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The Raft: Resilience Adaptation Feasibility Tool

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To help Virginia’s coastal localities improve resilience to flooding and other coastal storm hazards while remaining economically and socially viable.
THE RAFT FUNDING

National Fish and Wildlife Foundation (NFWF)

Virginia Environmental Endowment (VEE)

Virginia Department of Environmental Quality (DEQ) Coastal Zone Management Program (CZM)

Virginia Sea Grant Adaptation and Resilience Program

Anonymous
THE RAFT TEAM

Multi-disciplinary academic partnership

Core Team:

Old Dominion University
Virginia Sea Grant Climate Adaptation and Resilience Program

William & Mary Law School
Virginia Coastal Policy Center

University of Virginia
Institute for Engagement & Negotiation
The RAFT: Project Advisors

Advisory Committee:
government, nonprofit, and academic representatives provided ongoing guidance and feedback regarding Scorecard development and selection of pilot communities

Focus Group #1:
during development of the Scorecard, state and local government representatives evaluated the Scorecard’s objectivity and relevance

Planning District Commissions:
provided feedback regarding development of the Scorecard and overall process during the pilot phase; provide ongoing assistance with identifying localities to participate in future iterations of The RAFT process

Focus Group #2:
during development of the Scorecard, academics and community representatives considered whether the Scorecard adequately addressed social equity

2015

2016

2017

2018

2019

The Collaborative Team:
three university partners responsible for overall development and ongoing implementation of The RAFT three-phase process

Pilot Communities:
staff, elected officials, residents, and others active in the community that participated in and assisted with initial launch of The RAFT three-phase process; provided feedback regarding the Scorecard and the overall process during the pilot phase

Eastern Shore Localities:
staff, elected officials, residents, and others active in the community that participated in and assisted with regional approach to The RAFT three-phase process

Scorecard process currently underway in Northern Neck localities
THE RAFT LOCALITIES

- **Pilot Project (2017-2018)**
  - Portsmouth
  - Gloucester
  - Cape Charles

  - Accomack County
  - Northampton County
  - Chincoteague
  - Onancock
  - Wachapreague
  - Saxis
  - Tangier

- **Northern Neck (2019-2020)**
  - Lancaster County
  - Westmoreland County
  - Northumberland County
  - Richmond County
  - White Stone
  - Colonial Beach
  - Kilmarnock
  - Warsaw
THE RAFT PROCESS

3 Step Process

1. Scorecard
   Resilience Assessment

2. Regional Workshop
   Resilience Action Checklists

3. Implementation
   Ongoing Assistance
STEP 1: THE RAFT SCORECARD

5 Scoring Categories

1. LEADERSHIP, POLICY AND COLLABORATION
2. RISK ASSESSMENT AND EMERGENCY MANAGEMENT
3. INFRASTRUCTURE RESILIENCE
4. PLANNING FOR RESILIENCE
5. COMMUNITY ENGAGEMENT, HEALTH, AND WELL BEING

*Scored by VCPC law students after thorough review of town documents and interviews with local government and planning agencies

<table>
<thead>
<tr>
<th>Category</th>
<th>Score Received</th>
<th>Total Possible Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) POLICY, LEADERSHIP, AND COLLABORATION</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>2) RISK ASSESSMENT, AND EMERGENCY MANAGEMENT</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>3) INFRASTRUCTURE RESILIENCE</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>4) PLANNING FOR RESILIENCE</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>5) COMMUNITY ENGAGEMENT, HEALTH, AND WELL BEING</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

