

Commonwealth Center for Recurrent Flooding Resiliency: An Update

Joint Subcommittee on Coastal Flooding, October 17th, 2016

Dr. Morris Foster, ODU

Dr. John Wells, VIMS



**WILLIAM & MARY
LAW SCHOOL**

VIRGINIA COASTAL POLICY CENTER

**OLD DOMINION
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I D E A FUSION

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VIRGINIA INSTITUTE OF MARINE SCIENCE

Enabling Legislation: HB 903



*. . . RESOLVED by the House of Delegates, the Senate concurring, That the **Commonwealth Center for Recurrent Flooding Resiliency** be designated jointly at **Old Dominion University, the Virginia Institute of Marine Science, and The College of William and Mary**. The Center shall **serve, advise, and support** the Commonwealth by conducting **interdisciplinary studies** and investigations and to provide **training, technical and nontechnical services, and outreach** in the area of **recurrent flooding and resilience research** to the Commonwealth and its political subdivisions . . . all state agencies, political subdivisions, and authorities be encouraged to consult with the Center on matters of information, data, and services **to improve methods of data sharing, efficiency, and resilience** within the Commonwealth.*

Outline

- Role of CCRFR
- Current Activities of CCRFR
- Next Steps for CCRFR
- Contacts & Questions



Role of the CCRFR

- Provide coordinated research and technical support for planners and decision makers for adaptation to and mitigation of recurrent flooding in Virginia
- Integrate federal, state, local and nongovernmental data, and provide easy, useful access for all stakeholders
 - Real-time water level and tide gauge data across multiple agencies and jurisdictions
 - Socio-economic analyses and planning tools in support of resiliency planning
 - Legal and policy reviews and guidance related to implementing resiliency actions
- Leverage institutional resources through the Center to bring more federal, foundation and philanthropic support to address flooding resiliency in the Commonwealth



Mission of the CCRFR



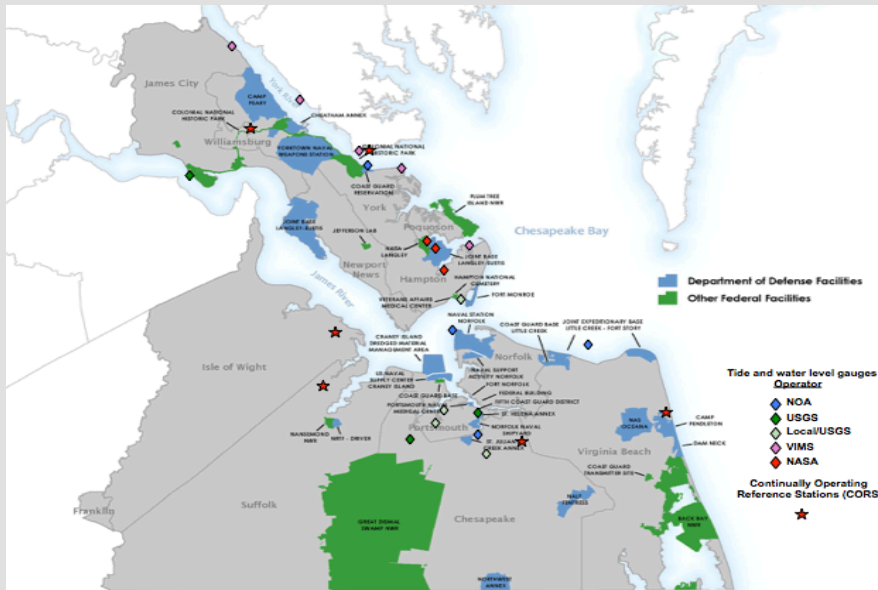
*The Commonwealth Center for Recurrent Flooding Resiliency engages the expertise, resources and intellectual vibrancy of **William & Mary and Old Dominion University** in support of **building resilience to rising waters**. The Center **serves, advises, and supports Virginia** by conducting interdisciplinary studies and providing training, technical and non-technical services, and policy guidance in the area of recurrent flooding resilience to the Commonwealth and its local governments, state agencies, industries and citizens.*

