# Climate Smart Communities Certification Program

*Certification Manual*

## PLEDGE ELEMENT 7: PLAN FOR ADAPTATION TO UNAVOIDABLE CLIMATE CHANGE

*Make a commitment to enhance local resilience by establishing a climate resiliency vision and associated goals, identifying vulnerabilities to climate change impacts for both government operations and the community, and developing and implementing strategies to address those vulnerabilities and increase overall community resilience.*

| Action # | Action Name | Action Pathway Phase | Possible Points | Priority |
|---|---|---|---|---|
| **Pledge Element 7: Enhance community resilience and prepare for the effects of climate change** | | | **119** | |
| **Establish a Baseline** | | | **11** | |
| 7.1 | Conduct a vulnerability assessment | Assess, Plan, Govern | 11 | √ |
| **Set Goals** | | | **2** | |
| 7.2 | Develop a climate resilience vision and associated goals | Commit | 2 | |
| **Planning and Policy** | | | **15** | |
| 7.3 | Review existing community plans, policies and projects to identify climate adaptation strategies and policies or projects that may decrease vulnerability | Assess, Plan, Govern | 4 | √ |
| 7.4 | Develop climate adaptation strategies | Assess, Plan, Govern | 5 | |
| 7.5 | Incorporate climate resiliency vision, goals, and strategies into local plans and projects | Assess, Plan, Govern | 3 | |
| 7.6 | Update the multi-hazard mitigation plan to address changing conditions and identify specific actions to reduce vulnerability to natural hazards | Assess, Plan, Govern | 3 | |
| **Strategies to Address Extreme Heat** | | | **10** | |
| 7.7 | Develop and implement a heat emergency plan | Assess, Plan, Govern | 4 | |
| 7.8 | Require shade structures and features in public spaces | Implement | 4 | |

| Action # | Action Name | Action Pathway Phase | Possible Points | Priority |
|---|---|---|---|---|
| 7.9 | Open new or expand existing cooling centers | Implement | 2 | |
| **Strategies to Address Flooding** | | | **67** | |
| 7.10 | Create or update a watershed assessment to identify flooding and water quality priorities | Assess, Plan, Govern | 4 | |
| 7.11 | Adopt a floodplain management and protection ordinance to reduce vulnerability to flooding and erosion | Assess, Plan, Govern | 3 | |
| 7.12 | Conserve, revegetate and reconnect floodplains and buffers in riparian areas | Implement | 7 | |
| 7.13 | Conserve natural areas for species migration and ecosystem resilience | Implement | 7 | |
| 7.14 | Facilitate a strategic relocation of uses that are not water dependent from flood prone areas | Implement | 5 | |
| 7.15 | Promote community flood prevention strategies through the National Flood Insurance Program Community Rating System | Assess, Plan, Govern | 3 | |
| 7.16 | Use green infrastructure to manage stormwater in developed areas | Implement | 7 | |
| 7.17 | Conserve wetlands and forests to manage stormwater, recharge groundwater and mitigate flooding | Implement | 8 | |
| 7.18 | Use natural, nature-based or ecologically enhanced shoreline protection | Implement | 8 | |
| 7.19 | Extend areas in which the two foot freeboard requirement applies | Implement | 3 | |
| 7.20 | Require consideration of sea-level rise in planning coastal development | Assess, Plan, Govern | 3 | |
| 7.21 | Right-size bridges and culverts and remove unnecessary and hazardous dams | Implement | 5 | |
| 7.22 | Develop or enhance early warning systems and community evacuation plans | Implement | 4 | |
| **Strategies to Address Drought** | | | **13** | |
| 7.23 | Implement a water conservation and reuse program | Implement | 6 | |
| 7.24 | Encourage xeriscaping | Assess, Plan, Govern | 2 | |
| 7.25 | Implement a source water protection program | Implement | 6 | |

*Please note: The recertification requirements for each action are subject to change in future versions of the CSC Certification Manual.*

## 7.1 CONDUCT A VULNERABILITY ASSESSMENT

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Within 5 years prior to the application date
**Total Possible Points:** 8
**Priority action**

### A. Why is this action important?

To increase local resilience, CSCs must understand where to target their staff and funding resources. Climate change will not affect all community assets, systems, operations, or community members equally, either within a community or among different communities, so performing a comprehensive assessment of local vulnerabilities and risks related to climate change provides an opportunity to effectively identify and thereby address key threats to community resilience in a cost effective and efficient manner.

### B. How to implement this action

Developing a vulnerability assessment involves identifying, analyzing and prioritizing the effects of climate hazards. A climate hazard is the potential occurrence of a physical event or trend that could affect specific assets or systems (e.g., transportation or energy infrastructure), vulnerable human populations, ecosystems, industries or the entire community.

Local governments may elect to undertake this action as a standalone project, or as part of a larger effort, such as a climate adaptation plan, climate action plan, comprehensive plan, sustainability plan, hazard mitigation plan, watershed assessment or local waterfront revitalization plan. Interested local governments may also integrate a risk assessment into this action or include risk criteria that address the *magnitude* of impact and *likelihood* of that effect taking place into their prioritization process.

The New York State Department of State (DOS) has developed a risk assessment tool for coastal and riverine communities. It includes guidance on how to prioritize vulnerability, and resilience is an important component DOS's Local Waterfront Revitalization Program (LWRP). See the "additional resources" section for more information. CSCs are encouraged to contact DOS for guidance on use of the risk assessment tool and planning assistance related to coastal and waterfront hazards.

Communities in New York State should consider the following climate hazards and their effects in their vulnerability assessments:

***Climate Hazards***

- increasing temperatures and extreme heat
- flooding
- drought

***Effects***

- more flooding
- less snowfall
- more heat waves

- more intense rainfall
- more short-term drought
- more extreme weather
- fluctuating lake levels

Relevant steps to conduct a vulnerability assessment include the following:

1. Research relevant studies of climate change projections
    a) Review and summarize state and regional studies, including Responding to Climate Change in New York State (NYSERDA, 2011) and the NYS 2100 Commission Report (2012)
    b) Review and summarize local studies, if available
    c) If gaps in key information exist between what is available in regional or local studies and what is needed to make local decisions, review and summarize relevant national studies
2. Identify potential impacts to the following assets and systems, as appropriate:
    a) Municipal and private facilities and buildings including critical facilities (e.g., schools, hospitals, fire and police departments)
    b) Transportation infrastructure and systems
    c) Waste disposal techniques and systems
    d) Wastewater treatment infrastructure and systems, including sewer systems
    e) Drinking water sources, infrastructure, and treatment processes
    f) Stormwater infrastructure
    g) Energy sources, infrastructure, and systems
    h) Communication systems
    i) Economic sectors (e.g., manufacturing, recreation and tourism)
    j) Social sectors (e.g., the elderly, youth, low-income and non-native English speakers)
    k) Parks and public land
    l) Public health
    m) Agriculture
    n) Food supply
    o) Natural assets and systems (e.g., wetlands, forests, grasslands, and shrub lands) and the services they provide (e.g., water storage and treatment, wildlife habitat )
    p) Cultural assets
    q) Emergency response systems
3. Identify and assess vulnerabilities of each asset or system (exposure, sensitivity, and adaptive capacity)
    a) Exposure is 1) the degree to which elements of a climate-sensitive asset or system are in direct contact with climate hazards or sensitive to climate variability and 2) the degree to

which the climate hazard may change over time. More information on how to assess exposure can be found in the "additional resources" section.

b) Sensitivity is the degree to which an asset or system will be affected by a change in climate, either beneficially or detrimentally. More information how to assess sensitivity can be found in the "additional resources" section.

c) Adaptive capacity is the ability of an asset or system to adjust to actual or expected climate stresses or to cope with the consequences. More information on assessing adaptive capacity can be found in the "additional resources" section.

4. Prioritize vulnerable assets and systems

   a) Prioritize assets based on their exposure and sensitivity to the effects of climate hazards and their adaptive capacity

5. Develop report of vulnerability assessment findings

6. Establish a timeline for re-assessing vulnerabilities

### C. Timeframe, project costs, and resource needs

The timeframe, costs and resources needed for a vulnerability assessment depend on the size of the study area and the staff resources available to contribute to the assessment. Local governments may also choose to develop an initial, less detailed vulnerability assessment with current resources and refine the assessment in the future. A typical timeline for completing a vulnerability assessment is between 6 months to 1 year, depending on staff resources and level of detail required.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments and all departments. The department or people with the responsibility for leading climate and sustainability efforts are most likely to be responsible for this action. These responsibilities are typically led by the chief elected official's office and undertaken by the city manager's office, the department of the environment or planning or by a volunteer body, such as the CSC task force. Cross-department involvement and support are recommended, and stakeholder involvement is crucial. The vulnerability assessment could also be developed at a regional level, by the county or a regional organization. Regional organizations or county agencies, like soil and water conservation districts, often have useful data for local assessments. The same departments or representatives listed above should be involved in such a regional effort.

### E. How to obtain points for this action

Points are earned for this action by completing a vulnerability assessment that engages staff and the public. The assessment must address at least one climate hazard. Vulnerability assessments completed as part of a community's participation in the NY Rising program or development of a DOS local waterfront revitalization plan would qualify for this action.

| | Possible Points |
|---|---|
| • Vulnerability assessment for 1 climate hazard (scope may be limited to a geographic area or system of concern) | 2 |
| • Vulnerability assessment for 2-3 climate hazards (scope may be limited to a geographic area or system of concern) | 3 |

- Comprehensive vulnerability assessment, covering the entire community and all relevant climate hazards 6

### F. What to submit

Local governments should submit a copy of the most recent vulnerability assessment report, created within five years prior to the application date. The report must describe the individuals or team that conducted the vulnerability assessment, the climate hazards and effects considered and summarize the assessment process used. If the vulnerability assessment was developed more than five years ago, local governments may update it with any new or updated data or projections, and submit that for credit. If the vulnerability assessment was completed through the NY Rising or Local Waterfront Revitalization Program, documentation of DOS approval of the local plan must be submitted.

### G. Links to additional resources or examples

- Responding to Climate Change in New York State: http://www.nyserda.ny.gov/climaid
- Climate Adaptation Guidebook for New York State: http://www.nyserda.ny.gov/climaid
- New York State, NYS 2100 Commission Report: http://www.governor.ny.gov/assets/documents/NYS2100.pdfDEC, Climate Smart Resiliency Planning Tool: http://www.dec.ny.gov/docs/administration_pdf/csrptool.pdf
- DOS, Local Waterfront Revitalization Program: http://www.dos.ny.gov/opd/programs/WFRevitalization/LWRP.html
- New York Rising Community Reconstruction Program : http://stormrecovery.ny.gov/community-reconstruction-program
- US EPA, Climate Change Impacts and Adapting to Change: http://www.epa.gov/climatechange/impacts-adaptation/index.html
- US EPA, Adaptation Tools for Public Officials: http://www.epa.gov/climatechange/impacts-adaptation/adapt-tools.html
- Ecosystem-Based Management Tools Network, Climate Change Vulnerability Assessment and Adaptation Tools: http://www.ebmtoolsdatabase.org/resource/climate-change-vulnerability-assessment-and-adaptation-tools
- ICLEI, Preparing for Climate Change-A Guidebook for Local, Regional and State Governments: http://cses.washington.edu/cig/fpt/planning/guidebook/gateway.php
- Scenic Hudson, Adaptation Planning Resources: http://www.scenichudson.org/slr/adaptation/adaptation-resources
- US EPA Climate Resilience Evaluation and Awareness Tool: http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm
- Social Vulnerability Index: http://webra.cas.sc.edu/hvri/products/sovi.aspxSurging Seas: Sea-level rise Risk Analysis http://sealevel.climatecentral.org/
- New York, NY, Climate Adaptation in New York City: Building a Risk Management Response: http://www.nyas.org/publications/annals/Detail.aspx?cid=ab9d0f9f-1cb1-4f21-b0c8-7607daa5dfcc
- Kingston, NY, Waterfront Flooding Task Force Final Report: www.kingsoncac.org

### H. Recertification Requirements

Local governments do not need to completely update their vulnerability assessment every five years for recertification; only the data and projections should be updated, if any new information exists. However, communities should address any significant infrastructure changes since the last vulnerability assessment, if these changes impact the findings and recommendations in the previous version of the vulnerability assessment.

## *Set Goals*

## 7.2 DEVELOP A CLIMATE RESILIENCE VISION AND ASSOCIATED GOALS

**Action pathway phase:** Commit
**Eligibility timeline:** Any time prior to the application date
**Total Possible Points:** 2

### A. Why is this action important?

Establishing a vision for what your community could look like when it's resilient to climate change is both important for building community cohesion and for providing a goal from which to gauge community resilience-building progress. An effective vision is established collectively with stakeholders and provides an opportunity for all community members to help achieve the desired vision. A vision provides a positive future that your community can work together collaboratively to achieve, creating a suite of ancillary community benefits such as enhanced community cohesion, better community health, heightened social networking, and enhanced innovation.

