

An aerial photograph of a residential area in Washington, DC, overlaid with a color-coded map showing projected sea level rise and flooding. The map uses a color gradient from yellow (low elevation) to red (high elevation) to indicate the extent of flooding. The text '15th St' is visible vertically on the map. The background of the slide is a solid blue color.

Sea Level Rise and Flooding in the Washington, DC Metropolitan Region

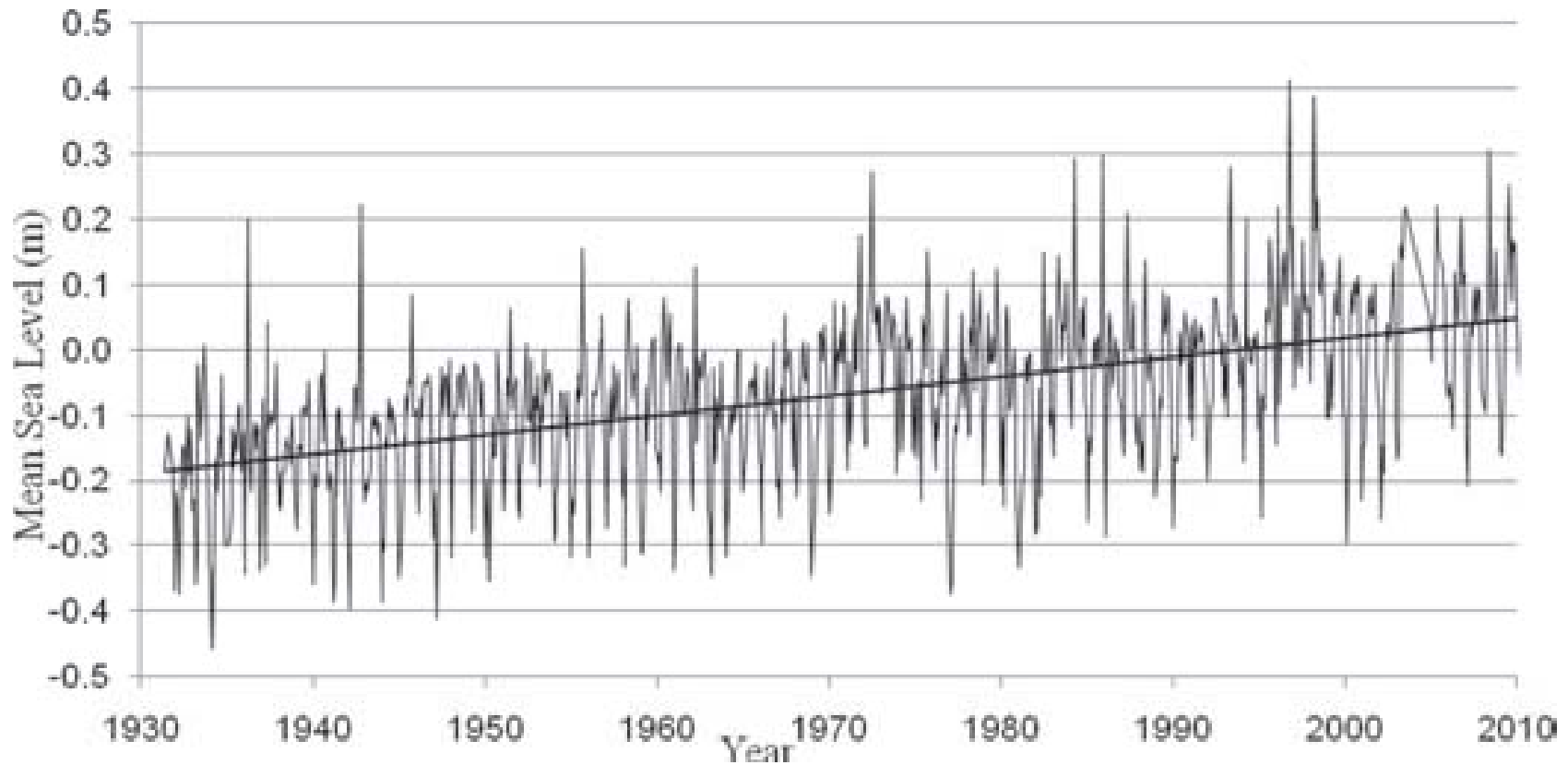
Wade Smith
Noblis
Falls Church, VA

Climate Change
Symposium

21 May 2012

Washington Metropolitan
Council of Governments

Sea Level Rise at Washington, DC



Source: Ayyub et al. in Risk Analysis, 2011

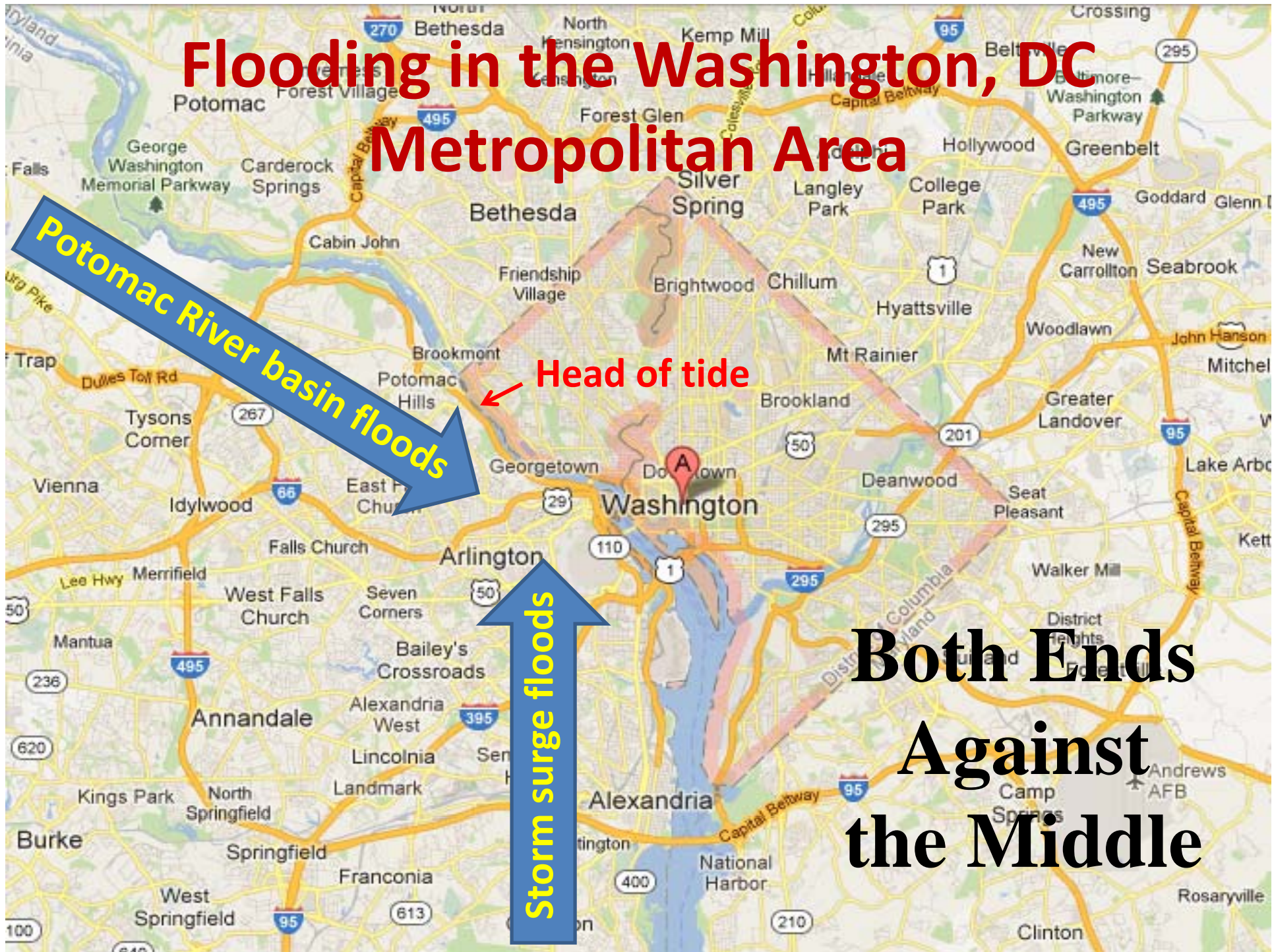
Flooding in the Washington, DC Metropolitan Area

