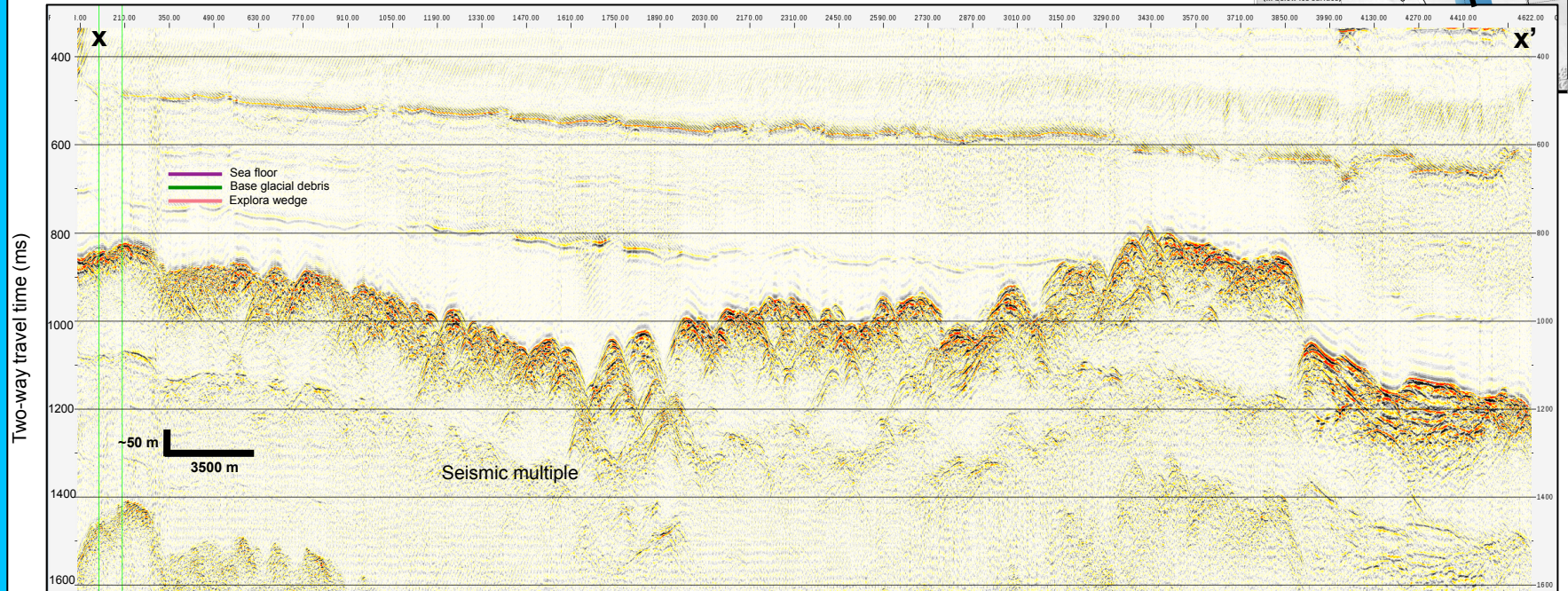
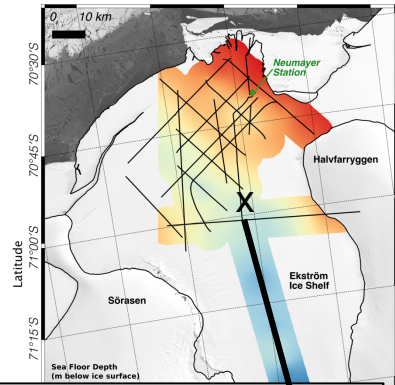
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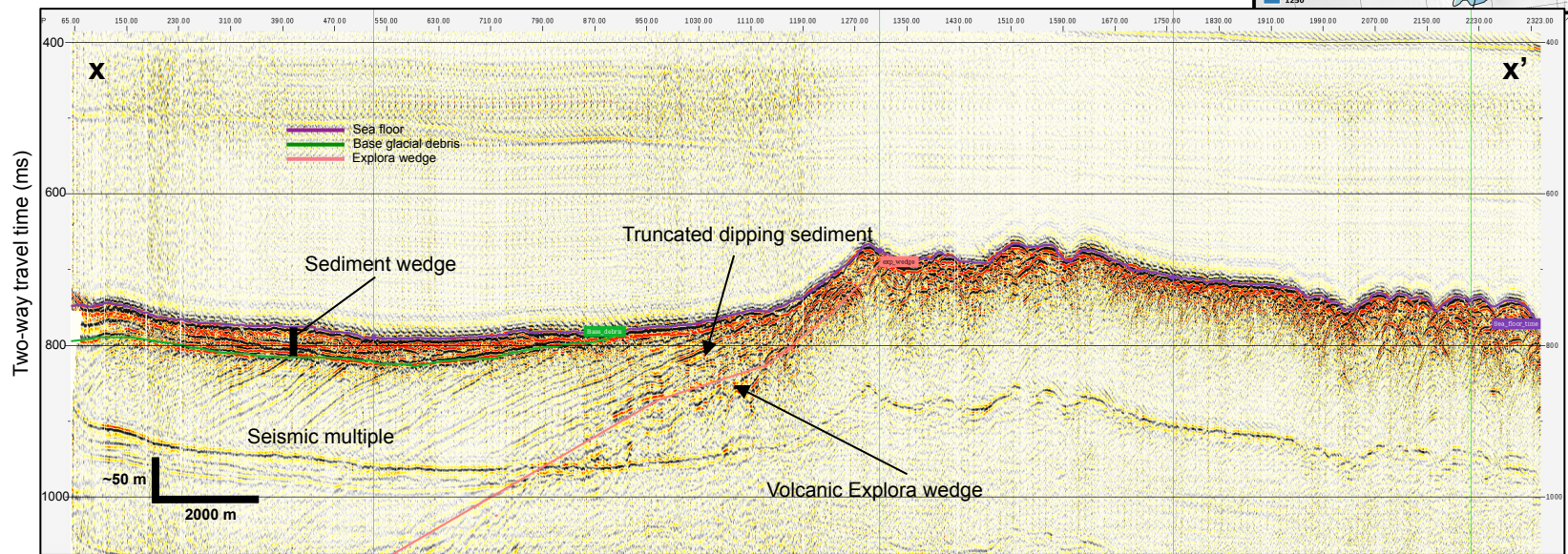
