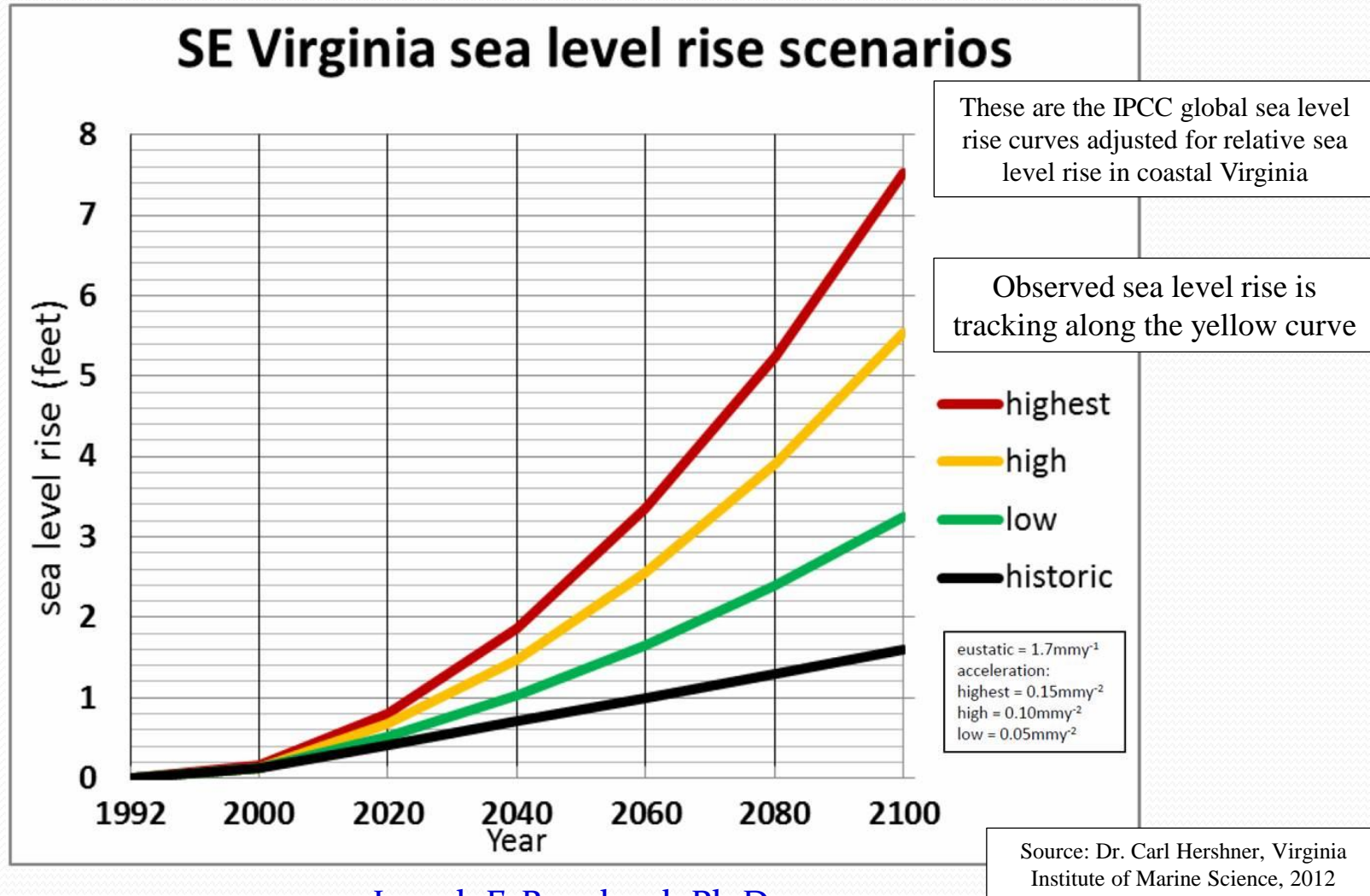