Potomac River basin floods

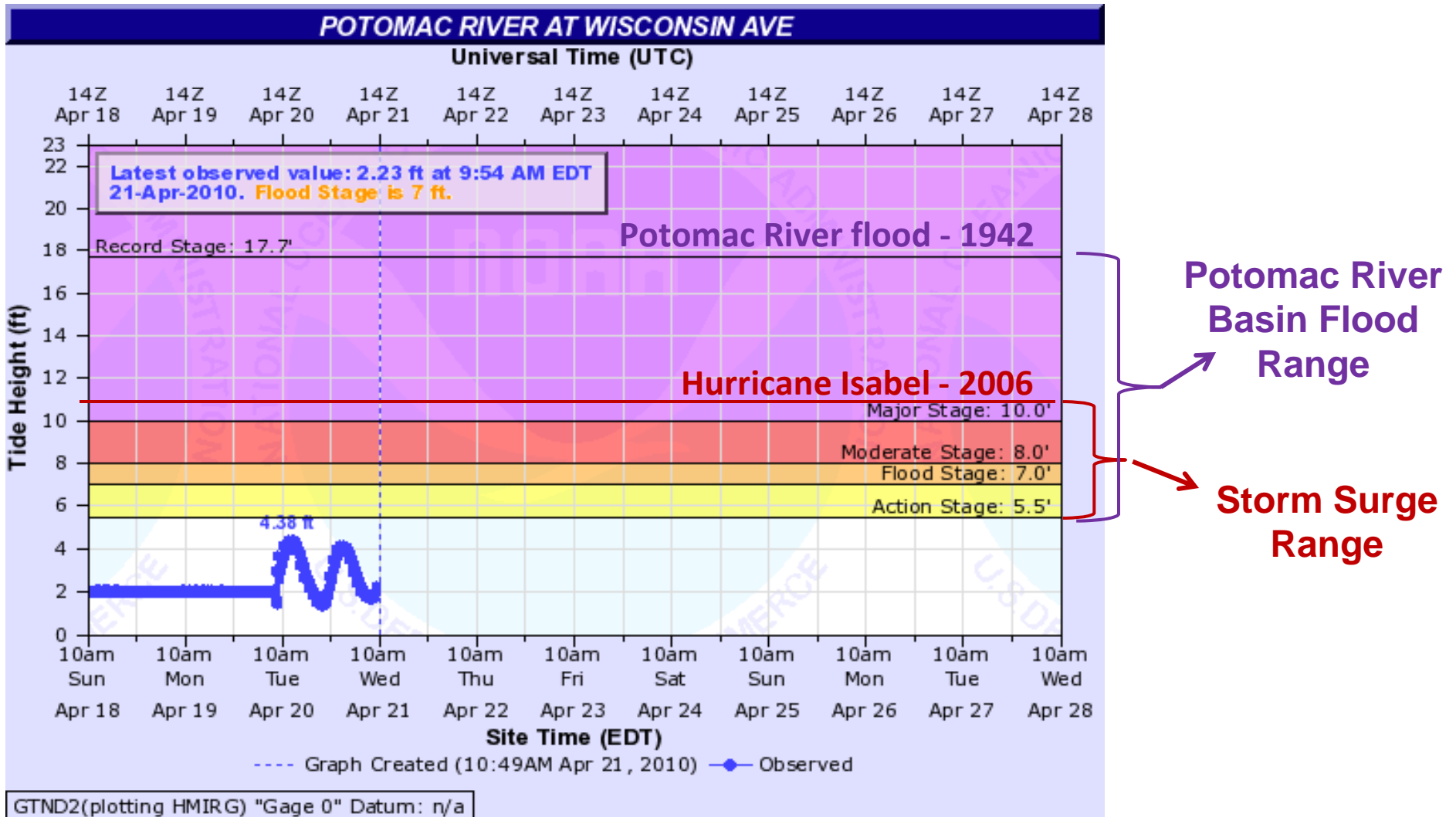
Head of tide

Storm surge floods

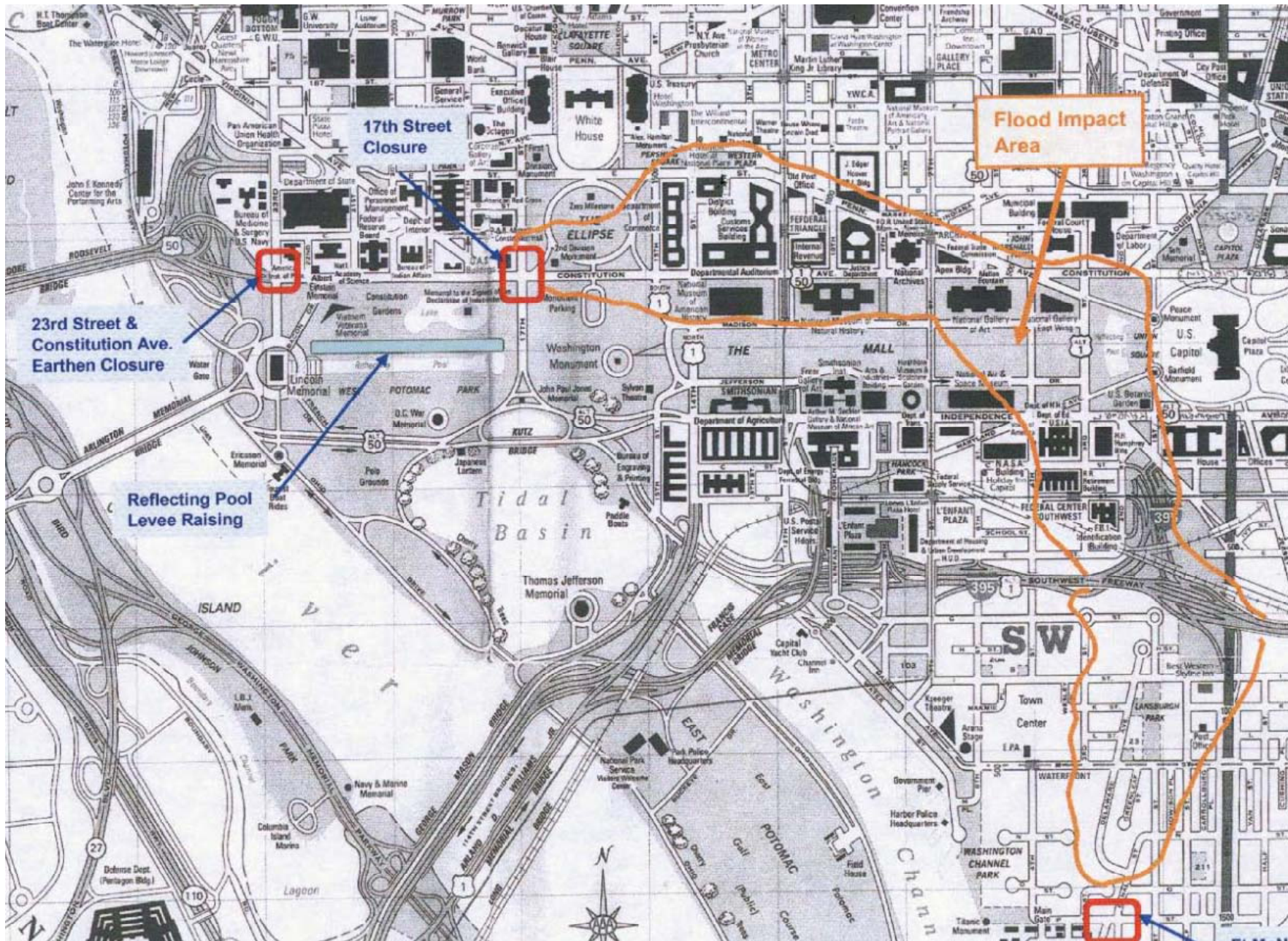
Both Ends
Against
the Middle



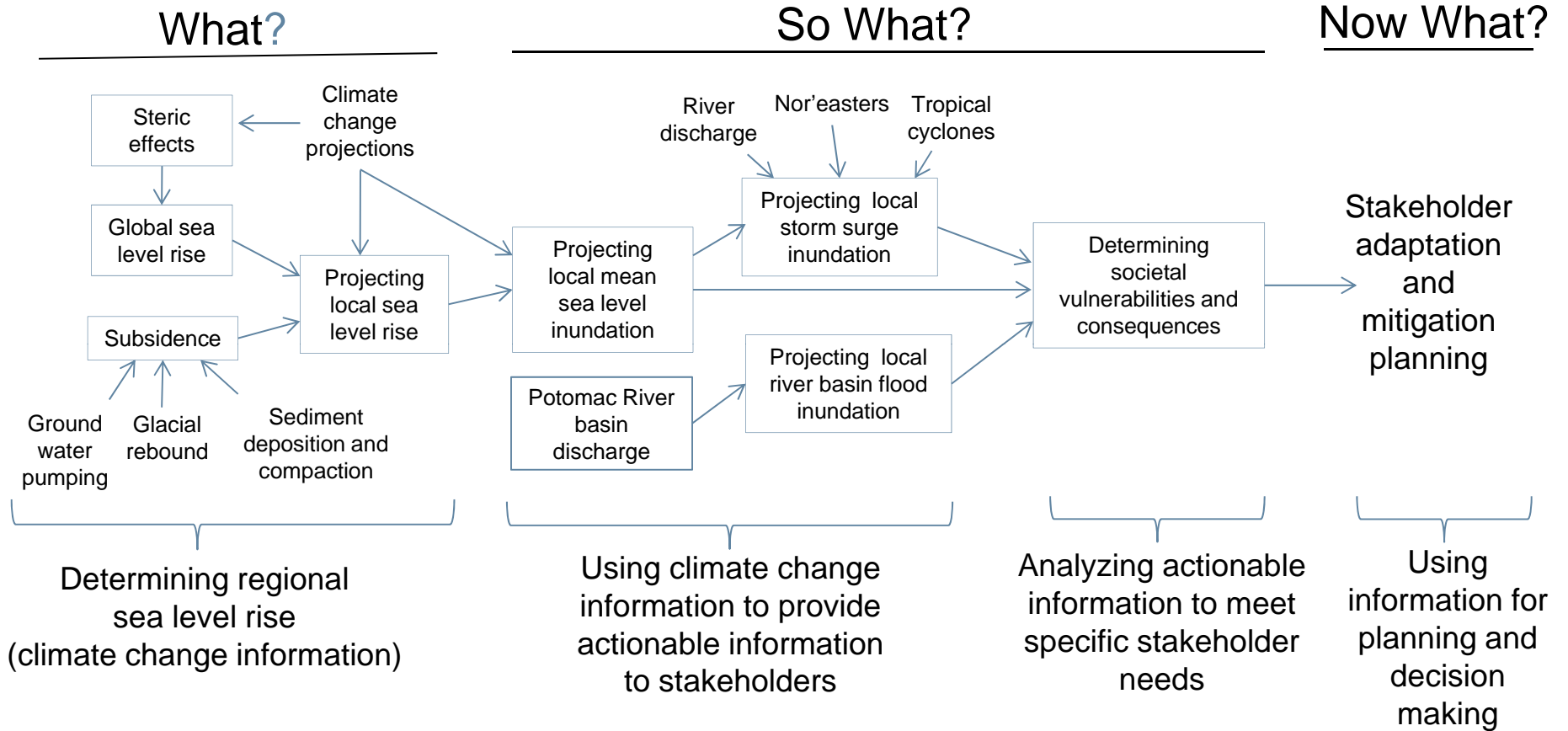
Range of Peak Water Level Events at Georgetown

