Reconstructing Palaeo -Environments for Offshore Wind Development

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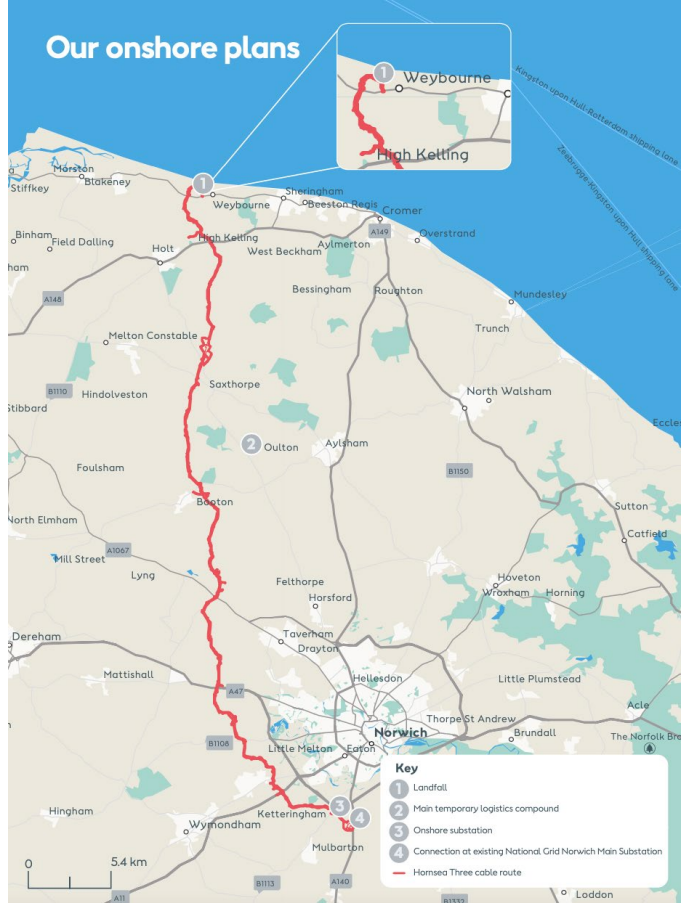
Ørsted

for the
East of England Energy Group Marine Science & Technology Sector Council

2024 -04-17
Norwich



Hornsea 1: 174 turbines, 1.2GW
Hornsea 2: 165 turbines, 1.32GW
Hornsea 3:
Hornsea 4: up to 180 turbines, TBC
Offshore Cable Route
Onshore Cable Route

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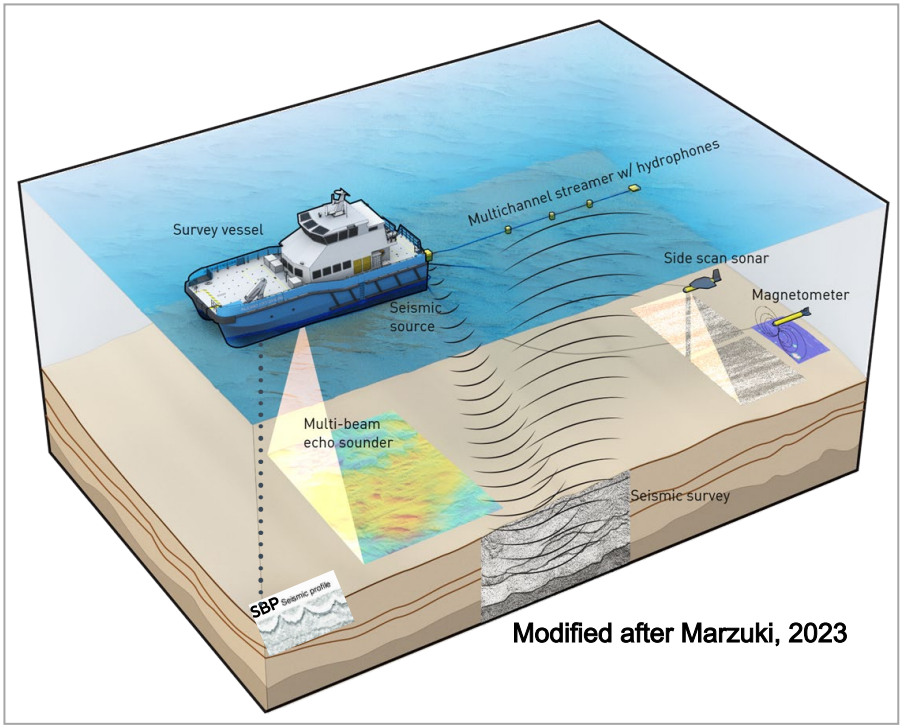
Types of geophysical data we work with in Site Investigations



Modified after Marzuki, 2023

The Role of Geoscience in Offshore Wind : S. Marzuki. EAGE The Future of Energy Conference, Kuala Lumpur, September 2023

Seismic – subseabed to ~200m
SBP – subseabed up to ~20m
SSS – seabed objects & surface type
MBES – seabed topography & type
MAG – ordnance/wrecks/pipelines

SSS = Side Scan Sonar
SBP = Sub Bottom Profiler
MBES = Multibeam Echo Sounder
MAG = Magnetometer
ROV = Remote Operated vehicle