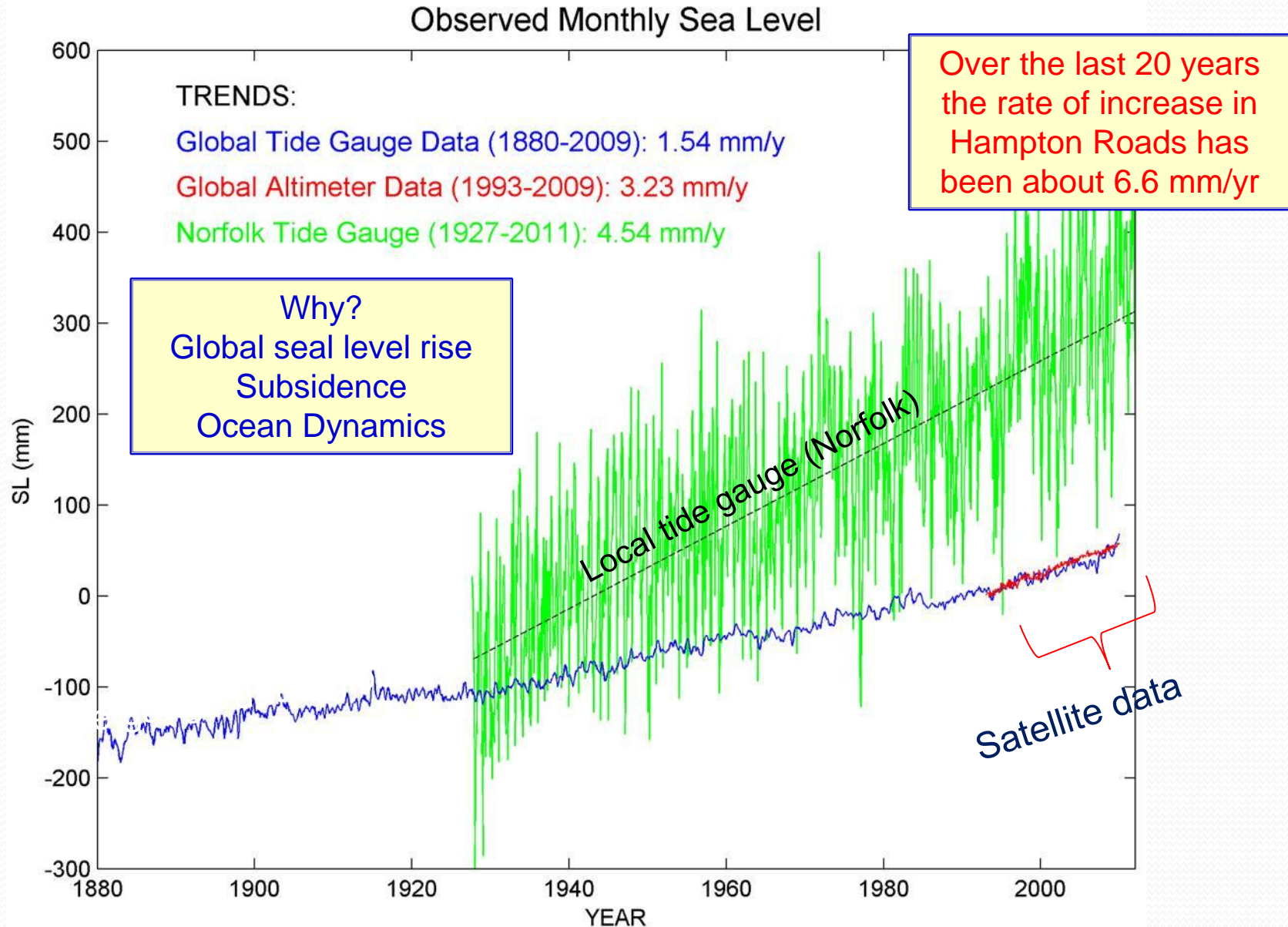