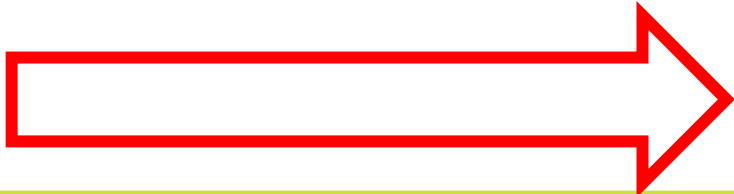


Washington, DC Flood Risk Area



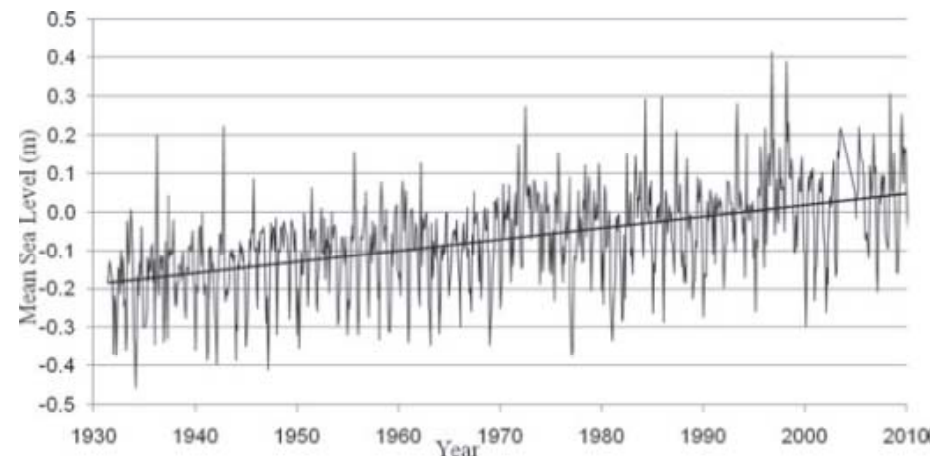
Adapting to Sea Level Rise



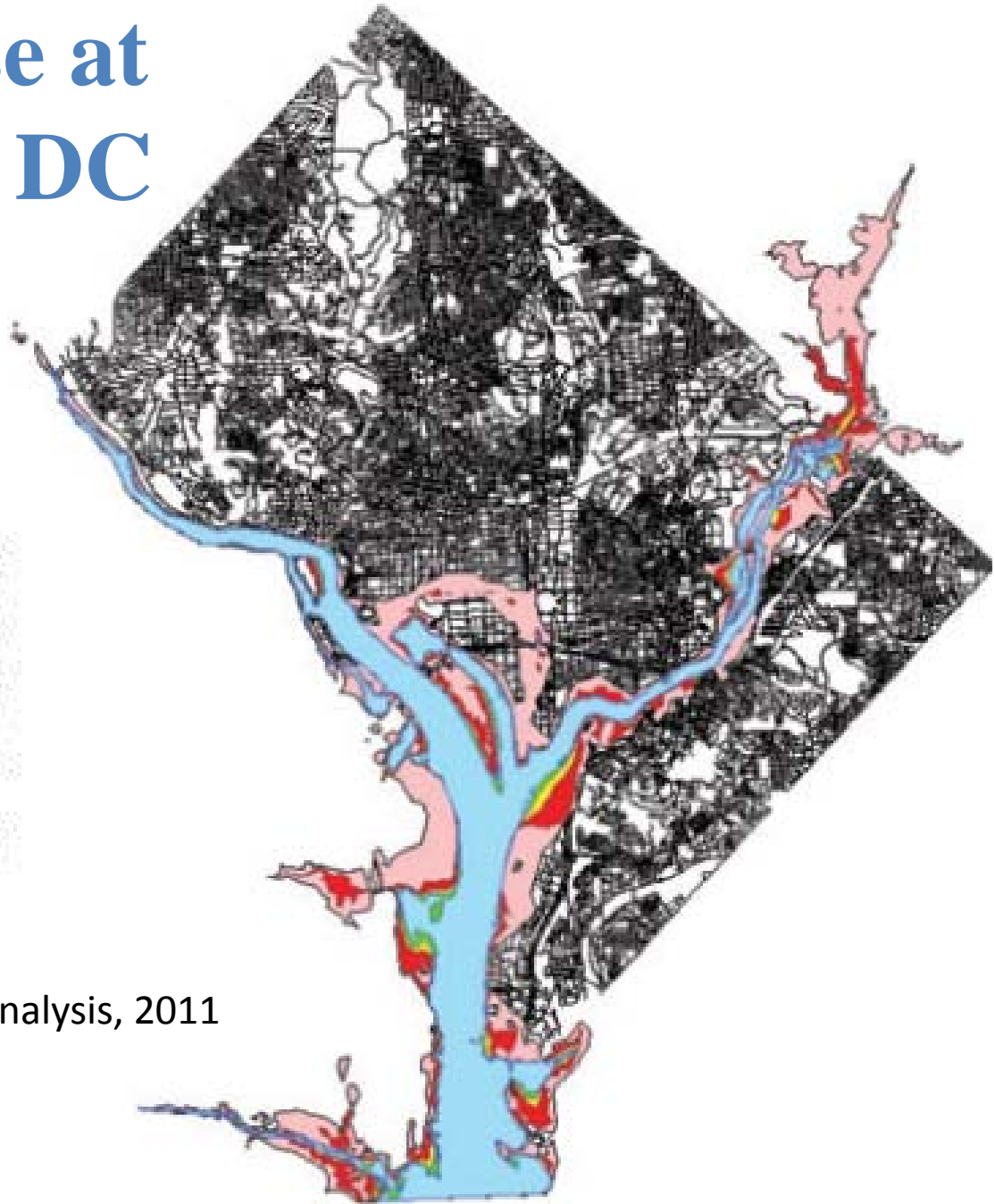
Information  **Action**



INUNDATION FROM SEA LEVEL RISE

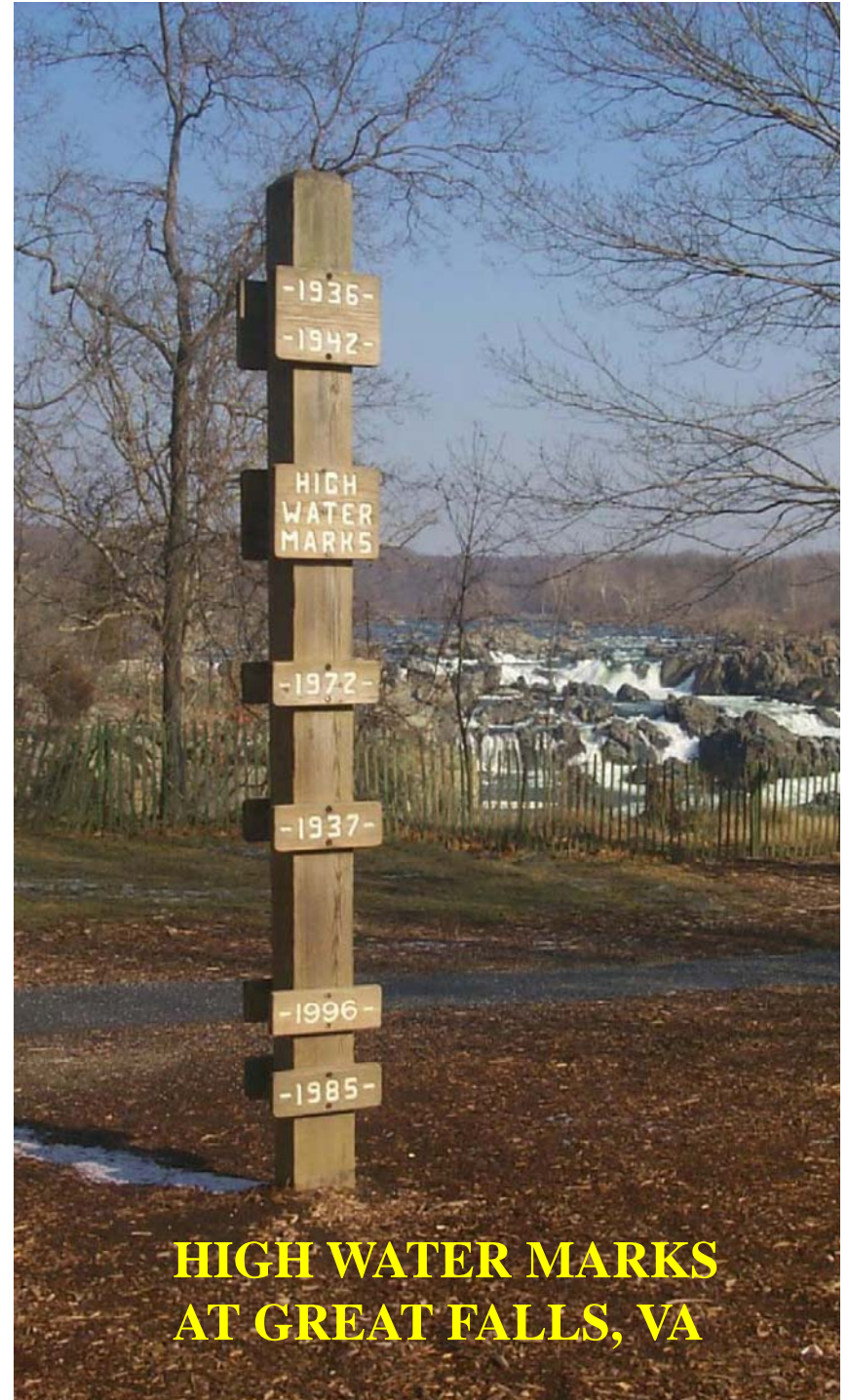


Sea Level Rise at Washington, DC



Source: Ayyub et al. in Risk Analysis, 2011

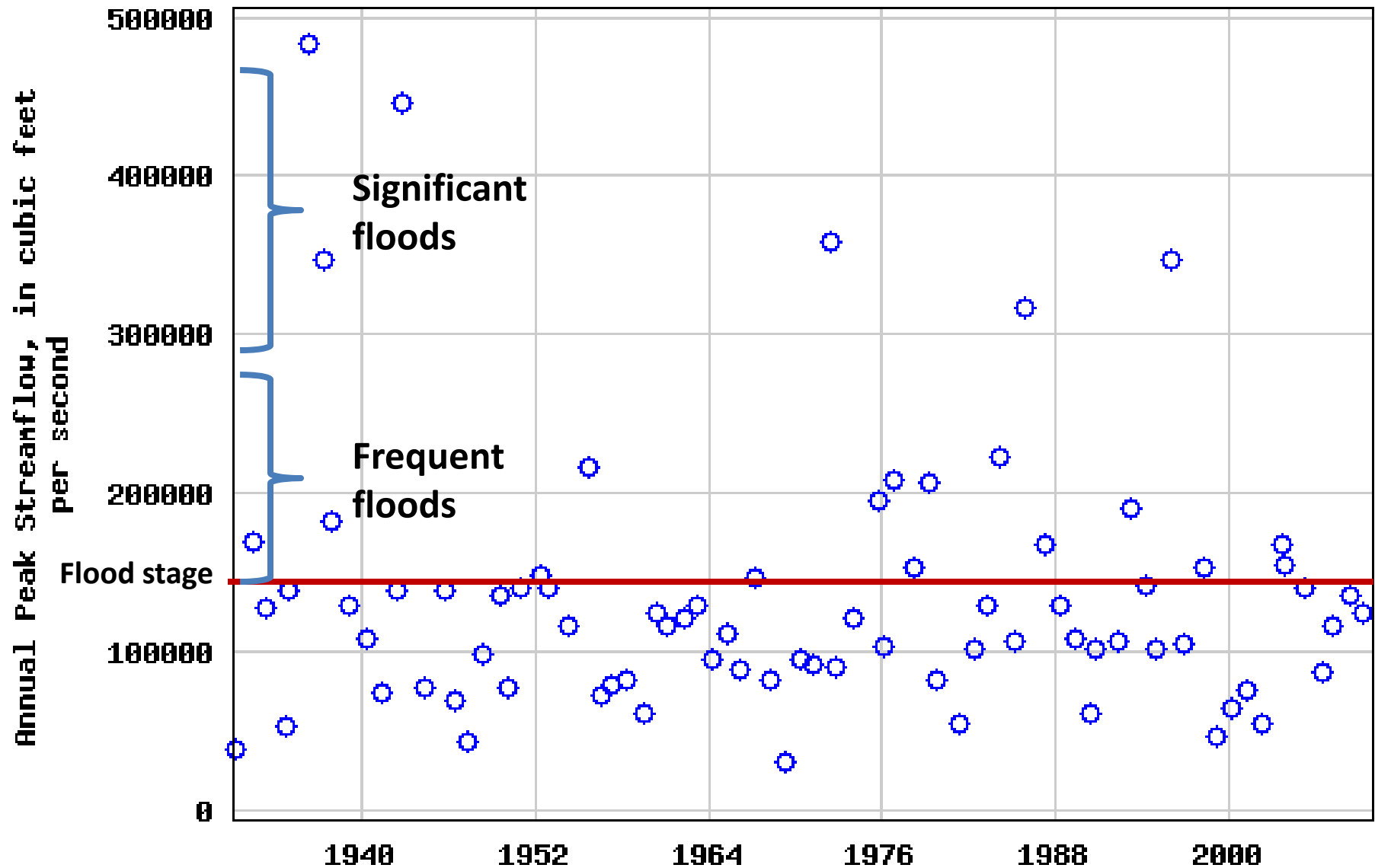
INUNDATION FROM POTOMAC RIVER BASIN FLOODS



**HIGH WATER MARKS
AT GREAT FALLS, VA**



USGS 01646500 POTOMAC RIVER NEAR WASH, DC LITTLE FALLS PUMP STA



1936 Potomac River Flood



1942 Potomac River Flood – Navy Yard



