SEA LEVEL RESPONSE TO LATE PLIOCENE-QUATERNARY EROSION AND DEPOSITION IN SCANDINAVIA

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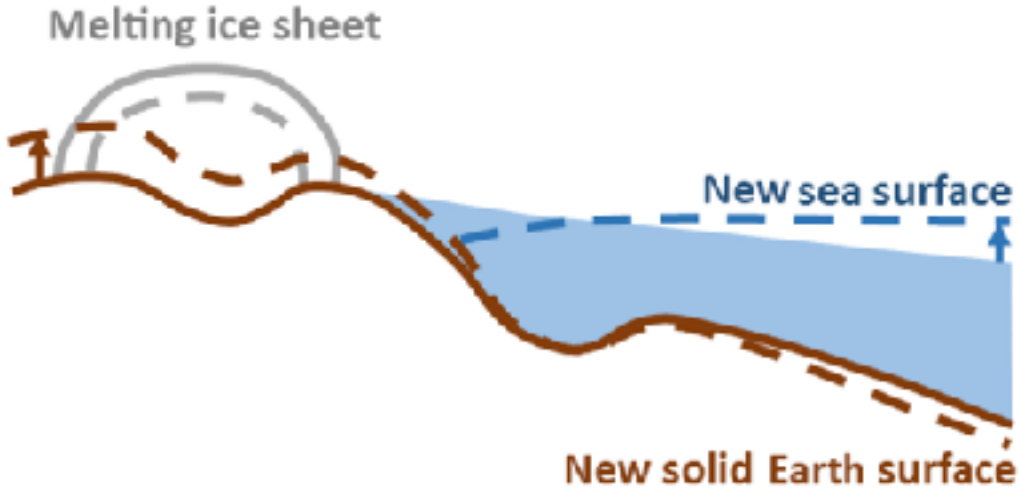
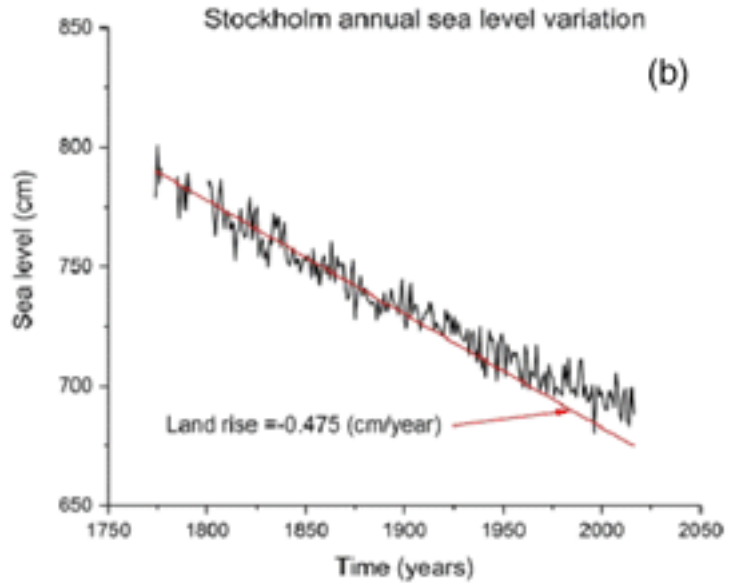
SEA LEVEL & GLACIAL ISOSTATIC ADJUSTMENT

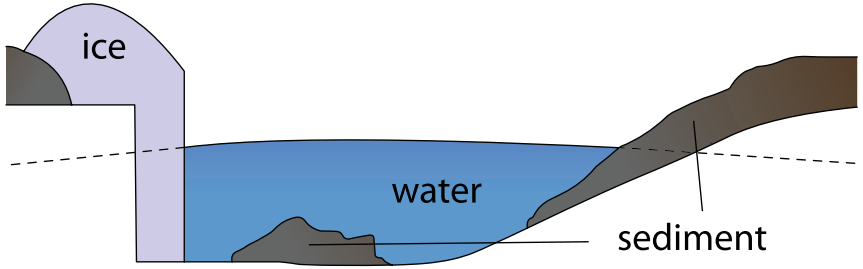


Whitehouse (2018)



