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Title:	Sea-level rise impacts on tidal marshes and estuarine biogeochemical processes
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Abstract:	We used a numerical model to investigate the effects of Sea-level Rise (SLR) on the biogeochemical processes in the York River Estuary with extensive tidal marshes. The fully-coupled hydrodynamic-water quality-marsh model accounts for the spatial and temporal variations of physical-biogeochemical interactions between the tidal marshes and surrounding waters. This study focuses on an SLR scenario where the vertical accretion of tidal marshes keeps pace with the rising sea levels. Results show that SLR amplifies the tidal range and prolongs flooding duration, which results in enhanced porewater exchanges of materials between the tidal marshes and the surrounding waters. The increased availability of shallow-water habitats and enhanced light utilization in the shallow areas under SLR promote phytoplankton production in the shallow-water regions of the York River. Consequently, the organic carbon in the open water is fueled by the contributions from shallow waters and the enhanced export of organic carbon from the marshes. The change in the dissolved oxygen (DO) budget in the York River Estuary is attributed to changes in water column respiration, net metabolism of the benthic layer, reaeration, phytoplankton production, and increased stratification under SLR. The net DO flux out of the York River increases at the York River mouth. Diel DO variation, especially in the marshes in the upper estuary, promotes phosphorus release from the sediment. The changes in dissolved nitrogen under SLR are relatively minimal.

Files Description:	SCHISM model inputs
Keywords:	SCHISM; Chesapeake Bay; Modeling; York River Estuary; Tidal Marsh
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