1942 Potomac River Flood – Navy Yard



River Flooding at Washington Harbor



March 2010

River Flooding at Washington Harbor



March 2010

River Flooding at Washington Harbor



March 2010

River Flooding at Alexandria



March 2010

1936 Potomac River Basin Flood Washington, DC

Hydrodynamic Model
Simulation
10 m Resolution

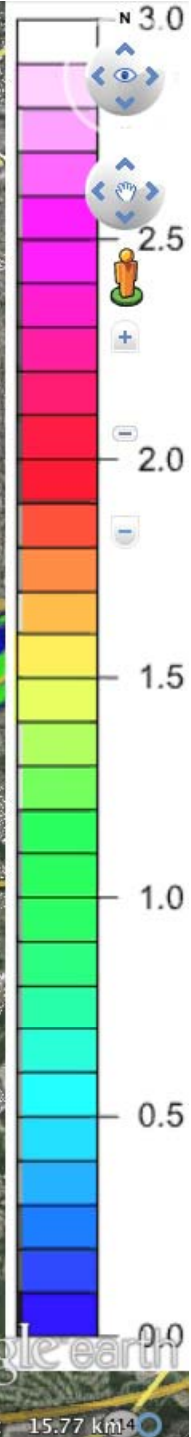
19 March 1936 at 8 PM

Courtesy :
Dr. Harry Wang
Dr. David Forrest
Derek Loftis



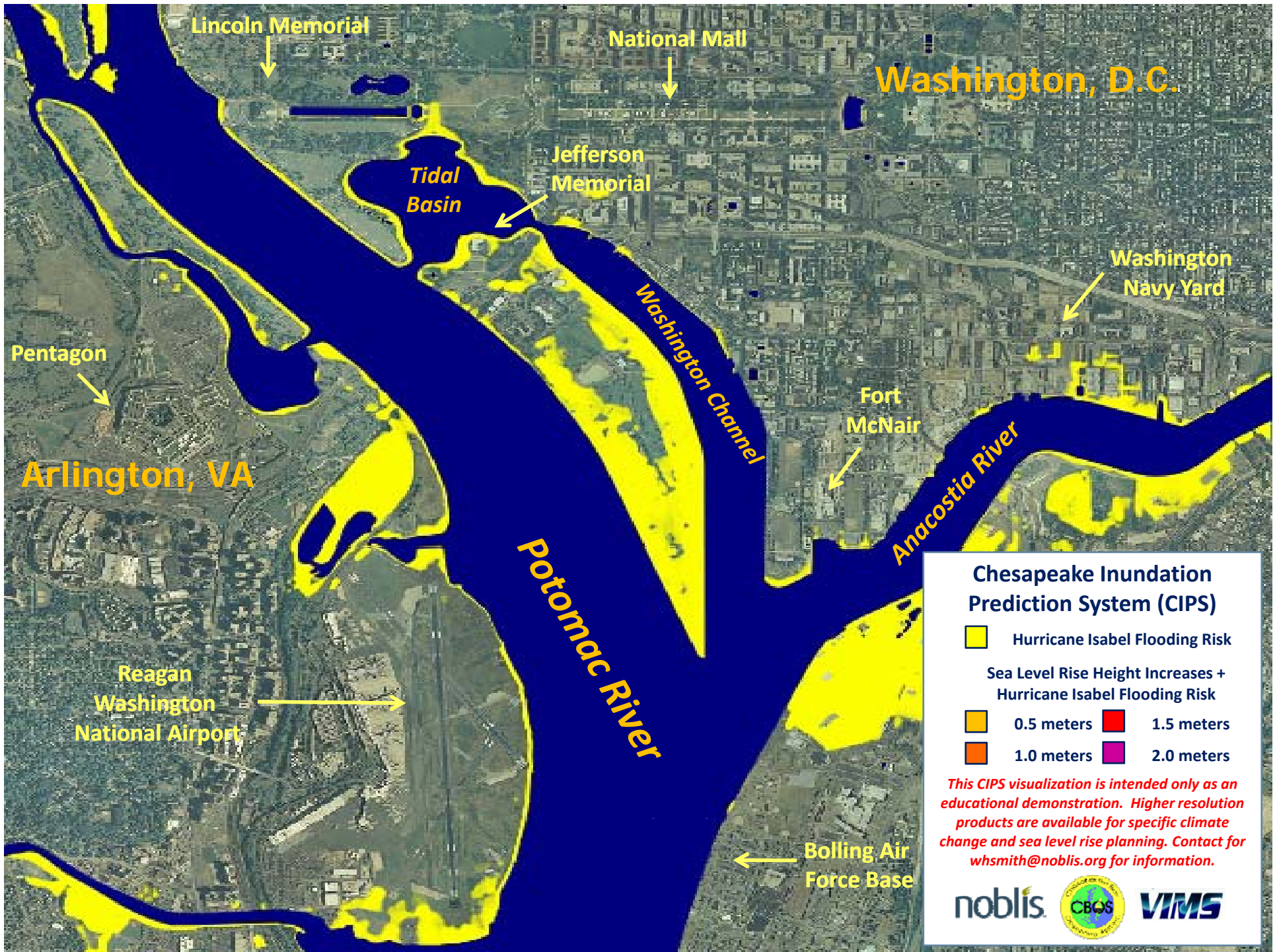
Gray Buildings © 2008 Sanborn
© 2012 Google
Gray Buildings © District of Columbia (DC GIS) & CyberCity
Gray Buildings © 2011 CyberCity