Building Critical Capacity

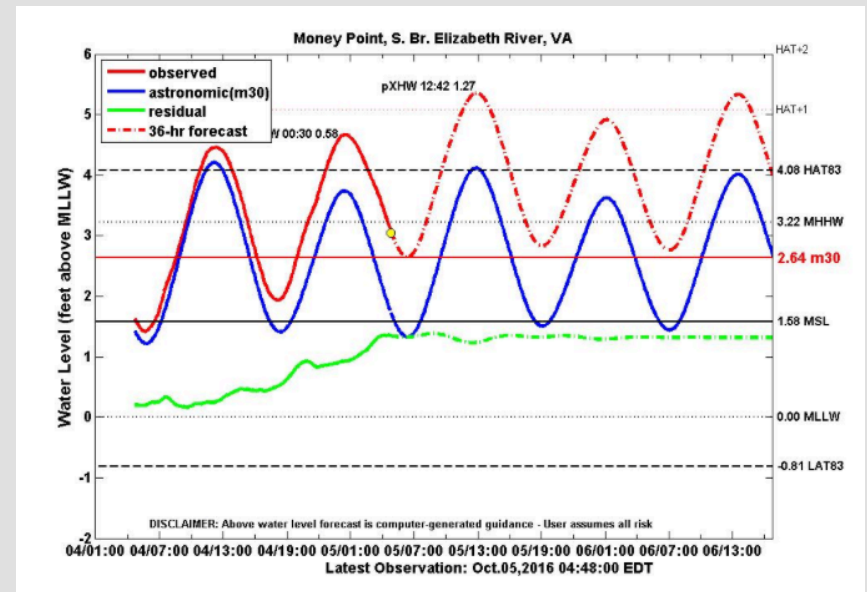


- Hire Center coordinator & help fund VCPC support
- Support water level data integration through Tidewatch & street level modeling
- Expand outreach to localities by VCPC, VIMS & ODU to develop long term initiatives
- Support various smaller projects in partnership with planners, emergency managers, etc.
- Provide flexible response to locality needs

Ongoing Projects: Data Integration - Tidewatch



Currently 20 tide gauge stations in the Hampton Roads area operated by different federal, state and local entities – more on the way.

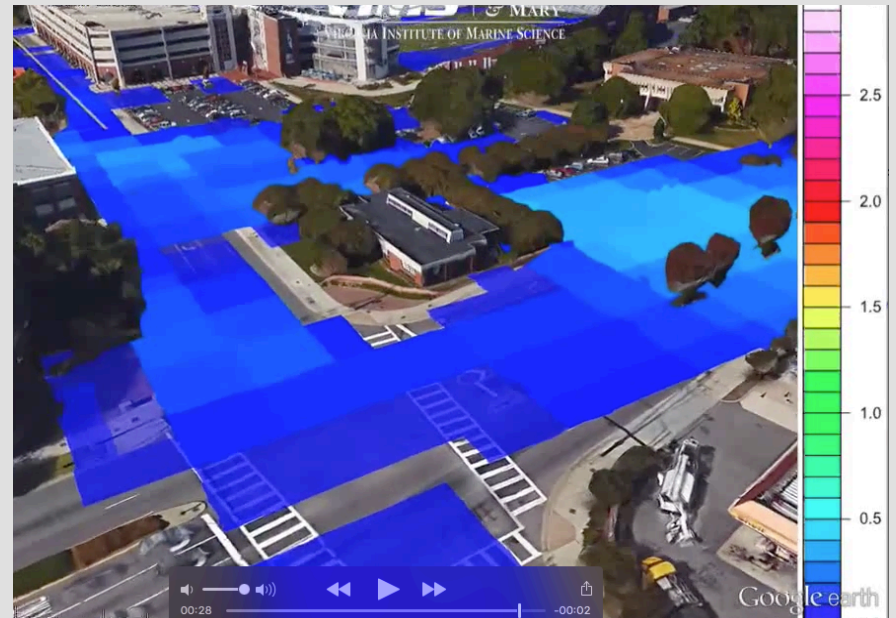


Tidewatch provides more accurate predictions of tidal heights up to 36 hrs. than NOAA predictions.

