What is the role of climate sensitivity in upper-tail sea-level rise projections?

Objective

We analyze the effect of high climate sensitivity on sea-level rise projections using a reduced complexity Earth system model, Hector-BRICK.

Approach

- Temperature and sea-level responses are analyzed in Hector-Brick with high/low ECS scenarios and different RCPs (Figure 1).
- We employ Bayesian calibration utilizing multiple atmosphere/ocean observational constraints to compare/contrast model sensitivities.
- We highlight upper-tail SLR outcomes (above 90th percentile) at global to regional scales using spatial fingerprinting (**Figure 2**).

Impact

- Modelled sea-level projections, particularly at the upper tail, depend substantially on equilibrium climate sensitivity.
- Results influence regional sea-level change projections and the timing of sea-level rise exceedances.



Figure 1: Global temp (left) and SLR (center) projections for high/low ECS scenarios; 2100 SLR vs Temp (right)



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