

# THE RAFT SCORECARD

A full service tool to assist localities in  
increasing their resilience

# WACHAPREAGUE

This project is a partnership between: The Institute for Engagement & Negotiation at the University of Virginia, The Virginia Coastal Policy Center at the William & Mary Law School, and Old Dominion University/Virginia Sea Grant Climate Adaptation and Resilience Program.



**INSTITUTE for  
ENGAGEMENT & NEGOTIATION**  
Shaping Our World Together



**WILLIAM & MARY**  
**LAW SCHOOL**  
VIRGINIA COASTAL  
POLICY CENTER



**OLD DOMINION UNIVERSITY**  
Resilience Collaborative

## Acknowledgment of Funders

We thank the following funders for their support in bringing The RAFT to seven localities on Virginia's Eastern Shore.

This Scorecard, Task #92.03 was funded, in part, by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant #NA17NOS4190152 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its sub agencies.



Anonymous

### **We are also grateful to these funders for supporting other aspects of The RAFT :**

The National Fish and Wildlife Foundation funded the initial launch of The RAFT.

### **Other institutions that have provided support include :**

Environmental Resilience Institute at the University of Virginia  
School of Architecture at the University of Virginia  
Virginia Environmental Endowment  
Virginia Sea Grant Climate Adaptation and Resilience Program



# CONTENTS

BACKGROUND	4
HOW DOES THE RAFT HELP A LOCALITY?	6
RAFT SCORECARD CATEGORIES	7
STEPS FOR THE RAFT	8
TOTAL SCORES AND INTERPRETING THE LOCALITY SCORE	10
<b>1) POLICY, LEADERSHIP, AND COLLABORATION</b>	
1.1 LOCALITY LEADERSHIP AND PLANNING FOR RESILIENCE	10
1.2 LOCALITY LEADERSHIP AND RESPONDING TO AN EMERGENCY	11
1.3 LOCAL COLLABORATION WITH STATE AGENCIES AND REGIONAL PLANNING DISTRICT COMMISSION (PDC)	12
1.4 ADAPTIVE MANAGEMENT	13
1.5 THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMMUNITY RATING SYSTEM	14
<b>2) RISK ASSESSMENT AND EMERGENCY MANAGEMENT</b>	
2.1 FLOOD EXPOSURE AND VULNERABILITY ASSESSMENT	15
2.2 RISK ASSESSMENT FOR VULNERABLE POPULATIONS	16
2.3 BUSINESS AND ECONOMIC RISK ASSESSMENT	17
2.4 HAZARD MITIGATION	18
2.5 RESIDENT EMERGENCY PREPAREDNESS	19
<b>3) INFRASTRUCTURE RESILIENCE</b>	
3.1 STORMWATER INFRASTRUCTURE	20
3.2 CRITICAL TRANSPORTATION INFRASTRUCTURE	21
3.3 WATER SUPPLY AND WASTEWATER MANAGEMENT SERVICES	22
3.4 CRITICAL INFRASTRUCTURE FOR EMERGENCY SERVICES	23
3.5 NATURAL AND NATURE-BASED FEATURES	24
<b>4) PLANNING FOR RESILIENCE</b>	
4.1 BUDGET, FUNDING, AND STATE & FEDERAL ASSISTANCE	25
4.2 COASTAL RESILIENCY IN COMPREHENSIVE PLAN	26
4.3 LAND USE ORDINANCES	27
4.4 INCENTIVES FOR COASTAL RESILIENCE	28
4.5 NATURAL RESOURCE PRESERVATION	29
<b>5) COMMUNITY ENGAGEMENT, HEALTH, AND WELL-BEING</b>	
5.1 PUBLIC INVOLVEMENT IN RESILIENCE PLANNING	30
5.2 PROVIDING COASTAL RESILIENCE INFORMATION TO THE PUBLIC	31
5.3 RESIDENT LEADERSHIP AND VOLUNTEER NETWORKS FOR COASTAL RESILIENCE	32
5.4 RESILIENT SYSTEMS TO PROVIDE FOOD, HEALTH, AND MEDICINE	33
5.5 PHYSICAL AND MENTAL HEALTH FOR SOCIAL EQUITY IN COMMUNITY RESILIENCE	34
REFERENCES	36

# BACKGROUND

## The Goal of The Resilience Adaptation Feasibility Tool (The RAFT)

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

## What is The RAFT?

The RAFT is a “full service” tool to assist coastal localities in increasing their resilience. Coastal resilience is the capacity to anticipate threats, reduce the community's vulnerability, respond to, and recover from hazardous events and chronic stresses. A community can be vulnerable not only due to their physical location and infrastructure, but also due to social factors with the community, such as access to transportation or medical fragility. A resilient community is one that is able to adapt, endure, and thrive in the face of change, uncertainty, and adversity - from being prepared for a hurricane to having policies that encourage appropriate land uses in the flood zone. To build resilience, localities need capacities in areas of emergency management, infrastructure, planning, policy, and community well-being. The RAFT was conceived and developed by an academic interdisciplinary collaborative, the “Core Team,” led by the University of Virginia Institute for Environmental Negotiation (IEN), the Virginia Coastal Policy Center (VCPC) at William & Mary Law School, and Old Dominion University (ODU)/ Virginia Sea Grant Climate Adaptation and Resilience Program. The RAFT features three key components that make the tool truly “full service:”

(1) The RAFT Scorecard, completed by the Core Team, provides a comprehensive assessment of the locality's resilience to flooding while remaining economically and socially viable. The Scorecard is comprehensive and measures environmental, economic and social resilience factors. It covers local policy and planning, infrastructure, budgeting, economics, land use, community engagement and health

(2) Findings from the Scorecard are presented to the locality and a community workshop is held where participants review with the Core Team the assessment findings, identify “low-hanging fruit” for increasing the locality's resilience, and create a one-year Resilience Action Checklist for adaptation actions to be implemented with assistance from partners.

(3) During implementation, the Core Team provides ongoing assistance to the locality, both in the form of technical assistance in implementing its Resilience Action Checklist and also assistance in finding funding if possible. Technical assistance may take the form of coursework done by students and/or faculty on policies, or specific engineering, architectural, or landscape designs that will advance the Resilience Action Checklist.

## Why Develop The RAFT?

Local governments in Virginia's coastal region face daunting challenges, such as sea level rise and frequent flooding. Historical and projected sea level rise present coastal localities with challenges that affect residents, businesses, and key national security facilities, as well as plans for the region's future development and infrastructure.

One important gap in the toolbox of Virginia's localities is an easy and accessible way to define and measure a locality's resilience. The RAFT attempts to fill this gap. While it draws ideas for indicators from many other resilience and sustainability report cards to create a scorecard covering environmental, economic, and social resilience, The RAFT does not rely on a locality's ability to conduct a self-assessment but instead offers the opportunity for an independent, objective assessment.

The long-term goal is to make this tool widely available to all coastal Virginia localities with the greatest need, risk, or interest.

## Who is Collaborating on The RAFT?

The Core Team is assisted by an Advisory Committee consisting of academic advisors as well as representatives of local governments, nonprofits, and state agencies. Academic advisors are drawn from the University of Virginia, Old Dominion University, Virginia Tech, College of William & Mary, Virginia Institute of Marine Science, and Louisiana State University with fields of study including architecture, landscape architecture, planning, environmental sciences, environmental psychology, engineering, and water quality. The Advisory Committee provided feedback and suggestions for indicators and measures throughout development of The RAFT Scorecard, developed criteria for selecting the first pilot communities, and selected the first three pilot communities: Gloucester County, City of Portsmouth, and Town of Cape Charles. Throughout the process, the Advisory Committee offered edits and guidance, and it will continue to provide guidance in coming years.

In addition to the Advisory Committee, the Core Team convened two special focus groups. The first was composed of representatives of coastal local governments, nonprofits, and relevant state agencies, to critically assess The RAFT and determine how to make it more relevant to Virginia's coastal localities. The second was composed of nonprofits, academia, and community representatives who reviewed the Scorecard to determine if it sufficiently addressed social equity concerns.

## Who is Funding The RAFT?

The first year of research for The RAFT was conducted in the 2015-16 academic year by the UVA Institute for Environmental Negotiation in collaboration with the Virginia Coastal Policy Center (VCPC) at William & Mary Law School. Old Dominion University (ODU) joined the Core Team in 2016 through the Virginia Sea Grant while The RAFT was piloted. The RAFT was officially launched by a 2016 Restoration and Community Stewardship grant by the National Fish & Wildlife Foundation (NFWF). This grant enabled completion of the Scorecard and testing of The RAFT process on three pilot communities in three different coastal planning district commission's. Since then, the project has received a variety of grants, including from the Virginia Environmental Endowment, the Virginia Coastal Zone Management Program, and Anonymous.



Photo Credit: Ken Lund

## How are Localities Scored?

The RAFT Scorecard is divided into five categories, each with five sections. Each section has four points for an overall total of 100 points. Working with Core Team oversight, graduate student assessors from VCPC and IEN complete the Scorecard assessment. Assessors will contact the locality about information that affects the score that cannot be found online. Assessors provide their justification for scores and sources of information in each section.



Photo Credit: National Fish & Wildlife Service

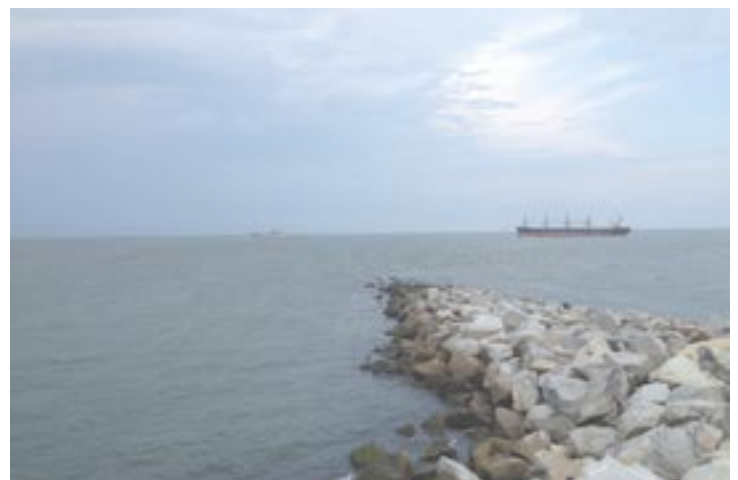


Photo Credit: CC0 Creative Commons

# HOW DOES THE RAFT HELP A LOCALITY?

Why would local governments want to use The RAFT to increase their resilience to flooding and coastal hazards? Based on lessons from the first RAFT communities, piloted in 2017, it is clear that The RAFT can help localities achieve multiple goals.

The RAFT process can help localities:

- (1) Understand their resilience strengths and opportunities.
- (2) Create a checklist to improve resilience.
- (3) Implement the checklist.
- (4) Be more engaged with residents and increase their resilience.

More specifically, the RAFT can help localities in planning, implementation and community engagement. Here are ways localities say the RAFT helps:

## Planning

- (1) Increase knowledge among elected officials, staff and city officials about specific challenges related to resilience, now and in the future.
- (2) Identify flood-prone areas, and understand the dimensions of vulnerability in those high-risk zones
- (3) Develop a vision from community leaders for a vibrant, viable, and resilient community.
- (4) Prioritize actions that will have the largest impact in increasing locality resilience.
- (5) Create a community-supported path forward to address the challenges.
- (6) Increase regional collaboration and integration between towns' and counties' programs and activities.
- (7) Improve communication and coordination between localities and government agencies, so everyone knows the plan (emphasize cross-departmental communication).
- (8) Be better positioned to find and apply for relevant funding opportunities.

## Implementation

- (9) Create systems for a rapid return to normalcy after coastal hazard events.
- (10) Update local plans, zoning code, land use policies, and design standards, to reflect changing conditions, new science, and current risk.
- (11) Develop ways to incentivize resilience in a locality.
- (12) Earn a better Community Rating System (CRS) score, which saves residents money on their flood insurance premiums.

## Engagement

- (13) Better understand/learn how to involve and engage vulnerable populations.
- (14) Fulfill roles and responsibilities to protect public safety and welfare.
- (15) Improve resilience from coastal hazard events.

## OUR GOAL:

**To help coastal communities improve resilience to flooding while remaining economically viable and socially relevant**



Photo Credit: Ole Bendik Kvisberg

# RAFT SCORECARD CATEGORIES

## Category 1: Policy, Leadership, and Collaboration

This category is for measuring policy and legislation in place for coastal resilience. It includes coordination and collaboration between various levels of government, and how accessible and open government data is to the public.

## Category 2: Risk Assessment and Emergency Management

This category examines how well a locality has conducted risk assessments to prepare for coastal storm hazards, identified vulnerable populations and their needs during or after a coastal storm hazard, and developed plans for disaster preparedness, including a Hazard Mitigation Plan.

## Category 3: Infrastructure Resilience

This category addresses critical infrastructure and assesses how well the locality has identified methods and plans for protecting this critical infrastructure during coastal storm hazards.

