Commonwealth Center for Recurrent Flooding Resiliency

VIMS | William & Mary
Virginia Institute of Marine Science

Institute for Coastal Adaptation & Resilience
Old Dominion University

William & Mary
Virginia Coastal Resilience Collaborative

September 2, 2025
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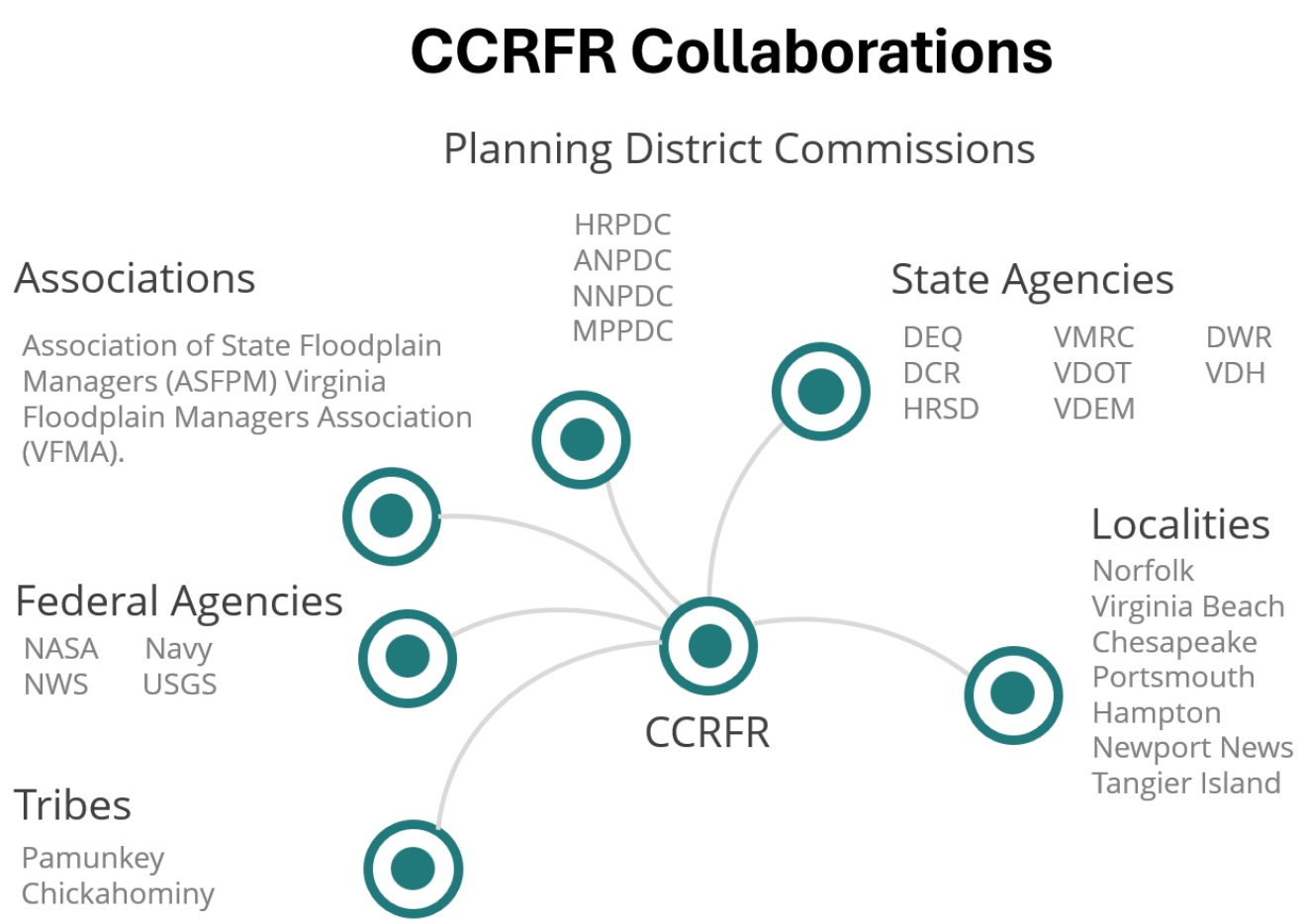
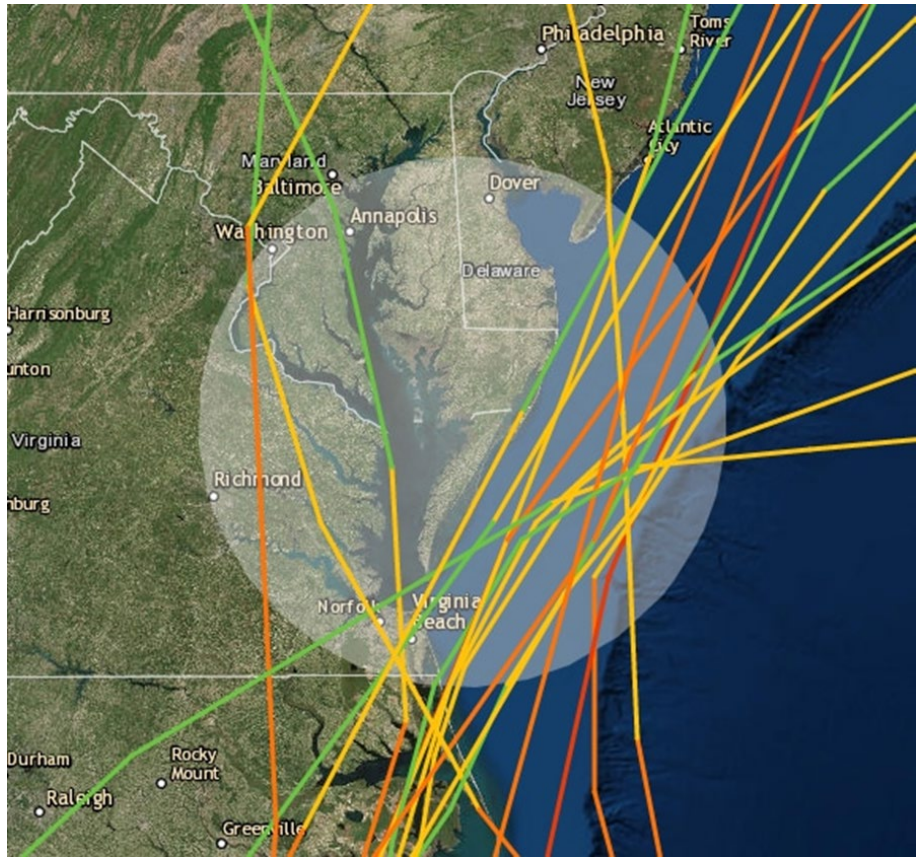
Agenda