Ongoing Projects: Street Level Flood Modeling



State-of-the-Art, high resolution modeling from storm surge and rainfall can accurately predict street-level flooding. Applications for emergency management and resiliency planning

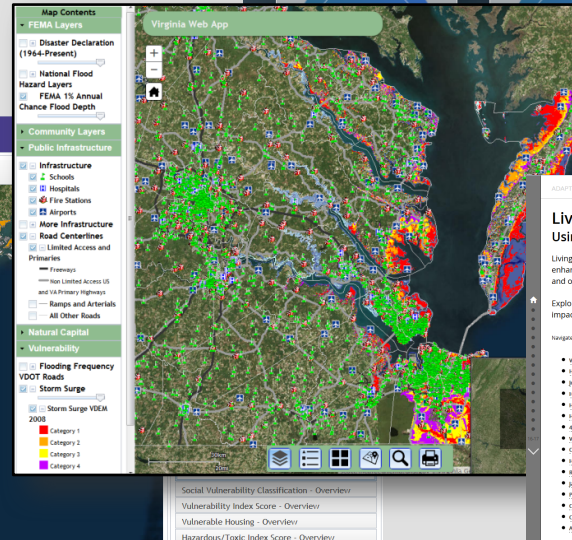
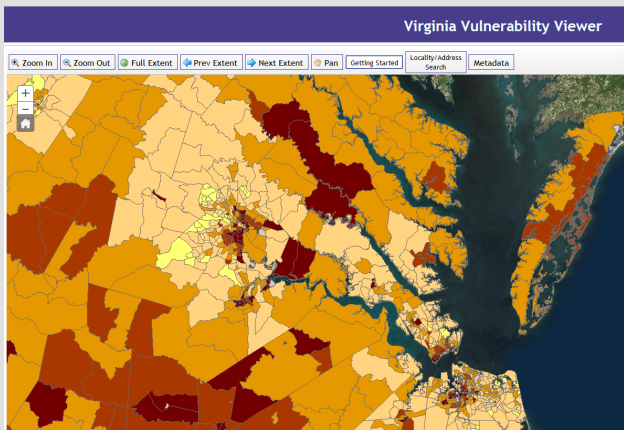
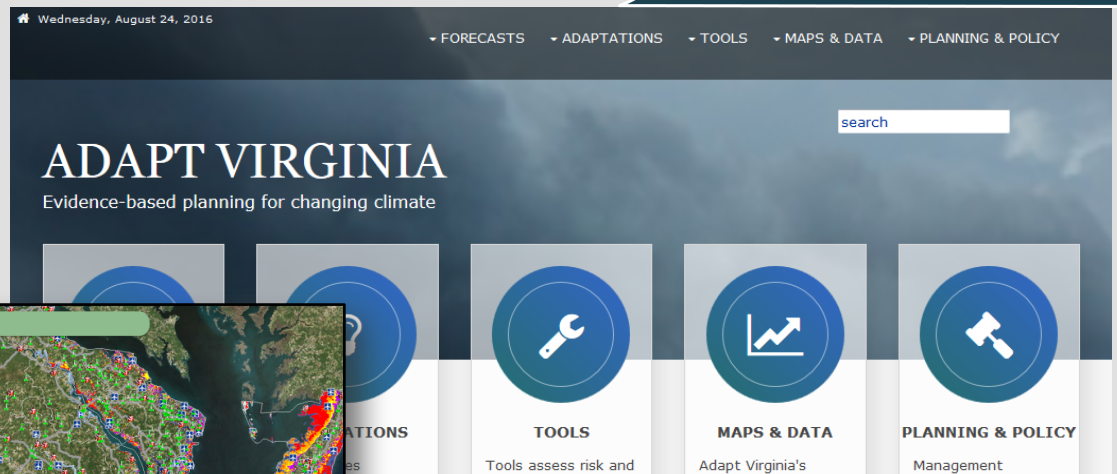


CCRFR is in the process of operationalizing this model throughout Hampton Roads

Ongoing Projects: Adapt Virginia



- Adapt Virginia “Data Portal” in partnership with DCR Floodplain Management, Wetlands Watch, and others will put tools, case studies, and more at users’ fingertips.
- Will feature ongoing research on sea-level changes and adaptation measures



Living Shorelines: Using Natural and Nature-Based Features

Living shorelines in lower energy settings can provide long-term protection, restoration, and enhancement of vegetated shoreline habitats through the strategic placement of plants, stone, sand fill and other structural or organic materials.