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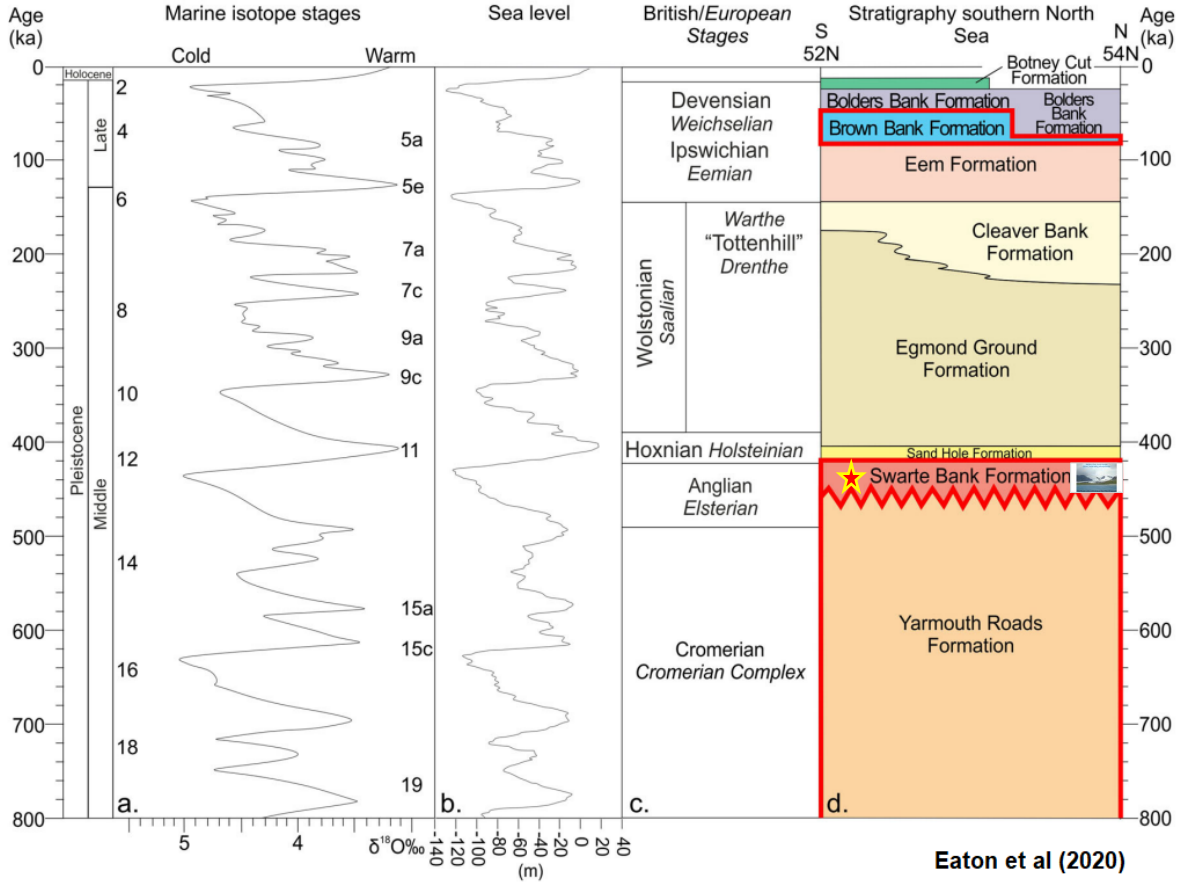
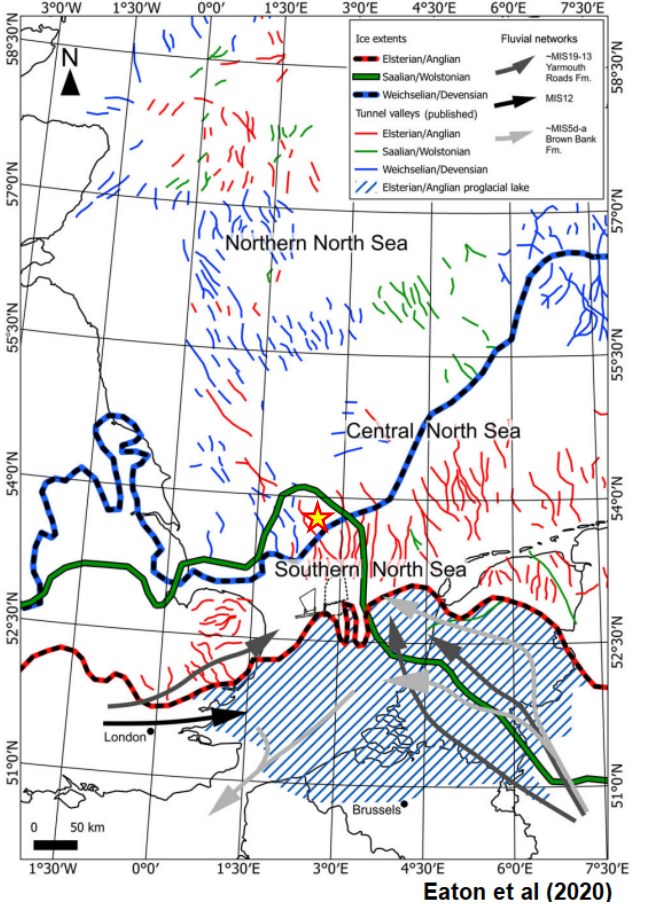
North Sea Stratigraphy, sea levels, glaciations and tunnel valleys





Palaeogeographical changes in response to glacial–interglacial cycles, as recorded in Middle and Late Pleistocene seismic stratigraphy, southern North Sea
Stephen J. Eaton, David M. Hodgson, Natasha L. M. Barlow, Estelle E. J. Mortimer, Claire L. Mellett *https://onlinelibrary.wiley.com/doi/10.1002/jqs.3230*

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Salisbury Plain, South Georgia
Glacier, tunnel valley, till and moraine
King Penguin rookery in the distance, Giant Petrel foreground