# Sea Level Rise Adaptation in Virginia and the Department of Defense



Joseph F. Bouchard, Ph.D.  
Captain, U.S. Navy (Ret.)  
October 17, 2013

# Sea Level is Rising Faster in Hampton Roads than Globally



# The Department of Defense and Armed Services Take Climate Change Seriously in Their Strategic Planning



## QUADRENNIAL DEFENSE REVIEW REPORT

FEBRUARY 2010

Department  
of  
Defense

National  
Academy  
of  
Sciences

### National Security Implications of Climate Change for U.S. Naval Forces

Committee on National Security Implications of Climate Change for U.S. Naval Forces; National Research Council

ISBN: 0-309-15426-X, 226 pages, 6 x 9, (2011)

This free PDF was downloaded from:  
<http://www.nap.edu/catalog/12914.html>

U.S. Navy

DOD SERDP

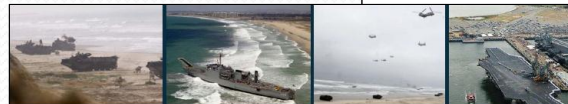
### U.S. NAVY CLIMATE CHANGE ROADMAP



April 2010

This document is sponsored by:  
Task Force Climate Change / Oceanographer of the Navy

1  
UNCLASSIFIED



### Assessing Impacts of Climate Change on Coastal Military Installations: Policy Implications

Prepared by:  
Strategic Environmental Research and Development Program  
US Department of Defense

January 2013



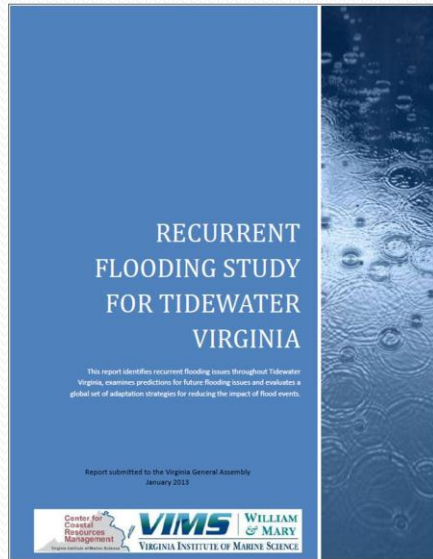
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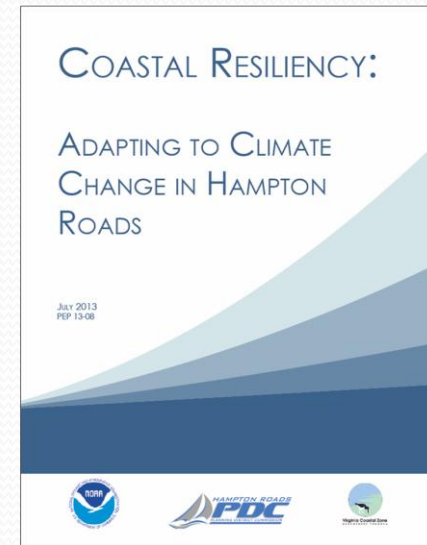


# Hampton Roads Takes Sea Level Rise Seriously

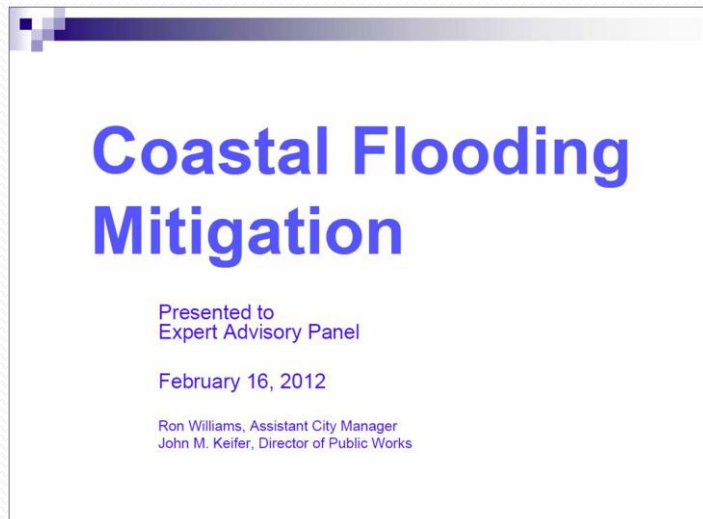
Virginia Institute of Marine Science



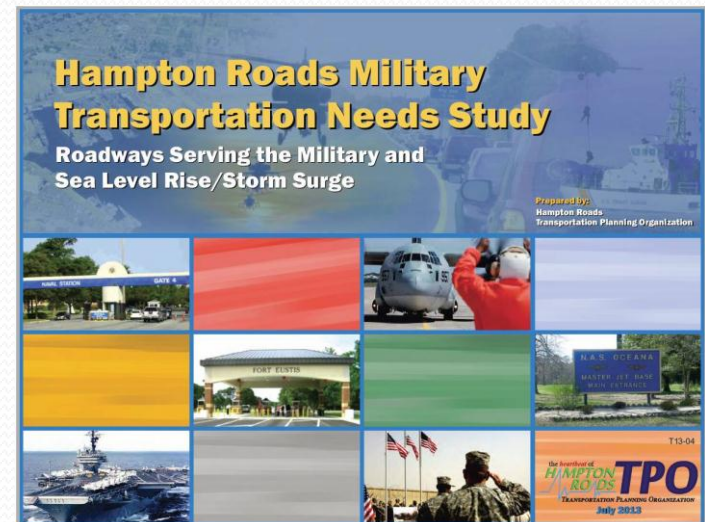
Hampton Roads Planning District Commission