TOTAL SCORES: 61 out of 100 points
## STEP 2: LOCALITY WORKSHOPS AND CREATING ACTION CHECKLISTS

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>PRIORITY RESILIENCE ACTION CHECKLIST</th>
<th>VOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRAINING</strong></td>
<td>Work closely with other departments and local non-profits to establish a uniform resilience goal</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Cross-department training on resilience</td>
<td>4</td>
</tr>
<tr>
<td><strong>COMMUNICATION &amp; OUTREACH</strong></td>
<td>Expand emergency kit backpack distribution (e.g. at Sunset Thursdays)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Provide residents with ways to reduce risk: cost for flooding insurance. Hold two community meetings next year</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>More flood signage throughout city in low lying areas</td>
<td>1</td>
</tr>
<tr>
<td><strong>DATA COLLECTION</strong></td>
<td>Map: First floor side scan with LIDAR with US Army Corps of Engineers. Support for homeless in low income areas.</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Survey other cities to learn their methods of citizen outreach</td>
<td>1</td>
</tr>
<tr>
<td><strong>PLANNING</strong></td>
<td>Insert coastal resilience incentives during zoning ordinance rewrite (refer back to Scorecard for incentives to consider)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Green infrastructure plan for urban areas (start study and look for funding)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Incentivize citizen business installing green infrastructure projects on their properties</td>
<td>4</td>
</tr>
<tr>
<td><strong>POLICY &amp; STATE LEGISLATION</strong></td>
<td>Seek recommendation by Joint Legislative Subcommittee on Coastal Flooding for legislation requiring flood disclosures</td>
<td>5</td>
</tr>
</tbody>
</table>
### Action Checklist and Project Examples

<table>
<thead>
<tr>
<th>Project</th>
<th>Description/ Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complete Comprehensive Plan</strong></td>
<td>Work with planning commission to finish developing the town comprehensive plan- add resilience.</td>
</tr>
<tr>
<td><strong>Design resilient wharf waterfront</strong></td>
<td>Research and provide a suite of options for improving drainage and preventing flooding of the parking lot and buildings</td>
</tr>
<tr>
<td><strong>Community education and outreach</strong></td>
<td>Provide information to the community about resiliency, promoting a continuity between council decisions and town resilience</td>
</tr>
<tr>
<td><strong>Increase Use of Living Shorelines &amp; Other Resilience Projects</strong></td>
<td>Educate Board of Supervisors, Wetlands Board, Planning Commission, property owners, and contractors; send info to HOAs and business/community groups; evaluate ordinances to determine if there are any barriers to use of living shorelines and other resilience measures</td>
</tr>
</tbody>
</table>
THE RAFT
SOLUTIONS TO MEET SPECIFIC NEEDS: RURAL LOCALITIES

- Improving Access to Basic Infrastructure
  - Addressing roads and bridges vulnerable to flooding (Chincoteague, Saxis)
  - Repairing and improving drainage at wharf (Onancock)
  - Installing cell phone tower and broadband internet (Wachapreague)

- Designing Green Infrastructure Solutions
  - Revegetation and water retention projects to manage floodwaters (Saxis, Northampton County)
  - Increased use of living shorelines (Accomack County)
  - Explore biogenic reefs & other options to mitigate shoreline erosion (Saxis, Tangier)

- Comprehensive Resilience Planning
  - Create comprehensive plan (Onancock, Chincoteague)
  - Update existing comp plans to include coastal resilience (Cape Charles)
THE RAFT
SOLUTIONS TO MEET SPECIFIC NEEDS: URBAN LOCALITIES

- Planning Initiatives
  - Incentives for coastal resilience
  - Green infrastructure plan for urban areas
  - Incentives for green infrastructure projects by private businesses

- Data Collection
  - First floor LiDAR map from USACE
  - Survey other cities regarding methods of citizen outreach

- Policy and State Legislation
  - Modify state legislation to require disclosure of flood damage and location in flood hazard zone when selling a property
  - Develop state policy to reduce standards to correct roads frequently damaged by flooding
STEP 3: IMPLEMENTATION ASSISTANCE FOR ONE YEAR

- Monthly calls between community leaders and the core team
- Provide assistance for checklist action items:
  - Communication products
  - Policy and legal analysis
  - Model ordinances and comprehensive plan language
  - GIS mapping
  - Connection to needed experts (i.e. engineers or planners)
  - Facilitation, presentations, community engagement, surveys
FOR ALL EMERGENCIES DIAL 9-1-1

Non-Emergency Contact Information

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northampton County Emergency</td>
<td>757-678-0442 757-678-0486</td>
</tr>
<tr>
<td>Operations Center</td>
<td></td>
</tr>
<tr>
<td>Northampton County Sheriff’s Office</td>
<td>757-678-0458 757-678-0490</td>
</tr>
<tr>
<td>Northampton County Administration</td>
<td>757-678-0440</td>
</tr>
</tbody>
</table>

What do you need in an Emergency?