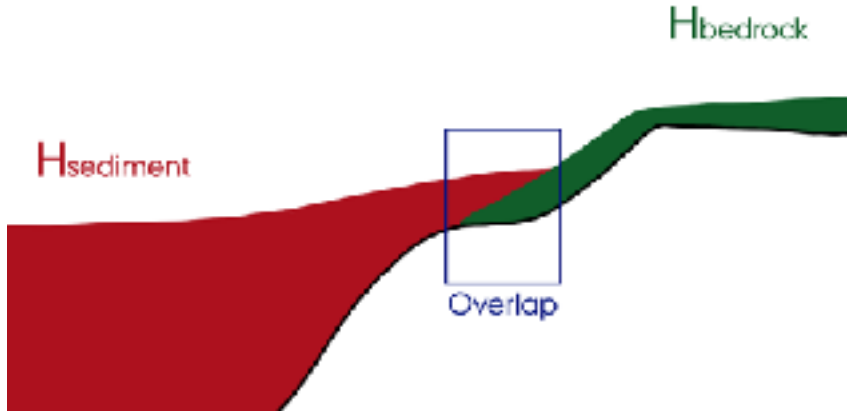
Weisse, R. et al. (2021)

SEA LEVEL & GLACIAL ISOSTATIC ADJUSTMENT



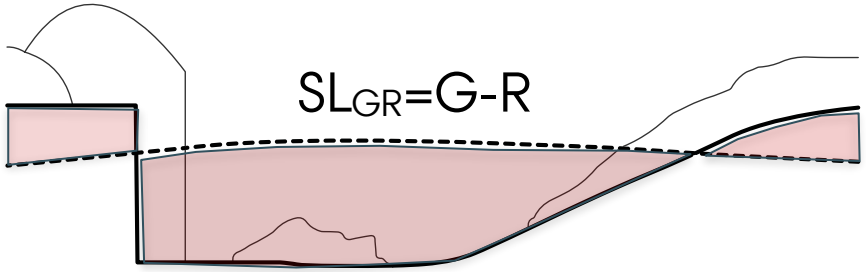
(b)

(c)



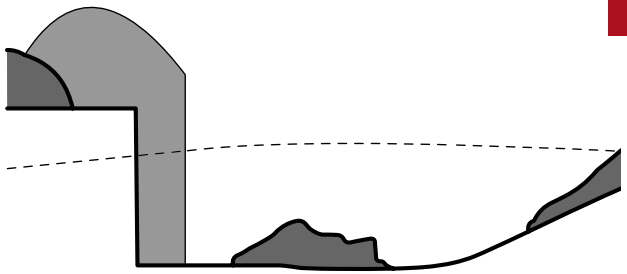
--- Height of sea surface equipotential (*G*)

— Crust height (*R*)



Ice thickness (*I*)

Sediment thickness (*H*)