- **Project Updates**
- **CCRFR Future Plans**
- **Update from VCRC**
- **Discussion**



Economic Impacts of Recurrent Flooding and Hurricanes in VA

- ODU Economics & GeoSEA faculty *calculated* impact of recurrent flooding and hurricanes in VA:
  - Total economic impacts of recurrent flooding thru 2099 are equal to $79.1 billion in 2021 dollars.
  - Direct damages from Florence-like Category 3 hurricane are $15.6 billion.
  - First year post hurricane short-term loss of 76,000 jobs.
- **Results:** Reports (2), presentations (live & virtual), media interviews (9), and book chapter in progress. Journal article: *Estimating the economic vulnerability of 2020–2099 storm flooding with sea level rise on Coastal Virginia*, Ocean & Coastal Management.

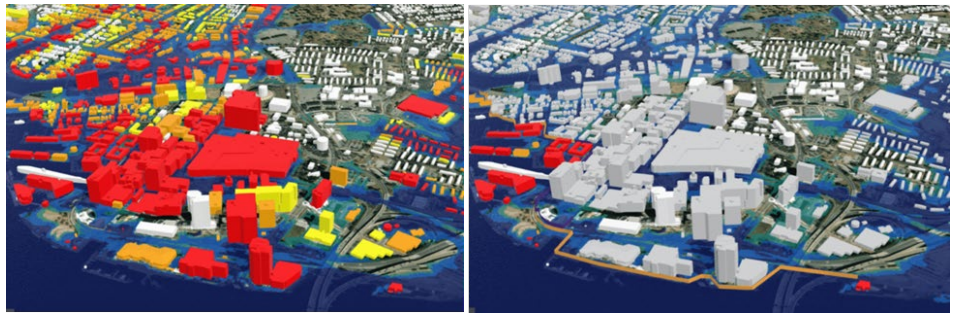


Community Engaged Flood Resilience

- *Developed* a web-based Community Engagement Application
- *Deployed* in Southside Norfolk engagement to understand flood impacts and solution preferences
  - **Results:** Awarded $760,709 for "Building Coastal Resilience in Underserved Communities: A Nature-Based Solution Approach in Southside Norfolk" project, National Fish and Wildlife Foundation. Journal article (1), conference presentations (2), Best Diversity Award at American Society of Engineering Educators Conference, and media interviews (4).
- *Launched* flood messaging campaign.

Exploring New Technologies and Supporting Existing Initiatives

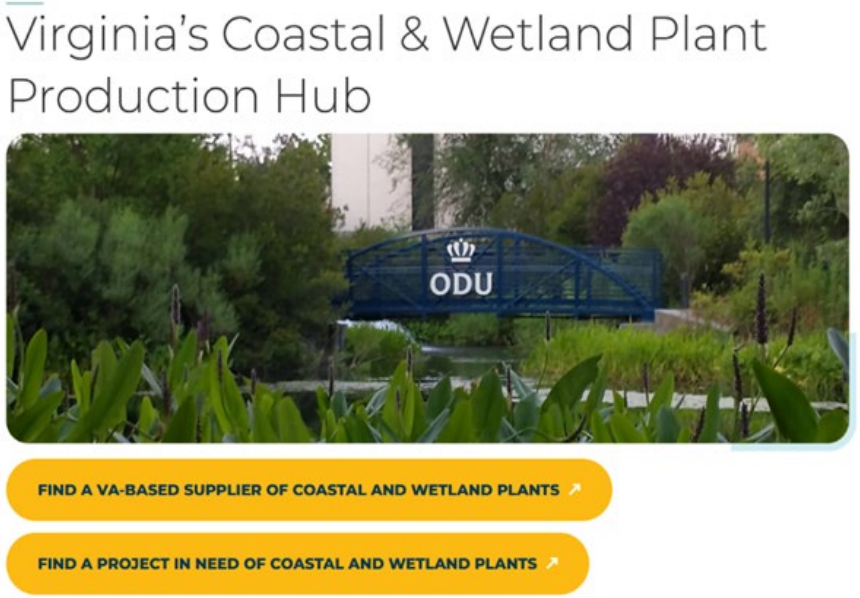
- *Launching* new technology
  - Drone technology for shoreline monitoring, erosion prediction, and quantification.
  - Virtual Reality (VR) for climate awareness and visualization of shoreline solutions.
- *Developed, implemented,* and *supporting* existing initiatives
  - RAFT Scorecard for Inland Communities
    - **Results:** Awarded $40,301 to develop VA Tribes Scorecard.
  - Coastal Virginia Small Business Resilience Self-Assessment and Guide.



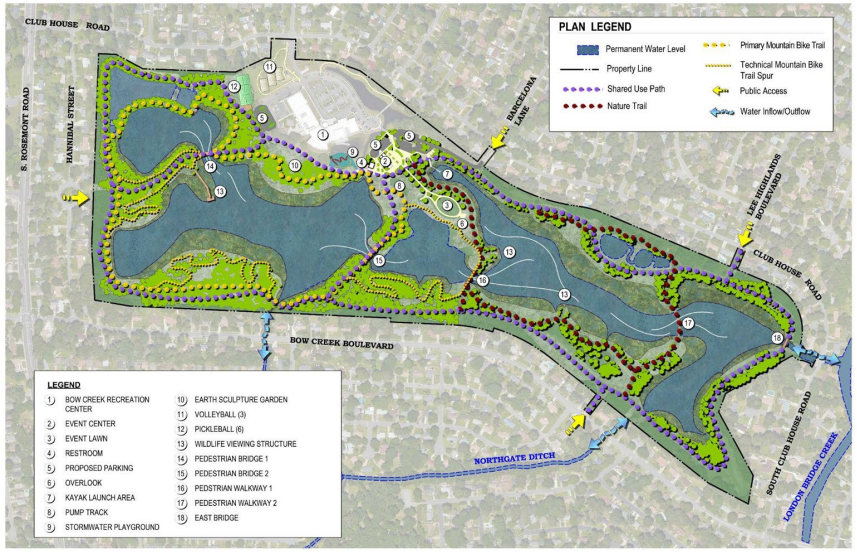
Future flooding impacts in 2080 in Downtown Norfolk without and with USACE flood protection measures.

