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New sea level scenarios for the coast of the Netherlands

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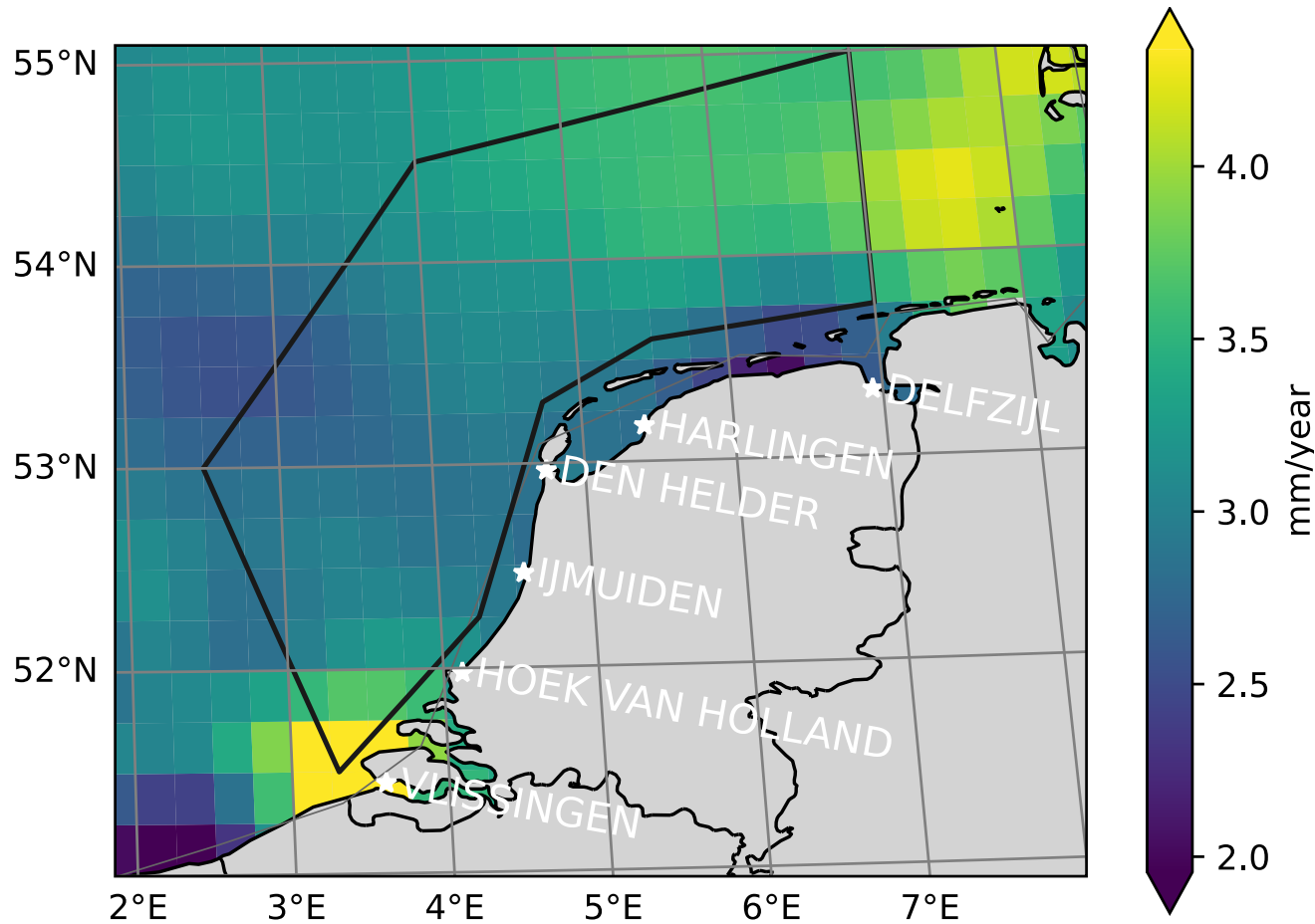


Highlights

- > **Understanding the past:**
sea level acceleration and budget
- > **Connection between observations and scenarios:**
CMIP6 model selection for Ocean Dynamic Sea Level (ODSL)
- > **Low-likelihood high-impact** scenarios



