A DUTCH DIALOGUE FOR HAMPTON ROADS

Integrated Water Management for Coastal Resilience

Organizing Sponsors:
Hampton Roads Planning District Commission
The Netherlands Embassy in Washington, DC
McNeilan & Associates

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November 21, 2014

Local Government Stakeholders Meeting

Water Management Issues in Hampton Roads

- Stormwater quantity and quality
- Groundwater supplies for industry and drinking water
- Wastewater
- Recurrent flooding
- Sea Level Rise

Attachment 7-A

Stormwater

- Impacts to infrastructure and property
- Regulatory mandates to manage quantity and quality
  - Changes to Virginia Stormwater Management Regulations
  - Chesapeake Bay Total Maximum Daily Load
  - MS4 Permits

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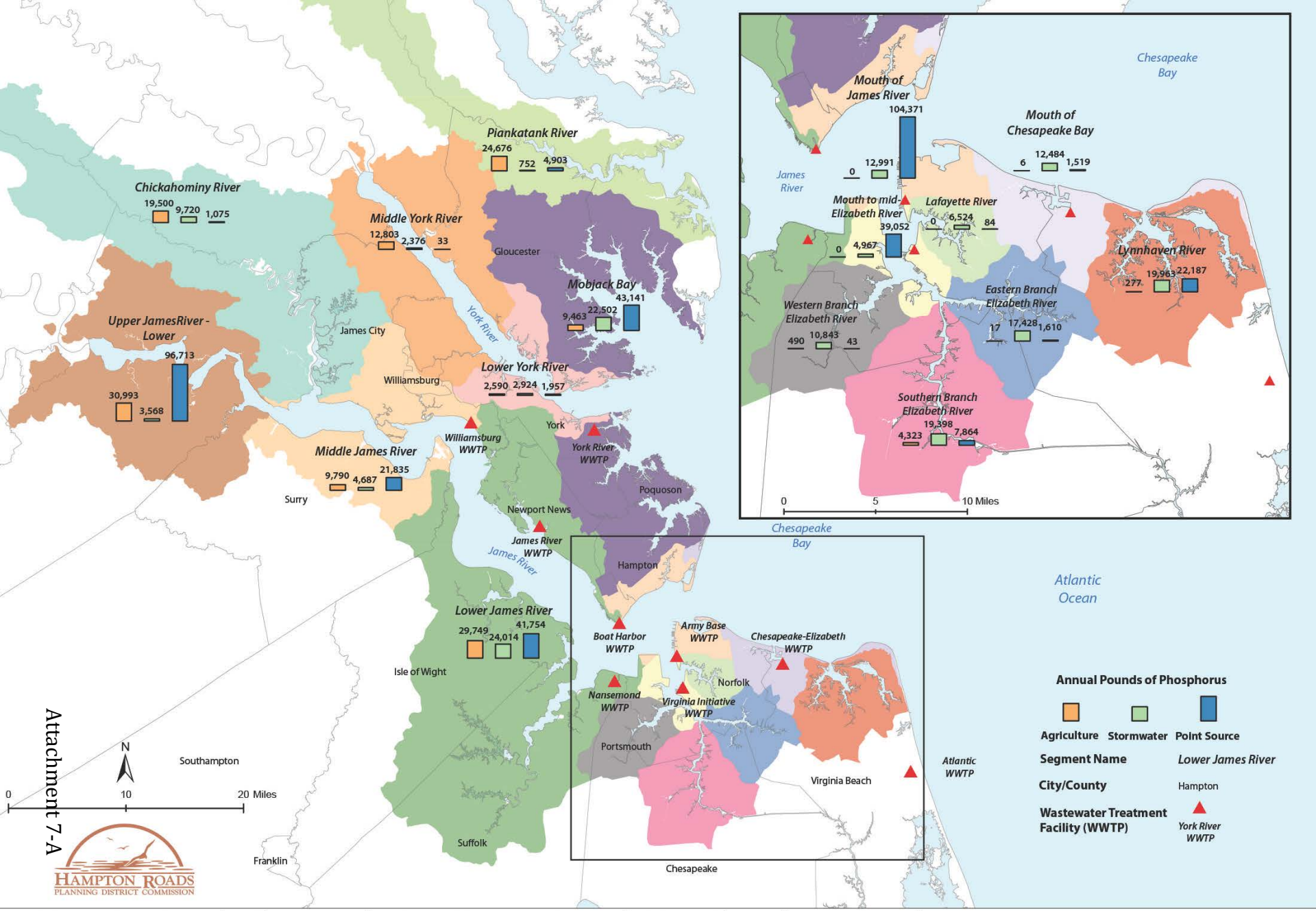