Coastal Virginia Small Business Resilience Self-Assessment and Guide

Natural and Nature-based Solutions

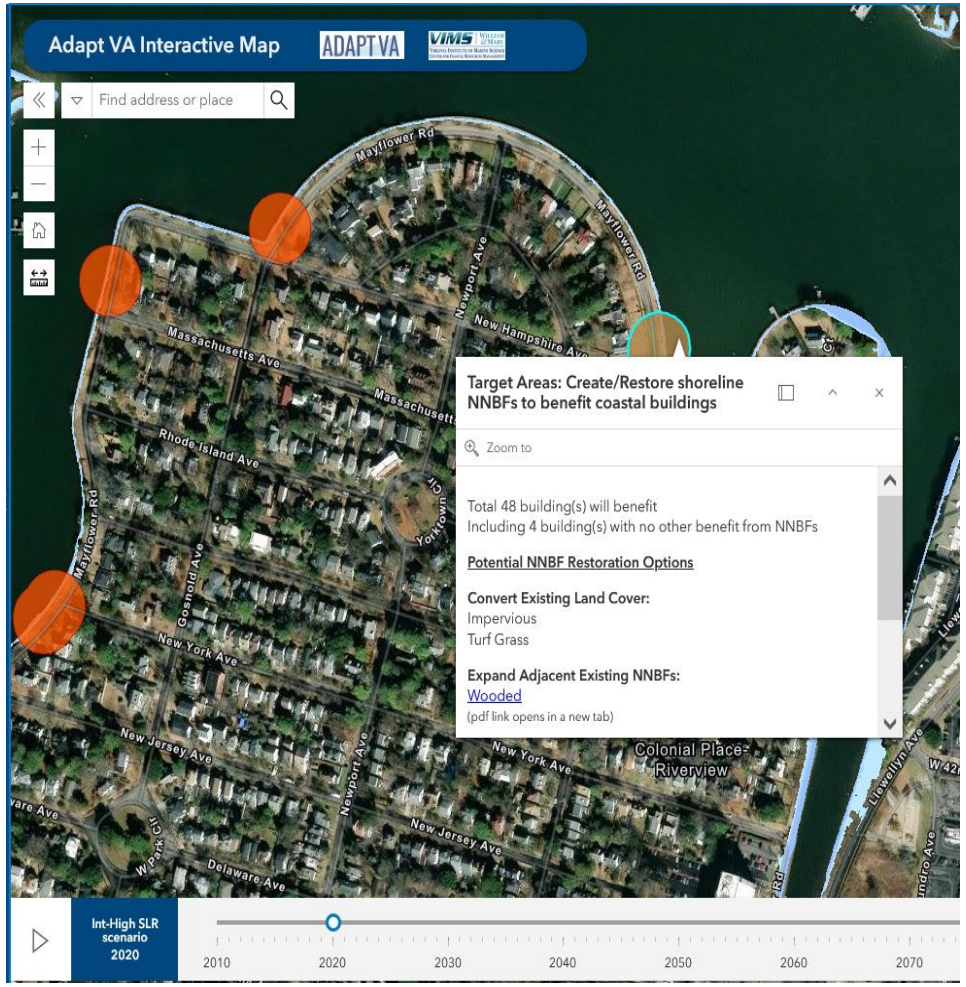


https://covaresilience.org/resources/wetland-plant-hub/



- *Assessed* VA Wetland Plant Production restoration needs and *founded* Plant Hub
  - **Results:** Awarded $75,664 in funding, journal article, conference presentation, and sector collaboration meetings.
- *Demonstrated* value of green infrastructure through ecological assessment and monetary evaluation of nature-based solutions.
  - Value beyond flooding impacts includes pollination, recreation, microclimate cooling.
  - Ecological assessment increases Benefit Cost Ratio of project by 23% in 10 years and 188% in 20 years.
  - **Results:** Journal publications (1in print, 2 in progress)

