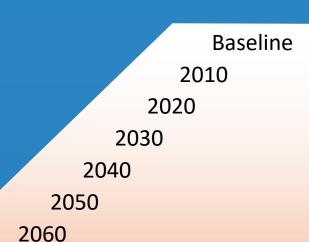


Challenges to calculate a worst case extreme sea levels along the global coastline by 2100

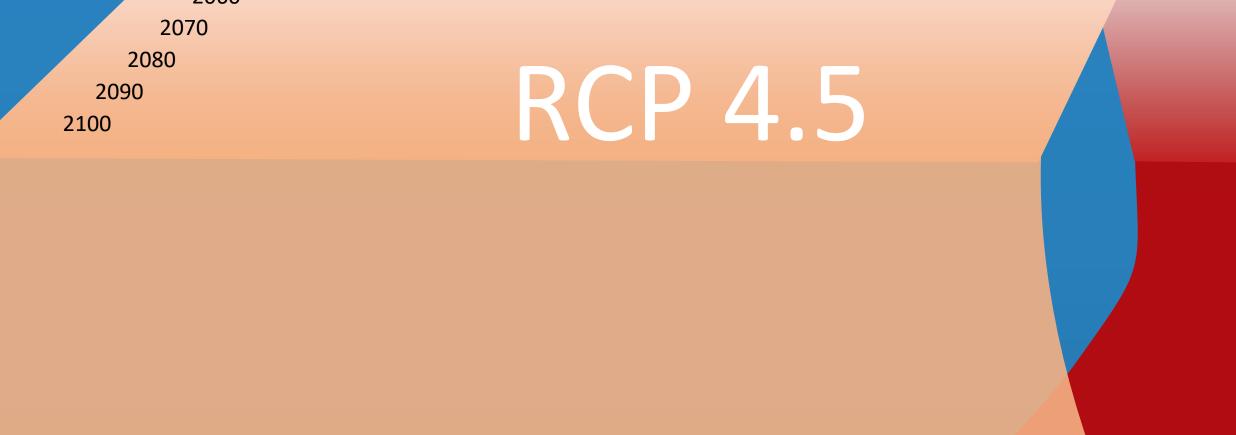
Svetlana Jevrejeva¹, Joanne Williams¹, Michalis I. Vousdoukas², and Luke P. Jackson³

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Here we calculate a "worst case scenario" for extreme sea levels at 4960 sites along the global coastline by 2100, as a combination of sea surface height associated with storm surge and wave (100-year return period, the 95th percentile), high tide (the 95th percentile) and a low probability but high impact sea level rise scenario (the 95th percentile).



We provide all results for both Representative Control Pathways RCP4.5 and RCP8.5 For RCP8.5 sea-level we use a high-end scenario j14 based on Jackson & Jevrejeva, 2016



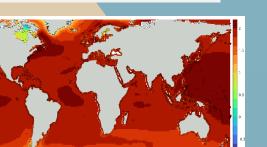
RCP 8.5

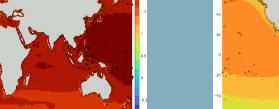
The Sea Level Rise projections include models of individual components. Each have probability distributions, for each RCP scenario.