Hampton Roads Chesapeake Bay Segments and 2010 Phosphorus Loads

Stormwater Efforts

- Chesapeake Bay TMDL/WIP Process
- Phase I MS4 Permit Negotiations
- Implementation of revised local stormwater programs

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Groundwater

- Concerns with long-term sustainability of deep aquifers for industrial uses and drinking water
- Land subsidence caused by groundwater withdrawals

Groundwater Efforts

- Negotiations with DEQ over proposed reductions in groundwater permits
- Partnership with USGS to study land subsidence

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Wastewater

- Impairments in water bodies
- Regulatory violations for Clean Water Act standards
- Infrastructure maintenance
- Water reuse/aquifer replenishment

Wastewater Efforts

- Sanitary Sewer Overflow Consent Order
- Consolidated Regional Wet Weather Management Plan
- Regional environmental education program (FOG)

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Recurrent Flooding

- Nuisance Flooding
- Storm Surge
- Economic Impacts
- Property Damage

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Credit: Ben McFarlane

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Credit: City of Norfolk

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Recurrent Flooding Efforts

- Joint Subcommittee on Recurrent Flooding
- HRPDC Committee

Attachment 7-A

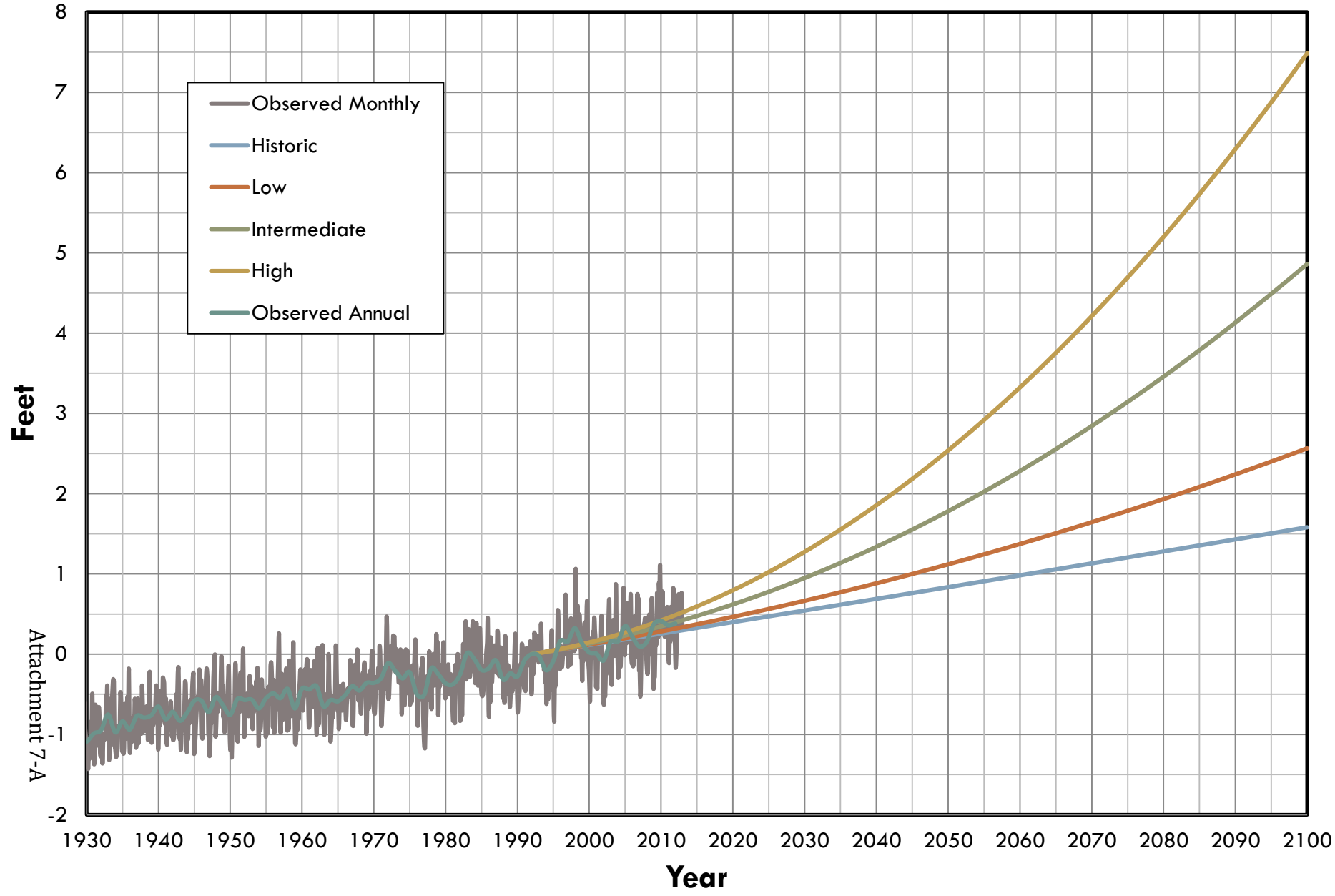
Sea Level Rise

- Global sea level rise
- Local influences
  - Ground subsidence (or uplift)
    - Glacial isostasy
    - Groundwater withdrawals
  - Changes in ocean currents
- In Hampton Roads, about half of the observed sea level rise is due to global sea level rise and half is due to subsidence

