The Historical Record: Sea Level Rise in Chesapeake Bay

Sea Level is Rising Faster in Hampton Roads than Globally

Over the last 20 years the rate of increase in Hampton Roads has been about 6.6 mm/yr

Why?
- Global seal level rise
- Subsidence
- Ocean Dynamics

Source: Tal Ezer, Old Dominion University, “Sea Level Rise and Floods in the Chesapeake Bay and the Mid-Atlantic Region,” March 14, 2013
Adaption Recommendations

Governor’s Commission on Climate Change
2008 Report

Adaptation Working Group Recommendations
• Acquire high resolution topographic data for all of coastal Virginia (LIDAR)
• Base all State and Local planning on:
  • Temperature increase of approximately 3.6°F
  • Sea level rise of 2.3 feet, but tailored to local relative sea level rise
  • Greater instability in weather patterns and precipitation
• Closely monitor trends and adjust policies as necessary
The Forecast for Hampton Roads

SE Virginia sea level rise scenarios

Source: Dr. Carl Hershner, Virginia Institute of Marine Science, 2012
Hampton Roads is a Military Concentration Area
Sea Level Rise Increases Storm Surge Threat

Area potentially affected by a 5 foot storm surge

- Orange: 2 foot rise in mean sea level above current mean sea level
- Red: 5 foot rise in mean sea level above current mean sea level
Adapting to Sea Level Rise: Three Approaches

• Protect

• Accommodate

• Retreat
As sea level has risen over the last century, utilities suspended beneath old single deck piers have become increasingly vulnerable to damage from sea water immersion and are less accessible for maintenance. Utility outages have serious impact on the readiness of ships at the piers.

On the new double deck piers utilities are suspended from the upper deck, 21 feet above sea level – well above normal tides and storm surge.
Langley Air Force Base: Protect

High tide with 4’ sea level rise

Impact on the Huntington Ingalls Shipyard

Regional downscaling and its applications to sea-level rise impacts

Impacts of Hurricane Isabel on the Northrop Grumman Ship Yard

Record high water level at the Shipyard

James River spilling into dry dock #1
The Department of Defense and Armed Services Take Climate Change Seriously in Their Strategic Planning
department of defense

U.S. Navy

Naval Studies Board

Center for Naval Analyses
“And do you agree to not subpoena his research notes if his findings on climate change are not consistent with your preconceived political notions?”