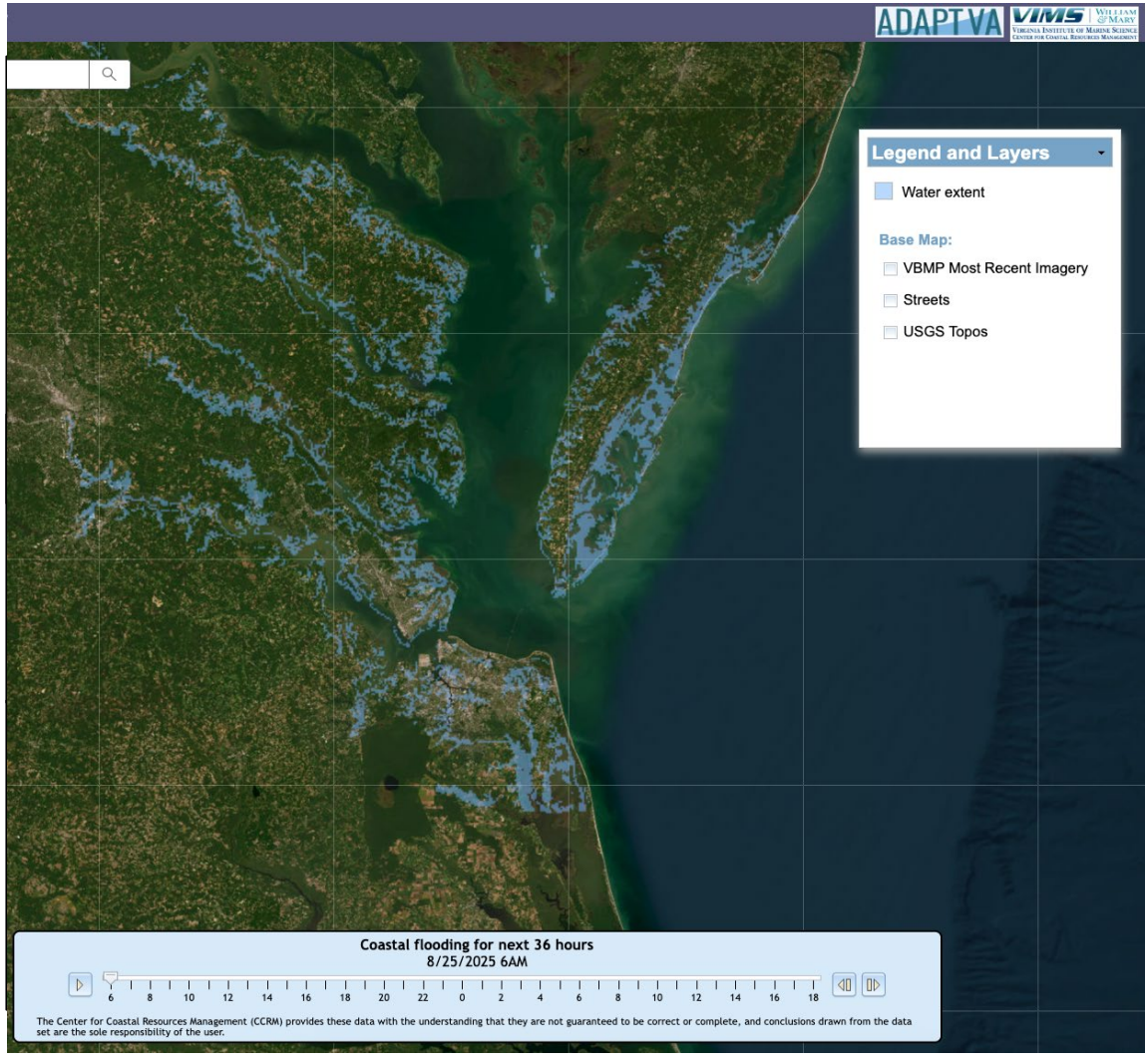
Natural and Nature-Based Solutions (cont.)



- *Targeting* restoration opportunities for flood reduction (data from NOAA funded project)
  - Restoration opportunities for creating or restoring shoreline to benefit coastal buildings, areas suitable for living shoreline, etc.
  - Lands for protection along the shoreline that offer benefits to coastal building, and conservation lands and easements
- *Forecasted* marsh migration potentials through 2050 for existing tidal wetlands (data from CZM funded project).