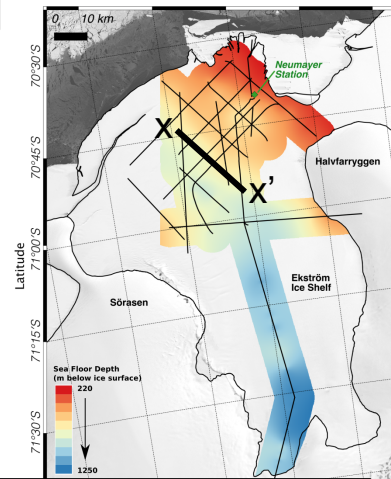
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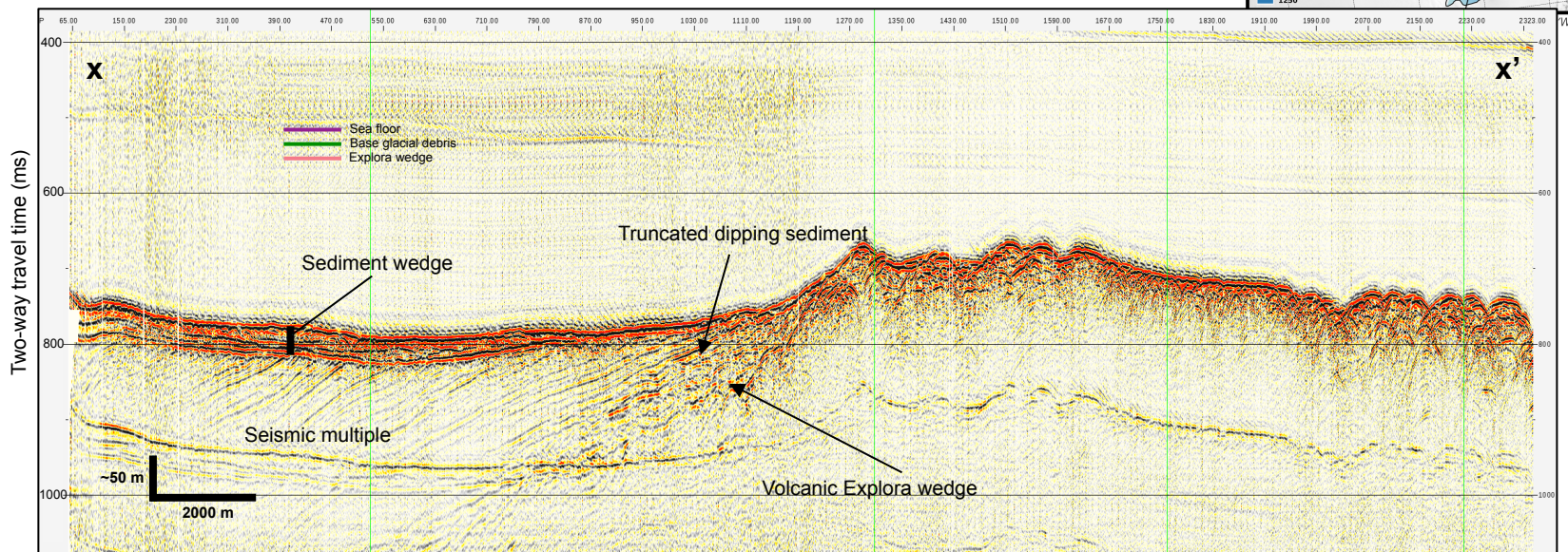
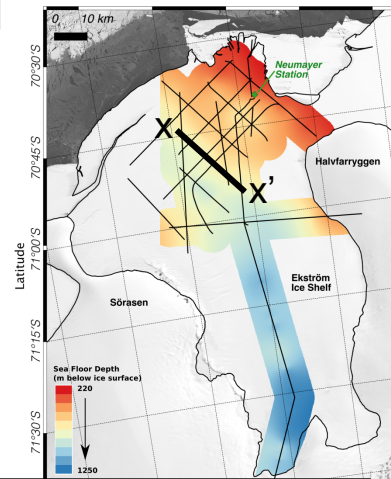