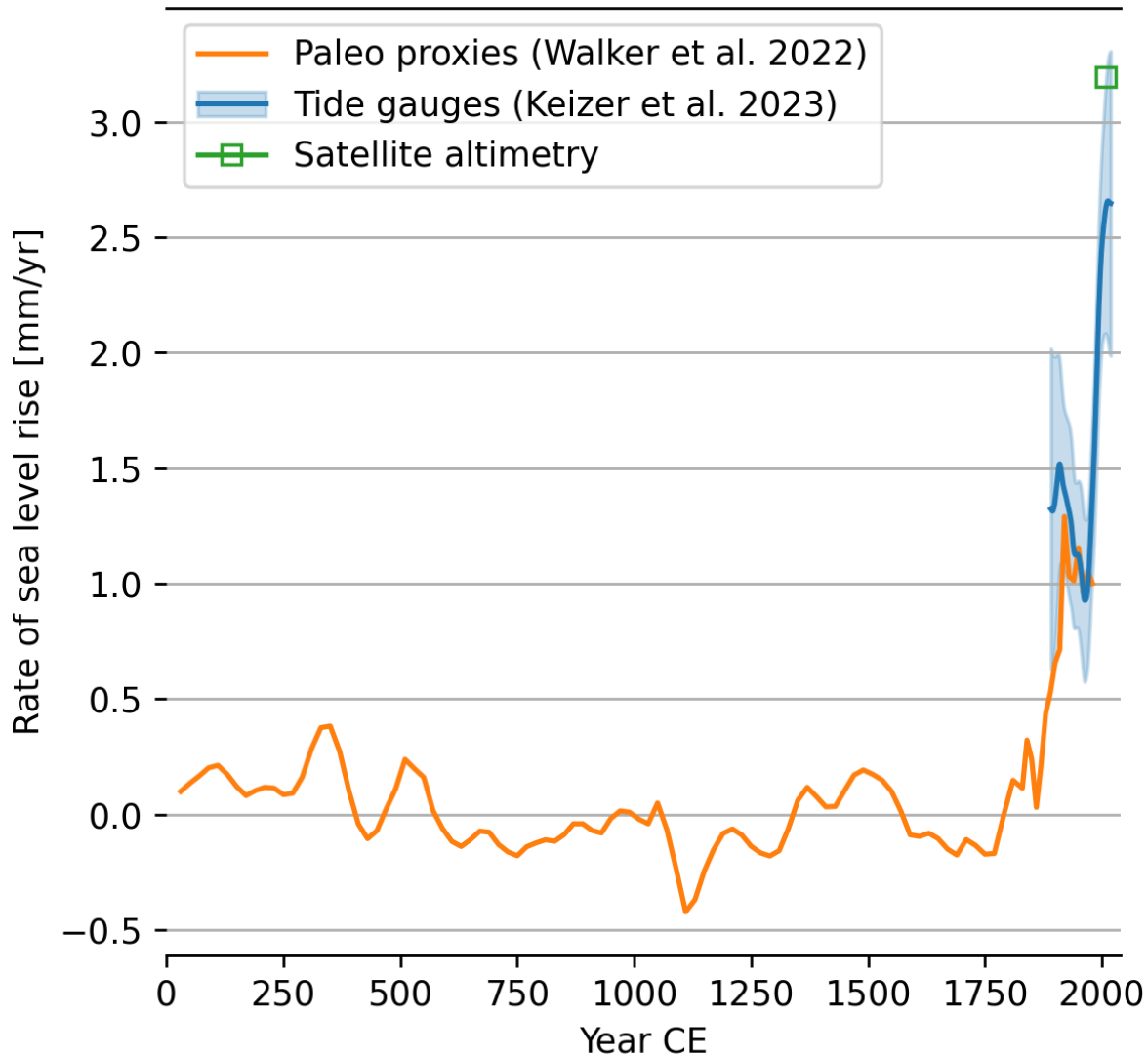
Data and region



- 6 reference tide gauges
- Satellite altimetry
- Region used for ODSL from CMIP6 models