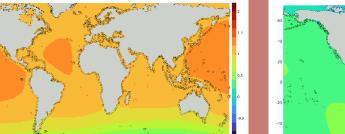


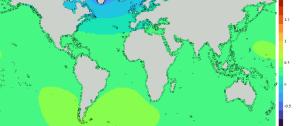
Greenland ice loss



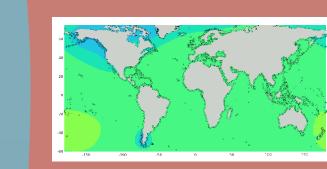


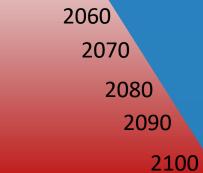
Glacial isostatic adjustment





Glaciers ice loss





Baseline

2010

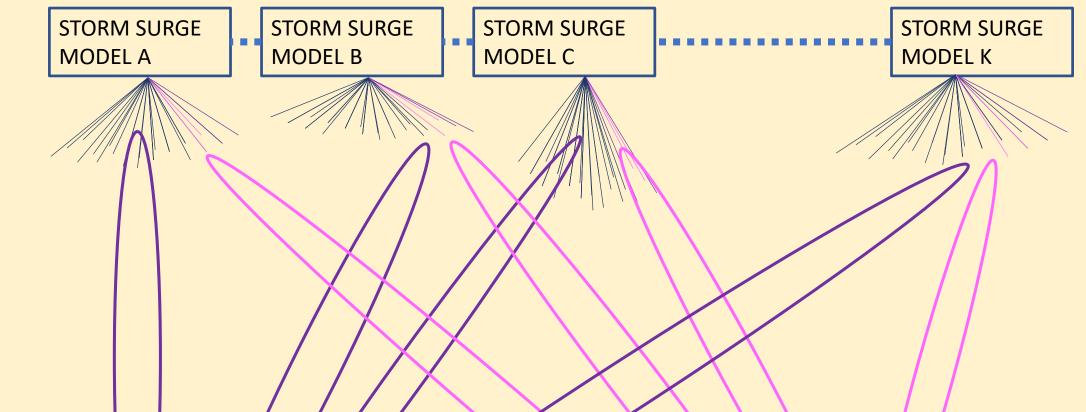
2020

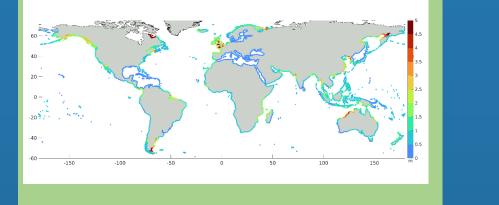
2030

2040

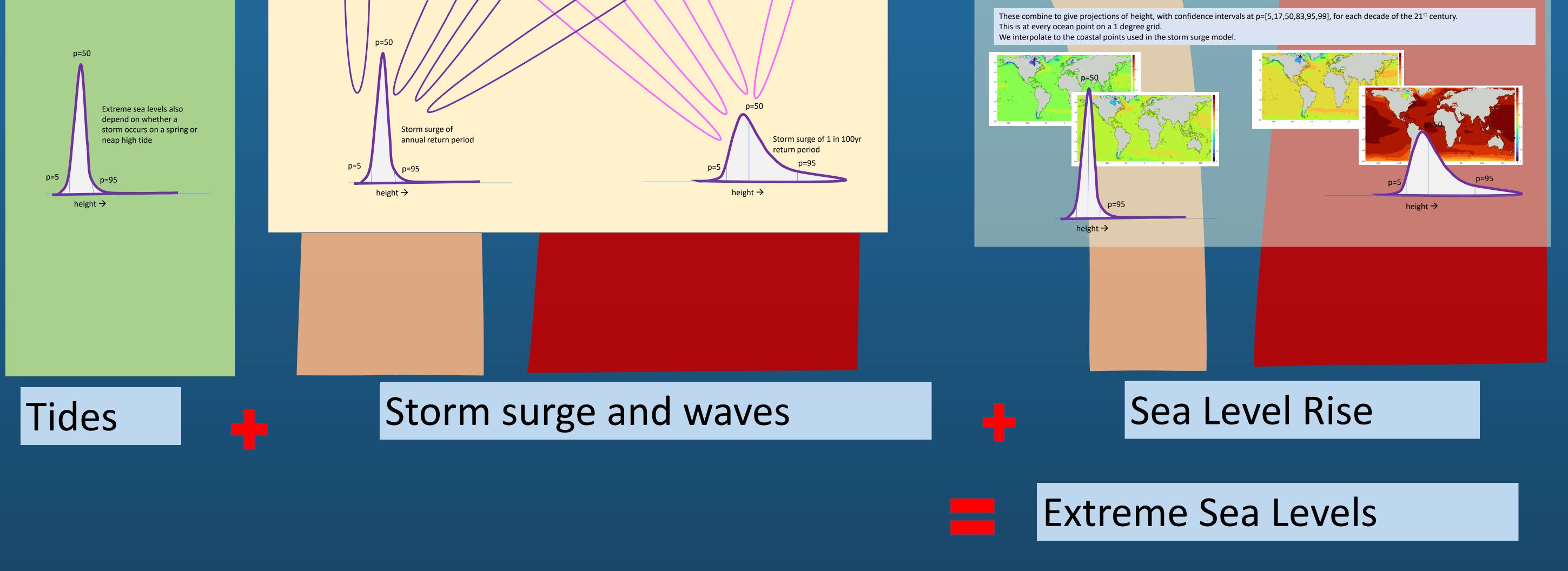
2050

Choice of CMIP5 surge and wave models \rightarrow range of responses. Each model has is run for many years, resulting in a distribution of surge and waves for events of different severity.