### B. How to implement this action

Local governments can initiate a standalone effort to develop the climate resilience vision and goals, or can include this in the scope of an existing effort, such as a vulnerability assessment, climate action plan, or comprehensive plan. Regardless of the approach taken, relevant steps in this process include the following:

1. Public participation sessions to evaluate climate hazards, discuss and prioritize vulnerabilities and develop possible visions for community resilience, including the alteration of any existing community visions to ensure they incorporate the concept of resilience
2. Establishment of a draft vision that is shared on the community's website and open for public comment
3. Revision of the draft vision based on stakeholder feedback
4. Submittal and approval of the draft vision by the community's elected officials
5. Incorporation of vision into planning documents

### C. Timeframe, project costs, and resource needs

The timeframe for this task depends on the number of public engagement sessions and the staff resources available. For a local government that opts to hold one public outreach session, it will likely take three to four months to plan for the event, facilitate the event, develop the draft vision, release the draft vision, and then finalize the vision for approval. For communities that opt for more

intensive stakeholder outreach (which is encouraged), this action could take between six and twelve months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments and all departments. The department or people with the responsibility for leading climate and sustainability efforts are most likely to be responsible for implementing this action. These responsibilities are typically led by the chief elected official's office and undertaken by the city manager's office, the department of the environment or planning or by a volunteer body, such as a Conservation Advisory Council. Cross-department involvement and support are recommended, along with support and involvement from the interdisciplinary climate adaptation task force (as identified in PE 1.2). Stakeholder involvement is crucial. The climate resiliency vision and goals could also be developed at a regional level, by the county or a regional organization. The same departments or representatives listed above should be involved in such a regional effort.

### E. How to obtain points for this action

Points for this action are earned by creating a community-wide vision of resilience that is publicly released, officially supported by the community's elected officials and incorporated into at least one plan. To develop the vision, a minimum of one public engagement session must have been performed to engage the public and gather input into the vision document.

### F. What to submit

Submit an officially adopted version of the community's vision for resilience and documentation of incorporation of the vision into a community plan. This can be a new vision or a revised version of an existing community-approved vision. Additionally, local governments must submit documentation summarizing the outreach efforts and the stakeholders involved. The vision and goals may have been developed at any time prior to the application date to be eligible for points.

### G. Links to additional resources or examples

- New York, NY, Climate Resilience Goal: http://www.nyc.gov/html/dcp/pdf/cwp/vision2020/chapter3_goal8.pdf
- Kingston, NY, Waterfront Flooding Task Force Final Report: www.kingstoncac.org
- New York Rising Community Reconstruction Program: http://stormrecovery.ny.gov/community-reconstruction-program

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.3 REVIEW EXISTING COMMUNITY PLANS, POLICIES AND PROJECTS TO IDENTIFY CLIMATE ADAPTATION STRATEGIES AND POLICIES OR PROJECTS THAT MAY DECREASE VULNERABILITY

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Within 5 years prior to the application date
**Total Possible Points:** 4
**Priority action**

### A. Why is this action important?

Some strategies identified in community planning processes may help to build a community's resilience to climate change, while others may fail to consider how climate change will affect their implementation. Sometimes slight modifications to existing policies or projects can help a community more effectively prepare for climate change. Conducting a survey of existing plans, policies and projects will help ensure that all community plans and policies will either help reduce or, at a minimum, not increase vulnerability. This will also help your community communicate the importance of climate action and provide an opportunity to integrate climate considerations into your community's operations.

### B. How to implement this action

Conduct a self-evaluation of local plans, policies and projects using the Climate Smart Resiliency Planning Tool (see additional resources section below). This action could be accomplished as a standalone project, or as part of another effort such as a vulnerability assessment, climate action plan or climate adaptation plan. The Climate Smart Resiliency Planning (CSRP) tool is designed to help municipal staff to work collaboratively to recognize the opportunities to enhance community resilience in existing documents and to begin to create a set of integrated planning documents that identify vulnerabilities, assess risk and mitigate hazards. A single person should be appointed as a facilitator to ensure that the most knowledgeable and relevant staff contribute to the self-evaluation. Although not necessary, local governments may find it useful to identify someone not associated with the municipality to serve as the facilitator, e.g., a knowledgeable volunteer from the CSC task force or a CSC regional coordinator.

An Excel spreadsheet to facilitate completion of the CRPR checklists is available from the Office of Climate Change.

### C. Timeframe, project costs, and resource needs

The timeframe for this depends on the number of plans evaluated and the staff available to undertake the task. A typical timeframe for this action is 1 to 3 months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments and all departments. The department or person with the responsibility for leading climate and sustainability efforts is most likely to be responsible for this action. This action is typically led by the chief elected official's office and undertaken by the city manager's office, or the department of the environment or planning.

Volunteer groups, such as the CSC task force may assist, but detailed input from knowledgeable municipal staff and officials will be necessary.

### E. How to obtain points for this action

Points are obtained for this action by conducting a formal review of existing community plans and projects using the Climate Smart Resiliency Planning tool and identifying strategies that help the community prepare for climate change as well as strategies that increase the community's vulnerability to climate change.

| | Possible Points |
|---|---|
| • Complete a review of existing plans and policies using the Climate Smart Resiliency Planning tool | 3 |
| • Identify deficiencies in local plans and develop specific recommendations to address them. | 1 |

### F. What to submit

CSCs should submit copies of the completed checklists from the Climate Smart Planning Tool or of the completed CSRP spreadsheet. A separate report describing the deficiencies identified during completion of the self-evaluation and the recommendation(s) to address each deficiency should also be submitted.

### G. Links to additional resources or examples

- DEC Climate Smart Resiliency Planning Tool: http://www.dec.ny.gov/docs/administration_pdf/csrptool.pdf

### H. Recertification Requirements

Local governments do not need to complete a new review of plans, policies and projects every five years for recertification. However, communities should address any significant infrastructure changes or new plans or policies that were not addressed in the initial report.

## 7.4 DEVELOP CLIMATE ADAPTATION STRATEGIES

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Within 5 years prior to the application date
**Total Possible Points:** 5

### A. Why is this action important?

Communities will need to adapt to changing conditions. Local governments should consider their vulnerability to climate hazards and develop strategies that enhance local resiliency using a collaborative, transparent, and inclusive decision-making process. This will ensure local support to implement actions. Moreover, working with a diverse array of stakeholders will likely increase the quality of potential adaptation strategies and provide opportunities for new partnerships. A variety of technical resources are available to help communities develop strategies through the Climate Smart Communities program.

### B. How to implement this action

Developing climate adaptation strategies can be part of an existing effort, such as the development of a climate action plan or sustainability plan, or it can be a standalone effort. Local governments should develop a vulnerability assessment first (Action 7.1) for at least one climate hazard, and then develop climate adaptation strategies to address identified vulnerabilities. Communities should take a watershed approach when developing strategies that address flooding, water quality and quantity and water infrastructure. A watershed approach will help the community understand uphill and upstream sources of flooding and be strategic in developing and prioritizing actions. A typical process for developing climate adaptation strategies includes the following steps:

1. Use a collaborative, inclusive, and transparent planning process
    a) Involve an intergovernmental taskforce
    b) Involve a cross-section of community stakeholders
    c) Perform public outreach
    d) Develop a website for the planning process
2. Research potential actions to address vulnerabilities caused by the effects of climate hazards on community assets and systems for at least one climate hazard as defined in action 7.1. For some issues, like flooding, where a watershed assessment can highlight the most strategic actions, specific studies may be necessary. Useful website information and case studies from other communities can be found on the NYS DEC Climate Smart Communities website (see “additional resources” section)
3. Develop strategies and identify specific actions or projects associated with at least one climate hazard that will help your community achieve its resilience vision and goals
4. Identify lead entities responsible for implementing each strategy and develop implementation plans for each recommended action or project. Consider the timing and construction of other improvements in the community.
5. To the extent appropriate, identify co-benefits of potential actions (e.g., urban forestry reduces the urban heat island effect and helps with stormwater management; water efficiency reduces the demand for water and reduces the amount of energy used to treat and pump water)
6. Develop and publicly release the climate adaptation strategies
7. Create timeline and process for regularly revisiting and updating the climate adaptation strategies

### C. Timeframe, project costs, and resource needs

The timeframe and costs of this effort depend on whether the approach taken is a standalone effort or part of a larger planning process. Local governments can anticipate a timeline of approximately nine months to a year to develop a comprehensive and representative set of climate adaptation strategies.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments and all departments. The department or people with the responsibility for leading climate and sustainability efforts is most likely to be

responsible for this action. These responsibilities are typically led by the chief elected official's office and undertaken by the city manager's office, the department of the environment or planning or by a volunteer body, such as a Conservation Advisory Council. Cross-department involvement and support are critical, along with support and involvement from stakeholders and the interdisciplinary climate adaptation task force (as identified in PE 1.2) since a variety of staff and local stakeholders will be involved in their implementation. It may be helpful to engage local watershed groups and coordinate with neighboring municipalities. The climate adaptation strategies could also be developed at a regional level, by the county or a regional organization. The same departments or representatives listed above should be involved in such a regional effort.

### E. How to obtain points for this action

Points are obtained for this action through creation or update of a climate adaptation plan or through development of adaptation goals and strategies within a climate action plan, sustainability, or comprehensive plan, or other adoptable document (*see 2.5 and 2.6*).

| | Possible Points |
|---|---|
| • Form an intergovernmental taskforce and draft strategies that covers at least one climate hazard for an area or system within your community | 1 |
| • Perform public outreach / public review of draft strategies | 1 |
| • Incorporate and respond to public comments and publicly release the climate adaptation strategies ideally as part of a climate action plan or other planning process | 3 |

### F. What to submit

Local governments should submit a copy of the climate adaptation strategies and/or plan. The strategies must have been created within five years prior to the application date. The plan can be a standalone climate adaptation plan, or a section of a climate action plan, comprehensive plan, sustainability plan, or similar document, which addresses the criteria described above. If the plan was developed more than five years prior to the application date, then local governments should update it with any new information, data, or projections as appropriate, and submit that version for credit.

### G. Links to additional resources or examples

- Mid-Hudson Valley's Regional Sustainability Plan: http://www.orangecountygov.com/filestorage/124/1362/MHRSP_Book_opt.pdf
- Climate Change Adaptation: Increasing Local Climate Resilience http://www.dec.ny.gov/energy/82168.html
- New York, NY, Special Initiative for Rebuilding and Resiliency, Adaptation Plan: http://www.nyc.gov/html/sirr/html/report/report.shtml
- New York Rising Community Reconstruction Program http://stormrecovery.ny.gov/community-reconstruction-program
- Kingston, NY, Waterfront Flooding Task Force Final Report www.kingstoncac.org

- Chula Vista, CA, Climate Adaptation Strategies: http://www.chulavistaca.gov/clean/conservation/Climate/documents/ClimateAdaptationStrategiesPlans_FINAL_000.pdf

### H. Recertification Requirements

Local governments do not need to completely update their adaptation strategies or plan every five years for recertification; only the data and projections should be updated, if any new information exists. However, communities should address any significant infrastructure changes since the last plan, if these changes affect the findings and recommendations in the previous version of the plan.

## 7.5 INCORPORATE CLIMATE RESILIENCY VISION, GOALS, AND STRATEGIES INTO LOCAL PLANS AND PROJECTS

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Within 5 years prior to the application date
**Total Possible Points:** 3

### A. Why is this action important?

In order to account for the impacts of climate change on the built and natural environment local governments need to factor climate change considerations into their general/comprehensive plans, zoning and building codes, and other relevant planning documents and projects. This is an effective way to ensure that resilience to climate change is being mainstreamed into internal operations, thereby saving money, time and staffing resources.

### B. How to implement this action

To implement this action, local governments need to identify relevant existing plans for projects and find ways to meaningfully integrate climate change adaptation into these efforts as part of the plan or project development or update. When integrating information on climate change impacts, local governments should use the most up to date climate projection information. Communities can require projects seeking funding through a capital improvement program to evaluate their vulnerability to existing and projected climate impacts and provide recommendations on how they will address these vulnerabilities. Sustainability rating systems and certification programs can serve as useful guides for integrating resilience principles into capital projects (see examples below). In general, climate resiliency should be incorporated into any plan or project where the outcomes could be affected by climate hazards. Examples of common plans and project documents that should incorporate climate resiliency include, but are not limited to, the following:

- Comprehensive plans
- Local zoning codes
- Local building codes and design guidelines
- Zoning and subdivision practices (e.g., restrictions on development in floodplains and landslide hazard areas, conservation development)
- Energy planning, management, and distribution
- Waste management planning and operations

- Water system planning and operations
- Watershed plans
- Stormwater management plans
- Water and stormwater management guidelines or local laws
- Local and regional multi-hazard mitigation plans
- Parks and recreation plans
- Open space plans
- Wildfire management plans
- Emergency preparedness and response plans
- Economic development plans
- Coastal zone management plans
- Local waterfront redevelopment plans
- Capital improvement program funded projects
- Building, road and other infrastructure design guidelines
- Health department plans
- County or regional plans and projects

Any local enactment to supersede the state building code will require approval by the State Fire Prevention and Building Code Council (http://www.dos.ny.gov/dcea/code_council.html).