- **Food** items for 3-7 days (non-perishable, easy to prepare), manual can-opener, any **special dietary items** or **special needs items** (for infants or elderly)
- 1 gallon of **water** per person per day for 3-7 days
- **Battery-powered radio** with NOAA weather alert
- First aid kit and any needed **medications** (prescriptions)
- Important documents, **picture ID**, insurance policies, etc.
- **Cell phone** with chargers and back up battery
- Vehicle full of **fuel, keys, and cash** in small denominations
- Multi-purpose tool or **basic tool set**
- **Flashlight** and extra **batteries**
- **Clothing**, cleansing wipes, **sanitizer**, personal hygiene supplies

*Consider your pets’ needs (do not leave them behind!)*

Sign up for emergency alerts http://Northampton-ems.org

Eastern Shore Warnings & Information

Radio Stations
WESR – 103.3FM, 1330AM

Television Channels
WVEC, WTKR, WAVY

Facebook
Northampton County Dept. of EMS
Eastern Shore of Virginia 911 Center

Sign up for emergency alerts http://Northampton-ems.org

FOR ALL EMERGENCIES DIAL 9-1-1

RAFT ASSISTANCE: EMERGENCY INFORMATION MAGNETS

(Completed for Eastern Shore localities)

*https://raft.ien.virginia.edu*
THE RAFT CORE TEAM

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Elizabeth Andrews: eaandrews@wm.edu
Angela King: amking02@wm.edu

Tanya Denckla Cobb: td6n@virginia.edu
Sierra Gladfelter: sg6us@virginia.edu
THANK YOU!!

ANY QUESTIONS?
THE SCORECARD:  
1) LOCALITY LEADERSHIP, POLICY, AND COLLABORATION

• 1.1 Locality Leadership and Planning for Resilience
• 1.2 Locality Leadership and Responding to Emergency
• 1.3 Local Collaboration with State Agencies and Regional PDCs
• 1.4 Adaptive Management
• 1.5 The National Flood Insurance Program’s (NFIP) Community Rating System
THE SCORECARD:
2) RISK ASSESSMENT AND EMERGENCY MANAGEMENT

- 2.1 Flood Exposure and Vulnerability Assessment
- 2.2 Risk Assessment for Vulnerable Populations
- 2.3 Business and Economic Risk Assessment
- 2.4 Hazard Mitigation
- 2.5 Resident Emergency Preparedness

2.1 Flood Exposure and Vulnerability Assessment

DESCRIPTION
Localities should conduct and use an assessment of their flood exposure and vulnerability in developing policies and programs. The assessments may be conducted by Virginia Institute of Marine Science (VIMS) or the state, but should be available and used at the locality level. Localities should be knowledgeable of their flooding risks, raise awareness in the community about vulnerable areas, help target action to assist the most threatened areas and reduce possible damage, and save costs by being preemptive instead of reactive.

LOCALITY ACTIONS
2.1.a: Flood exposure and vulnerability assessments are created and existing assessments are updated every 5 years or less. These assessments are available at the locality level and used by localities in developing policy and programs.
2.1.b: Sources of flooding including both tidally-driven flooding (including, but not limited to, storm surge) and precipitation-driven flooding are identified and mapped. Flooding may include groundwater, rivers, streams, coastal, storm sewers, dams, and reservoirs.
2.1.c: Flooding for different storm events, by either probabilities or return periods, is identified.
2.1.d: Additional potential vulnerabilities related to health, economy, cultural and historic resources, environment, property, physical damages, population, land, critical infrastructure, and ecosystems are identified and mapped.

SCORING
✓ - A flood exposure and vulnerability assessment is completed, mapped and updated within the last 5 years, available at the locality level, and (as evidence of being used) referenced in locality policy making.
✗ - Sources of flooding for both tidally-driven and precipitation-driven events are identified and updated within last 5 years.
✓ - Flooding for different return period storm events is identified and mapped.
✓ - Additional vulnerabilities (see above), including cultural, historic and economic assets, are identified and

DATA SOURCES
- Flood exposure and vulnerability assessment publications (VIMS, FEMA, and DCR), such as FEMA floodplain maps and DCR’s Virginia Flood Risk Information System
- Hazard mitigation plan, floodplain plan, or sea level rise work (note that Section 3.7 of the Commonwealth’s Hazard Mitigation Plan addresses flooding)
- PDC website
- Calls to the locality and PDC