Explore case studies that highlight the use of natural or nature-based features to adapt to climate impacts.

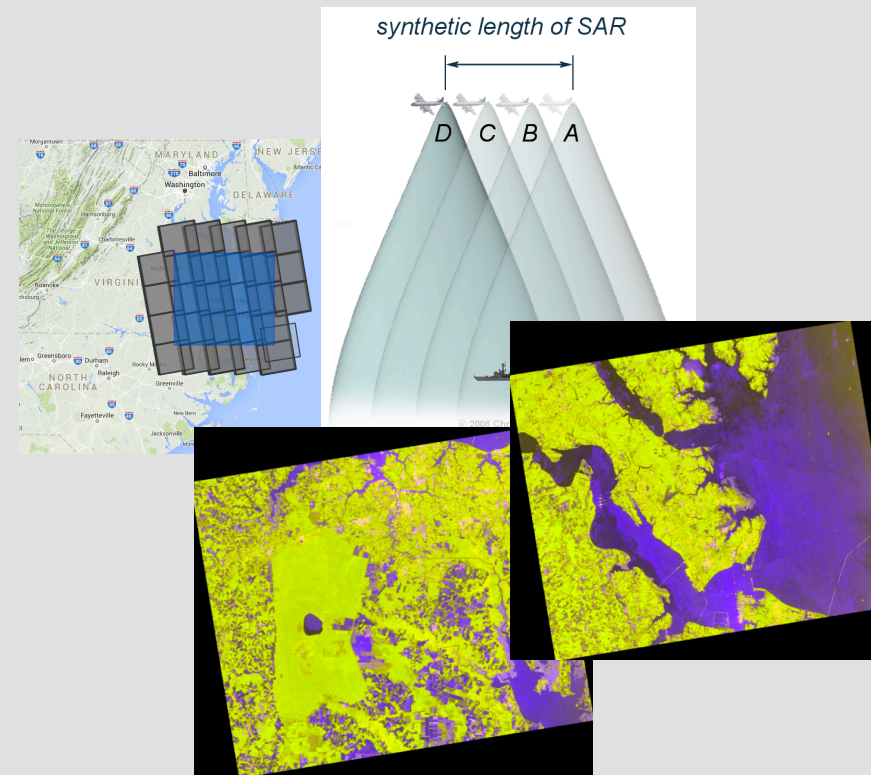
Navigate through the stories three ways: scrolling down, using the bullet links to the left, or clicking on the list below.

- WMU Teaching Marsh, Gloucester
- Shoreline Mitigation & Gardens Oyster Reef and Living Shoreline, Norfolk
- Beach Front Living Shoreline, Gloucester
- Hanes Creek Wetland and Walking Path Restoration, Norfolk
- Lost Cove Living Shoreline, Maryland
- Sandy Neck Nature Park, Cambridge
- 40th Street Project, Norfolk
- Virginia Zoo Living Shoreline and Oyster Reef, Norfolk
- Oyster Village/Chesapeake Road Living Shoreline, Oyster
- Hill Springs Farm Living Shoreline, Westmore
- Rowcliffe Living Shoreline, Rowcliffe
- Jerningham Beach Restoration, Jameson
- Shoshone Living Shoreline, Springfield
- Camp Occobahock Living Shoreline, Belle Haven
- Lobby Day Living Shoreline, Norfolk
- Additional Resources