### C. Timeframe, project costs, and resource needs

The timing and costs of this action depend on the extent of work the community has already done to develop a resilience vision and goals, conduct a vulnerability assessment and outline specific adaptation strategies for assets and systems. Incorporating climate adaptation concepts into an existing plan or project may have a slight impact in the scope or resource needs for a project, but the costs will depend on the nature of the project and are likely to be modest compared to the long-term costs to the community if climate change is not considered in planning decisions.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

Applicable to all communities with a comprehensive plan, zoning codes, building codes, subdivision and site plan review and design guidelines. The department or people with the responsibility for leading climate and sustainability efforts are most likely to be responsible for this action. These responsibilities are typically led by the chief elected official's office and undertaken by the city manager's office, the department of the environment or planning or by a volunteer body, such as a conservation advisory council. Cross-department involvement and support are recommended, along with support and involvement from the interdisciplinary climate adaptation task force (as identified in PE 1.2). Stakeholder involvement is recommended.

### E. How to obtain points for this action

Points are obtained for this action through formal incorporation of a climate resiliency vision, goals and appropriate response strategies into local planning documents and key projects. Local governments should demonstrate that they have incorporated climate change adaptation into at least one plan or project, other than a climate action plan or climate adaptation plan, to receive credit. Points can also be achieved by requiring projects of a specified scale to incorporate climate adaptation considerations. This may be accomplished through policy or ordinance that requires such projects meet specific standards in sustainability rating system that incorporates climate adaptation or risk. One point will be awarded for each plan into which the climate resiliency vision, goals, and appropriate response strategies have been incorporated, up to a total of three points during any five-year period.

### F. What to submit

Local governments should submit any recently updated comprehensive plans, plan amendments, zoning codes, building codes, design guidelines, or other plans that have been updated within five years prior to the application date to address climate adaptation. Local governments must include a memorandum summarizing the relevant updates to the submitted documentation that explains how the local government incorporated climate adaptation into the plan or project.

### G. Links to additional resources or examples

- Grand Rapids, MI, Comprehensive Sustainability Plan: http://grcity.us/enterprise-services/officeofenergyandsustainability/Documents/Sust%20Plan%20as%20amended%206-21-11.pdf
- Keene, NH, Comprehensive Master Plan: http://www.ci.keene.nh.us/departments/planning/master-plan-process/cmp-resources
- City of Lewes, DE, Multi-Hazard and Climate Adaptation Plan: http://www.ci.lewes.de.us/pdfs/Lewes_Hazard_Mitigation_and_Climate_Adaptation_Action_Plan_FinalDraft_8-2011.pdf
- Envision™ Rating Tool (sustainability rating program for horizontal infrastructure projects): www.sustainableinfrastructure.org
- Sustainable Sites: http://www.sustainablesites.org/
- LEED for Neighborhood Development: http://www.usgbc.org/neighborhoods
- International Green Construction Code: http://www.iccsafe.org/cs/IGCC/Pages/default.aspx

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.6 UPDATE THE MULTI-HAZARD MITIGATION PLAN TO ADDRESS CHANGING CONDITIONS AND IDENTIFY SPECIFIC STRATEGIES TO REDUCE VULNERABILITY TO NATURAL HAZARDS

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Within 5 years prior to the application date
**Total Possible Points:** 3

### A. Why is this action important?

Changing climate conditions will increase the frequency and magnitude of natural hazards throughout the State. To prepare, communities should integrate projected future changes in precipitation, sea-level rise, and extreme weather into their multi-hazard mitigation plans, and identify specific mitigation and vulnerability reduction actions. Plans should be updated according to the most recent planning standards developed by the NYS Office of Emergency Management. Watershed assessments, if they exist, should be used to prioritize flood vulnerabilities, like unmaintained dams and undersized culverts, and water quality and quantity issues and how they are likely to change over time Identifying water bodies, wetlands, and floodplains and the upstream sources of flooding is critical to understanding the watershed context of flooding issues.

### B. How to implement this action

This action can be implemented by undertaking the following:

1. Convene a group of key stakeholders or participate, as a municipality, in a county-level effort,
2. Utilize the results of local or regional vulnerability and watershed assessments and heat and other emergency management plans, if they exist, to identify assets and systems particularly vulnerable to natural hazards in your community and provide this information to the process.
3. Use this information to develop a new multi-hazard mitigation plan or update an existing plan to accommodate projected effects of climate change. Plans must be updated according to the most current planning standards developed by the NYS Office of Emergency Management (see additional resources for more information).

### C. Timeframe, project costs, and resource needs

Updating a community or county multi-hazard mitigation plan can take anywhere between four-six months, depending on the amount of time and resources available to help with plan creation.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The department or people with the responsibility for leading emergency management are most likely to implement this action. If no emergency management staff exist, this action can be implemented by those responsible for environmental issues or planning. Cross-department involvement and support are recommended, along with support and involvement from an interdisciplinary climate adaptation taskforce (see 1.2). Staff responsible for public works, transportation planning, engineering and floodplain management should be involved. Municipal committees, such as CSC task forces, conservation advisory councils, environmental conservation committees, watershed groups and neighboring municipalities may also be involved. The hazard mitigation plan may also be developed and updated at a regional level, by the county or a regional organization. The same departments or representatives listed above should be involved in such a regional effort.

### E. How to obtain points for this action

Points are obtained for this action by submitting a new or a revised hazard-mitigation plan according to the most up to date planning standards developed by the NYS Office of Emergency Management. The plan must include updated information on flood risk and other climate hazards, along with new,

revised or expanded strategies to address the updated risks, and be approved by the community and the NYS Office of Emergency Management.

#### F. What to submit

A copy or web address of the state-approved new or updated community hazard mitigation plan. The plan must have been updated or created within five years prior to the application date. Local governments must also submit a memorandum summarizing the changes to the hazard mitigation plan that address climate change. If the county led the plan development process, the local government must demonstrate substantial involvement in the process (see introduction).

#### G. Links to additional resources or examples

- FEMA, Multi-hazard Mitigation Planning. http://www.fema.gov/multi-hazard-mitigation-planning
- NYS Department of Homeland Security and Emergency Management, Multi-hazard Mitigation Planning Standards: http://www.dhses.ny.gov/oem/mitigation/documents/hazard-mit-plan-standards2012.pdf
- Natural Hazard Mitigation Association: http://nhma.info/

#### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## *Strategies to Address Extreme Heat*

## 7.7 DEVELOP AND IMPLEMENT A HEAT EMERGENCY PLAN

> *Pending finalization of review procedures, documentation of this action cannot be accepted at this time.*

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Within 5 years prior to the application date
**Total Possible Points:** 4

#### A. Why is this action important?

Changing climate conditions will increase temperatures, leading to more frequent and more intense heat waves. Heat waves are often considered silent killers as they can last for multiple days and slowly wreak havoc on a community. They are particularly dangerous for the elderly, the sick, the socially isolated, non-English speaking populations and the young. Addressing heat waves is critical for ensuring both the long-term resilience of a local community as well as for reducing the number of mortalities and hospitalizations that take place during high-heat events.

#### B. How to implement this action

This action can be implemented by undertaking the following:

1. Convene a group of key stakeholders to discuss current heat emergency management systems, their effectiveness, and applicability to high-heat events

2. Create a heat emergency plan that identifies and maps vulnerable populations and specifically outlines what your community will do in the case of a heat wave, including an assessment of the capacity of existing programs and barriers to their use
3. Identify existing cooling centers and determine if they have adequate capacity. If necessary, expand existing or designate new geographically distributed cooling centers and a diversity of transportation options to get stakeholders to these cooling centers
4. Work with existing social networks such as neighborhood-based associations, the Salvation Army, Meals on Wheels, the Boy Scouts and Girl Scouts, and religious institutions to create a system to check on the most vulnerable people during heat waves
5. Coordinate with utilities to address public health needs resulting from power disruptions associated with extreme heat events
6. Coordinate with relevant local, regional, and state agencies to determine appropriate trigger levels of key indicators to implement the plan
7. Develop and implement a plan to use existing telecommunications technology and social networking systems to improve early warning and evacuation systems
8. Develop a plan and materials for communicating to non-English speaking populations
9. Review and update the plan after extreme weather events or on a regular basis to ensure its effectiveness

### C. Timeframe, project costs, and resource needs

If your community does not already have a heat emergency plan, creating a new one can take from six to ten months, depending on the amount of time and resources available to help with plan creation. If your community already has a plan, updating it to incorporate strategies that can handle existing heat waves as well as future heat waves that could potentially be longer and more intense should take between two to three months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments, but is particularly important for urban communities and communities with large vulnerable populations such as the elderly. The department or people with the responsibility for leading public health efforts are most likely to be responsible for this action. In many cases, the county health department may assume the lead role for this action. Stakeholder involvement is important to understand needs of vulnerable populations.

### E. How to obtain points for this action

Points are obtained for this action by submitting a new or a revised heat emergency plan that has been approved by local elected officials and the county emergency management office.

### F. What to submit

Submit a copy of the community heat emergency plan and documentation of how strategies within this plan have been implemented. The plan must have been developed or updated within five years prior to the application date, and be actively in use.

### G. Links to additional resources or examples

- Philadelphia, PA, Heat Emergency Plan: http://oem.readyphiladelphia.org/HeatPlan
- State of Maryland, Heat Emergency Plan: http://dhmh.maryland.gov/extremeheat/Documents/Heat_Emergency_Plan_Final_Version.pdf
- American Red Cross, Heat Wave Safety Tips: http://www.redcross.org/prepare/disaster/heat-wave
- FEMA, Extreme Heat: http://www.ready.gov/heat

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.8 REQUIRE SHADE STRUCTURES AND FEATURES IN PUBLIC SPACES

**Action pathway phase:** Implement
**Eligibility timeline:** Any time prior to the application date
**Total Possible Points:** 4

### A. Why is this action important?

Ensuring that public spaces have shade provides relief for residents and pets during times of heat. Shade structures can include gazebos, trees, or covered outdoor facilities. Having shade structures is particularly important for individuals that may not have access to air conditioning. Moreover, shade structures in public spaces provide opportunities for social networking and public gatherings. Conserving existing forest cover and planting trees and green spaces can moderate temperatures and reduce the urban heat island effect, along with managing stormwater and improving habitat.

### B. How to implement this action

To implement this action, local government should:

1. Determine areas in the community particularly vulnerable to high heat or the urban heat island effect or lacking significant shade
2. Create a policy requiring that all public development projects integrate shade features
3. Work with local developments, building commission, external commissions (i.e., planning and zoning), and internal staff to educate them about the goals and specifics of the policy
4. Have the policy approved by local elected officials
5. Ensure compliance with the policy

### C. Timeframe, project costs, and resource needs

The costs of implementing this action are minimal and will consist primarily of staff time. The policy can likely be drafted and approved in 3 to 6 months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments, but is particularly important for highly urbanized communities. The department or people with the responsibility for leading climate and

sustainability efforts are most likely to be responsible for this action. These responsibilities are typically led by the department of the environment or planning or by a volunteer body, such as a Conservation Advisory Council. Cross-department involvement and support are recommended, along with support and involvement from the interdisciplinary climate adaptation task force (as identified in PE 1.2). Stakeholder involvement is recommended to ensure community support for the effort.

#### E. How to obtain points for this action

Local governments must adopt a formal policy to require the use of shade structures/features in public development projects. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation.

#### F. What to submit

A copy of the policy as approved by the local elected officials as well as any documentation highlighting the increase in shade structures throughout the community. The policy may have been adopted at any time prior to the application date, and must be actively enforced.

#### G. Links to additional resources or examples

- Creating Shade at Public Facilities: http://www.health.qld.gov.au/ph/documents/hpu/20267.pdf
- US EPA, Trees and Vegetation: http://www.epa.gov/heatisland/mitigation/trees.htm
- NRDC, The Multiple Benefits of Green Infrastructure Solutions, Rooftops to Rivers II (2011), p. 13-16: http://www.nrdc.org/water/pollution/rooftopsii/files/rooftopstoriversII.pdf.

#### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.9 OPEN NEW OR EXPAND EXISTING COOLING CENTERS

*Pending finalization of review procedures, documentation of this action cannot be accepted at this time.*

**Action pathway phase:** Implement
**Eligibility timeline:** Currently active
**Total Possible Points:** 2

#### A. Why is this action important?

As temperatures increase, so will the frequency and potential magnitude of heat waves. Vulnerable populations, like the poor and the elderly and non-English speaking populations often lack access to air-conditioning. Public spaces with cooling are vital to their survival during heat waves. Ensuring that a sufficient number of cooling centers are available and accessible, via public transit, to the populations that need them most can reduce hospitalization rates and deaths associated with heat waves.