LOCALITY SCORE
3/4 POINTS

NOTES
3.1 Stormwater Infrastructure

3.2 Critical Transportation Infrastructure

3.3 Water Supply and Wastewater Management Services

3.4 Critical Infrastructure for Emergency Services

3.5 Natural and Nature-Based Features

3.1 STORMWATER INFRASTRUCTURE

DESCRIPTION
Stormwater management is regulated by state law, which requires that localities either create and operate a stormwater management program or request the state to operate its stormwater management program. Local ordinances must comply with the Virginia Stormwater Management Act and regulations, as well as the Virginia Erosion and Sediment Control Law. Additional stormwater management and flood risks are typically handled at the local level through environmental regulation, site plan approval, and subdivision approval. Localities that go above and beyond the minimum state requirements are better able to manage stormwater and increase their resilience to coastal storm hazards. Stormwater infrastructure may include use of bioswales, dry ponds, retention basins, rainwater management systems, low impact development, rainwater collection and management systems, green infrastructure, rooftop gardens, and green and open spaces.

LOCALITY ACTIONS

3.1.a: Locality utilizes one or more incentives to encourage private property owners to implement or install stormwater management best practices on their sites.

3.1.b: Locality establishes funding mechanisms to help fund its stormwater management program. These could include stormwater utility fees, user fees, grants (e.g., the Stormwater Local Assistance Fund or Virginia Revolving Loan Fund), or other creative funding mechanisms.

3.1.c: The locality implements and maintains stormwater Best Management Practices (BMPs), which can serve as an educational demonstration of best practices for private property owners to follow, and also as a direct means of improving stormwater management.

3.1.d: Locality addresses stormwater management in the zoning ordinance with provisions for floodplain management, erosion and sediment control, monitoring, and maintenance, and goes above and beyond the minimum state requirements.

SCORING

x = Locality offers at least one official incentive for private property activities that manage stormwater.

x = Locality funds stormwater management projects through stormwater utility fees, user fees, grants, or other creative funding mechanisms.

x = Locality implements one or more stormwater BMPs on public property for educational demonstration, as shown by visible information to signage, tours, or other information.

x = Locality stormwater policy goes above and beyond the minimum state requirements.

DATA SOURCES

- Hazard mitigation website
- Locality website (e.g., stormwater management, environmental programs, community development)
- Emergency Operations Plans
- Dam Management Plan
- LEED for Neighborhood Development

LOCALITY SCORE

0/4 POINTS

NOTES

No points awarded because research did not find evidence of an incentive; stormwater management projects funded through fees, grants, or other creative mechanisms; a stormwater BMP on public property for educational demonstration; and stormwater policy goes above and beyond the minimum state requirements.
THE SCORECARD

4) PLANNING FOR RESILIENCE

- 4.1 Budget, Funding, and State & Federal Assistance
- 4.2 Coastal Resiliency in Comprehensive Plan
- 4.3 Land Use Ordinances
- 4.4 Incentives for Coastal Resilience
- 4.5 Natural Resource Preservation

4.1 BUDGET, FUNDING AND STATE & FEDERAL ASSISTANCE

DESCRIPTION
Coastal hazard mitigation efforts, when properly funded, can reduce or prevent damage and decrease costs from storm damage. To ensure proper funding a locality can budget for mitigation efforts, assess the potential economic impact from a coastal storm hazard, and identify sources of funding for mitigation projects.

LOCALITY ACTIONS

4.1.a: Locality has incorporated coastal resilience projects into its Capital Improvement Plan (CIP), and funding for these projects are identified, such as taxes, utility fees, state and federal funds. CIP projects for coastal resilience might include upgrading critical infrastructure, water and wastewater management systems, and food, health, and medicine systems.

4.1.b: Locality identifies and quantifies the economic impacts from flooding, including property and infrastructure damage, unemployment, loss of businesses, impacts on vulnerable populations, utility restoration, and lost tax revenue.

4.1.c: The budget has been assessed to identify which funds are specifically allocated for coastal storm hazard protection and mitigation.

4.1.d: The budget should specifically address the needs of vulnerable populations impacted by coastal storm hazards.

SCORING

✓ Locality has incorporated into its Capital Improvement Plan (CIP) funding for coastal resilience (e.g., pre- and post-flooding projects to improve protection, mitigation and recovery). These could include upgrading critical infrastructure, water and wastewater management systems, and food, health, and medicine systems, with priority for needs of vulnerable populations impacted by coastal hazards.