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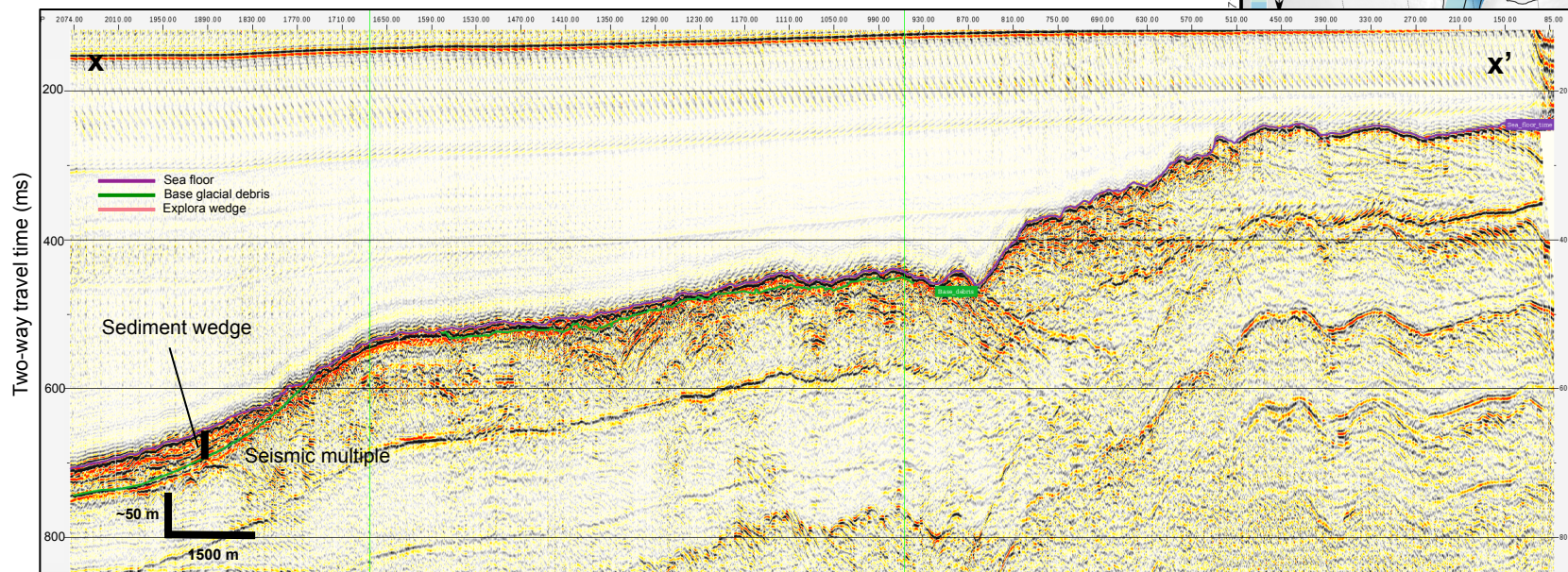
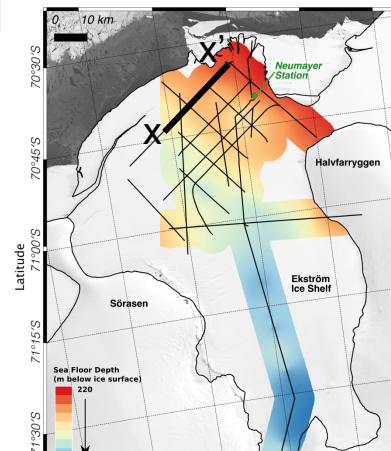