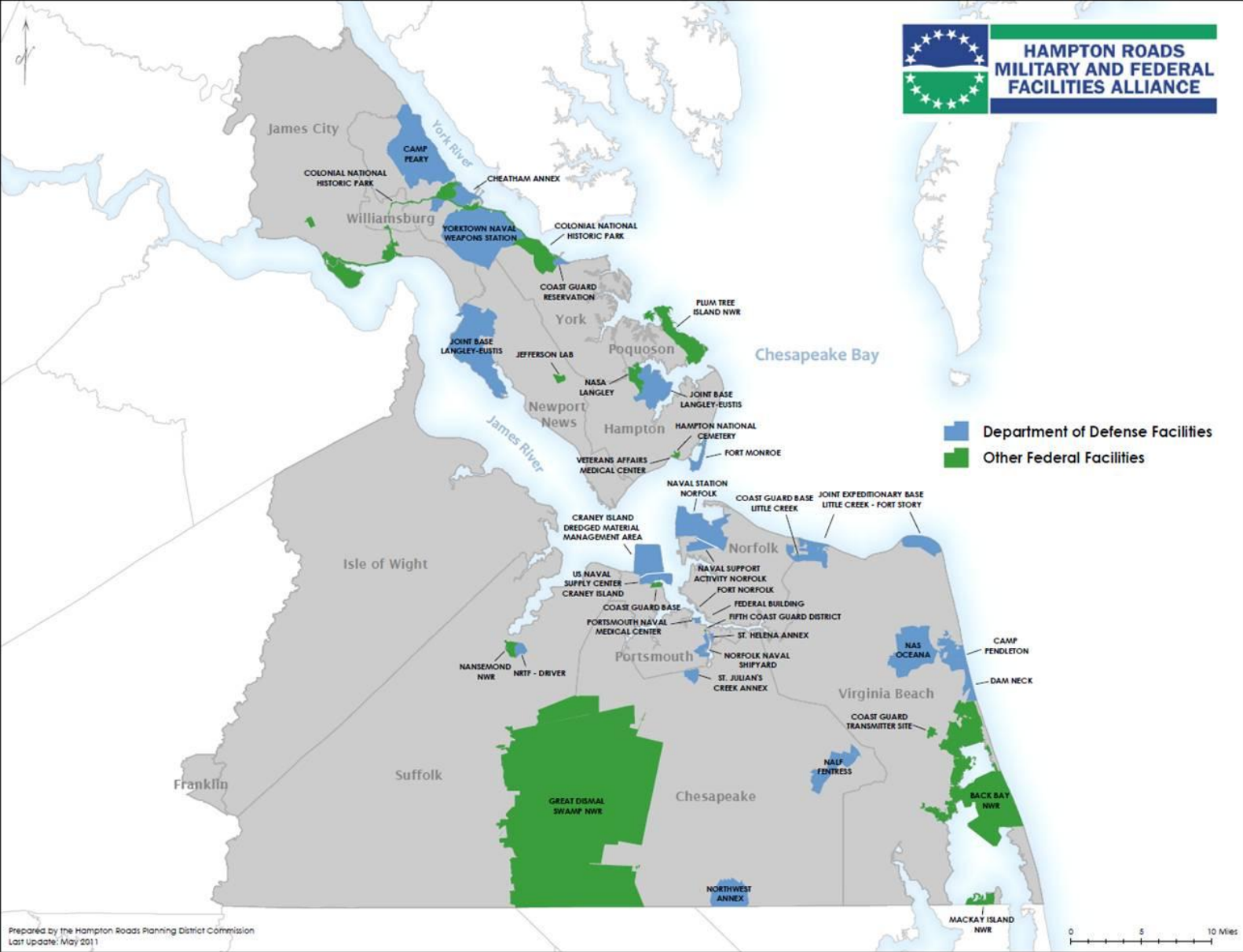
City of Norfolk



Hampton Roads Transportation Planning Organization

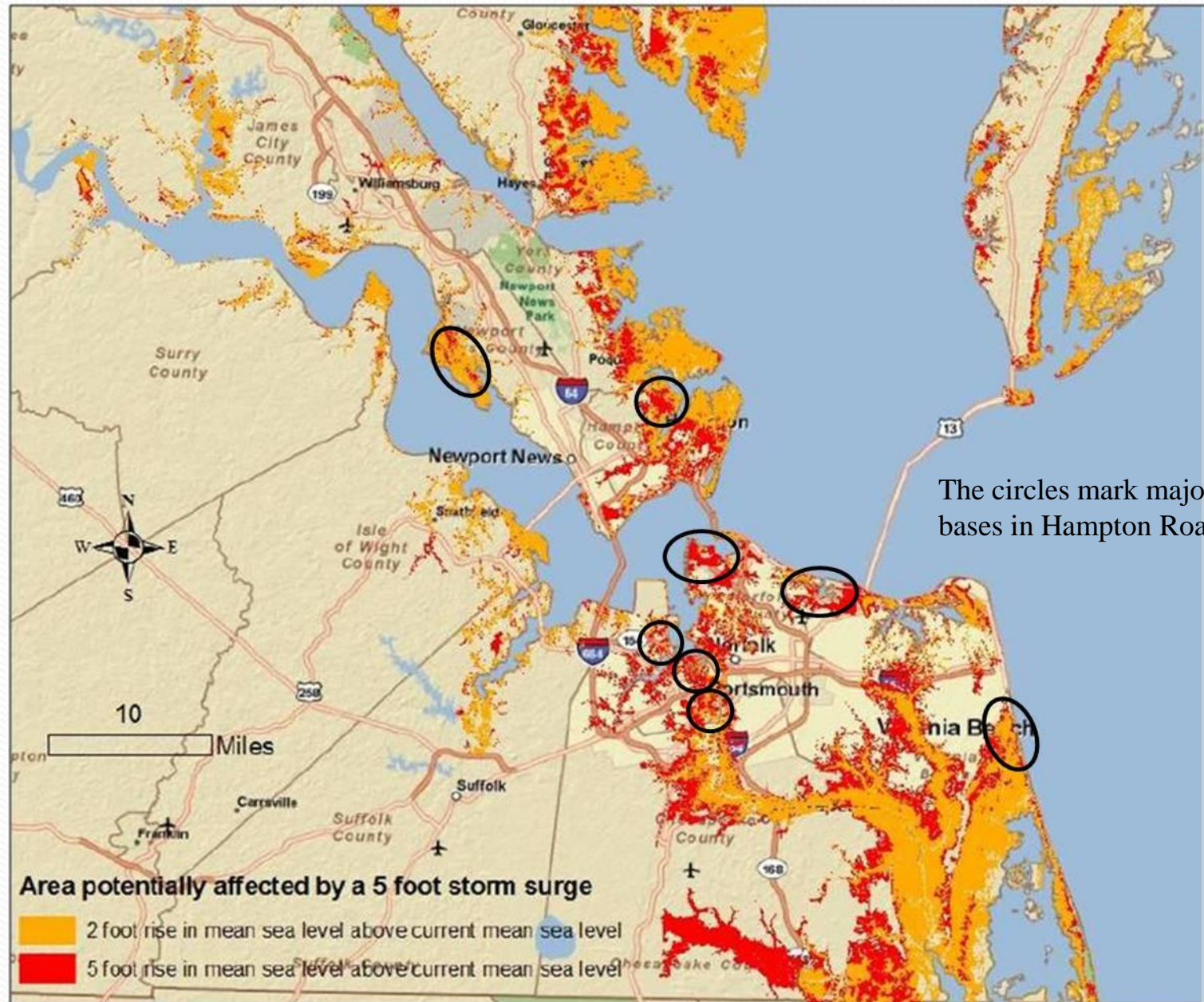


# Hampton Roads Virginia is a Military Concentration Area





# Sea Level Rise Increases Storm Surge Threat





# Naval Station Norfolk



Hurricane Isabel September 2003



50 year storm with 5 feet of sea level rise  
100 year storm with 5 feet of sea level rise





# Langley Air Force Base

November 2009 Nor'easter



High tide with 4' sea level rise



Hurricane Isabel September 2003

Source: Oak Ridge National Laboratory, "Langley Air Force Base: An Assessment of Vulnerability to Projected Climate Change Impacts," <http://www.ornl.gov/sci/knowledgediscovery/Langley/>



# Military Bases in Florida are Vulnerable

**FINAL REPORT**  
Effects of Near-Term Sea-Level Rise on Coastal Infrastructure

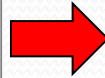
SERDP Project RC-1700

MARCH 2013

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# Recommendations

## Start Investing in Adaptation *NOW*

- Include projected sea level rise in the design of new or replacement infrastructure
- Don't wait until it becomes a crisis – acting now is the best way to ensure a robust economic future

## Give priority to critical infrastructures

- Electrical grid, transportation systems, water, sanitation, telecommunications, etc.
- Challenge: Some are privately owned

## Local communities and state must partner with military bases

- No base is self-sufficient – all depend on surrounding region for critical infrastructure

## Remember the Adaptation-Mitigation tradeoff:

- *Mitigation* fosters new industries, grows the economy and creates new jobs
- *Adaptation* only reduces economic loss