✓ Locality has conducted an economic impacts assessment of coastal storm hazards.

✓ Locality has identified specific actions for coastal resilience (pre- and post-flooding mitigation) in its Hazard Mitigation Plan.

x Locality has identified funding for non-CIP coastal resilience projects, including priority for needs of vulnerable populations impacted by coastal storm hazards.

DATA SOURCES

- Hazard Mitigation Plan
- Capital Improvement Plan
- Local Economic Impact Assessments
- Local budget

LOCALITY SCORE

3 / 4 POINTS

NOTES

County’s CIP incorporates funding for coastal resilience projects, economic impact assessments have been conducted, specific coastal resilience actions are identified in the Regional Hazard Mitigation Plan. It is not evident that funding for non-CIP coastal resilience projects has been identified, including priority for needs of vulnerable populations.
5) COMMUNITY ENGAGEMENT, HEALTH, AND WELL-BEING

- 5.1 Public Involvement in Resilience Planning
- 5.2 Providing Coastal Resilience Information to the Public
- 5.3 Citizen Leadership & Volunteer Networks for Coastal Resilience
- 5.4 Resilient Systems to Provide Food, Health, and Medicine
- 5.5 Physical and Mental Health for Social Equity in Community Resilience

### 5.1 PUBLIC INVOLVEMENT IN RESILIENCE PLANNING

**DESCRIPTION**
A locality engages residents in resilience planning, using meaningful engagement strategies where residents are able to provide feedback and suggestions through meetings, workshops, and surveys. To reach people of color, minorities and the elderly, the locality uses media and social media that serves these populations. Through public engagement, residents become better informed and are better able to ensure their locality remains resilient to coastal storm hazards. Additionally, public engagement enables residents and other stakeholders to provide input to the locality.

**LOCALITY ACTIONS**

- 5.1.a: Locality has identified local demographics and organizations in order to understand the best method to engage them.
- 5.1.b: Locality provides educational and training opportunities for residents. Costs and benefits of various scenarios, including taking no action, are explained thoroughly. To build capacity within the community for greater resident resilience, localities may want to create Community Emergency Response Teams (CERT), where community leaders are trained in disaster preparedness for a range of hazards, including coastal storm hazards; in turn, these leaders help prepare others in their community build preparedness and disaster response. A wide array of tools is available to localities, such as hosting the EPA Environmental Justice Academy, or sponsoring awards for individual and community preparedness (like FEMA) or creating "Street Teams for Energy Efficiency and Climate Resilience."
- 5.1.c: Locality has staff dedicated to public engagement and input, and has established a standing committee that addresses coastal resilience that includes people representing socially vulnerable populations.
- 5.1.d: Locality holds coastal resilience meetings, workshops, and trainings to reach a variety of audiences with an emphasis on communities that are disproportionately impacted by coastal storm hazards.
- 5.1.e: Locality has a written policy regarding public engagement and input which includes guidance or principles for "meaningful public engagement."
- 5.1.f: Locality utilizes its website and social media for public engagement and input.

**SCORING**

- ✓ - Locality has a written policy statement regarding the role of residents and businesses, schools and educators, institutional, nonprofit, faith-based communities, hospitals, veterans, and other stakeholders in coastal resilience.
- ✓ - Locality has staff dedicated to public engagement and input on coastal resilience, including a standing committee that addresses coastal resilience as part of its work.
- ✓ - Locality holds at least one public meeting per year, including one held in vulnerable resident areas to address coastal resilience issues and posts the results of the public meetings (for example, listening sessions, social gatherings, mapping sessions, planning meetings, etc.). For 75-150,000, at least two such public meetings must be held; for 150,000+ at least three such meetings must be held.
- ✓ - Locality uses its website, social media, media serving people of color and minorities, faith-based organizations (i.e., “trusted messengers”) to engage and inform the public, particularly vulnerable populations, about coastal resilience issues, and to enable the public to provide suggestions about issues and strategies.

**DATA SOURCES**
- Comprehensive Plan
- Locality website
- Emergency Operations Plan
- Floodplain Management Plan
- Boards and Commissions set up to advise the elected officials

**LOCALITY SCORE**
3/4 POINTS