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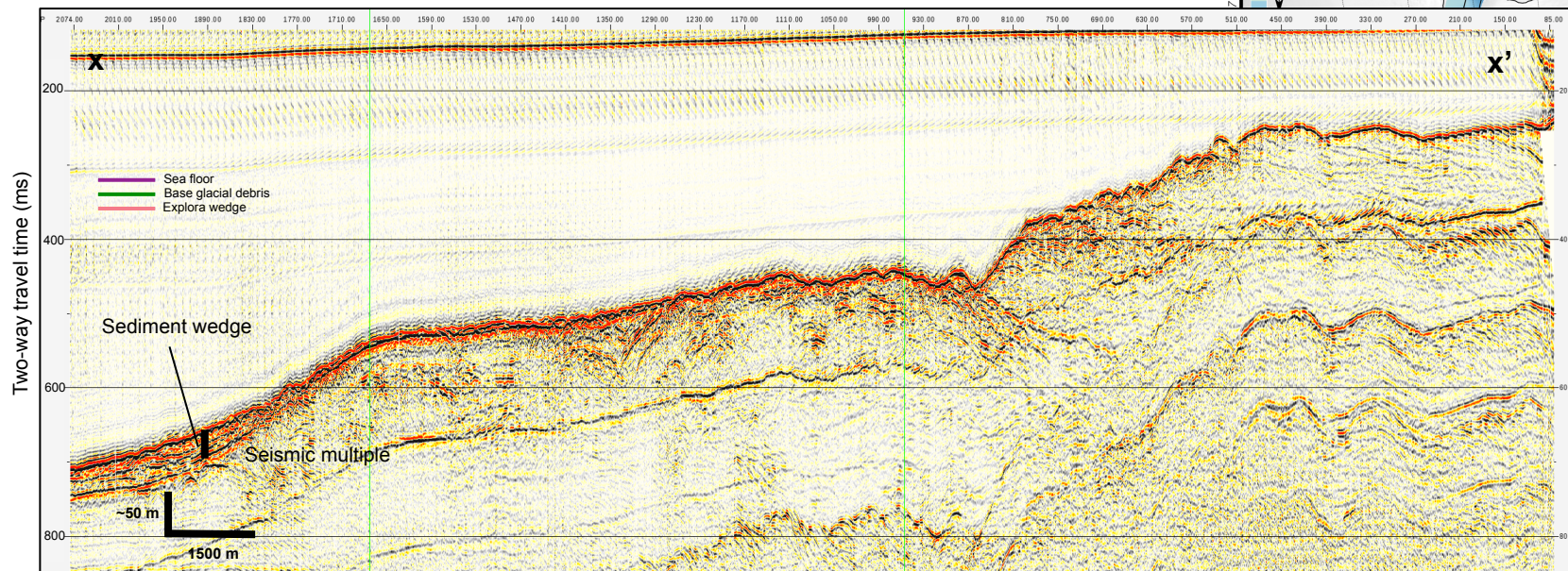
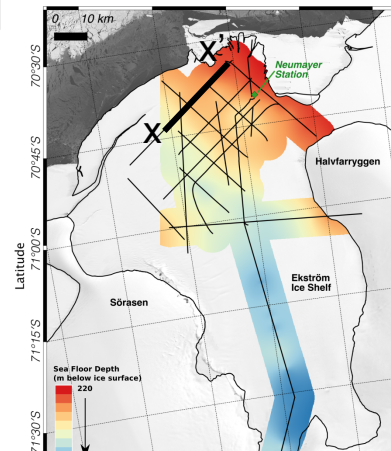
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