## Category 4: Planning for Resilience

This category covers land use, planning, and incentives. It assesses the comprehensive plan and zoning code for attention to resilience. It also looks at how much a locality is using various incentives to promote resilience in building and development. It shows how well a locality's policies to protect its ecosystems and green infrastructure to improve its resilience, as well as how much resilience has been incorporated into the Capital Improvement Plan and Hazard Mitigation Plan.

## Category 5: Community Engagement, Health, and Well-Being

This category assesses how well the community engages with residents in planning for coastal storm hazards, and supports and empowers residents to provide leadership to support resilience. Social equity considerations are important, as localities should be especially active in involving low income and minority members of the community who may be more vulnerable, who may have greater needs for assistance during and after coastal storm hazard events, and who may also benefit from different methods of engagement. This category also examines aspects of the locality's attention to issues of health and wellness during and after coastal events, as community 'wellness' builds the capacity of a community to become more resilient and adaptive.



Photo Credit: National Fish & Wildlife Service



Photo Credit: National Fish & Wildlife Service



Photo Credit: National Fish & Wildlife Service

# STEPS FOR THE RAFT

## RESILIENCE ADAPTATION FEASIBILITY TOOL

### OUR GOAL

To help coastal communities improve resilience to flooding while remaining economically viable and socially relevant

### THE TEAM

University of Virginia's Institute for Environmental Negotiation (IEN); Virginia Coastal Policy Center (VCPC) at William & Mary Law School, and Old Dominion University/Virginia Sea Grant Climate Adaptation and Resilience Program

### HOW DOES THE RAFT IMPROVE COASTAL RESILIENCE?

#### 1. SCORECARD ASSESSMENT

**ASSESSMENT:** RAFT team collaborates to assess localities for resilience to coastal flooding and hazards.

**RESEARCH:** RAFT team conducts research on each section of the scorecard, calling locality and regional staff for additional information when needed.

**REVIEW:** RAFT team reviews findings with local leaders. Where additional information warrents, the RAFT team may adjust scores.

#### 2. RESILIENCE ACTION WORKSHOP

**IDENTIFY COMMUNITY LEADERS:** RAFT team works with locality to identify appropriate community leaders and convenes a Resilience Action Workshop.

**SCORECARD RESULTS:** RAFT team shares results of the Scorecard assessment with workshop participants.

**ONE-YEAR ACTION CHECKLIST:** Workshop participants develop an achievable and manageable one-year Resilience Action Checklist.

#### 3. IMPLEMENT RESILIENCE ACTION CHECKLIST

**WORKSHOP OUTCOMES:** RAFT team provides locality with a report on workshop outcomes, including the Resilience Action Checklist.

**ONGOING SUPPORT:** RAFT team supports implementation of the Resilience Action Checklist by the locality and others for one year.

#### 3. IF YOU LIKE...

RAFT team can establish periodic support calls with your locality.

RAFT team can provide assistance by conducting research, identifying Univeristy expertise, or potential funding sources.

RAFT team can schedule a timeline when the locality may wish to be reassessed.

Advisory Committee is drawn from academia (UVA, WM, ODY, VT), localities, PDCs, NGOs, and state agencies. The Advisory Committee's role is to provide guidance on Scorecard content, application, RAFT process, and to provide additional support as needed during the Workshop and Implementation phases.





Wachapreague. Photo Credit: Patrick J. Hendrickson



Tangier Island. Photo Credit: Patrick J. Hendrickson



Onancock. Photo Credit: Patrick J. Hendrickson

## TOTAL SCORES

Category	Score Received	Total Possible Score
<b>1) POLICY, LEADERSHIP, AND COLLABORATION</b>	11	20
<b>2) RISK ASSESSMENT, AND EMERGENCY MANAGEMENT</b>	17	20
<b>3) INFRASTRUCTURE RESILIENCE</b>	12	20
<b>4) PLANNING FOR RESILIENCE</b>	12	20
<b>5) COMMUNITY ENGAGEMENT, HEALTH, AND WELL BEING</b>	9	20
<b>TOTAL SCORES: <u>61</u> out of 100 points</b>		

### Interpreting The Locality Score

#### Low Resilience: 0% to 50% of Total Possible Score

Localities that score low resilience have plenty of opportunity for improvement. The locality should decide whether it will be more beneficial to achieve the least difficult improvements first, or to tackle the more challenging problems as a priority. The key is for locality “thought leaders” to decide which of these approaches makes the most sense, as they develop the Locality Resilience Action Checklist.

#### Moderate Resilience: 51% to 74% of Total Possible Score

Localities that score moderate resilience are already actively involved in coastal resilience planning and have achieved some successes. There are still opportunities for strengthening resilience. Checklist should focus on weakest categories and anticipate moderate to difficult improvements.

#### High Resilience: 75% to 100% of Total Possible Score

Localities with high resilience are well prepared for flooding while remaining economically viable and socially relevant! There may still be room for resilience and the Locality Resilience Action Checklist may focus on ways to retain resilience and further engage locality residents. The locality’s policies, tools, actions, and checklist may assist other localities as a guide and source of inspiration.

# 1.1 LOCALITY LEADERSHIP AND PLANNING FOR RESILIENCE

## DESCRIPTION

Collaboration among local government decision makers, officials, departments, academia, and NGOs is important in planning for coastal resilience. Effective collaboration requires identifying local leaders and organizations, establishing the roles of such leaders and organizations, and providing leadership training and educational resources.

## LOCALITY ACTIONS

- 1.1.a: Locality has identified leadership for coastal resilience, including at a minimum but not limited to elected officials and staff in planning, zoning, public works, engineering, building officials, parks and recreation, stormwater management, emergency management, police, and fire.
- 1.1.b: Roles of these leaders, departments and organizations are established to prepare and plan for coastal resilience.
- 1.1.c: Leadership training and educational resources are readily available to these leaders listed above. "Readily available" can mean they are available on the local government and/or partner websites, at low or no cost.
- 1.1.d: There is coordination among all these leaders involved in creative thinking, long-term planning, careful budgeting, strong communication, and fostering trust in local government.
- 1.1.e: Collaboration includes many of these leaders listed above (e.g. planning, zoning, public works, engineering, fire-rescue, etc.) across a range of professions in planning for resilience.
- 1.1.f: Leadership is aware of communities that have been traditionally under-served and may be disproportionately affected by coastal storm hazards in their region.

## SCORING

- ✓ - Leadership roles are identified for staff and/or elected officials important for planning for resilience. If staff is limited or nonexistent, the locality has tasked someone with handling resilience efforts for the community.
- ✓ - Training and education events are held for elected officials specifically on resilience issues.
- ✓ - Training and education events are held for locality staff, or if staff is limited or nonexistent, training of whomever has been tasked with handling resilience efforts for the community.
- x - Locality staff and/or elected officials/ or whomever has been tasked with handling resilience efforts for the community, are meeting at least once per quarter to coordinate planning specifically on resilience issues.

## DATA SOURCES

- Locality website
- PDC website
- Calls to the locality and Planning District Commission (PDC)
- Locality resilience plan or strategy
- Emergency Operations Plan
- Hazard Mitigation Plan

## LOCALITY SCORE

3 / 4 POINTS

## NOTES

Town has staff training opportunities for mitigation issues. Town is aware of special needs populations. Town offers training opportunities for public officials. Town does not meet once per quarter to discuss resiliency issues.

## 1.2 LOCALITY LEADERSHIP AND RESPONDING TO EMERGENCY

### DESCRIPTION

Collaboration among local officials and relevant stakeholders is equally important in responding to a coastal hazard. An organized, coordinated response to a coastal hazard requires identifying stakeholders, establishing roles, creating plans, and publicizing information.

### LOCALITY ACTIONS

- 1.2.a: The locality has identified important stakeholders whose activities are relevant to emergency response, including but not limited to post-flooding activities, planning, stormwater management, design, environmental, public health, utilities, water, security, infrastructure, transportation, waste, public safety, and lower income or socially vulnerable populations. The roles and responsibilities of all these parties and partners are clearly defined in writing, up-to-date, and documented. The locality has identified internal roles for responding to different aspects of a coastal storm hazard event.
- 1.2.b: Relevant parties and partners in local government participate in at least one training each year on response to emergencies, including but not limited to the locality's Floodplain Management Committee, Hazard Mitigation Committee, and Regional Committees. The PDC's often provide this training for local governments.
- 1.2.c: Local government coastal resilience initiatives (e.g. plans, goals, actions, ordinances, codes, development, etc.) are consistent with those of relevant stakeholders, identified by the locality (see above for list of stakeholders), including Fire and Rescue, VDOT, Law Enforcement, other local governments, and the Planning District Commission (PDC). Networks are established to facilitate collaboration during a response to a coastal storm hazard event, enable localities to remain informed to coordinate their efforts, and to expand and connect different programs. The PDC's often perform this networking role for local governments.

### SCORING

- ✓ - Locality has identified stakeholders who will require emergency response including socially vulnerable populations.
- ✓ - Locality has established internal emergency response roles (e.g., standing committees, staff titles), and these staff and partners participate in at least one training each year.
- ✓ - Locality collaborates on resilience planning with the stakeholders who will need emergency response, and has provided the public with opportunity to give input in the formation of its emergency management and evacuation plans, particularly those from lower income and vulnerable populations.
- ✓ - Locality has a means of communicating these plans to the public during a coastal storm hazard event.

### DATA SOURCES

- Locality Hazard Mitigation Plan
- Emergency Operation Plans
- Locality and fire department website
- Calls to the locality and PDC
- PDC websites (regional coastal storm Hazard Mitigation Plan which includes local components)

### LOCALITY SCORE

4/4 POINTS

### NOTES

Town is aware of special needs populations. Town collaborates with stakeholders and gives citizens input via CCC (The Eastern Shore CCC oversees the Citizen Emergency Response Team (CERT) and Medical Reserve Corp (MRC) programs. Both of these programs are voluntary (and free) programs designed to teach citizens how to prepare themselves for disasters as well as give an outlet for members to assist the counties in their emergency preparedness outreach programs. Town provides a means for communicating these plans (through Accomack County). Town established emergency response roles.

## 1.3 LOCAL COLLABORATION WITH STATE AGENCIES AND REGIONAL PDCs

### DESCRIPTION

Coastal resilience issues go well beyond political boundaries and, therefore, benefit from regional collaboration in planning and response. Regular communication between local, multi-jurisdictional, and state officials encourages the sharing of information and ideas related to coastal resilience. Locality collaboration should also specifically include working with agencies and organizations that serve socially vulnerable communities. Localities are part of a PDC, which typically coordinates many of these activities on multiple levels.

### LOCALITY ACTIONS

- 1.3.a: Locality staff and/or officials meet regularly (at least once per month) with state and multi-jurisdictional officials to address resilience issues.
- 1.3.b: Locality staff and/or officials engage in local and regional work groups (often through the PDC) to share ideas and network around resilience, specifically including working with agencies and organizations that serve socially vulnerable communities.
- 1.3.c: Locality staff and/or officials work to identify at the local and regional levels program and funding opportunities and priorities for resilience issues.

### SCORING

- x - Locality staff and/or officials engage with regional and state agencies on resilience-oriented issues.
- x - Locality participation in local and regional resilience-oriented committees and initiatives to serve socially vulnerable populations.
- x - Locality elected officials participate on relevant local and regional resilience-oriented commissions.
- x - Locality staff work to identify funding opportunities and priorities to address resilience issues at the regional and state level.

### DATA SOURCES

- PDC website
- Locality website
- Department of Conservation and Recreation
- Calls to the locality and PDC

### LOCALITY SCORE

0/4 POINTS

### NOTES

No points awarded because it is not clear which committees and initiatives and agencies (state and Federal) the town is involved with.

## 1.4 ADAPTIVE MANAGEMENT

### DESCRIPTION

Adaptive management involves updating ordinances and plans for coastal resilience based on new findings and emerging available strategies. Use of data, scientific analyses, and new information is important to inform local ordinances and policies to prepare for potential risks. Adaptive management also means incorporating lessons learned from research that informs best methods for addressing the needs of socially vulnerable populations.

### LOCALITY ACTIONS

- 1.4.a: Local ordinances and policies are updated within at least the last five years to address coastal resilience.
- 1.4.b: Local ordinances and policies address resilience in all domains, including but not limited to planning, zoning, the built environment, ecology, public health and safety, stormwater management, floodplain management, and coastal storm hazard relief.
- 1.4.c: Local ordinances and policies incorporate data, scientific, analyses, and new information to prepare for potential risks to the locality's resilience.
- 1.4.d: Locality adaptive strategies incorporate lessons learned from research relevant to the protection of socially vulnerable populations.

### SCORING

Locality has reviewed and incorporated data, scientific analyses, and new information and approaches to resilience, including approaches relevant to the protection of socially vulnerable populations, into the following, within the last five years:

- ✓ - Floodplain Management Ordinance.
- x - Zoning Ordinance.
- x - Site and Subdivision Ordinances.
- ✓ - Comprehensive Plan.