#### B. How to implement this action

This action can be implemented by undertaking the following:

1. Evaluate the distribution of places like libraries, schools, movie theaters, malls and other publicly available “cooling” spaces and assess and address barriers that might keep

vulnerable populations from using them. Use the results from the vulnerability assessment (7.1) or heat emergency plan (7.6) to identify the locations of vulnerable populations in the community

2. If existing cooling centers are not adequate to meet the communities' needs identify additional sites and work with property owners and staff at these locations to determine if they can be prepared to serve the public during the next heat wave. Consider the availability of potable water and adequacy of restroom facilities and wastewater treatment.
3. Ensure that multiple types of transit options, including public transit, are available to existing and new cooling centers
4. Ensure that new and existing cooling centers have extended hours, particularly evening hours as this is when the health impacts associated with heat are most acute
5. Work with cooling centers and transit authorities to ensure that pets are able to visit cooling centers and receive transport to cooling centers
6. Work with existing social networks to advertise the existence of cooling centers
7. Open cooling centers during heat waves or particularly warm days
8. Track use of cooling centers and evaluate their effectiveness

### C. Timeframe, project costs, and resource needs

Identifying existing cooling centers and designating new ones is a relatively inexpensive and quick thing to accomplish. A local government should be able to achieve this action within 3 to 6 months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments, but is particularly important for urban communities and communities with large vulnerable populations such as the elderly. The department or person with the responsibility for leading public health efforts is most likely to be responsible for this action. In many cases, the county health department may assume the lead role for this action. Cross-department involvement and support are recommended, along with support and involvement from the interdisciplinary climate adaptation task force (as identified in PE 1.2).

### E. How to obtain points for this action

Points are obtained for this action by submitting documentation demonstrating the location of existing cooling centers as well as new cooling centers and mapping out the transportation options available to all cooling centers. Data on attendance at cooling centers should also be submitted as well as any supporting documentation about acceptance of pets at cooling centers.

### F. What to submit

Local government must submit documentation of active cooling centers and information denoting the acceptance of pets in cooling centers. The cooling centers must be actively in use or available if needed at the time of application.

### G. Links to additional resources or examples

- American Red Cross: http://www.redcross.org/prepare/disaster/heat-wave
- FEMA: http://www.ready.gov/heat

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## *Strategies to Address Flooding*

## 7.10 CREATE OR UPDATE A WATERSHED ASSESSMENT TO IDENTIFY FLOODING AND WATER QUALITY PRIORITIES

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Within 5 years prior to the application date
**Total Possible Points:** 4

### A. Why is this action important?

Changing precipitation patterns are likely to result in increased flooding affecting communities and ecosystems. Water quantity can be affected by localized, riverine, or coastal flooding; drought; and depletion of groundwater resources. Water quality can be affected by increased erosion and transport of sediment from high flows, increased stormwater pollution, increased sewage overflows from wastewater systems, and higher stream temperatures. These conditions can affect drinking water supplies, infrastructure, recreational opportunities, and stream habitat.

Implementing high-priority strategies and projects to mitigate water quantity and quality impacts requires a comprehensive understanding of hydrology, land use, infrastructure, and changing conditions in and around the community. Watersheds are the framework best suited to managing water resources, and can be delineated at a scale that is appropriate to the community. Understanding how water flows through your community can help ensure that resources are spent on the most strategic and cost-effective actions. Conducting a watershed assessment and creating a watershed management plan can help identify key projects and strategies to improve climate adaptation.

### B. How to implement this action

This action can be implemented by undertaking the following:

1. Identify an area or areas on which to focus within the municipality and delineate watersheds that flow to that water body or location. Consider what scale is most appropriate based on your community's concerns and priorities. If watersheds extend beyond the community's boundaries, consider engaging neighboring municipalities and county partners.
2. Review existing baseline information on floodplains, water quality, quantity, land use, intact natural areas, water infrastructure, transportation infrastructure including stream-road crossings and existing watershed management or planning documents. Develop baseline information if none exists.
3. Create or update a watershed assessment that outlines existing conditions in watersheds across the community and describes potential vulnerabilities in the future based on climate hazards. Identify areas vulnerable to flooding, drought, and poor water quality. To the extent possible, identify causes of vulnerabilities and potential mitigation options by assessing conditions upstream of problem areas and within the watershed that drains to those areas.

4. Create or update a list of priority projects based on specific locations, causes of flooding or water quality issues, their watershed context, and the community's needs. Additional research or studies should be undertaken to evaluate specific priorities, if needed. Communities may want to combine this effort with a vulnerability assessment and other adaptation planning actions (7.1-7.5). The development of an assessment will be useful for the implementation of many other actions in Pledge Element 7. Priority projects may include projects to implement adaptation strategies that are listed elsewhere in PE 7, including the following:
    - 7.6 – Update the multi-hazard mitigation plan to address changing conditions and identify specific strategies to reduce vulnerability to natural hazards
    - 7.12 – Conserve, revegetate and reconnect floodplains and buffers in riparian areas
    - 7.13 – Protect natural areas for wildlife migration and flood mitigation
    - 7.16 – Use green infrastructure to manage stormwater in developed areas
    - 7.18 – Use natural, nature-based or ecologically enhanced shoreline protection
    - 7.21 – Right-size bridges and culverts, and remove unnecessary and hazardous dams

### C. Timeframe, project costs, and resource needs

Depending on the amount of time and resources available to help with plan creation, this action could take a year or more.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The department or people with the responsibility for emergency management, planning or climate or sustainability efforts are most likely to help implement this action. In some cases, outside expertise will likely prove useful. Cross-department involvement and support are recommended, along with support and involvement from local or regional watershed groups, neighboring municipalities in the watershed and county agencies (such as planning departments, Soil and Water Conservation Districts, etc.) Municipal committees, such as CSC task forces, conservation advisory councils and environmental conservation committees may also be involved. The watershed-based plan could also be developed and updated at a regional or intermunicipal level by the county or a regional or intermunicipal organization. Since watersheds often cross municipal boundaries, this could be especially useful. Local governments claiming credit for participation in regional or intermunicipal assessments will be required to demonstrate substantial involvement in that process to be eligible for points. The same departments or representatives listed above should be involved in such a regional effort.

### E. How to obtain points for this action

Points are obtained for this action by collecting and reviewing baseline data and developing a watershed assessment that identifies priority projects to address water quality and water quantity issues.

| | Possible Points |
|---|---|
| • Create or update a watershed assessment document that identifies areas vulnerable to flooding, erosion and/or water quality or quantity problems (1 point awarded for a document that covers less than 75 percent of the community area, 2 points for 75 percent or more) | 2 |
| • Create or update a list of specific priority projects that identifies responsible parties | 2 |

### F. What to submit

A new or a revised watershed-based assessment and/or watershed management plan.

### G. Links to additional resources or examples

- US EPA, A Watershed Approach: http://water.epa.gov/type/watersheds/approach.cfm
- DEC, Watershed Management: http://www.dec.ny.gov/lands/25563.html
- Hudson River Watershed Alliance, Links to watershed plans: http://www.hudsonwatershed.org/maps-resources/watershed-planning/watershed-management-plans.html
- Quassaick Creek Watershed Plan: http://waterauthority.orangecountygov.com/quassaick_watershed.html
- DOS, Watershed Plans-Protecting and Restoring Water Quality: http://www.dos.ny.gov/communitieswaterfronts/pdfs/Guidebooks/watershed/WatershedPlansGuidebook%20wo%20secretary.pdf
- Center for Watershed Protection, Resources on watershed planning: http://www.cwp.org/ .

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.11 ADOPT A FLOODPLAIN MANAGEMENT AND PROTECTION ORDINANCE TO REDUCE VULNERABILITY TO FLOODING AND EROSION

**Action pathway phase:** Assess, Plan, Govern
**Eligibility timeline:** Any time prior to the application date
**Total Possible Points:** 3

### A. Why is this action important?

A floodplain is the area adjoining a water body or watercourse (lake, ocean, estuary, river or stream) that is subject to flooding either on a regular basis or during a storm event. These areas are also highly susceptible to erosion. FEMA uses data, models and maps to identify the 1-percent and .2-percent floodplains. Undeveloped floodplains can provide a vital service by collecting and storing overflow and slowing water movement during and after storm events. This also reduces erosion risks. A local government can take action to protect the integrity of a floodplain by restricting or closely managing activities that occur within it.

### B. How to implement this action

This action can be implemented through the following steps:

1. Confirm areas vulnerable to flooding and erosion using FEMA Flood Insurance Rate Maps, state maps of Coastal Erosion Hazard Areas (CEHA) and local knowledge. Develop or obtain maps of vulnerability to sea-level rise, if appropriate.
2. Develop policies that are consistent with the local comprehensive plan enabling the floodplain to store and slow water and mitigate flooding and erosion as conditions change.

(For example, setting limits on the types of land uses or structures allowed in floodplains in zoning code, site plan or subdivision review or enforcing coastal erosion hazard areas)

3. Develop and adopt policy(-ies), ordinances or modify zoning to reduce vulnerability
4. Demonstrate enforcement of policy(-ies)

### C. Timeframe, project costs, and resource needs

This action contains both short-term and long-term strategies with varying degrees of implementation costs. In general, a community can expect to make progress on this measure in between three-six months and up to a year or more.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The departments or people with the responsibility for floodplain administration, leading planning and zoning, and environmental protection will most likely be responsible for this action. Municipal committees, such as CSC task forces, conservation advisory councils, environmental conservation committees, watershed groups and neighboring municipalities may also be involved. For this effort to be successful, cross-department involvement and support is recommended.

### E. How to obtain points for this action

Points are obtained for this action by providing documentation of the adoption of the policies, ordinances, or actions implemented, demonstration of enforcement. Metrics of success can be submitted for performance points. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation. CSCs are encouraged to contact the DOS Division of Local Government Services for training and assistance related to zoning procedures, adoption of land-use regulations, and legal advice on authorities and procedures (http://www.dos.ny.gov/lg/).

### F. What to submit

Local governments must submit copies of ordinances, regulations, updated zoning or incentives that discourage development in floodplains, along with any documentation denoting acres conserved for flood storage or natural buffers created in the community and any associated metrics. The ordinance may have been adopted at any time prior to the application date.

### G. Links to additional resources or examples

- FEMA, Floodplain Management Ordinances: http://www.fema.gov/national-flood-insurance-program-2/floodplain-management-ordinances
- FEMA, Stay Dry Program: http://www.fema.gov/media-library/assets/documents/13503?id=3293
- FEMA, Flood Smart Program: https://www.floodsmart.gov/floodsmart/
- Pace Law School, Floodplain Protection Ordinances: http://landuse.law.pace.edu/landuse/documents/FloodplainProt-TPenefield-edited.doc.
- Scenic Hudson, Sea-Level Rise Mapper. http://www.scenichudson.org/slr/mapper
- DEC, Coastal Erosion: http://www.dec.ny.gov/lands/28923.html
- New York, NY, Staten Island Bluebelt: A Natural Solution to Stormwater Management. http://www.nyc.gov/html/dep/html/dep_projects/bluebelt.shtml

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.12 CONSERVE, REVEGETATE AND RECONNECT FLOODPLAINS AND BUFFERS IN RIPARIAN AREAS

**Action pathway phase:** Implement
**Eligibility timeline:** Within 10 years prior to the application date
**Total Possible Points:** 7

### A. Why is this action important?

Riparian buffers include floodplains and other natural areas between a stream or other water bodies and human land uses. Expanding riparian buffer areas and restoring vegetation, especially native trees and shrubs, in buffer areas can help reduce some of the impacts of existing and projected future flooding. Vegetation along permanent and intermittent streams, wetlands, and other water bodies can protect or restore those water bodies and contribute a natural buffer around flood zones. In addition to intercepting rainfall, filtering runoff, capturing sediment, soaking in excess floodwaters, providing shade and reducing stream temperatures, reducing erosion, and slowing down the flow of the water, healthy vegetated riparian buffers can contribute to ecosystem resiliency. Native trees and shrubs also offer benefits to habitat. Riparian buffers can help reduce the effects of heavy precipitation events and store water through droughts. Restoring vegetated buffers is important in flood-prone areas, but also in areas upstream of those places to reduce the speed and potentially the volume of floodwaters.

In general, the wider the buffer, the more effective it can be in providing all of the benefits described above. To address flooding, the most effective buffers should include the entire width of the floodplain. A minimum riparian buffer of at least 100 feet is recommended by the US EPA to provide a wide range of stream protection functions.

It is also critical to ensure that streams are connected to their floodplains, so that floodwaters have a place to go. Removing berms, levees or other built barriers that block floodwaters from accessing floodplains may allow those areas to once again collect, store and slow water movement during and after storm events.

### B. How to implement this action

This action is focused on implementation efforts to conserve, revegetate and reconnect floodplains and riparian buffers to protect streams and minimize the effects of flooding. Steps taken to implement this action include the following:

1. Use FEMA flood insurance rate maps, historic maps, aerial photos, watershed assessments and local knowledge to confirm current floodplains and identify potential floodplain conservation and restoration/reconnection areas
2. Use aerial photos, watershed assessments and local knowledge to identify areas to conserve or revegetate riparian buffers
3. Use this information to inform land conservation. Your municipality might conserve (or work with a partner to conserve) priority riparian or floodplain areas through conservation

easements, or through land purchase to create parks, nature preserves or other types of protected areas.