lat 38.877095° lon -77.044080° elev 5 m



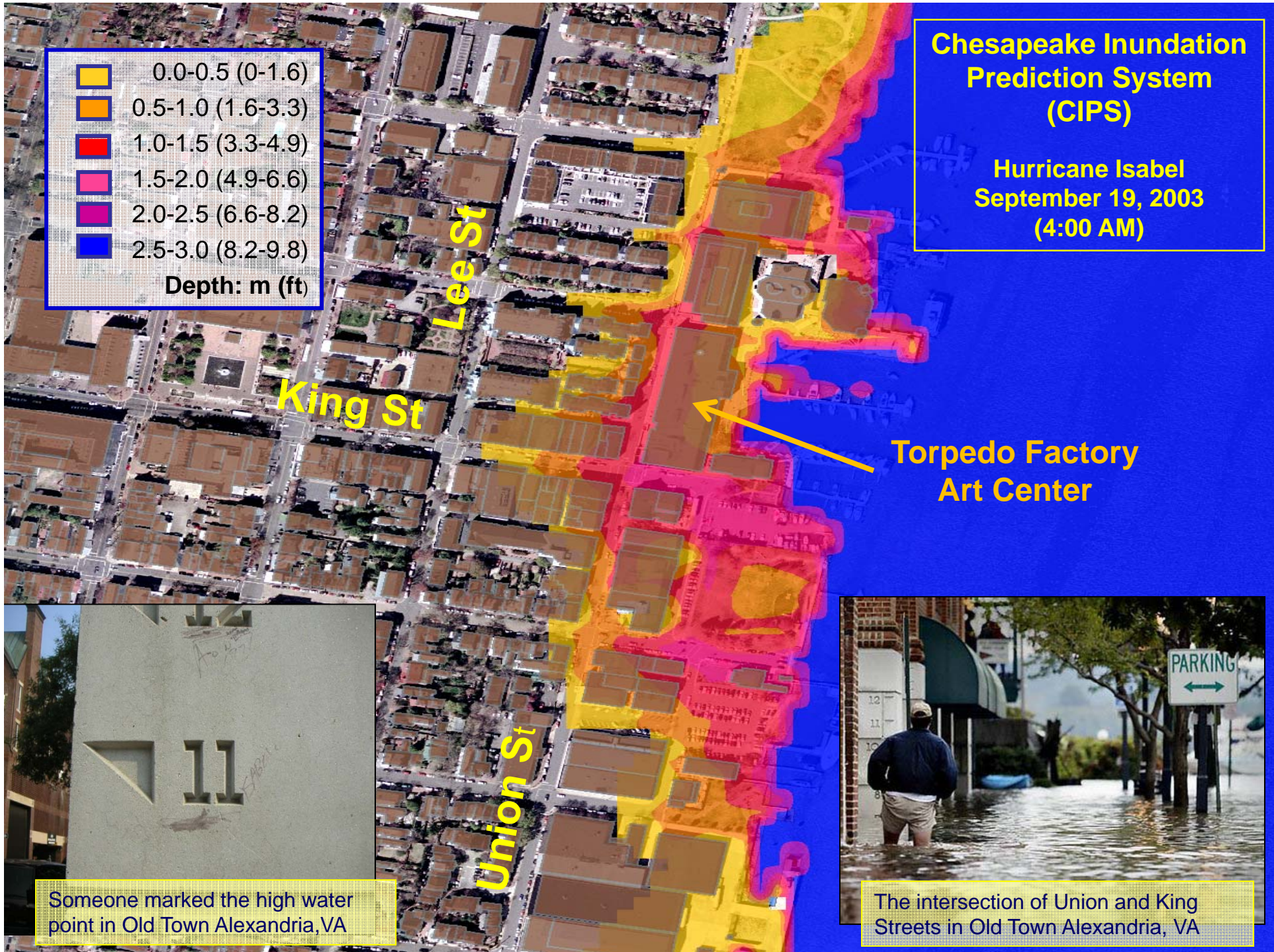
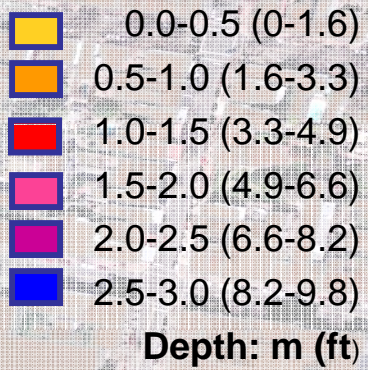
INUNDATION FROM STORM SURGE





Chesapeake Inundation Prediction System (CIPS)

Hurricane Isabel
September 19, 2003
(4:00 AM)