Sea Level Rise

- Sea level rise will result in significant impacts to our region.
  - Permanent inundation of some areas.
  - More frequent flooding of other areas.
  - Some areas that have not seen flooding will start to experience it.
- The long-term sea level trend in Hampton Roads is approximately 1.5 feet per century, but sea level rise is projected to accelerate.

Observed and Projected Relative Sea Level Change at Sewells Point Tide Gauge, Norfolk, VA (1930-2100)



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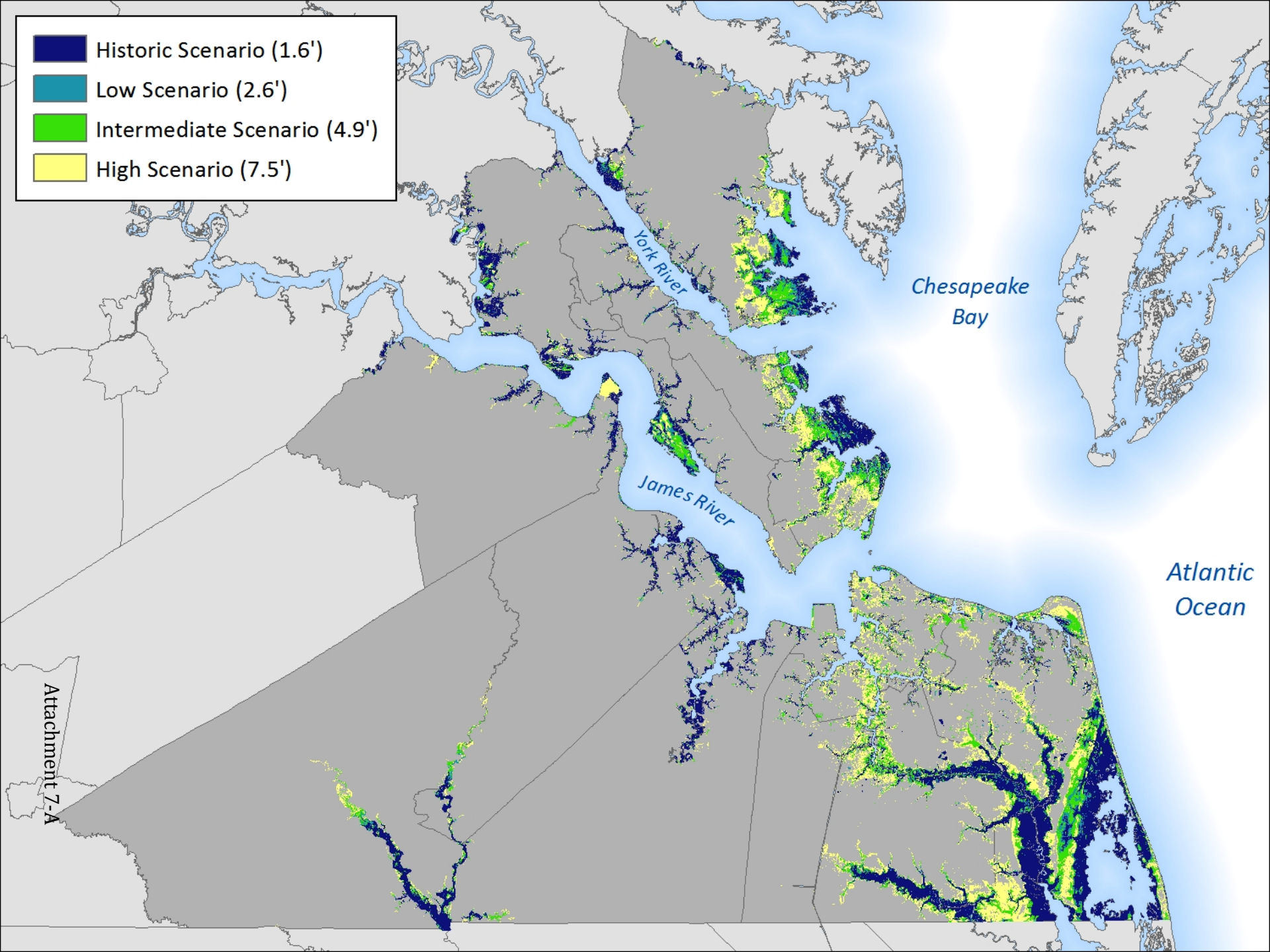