4. Coordinate with state and federal agencies, to the extent required, to ensure adherence with state and national policies in restoring floodplain connectivity to the waterway
5. Protect and revegetate riparian buffers with native trees, shrubs, and grasses

### C. Timeframe, project costs, and resource needs

This action contains both short-term and long-term strategies with varying degrees of implementation costs. In general, a community can expect to make progress on this measure in between six to twelve months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The departments or people with the responsibility for leading parks and recreation development, and planning and zoning are likely to be responsible for this action. If these do not exist, the department or people with the responsibility for leading the climate and sustainability efforts are most likely to be responsible for this action. For this effort to be successful, cross-department involvement and support are recommended. Municipal committees, such as CSC task forces, conservation advisory councils, environmental conservation committees and watershed groups may also be involved and can help with outreach to local landowners. County Soil and Water Conservation Districts may be able to provide technical assistance with riparian buffer revegetation, especially in agricultural areas.

In some cases, local governments may wish to work together to implement this action, or by participating in a county-led process. Local governments will need to demonstrate substantial involvement in that process to be eligible for points.

### E. How to obtain points for this action

Points are obtained for this action by providing documentation of the actions implemented to protect or restore natural buffers in floodways or coastal zones. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation. Metrics of success are encouraged.

| | Possible Points |
|---|---|
| • Complete an assessment of floodplain and riparian areas, and identify and prioritize sites for conservation, restoration and reconnection of floodplains and conservation or revegetation of buffers | 1 |
| • Conserve floodplains or vegetated buffers through conservation easements or land acquisition | 1 |
| • Incorporate stream buffer protection into zoning or other land-use regulation | 2 |
| • Revegetate a floodplain or riparian buffer area for at least the mapped floodplain width or 100 feet and a length sufficient to reconnect existing vegetated buffer areas | 1 |
| • Reconnect a stream to floodplain area | 2 |

### F. What to submit

CSCs must submit a new or revised assessment of priority floodplain and riparian areas and any maps and documentation denoting the number of projects protecting or restoring riparian buffers and floodplains, along with their length and width, and any other associated metrics (location, dimensions of the area, vegetation planted or protected). Also, submit any additional documentation demonstrating the reconnection, revegetation or protection of new natural buffers abutting rivers, lakes, coastal areas, or floodplains. If applicable, submit documentation of updated zoning or other regulations protecting stream buffers. The project must have been completed within ten years prior to the application date.

### G. Links to additional resources or examples

- DEC, NYS Trees for Tribs: http://www.dec.ny.gov/animals/77710.html
- DEC, Hudson River Estuary Trees for Tribs: http://www.dec.ny.gov/lands/43668.html
- US EPA, National Pollutant Discharge and Elimination System: Riparian/Forested Buffer: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=82
- NYS Association of Soil and Water Conservation Districts: http://nyacd.org/local-districts/
- New York, NY, Staten Island Bluebelt: A Natural Solution to Stormwater Management. http://www.nyc.gov/html/dep/html/dep_projects/bluebelt.shtml

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.13 CONSERVE NATURAL AREAS FOR SPECIES MIGRATION AND ECOSYSTEM RESILIENCE

**Action pathway phase:** Implement
**Eligibility timeline:** Within 10 years prior to the application date
**Total Possible Points:** 7

### A. Why is this action important?

Natural systems support life on earth. They purify our water, clean our air, provide habitat for plants and animals, reduce stormwater runoff, provide natural flood protection, and provide a source of recreation and aesthetic beauty. With climate change and other stressors, many of our natural systems and the benefits they provide to humans are at risk. Large, natural areas with diverse physical conditions and little fragmentation by roads or development are most likely to maintain diverse ecosystems and ecological processes contributing to resiliency. Sustaining resilient ecosystems in a changing climate requires conserving a sufficient variety and amount of habitat and ensuring habitat connectivity through a network of natural areas, corridors, and habitat islands that allow plants and animals to move northward and up in elevation as temperatures increase.
There are many ways to foster habitat connectivity and ecosystem resilience at the local scale through land conservation, zoning and regulations that minimize fragmentation and protect priority natural areas. Wide natural buffers along stream corridors can facilitate terrestrial wildlife movement between larger natural areas and protect aquatic habitat. Aquatic habitat fragmentation should be minimized by correctly designing and installing culverts and removing dams where

appropriate. Larger, landscape-scale natural areas can cross municipal boundaries, and should be assessed in both a watershed and regional context.

### B. How to implement this action

Implementation of this action could include the following:

- Identify the natural areas in your municipality that can contribute most to species migration and ecosystem resilience. This can be achieved by using existing tools such as natural resource inventories (6.17) or open space plans, or can be incorporated into new or ongoing town-wide inventories or planning efforts. To identify such areas, municipalities should seek out information on the following:
    - the most vulnerable ecosystems and populations in the community
    - large natural areas at the municipal and regional scale
    - areas with diverse physical geography, e.g., varying geology, soil conditions and topography
    - naturally vegetated stream corridors and floodplains
    - local and regional natural corridors connecting larger natural areas, and known migratory pathways
    - areas where dunes, beaches, and wetlands will migrate as sea levels rise
- Conduct an analysis to prioritize the most important natural areas for species migration and ecosystem resilience. This can be done in an open space plan or other local plan or inventory or by collaborating with a land trust to incorporate species migration and ecosystem resilience into its strategic conservation plan.
- Use the conservation analysis to identify gaps in protection or connectivity between natural areas, especially considering the watershed or regional context, identify areas adjacent to dunes, wetlands and beaches that may serve as migration areas as sea levels rise.
- Use the conservation analysis to inform land conservation. Your municipality might conserve (or work with a partner to conserve) priority natural areas through conservation easements, or acquisition to create parks, nature preserves or other type of protected area.
- Use the conservation analysis to inform land-use planning and a comprehensive plan. For example, establish a critical environmental area or identify areas where conservation development might be used to avoid impacts to a priority natural area.
- Reconnect aquatic habitat in a priority watershed by reconnecting a streams to its floodplain, revegetating shorelines, replacing key culverts or dam removal.
- Increase public awareness and understanding of climate impacts and other stressors to natural systems, fish, wildlife, and the benefits they provide human communities.

### C. Timeframe, project costs, and resource needs

This action contains both short-term and long-term strategies with varying degrees of implementation costs, including volunteer time, staff time, consultant time, land purchases, marketing and education materials.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The departments or people with the responsibility for planning and zoning or parks and recreation will most likely be responsible for this action. For this effort to be successful, cross-department involvement and support are recommended. Municipal committees such as CSC task forces, conservation advisory councils and environmental conservation committees may conduct natural resource inventories and support education efforts. External organizations, especially land trusts, are an excellent partner in conservation planning and implementation. Watershed groups and nature centers may also be important partners, especially for educational efforts.

Natural areas often cross political boundaries, and in some cases, local governments may wish to work together to implement this action or participate in a county-led process. Local governments will need to demonstrate substantial involvement in that process to be eligible for points. Local governments may also consider collaborating with land trusts or other conservation organizations to implement this action.

### E. How to obtain points for this action

Points are obtained for this action by actively planning for and preserving or increasing the total acreage of conservation land in priority natural areas. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation. CSCs may receive points for each separate and distinct high-priority natural area conserved during a five-year period.

| | Possible Points |
|---|---|
| • Conduct an analysis to identify and prioritize high-priority natural areas for species migration and ecosystem resilience based on a natural resource inventory, open space plan or other study | 1 |
| • Incorporate conservation of high-priority natural areas into a comprehensive plan | 1 |
| • Incorporate conservation of high-priority natural areas into zoning or other land-use regulations | 3 |
| • Conserve a high-priority priority natural area identified through a natural resources inventory or conservation analysis and planning | 2 |

### F. What to submit

Submit a new or updated natural resource inventory, open space inventory, open space plan, or other conservation plan identifying high-priority areas for species migration or ecosystem resilience, and any maps or documentation demonstrating conservation of a high-priority natural area, or relevant updates to a comprehensive plan, zoning or other land-use regulations targeting the conservation of high-priority natural areas.

### G. Links to additional resources or examples

- Environmental Land Institute, Strategic Conservation Planning: http://www.eli.org/pdfs/landtrusthandbook/1.pdf

- IUCS, Global Protected Areas Program Best Practices: http://www.iucn.org/about/work/programmes/gpap_home/gpap_capacity2/gpap_bpg/
- DEC, Conserving Natural Areas and Wildlife in Your Community: http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrebch.pdf
- DEC, Local Open Space Planning Guide: http://www.dos.ny.gov/lg/publications/Local_Open_Space_Planning_Guide.pdf
- DEC and National Wildlife Federation, *Assessing the Vulnerability of Key Habitats in New York. A Foundation for Climate Adaptation Planning*: http://www.nwf.org/What-We-Do/Energy-and-Climate/Climate-Smart-Conservation/Adaptation-Reports.aspx
- US Fish and Wildlife Service*, National Fish, Wildlife and Plants Climate Adaptation Strategy*: http://www.wildlifeadaptationstrategy.gov/index.php
- Dutchess County, NY, Natural Resources Inventory: http://www.co.dutchess.ny.us/countygov/departments/planning/16138.htm
- Rosendale, NY, Natural Resources Inventory: http://www.townofrosendale.com/government/commissions/environmental-commission/
- Montgomery and Wallkill, NY, Natural Resources Inventory: https://sites.google.com/site/townofmontgomerycac/nri

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.14 FACILITATE A STRATEGIC RELOCATION OF USES THAT ARE NOT WATER DEPENDENT FROM FLOOD PRONE AREAS

**Action pathway phase:** Implement
**Eligibility timeline:** Within 10 years prior to the application date
**Total Possible Points:** 5

### A. Why is this action important?

In nearly every community, there are areas that regularly flood. In many cases, the flooding of these areas leads to significant costs (financially and socially) to the community and the region. In some cases, such as a port or boat launch, where the land use is water dependent, it may not make sense to relocate the use. In other cases, such as a school or hospital, it may make sense to relocate the use to reduce risk. Identifying areas that repeatedly flood and are appropriate for relocation and devising a program to strategically relocate those uses or assets can reduce or eliminate the risk of flood damage, reduce emergency response demands and potentially save lives. In addition, strategic relocation can facilitate landward migration of natural shoreline areas and promote the creation of intertidal habitat.

### B. How to implement this action

Strategic relocation of assets or land uses could be implemented using various legislative, policy or incentive tools. Typically, the first step is to map at-risk assets or uses. This might also include areas of potential development like zoning districts. Then an assessment can be done of uses or structures that might be cost-effective to relocate to reduce long-term risk. If a use or structure is relocated,

suitable areas must be found within the community. A use could also be discontinued if it no longer meets a need. In cases where a water dependent use must be located near the shoreline or relocation is not feasible it may make sense to consider other resiliency measures such as elevating the structure or its critical systems to reduce vulnerability.

To plan and implement strategic relocation of assets or land uses, communities should:

1. Map areas at risk from flooding and sea-level rise and uses or assets along the waterfront. Refer to a vulnerability assessment (7.1) or watershed assessment (7.10), if one exists.
2. Work with stakeholders to 1) identify uses that are water dependent and/or cannot be relocated and 2) identify uses or assets that could be relocated, and 3) identify potential sites that could receive a relocated structure or land use
3. Work with stakeholders to identify uses most appropriate for relocation, whether the uses continue to meet a need, and whether there are more appropriate sites in the community that are less vulnerable to flooding.
4. Create a plan or strategy for what strategic relocation would look like in the various areas of the community where it is warranted. Ensure that this plan is connected, to the extent relevant, to other waterfront planning efforts (e.g., a Local Waterfront Revitalization Program). The strategy or plan must have clear timelines for each action as well as detail about who is responsible for implementing each step and what public education or engagement strategies need to happen to ensure the seamless implementation of the plan.
5. Work with partners to facilitate strategic relocation of uses or structures

Communities should also explore the use of planning and regulatory tools such as the transfer of development rights (TDR) to ensure that structures damaged or destroyed due to flooding in high-risk areas are rebuilt in less vulnerable areas.

### C. Timeframe, project costs, and resource needs

Creating the framework for strategic relocation in a community's flood prone areas should be done in collaboration with stakeholders affected by this change. If a community has not already started this process, it is possible planning for strategic relocation could take a year or more. Implementation of the plan will likely take many years and require external as well as internal funding.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The departments or people with the responsibility for planning and zoning will most likely be responsible for this action. For this effort to be successful, cross-department involvement and support are recommended. Municipal committees, such as CSC task forces, conservation advisory councils, environmental conservation committees, or watershed groups may also be involved. This action could be led by another organization, such as a county, but the local government must demonstrate substantial involvement in the effort to receive points.