#### DATA SOURCES

- Local ordinances and Comprehensive Plan
- Local resilience plan/strategy
- Emergency management plans
- Call to the locality

#### LOCALITY SCORE

2/4 POINTS

### NOTES

Comprehensive plan was updated in 2016; includes sea level rise figures on page 22. Town has floodplain ordinances. County does not appear to have zoning or building ordinances. Zoning permits are required but it does not appear that they have a code.

## 1.5 THE NFIP'S COMMUNITY RATING SYSTEM

### DESCRIPTION

Communities wishing to go above and beyond the minimums of the National Flood Insurance Program can choose to participate in the Community Rating System (CRS). Participating communities implement higher standards of floodplain management, and, in return, residents are eligible for flood insurance premium reductions. Localities can do many things to improve their scores. For more information, see FEMA's CRS website or the Wetlands Watch website on the subject.

### LOCALITY ACTIONS

- 1.5.a: Read through Virginia-specific guides, such as Wetlands Watch's Flood Protection Payoffs; A Local Government Guide to the Community Rating System
- 1.5.b: Become familiar with the CRS categories and requirements
- 1.5.c: Identify where the community can make reasonable changes in order to receive more CRS credits
- 1.5.d: Apply to join CRS. Note: CRS classes are listed as 1-10 with 1 being the best possible score. The CRS was developed to provide incentives in the form of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding.

### SCORING

- ✓ - Locality has achieved a CRS Score of 9 or higher.
- ✓ - Locality has achieved a CRS Score of 8.
- x - Locality has achieved a CRS Score of 7.
- x - Locality has achieved a CRS Score of 6 or lower.

### DATA SOURCES

- DCR Floodplain Management Program
- Wetlands Watch
- FEMA's CRS website generally, as well as publication of recent scores (<https://www.fema.gov/media-library/assets/documents/15846>)

### LOCALITY SCORE

2/4 POINTS

### NOTES

CRS score of 8.

**TOTAL SCORE FOR SECTION 1: 11 OUT OF 20 POSSIBLE POINTS**

## 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

### 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.
- x - 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

A flood-exposure and vulnerability assessment has been completed, mapped, and updated within the last 5-7 years, is available at the town level, and is referenced in locality policy making. Flooding for different return period storm events is identified and mapped. Additional vulnerabilities including cultural, historic and economic assets, are identified and updated within the last 5 years.



## 2.2 RISK ASSESSMENT FOR VULNERABLE POPULATIONS

### DESCRIPTION

To be resilient, localities should conduct risk assessments of their socially vulnerable populations. These populations often include those in areas of high poverty, the elderly, caregivers, veterans, the homeless, transient or nomadic communities, children and youth, physically or mentally disabled people, other medically fragile people and non-native English speakers. Because these populations may not have resources to change their level of vulnerability (by moving, by elevating homes, or by taking other action), it is vital for localities to identify these populations, identify ways to reduce their risk, and create plans for assisting them during and after significant coastal storm hazard events. To ascertain their specific needs to prepare for and recover from coastal storm hazard events, localities need to engage and conduct outreach to vulnerable populations.

### LOCALITY ACTIONS

- 2.2.a: Locality identifies the populations (identified above) that are vulnerable to coastal storm hazard events in a clear way, such as direct observations, measurements, reports, maps, and graphs, using tools such as EPA Environmental Justice screen.
- 2.2.b: Locality engages vulnerable populations through schools, neighborhood organizations, NGOs, grassroots organizations, faith-based community, social and civic organizations, media that reaches the specific vulnerable population, or other groups that work with vulnerable populations to educate them about their vulnerability to coastal storm hazards.
- 2.2.c: Locality engages with vulnerable populations to reduce their vulnerability by increasing their emergency preparedness (e.g. emergency drills), and providing other relevant information to help them know what they should do during and after a coastal storm hazard event. For example, vulnerable populations should understand the differences between a storm warning and watch.
- 2.2.d: Locality recognizes, supports and works closely with community organizations (e.g. food banks, pantries, social services, hospitals, non-profit agencies, civic organizations, Department of Health) that provide assistance to vulnerable populations, specifically to ensure meaningful engagement of socially and environmentally vulnerable populations.

### SCORING

- ✓ - Locality has identified vulnerable populations that are subject to flooding and coastal storm hazards.
- ✓ - Locality has engaged vulnerable populations and provided them with meaningful information (e.g., in their own language, relevant to their circumstances) relating to their vulnerability to flooding and other coastal storm hazards.
- ✓ - Locality has worked with vulnerable populations to increase their emergency preparedness and evacuation plans so they know their risk and know what steps should be taken during and after an event.
- x - Locality partners and coordinates with organizations that provide assistance to vulnerable populations before, during and after coastal storm hazards, including food banks or pantries with refrigeration units and backup generators.

### DATA SOURCES

- Locality website
- Local Department of Health
- Social Services
- Local or Regional Homeland Security Office
- Hospitals
- Emergency Operations Plan
- Comprehensive Plan
- PDC Website
- Calls to locality and PDC

### LOCALITY SCORE

3/4 POINTS

### NOTES

Town is aware of special needs populations. Town collaborates with stakeholders citizen an input via CCC. The Eastern Shore CCC oversees the Citizen Emergency Response Team (CERT) and Medical Reserve Corp (MRC) programs. Both of these programs are voluntary (and free) programs designed to teach citizens how to prepare themselves for disasters as well as give an outlet for members to assist the counties in their emergency preparedness outreach programs. Town coordinates with organizations that focus on socially vulnerable populations.

## 2.3 BUSINESS AND ECONOMIC RISK ASSESSMENT

### DESCRIPTION

To be resilient, localities need to understand and identify local business and economic vulnerabilities to flooding and other coastal storm hazards. Businesses are differentially affected by these hazards and attention should be paid to making sure that businesses that serve vulnerable populations are considered. Local businesses are an important part of the community, both economically and for the services they provide. Including business and economic vulnerability in a risk assessment and emergency management is important for resilience and recovery.

### LOCALITY ACTIONS

- 2.3.a: Locality examines economic risk and potential losses due to risk factors such as lack of business diversity, high percentage of small businesses, non-employer establishments, high percentage of retail and/or wholesale trade businesses, and a high percentage of tourism, leisure and/or land-dependent businesses.
- 2.3.b: Locality engages with business community and economic development departments to encourage emergency preparedness, hazards mitigation, and resilience planning.
- 2.3.c: Locality and/or business associations encourage local businesses to prepare for an emergency and plan for business continuity.
- 2.3.d: Locality emergency management communicates with the business sector during emergencies and evacuations.

### SCORING

- ✓ - Locality has included the business sector in its assessment and mapping of coastal hazard vulnerability.
- ✓ - Locality has engaged economic development department and/or independent chamber of commerce in locality hazards mitigation and/or resilience planning.
- ✓ - Locality and/ or business associations have programs for small businesses, and particularly businesses that serve socially vulnerable populations, to encourage each business to be prepared for an emergency and plan for business continuity.
- ✓ - Locality emergency management communicates with business sector in the event of severe weather emergency or

### DATA SOURCES

- Coastal hazard mitigation plan
- Locality website
- Local chamber website
- Other business association website
- Call to locality

### LOCALITY SCORE

4/4 POINTS

### NOTES

Town has engaged economic development department and/or independent chamber of commerce in town hazards mitigation and/or resilience planning. Town has included the business sector in its assessment and mapping of coastal hazard vulnerability. Town and/ or business associations have programs for small businesses, and particularly businesses that serve socially vulnerable populations, to encourage each business to be prepared for an emergency and plan for business continuity. Town emergency management communicates with business sector in the event of severe weather emergency or evacuation.

## 2.4 HAZARD MITIGATION

### DESCRIPTION

The Hazard Mitigation Plan (HMP) is required by state code as a condition of emergency assistance. In the coastal region, it is important for the HMP to specifically address coastal storm hazards by identifying what locality resources and areas are at risk, to enable the locality to take actions to reduce future risks. Furthermore, having an HMP is essential to be eligible for certain grants and funding related to coastal storm hazards.

### LOCALITY ACTIONS

- 2.4.a: The locality's HMP specifically addresses coastal resilience, to enable the locality to take actions to reduce future risks.
- 2.4.b: The locality is working to advance regional coordination for hazard mitigation, by collaborating with other localities in its region.
- 2.4.c: The locality collaborates with Virginia Department of Emergency Management (VDEM), DCR Floodplain Management, or the State Hazard Mitigation Officer (SHMO).
- 2.4.d: The locality's HMP is reviewed and updated every 5 years, is approved by FEMA, and involves the public in the review and update of the plan (which is required by FEMA).
- 2.4.d: The locality's HMP addresses needs of socially vulnerable communities, includes input and review by organizations that can represent vulnerable communities and/or members of these communities.
- 2.4.f: The locality's HMP contains data on vulnerable populations gathered through direct observations and/or measurement.

### SCORING

- ✓ - The locality's HMP specifically addresses coastal resilience.
- ✓ - The locality is engaging in regional coordination for Hazard Mitigation, through a regional plan.
- ✓ - The locality's HMP details how the locality collaborates with VDEM, DCR Floodplain Management, or SHMO.
- ✓ - The locality's HMP is approved by FEMA, was developed with meaningful public engagement with socially vulnerable communities, and is formally adopted by locality governing body (the engagement is meaningful with

### DATA SOURCES

- Coastal hazard mitigation plan
- Locality website
- PDC website
- Calls to locality and PDC
- Use metrics for meaningful engagement like time on the agenda for discussion, questions, feedback

### LOCALITY SCORE

4/4 POINTS

### NOTES

Town's HMP specifically addresses coastal resilience. The town is engaging in regional coordination for Hazard mitigation, through a regional plan. The town's HMP details how the locality collaborates with VDEM, DCR Floodplain Management, or SHMO. The town's HMP is approved by FEMA, was developed with meaningful public engagement with socially vulnerable communities, and is formally adopted by locality governing body-(the engagement is meaningful with vulnerable communities).

## 2.5 RESIDENT EMERGENCY PREPAREDNESS

### DESCRIPTION

An important aspect of a locality’s resilience is the level of its emergency preparedness to meet the needs of community residents, particularly those who are most socially vulnerable. Well-organized emergency preparedness and plans save lives and property, and help ensure that localities can act in sufficient time. They also contribute to community resilience in the form of faster and more efficient post-hazard recovery. Preparedness for vulnerable populations also includes ensuring that residents have the opportunity to learn basic swimming and water safety skills. Communities should consider participating in regional, national, or state-wide outreach events such as Hurricane Preparedness Week or Rally for Resilience.

### LOCALITY ACTIONS

- 2.5.a: Locality has created and/or updated within the last five years a preparedness plan for residents, which can include medical supplies, food, water, shelter, and staple goods.
- 2.5.b: Locality conducts community outreach at least once a year to ensure that residents understand how to prepare for coastal storm hazard emergencies with an emphasis and/or inclusion of lower income and other vulnerable populations
- 2.5.c: Locality helps the community be prepared for emergencies through different types of engagement, such as planning workshops, school emergency drills, as well as drills and exercises for emergency personnel and residents.
- 2.5.d: Locality has implemented an early warning system to alert all residents, about an imminent coastal storm hazard event. This could include a range of tools such as loud sirens or text alerts.

### SCORING

- ✓ - Locality has a current resident emergency preparedness plan, updated within the last five years, which identifies resident emergency preparedness risks and needs, including knowledge of water safety.
- ✓ - Locality conducts community outreach at least once a year to inform residents about community emergency preparedness.
- ✓ - Locality engages resident groups, including schools, hospitals, and other groups, in testing preparedness through emergency drills, disaster simulations, and planning workshops.
- x - Locality has implemented early warning signals/systems/ emergency warning tools for its residents, particularly

#### DATA SOURCES

- Hazard Mitigation Plan
- Locality website
- Calls to locality

#### LOCALITY SCORE

3/4 POINTS

### NOTES

Town has a comprehensive plan. Town conducts community outreach. Town involves resident groups.

**TOTAL SCORE FOR SECTION 2: 17 OUT OF 20 POSSIBLE POINTS**

## 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

Locality currently updating stormwater infrastructure plan.

## 3.2 CRITICAL TRANSPORTATION INFRASTRUCTURE

### DESCRIPTION

An evaluation of critical transportation infrastructure allows a locality to understand its capacity and preparedness for coastal storm hazards. Although most localities do not manage their own roads, as this is handled at the state level, they nevertheless do have the ability to identify their transportation needs and priorities.

### LOCALITY ACTIONS

- 3.2.a: Locality forecasts potential loss of public service from various coastal storm hazards, including percent of households affected.
- 3.2.b: Locality evaluates critical transportation infrastructure for safety, reliability and capacity. In the case of a coastal storm hazard, transportation infrastructure must be depended on for evacuation, hospital, and emergency access. Forecast how many roads or systems would be closed during various coastal storm hazards.
- 3.2.c: Locality uses the Community Rating System’s higher standards for critical facilities as a guide to assessing critical infrastructure, and identifies what changes should be made to improve existing infrastructure.
- 3.2.d: Locality has located critical transportation infrastructure outside of flood zones or in areas otherwise passable during design floods when possible.
- 3.2.e: Locality uses the Department of Homeland Security’s Infrastructure Data Taxonomy to catalog and characterize infrastructure.
- 3.2.f: Locality uses the Department of Transportation’s Federal Highway Authority’s sustainability tools, such as the Guide to Assessing Criticality in Transportation Adaptation Planning, to assess vulnerability in transportation infrastructure.
- 3.2.g: Locality uses modeling and statistical analysis to project sea level rise impacts on transportation infrastructure in the next 10, 20, 30 years and beyond.