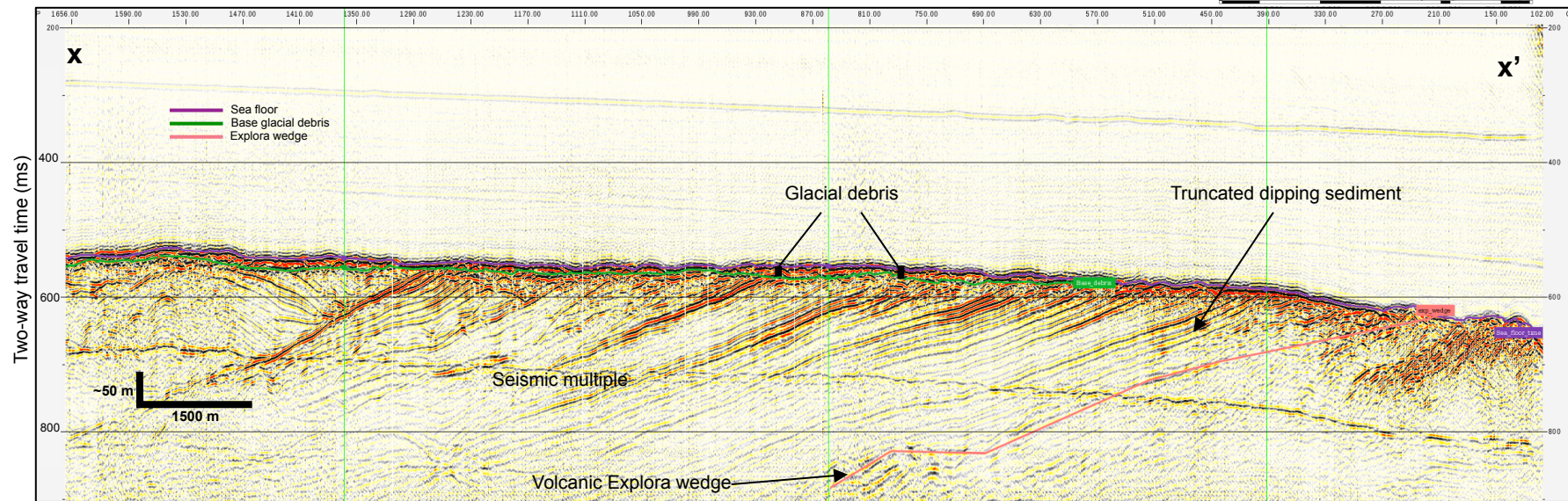
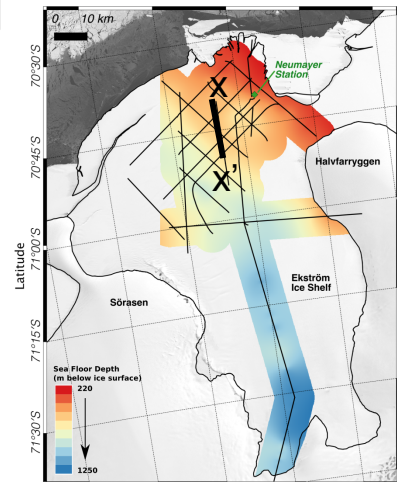
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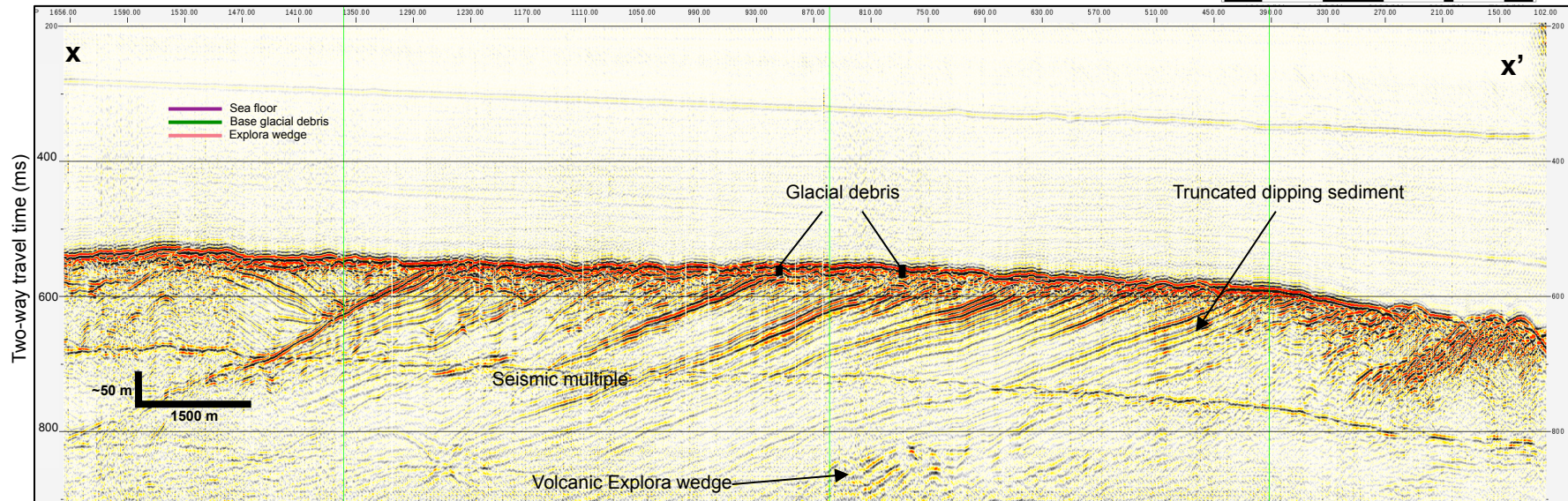