### E. How to obtain points for this action

Points for this action are obtained by demonstrating that a plan for strategic relocation from flood prone areas exists, as a standalone document or as part of a larger report, and that steps have been

taken to implement the substance of the strategic location plan through incorporation of plan provisions into the comprehensive plan, zoning or other regulations.

| | Possible Points |
|---|---|
| • Develop and officially adopt a plan for strategic relocation | 2 |
| • Incorporate provisions of the strategic location plan into the comprehensive plan | 1 |
| • Incorporate provisions of the strategic location plan into zoning or other regulations. | 2 |

### F. What to submit

A plan detailing to which areas in the community a strategic relocation will apply, why relocation is being planned in this area, who is responsible for implementing relocation, and how it will be achieved must be submitted. Additionally, public outreach materials developed to inform and engage stakeholders in the strategic relocation planning and implementation process should be submitted. Documentation of relevant amendments to the comprehensive plan, zoning or regulations should also be submitted. The plan and implementation of the plan must have occurred within ten years prior to the application date.

### G. Links to additional resources or examples

- NOAA Ocean and Coastal Management: http://coastalmanagement.noaa.gov/initiatives/shoreline_ppr_retreat.html
- Soldiers Grove, WI: http://www.soldiersgrove.com/Floods.htm
- City of Kingston CAC Tidal Waterfront Flooding Taskforce: http://kingstoncac.org/index.php/initiatives/tidal-waterfront-flooding-task-force
- Cedar Rapids, IA, Voluntary Property Acquisition (Buyout) Program: http://www.cedar-rapids.org/city-news/flood-recovery-progress/floodrecoveryresources/buyoutprogram/Pages/default.aspx
- NOAA, Ocean and Coastal Resource Management, Managed Retreat Strategies Case Studies: http://coastalmanagement.noaa.gov/initiatives/shoreline_ppr_retreat.html#1

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.15 PROMOTE COMMUNITY FLOOD PREVENTION STRATEGIES THROUGH THE NATIONAL FLOOD INSURANCE PROGRAM COMMUNITY RATING SYSTEM

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Currently active
**Total Possible Points:** 3

### A. Why is this action important?

The Community Rating System (CRS) is a program of the Federal Emergency Management Agency National Flood Insurance Program. Participating in the CRS reduces flood risk and can help to reduce insurance rates for property owners. Ensuring that citizens are aware of potential flood risk and

know what to do to prevent or minimize the extent of flooding in their personal lives is critical to ensuring public health and safety are maintained during extreme weather events, and is vital to helping the community enhance its overall resilience to climate change. Moreover, having a well-prepared community can lead to an overall cost savings for both the local government and for local residents.

### B. How to implement this action

Local governments can implement this action by participating in the CRS program and undertaking actions in the CRS such as the following:

- Notify residents in the 1-percent and .02-percent floodplain of their flood risk and provide information on the National Flood Insurance Program
- Obtain and maintain FEMA elevation certificates on all new buildings and substantially improved structures constructed in the 1-percent floodplain
- Map and track repetitive loss properties and develop a plan to address the repetitive loss problem
- Compile educational information on common flood prevention strategies that residents and businesses can take and disseminate that information to property owners in flood prone areas.
- Provide incentives for residents and businesses that proactively undertake efforts to prepare for flooding

Local governments are encouraged to apply a watershed approach when evaluating and prioritizing projects.

### C. Timeframe, project costs, and resource needs

The specific costs and timeframe associated with this action depend on the size of the community and the amount of pre-existing work that has taken place to help residents and businesses prepare for flooding. In general, a community should be able to complete this action within six to nine months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all cities, villages and towns, but the local government must be a participant in the National Flood Insurance Program to be eligible for the Community Rating System. The departments or people with the responsibility for leading, planning and zoning, and environmental protection will most likely be responsible for this action. For this effort to be successful, cross-department involvement and support are recommended. Municipal committees, such as CSC task forces, conservation advisory councils and environmental conservation committees and watershed groups and neighboring municipalities may also be involved.

### E. How to obtain points for this action

Points for this action can be obtained by demonstrating participation in the Community Rating System of the National Flood Insurance Program.

| | Possible Points |
|---|---|
| • Active enrollment in the National Flood Insurance Program Community Rating System | 3 |

### F. What to submit

Local governments should submit documentation indicating that they are participating in the FEMA Community Rating System program (CRS) and their rating system level.

### G. Links to additional resources or examples

- FEMA, National Flood insurance Program Community Rating System: http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-rating-system

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.16 USE GREEN INFRASTRUCTURE TO MANAGE STORMWATER IN DEVELOPED AREAS

**Action pathway phase:** Implement
**Eligibility timeline:** Within 10 years prior to the application date
**Total Possible Points:** 7

### A. Why is this action important?

Green infrastructure is an approach to stormwater management that uses natural or engineered features to store stormwater, instead of solely relying on "grey infrastructure" such as sewers and water treatment facilities. Green infrastructure captures rain and stormwater close to where it hits the ground, slowing down its flow and allowing it to infiltrate into groundwater. This helps to decrease flooding and combined sewer overflow events by reducing runoff. With increasing storms, even separated storm sewers may not be sized to deal with larger volumes of runoff; implementing green infrastructure practices can help maintain the capacity of existing infrastructure. This can save the local government significant financial resources, reduce flooding from stormwater, improve water quality and quantity problems, and create more community green space.

Green infrastructure projects should be implemented in strategic locations, either as high-visibility demonstration projects for the community or in key locations to mitigate water quantity or quality impacts. A watershed approach should be used to assess the most strategic sites or strategies to capture stormwater using green infrastructure.

### B. How to implement this action

To implement this action, communities should:

1. Identify existing developed sites that are viable sites for onsite stormwater management retrofits using green infrastructure. Assess all municipally owned or operated properties or facilities for opportunities to install green infrastructure demonstration projects.
2. To the extent necessary, identify the most strategic locations for green infrastructure within

the community by updating or creating a plan for holistically managing stormwater, based on watersheds and including combined or separated sewersheds. Consider upstream sources of localized or riverine flooding.

3. Ensure that all aspects of selected strategy comply with Department of Health regulations and building codes regarding rainwater harvesting and gray water recycling.
4. Work with landowners to obtain permission to implement projects in strategic locations that could reduce flooding, improve water quality or serve as high-visibility demonstration sites.
5. Consult with an engineer or landscape architect for appropriate design practices for retrofits in highly urbanized areas.
6. Implement selected projects.
7. Encourage or require training for local government staff, code enforcement officers, planning board members, and zoning board members in planning, siting, implementing and maintaining green infrastructure stormwater management practices.
8. Implement the most appropriate green infrastructure practices in targeted areas, which could include the following:
    - Downspout disconnection
    - Rainwater harvesting (rain barrels and cisterns)
    - Rain gardens and bioretention areas
    - Stormwater planters
    - Vegetated swales
    - Permeable pavements
    - Green roofs
    - Tree plantings/tree pits
    - Stream daylighting (i.e., exposing formerly culverted or buried streams)
9. These practices could be implemented in targeted locations:
    - Alleys and streets
    - Parking lots
    - Municipally-owned land
    - Residential and commercial properties

Green infrastructure installations must comply with all applicable codes.

### C. Timeframe, project costs, and resource needs

The timeframe to implement this measure depends on the number and scale of specific green infrastructure projects a community is looking to implement. In general, a community should be able to complete this action within one or two years. In many cases, additional funding or staffing resources may be needed to implement this action.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The departments or people with the responsibility for leading the Municipal Separated Storm Sewer System (MS4) program, planning and zoning, and building codes will most likely be responsible for this action. For this effort to be successful, cross-department involvement and support are recommended. Municipal committees, such as CSC task forces, conservation advisory councils, and environmental conservation committees and neighboring municipalities may also be involved. Watershed groups, regional groups and county agencies may be able to contribute valuable information and expertise.

For more complex designs, communities should work with an engineer or landscape architect or designer to create plans.

### E. How to obtain points for this action

Points for this action are achieved by demonstrating that a community has implemented green infrastructure practices or projects and participated in green infrastructure training over any ten-year period.

| | Possible Points |
|---|---|
| • Develop a community-wide plan for green infrastructure retrofits | 1 |
| • Design and implement 1 green infrastructure practices or project to mitigate stormwater from existing development | 1 |
| • Design and implement 2 green infrastructure practices or projects, to mitigate stormwater from existing development | 2 |
| • Design and implement 3 green infrastructure practices or projects, to mitigate stormwater from existing development | 3 |
| • Design and implement 4 green infrastructure practices or projects, to mitigate stormwater from existing development | 4 |
| • Completion of green infrastructure training by more than half of community's code enforcement officers, and zoning and planning board members | 2 |

### F. What to submit

To achieve credit, local communities must submit documentation of any community-wide plans and green infrastructure projects implemented. Calculations on the decrease in runoff due to the increase in natural stormwater storage capacity can be submitted for performance points. If trainings were completed, submit documentation with the names and titles of the staff that received training and date the training occurred. The project(s) must have been complete within ten years prior to the application date, except that training must have been completed within the past 5 years.

### G. Links to additional resources or examples

- DEC, Stormwater: http://www.dec.ny.gov/chemical/8468.html

- DEC, New York State Stormwater Management Design Manual: http://www.dec.ny.gov/chemical/29072.html
- DEC, Erosion and Sediment Control Training: http://www.dec.ny.gov/chemical/8699.html
- DEC, Hudson River Estuary Program Green Infrastructure Examples for Stormwater Management in the Hudson Valley: http://www.dec.ny.gov/lands/58930.html
- US EPA, Green Infrastructure: http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm#tabs-1
- US EPA National Menu of Stormwater Best Management Practices: http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm
- US EPA Low Impact Development Resources: http://water.epa.gov/polwaste/green/
- Low Impact Development Center: http://www.lowimpactdevelopment.org

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.17 CONSERVE WETLANDS AND FORESTS TO MANAGE STORMWATER, RECHARGE GROUNDWATER AND MITIGATE FLOODING

**Action pathway phase:** Implement
**Eligibility timeline:** Within 10 years prior to the application date
**Total Possible Points:** 8

### A. Why is this action important?

Identifying and protecting natural areas like wetlands and forests is an important first step in managing stormwater and flooding. Wetlands and forests are very effective at holding stormwater and allowing it to slowly infiltrate into the soil. By slowing and filtering excess water across the watershed, wetlands and forests can help protect streams against water quality or quantity issues. It is especially useful to understand wetlands and forests within a watershed context to better assess how they contribute to managing stormwater and mitigating flooding at the local scale. Large, intact wetlands and forests and those that provide connectivity between natural areas also contribute to ecosystem resilience and will facilitate species migration with climate change (see 7.13).

It is far more cost-effective to protect natural areas than to restore them, or the streams they are protecting, after they have been degraded. Conserving wetlands and forests in floodplain areas is particularly important (see 7.11), but conserving these areas throughout the watershed can contribute numerous benefits. These benefits include providing clean water, improving air quality, moderating extreme heat and serving as critical wildlife habitat (see 7.13). These benefits can be maintained by clustering housing units away from wetlands and streams, maintaining or restoring natural riparian buffers (see 7.12), and minimizing the fragmentation of large forest areas by roads or development. Reducing the amount of impervious surface such as roads and driveways is also important to limit the amount of runoff that is produced in developed areas.

In New York State, forests have no legal protection, and wetlands smaller than 12.4 acres in size are not protected by the Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law)

unless they are determined to be of 'Unusual Local Importance' by DEC. At the federal level, recent Supreme Court decisions have potentially left "isolated" wetlands (those without a permanent surface water connection to larger water bodies) vulnerable to filling, draining and other impacts. Isolated wetlands contribute to groundwater recharge and floodwater retention, and because they serve as nutrient sinks, they help to maintain water quality. They also provide important wildlife habitat. Local governments can play an important role in filling the gap in wetland and forest protection through comprehensive planning, zoning, regulations and land acquisition in fee or conservation easements. Forestry can be compatible with stormwater and other benefits provided it is done in accordance with established guidelines, and can provide economic incentives for forest conservation.

### B. How to implement this action

This action can be implemented by undertaking the following:

1. Conduct an analysis to identify and map important forests and wetlands in the community. Map and overlay watersheds, at a scale that is appropriate for the community, to assess which natural areas might be more significant for stormwater management and flooding mitigation on particular streams. This analysis may be completed based on a natural resource inventory (6.17) or as part of a watershed assessment (7.10).
2. Use the analysis of forests, wetlands and watersheds to inform land-use planning and improve local protection and conservation, such as through a wetland ordinance. Site plan or subdivision regulations can require identification of these areas and set guidelines to protect them, including identifying areas where conservation development might be used to protect the integrity of wetlands and forests. Identifying sustainable forestry as a use or adopting a forest zone may help prevent the fragmentation and conversion of forestland to other developed uses.
3. Protect high-priority forests or wetlands through land purchase or conservation easements, working with land trusts or other partners.
4. Conserve forests and wetlands on municipally owned property and develop a management plan that protects stormwater handling capacity and other benefits.
5. Educate residents on the importance of conserving forests and wetlands.

CSCs are encouraged to contact the New York State Department of State Division of Local Services for training, technical assistance and legal guidance on stormwater management and flood mitigation (http://www.dos.ny.gov/lg/index.html ).