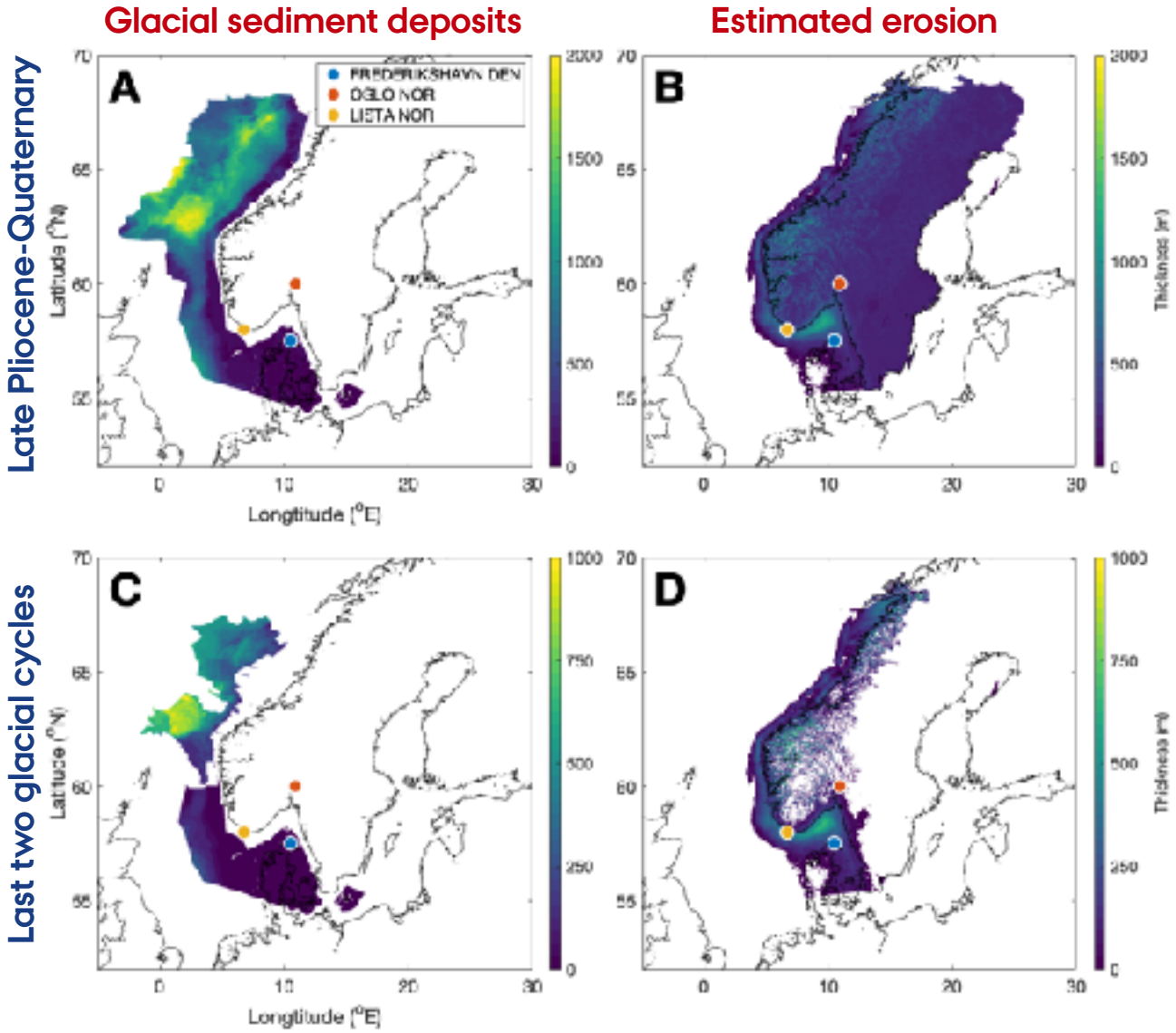
Dalca et al. (2013)