### SCORING

- ✓ - Locality has identified critical transportation infrastructure and assessed its vulnerability within last 5 years.
- x - Locality has developed a plan to protect critical transportation infrastructure within last 5 years.
- ✓ - Locality has a plan available and has informed residents which critical transportation infrastructure to utilize in the case of coastal storm hazards.
- ✓ - Locality has a contingency plan for critical transportation infrastructure. This plan has been created and/or

### DATA SOURCES

- Hazard Mitigation Plan
- Local Transportation Plan
- Local Public Works Design & Construction Standards
- Virginia Department of Transportation Road and Bridge Standards
- Locality website
- Calls to locality

### LOCALITY SCORE

3/4 POINTS

### NOTES

Town identifies critical infrastructure. Locality informs residents which infrastructure to use via local media outlets and social media. Contingency plans can be found in the Emergency Operations Plan.

### 3.3 WATER SUPPLY AND WASTEWATER MANAGEMENT SERVICES

#### DESCRIPTION

Communication and coordination between a locality and its municipal water utility(ies) and wastewater utility(ies) enable a coordinated, cohesive, and synchronized response to a coastal storm hazard.

#### LOCALITY ACTIONS

- 3.3.a: Locality considers opportunities where cooperative action could enhance a coordinated, multi-agency response to a coastal storm hazard in a cohesive and synchronized manner. The locality considers local opportunities, as well those in neighboring localities or on the regional scale.
- 3.3.b: Locality develops risk scenarios for coastal storm hazards and prioritizes specific scenarios for evaluation and multi-agency response and recovery planning.
- 3.3.c: Locality has relationships and established lines of communication with municipal water utilities and wastewater utilities, and is discussing issues such as reserve water supplies, greywater supplies for emergency, back-up supplies such as rainwater catchment, and considerations for rainwater collection and management. With private well and water system owners, it is discussing ways they can increase their water system resiliency, such as being prepared with generators, raising generators above 100 year flood levels, and upgrading and repairing distribution systems.
- 3.3.d: Locality has provided contact information for wastewater and drinking water utilities in the case of an emergency.

#### SCORING

- ✓ - Locality conducts an assessment of its drinking water supply and wastewater management, both public sources and private well owners, to identify vulnerabilities to coastal storm hazards.
- x - Locality water supply plan addresses coastal flooding and hazard events to assure safe drinking water supply and water conservation.
- x - Locality conducts a resident education program on safe drinking water to assure post-event public health and safety.
- ✓ - Locality has a method of communication with the municipal water and wastewater utility, to ensure that communications are in place to manage ongoing challenges to safe water, including during and after an emergency. Alternatively or additionally, the locality also has established method of communication with private well and water system owners, to ensure all are informed about how they can protect and increase their water system resiliency.

#### DATA SOURCES

- Locality website
- Hazard Mitigation Plan
- Local utility Website
- Comprehensive Plan
- Locality Water Supply Plan
- Department of Health, Department of Environmental Quality; website/regulations
- Calls to locality and PDC

#### LOCALITY SCORE

2/4 POINTS

#### NOTES

Town has conducted an assessment of its drinking water supply and wastewater management, both public sources and private well owners, to identify vulnerabilities to coastal storm hazards. The town only has private wells and septic tanks. There were problems in the past with the septic tanks and it was addressed in the comprehensive plan from 2016.

### 3.4 CRITICAL INFRASTRUCTURE FOR EMERGENCY SERVICES

#### DESCRIPTION

An evaluation of critical infrastructure for emergency services including shelters, emergency facilities, medical, electrical, and other essential services that allows a locality to understand its capacity and preparedness for coastal storm hazards. Critical infrastructure ensures that socially vulnerable populations, not just those who can afford it, will have access to quality drinking water, electricity, food, and shelter.

#### LOCALITY ACTIONS

- 3.4.a: Locality identifies critical infrastructure for emergency services and assessed its vulnerability within last 5 years.
- 3.4.b: Locality evaluates protective and emergency infrastructure, and ensures it is adequately equipped to handle various coastal storm hazards.
- 3.4.c: Locality uses FEMA's higher standards for critical facilities as a guide to assessing critical infrastructure and identifies what changes should be made to improve existing infrastructure.
- 3.4.d: Locality identifies critical infrastructure outside of flood hazard areas when possible.
- 3.4.e: Locality uses the Department of Homeland Security's Infrastructure Data Taxonomy to catalog and characterize infrastructure.
- 3.4.f: Locality uses modeling and statistical analysis to project sea level rise impact on critical infrastructure in the next 10, 20, 30 years and beyond.

#### SCORING

- ✓ - Locality identifies critical infrastructure for emergency services and assessed its vulnerability within last 5 years.
- ✓ - Locality has a plan to protect this critical infrastructure from storms and sea level rise within last 5 years.
- ✓ - Locality informs residents which critical infrastructure they should use during coastal storm hazards.
- ✓ - Locality has a contingency plan for continuing services. This plan has been developed or updated in the last 5 years.

#### DATA SOURCES

- Hazard Mitigation Plan
- Locality website
- Calls to locality
- Comprehensive Plan

#### LOCALITY SCORE

4/4 POINTS

#### NOTES

Town has identified critical infrastructure for emergency services and assessed its vulnerability within last 5 years. Town has developed a plan to protect this critical infrastructure from storms and sea level rise within last 5 years, including outreach to private well and private water system owners about their they can protect and increase their water system resiliency. Town informs residents which critical infrastructure they should use during coastal storm hazards. Town has a contingency plan for continuing services. This plan has been created and/or updated in the last 5 years.



## 3.5 NATURAL AND NATURE-BASED FEATURES

### DESCRIPTION

Natural and nature-based features (NNBF) are features that define natural coastal landscapes, and are either naturally occurring or have been engineered to mimic natural conditions. Examples include beaches and dunes; vegetated forest buffers, salt marshes, freshwater wetlands, and submerged aquatic vegetation; oyster reefs; and barrier islands. Green infrastructure (GI) is similar and complementary, and uses vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments. At the city or county scale, green infrastructure is a patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the neighborhood or site scale, stormwater management systems that mimic nature soak up and store water. Both NNBF and GI may be undertaken by a community in a variety of ways.

### LOCALITY ACTIONS

- 3.5.a: Locality plans for natural and nature-based features such as: planting native trees and plants, restoring wetlands, promoting living shorelines, rain gardens, riparian buffers, increasing tree canopy, stormwater parks, permeable pavement, green roofs, cisterns and rain barrels, improving soil quality, brownfield redevelopment, and reducing erosion.
- 3.5.b: Locality has a green infrastructure plan to identify ecological assets and to propose natural and nature-based solutions in problematic areas. The plan establishes locality preference for using natural and nature-based features, including in lower income communities, and places an emphasis on resource restoration and living infrastructure.
- 3.5.c: Locality provides incentives to encourage the use of natural and nature-based features to increase coastal resilience. Incentives may include tax exemptions for riparian buffers and living shorelines or other financial assistance, such as a grant program, for the completion of these types of projects.

### SCORING

- ✓ - Locality has identified natural and nature-based features that are protective and can assist with coastal resilience.
- ✓ - Locality has developed plans and policies that use natural and nature-based features to enhance coastal resilience
- ✓ - Locality is implementing projects that are in accordance with the plans and policies developed to utilize natural and nature-based features to increase coastal resilience.
- x - Locality offers incentives for the use of natural and nature-based features to increase coastal resilience.

### DATA SOURCES

### LOCALITY SCORE

- Local assessments of ecological assets
- Local plans (e.g., green infrastructure plans, recreational strategy, tourism development strategy, comprehensive plan)
- Local ordinances (e.g., zoning)
- Proposed project plans

3/4 POINTS

### NOTES

Town has identified ecological assets vulnerable to flooding and coastal storm hazards, as apparent in their section of the Hazard Mitigation Plan as well as their Comprehensive Plan, where ecological areas are identified as at risk of coastal erosion and susceptible to damage from storm surge. Town has also developed plans and policies that use natural and nature-based features to enhance coastal resilience being part of the Accomack County Green Infrastructure Plan. Town is also in the process of implementing projects to enhance coastal resilience, such as marsh refurbishment and oyster castles. However, it is not evident whether the Town offers incentives for NNBF to increase coastal resilience.

**TOTAL SCORE FOR SECTION 3: 12 OUT OF 20 POSSIBLE POINTS**

## 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.
- ✓ - Locality has identified funding for non-CIP coastal resilience projects, including priority for needs of vulnerable

### DATA SOURCES

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

### LOCALITY SCORE

4/4 POINTS

### NOTES

Hazard Profile in HMP goes over economic impact of coastal flooding. Multiple projects noted for specific action on Coastal Resilience. Town works with US Army Corp of Engineers for funding to minimize storm wave damage.

## 4.2 COASTAL RESILIENCY IN COMPREHENSIVE PLAN

### DESCRIPTION

A comprehensive plan is a locality's vision for future land use, development, adaptation, and resilience. Coastal resilience can be addressed in comprehensive plans by incorporating elements such as green infrastructure, open space preservation, infill development, the National Flood Insurance Program (NFIP), the Community Rating System (CRS), and stormwater management. The ideal comprehensive plan identifies equity and the need to identify and support socially vulnerable populations as a priority for resilience, as well as a priority preference for restoration, green infrastructure and connectivity.

### LOCALITY ACTIONS

- 4.2.a: Locality staff, residents, stakeholders, and others are involved in creating the comprehensive plan.
- 4.2.b: Locality recognizes coastal resilience as an issue for consideration in the comprehensive plan, and gathers information (either by conducting its own studies and analysis, or locating other sources) to develop strategies to enhance its coastal resilience.
- 4.2.c: The comprehensive plan identifies natural resources that help mitigate flooding, and provides strategies to preserve and protect such resources from risks associated with coastal storm hazards.
- 4.2.d: The comprehensive plan identifies critical infrastructure necessary for essential services, and provides strategies to protect such infrastructure from risks associated with coastal storm hazards.

### SCORING

- x - The comprehensive plan discusses how community engagement around coastal resilience informed the plan.
- ✓ - The comprehensive plan includes clear discussion of coastal resilience and coastal storm hazards, and incorporates assessments to inform the development of policies to reduce vulnerability to coastal storm hazards.
- ✓ - The comprehensive plan includes goals and objectives for preserving and protecting natural resources that mitigate coastal storm hazards.
- ✓ - The comprehensive plan addresses impacts on critical infrastructure and essential services from coastal storm hazards, particularly for impacts affecting socially vulnerable populations.

### DATA SOURCES

- Comprehensive Plan.

### LOCALITY SCORE

3/4 POINTS

### NOTES

The comprehensive plan includes discussion of SLR/chronic inundation and mentions resilience in floodplain management section; it also discusses storms in the context of CZMA compliance. The comprehensive plan does include goals for protecting natural resources, especially seen in Goal #5. The comprehensive plan discusses impact of SLR on transportation, then generally addresses storms as another source of flooding.

## 4.3 LAND USE ORDINANCES

### DESCRIPTION

A locality's land use ordinances – such as zoning, subdivision, and floodplain – should enact the locality's vision and policies laid out in its comprehensive plan. Land use ordinances can be used to conserve and protect natural resources, ecosystems, agricultural lands, and areas vulnerable to flooding. (For more information, see Section 3.5 on Natural and Nature-Based Features) For purposes of this section it is expected that the locality has a Chesapeake Bay Preservation Act Ordinances (CBPA Ordinances). Scoring for this section will focus on whether the locality has implemented additional protections beyond the CBPA A Ordinance, for example does the locality have some type of buffer requirement in addition to the Resource Protection Area established under its CBP A Ordinance.

### LOCALITY ACTIONS

- 4.3.a: Locality protects vulnerable areas by limiting development inside the floodplain, or encouraging development outside the floodplain.
- 4.3.b: Locality strives to preserve open space by incorporating items such as cluster developments into its land use ordinances.
- 4.3.c: Locality establishes overlay districts, setbacks, and/or buffers for natural areas.
- 4.3.d: Locality utilizes land use ordinances to guide development in a sustainable way.
- 4.3.e: Locality adopts the current Flood Insurance Rate Maps (FIRMs) provided by FEMA, and regulates the identified flood zones according to its floodplain ordinance.
- 4.3.f: Locality compliant with the Federal floodplain management criteria set forth in 44 CFR 60.3

### SCORING

- ✓ - Locality land use regulations protect areas vulnerable to flooding by limiting development inside the floodplain, or encouraging development outside the floodplain.
- ✓ - Locality land use regulations protect areas vulnerable to flooding by setting higher standards in existing flood zones or by designating additional flood zones beyond those designated by FEMA.
- x - Locality land use regulations protect areas vulnerable to flooding by setting buffers, including open space.
- x - Locality land use regulations protect areas vulnerable to flooding by using setbacks to protect flood-prone

### DATA SOURCES

- Locality website
- Local ordinances (e.g., zoning, subdivision, floodplain)
- Comprehensive Plan
- Capital Improvement Plan
- Local programs and policies

### LOCALITY SCORE

2/4 POINTS

### NOTES

Town land use regulations protect areas vulnerable to flooding by limiting development inside the floodplain, or encouraging development outside the floodplain. There is a floodplain ordinance that restricts how buildings are developed in floodplains.