Sea level rise acceleration

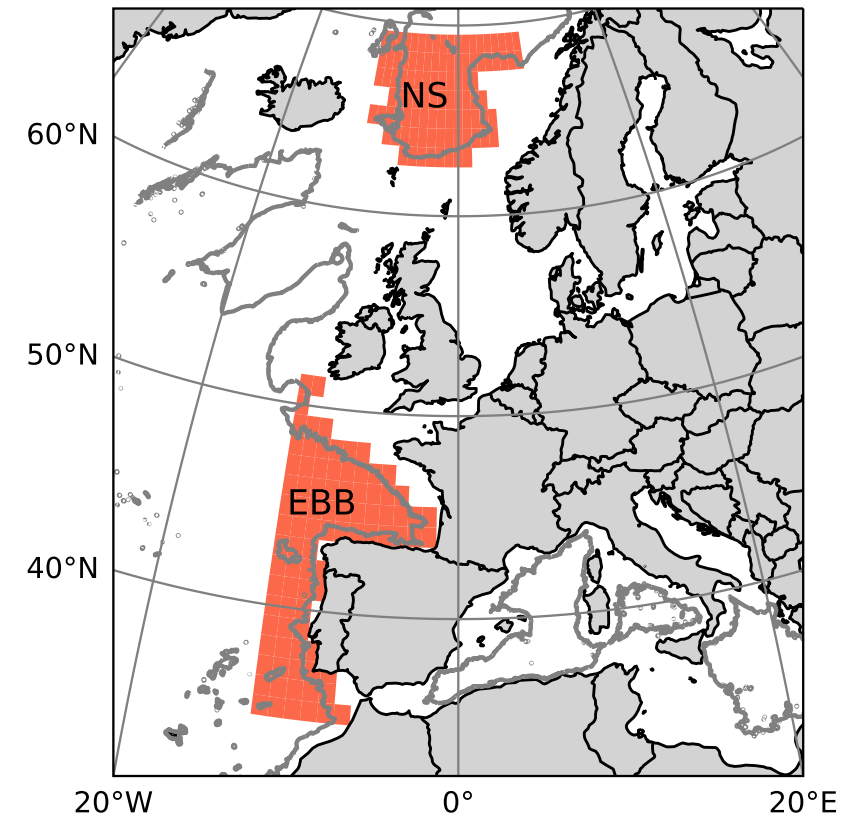
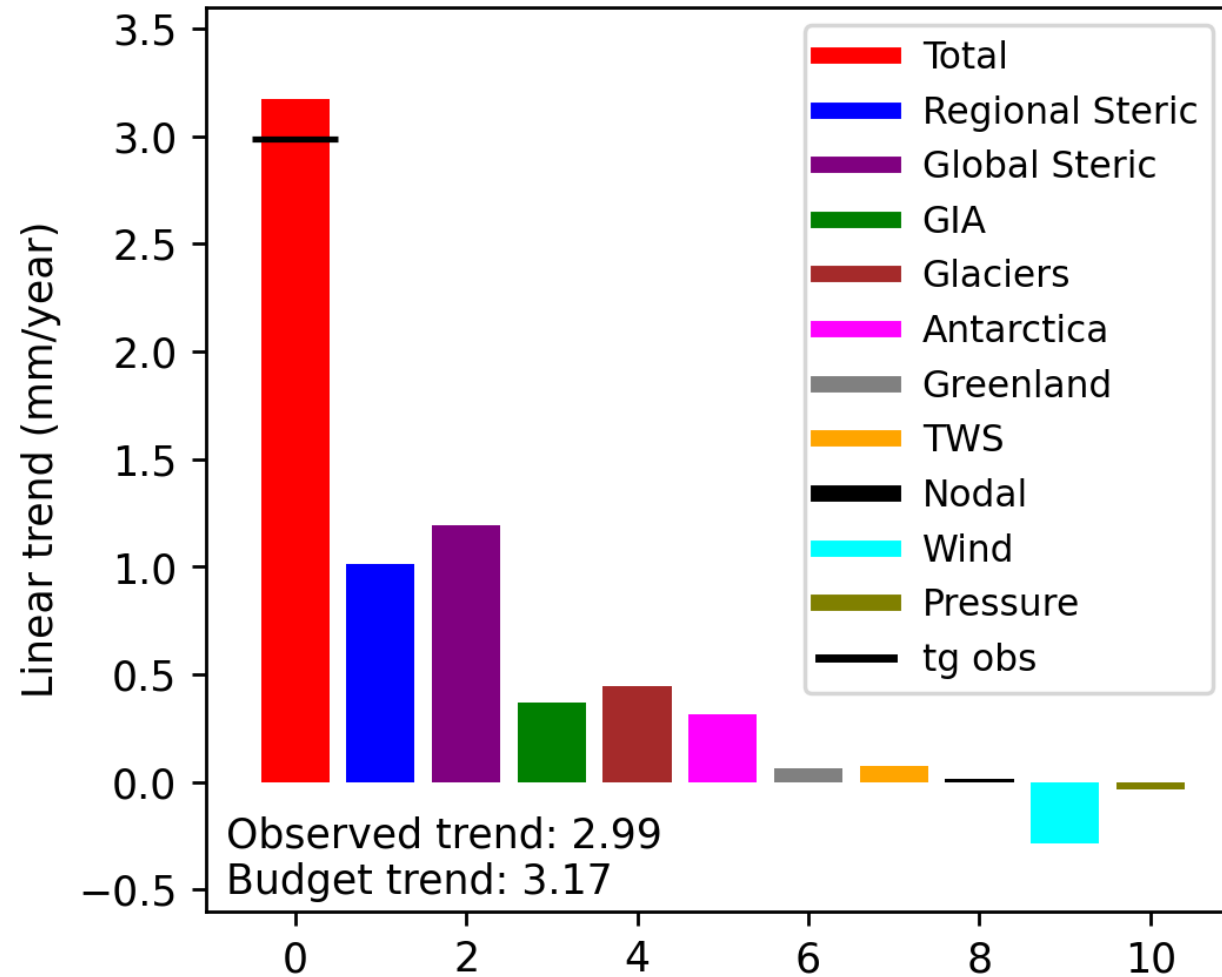