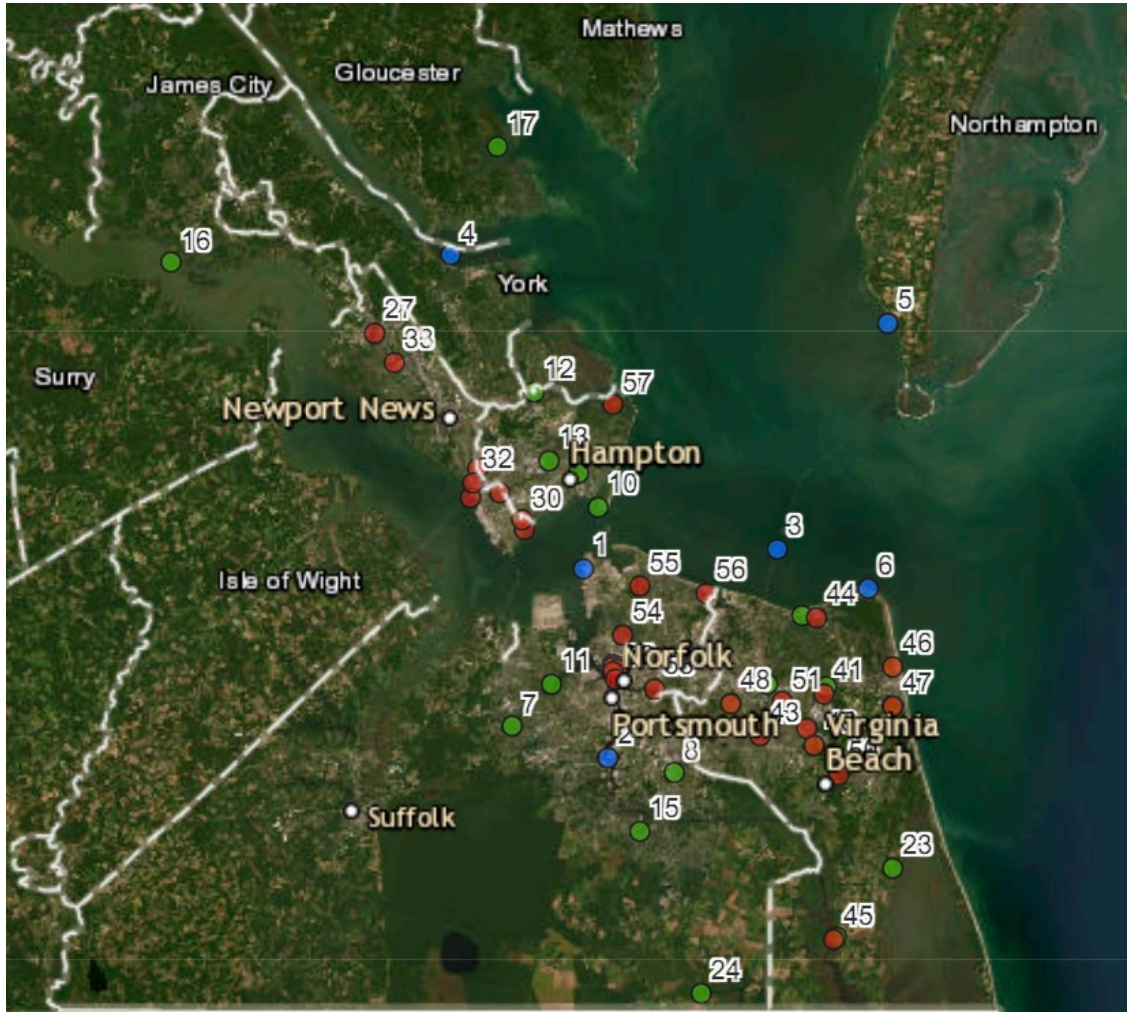
Water Level Sensors & Forecasting

- In collaboration with local governments, tribes, federal agencies VIMS has installed 59 tide gauges and other water-level sensors:
  - 12 are currently visible on the Tidewatch webpage that provides real-time data and 36-hr water level forecasts.
    - A dozen more will be posted to the website this month, and the remaining ones will follow shortly
    - Received federal funding to deploy 20 more in coastal VA
    - Tidewatch maps provide visualization of predicted coastal inundation through out coastal Virginia