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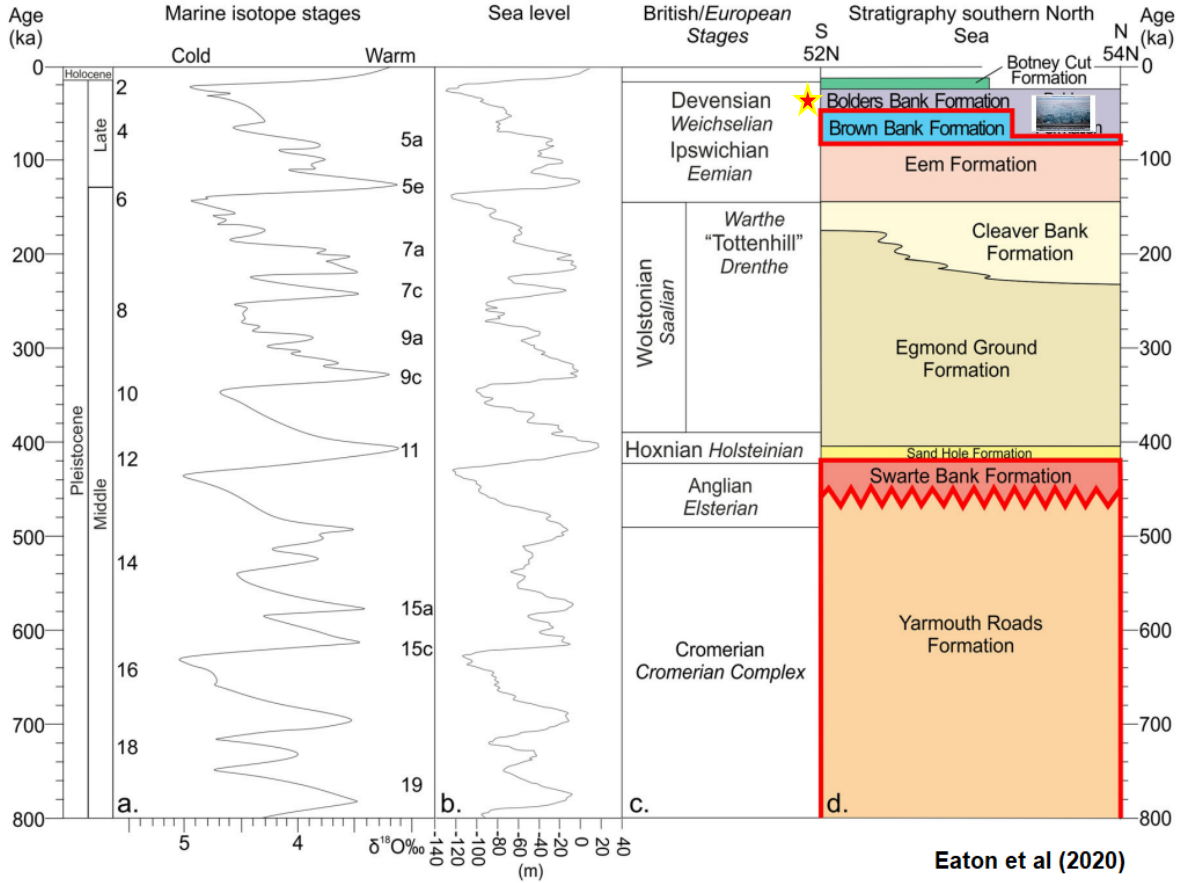
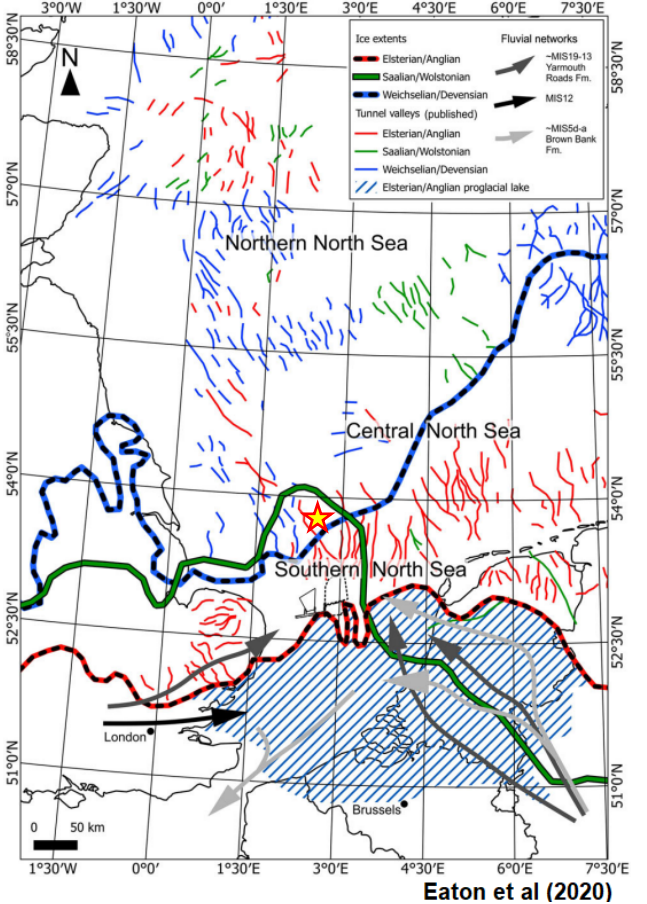
North Sea stratigraphy, sea levels, glaciations and tunnel valleys





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Magdelena Fjorden , Svalbard
Terminal moraine at glacier snout, pro -glacial lake, gravels, boulders
This is a direct analogy for the colder periods of the
Pleistocene landscape – looking to the North