### C. Timeframe, project costs, and resource needs

This action includes both short-term and long-term strategies with varying implementation costs. In general, a community can expect to make progress on this measure in six to twelve months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The department or people with the responsibility for planning and zoning, stormwater or managing open space and natural areas are most likely to be responsible. Cross-department involvement and support are recommended. Municipal committees, such as CSC task forces, conservation advisory councils or environmental conservation committees and watershed planning groups may also be involved. This action could be led by another organization, such as a county, but the local government must demonstrate substantial involvement in the effort to receive points.

### E. How to obtain points for this action

Points are obtained for this action by submitting documentation that demonstrates the planning and implementation of projects to conserve wetlands and forests. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation.

| | Possible Points |
|---|---|
| • Incorporate wetland and forest conservation into a comprehensive plan goal | 1 |
| • Conduct an analysis to identify important forests and wetlands in the community, including watershed boundaries, and prioritize key areas for conservation | 1 |
| • Incorporate conservation of unprotected wetlands and forests into site plan and subdivision regulations, performance standards, or other land use regulations | 2 |
| • Develop a local wetland protection ordinance | 2 |
| • Establish a management plan for municipal forest land that conserves stormwater regulation and other benefits | 1 |
| • Conserve one high-priority priority wetland or forest areas | 1 |

### F. What to submit

Local governments should submit a new or updated plan identifying priorities for wetland and forest conservation, an updated comprehensive plan, zoning or other regulations contributing to wetland and forest conservation, a new wetland protection ordinance, a forest management plan for municipal property, and/or any documentation of land conservation. The projects must have been completed within ten years prior to the application date to be eligible for points. CSCs may receive 1 point for conservation of each separate and distinct high-priority priority wetland or forest area over the 10-year period.

### G. Links to additional resources or examples

- DEC, Hudson River Estuary Program Code and Ordinance Worksheet for Development Rules in New York State http://www.dec.ny.gov/docs/remediation_hudson_pdf/cownys.pdf
- DEC, Forest Stewardship Program: http://www.dec.ny.gov/lands/45934.html
- DEC, Conserving Natural Areas and Wildlife in Your Community. http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrebch.pdf
- DEC, Small Wetlands Conservation: http://www.dec.ny.gov/docs/remediation_hudson_pdf/hrebswres.pdf
- New York Planning Federation, DEC, Empire State Forest Products Association, *The Municipal Official's Guide to Forestry in New York State*: http://www.dec.ny.gov/docs/lands_forests_pdf/guidetoforestry.pdf
- US EPA, Natural Infrastructure: http://www.epa.gov/region03/green/infrastructure.html

- Green Infrastructure Center, *Green Infrastructure Guide for New York:* http://www.gicinc.org/book.htm
- Aspen Institute, *Nature as a Foundation of Economy: Investing in Natural Infrastructure for Conservation Supporting Human Development*: http://www.aspeninstitute.org/publications/nature-foundation-economy-investing-natural-infrastructure-conservation-supporting
- Climate Solutions, *Natural Infrastructure: A Climate-Smart Solution.* http://www.aspeninstitute.org/publications/nature-foundation-economy-investing-natural-infrastructure-conservation-supporting
- Center for Watershed Protection, *Watershed Forestry Resource Guide*: http://www.forestsfor watersheds.org/forests-and-drinking-water/
- Cornell Cooperative Extension, Forest Connect: http://www2.dnr.cornell.edu/ext /forestconnect/
- New York, NY, Staten Island Bluebelt: A Natural Solution to Stormwater Management. http://www.nyc.gov/html/dep/html/dep_projects/bluebelt.shtml

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.18 USE NATURAL OR ECOLOGICALLY-ENHANCED SHORELINE PROTECTION

**Action pathway phase:** Implement

**Eligibility timeline:** Within 10 years prior to the application date

**Total Possible Points:** 8

### A. Why is this action important?

Changes in climate are projected to increase the frequency of intense storms and sea-level rise. Inland water bodies will experience more erosion of their banks and overflowing of their banks (flooding) and, potentially. Shorelines in coastal and estuarine areas will experience erosion and flooding due to increased storm intensities and, ultimately, permanent inundation of areas of the shore zone due to sea-level rise. Greater fluctuations in water levels and reduced ice cover may lead to greater shoreline erosion in the Great Lakes.

Actions in this pledge element address vulnerability along stream and riverbanks, and lake, estuarine and ocean shorelines: where water meets the land. Sea-level rise and stronger storms will increase community demand for protection from erosion, flooding and permanent inundation. Banks and shorelines naturally move in response to erosion and deposition of sediment, but structures used to harden shorelines to protect buildings and property and prevent erosion upset the balance between erosion and sediment deposition.

Bank and shoreline protection can range from conserving natural shorelines and allowing nature to maintain a balance, to nature-based solutions, to “grey” or hard-engineered methods. Nature-based solutions (sometimes referred to as “bio-engineered” or “green”) use vegetation or a combination of structural features and vegetation to prevent erosion. In some cases, they can also provide flood

protection. Nature-based treatments such as dunes, shellfish reefs and constructed wetlands and re-vegetated banks provide habitat and other ecological functions. Traditional engineered hard (or "grey") methods use materials like steel, wood, concrete or rock with no vegetation. They include sloped armoring (revetments), vertical armoring (bulkheads and cribbing), seawalls and shore stabilization approaches such as jetties, breakwaters and groins. Grey structures can be ecologically enhanced by adding structural diversity (nooks and crannies), avoiding straight lines and using materials that encourage aquatic growth.

Note: The term green infrastructure is increasingly used to describe erosion protection and coastal defenses using nature-based methods. It is important to not confuse the use of this term in the context of erosion control with its other common usage in the context of stormwater management.

"Grey" infrastructure has traditionally been used to accommodate working waterfronts, prevent erosion or attempt to keep water out of an area entirely. However, these types of structures often encourage development in risky areas leading to catastrophic consequences if they are overtopped or fail. In addition, because they are difficult to modify once built, their effectiveness is likely to diminish over time as sea levels rise and storms become more intense. They also often have negative impacts on adjacent properties, and plants and animals that use the shoreline or bank. For these reasons, conservation of natural areas and construction of nature-based or "green" shoreline protection and bank stabilization measures are preferred, especially in low-risk areas. In cases where grey infrastructure protection measures are needed they can be ecologically-enhanced.

### B. How to implement this action

To implement this action, local communities should utilize the results from the climate vulnerability assessment to understand which areas may be prone to erosion and flooding. Communities should complete a shoreline assessment in these areas to determine if shoreline protection or bank stabilization is warranted and whether nature-based or ecologically-enhanced measures can be used. Points will be awarded for conserving natural areas and using nature-based solutions. To choose whether and where protective measures are necessary, local governments should take the following steps:

1. Understand what areas in the community are vulnerable to flooding and erosion, and evaluate whether shoreline protection or bank stabilization is necessary. Plan to conserve natural shoreline where possible, especially in low-risk areas.
2. Identify areas where constructed measures are necessary and the type and extent of structures. Consider whether existing grey infrastructure can be enhanced or replaced with nature-based measures or is no longer needed. .
3. Work with state agencies and the Army Corps of Engineers, where necessary, to design and site projects. Ensure that future projections of climate change are incorporated into design specifications.
4. Conserve natural shoreline and bank areas. Update or build necessary protective shoreline or bank stabilization infrastructure.

Almost all shoreline protection or stabilization projects require approval by DEC and, potentially, other agencies. Project managers are encouraged to contact the regional permit administrators for the DEC region in which they are located for information on permitting requirements (http://www.dec.ny.gov/about/50230.html) and to contact staff in the DEC programs referenced below for design guidance.

### C. Timeframe, project costs, and resource needs

From initiation to implementation, this measure will likely take a local government one to three years. Additional staffing resources and financial resources will likely be needed to successfully implement this action.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The departments or people responsible for public works, planning and engineering are most likely to be responsible for this action. For this effort to be successful, cross-department involvement and support are recommended. Since the effects of shoreline hardening or bank stabilization cross property and municipal boundaries, it is important to have support and involvement from neighboring property owners, municipalities and county agencies. Municipal committees, such as CSC task forces, conservation advisory councils or environmental conservation committees may also be involved.

### E. How to obtain points for this action

In order to achieve points for this action, a local government must demonstrate that a shoreline or bank stabilization assessment has been completed, natural shorelines or banks have been conserved, and nature-based or ecologically-enhanced protection has been used instead of or to replace grey infrastructure. To be eligible for points for this action, local governments are not required to incorporate policies related this element into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation.

| | Possible Points |
|---|---|
| • Complete a shoreline or bank assessment | 2 |
| • Conserve natural shoreline and banks wherever possible | 3 |
| • Use nature-based or green protection instead of or to replace grey infrastructure | 2 |
| • Enhance grey infrastructure with ecological improvements | 1 |

### F. What to submit

In order to achieve points for this action a local government must submit documentation of the action taken. If existing or planned traditional grey infrastructure was replaced with nature-based or ecologically-enhanced measures submit photos or other documentation of pre-existing grey infrastructure that was replaced, or plans or demonstrated need for grey infrastructure that was modified. If the action was taken on private property, the local government must demonstrate substantial involvement (see introduction). Local governments are encouraged to submit documentation on the percentage of shoreline or waterfront affected and provide any information on overall performance of the infrastructure during storms.

### G. Links to additional resources or examples

- DEC, Hudson River National Estuarine Research Reserve, Hudson River Sustainable Shorelines, http://www.hrnerr.org/hudson-river-sustainable-shorelines
- DEC, Shoreline Stabilization Techniques: http://www.dec.ny.gov/permits/67096.html
- DEC, Protection of Waters Program: http://www.dec.ny.gov/permits/6042.html
- DEC, Dam Safety: http://www.dec.ny.gov/lands/4991.html

- DEC, Coastal Erosion Control Design, http://www.dec.ny.gov/lands/86534.html.
- Filipowicz, Amy B. (2006) The Guide to Ecologically-Based Stream Restoration in New York's Coastal Watersheds: http://www.csc.noaa.gov/cms/fellows/04_fellows_Ecologically_Based_Stream_Restoration%20Guide.pdf
- New York, NY, Vision 2020: New York City Comprehensive Waterfront Plan: http://www.nyc.gov/html/dcp/html/cwp/index.shtml
- New York, NY, Urban Waterfront Adaptive Strategies: http://www.nyc.gov/html/dcp/html/sustainable_communities/sustain_com7.shtml
- Northwest Regional Planning Commission
  The Shoreline Stabilization Handbook for Lake Champlain and Other Inland Lakes
  http://www.uvm.edu/seagrant/publications/35
- United States Army Corps of Engineers: http://www.usace.army.mil

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.19 EXTEND AREA IN WHICH THE TWO-FOOT FREEBOARD REQUIREMENT APPLIES

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Currently active
**Total Possible Points:** 3

### A. Why is this action important?

Freeboard is the distance between the top of the lowest floor of a structure or bottom of the lowest supporting horizontal structural member and the design flood level, usually the one-percent base flood elevation. The New York State Uniform Fire Prevention and Building Code (2010) requires two feet of freeboard above the one-percent base flood elevation for one- and two-family dwellings. New, substantially damaged or substantially improved dwellings must meet the two-foot freeboard requirement. Additional freeboard, e.g., three feet above the one-percent base flood elevation could lead to significant reductions in vulnerabilities to flooding and substantial reductions in flood insurance rates.

Local governments may impose an additional, more protective freeboard requirement using one of two approaches. Local governments may amend the local building code to require additional freeboard within the special flood hazard area[1] defined by FEMA. However, such amendments must be approved by the State Fire Prevention and Building Code Council (http://www.dos.ny.gov/DCEA/code_council.html). Local governments may achieve a similar objective, without the need for Code Council approval, by identifying an area landward of the special flood hazard area, e.g., the 0.2% (500-year) floodplain, in which the two-foot freeboard requirement applies.

[1] http://www.fema.gov/floodplain-management/flood-zones

This action involves extending area in which the two-foot freeboard requirement applies to the 0.2-percent floodplain.

### B. How to implement this action

To implement this action, local communities should do the following:

1. Work with coastal residents, businesses, and developers to educate them about coastal flooding and the need for resilient building standards
2. Pilot a freeboard program by offering incentives such as reduced building fees or streamlined permitting for meeting elevation requirements
3. Develop and adopt a formal freeboard policy requiring all new or significantly renovated properties be elevated to more than two feet above the 1-percent flood elevation, or extend the area in which the two-foot freeboard requirement applies to the 0.2-percent flood elevation through local zoning or an ordinance
4. Monitor progress and effect of freeboard requirement in reducing damages

As with any change in local laws and policies, please consult with the local government attorney for guidance on drafting and enacting the new legislation or policy.

### C. Timeframe, project costs, and resource needs

This action contains both short-term and long-term strategies with varying degrees of implementation costs. In general, a community can expect to make progress on the educational element of this action within three to six months and progress in creating and implementing the freeboard policy within six-twelve months. This strategy should have minimal additional costs and resource needs for the community.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable local governments with zoning authority, i.e., villages, cities and towns. The departments or people responsible for building and planning are most appropriate to lead this effort. Cross-department involvement and support are recommended.