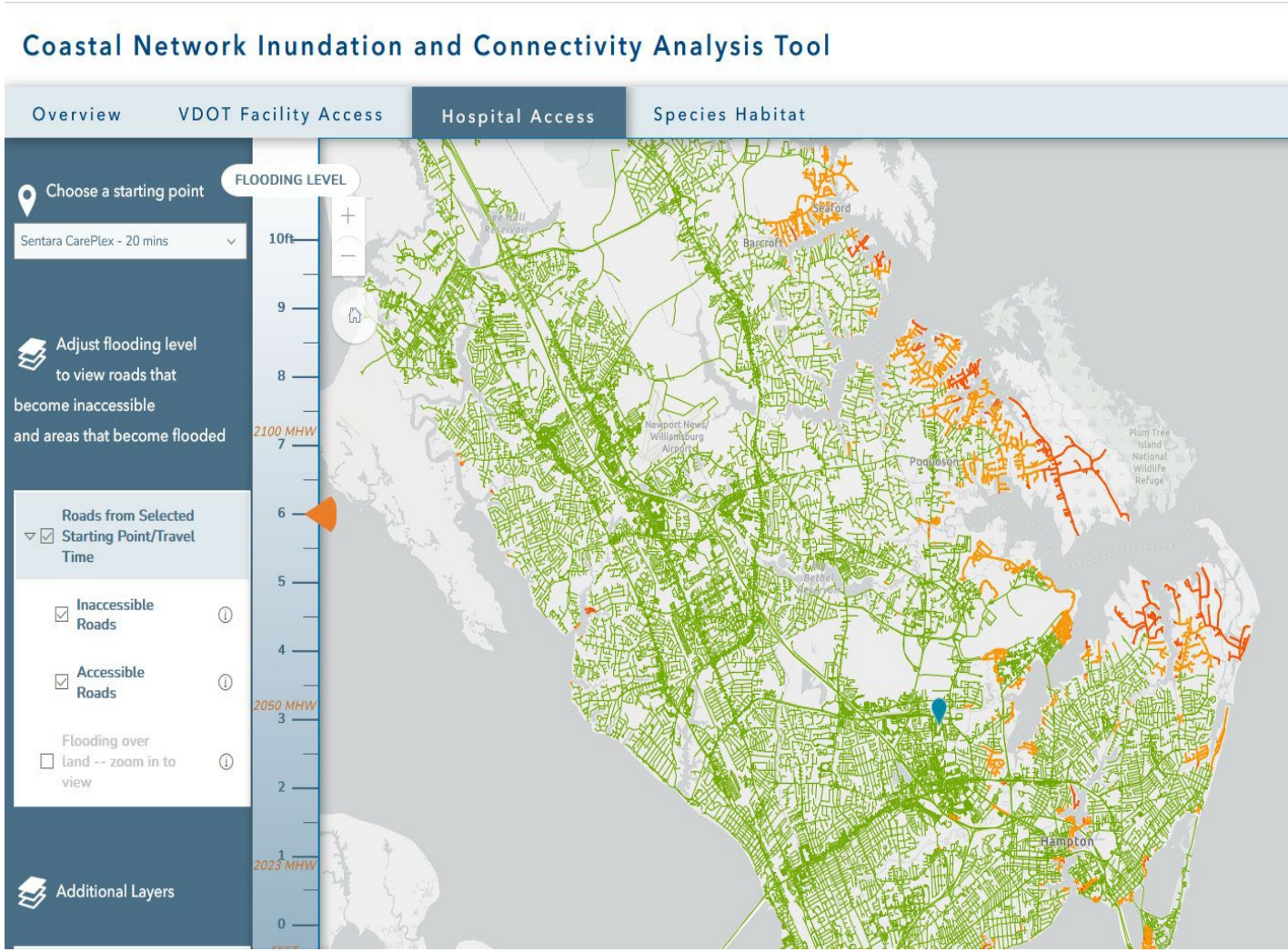
StormSense: Real-time Streel-level Flooding