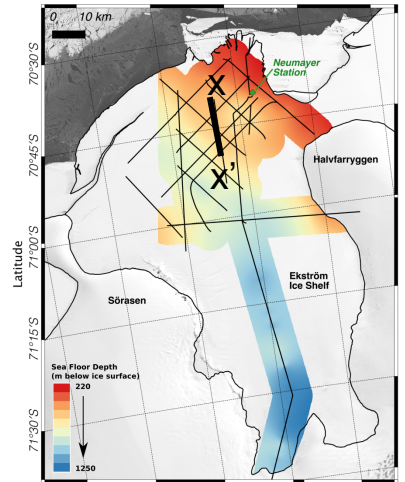
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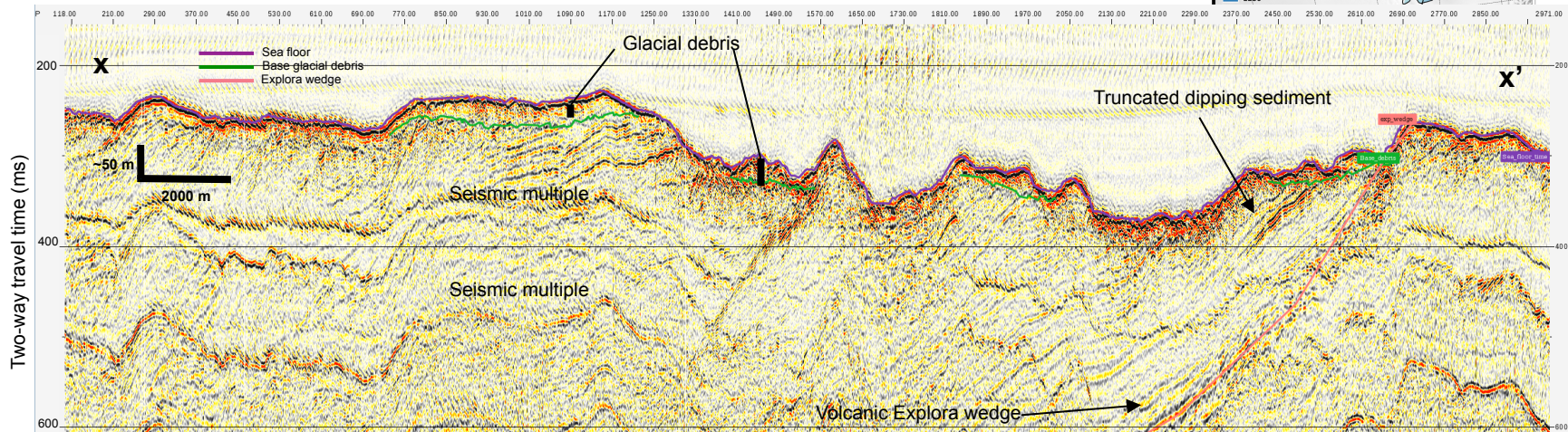
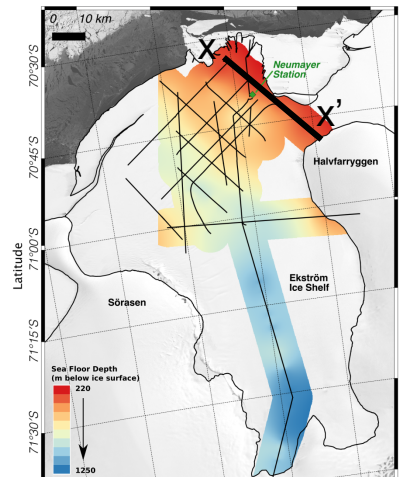