SEA LEVEL RESPONSE TO QUATERNARY EROSION AND DEPOSITION IN SCANDINAVIA

- Marine deposits from the l**ate Pliocene-Quaternary**

- The **NAUST-formation** + deposits in the North Sea

- Shortest time scale is the **last two glacial cycles**



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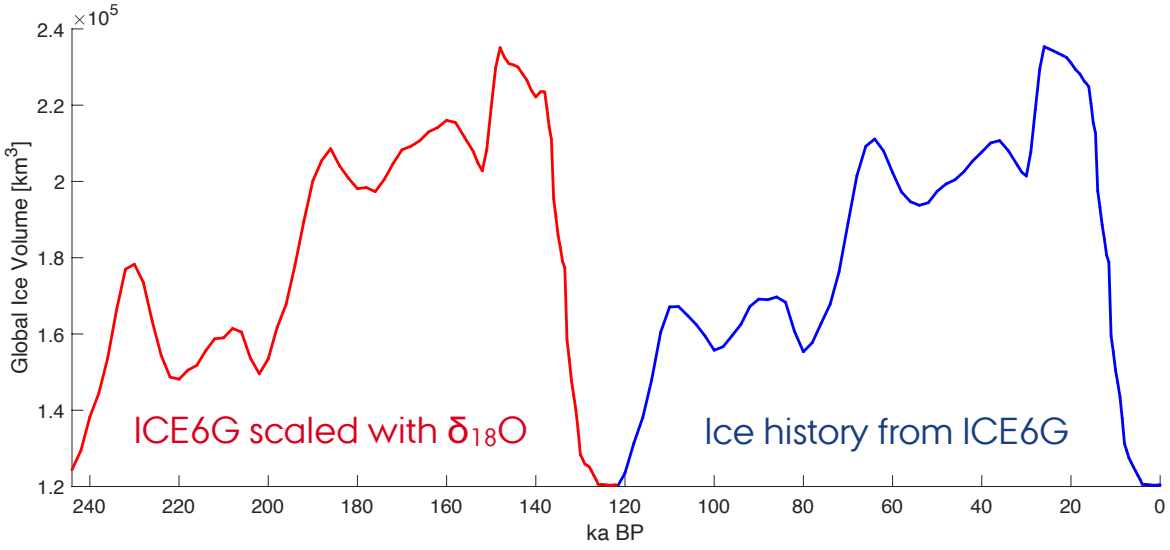
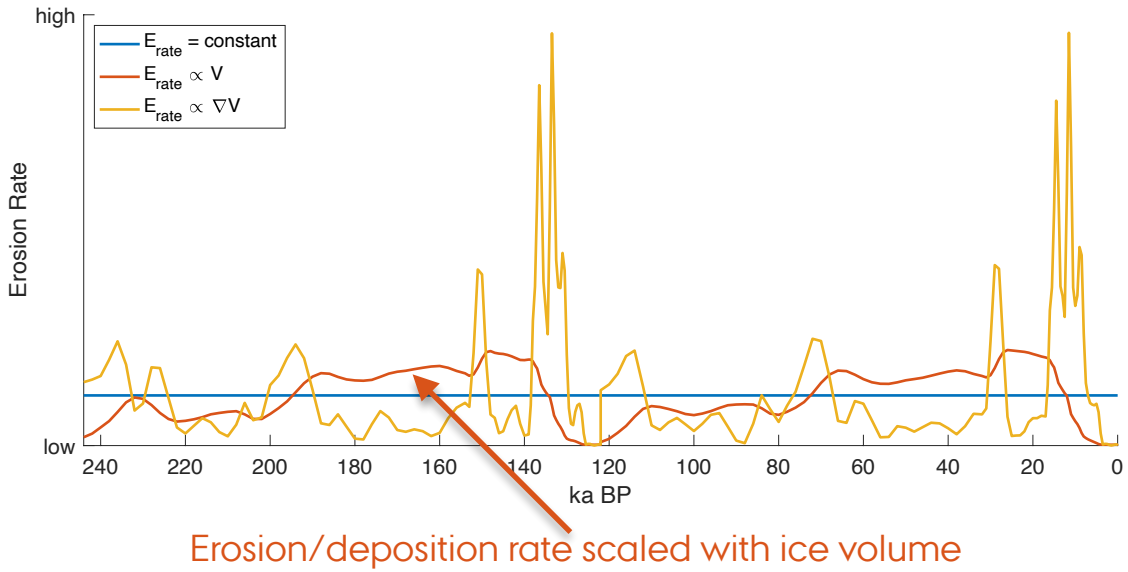
Ice volume



Erosion/deposition rates



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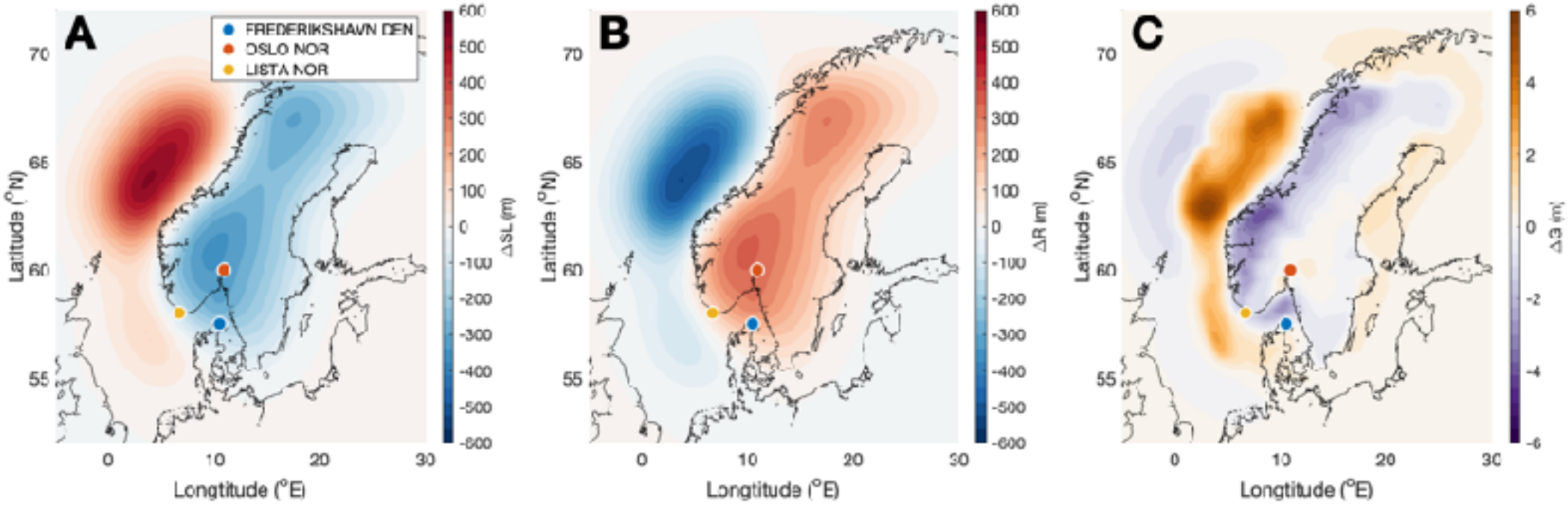
ΔSL_{GR} (sea-level changes)