- In conjunction with funding from NIST, Smart Cities, VDEM, MARACOOS, and VA Innovation Partnership Corp., CCRFR developed StormSense to provide early warning and real-time system of street-level flooding.
- New inexpensive video sensors have been deployed in VA Beach more planned throughout coastal VA.
- Local governments own and maintain these sensors; VIMS retrieves the data and pushes out flooding forecasts.
- A free mobile app provides automated water-level alerts to citizens when street flooding is imminent.
- Expanding water level sensor beyond Hampton Roads



Adapt Virginia

- Adapt Virginia "Data Portal" provides forecasts, adaptation case studies, tools, maps, data, and planning and policy options in one location.
- Features ongoing research on sea-level changes and adaptation measures
- The Coastal Network Inundation and Connectivity Analysis Tool
  - road networks flood analysis, hospital access,
  - supports road project planning and resilience efforts.
- Over 50,000 people visited this website in the past year (37 unique visitors/d.)



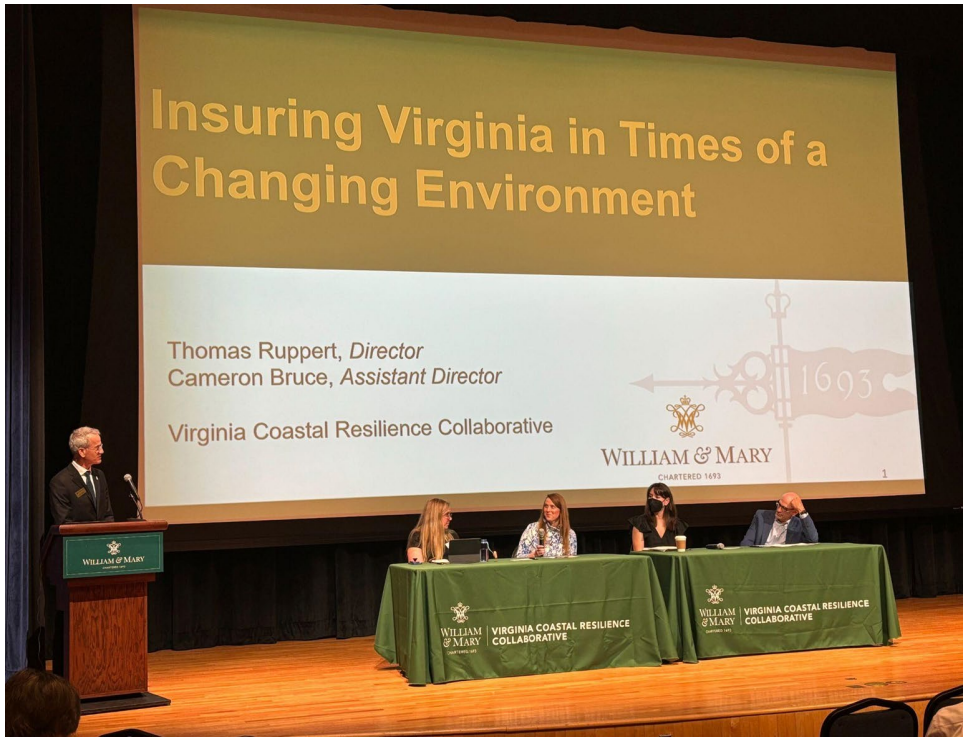
Flooding Policy

- **Provide local governments information supporting protection of people and property from flooding**
- Project follows the lead of the national organization Association of State Floodplain Managers and its promotion of “No Adverse Impact” (NAI) floodplain management
- Analysis of Virginia law to establish forms of potential legal liability and how to avoid them

CCRFR Future Plans

- Save the date: VCRC Inaugural Fall Conference: *Securing Virginia's Future*, October 3, 2025.
- Sustain and expand resources including Tidewatch, StormSense, and Adapt VA.
- Increase water-level gauges throughout coastal Virginia.
- Continue economic impact studies.
- Develop projects based on needs of state agencies and regional/local governments matched with faculty expertise.
- Leverage CCRFR funds to obtain federal and private support for resilience in coastal Virginia.
- Update the CCRFR website.

Update from VCRC



- **Cross-university collaborative to design, facilitate, and assist in management of projects.**
- Continuing a legacy of service and experiential learning.
- Expanding on previous work of the Virginia Coastal Policy Center.
- Law & policy analysis.

Discussion

Contact

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