



Integration of Sea level Change Curve into Long-term Simulations with the Coastal Modeling System

ERDC Dredging Operations Technical Support Program (DOTS)

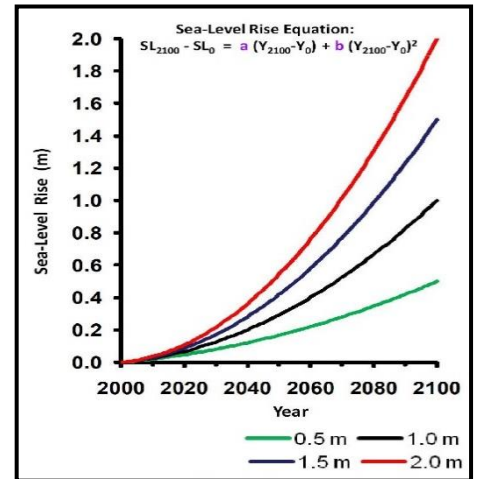
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Response Summary:

Global warming and rise in ocean temperature result in an increase in ocean volume and a change in sea level. Potential global sea level rise (SLR) combined with coastal storms can drastically change the depth of navigation channels such that it may introduce sediment into navigation channels through adjacent shore erosion, overflow of low-lying barrier islands, increased wave forcing in the nearshore, and flanking of jetties.

Coastal Modeling System (CMS) is widely used by U.S. Army Corps of Engineer Districts for planning, design, navigation O&M, and research. Users of CMS require its ability to simulate waves, hydrodynamics, sediment transport, and morphodynamics with the effect of SLR to address problems related to channel shoaling, dredging, placement of dredged material, and coastal structure modifications. In order to well evaluate sea level change and its impact on the coastal zone, the present DOTS study, requested by the Seattle District, is to incorporate projected sea level change curves into the CMS and to conduct coastal simulations with SLR scenarios.



Period of Performance:

1 May – 30 June 5, 2018.

Benefits of the Response to the USACE Dredging/Navigation Program:

Recognizing global climate change with potential sea level rise threats and immediate impacts on coastal and estuarine waterways, the measures need to be taken to assess climate risk and vulnerability of navigation projects, to conduct R&D in reduction of future O&M costs, and to develop adaptation strategies and management plans to support O&M practice.

The feature integration of SLR into the CMS would enable Districts to quickly and accurately setup SLR scenarios on already calibrated/validated models.

Deliverable:

The CMS will be modified to obtain sea level change curves from an external file. The input curves will be added to various types of CMS water level boundary conditions and the corresponding Surface-water Modeling System GUI will be developed for users.

Final deliverables are the updated CMS executable program, SMS GUI, and a technical note on user instructions.



Providing environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance navigation and dredging missions

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