



## Towards Physically Consistent Sea Level Rise Storylines for the United Kingdom

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There is increasing awareness of the need for comprehensive information on potential future sea-level rise to inform adaptation planning and coastal decision-making. The IPCC Sixth Assessment Report (AR6) states that global mean sea level rise approaching 5 m by 2150, and more than 15 m by 2300, cannot be ruled out under high greenhouse gas emissions due to uncertainty in ice sheet processes. Moreover, local sea level rise may be further exacerbated through systematic changes in the climate system, such as a rapid weakening of the Atlantic Meridional Overturning Circulation (AMOC).

We combine the latest United Kingdom national sea-level projections (UKCP18) with recently published projections of Antarctic ice mass loss to develop a small set of physically consistent storylines of local sea-level change that extend to 2300. The storylines span the range of uncertainty assessed by AR6 and deliver continuous sea level rise information around the UK coastline. While we focus on the UK, the methods are generic and can be readily applied to other geographic locations. Further, we consider potential changes in coastal flood hazard associated with a weakening of the AMOC using dynamical downscaling and storm surge modelling of climate model projections.