Solid Earth deformation

Geoid changes



Total relative sea level changes (ΔSL_{GR}) from erosion and deposition in the **late Pliocene-Quaternary**

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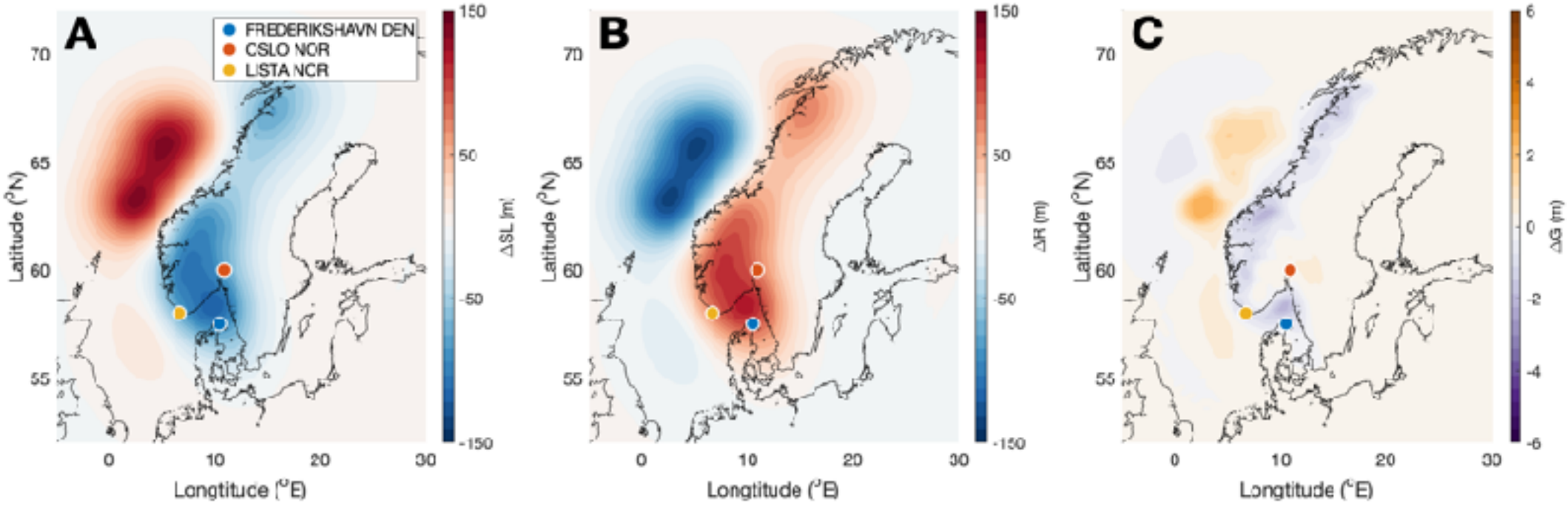
ΔSL_{GR} (sea-level changes) | Solid Earth deformation | Geoid changes