Ongoing Projects: Subsidence



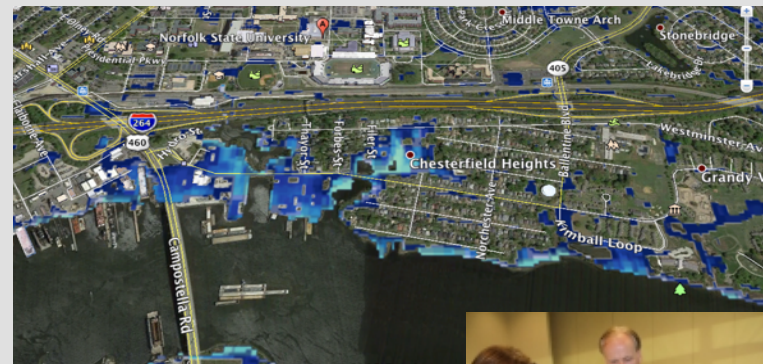
- Hampton Roads is impacted by subsidence but we do not have current and localized data
- We are using InSAR data taken by the same satellite at the same vantage point at different times to estimate localized subsidence
- This will generate improved localized subsidence map and show current trends with resolution in order of 10s of meters.



Ongoing Projects: Risk Communication



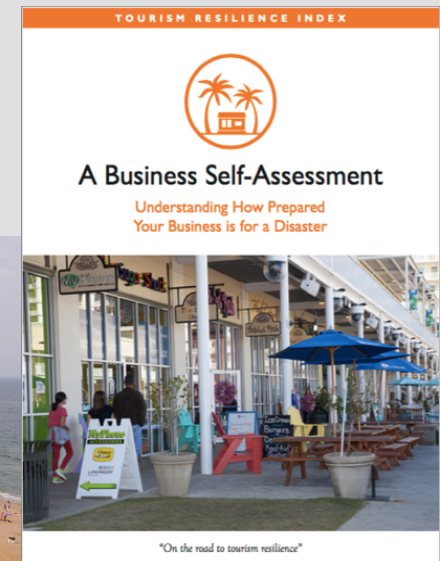
- Bringing together previous research on nuisance flooding communication & structured public involvement (IPP Case Study) with street level storm surge modeling capabilities and emergency manager feedback.
- Using innovative gaming strategies, to analyze and then enhance flood risk communication with specific groups of stakeholders using output from VIMS street level storm surge models.



Ongoing Projects: Tourism Resilience



- Modeled on a similar tool, the Tourism Resilience Index, developed by Mississippi – Alabama Sea Grant
- Needs Assessment & Info Gathering: In-person survey, with owners of tourism-related companies to determine current level of resilience and assess areas for improvement.
- Build Resiliency: Workshops, Coastal Virginia TRI, VB Tourism Resilience Assessment
- Policy Analysis: VCPC analyzing current laws & policies for resilience opportunities



Flickr, Creative Commons, Jason Pratt

Ongoing Projects: Economic Impacts Analysis



- Over time create series of white papers & database to couple with VIMS & VMASC modeling.
- Partnerships with Hampton Roads Economic Development Alliance & others
- Ongoing:
 - Cluster analysis of potential water management cluster in Hampton Roads,
 - Convening others conducting impact research to coordinate and communicate needs, etc.
- Sample Future Topics:
 - Resilient Zoning & commercial development
 - Flood risk (or perceived risk) impact on firm attraction & relocation
 - Individual and regional participation in NFIP program



Ongoing Projects: Western VA



- The Piedmont, Shenandoah Valley, and mountains are vulnerable to flooding events from a variety of processes:
 - "Backdoor storms" or tropical systems approaching from the west and southwest (e.g. Hurricane Camille)
 - Orographic precipitation amplification of tropical and extra tropical storm rainfall; and
 - Isolated airmass thunderstorms that can become "terrain-locked"
- Investigate and map these multiple flood hazards, identifying vulnerability
- In partnership with local officials, emergency managers, and floodplain managers inland



Photos: Nelson County Museum

Leveraging Resources

- NASA support of subsidence research a direct result of CCRFR funding
- NIST support of VIMS + Newport News/Hampton Smart Cities Project
- blue moon fund support of Adapt Virginia data portal
- Additional proposals submitted to NASA and NIST are still outstanding
- CCRFR will continue to partner with localities on grants and other funding opportunities to leverage resources.