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Fortuna Bay, South Georgia

Pro-glacial landscape of till, outwash, rivers & lateral scree

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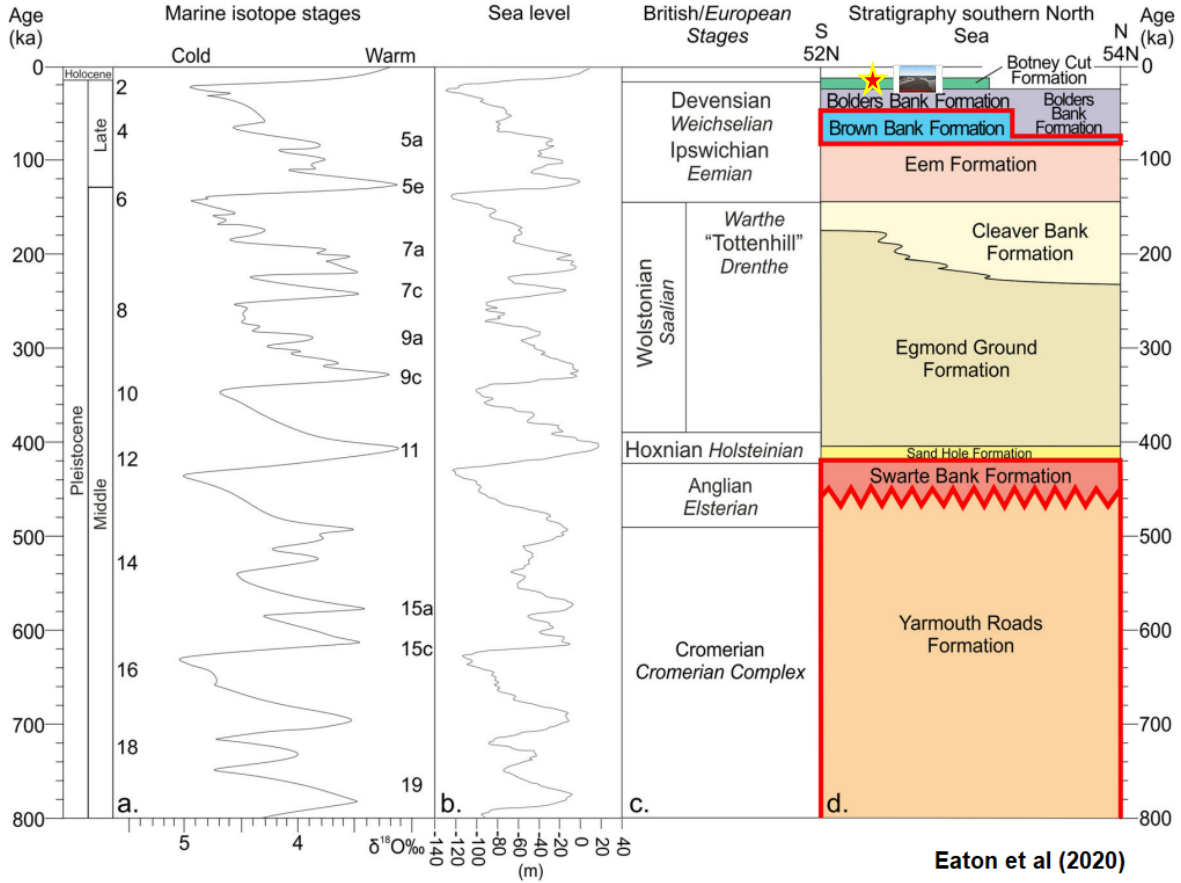
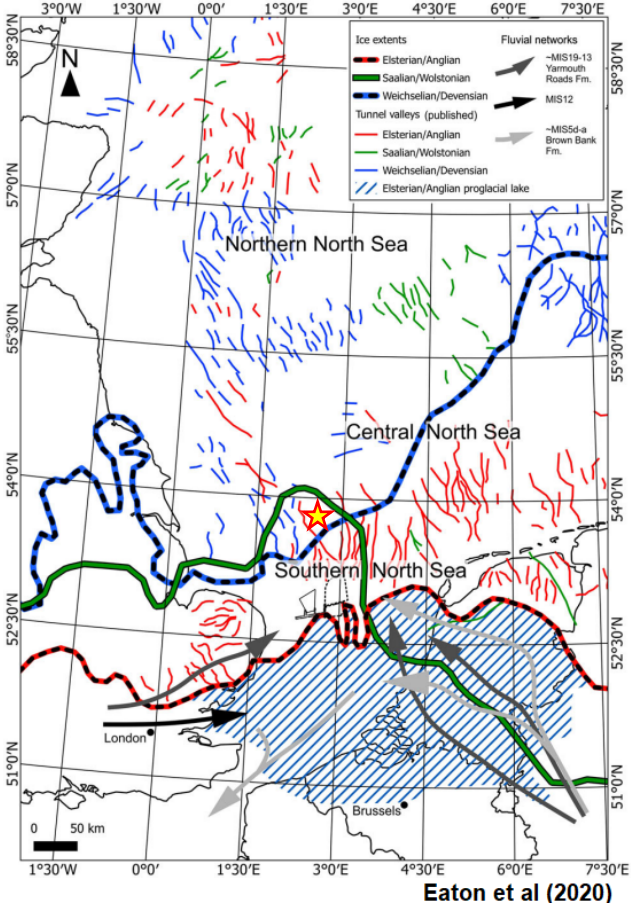
North Sea stratigraphy, sea levels, glaciations and tunnel valleys





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Stromness, South Georgia - Glacial outwash plain