## 4.4 INCENTIVES FOR COASTAL RESILIENCE

### DESCRIPTION

Incentive programs encourage infill development and protect open spaces, while protecting flood-prone areas and critical ecosystems. Incentives should be developed with community input, with particular attention to consulting agencies and organizations working with or providing services to lower income and vulnerable populations as well as agencies and organizations working to build community resilience.

### LOCALITY ACTIONS

- 4.4.a: Localities offer incentives including, but not limited to, the following: transfer of development rights specifically applied within areas vulnerable to coastal storm hazards; density bonuses; tax credit programs; preferential assessment programs; and tax abatements.
- 4.4.b: Incentives align with local zoning ordinances and comprehensive plans.
- 4.4.c: Incentives seek to achieve the following goals: discourage development in areas prone to flooding; protect critical ecosystems; encourage sustainable development; improve resilience in high-risk areas; and preserve natural assets.

### SCORING

- x - Locality offers one incentive for achieving coastal resilience goals.
- x - Locality offers a second incentive for achieving the goals in 4.4.c.
- x - Locality offers a third incentive for achieving the goals in 4.4.c.
- x - Locality develops incentives in consultation with agencies and organizations working with socially vulnerable populations.

### DATA SOURCES

### LOCALITY SCORE

- Comprehensive Plan
- Zoning code: agriculture and forestry districts; economic development; erosion and sedimentation control; Historical centers; the category of land; parks and recreation; building permits fees; property; real estate; subdivision of land; taxation; water; zoning districts
- Local programs – e.g., Hazard Mitigation Grant Program
- Locality website
- Call to locality

0 / 4 POINTS

### NOTES

Town is working with VIMS to design incentives, but so far do not meet the criteria for awarding points.

## 4.5 NATURAL RESOURCE PRESERVATION

### DESCRIPTION

Natural resources are important to the locality's economy, environment, and quality of life. Natural resources also can help protect against coastal storm hazards and minimize damage from coastal storm events. The preservation of these critical natural resources is paramount to providing resilience for a coastal locality during these events. For purposes of this section it is expected that the locality has a Chesapeake Bay Preservation Act Ordinance (CBPA Ordinance). Scoring for this section will not consider the locality's CBPA Ordinance to be a natural resource preservation plan.

### LOCALITY ACTIONS

- 4.5.a: Locality identifies natural resources and publishes information in local website or plan.
- 4.5.b: Locality works with the public to develop a plan for natural resource preservation, including such things as green space and habitat preservation, to increase coastal resilience.
- 4.5.c: Locality educates the community about the natural resource preservation plan, and the value of natural resources for coastal resilience.
- 4.5.d: Locality works with the public, through civic organizations and nonprofit organizations, to implement the plan for natural resource preservation.
- 4.5.e: Locality provides funding toward implementation of the natural resource preservation plan.

### SCORING

- ✓ - Locality has identified and mapped natural resources that are important for broad ecosystem health and which are at risk of being lost due to flooding and coastal storm hazards.
- ✓ - Locality has developed plans and policies that preserve and restore natural resources to increase coastal resilience.
- x - Locality has programs with residents, civic organizations, and nonprofit organizations to educate community about the natural resource preservation plan, and engage them in helping to implement the plan.
- ✓ - Locality is funding actions that implement the natural resource preservation plan.

### DATA SOURCES

- Local plans (e.g., recreational, green infrastructure, natural asset assessments)
- Local ordinances
- Local programs with residents, civic organizations, and nonprofit organizations to educate community about the natural resource plan, and engage them in helping to implement the plan
- Locality website and social media

### LOCALITY SCORE

3/4 POINTS

### NOTES

Town has identified and mapped natural resources that are vulnerable to flooding and coastal hazards. Town has developed a natural resource protection plan. Town is funding actions that implement the natural resource protection plan.

**TOTAL SCORE FOR SECTION 4: 12 OUT OF 20 POSSIBLE POINTS**

## 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.
- x - 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
- Social Media Sites and Programs and online calendar of events for locality
- School curriculum
- Organizational chart
- For information on meaningful engagement, see: Kresge Foundation: Climate Vulnerabilities to Underserved Communities; EPA Environmental Justice Academy; FEMA Award for individual and community preparedness engagement

#### LOCALITY SCORE

3 / 4 POINTS

### NOTES

Town has a written policy statement regarding the role of residents and commercial, schools and educators, institutional, nonprofit, faith-based communities, hospitals, veterans, and other stakeholders in coastal resilience. Town 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 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.

## 5.2 PROVIDING COASTAL RESILIENCE INFORMATION TO THE PUBLIC

### DESCRIPTION

The public needs free and open access to important information, research, and data related to coastal resilience and planning. Information sharing allows the public to understand the risks their locality faces and why resilience is important. Information that is shared in a central location and does not require a login or payment allows for greater accessibility. Such information is best understood by the public when presented in a manner which is clear and easy to understand, without jargon, easy to access in multiple ways (e.g. online, at public locations, social services, facebook and social media, television spots, etc.), and in languages that reach different populations in the community. Best practices for providing meaningful information include consulting representatives of different community populations on the types of information that would be helpful, as well as best ways for delivering the information.

### LOCALITY ACTIONS

- 5.2.a: Locality has a method, process, and/or statement regarding how public resources concerning coastal resilience are distributed, and a point person who is fully or partially responsible for making sure that residents can access coastal resilience resources. Specific attention is given to identifying issues faced by socially vulnerable communities and developing information resources to address those issues.
- 5.2.b: Locality provides residents with general information on coastal resilience issues, through its minority media sources, faith-based communities, community-scale programming that can disseminate information across the community (e.g. Rallies for Resilience), website or links to other sites, including GIS interactive maps, Hazard Mitigation Plan, local plans and ordinances, and Flood Insurance Rate Maps.
- 5.2.c: Locality provides information on the potential scale of flooding in the area and the potential economic and human risks and costs, particularly targeting vulnerable populations.
- 5.2.d: Locality provides information in multiple appropriate languages, depending on the demographics of the locality.
- 5.2.e: Locality avoids jargon and provides information in a transparent manner.

### SCORING

- ✓ - Locality has staff dedicated to public engagement and input on coastal resilience, including a standing committee that addresses resilience as part of its work.
- x - Locality provides localized user-friendly information on coastal resilience as well as resident risks and areas vulnerable to flooding, on website (e.g., interactive maps), and in multiple languages where appropriate based on demographics.
- x - Locality provides localized user-friendly information on coastal resilience as well as resident risks and areas vulnerable to flooding, in public spaces (e.g., public offices or library), and in multiple languages where appropriate based on demographics.
- x - Locality provides public with localized, user-friendly information about economic costs and risks associated with coastal storm hazards, in both digital (online) and non-digital (public offices or library) forms, and in multiple

### DATA SOURCES

- Locality website
- Locality public offices
- Public libraries
- Hazard Mitigation Plan
- Virginia Department of Emergency Management
- Virginia Department of Conservation and Recreation
- Flood Vulnerability Assessment and Flood Insurance maps
- Call to locality

### LOCALITY SCORE

1/4 POINTS

### NOTES

Town has staff dedicated to public engagement and input on coastal resilience, including a standing committee that addresses resilience as part of its work.



## 5.3 CITIZEN LEADERSHIP AND VOLUNTEER NETWORKS FOR COASTAL RESILIENCE

### DESCRIPTION

Developing resident leaders and strong volunteer networks are important aspects of building a locality's health and wellness resilience. Resident leaders know their neighborhoods and resident needs, and are prepared to represent and assist local residents. Leaders can be responsible for informing residents, expressing resident concerns, encouraging new leaders, and assisting with local preparedness drills in order to create a more resilient, prepared, and collaborative locality. Leaders can also be called on during emergencies to assist residents in need and to assist with post-hazard recovery and information dissemination. Strong volunteer networks strengthen a community's capacity to respond to urgent situations or crises. Communities can build this capacity by offering volunteer opportunities to cultivate experienced, local responders. Resident volunteers will understand their neighborhoods and resident needs, and therefore be able to provide needed assistance in the event of a coastal storm hazard.

### LOCALITY ACTIONS

- 5.3.a: Locality provides financial and technical support to community-led initiatives to improve coastal resilience with an emphasis on socially vulnerable communities, or those that are disproportionately impacted by coastal storm hazards.
- 5.3.b: Locality utilizes where possible existing organizations, such as neighborhood organizations, green groups, environmental justice, or other local groups to provide training opportunities and education for resident leaders or volunteers on what residents can do on their individual properties or in their neighborhood to increase their resilience. To build resident leadership and volunteer networks within the community for increased resilience, it is important that localities prioritize communities that are socially vulnerable. There are a wide array of tools available to localities to build leadership and networks, such as Community Emergency Response Teams (CERT) (see section 5.1), the EPA Environmental Justice Academy, sponsoring awards for individual and community preparedness (like FEMA), or creating "Street Teams for Energy Efficiency and Climate Resilience." (See Section 5.1)
- 5.3.c: Locality supports resident leaders or volunteers in community education and outreach efforts about coastal resilience.
- 5.3.d: Locality educates resident leaders and volunteers about plans and projects to improve coastal resilience.

### SCORING

- ✓ - Locality supports and invests in community-led initiatives on coastal resilience.
- ✓ - Locality offers training opportunities (using existing organizations where possible, as above) and education opportunities for resident leaders or volunteers to educate residents on what they can do to increase their resilience on individual properties or in neighborhoods.
- ✓ - Locality supports resident leaders or volunteers in community education and outreach efforts about coastal resilience by providing them with materials, speakers for gatherings, or support for resident action projects.
- ✓ - Locality highlights the work of resident leaders or volunteers in supporting and advancing coastal resilience, on

### DATA SOURCES

- Locality website and news releases
- Locality social media
- Calls to locality and community groups

### LOCALITY SCORE

4/4 POINTS

### NOTES

Town supports and invests in community-led initiatives on coastal resilience. Town offers training opportunities (using existing organizations where possible, as above) and education opportunities for resident leaders or volunteers to educate residents on what they can do to increase their resilience on individual properties or in neighborhoods. Town supports resident leaders or volunteers in community education and outreach efforts about coastal resilience by providing them with materials, speakers for gatherings, or support for resident action projects. Town highlights the work of resident leaders or volunteers in supporting and advancing coastal resilience, on its website, through social media, Facebook, awards, or other means. Town has no citizen leadership training or volunteer opportunities.

## 5.4 RESILIENT SYSTEMS TO PROVIDE FOOD, HEALTH, AND MEDICINE

### DESCRIPTION

A community needs to have a number of resources and assets to be resilient. If a community's food, health, and medicine systems are not already resilient before a coastal storm hazard event, then the community may face a substantially longer recovery period. Food, health, and medicine delivery systems must be sustained before, during and after disasters, and are dependent on other critical systems, including transportation and utilities. Lower-income and minority populations often already struggle to access food, health, and medicine, and may be among the more vulnerable populations during a coastal storm hazard. (For these to be effective, critical systems also need to be in place. For this, please see Section 3).

### LOCALITY ACTIONS

- 5.4.a: Locality includes food, health, and medicine systems planning in the locality's comprehensive plan, hazard mitigation plan, or other plan.
- 5.4.b: Locality has obtained information about the current status of food, health, and medicine systems, and has identified gaps and areas for improvement.
- 5.4.c: Locality has a plan for providing food, health, and medicine for vulnerable populations.
- 5.4.d: Locality forms public-private partnerships to address food, health, and medicine systems' resilience.
- 5.4.e: Locality provides information to the public regarding food, health, and medicine access as it relates to coastal storm hazards to the public.
- 5.4.f: Locality provides information regarding food, health, and medicine access as it relates to coastal storm hazards to businesses and supply chains.

### SCORING

- ✓ - Locality has developed coastal storm hazard plans for provision of food, health, and medicines to residents, through its comprehensive plan, hazard mitigation plan, or other plans.
- x - Locality has plans for providing food to vulnerable populations, has identified gaps and areas for improvement, has developed public-private partnerships to address these needs, and has provided information to the public on how it can access food at all times, including during emergencies and coastal storm hazards.
- x - Locality has plans for providing healthcare to vulnerable populations, has identified gaps and areas for improvement, has developed public-private partnerships to address these needs, and has provided information to the public on how it can access healthcare at all times, including during emergencies and coastal storm hazards.
- x - Locality has plans for providing medicine to vulnerable populations, has identified gaps and areas for improvement, has developed public-private partnerships to address these needs, and has provided information to the public on how it can access medicine at all times, including during emergencies and coastal storm hazards.