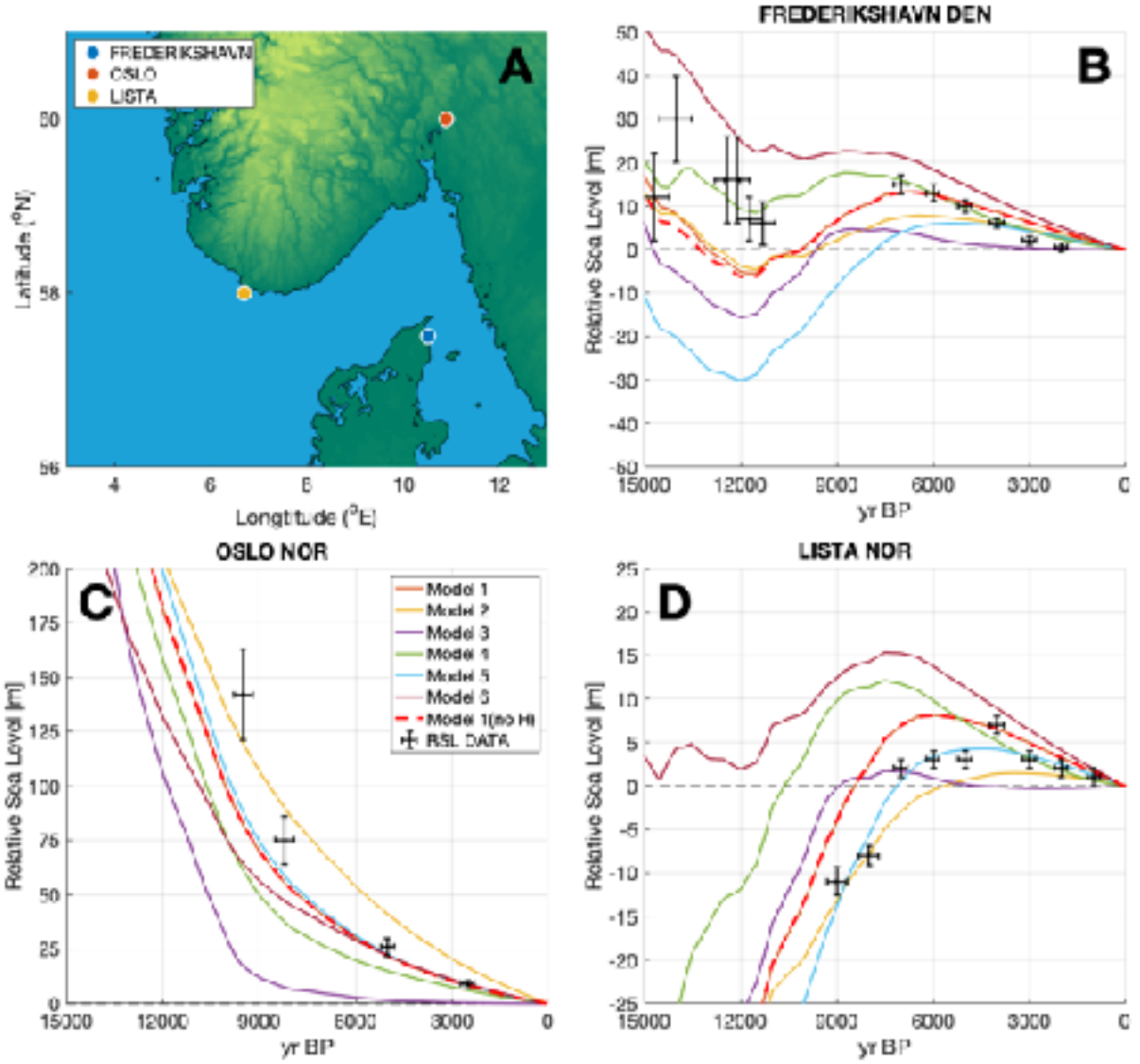


Total relative sea level changes (ΔSL_{GR}) from erosion and deposition in the **last two glacial cycles**

SEA LEVEL RESPONSE TO QUATERNARY EROSION AND DEPOSITION IN SCANDINAVIA

- Most observations are **limited** to late deglaciation/Holocene
- I am working on comparisons with a larger database of paleo sea-level markers
- Models with and without sediment redistribution are **mostly indistinguishable in the Holocene**

Model	L [km]	$\mu_{um}[10^{20} Pa \cdot s]$	Time scale
Model 1 (reference)	70	2	Naust T
Model 2 (high μ_{um})	70	4	Naust T
Model 3 (low μ_{um})	70	0.5	Naust T
Model 4 (low viscosity zone)	70	2 (0.13 from 70-130 km depth)	Naust T
Model 5 (low L)	50	2	Naust T
Model 6 (high L)	140	2	Naust T
Model 7 (Quaternary)	70	2	Full Naust
Model 8 (Quaternary)	50	2	Full Naust



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Conclusions

- Erosion and deposition has caused a relative sea level (ΔSL_{GR}) fall along the coast of south and south west-Norway of 50-100 m reaching upwards of 120 m in the northern part of the North Sea in the last two glacial cycles and up to 350 m in the Quaternary.