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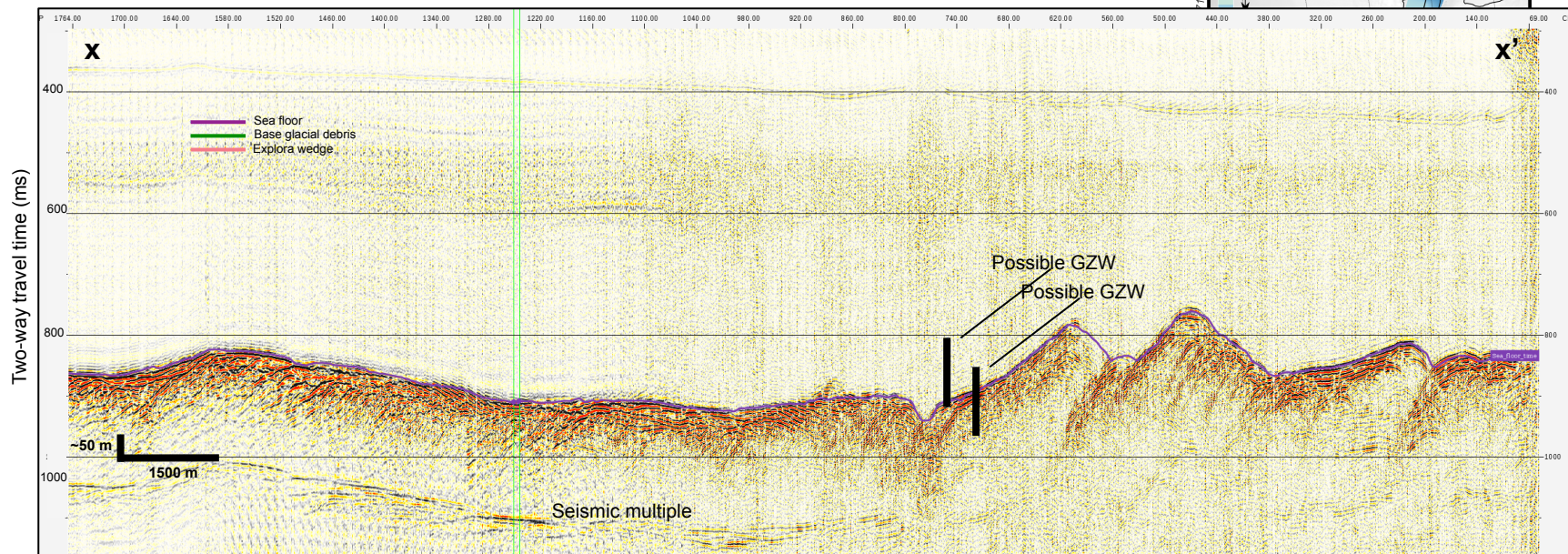
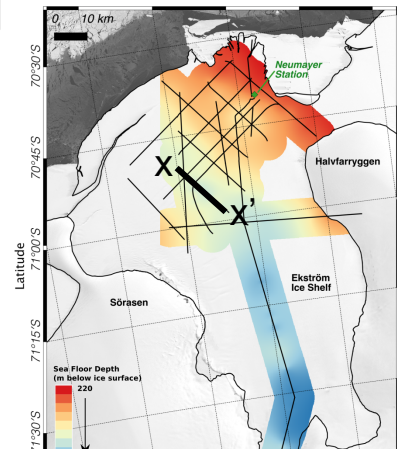