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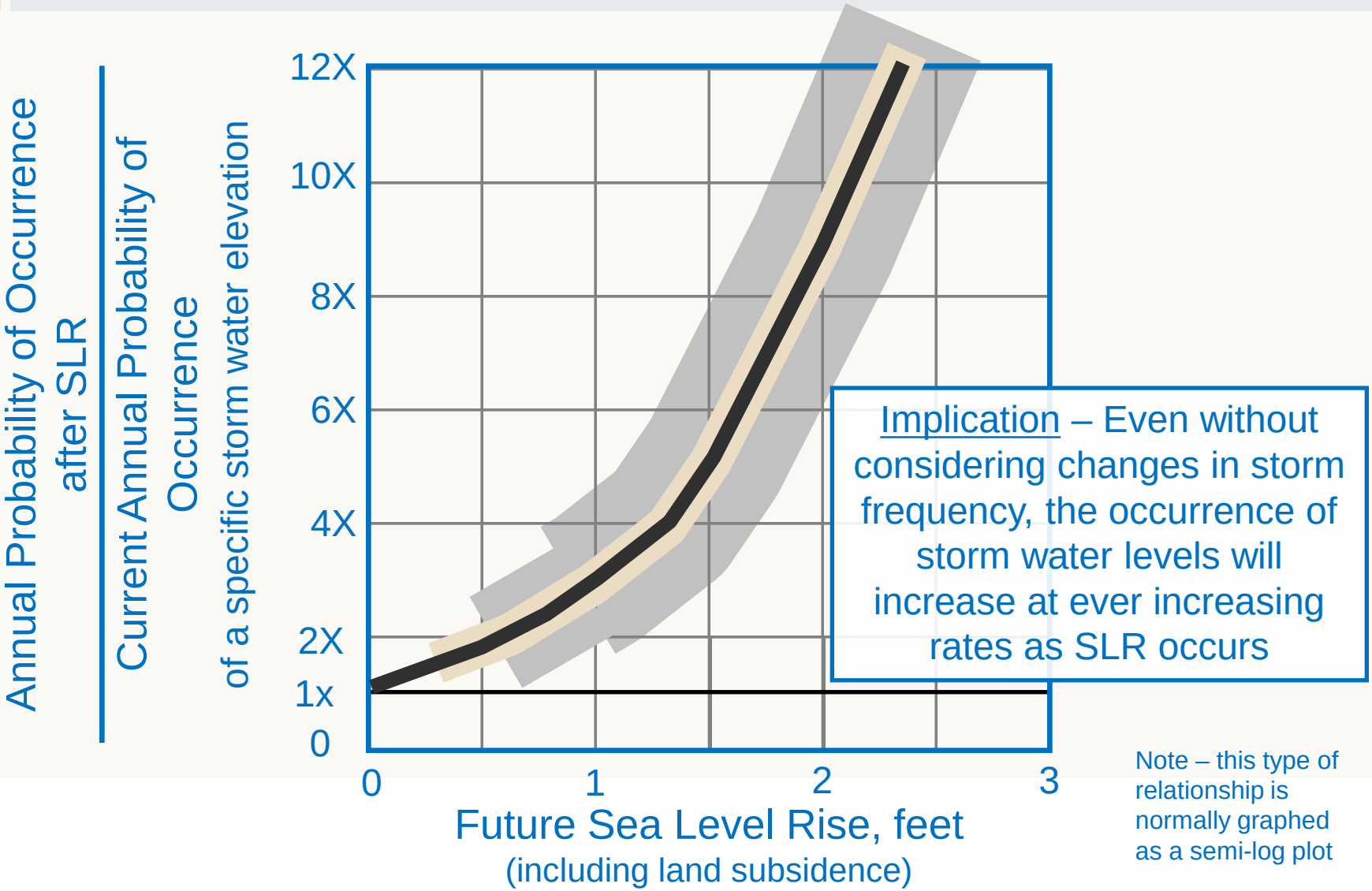
Sea Level Rise and Flooding



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Sea Level Rise Efforts

- Federal
  - USACE
- State
  - Governor's Climate Change and Resiliency Update Commission
- Regional
  - HRPDC Committee
  - ODU "Pilot Project"
- Local
  - Norfolk planning and analysis work
  - Virginia Beach watershed-based planning effort and studies
  - Poquoson partnership with NASA Langley
- Academic
  - Virginia Institute of Marine Science Center for Coastal Resources Management
  - ODU Mitigation and Adaptation Research Institute ("MARI")

- The challenge for Hampton Roads is to address water management issues while also encouraging economic growth and ensuring a high quality of life for residents.