### DATA SOURCES

- Locality website
- Comprehensive Plan
- Hazard Mitigation Plan
- Emergency Operations Plan

### LOCALITY SCORE

1/4 POINTS

### NOTES

Only one point was awarded for the development of plans for provision of food, health, and medicines to residents.

## 5.5 PHYSICAL AND MENTAL HEALTH FOR SOCIAL EQUITY IN COMMUNITY RESILIENCE

### DESCRIPTION

To ensure that socially vulnerable and underserved populations do not experience disproportionate impacts from flooding and coastal hazards, a locality needs to be able to predict how its residents may fare during a coastal storm hazard event, and then to help those who are most vulnerable to improve their ability to respond in an effective and timely manner. One key measure that can be useful to localities in this effort is the metric for “deaths of despair”— or the prevalence of suicide, cirrhosis of the liver, and overdoses – which can serve as a proxy for the locality’s physical and mental health, as persons who are suffering from depression and addictions are less likely to be able to respond effectively during flooding events. A locality with good physical and mental health will be better able to respond effectively to new or changing conditions as well as to recover from stressful events.

### LOCALITY ACTIONS

- 5.5.a: Locality is aware of its community’s degree of physical and mental wellness, which can be measured by the community’s “deaths of despair.”
- 5.5.b: Locality identifies community partners and media serving people of color and minorities, faith-based community (i.e. “trusted messengers”) to engage with vulnerable populations about issues associated with coastal flooding and hazards.
- 5.5.c: Locality works with non-governmental organizations, faith-based organizations, and health and community services board to identify its physically and mentally challenged vulnerable populations.
- 5.5.d: Locality works with non-governmental organizations, faith-based organizations, and health and community services board to create a plan to assist its physically and mentally challenged vulnerable populations to increase their preparedness, and to assist them during and after coastal flooding events.

### SCORING

- x - Locality maintains data on community physical and mental wellbeing and challenges through specific metrics, such as the metrics for “deaths of despair” (suicide, cirrhosis of the liver, overdoses).
- x - Locality has met at least once with community partners to identify “trusted messengers” for communicating with vulnerable populations.
- x - Locality has identified, or maps its vulnerable neighborhoods, and has done this in partnership with NGOs, faith-based organizations, and its health and community services board.
- x - Locality has a plan with these NGOs, faith-based organizations, and health and community services board that helps its physically and mentally challenged vulnerable populations prepare for coastal flooding events, and that provides assistance to them during and after these events.

### DATA SOURCES

- Call to locality
- Call to PDC
- Community services board
- Comprehensive Plan
- Hazard Mitigation Plan
- Emergency Operations Plan
- Substance Abuse and Mental Health Services Administration (SAMHSA) at <https://www.samsa.gov/>
- Centers for Disease Control
- Department of Veterans Affairs
- U.S. National Library of Medicine, the National Information Center on Health Services Research and Health Care Technology (NICHSR) at [https://www.nlm.nih.gov/hsrinfo/behavioral\\_mental\\_health.html](https://www.nlm.nih.gov/hsrinfo/behavioral_mental_health.html)
- Mental Health America at [www.mentalhealthamerica.net/](http://www.mentalhealthamerica.net/)
- County Health Rankings and Roadmaps at [www.countyhealthrankings.org](http://www.countyhealthrankings.org)

### LOCALITY SCORE

0 /4 POINTS

### NOTES

It is not evident whether the Town maintains this data has met with community partners, identified and mapped its vulnerable neighborhoods, or has a plan to help such populations prepare for storm hazards.

**TOTAL SCORE FOR SECTION 5: 9 OUT OF 20 POSSIBLE POINTS**

## Resilience and Sustainability Scorecards and Report Cards

- 2014 State of the Bay Report. (2018, April 3). Retrieved April 3, 2018, from <http://www.cbf.org/about-the-bay/state-of-the-bay-report/2014/index.html>
- Analysis of the Vulnerability of Southeast Florida to Sea Level Rise. (2012, August). Southeast Florida Regional Climate Change Compact. Retrieved from <http://www.southeastfloridaclimatecompact.org/wp-content/uploads/2014/09/vulnerability-assessment.pdf>
- Building Coastal Resilience in the Face of Climate Change. (n.d.). The Nature Conservancy. Retrieved from [https://www.conservationgateway.org/ConservationPractices/Marine/crr/library/Documents/Coastal%20Resilience%20Network%20Adaptation%20Guidebook\\_2015.pdf](https://www.conservationgateway.org/ConservationPractices/Marine/crr/library/Documents/Coastal%20Resilience%20Network%20Adaptation%20Guidebook_2015.pdf)
- California Coastal Commission: Draft Sea-Level Rise Policy Guidance. (2014, January 9). California Coastal Commission. Retrieved from [http://www.coastal.ca.gov/climate/Final\\_JanCommissionHearing.pdf](http://www.coastal.ca.gov/climate/Final_JanCommissionHearing.pdf)
- City Strategies Archive. (2018, April 3). Retrieved April 3, 2018, from <http://www.100resilientcities.org/strategies/>
- Climate Change Preparedness & Resilience - CDD - City of Cambridge, Massachusetts. (n.d.). Retrieved April 3, 2018, from <http://www.cambridgema.gov/CDD/Projects/Climate/climatechangeresilienceandadaptation.aspx>
- Coastal Defense | Coastal Resilience. (2018, April 3). Retrieved April 3, 2018, from <http://coastalresilience.org/project/coastal-defense/>
- Coastal Resilience | New Jersey. (2018, April 3). Retrieved April 3, 2018, from <http://maps.coastalresilience.org/newjersey/>
- Coastal Storms Program - Home - Mississippi-Alabama Sea Grant Consortium. (2018, April 3). Retrieved April 3, 2018, from <http://masgc.org/coastal-storms-program/resilience-index>
- Community Rating System | FEMA.gov. (2018, April 3). Retrieved April 3, 2018, from <https://www.fema.gov/community-rating-system>
- Disaster resilience scorecard for cities - UNISDR. (2018, April 3). Retrieved April 3, 2018, from <https://www.unisdr.org/we/inform/publications/53349>
- FareHarbor. (2018, April 3). Booking powered by FareHarbor. Retrieved April 3, 2018, from <https://fareharbor.com/>
- Floodplains by Design | Washington. (2018, April 3). Retrieved April 3, 2018, from <http://www.floodplainsbydesign.org/>
- Getting to Resilience | A New Jersey Community Planning Tool. (2018, April 3). Retrieved April 3, 2018, from <http://www.prepareyourcommunitynj.org/>
- Great Lakes Coastal Resilience Planning Guide. (2018, April 3). Retrieved April 3, 2018, from <http://www.greatlakesresilience.org/>
- Health Impact Assessment: Minimizing the Health Effects of Climate Change in the South Florida Region. (2014, March). Southeast Florida Regional Partnership. Retrieved from <http://www.southeastfloridaclimatecompact.org/wp-content/uploads/2014/09/REVISED-HIA-Final-Report-101514-1.pdf>
- Home - Chesapeake Bay Report Card - Chesapeake EcoCheck. (2018, April 3). Retrieved April 3, 2018, from <http://ian.umces.edu/ecocheck/report-cards/chesapeake-bay/2013/>
- Johnson, T. R., Henry, A., & Thompson, C. (2014, May). In Their Own Words: Fishermen's Perspectives of Community Resilience. University of Maine School of Marine Sciences. Retrieved from [http://www.seagrant.umaine.edu/files/pdf-global/InTheirOwnWords\\_062314.pdf](http://www.seagrant.umaine.edu/files/pdf-global/InTheirOwnWords_062314.pdf)
- Maryland CoastSmart Council. (2018, April 3). Retrieved April 3, 2018, from [http://dnr.maryland.gov/climate/resilience/Pages/cs\\_Council.aspx](http://dnr.maryland.gov/climate/resilience/Pages/cs_Council.aspx)

National Sea Grant Resilience Toolkit | U.S. Climate Resilience Toolkit. (2018, April 3). Retrieved April 3, 2018, from <https://toolkit.climate.gov/tool/national-sea-grant-resilience-toolkit>

Port Tomorrow: Resilience Planning Tool [Prototype]. (2018, April 3). Retrieved April 3, 2018, from <https://webqa.coast.noaa.gov/port/#Resources>

Resilient Communities Scorecard: A Tool for Assessing Your Community. (2013). Vermont Natural Resources Council. Retrieved from <http://vnrc.org/wp-content/uploads/2013/04/Whole-Scorecard-FINAL-full-color-REDUCED-SIZE.pdf>

Sempier, T. T., Swann, D. L., Emmer, R., Sempier, R. H., & Schneider, M. (2010). Coastal Community Resilience Index: A Community Self-Assessment. The University of Southern Mississippi. Retrieved from [http://masgc.org/assets/uploads/publications/662/coastal\\_community\\_resilience\\_index.pdf](http://masgc.org/assets/uploads/publications/662/coastal_community_resilience_index.pdf)

STAR Communities | Sustainability Tools for Assessing and Rating Communities. (2018, April 3). Retrieved April 3, 2018, from <http://www.starcommunities.org/>

Swann, L., Sempier, T., Boehm, C., & Thompson, J. (2015). A Business Self-Assessment: Understanding How Prepared Your Business is for a Disaster. Mississippi-Alabama Sea Grant Consortium. Retrieved from [http://masgc.org/assets/uploads/publications/1141/fisheries\\_resilience\\_index.pdf](http://masgc.org/assets/uploads/publications/1141/fisheries_resilience_index.pdf)

Swann, L., Sempier, T., Boehm, C., Wright, C., & Thompson, J. (2015). Tourism Resilience Index: A Business Self-Assessment. Mississippi-Alabama Sea Grant Consortium. Retrieved from [http://masgc.org/assets/uploads/publications/1142/tourism\\_resilience\\_index.pdf](http://masgc.org/assets/uploads/publications/1142/tourism_resilience_index.pdf)

U.S. Climate Resilience Toolkit | U.S. Climate Resilience Toolkit. (2018, April 3). Retrieved April 3, 2018, from <https://toolkit.climate.gov/>

VCAPS: Vulnerability, Consequences, and Adaptation Planning Scenarios. (2018, April 3). Retrieved April 3, 2018, from <http://vcapsforplanning.org/>

## Definitions

Schiavinato, L., & Payne, H. (2015). Mapping Coastal Risks and Social Vulnerability: Current Tools and Legal Risks (Law School Clinics and Centers No. 16). Virginia Coastal Policy Center at the College of William & Mary Law School. Retrieved from <http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1016&context=vcplclinic>

## Category 1: Policy, Leadership, and Collaboration

### Section 1.1 Locality Leadership and Planning for Resiliency

United Nations Office for Disaster Risk Reduction. (2017). Disaster Resilience Scorecard for Cities. Retrieved from [https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment\\_Disaster%20resilience%20scorecard%20for%20cities\\_UNISDR.pdf](https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment_Disaster%20resilience%20scorecard%20for%20cities_UNISDR.pdf)

Rockefeller 100 Resilient Cities. (2018, April 2). Retrieved April 2, 2018, from <http://www.100resilientcities.org/>

### Section 1.2 Leadership and Responding to an Emergency

Beatley, T. (2009). Planning for Coastal Resilience: Best Practices for Calamitous Times. Washington, DC: Island Press.

