The Sea Level Rise Inundation Tool

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The Sea Level Rise Inundation Tool

Part of the Comprehensive Coastal Resource Management Portal
Center for Coastal Resources Management

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VIMS shall...Develop comprehensive coastal resource management guidance for local governments to foster the sustainability of shoreline resources by December 30, 2012. The guidance shall identify preferred options for shoreline management and taking into consideration the resource condition, priority planning, and forecasting of the condition of the Commonwealth's shoreline with respect to projected sea-level rise.
Comprehensive Coastal Resource Management Portal

- Beginning in 2012, CCRM started developing portals for each Tidewater locality
  - Right now there are 12 available with 5 more completed by the end of 2014

- The portals are gateways to resources that address **data gaps**, **shoreline best management practices**, and **sea level rise issues** at the local level
Creating the topographic surface

- LIDAR (elevation data) was acquired from VGIN and individual localities
  - The most accurate LIDAR available was used
    - Where no LIDAR available, VBMP was used
  - The topo surface will be updated as higher resolution LIDAR becomes available
- Data were merged into seamless layers for larger regions and then clipped to the locality boundaries
- Data were projected to Virginia State Plane HARN (ft)
Modeling Sea Level

- A digital Mean High Water shoreline (NOAA) was used as the current locality shoreline
  - Used tidal datum for reference rather than elevation datum because it allows for variation in local tides
  - Converted land elevation to MHW reference using NOAA’s Coastal Service Center tool (Vdatum)
- Sinks were “filled” in the land surface
- Sea level rise scenarios were selected and raster calculator was used to create mosaic datasets of different time frames
Relative Sea Level Rise

[Graph showing relative sea level rise projections for different scenarios: NCA Historic, NCA Low, NCA High, NCA Highest, and Boon 2012. The x-axis represents years from 1992 to 2100, and the y-axis represents RSLR above 1983-2001 TDE (feet).]
Sea Level Rise Risk and Vulnerability Tool

The Sea Level Rise Risk and Vulnerability Tool displays the shift in the National Oceanic and Atmospheric Administration's (NOAA) mean high water shoreline (MHW) over time as a result of sea level rise and local land subsidence. Future sea level rise scenarios are based on the 2012 National Climate Change Assessment (Farns et al, 2012) with consideration of local subsidence known to occur in southeastern Virginia. Surface elevations have been derived using high resolution LIDAR data where available.

To run the tool, users must have Silverlight downloaded to their desktop computers. In most cases users are prompted for the download when they open the tool for the first time. If not, instructions for this download are available in the Sea Level Rise Tool User's Guide (see tab below). This is not necessary for those running Microsoft Office version 2010 or higher which includes Silverlight. The user's guide also provides important details on the tool's development, use, and applications.

FAQ:

Q. Why don’t water levels change as the time slider bar progresses through time?

A. The Sea Level Rise Tool uses port 6080 along with the traditional http port 80. If you have a firewall or proxy server that is blocking port 6080 it must be opened for the tool to work properly. Your IT department should be able to make that change.
Tour of the viewer

- Suffolk County map & Comprehensive Viewer
Tour of the viewer

- Suffolk County map & Comprehensive Viewer

What can you do with this info?
Find specific addresses

Compare changes between 2 years
Consider longevity of conservation areas.

Look at impacts to roads under different flooding scenarios.
SE Virginia sea level rise scenarios

- Graph showing sea level rise from 1992 to 2100 with different scenarios.
- Map indicating areas between predicted sea level rise curves in 2080.
Projected marsh impacts

Bilkovic et al. 2009 Vulnerability of shallow tidal water habitats in Virginia to climate change

Marshes are at high risk when:

1. They can’t retreat landward due to shoreline structures

2. They can’t retreat landward due to the height of the bank

~ 2 ft increase in relative sea level
Future plans

- Update SLR models on new LIDAR as available
- Update SLR models as new NCA reports are issued
- Continue to explore the impact of SLR on management actions and the impact of management actions on SLR