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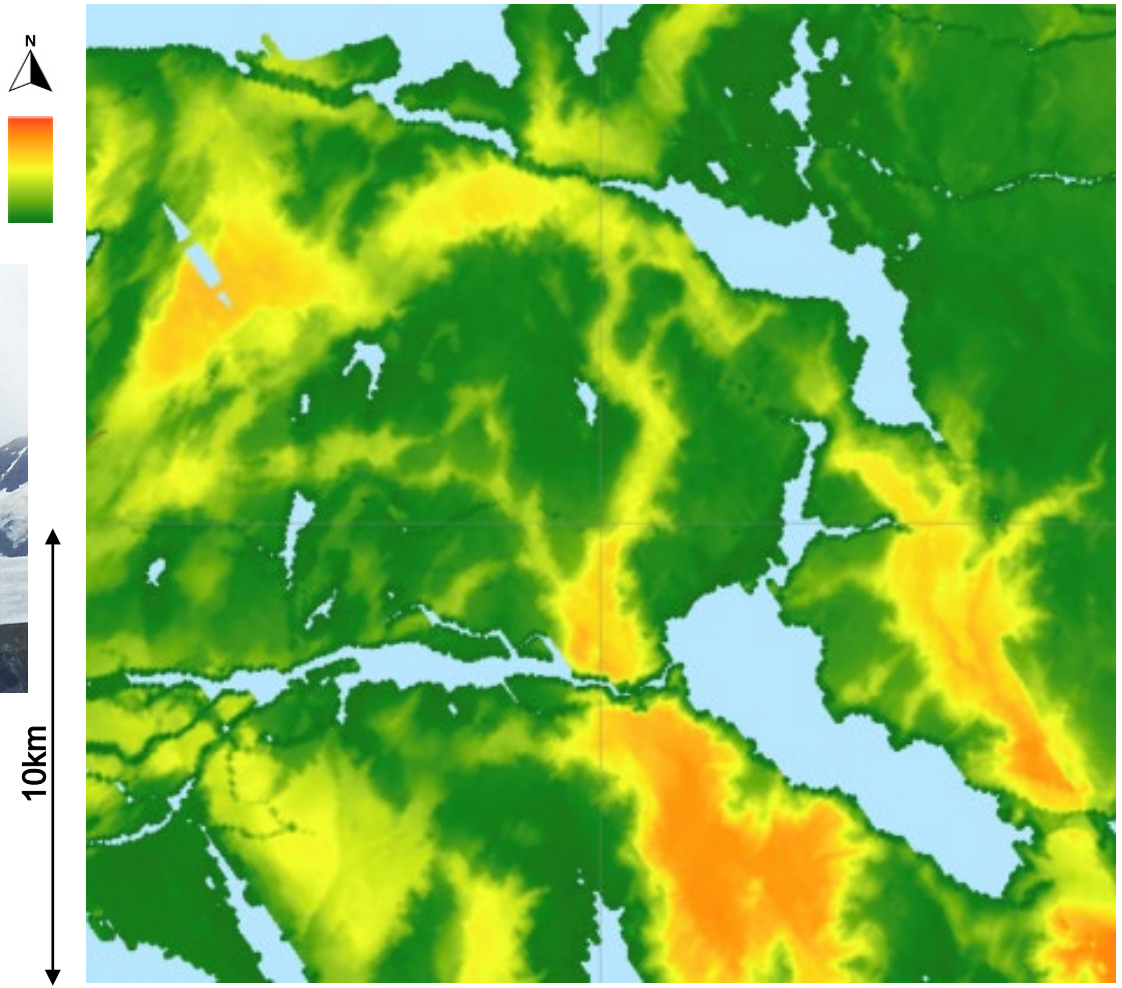
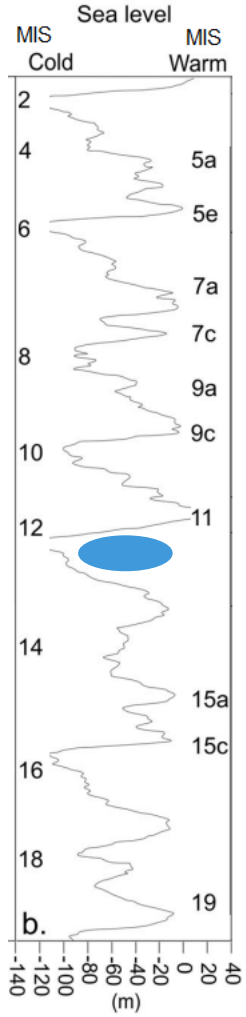
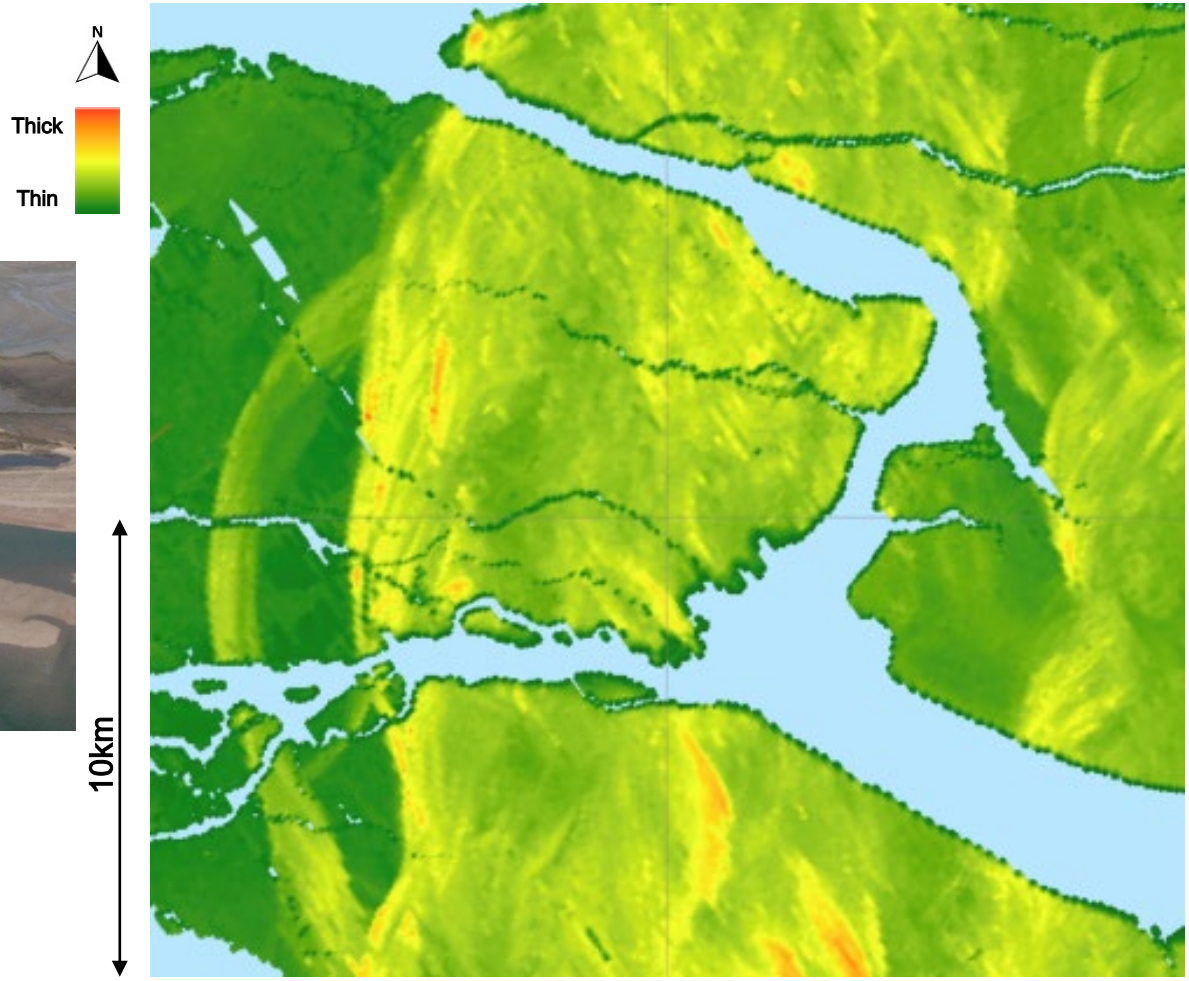
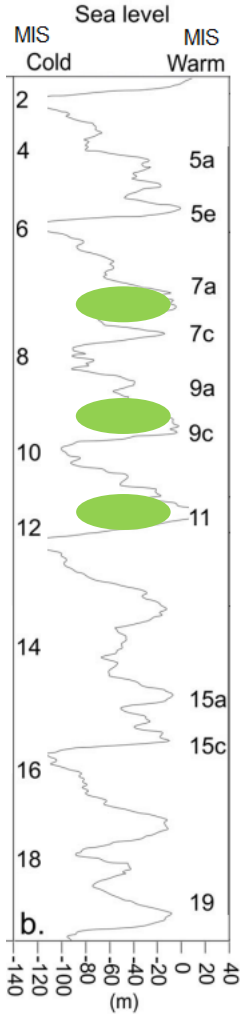
Swarte Bank thickness – Tunnel Valleys