Building Coastal Resilience for Disaster Risk Reduction and Climate Adaptation. (2018, April 2). The Nature Conservancy. Retrieved from <https://www.nature.org/media/climatechange/building-coastal-resilience.pdf>

United Nations Office for Disaster Risk Reduction. (2017). Disaster Resilience Scorecard for

Cities. Retrieved from [https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment\\_Disaster%20resilience%20scorecard%20for%20cities\\_UNISDR.pdf](https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment_Disaster%20resilience%20scorecard%20for%20cities_UNISDR.pdf)

Vaughan, H. (2012). *Leadership & Legacy: Handbook for Local Elected Officials on Climate Change*. ICLEI - Local governments for Sustainability (Management) Inc. Retrieved from [http://www.icleicanada.org/files/elected\\_officials\\_handbook\\_final\\_sm.pdf](http://www.icleicanada.org/files/elected_officials_handbook_final_sm.pdf)

### **Section 1.3 Local Collaboration with State Agencies and Planning District Commissions**

Norfolk Vision 2100. (2016). City of Norfolk. Retrieved from <https://www.norfolk.gov/DocumentCenter/View/26972>

The Center for Sea Level Rise. Retrieved from <http://www.centerforsealevelrise.org/>

United Nations Office for Disaster Risk Reduction. (2017). *Disaster Resilience Scorecard for Cities*. Retrieved from [https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment\\_Disaster%20resilience%20scorecard%20for%20cities\\_UNISDR.pdf](https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment_Disaster%20resilience%20scorecard%20for%20cities_UNISDR.pdf)

Yusuf, J.-E. (Wie), Covi, M., & St. John, III, B. (2015). *Hampton Roads Resilient Region Reality Check: Increasing Community Resilience and Capacity to Adapt to Changes*. Old Dominion University & Urban Land Institute Hampton Roads. Retrieved from <https://vaseagrant.org/wp-content/uploads/HRRRC-Report-Formatted-FINAL.pdf>

### **Section 1.4 Adaptive Management**

Nichols, S. S., & Bruch, C. (2008). *New Frameworks for Managing Dynamic Coasts: Legal and Policy Tools for Adapting U.S. Coastal Zone Management to Climate Change*. *Sea Grant Law and Policy Journal*, 1(1). Retrieved from <http://nsglc.olemiss.edu/sglpj/Vol1No1/2Nichols.pdf>

Williams, B. K., & Brown, E. D. (2012). *Adaptive Management: The U.S. Department of the Interior Applications Guide*. U.S. Department of the Interior. Retrieved from <https://www.doi.gov/sites/doi.gov/files/migrated/ppa/upload/DOI-Adaptive-Management-Applications-Guide.pdf>

### **Section 1.5 Community Rating System**

Community Rating System (CRS). (2018, April 2). Retrieved April 2, 2018, from <http://www.dcr.virginia.gov/dam-safety-and-floodplains/fp-crs>

## **Category 2: Risk Assessment, and Emergency Management**

### **Section 2.1 Flood Exposure and Vulnerability Assessment**

United Nations Office for Disaster Risk Reduction. (2017). *Disaster Resilience Scorecard for Cities*. Retrieved from [https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment\\_Disaster%20resilience%20scorecard%20for%20cities\\_UNISDR.pdf](https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment_Disaster%20resilience%20scorecard%20for%20cities_UNISDR.pdf)

Mapping the Zone: Improved Flood Map Accuracy. (2009). Washington, DC: The National Academies Press. Retrieved from <https://www.nap.edu/catalog/12573/mapping-the-zone-improving-flood-map-accuracy>

Flooding in England: A National Assessment of Flood Risk. (2009). Environment Agency. Retrieved from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/292928/geho0609bqds-e-e.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292928/geho0609bqds-e-e.pdf)

## Section 2.2 Risk assessment for vulnerable populations

NOAA Office for Coastal Management. (2018, April 2). Retrieved April 2, 2018, from <https://coast.noaa.gov/>

Surging Seas: Sea level rise analysis by Climate Central. (2018, April 2). Retrieved April 2, 2018, from <http://sealevel.climatecentral.org/>

## Section 2.2 Risk assessment for vulnerable populations

United Nations Office for Disaster Risk Reduction. (2017). Disaster Resilience Scorecard for Cities. Retrieved from [https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment\\_Disaster%20resilience%20scorecard%20for%20cities\\_UNISDR.pdf](https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment_Disaster%20resilience%20scorecard%20for%20cities_UNISDR.pdf)

## Section 2.3 Business and Economic Risk Assessment

### Section 2.4 Hazard Mitigation

Hazard Mitigation Grant Program | FEMA.gov. (2018, April 2). Retrieved April 2, 2018, from <https://www.fema.gov/hazard-mitigation-grant-program>

Local Mitigation Planning Handbook. (2013, May). FEMA. Retrieved from [https://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema\\_local\\_mitigation\\_handbook.pdf](https://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema_local_mitigation_handbook.pdf)

Virginia Department of Emergency Management (VDEM). (2018, April 2). Retrieved April 2, 2018, from <http://www.vaemergency.gov/>

### Section 2.5 Resident Emergency Preparedness

United Nations Office for Disaster Risk Reduction. (2017). Disaster Resilience Scorecard for Cities. Retrieved from [https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment\\_Disaster%20resilience%20scorecard%20for%20cities\\_UNISDR.pdf](https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment_Disaster%20resilience%20scorecard%20for%20cities_UNISDR.pdf)

## Category 3: Future Risk and Current Infrastructure Assessment

### Section 3.1 Stormwater Infrastructure

Local Mitigation Planning Handbook. (2013, May). FEMA. Retrieved from [https://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema\\_local\\_mitigation\\_handbook.pdf](https://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema_local_mitigation_handbook.pdf)

Publications. (2018, April 2). Retrieved April 2, 2018, from <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/Publications.aspx>

Virginia Stormwater BMP Clearinghouse. (2018, April 2). Retrieved April 2, 2018, from <http://www.vwrrc.vt.edu/swc/>

### Section 3.2 Critical Transportation Infrastructure

United Nations Office for Disaster Risk Reduction. (2017). Disaster Resilience Scorecard for Cities. Retrieved from [https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment\\_Disaster%20resilience%20scorecard%20for%20cities\\_UNISDR.pdf](https://www.unisdr.org/campaign/resilientcities/assets/documents/guidelines/04%20Detailed%20Assessment_Disaster%20resilience%20scorecard%20for%20cities_UNISDR.pdf)

Virginia Department of Emergency Management (VDEM). (2018, April 2). Retrieved April 2, 2018, from <http://www.vaemergency.gov/>

Critical Facilities and Higher Standards. (2018, April 2). FEMA. Retrieved from <https://www.fema.gov/media-library->

data/1436818953164-4f8f6fc191d26a924f67911c5eaa6848/FPM\_1\_Page\_CriticalFacilities.pdf

Reducing Flood Effects in Critical Facilities. (2013, April). FEMA. Retrieved from [https://www.fema.gov/media-library-data/1381404651877-881a2cf70a90ac63b9c067100ffccace/SandyRA2CriticalFacilities\\_508\\_FINAL2.pdf](https://www.fema.gov/media-library-data/1381404651877-881a2cf70a90ac63b9c067100ffccace/SandyRA2CriticalFacilities_508_FINAL2.pdf)

FEMA. (2007). Design Guide for Improving Critical Facility Safety from Flooding and High Winds (Risk Management Series No. 543). Retrieved from [https://www.fema.gov/media-library-data/20130726-1557-20490-1542/fema543\\_complete.pdf](https://www.fema.gov/media-library-data/20130726-1557-20490-1542/fema543_complete.pdf)

National Infrastructure Protection Plan: Partnering for Critical Infrastructure Security and Resilience. (2013). Department of Homeland Security. Retrieved from <https://www.dhs.gov/sites/default/files/publications/national-infrastructure-protection-plan-2013-508.pdf>

Hampton Roads Intergovernmental Pilot Project Archive | Old Dominion University Research | ODU Digital Commons. (2018, April 2). Retrieved April 2, 2018, from [https://digitalcommons.odu.edu/odurc\\_pilot/](https://digitalcommons.odu.edu/odurc_pilot/)

### **Section 3.3 Water Supply and Wastewater Management Services**

US EPA, O. (2015a, January 29). Protect Sources of Drinking Water [Collections and Lists]. Retrieved April 2, 2018, from <https://www.epa.gov/sourcewaterprotection>

US EPA, O. (2015b, April 8). Tools and Resources for Source Water Protection [Policies and Guidance]. Retrieved April 2, 2018, from <https://www.epa.gov/sourcewaterprotection/tools-and-resources-source-water-protection>

10 Ways You Can Protect Our Water. (2018, April 2). Clean Water Action California. Retrieved from [https://www.cleanwateraction.org/files/publications/ca/10\\_Ways\\_to\\_Protect\\_Our\\_Water.pdf](https://www.cleanwateraction.org/files/publications/ca/10_Ways_to_Protect_Our_Water.pdf)

Flood Resilience: A Basic Guide for Water and Wastewater Utilities. (2018, April 2). EPA. Retrieved from [https://www.epa.gov/sites/production/files/2015-08/documents/flood\\_resilience\\_guide.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/flood_resilience_guide.pdf)

Nutrition, C. for F. S. and A. (2018, April 2). Recalls, Outbreaks & Emergencies [WebContent]. Retrieved April 2, 2018, from <https://www.fda.gov/Food/RecallsOutbreaksEmergencies/>

### **Section 3.4 Critical Infrastructure for Emergency Services**

#### **Section 3.5 Nature and Nature-Based Features**

What is Green Infrastructure? (2018, April 2). Retrieved April 2, 2018, from <https://www.americanrivers.org/threats-solutions/clean-water/green-infrastructure/what-is-green-infrastructure/>

NYC Green Infrastructure Program. (2018, April 2). Retrieved April 2, 2018, from [http://www.nyc.gov/html/dep/html/stormwater/using\\_green\\_infra\\_to\\_manage\\_stormwater.shtml](http://www.nyc.gov/html/dep/html/stormwater/using_green_infra_to_manage_stormwater.shtml)

US EPA, O. (2015c, April 24). Green Infrastructure [Collections and Lists]. Retrieved April 2, 2018, from <https://www.epa.gov/green-infrastructure>

## **Category 4: Planning for Resilience**

### **Section 4.1 Budget, Funding, State and Federal Assistance**

Hazard Mitigation Grant Program | FEMA.gov. (2018, April 2). Retrieved April 2, 2018, from <https://www.fema.gov/hazard-mitigation-grant-program>

Commonwealth of Virginia Hazard Mitigation Plan. (2018, April 2). Retrieved April 2, 2018, from <http://www.vaemergency.gov/emergency-management-community/recovery-and-resilience/commonwealth-of-virginia->



## Section 4.2 Coastal Resiliency in Comprehensive Plan

Smart Growth For Coastal and Waterfront Communities. (2018, April 2). NOAA. Retrieved from [https://coastalsmartgrowth.noaa.gov/smartgrowth\\_fullreport.pdf](https://coastalsmartgrowth.noaa.gov/smartgrowth_fullreport.pdf)

Pace, J.D., LL.M., N. L. (2018, April 2). Resilient Coastal DEvelopment Through Land Use Planning: Tools and Management Techniques in the Gulf of Mexico. University of Mississippi School of Law. Retrieved from [http://research3.fit.edu/sealevelriselibrary/documents/doc\\_mgr/434/Pace.\\_2013.\\_Resilient\\_Coasts\\_through\\_Land\\_Use\\_Planning.pdf](http://research3.fit.edu/sealevelriselibrary/documents/doc_mgr/434/Pace._2013._Resilient_Coasts_through_Land_Use_Planning.pdf)

Center for Coastal Resources Management. (2013). Recurrent Flooding Study for Tidewater Virginia. Retrieved from [http://ccrm.vims.edu/recurrent\\_flooding/Recurrent\\_Flooding\\_Study\\_web.pdf](http://ccrm.vims.edu/recurrent_flooding/Recurrent_Flooding_Study_web.pdf)

Grannis, J. (2011, October). Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use: How Governments Can Use Land-Use Practices to Adapt to Sea-Level Rise. Georgetown Climate Center. Retrieved from [http://www.georgetownclimate.org/files/report/Adaptation\\_Tool\\_Kit\\_SLR.pdf](http://www.georgetownclimate.org/files/report/Adaptation_Tool_Kit_SLR.pdf)

US EPA, R. 01. (2015, March 30). Climate Change: Resilience and Adaptation in New England (RAINE) [Collections and Lists]. Retrieved April 2, 2018, from <https://www.epa.gov/raine>

## Section 4.3 Land Use Ordinances

Adapting to the Rise: A Guide for Connecticut's Coastal Communities. (2018, April 2). The Nature Conservancy in Connecticut. Retrieved from [http://www.ct.gov/ctrecovery/lib/ctrecovery/TNC\\_Adapting\\_to\\_the\\_Rise.pdf](http://www.ct.gov/ctrecovery/lib/ctrecovery/TNC_Adapting_to_the_Rise.pdf)

Smart Growth For Coastal and Waterfront Communities. (2018, April 2). NOAA. Retrieved from [https://coastalsmartgrowth.noaa.gov/smartgrowth\\_fullreport.pdf](https://coastalsmartgrowth.noaa.gov/smartgrowth_fullreport.pdf)

Pace, J.D., LL.M., N. L. (2018, April 2). Resilient Coastal DEvelopment Through Land Use Planning: Tools and Management Techniques in the Gulf of Mexico. University of Mississippi School of Law. Retrieved from [http://research3.fit.edu/sealevelriselibrary/documents/doc\\_mgr/434/Pace.\\_2013.\\_Resilient\\_Coasts\\_through\\_Land\\_Use\\_Planning.pdf](http://research3.fit.edu/sealevelriselibrary/documents/doc_mgr/434/Pace._2013._Resilient_Coasts_through_Land_Use_Planning.pdf)

Schiavinato, L., & Payne, H. (2015). Mapping Coastal Risks and Social Vulnerability: Current Tools and Legal Risks (Law School Clinics and Centers No. 16). Virginia Coastal Policy Center at the College of William & Mary Law School. Retrieved from <http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1016&context=vcplclinic>

Center for Coastal Resources Management. (2013). Recurrent Flooding Study for Tidewater Virginia. Retrieved from [http://ccrm.vims.edu/recurrent\\_flooding/Recurrent\\_Flooding\\_Study\\_web.pdf](http://ccrm.vims.edu/recurrent_flooding/Recurrent_Flooding_Study_web.pdf)