- "Global mean sea level (GMSL) rose faster in the 20th century than in any prior century over the last three millennia"
IPCC AR6
- This is also the case for the Western European coast (*Walker et al. 2022*)
- Also accelerating over 1890-2021 (*Keizer et al. 2023*)



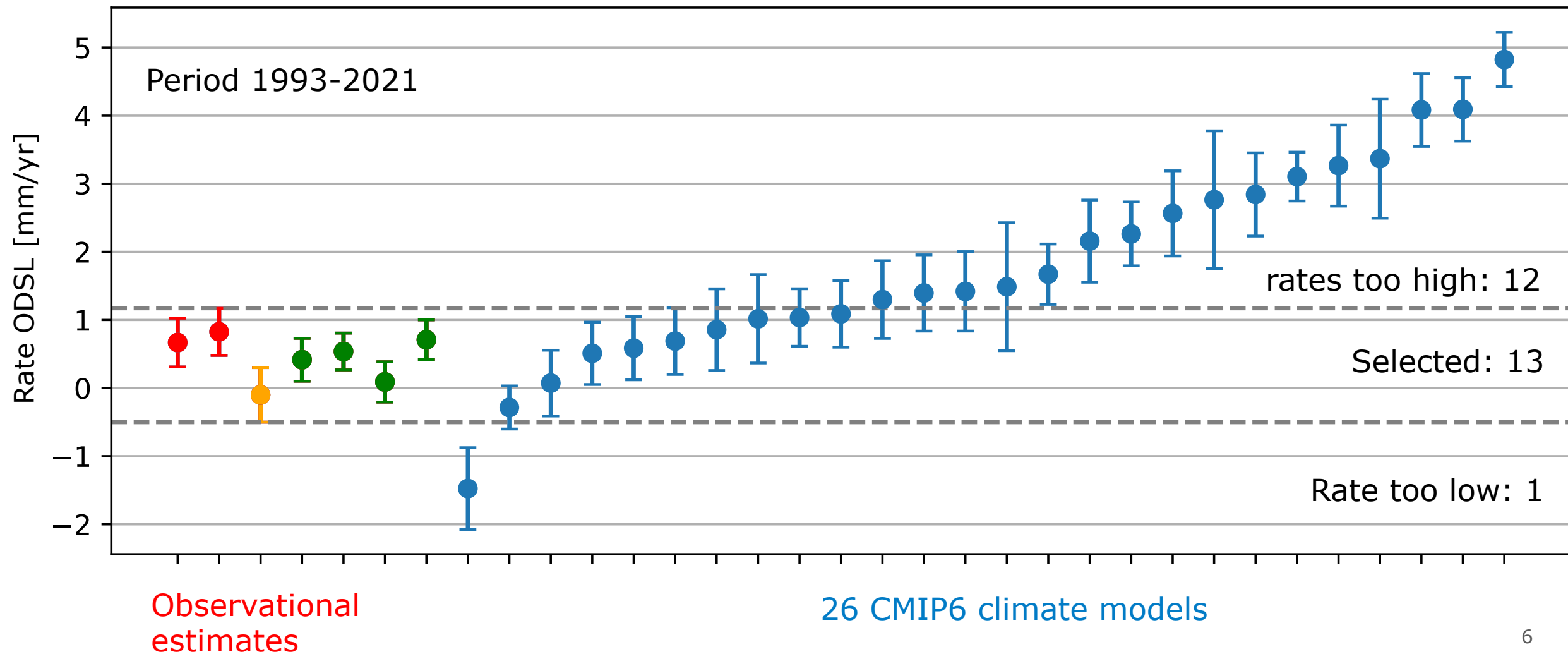
Sea level budget (1993-2021)