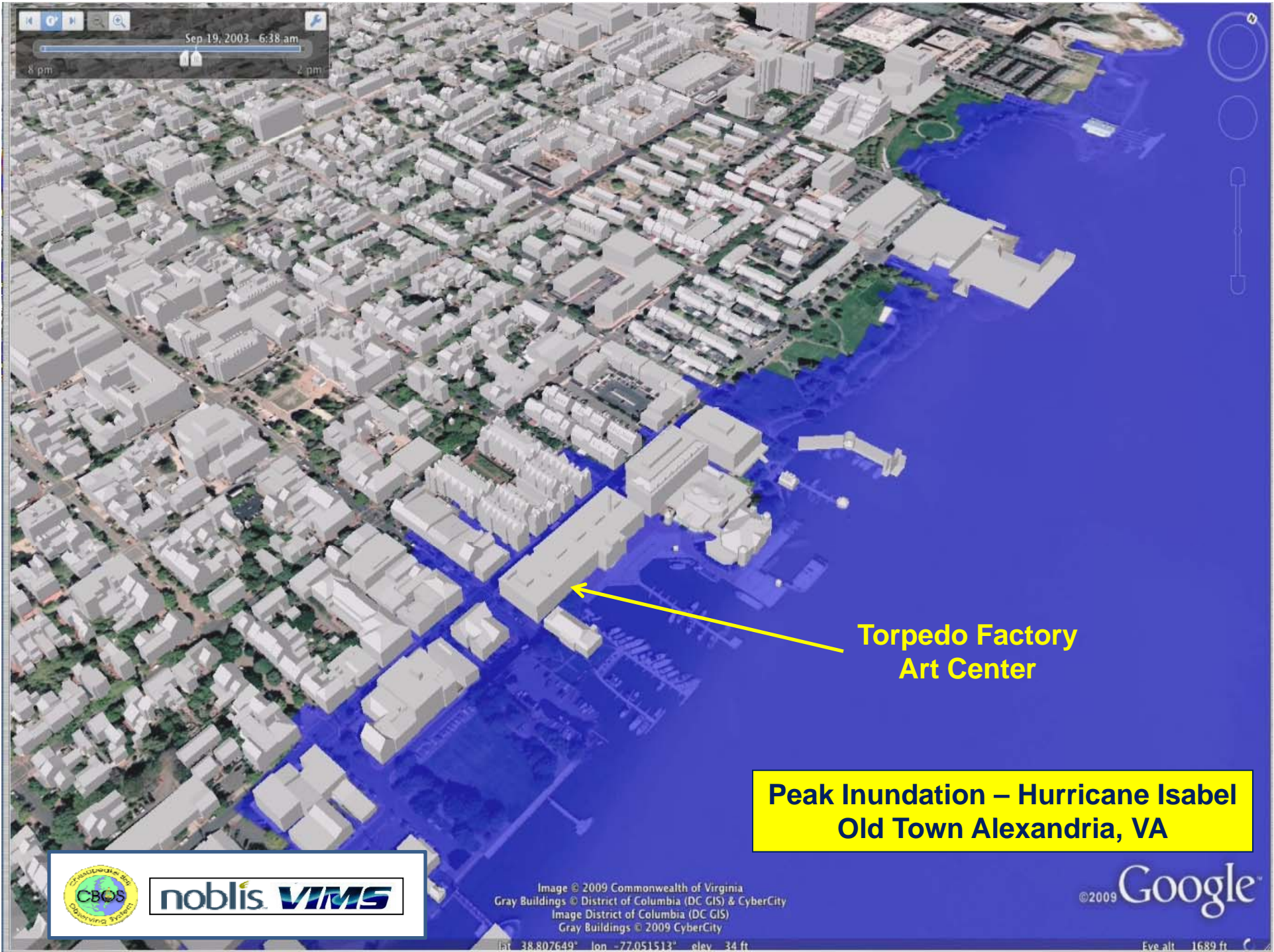
Torpedo Factory
Art Center



Someone marked the high water point in Old Town Alexandria, VA



The intersection of Union and King Streets in Old Town Alexandria, VA



**Torpedo Factory
Art Center**

**Peak Inundation – Hurricane Isabel
Old Town Alexandria, VA**

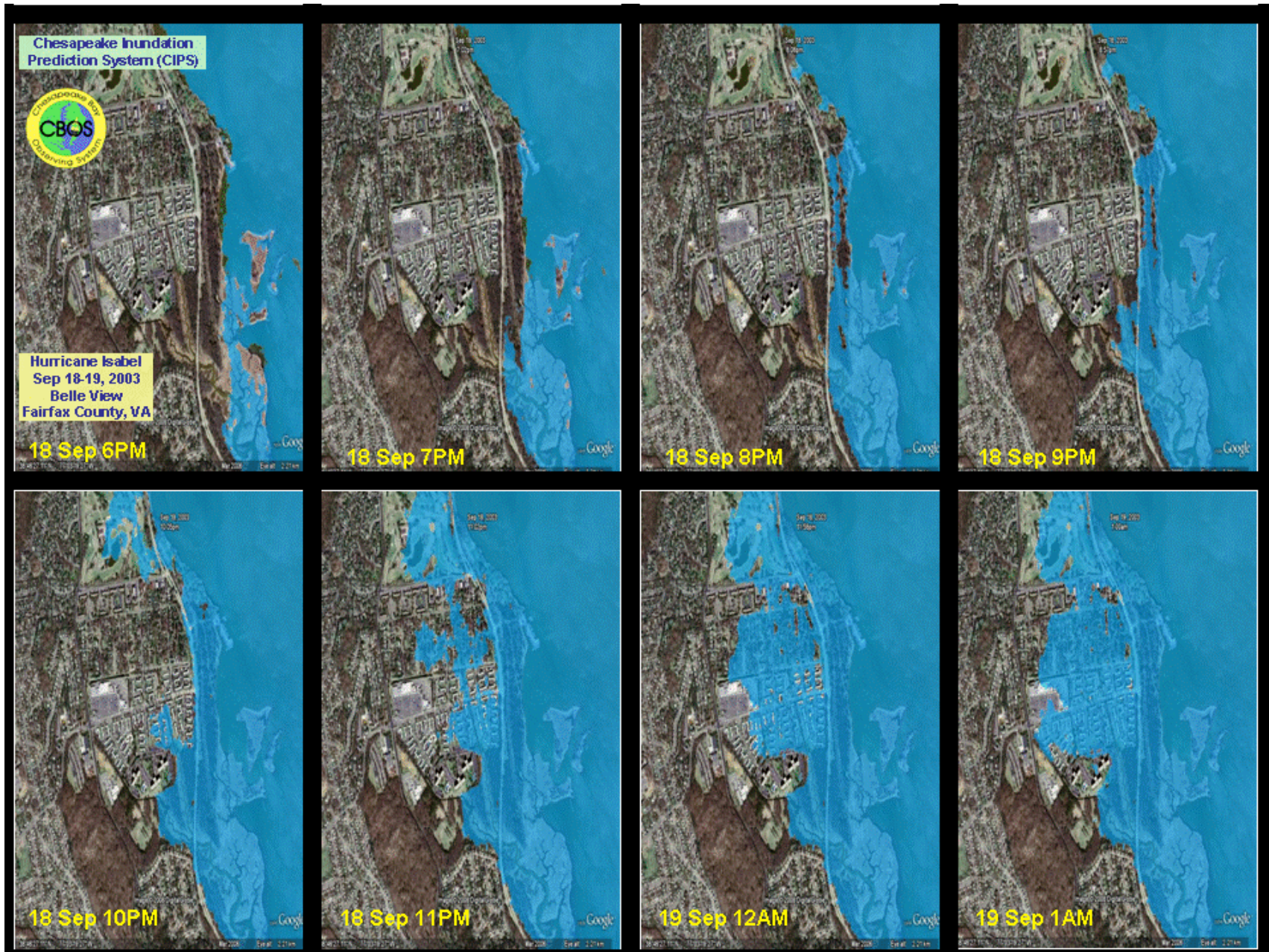


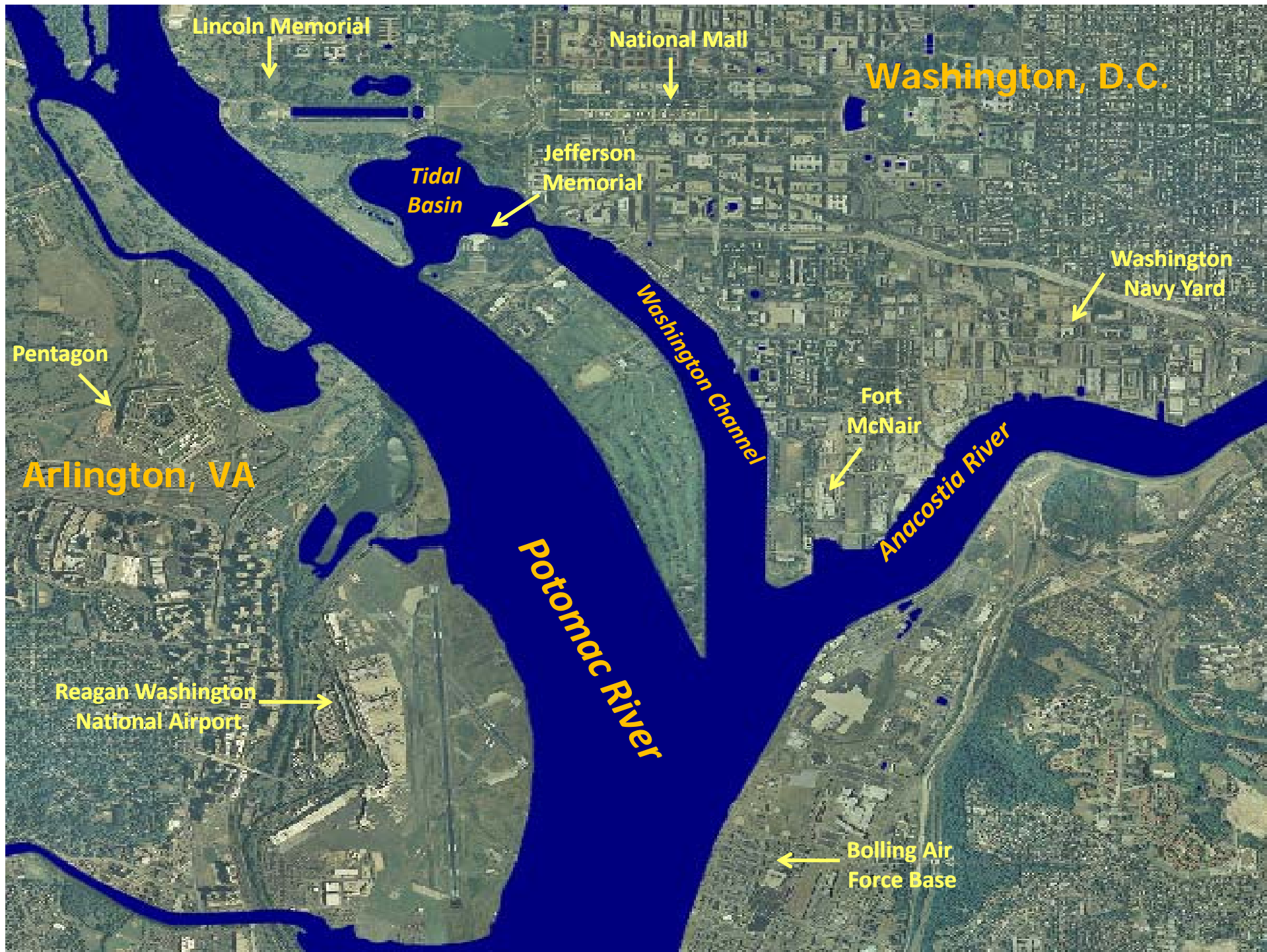
Image © 2009 Commonwealth of Virginia
Gray Buildings © District of Columbia (DC GIS) & CyberCity
Image District of Columbia (DC GIS)
Gray Buildings © 2009 CyberCity

©2009 Google

lat 38.802649° lon -77.051513° elev 34 ft Eye alt 1689 ft

Hurricane Isabel Flooding at Belle View, VA





Lincoln Memorial

National Mall

Washington, D.C.