Grannis, J. (2011, October). Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use: How Governments Can Use Land-Use Practices to Adapt to Sea-Level Rise. Georgetown Climate Center. Retrieved from [http://www.georgetownclimate.org/files/report/Adaptation\\_Tool\\_Kit\\_SLR.pdf](http://www.georgetownclimate.org/files/report/Adaptation_Tool_Kit_SLR.pdf)

## Section 4.4 Incentives for Coastal Resilience

Adapting to the Rise: A Guide for Connecticut's Coastal Communities. (2018, April 2). The Nature Conservancy in Connecticut. Retrieved from [http://www.ct.gov/ctrecovery/lib/ctrecovery/TNC\\_Adapting\\_to\\_the\\_Rise.pdf](http://www.ct.gov/ctrecovery/lib/ctrecovery/TNC_Adapting_to_the_Rise.pdf)

US EPA, R. 01. (2015, March 30). Climate Change: Resilience and Adaptation in New England (RAINE) [Collections and Lists]. Retrieved April 2, 2018, from <https://www.epa.gov/raine>

Pace, J.D., LL.M., N. L. (2018, April 2). Resilient Coastal DEvelopment Through Land Use Planning: Tools and Management Techniques in the Gulf of Mexico. University of Mississippi School of Law. Retrieved from [http://research3.fit.edu/sealevelriselibrary/documents/doc\\_mgr/434/Pace.\\_2013.\\_Resilient\\_Coasts\\_through\\_Land\\_Use\\_Planning.pdf](http://research3.fit.edu/sealevelriselibrary/documents/doc_mgr/434/Pace._2013._Resilient_Coasts_through_Land_Use_Planning.pdf)

Use\_Planning.pdf

Smart Growth For Coastal and Waterfront Communities. (2018, April 2). NOAA. Retrieved from [https://coastalsmartgrowth.noaa.gov/smartgrowth\\_fullreport.pdf](https://coastalsmartgrowth.noaa.gov/smartgrowth_fullreport.pdf)

Center for Coastal Resources Management. (2013). Recurrent Flooding Study for Tidewater Virginia. Retrieved from [http://ccrm.vims.edu/recurrent\\_flooding/Recurrent\\_Flooding\\_Study\\_web.pdf](http://ccrm.vims.edu/recurrent_flooding/Recurrent_Flooding_Study_web.pdf)

Grannis, J. (2011, October). Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use: How Governments Can Use Land-Use Practices to Adapt to Sea-Level Rise. Georgetown Climate Center. Retrieved from [http://www.georgetownclimate.org/files/report/Adaptation\\_Tool\\_Kit\\_SLR.pdf](http://www.georgetownclimate.org/files/report/Adaptation_Tool_Kit_SLR.pdf)

## **Section 4.5 Natural Resource Preservation**

Building Coastal Resilience for Disaster Risk Reduction and Climate Adaptation. (2018, April 2). The Nature Conservancy. Retrieved from <https://www.nature.org/media/climatechange/building-coastal-resilience.pdf>

Hopkins, T., Ph.D., L. P. F., Cooperative May 3, Scape C., & 2017. (2018, April 2). Enhancing the climate resilience of America's natural resources. Retrieved April 2, 2018, from <https://www.fws.gov/southeast/articles/enhancing-the-climate-resilience-of-americas-natural-resources/>

Resources | Coastal Resilience. (2018, April 2). Retrieved April 2, 2018, from <http://coastalresilience.org/resources/>

NFWP Climate Adaptation Strategy. (2018, April 2). Retrieved April 2, 2018, from <https://www.wildlifeadaptationstrategy.gov/strategy.php>

Living Shorelines for the Chesapeake Bay Watershed. (2018, April 2). Chesapeake Bay Foundation. Retrieved from [http://www.cbf.org/document-library/cbf-publications-brochures-articles/Living\\_Shorelines011a.pdf](http://www.cbf.org/document-library/cbf-publications-brochures-articles/Living_Shorelines011a.pdf)

Living Shorelines for the Chesapeake Bay Watershed. (2018, April 2). Chesapeake Bay Foundation. Retrieved from [http://www.cbf.org/document-library/cbf-publications-brochures-articles/Living\\_Shorelines011a.pdf](http://www.cbf.org/document-library/cbf-publications-brochures-articles/Living_Shorelines011a.pdf)

## **Category 5: Community Engagement, Health and Wellbeing for Resilience**

### **Section 5.1 Public Involvement in Resilience Planning**

Furth, I., & Gantwerk, H. (2013). Citizen Dialogues on Sea Level Rise: Start with Impacts/End with Action (Project Report). Union of Concerned Scientists. Retrieved from <http://www.viewpointlearning.com/wp-content/uploads/2013/11/UCS-Sea-Level-Rise-Web.pdf>

Yusuf, J.-E. (Wie), Covi, M., & St. John, III, B. (2015). Hampton Roads Resilient Region Reality Check: Increasing Community Resilience and Capacity to Adapt to Changes. Old Dominion University & Urban Land Institute Hampton Roads. Retrieved from <https://vaseagrant.org/wp-content/uploads/HRRRC-Report-Formatted-FINAL.pdf>

Norfolk Vision 2100. (2016). City of Norfolk. Retrieved from <https://www.norfolk.gov/DocumentCenter/View/26972>

CHARM. (2018, April 2). Retrieved April 2, 2018, from <https://tcwp.tamu.edu/charm/>

Florida Atlantic University - Center for Environmental Studies. (2018, April 2). Retrieved April 2, 2018, from <http://www.ces.fau.edu/outreach/>

Resilient Coastlines Project of Greater San Diego. (2018, April 2). Retrieved April 2, 2018, from <http://www.climate-science-alliance.org/single-post/2016/08/02/Resilient-Coastlines-Project-of-Greater-San-Diego>

Take Action - Heart & soul of Essex. (2018, April 2). Retrieved April 2, 2018, from <http://www.heartandsoulofessex.org/take-action.html>

Take Action - Heart & soul of Essex. (2018, April 2). Retrieved April 2, 2018, from <http://www.heartandsoulofessex.org/take-action.html>

Community Engagement. (2018, April 2). FEMA. Retrieved from [https://www.fema.gov/media-library-data/20130726-1800-25045-2028/risk\\_map\\_community\\_engagement.pdf](https://www.fema.gov/media-library-data/20130726-1800-25045-2028/risk_map_community_engagement.pdf)

Success Stories: The Importance of Effective Community Engagement. (2013, October). Community & Regional Resilience Institute. Retrieved from <http://www.resilientus.org/wp-content/uploads/2013/10/Oct-Success-Stories-Compilation-Community-Engagement.pdf>

## **Section 5.2 Provide Coastal Resilience information to The Public**

Furth, I., & Gantwerk, H. (2013). Citizen Dialogues on Sea Level Rise: Start with Impacts/End with Action (Project Report). Union of Concerned Scientists. Retrieved from <http://www.viewpointlearning.com/wp-content/uploads/2013/11/UCS-Sea-Level-Rise-Web.pdf>

Yusuf, J.-E. (Wie), Covi, M., & St. John, III, B. (2015). Hampton Roads Resilient Region Reality Check: Increasing Community Resilience and Capacity to Adapt to Changes. Old Dominion University & Urban Land Institute Hampton Roads. Retrieved from <https://vaseagrant.org/wp-content/uploads/HRRRC-Report-Formatted-FINAL.pdf>

Norfolk Vision 2100. (2016). City of Norfolk. Retrieved from <https://www.norfolk.gov/DocumentCenter/View/26972>

CHARM. (2018, April 2). Retrieved April 2, 2018, from <https://tcwp.tamu.edu/charm/>

Florida Atlantic University - Center for Environmental Studies. (2018, April 2). Retrieved April 2, 2018, from <http://www.ces.fau.edu/outreach/>

Resilient Coastlines Project of Greater San Diego. (2018, April 2). Retrieved April 2, 2018, from <http://www.climatealliance.org/single-post/2016/08/02/Resilient-Coastlines-Project-of-Greater-San-Diego>

Take Action - Heart & soul of Essex. (2018, April 2). Retrieved April 2, 2018, from <http://www.heartandsoulofessex.org/take-action.html>

Community Engagement. (2018, April 2). FEMA. Retrieved from [https://www.fema.gov/media-library-data/20130726-1800-25045-2028/risk\\_map\\_community\\_engagement.pdf](https://www.fema.gov/media-library-data/20130726-1800-25045-2028/risk_map_community_engagement.pdf)

Success Stories: The Importance of Effective Community Engagement. (2013, October). Community & Regional Resilience Institute. Retrieved from <http://www.resilientus.org/wp-content/uploads/2013/10/Oct-Success-Stories-Compilation-Community-Engagement.pdf>

CHARM. (2018, April 2). Retrieved April 2, 2018, from <https://tcwp.tamu.edu/charm/>  
Coastal Resources for Community Officials | FEMA.gov. (2018, April 2). Retrieved April 2, 2018, from <https://www.fema.gov/coastal-resources-community-officials>

## **Section 5.3 Resident Leadership and Volunteer Networks for Coastal Resilience**

## **Section 5.4 Resilient Systems to Provide Food, Health, And Medicine**

Schiavinato, L., & Payne, H. (2015). Mapping Coastal Risks and Social Vulnerability: Current Tools and Legal Risks (Law School Clinics and Centers No. 16). Virginia Coastal Policy Center at the College of William & Mary Law School. Retrieved from <http://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1016&context=vcplclinic>

## **Section 5.5 Physical and Mental Health for Social Equity in Community Resilience**

## Images

- U.S. Fish and Wildlife Service – Northeast Region. 2008, August 21. Eastern Shore of Virginia National Wildlife Refuge [Digital Image]. Retrieved from [https://commons.wikimedia.org/wiki/File:Aerial\\_view\\_of\\_the\\_refuge\\_\(11803669813\).jpg](https://commons.wikimedia.org/wiki/File:Aerial_view_of_the_refuge_(11803669813).jpg)
- Bay With Birds [Digital Image]. Retrieved from <https://naturalresources.virginia.gov/chesapeake-bay-restoration/> 2013, August 10. No title [Digital Image]. Retrieved from [https://commons.wikimedia.org/wiki/File:Chesapeake\\_Bay\\_Bridge\\_Tunnel.jpg](https://commons.wikimedia.org/wiki/File:Chesapeake_Bay_Bridge_Tunnel.jpg)
- CCO Creative Commons
- U.S. Fish and Wildlife Service – Northeast Region. 2007, January 1. Eastern Shore of Virginia National Wildlife Refuge [Digital Image]. Retrieved from [https://commons.wikimedia.org/wiki/File:Eastern\\_Shore\\_of\\_Virginia\\_National\\_Wildlife\\_Refuge,\\_VA.\\_Credit-USFWS\\_\(11804180236\).jpg](https://commons.wikimedia.org/wiki/File:Eastern_Shore_of_Virginia_National_Wildlife_Refuge,_VA._Credit-USFWS_(11804180236).jpg)
- Lund, Ken. 2014, June 13. No Title [Digital Image]. Retrieved from [https://commons.wikimedia.org/wiki/File:Chesapeake\\_Bay,\\_Eastern\\_Shore,\\_Virginia\\_\(14237972007\).jpg](https://commons.wikimedia.org/wiki/File:Chesapeake_Bay,_Eastern_Shore,_Virginia_(14237972007).jpg)
- U.S. Fish and Wildlife Service – Northeast Region. 2007, January 1. Eastern Shore of Virginia National Wildlife Refuge [Digital Image]. Retrieved from <https://www.flickr.com/photos/usfwsnortheast/11803670733/>
- U.S. Fish and Wildlife Service – Northeast Region. 2008, November 29. Eastern Shore of Virginia National Wildlife Refuge [Digital Image]. Retrieved from <https://www.flickr.com/photos/usfwsnortheast/11803839394/>
- U.S. Fish and Wildlife Service – Northeast Region. 2007, January 1. Eastern Shore of Virginia National Wildlife Refuge [Digital Image]. Retrieved from [https://commons.wikimedia.org/wiki/File:Tree\\_swallow\\_swarm\\_\(11804175946\).jpg](https://commons.wikimedia.org/wiki/File:Tree_swallow_swarm_(11804175946).jpg)
- Lund, Ken. 2014, June 13. No Title [Digital Image]. Retrieved from [https://commons.wikimedia.org/wiki/File:Chesapeake\\_Bay,\\_Eastern\\_Shore,\\_Virginia\\_\(14237972007\).jpg](https://commons.wikimedia.org/wiki/File:Chesapeake_Bay,_Eastern_Shore,_Virginia_(14237972007).jpg)
- Kvisberg, Ole Bendik. 2010, September 14. Chesapeake Bay Bridge Tunnel [Digital Image]. Retrieved from [https://commons.wikimedia.org/wiki/File:Chesapeake\\_Bay\\_Bridge-Tunnel,\\_Virginia\\_Beach\\_Area.jpg](https://commons.wikimedia.org/wiki/File:Chesapeake_Bay_Bridge-Tunnel,_Virginia_Beach_Area.jpg)