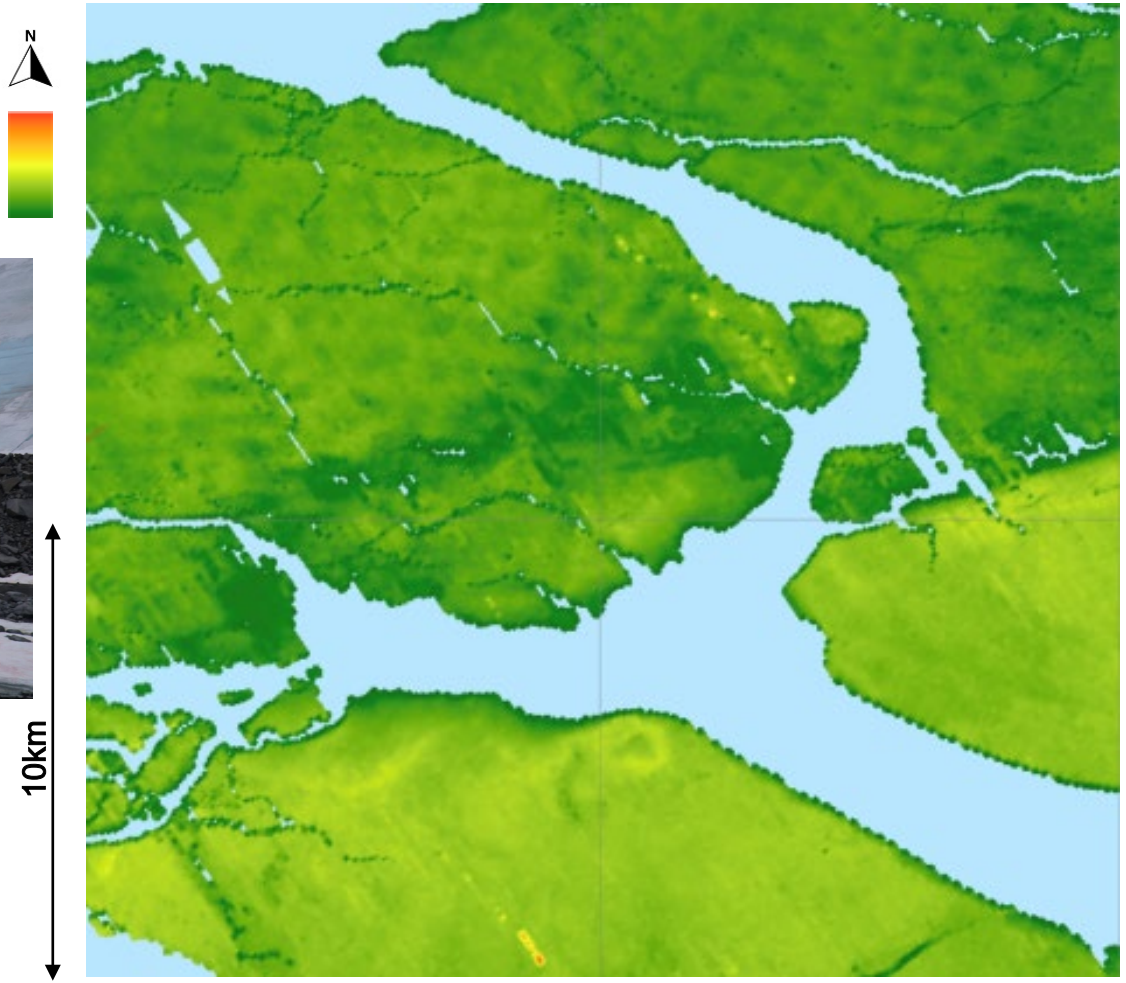


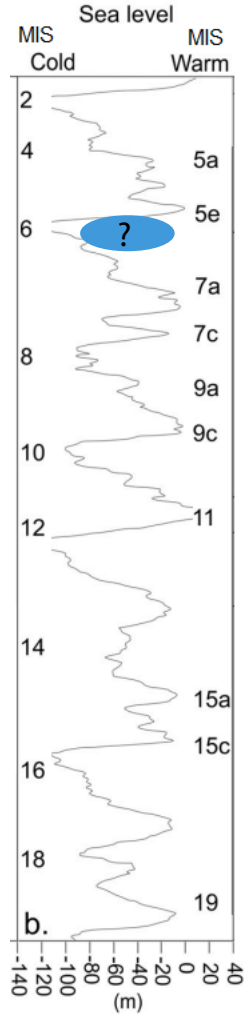
Egmond Ground thickness – Sea level rise, marine incursion