Jefferson Memorial

Tidal Basin

Washington Navy Yard

Pentagon

Fort McNair

Arlington, VA

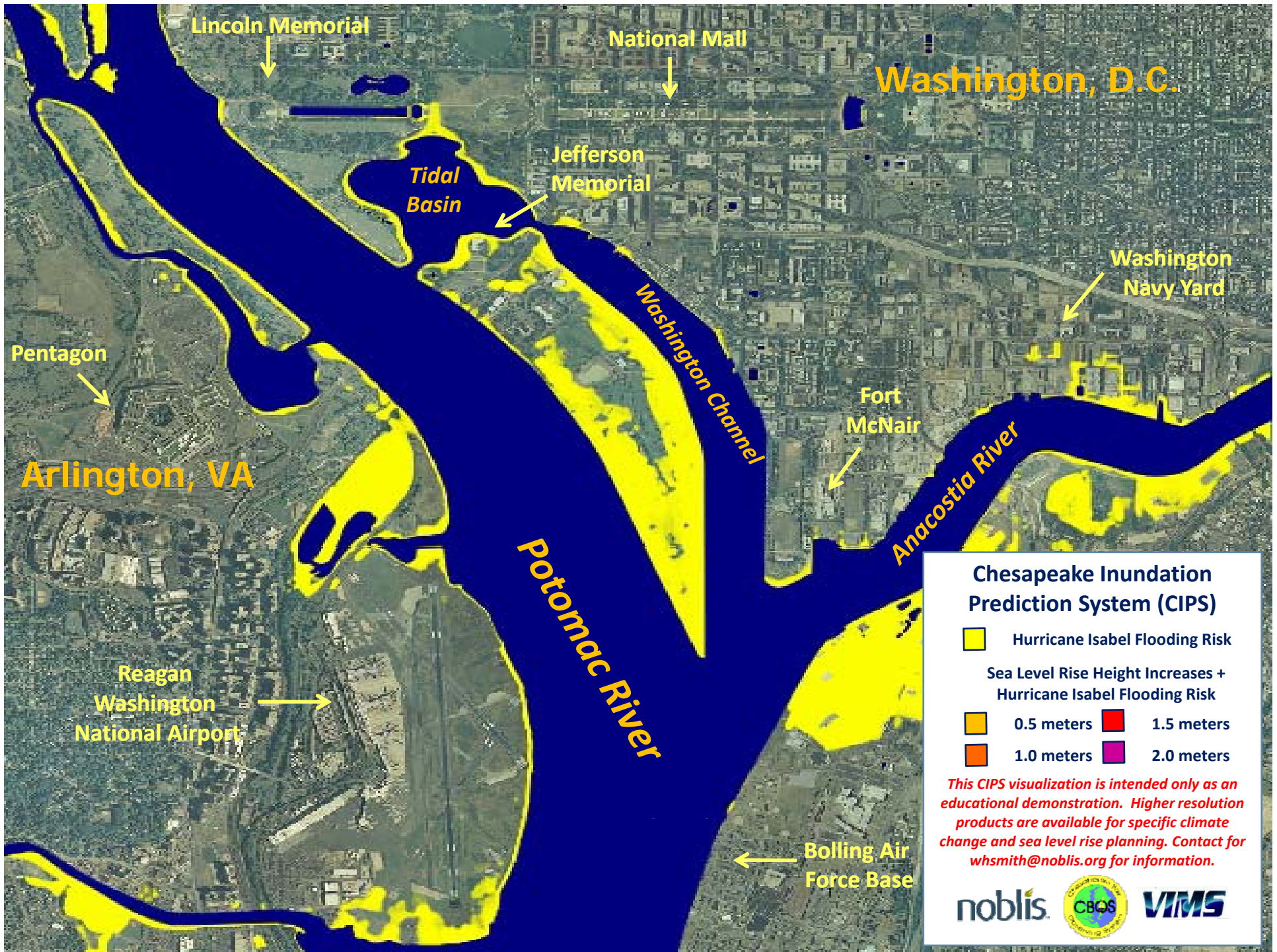
Washington Channel

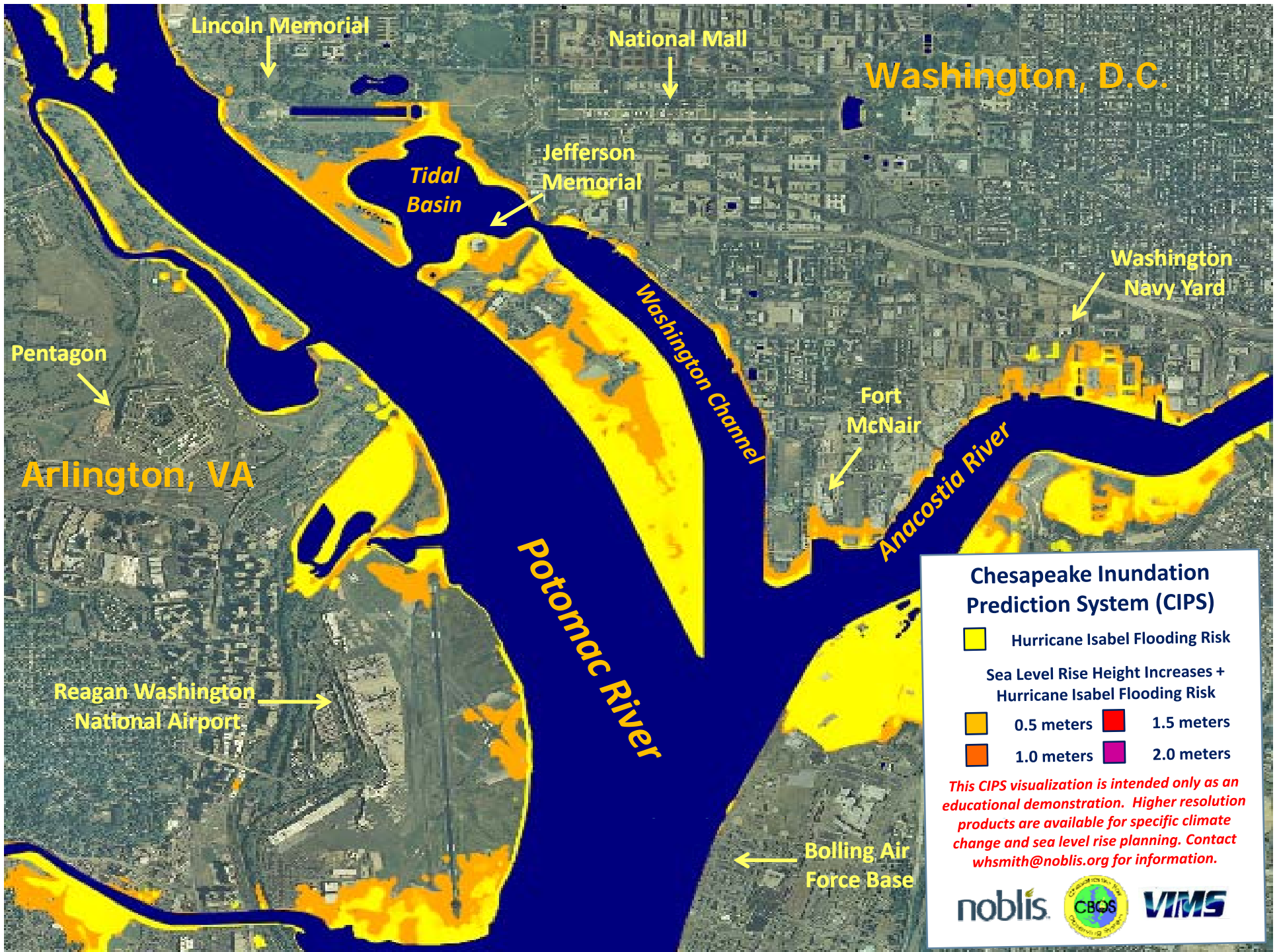
Anacostia River

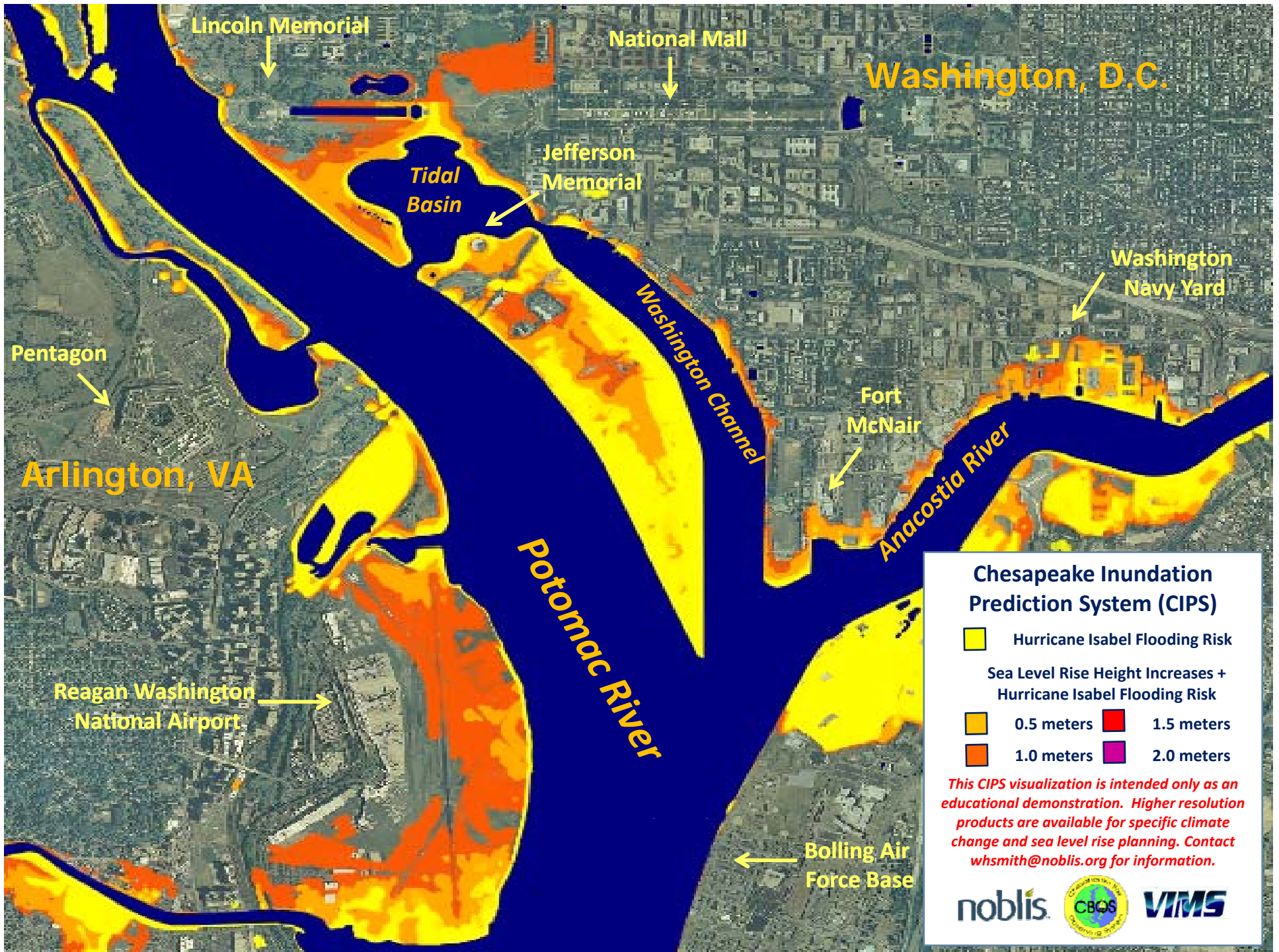
Potomac River

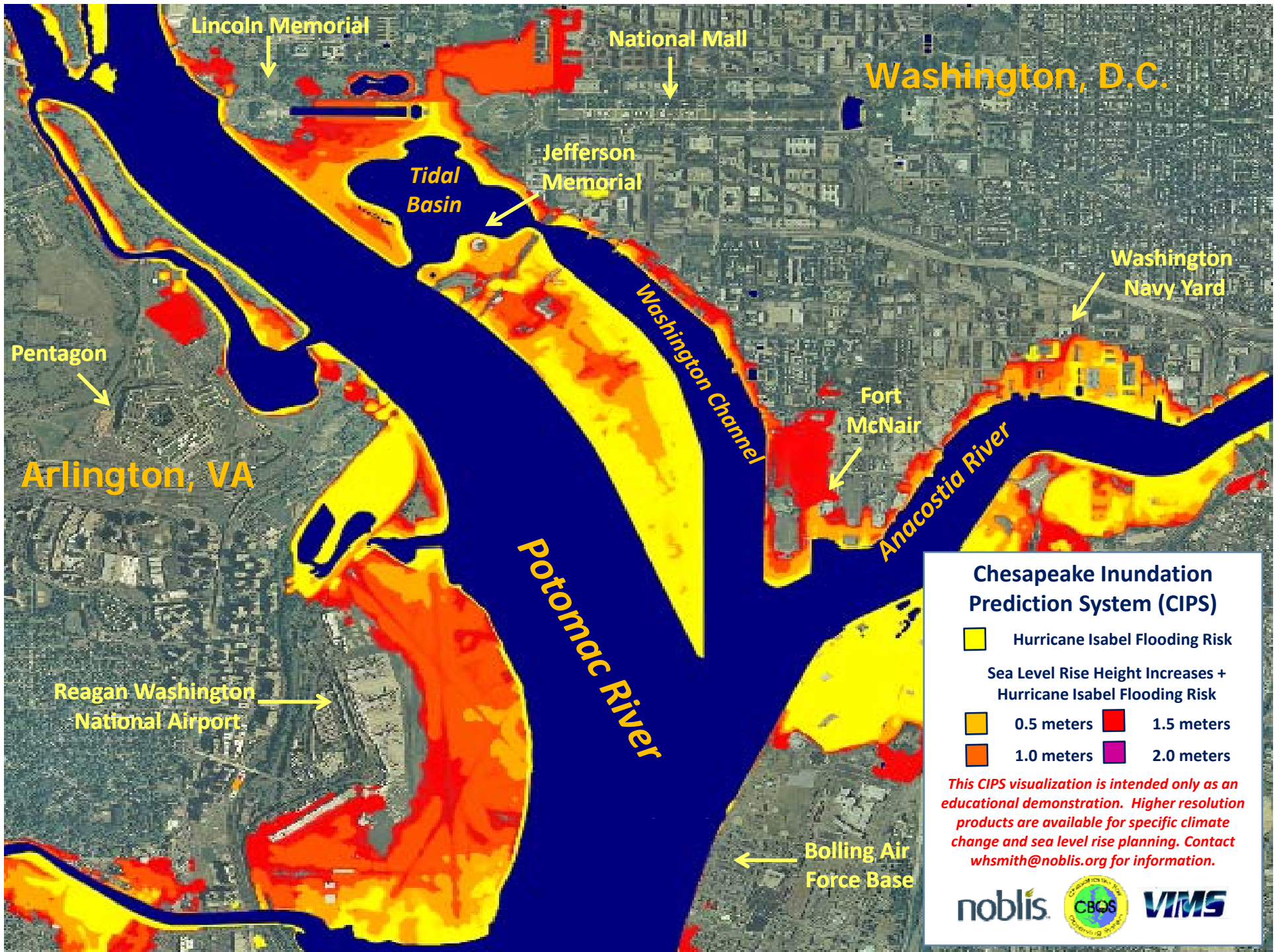
Reagan Washington National Airport

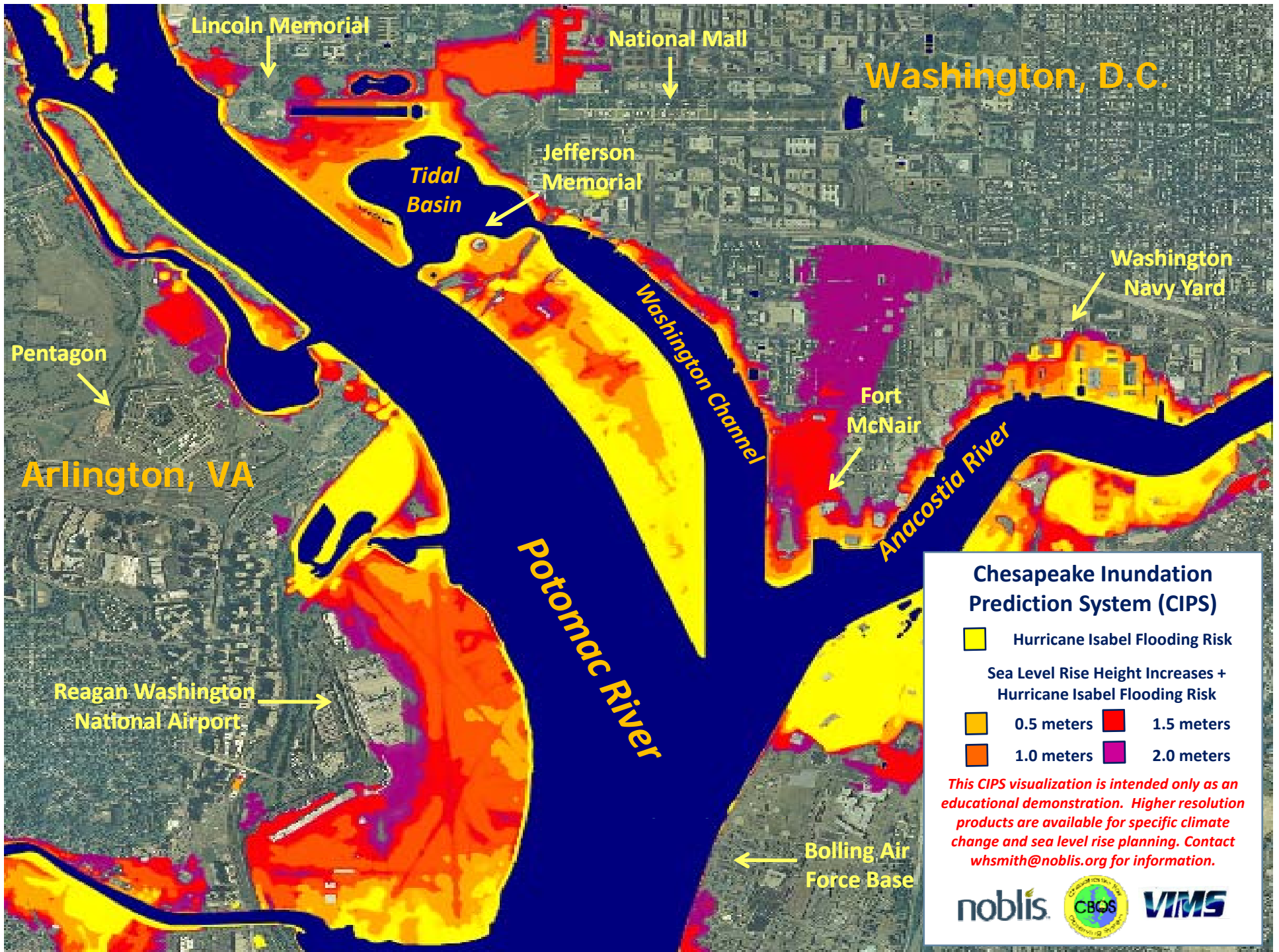
Bolling Air Force Base











Information to Action

- What?
 - Sea level will continue to rise
 - Will the rate increase?
 - Climate will change
 - How will Potomac River basin floods change?
 - How will storm surge change?
- So what?
 - More river floods will be damaging in near- to mid-term
 - Storm surge floods will become significant threat in long term

Information to Action

- Now what?
 - River basin floods
 - Identify possible future rainfall for Potomac River basin
 - Identify possible future Potomac River basin flood scenarios
 - Storm surge floods
 - Determine how storm surge could change with climate change
 - Use modeling capability to assess flooding effects
 - Use scenarios
 - Use information to identify actions and timing