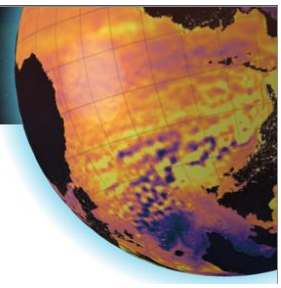

Multiscale modeling of the Scheldt-North Sea continuum and atmospheric resolution's impact on Storm Surges

With the rise of global warming, the intensity of compound events involving storm surges, tides, and river discharge is expected to increase, amplifying coastal damage and flooding, especially in estuarine regions. The Scheldt river-estuary and the North Sea are densely populated areas with significant economic interests, including shipping, fisheries, and tourism. Given the economic importance of this region, it is crucial to understand the interactions within the river-estuary-ocean continuum during extreme events. However, this is a challenging task due to the complexity arising from the interaction between river and seawater masses, which operate on different temporal and spatial scales. Detailed modeling is essential to capture these multiple behaviors and dynamics. This knowledge is vital for developing effective strategies to protect the economic assets and communities in the region. This study assesses the impact of small-scale changes in the Scheldt river-estuary and atmospheric conditions on the dyn

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