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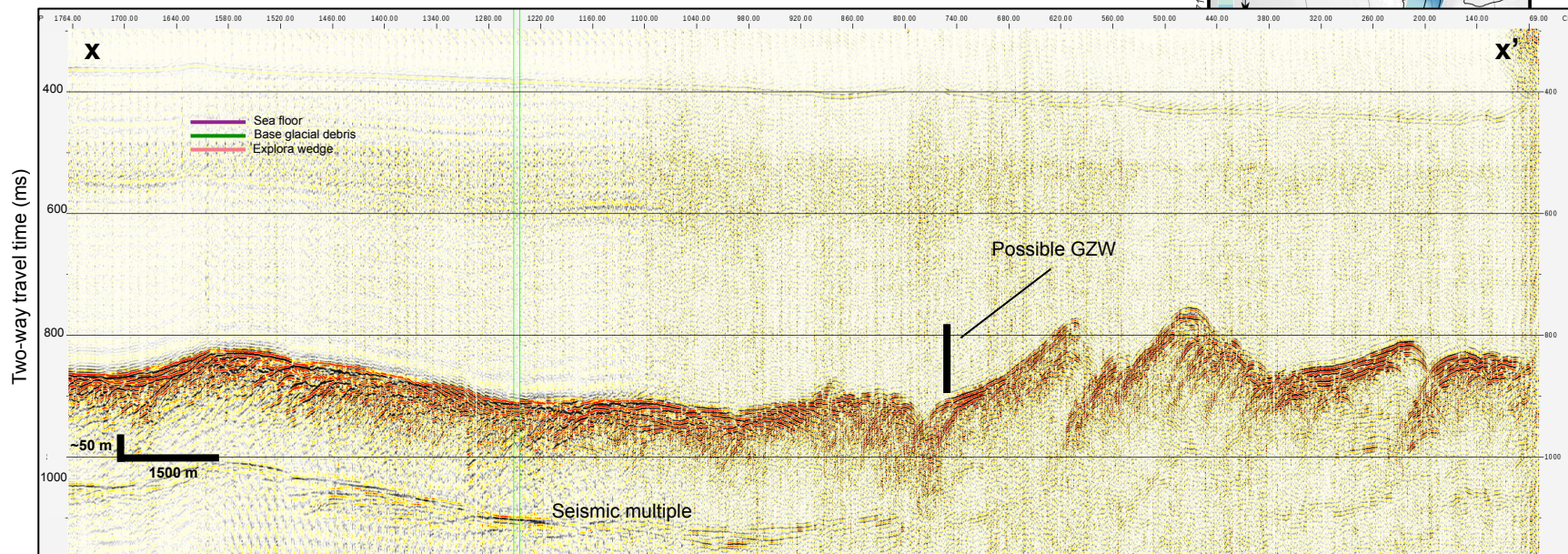
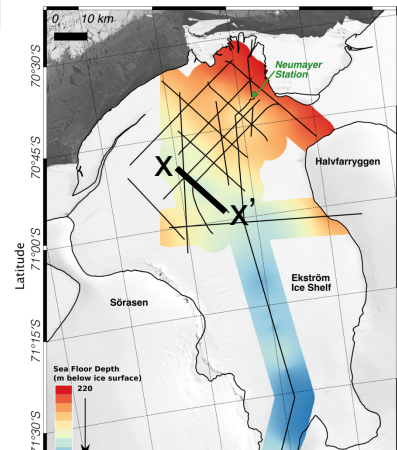
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