Tides are assumed to be invariant for this study, so there are just tidal heights with confidence intervals at p=[5,17,50,83,95,99]. These are at coastal sites.



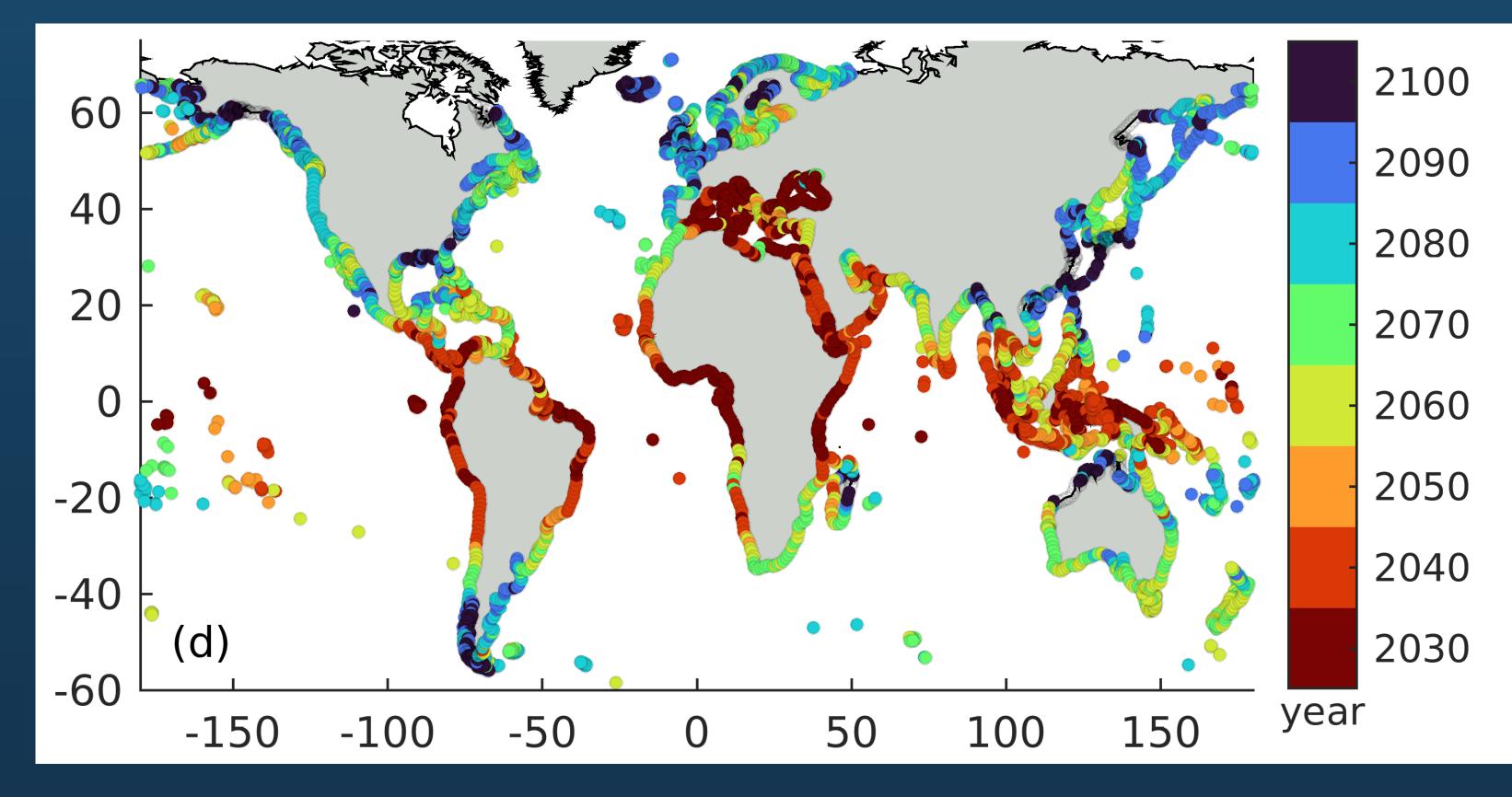


Figure shows a decade by 2100 in which the sea surface height of present day extreme sea level event ones in 100 (magnitude of extreme sea level with return period years 100 yrs) projected to be **at least ones a year**.

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Jevrejeva et al, 2023. Future sea level rise dominates changes in worst case extreme sea levels along the global coastline by 2100, Environmental Research Letters, DOI 10.1088/1748-9326/acb504