Linear trend budget: 1993-2021



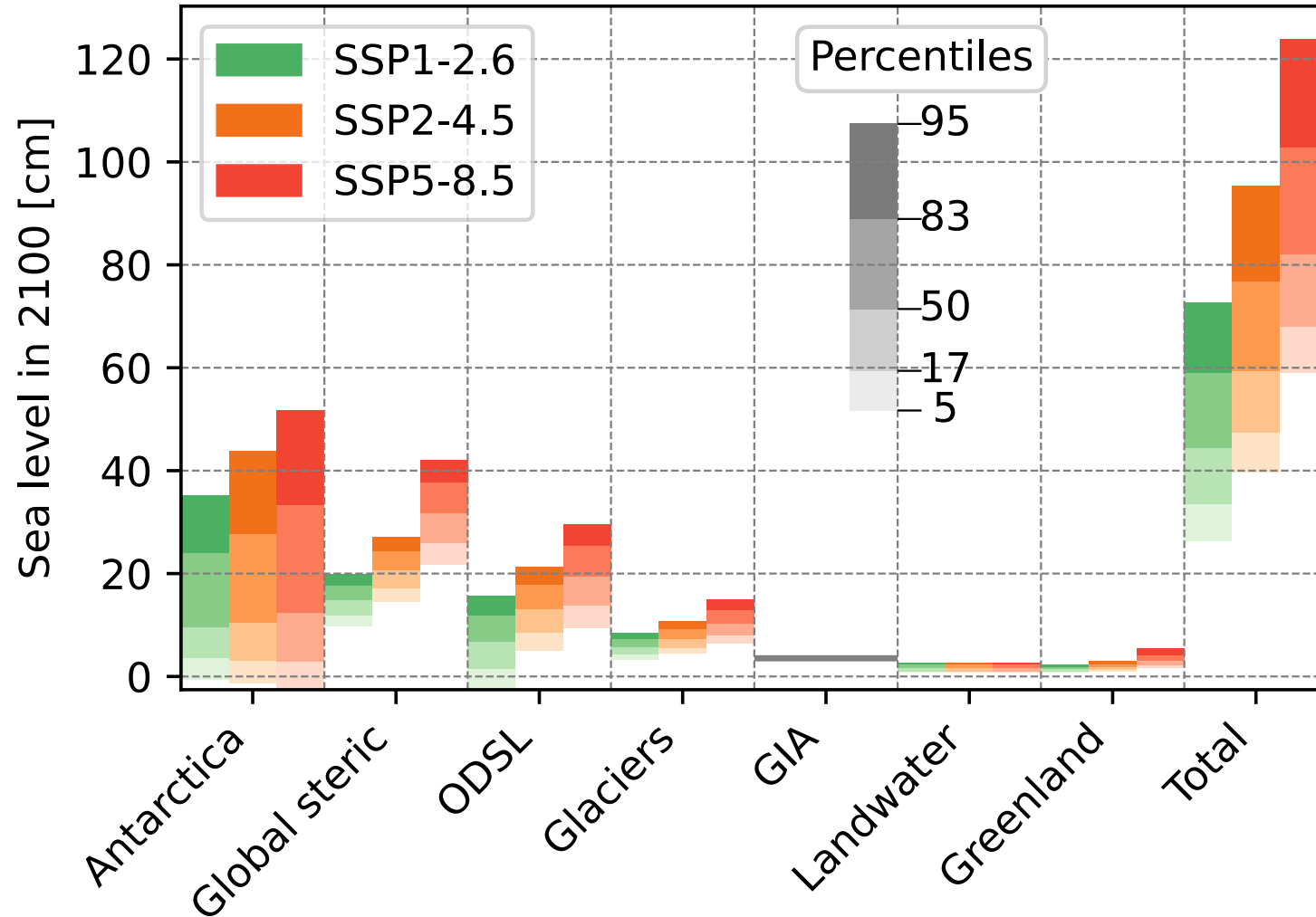


Model selection for ODSL



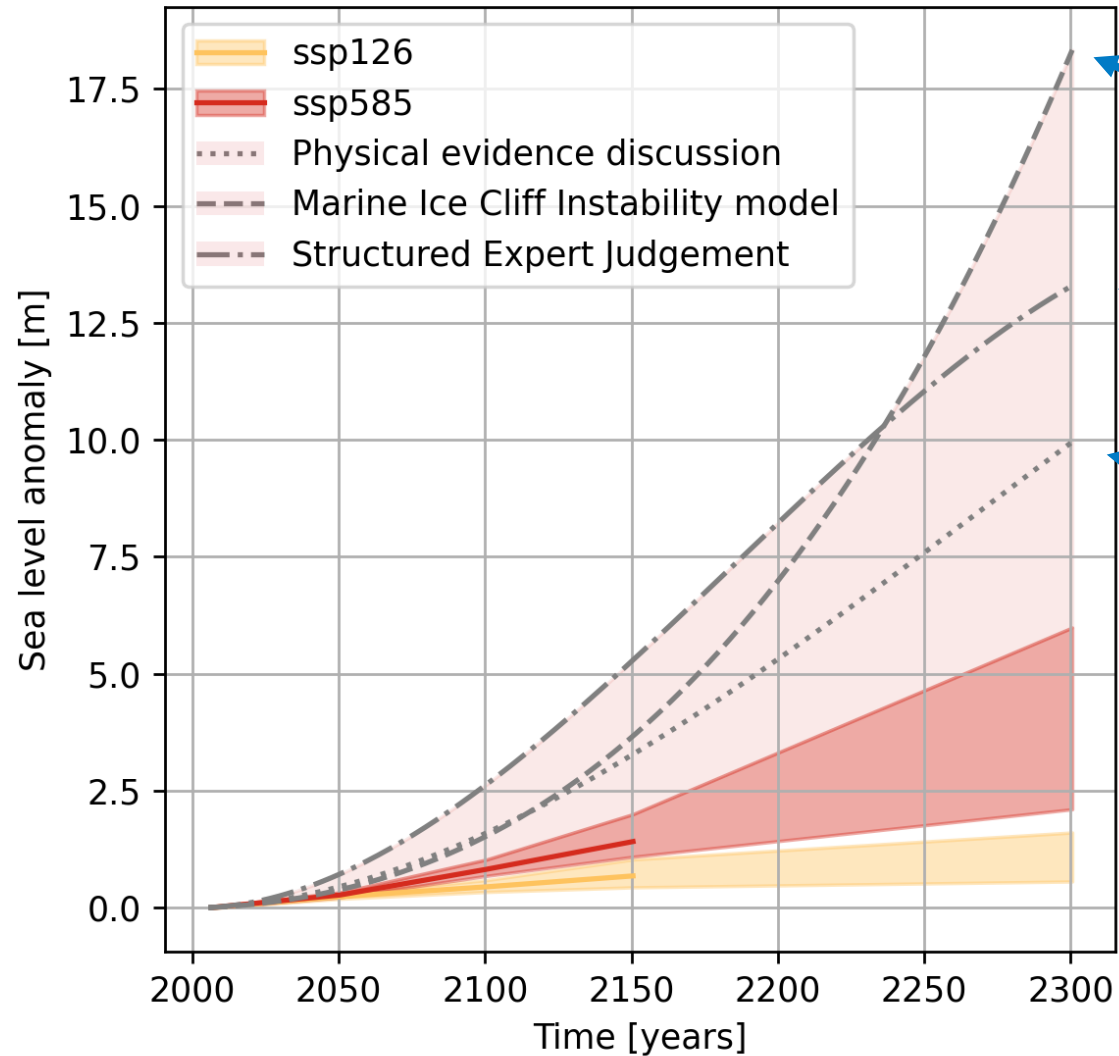


KNMI'23 sea-level scenarios in 2100





Low-likelihood high-impact scenarios



Three lines, three methods:

- Marine ice cliff instability (*DeConto et al. 2021*)
- Structured expert judgement (*Bamber et al 2019*)
- Physical evidence discussion (*van de Wal et al. 2022*)



Conclusions

- › Sea-level is accelerating along the Dutch coast
- › We can close the sea level budget for the last 30 years
- › KNMI provides sea-level scenarios up to 2100 (SSP1-2.6, SSP2-4.5, SSP5-8.5) and up to 2300 (SSP1-2.6, SSP5-8.5) for the Netherlands to adapt
- › 3 Low-Likelihood High-Impact scenarios based on different methods
- › More information: <https://www.knmi.nl/kennis-en-datacentrum/achtergrond/knmi-23-klimaatscenario-s>