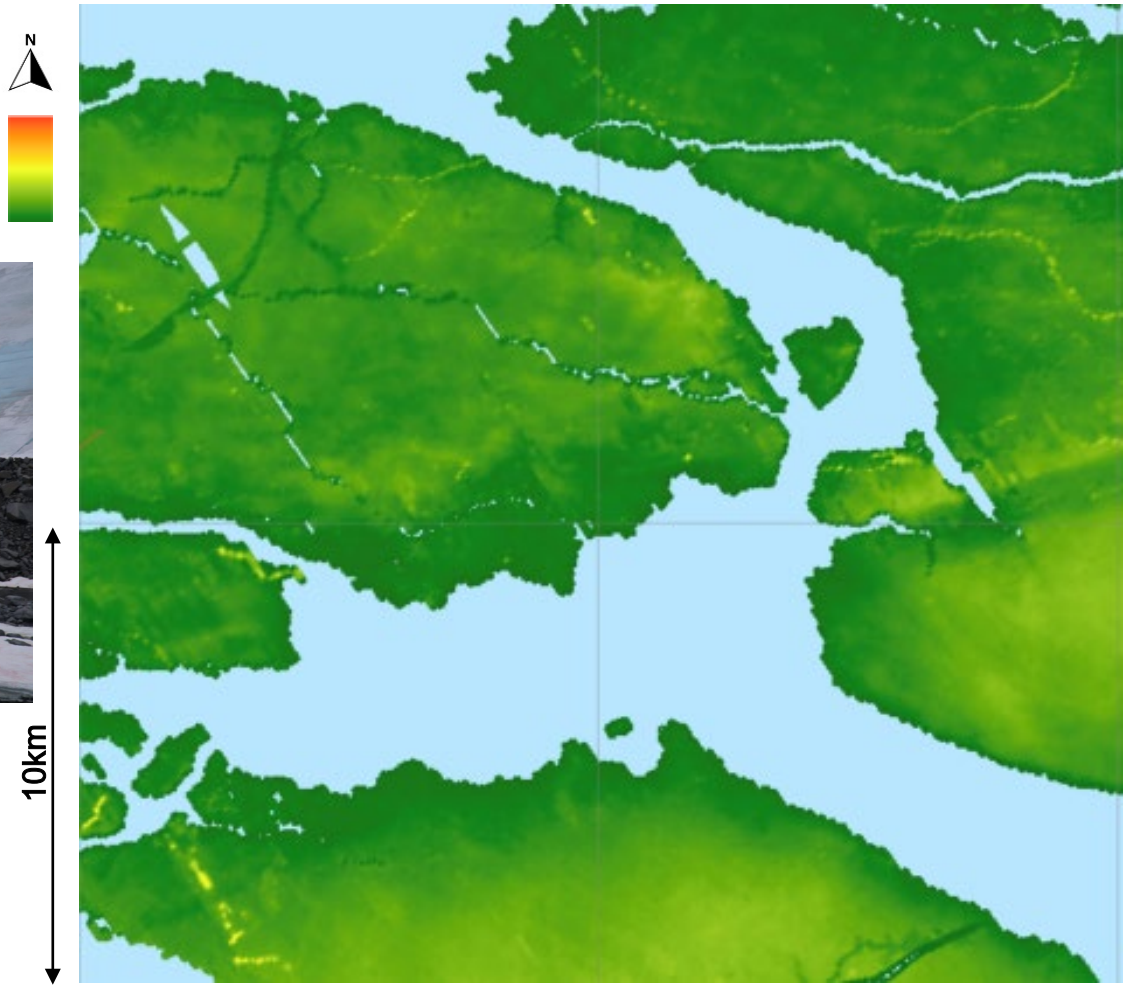


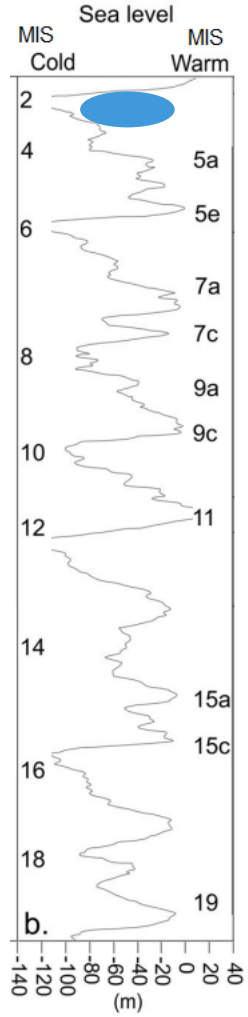
Lower Bolders Bank thickness – Till/moraine