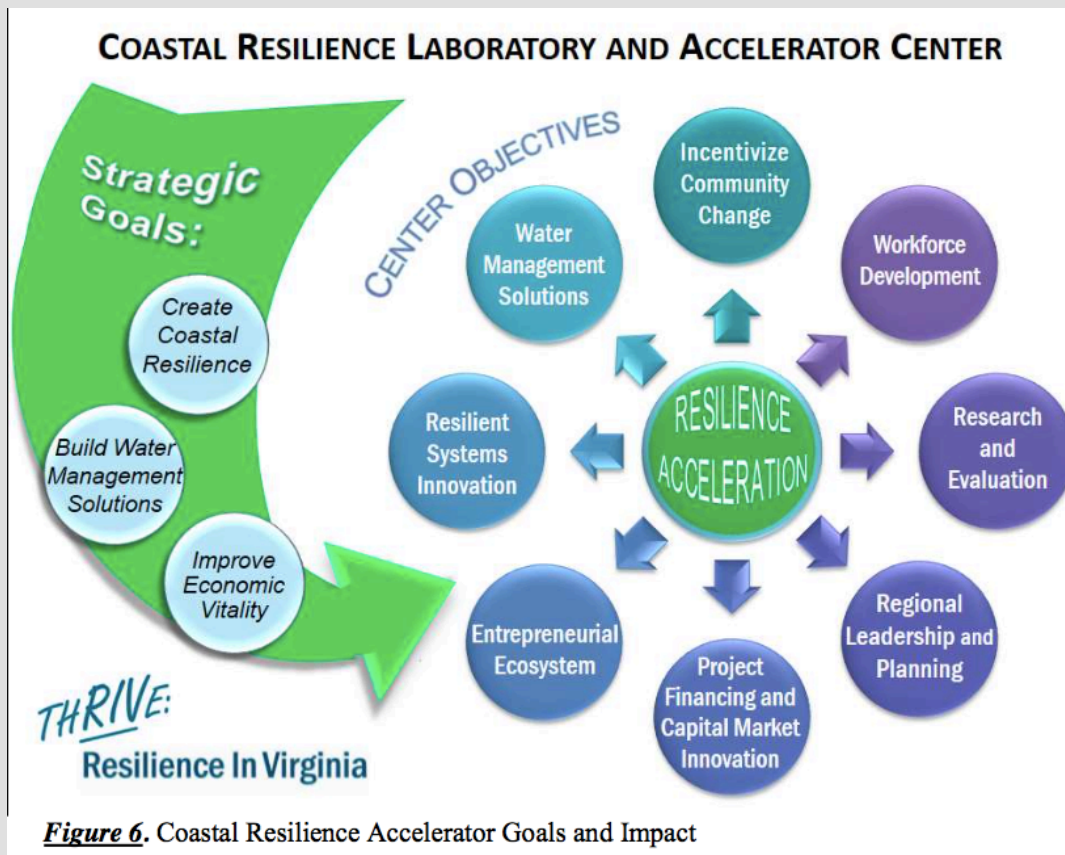


On the Horizon



- CRS Support - Working with localities to identify long-term projects that will benefit many localities
- Continued development of resources and identification of needs where CCRFR can have greatest impact
- Provide continued **liaison** with federal program directors and researchers (e.g. NOAA, NASA, USGS) and with the military concerning national security issues associated with sea level rise.
- Over time, accumulate data leveraging federal, state, local, NGO/Private, and university data to provide easy, **useful access for all stakeholders.**
- Expansion of efforts into western VA
- Provision of legal and policy advice to assist localities in moving research into action

Working together for resiliency: CCRFR & NDRC Accelerator



- NDRC Accelerator, an independent 501(c)(3) organization, will use resilience challenges as a catalyst for economic opportunity by driving innovation and taking advantage of our “natural testbed”
- CCRFR will support & collaborate w/ NDRC Accelerator by providing data and leveraging local partnerships & vice versa

Figure 6. Coastal Resilience Accelerator Goals and Impact

Contacts

www.floodingresiliency.org

Mark Luckenbach, VIMS

luck@vims.edu

Elizabeth Andrews, VCPC

eaandrews@wm.edu

Emily Steinhilber, ODU

esteinhi@odu.edu



COMMONWEALTH CENTER FOR
RECURRENT FLOODING RESILIENCY