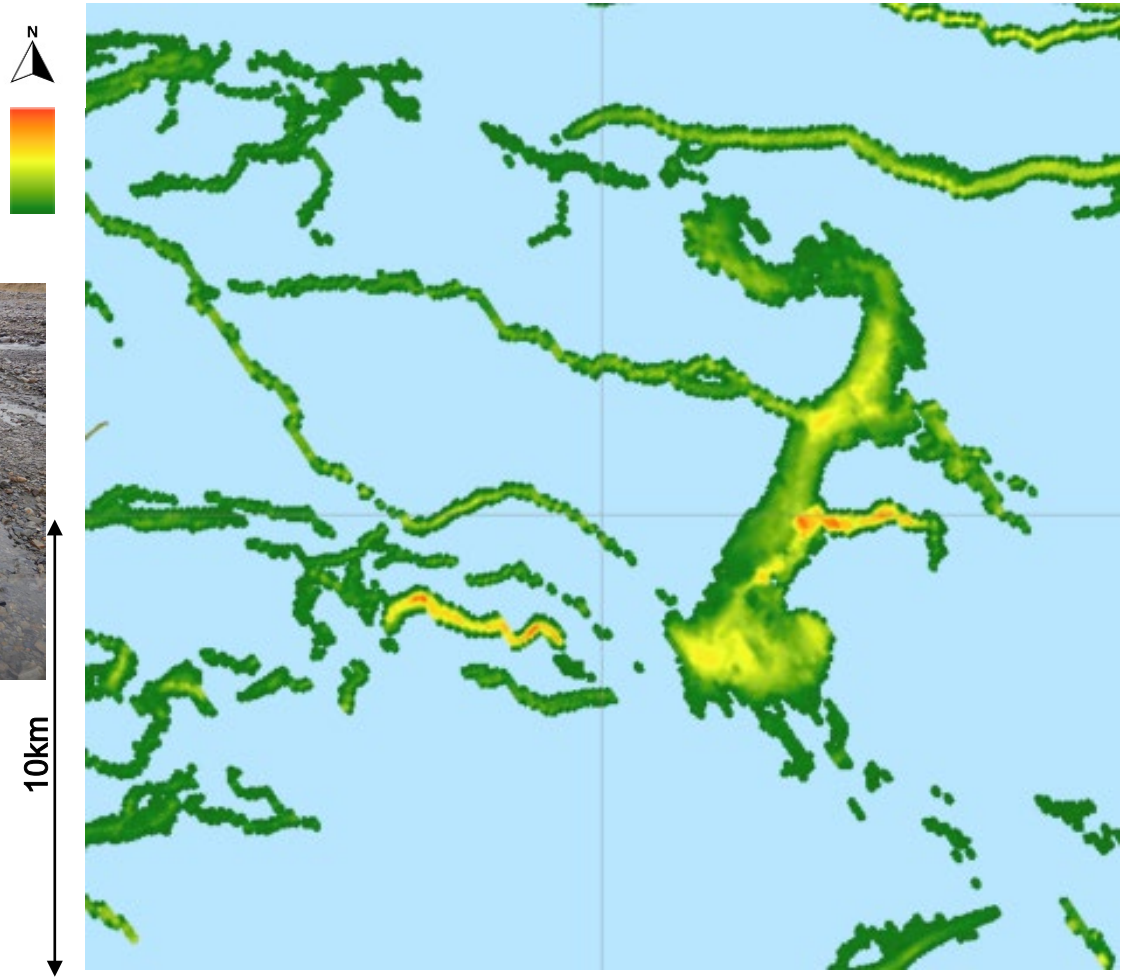


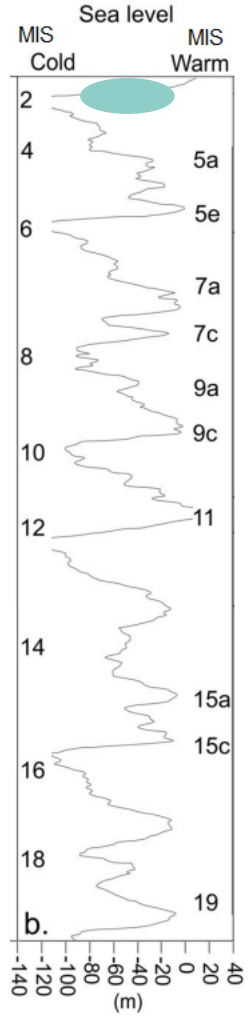
Upper Bolders Bank thickness – Subglacial till



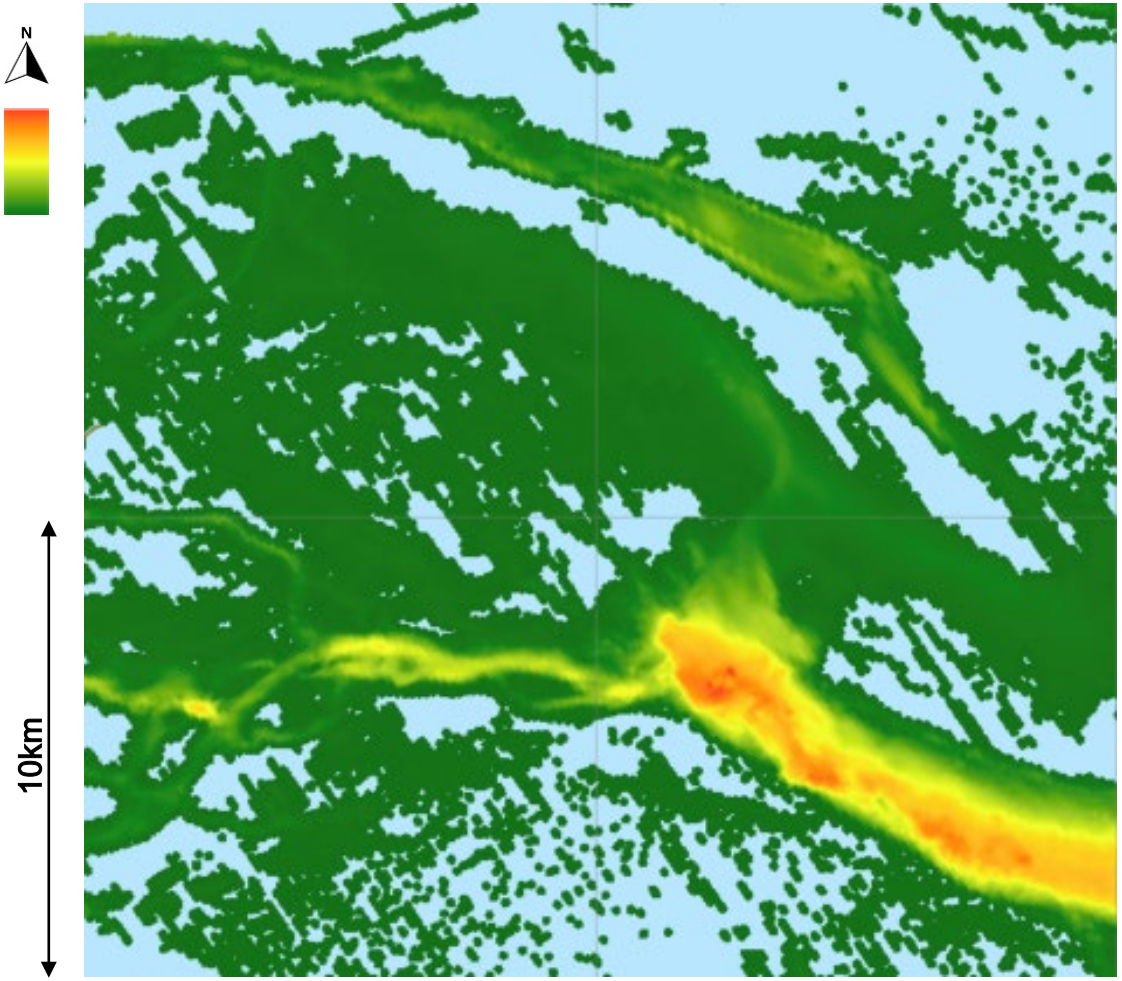


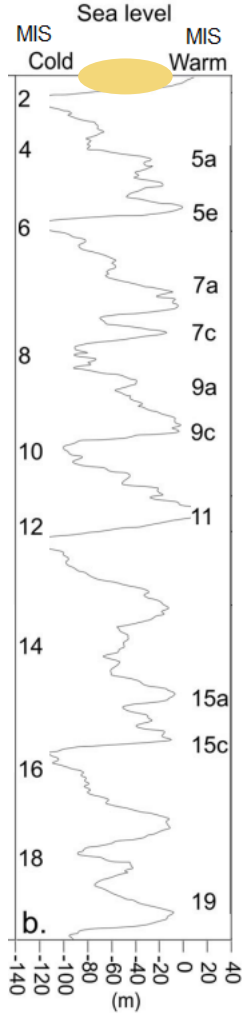
Botney Cut thickness – Pro-glacial rivers





Holocene thickness – Sea Level rise, rivers & marine





Thank you!

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