### E. How to obtain points for this action

Points for this action are achieved by creating a council approved freeboard policy and demonstrating enforcement of the policy. This action will receive points as long as it remains active. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation.

### F. What to submit

A copy of the enhanced freeboard policy, approved by the Codes Council, or a copy of the ordinance, building code or zoning change demonstrating that the 2-foot freeboard requirement has been extended to the 0.2-percent flood level, should be submitted.

### G. Links to additional resources or examples

- DEC, Floodplain Management: http://www.dec.ny.gov/lands/24267.html
- FEMA, Floodplain Management: http://www.fema.gov/floodplain-management

- NOAA, Storm Smart Coasts: http://stormsmartcoasts.org, and http://www.riema.ri.gov/prevention/floods/floods_documents/Raise%20Your%20Home%20Value.pdf

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.20 REQUIRE CONSIDERATION OF SEA-LEVEL RISE IN PLANNING COASTAL DEVELOPMENT

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Any time prior to the application date
**Total Possible Points:** 3

### A. Why is this action important?

New York's coastal areas include the shoreline of Long Island, eastern Westchester County, New York City and the Hudson estuary to the Federal Dam at Troy. Climate change is leading to notable changes in sea levels along the New York coastline. With rising sea levels come enhanced storm surges, greater likelihood of localized and regional erosion, flooding and permanent inundation. In order to ensure that buildings and infrastructure are prepared for existing as well as future changes in sea level, all planning and projects in coastal areas should take sea-level rise projections into account.

### B. How to implement this action

To implement this action, coastal communities should:

1. Work with coastal residents, businesses and developers to educate them about the importance of preparing for sea-level rise and enhanced storm surge as a result or rising water levels and stronger storms.
2. Develop standards for planning and evaluating projects based on present risk and future risk from rising sea levels in coastal areas. Ensure the most up to date projections are used.
3. Update the local zoning and building code to require that new coastal development or major coastal renovations integrate sea-level rise considerations. Consider other tools like density restrictions, setbacks, height limitations or requirements for upgrading or rebuilding significantly damaged properties in vulnerable coastal areas. Any amendments to local building codes must be approved by the State Fire Prevention and Building Code Council (http://www.dos.ny.gov/DCEA/code_council.html).
4. Enforce policy and monitor compliance

As with any change in local laws and policies, please consult with the local government attorney for guidance on drafting and enacting the new legislation or policy.

### C. Timeframe, project costs, and resource needs

This action contains both short-term and long-term strategies with varying degrees of implementation costs. In general, a community can expect to make progress on the educational

element of this action within three to six months and progress in creating and implementing the zoning or building code update within nine to twelve months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The departments or people responsible for building and planning are most appropriate to lead this effort. Cross-department involvement and support are recommended. Municipal committees, such as CSC task forces, conservation advisory councils or environmental conservation committees may also be involved.

### E. How to obtain points for this action

Points for this action are achieved by updating the local zoning and/or building code to incorporate sea-level rise projections and demonstrating enforcement of the policy. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation.

| | Possible Points |
|---|---|
| • Create or update a zoning or building code to incorporate vulnerability from sea-level rise | 2 |
| • Demonstrate enforcement of new zoning or building code | 1 |

### F. What to submit

A copy of the approved zoning code and/or building code that incorporates sea-level rise projections should be submitted. This action may have been completed at any time prior to the application date to be eligible for points.

### G. Links to additional resources or examples

- DEC, Sea-level Rise: http://www.dec.ny.gov/energy/45202.html
- DEC, New York State Sea-Level Rise Task Force Report: http://www.dec.ny.gov/energy/67778.html
- Georgetown Climate Center, Sea-level rise Toolkit: http://www.georgetownclimate.org/sites/default/files/Adaptation_Tool_Kit_SLR.pdf
- Kingston, NY, Waterfront Flooding Task Force Final Report: www.kingstoncac.org
- Climate Central, Surging Seas: Sea-level rise Risk Analysis: http://sealevel.climatecentral.org/
- NYS 2100 Commission Report: http://www.governor.ny.gov/assets/documents/NYS2100.pdf

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.21 RIGHT-SIZE BRIDGES AND CULVERTS, AND REMOVE UNNECESSARY AND HAZARDOUS DAMS

*Pending finalization of review procedures, documentation of this action cannot be accepted at this time.*

**Action pathway phase:** Implement
**Eligibility timeline:** Within 10 years prior to the application date
**Total Possible Points:** 5

### A. Why is this action important?

Improperly sized culverts and bridges can contribute to localized flooding near stream-road crossings, and present a hazard to the community if they are routinely overtopped or blowout. Intense precipitation can cause more water and debris to be carried by streams, potentially resulting in jams, overflows and blowouts at culverts and bridges that are too small. Many culverts also act as barriers to aquatic animals, including fish. Right-sizing bridges and culverts help to protect stream continuity, reduce flooding and connect aquatic habitat. The goal of these right-sizing projects is to maintain or restore pre-installation conditions as much as possible.

Many dams in New York State are not properly maintained and past their engineered lifespan. They can present a flooding hazard to upstream communities and, in the event of a dam failure, to downstream communities as well. Some dam owners are interested in removing their dam if the right support and resources are offered. Dam removal, where appropriate, can reduce the possibility of dam failure and reconnect streams for animals, including fish.

### B. How to implement this action

Points for this action are obtained by:

***Culverts***

- Identify stream crossings that have caused flooding or may cause flooding in the future due to changes in precipitation from climate change or changes in upstream land use. Use a watershed assessment, if one exists, to identify problem areas. When evaluating sites, consider the larger watershed context and effects both up and down stream. Problems could arise from the following:
    - Undersized crossings
    - Shallow crossings
    - Perched crossings
    - Multiple culverts at one stream crossing
- Work with local soil and water conservation districts, qualified engineers and regional staff from DEC to design the appropriate type of stream crossing and minimizes impact to the stream. Use open-bottomed culverts, that span at least 1.25 times the bankfull width, where possible, to reduce barriers to aquatic life.
    - Use the most recent flow volume standards. Incorporate projections of future rainfall, if available.
- Contact DEC to determine if a permit is necessary. Permits are required for streams classified as C(T) or higher quality (ECL Article 15-0501), navigable bodies of water (ECL Article 15-0505), and DEC regulated wetlands (ECL Article 24).
- Install the right-sized stream crossing(s).

  Perform annual maintenance on all stream crossing structures and check for structural deficiencies, undermining and debris buildup.

***Dams***

- Create an inventory of dams in the municipality, both publicly and privately owned. Use a watershed assessment if one exists. Assess their maintenance status and the landowners' interest in dam removal.
- Prioritize removing dams where appropriate, removing the risk of dam failure and costs of future maintenance. Only upgrade and maintain dams that are serving an important community need, such as water supply, recreation, historical preservation, flood control and power generation.
- Where appropriate, work with local and regional DEC staff, town engineers and attorneys, and other stakeholders to design the appropriate dam removal strategy.

### C. Timeframe, project costs, and resource needs

The timing and costs to right-size a stream crossing depend on the number of crossings to be replaced and the type of replacement involved. One crossing might be replaced in 6-8 months. Dam removal projects require several planning steps and can be lengthy process. Costs of these projects are variable, depending on the complexity of the removal strategy. An additional timing constraint involves applying for the necessary permits. Local governments will typically need to devote some staff time and capital resources for the improvement of stream crossings and removal of unwanted dams.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The department or people responsible for public works, highways or engineering are most appropriate to lead this action, although dam removal projects will likely need help from dam removal experts outside the municipal staff. Culvert resizing should be included in municipal highway annual maintenance plans. For this effort to be successful, cross-department involvement and support are recommended. Private landowner partnerships will be needed in many cases. Municipal committees, such as CSC task forces, conservation advisory councils, environmental conservation committees or watershed groups may also be involved. This action could be led by another organization, such as a county agency, but the local government must demonstrate substantial involvement in the effort to receive points.

### E. How to obtain points for this action

Local governments can earn points for this action by conducting the necessary planning to identify appropriate dams, culverts and bridges. More points are earned upon demonstrating that a bridge or culvert has been right-sized or a dam has been removed. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation. CSCs may receive points for each dam removed and each pair of bridges or culverts right-sized over any 10-year period.

| | Possible Points |
|---|---|
| • Develop a road-stream crossing right-sizing plan or strategy based on a culvert assessment to identify those that are undersized or barriers to aquatic or riparian organisms. | 1 |
| • Right-size 2 or more bridges or culverts and ensure that they are not barriers to aquatic connectivity. | 1 |
| • Conduct a dam inventory and required engineering studies for town-owned dams and others dams of interest in the community that are potentially appropriate for removal. | 1 |
| • Remove 1 dam identified by the dam inventory as appropriate for removal. | 2 |

### F. What to submit

Local governments should submit information on any plans, strategies or design documents demonstrating a plan to replace stream crossings and/or identifying dams that are appropriate for removal. For points associated with removing or mitigating aquatic barriers, local governments should submit evidence, such as before and after photographs, of the replaced stream crossing or removed dam, along with a description of the design features of the new crossing or restored stream reach.

### G. Links to additional resources or examples

- DEC, Stream Crossings: Guidelines and Best Management Practices: http://www.dec.ny.gov/permits/49066.html
- DEC, Stream Crossings: Protecting and Restoring Stream Continuity. http://www.dec.ny.gov/permits/49060.html
- DEC, Dam Removal and Barrier Mitigation draft guidance: http://www.dec.ny.gov/docs/remediation_hudson_pdf/damremoval.pdf
- DEC, Environmental Resource Mapper: http://www.dec.ny.gov/animals/38801.html
- New England's Sustainable Knowledge Corridor, Best Management Practices for Stream Crossing Replacement: http://www.sustainableknowledgecorridor.org/site/sites/default/files/uploads/Climate/PVPC_ClimateActionPlan_App2_BMPs-for-Stream-Crossings_12-08-12.pdf
- Northeast Regional Climate Center, Extreme Precipitation in New York & New England: http://precip.eas.cornell.edu/

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.22 DEVELOP OR ENHANCE EARLY WARNING SYSTEMS AND COMMUNITY EVACUATION PLANS

**Action pathway phase:** Implement
**Eligibility timeline:** Within 10 years prior to the application date
**Total Possible Points:** 4

### A. Why is this action important?

Public safety officials and emergency managers must provide the public with life-saving information quickly in an emergency. Timely information on imminent flood hazards and extreme weather, preparedness actions and evacuation routes can speed evacuations and allow property owners time to prepare. Information on hazards from federal or state authorities, like the National Weather Service, can be enhanced by local information from stream gages (for flood flows) and weather stations and from the public via social media and telephone. Local governments should have systems in place to capture local data and transmit real-time information on hazards and preparedness actions to the public. Evacuation plans and routes should be designated across jurisdictions to ensure coordination and safe passage in an emergency.

The NY-ALERT mass notification system is available to all New York State agencies and municipalities for public safety messaging. Information from local stream gages or emergency service providers on threats from natural hazards can be disseminated quickly through the NY-ALERT system. Municipalities, working through designated county coordinators, can also disseminate emergency messages via reverse 911 phone calls to households within a specified jurisdiction or geographic area. Individual counties must request and authorize reverse 911 calling on behalf of local municipalities so coordination between the county and the municipalities is critical to the functioning of these systems in an emergency.

### B. How to implement this action

Communities should coordinate with their neighbors and respective counties to develop emergency warning systems that incorporate local data sources and real-time information, develop evacuation plans and routes, and clarify procedures for the authorization of reverse 911 calling in emergencies.

### C. Timeframe, project costs, and resource needs

Updating a community or county emergency and evacuation plan, including the incorporation of local and real-time data, can take 4 to 6 months, depending on the amount of time and resources available to help with plan creation.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The department or people responsible for emergency management are most appropriate to lead this action. This action may be led by another organization, such as a county agency. The local government must demonstrate substantial involvement in a regional effort to receive points.

### E. How to obtain points for this action

Local governments can earn points for this action by assessing current emergency warning systems for flooding and other natural hazards, if they exist, and implementing actions to develop or enhance these systems. Enhancements might include the use of the NY-Alert system or guidelines for using local information like stream gage data. CSCs can also obtain points for coordinating on the designation of evacuation routes and developing clear guidelines for the authorization of reverse 911 calling.

| | Possible Points |
|---|---|
| • Assess current early warning systems for flooding and natural hazards | 1 |

| | |
|---|---|
| • Develop a new or improve an existing early warning system for flooding and natural hazards (using NY- ALERT or incorporating local data), or add local stream gages | 1 |
| • Develop evacuation routes for a variety of natural hazards across several jurisdictions | 1 |
| • Develop guidelines for the authorization of reverse 911 calling. | 1 |

Alternatively, communities may receive full credit of 4 points for this action by providing proof of recognition as a StormReady® community by the National Weather Service.

#### F. What to submit

Local governments should submit information on development of a new system or enhancements to existing early warning systems, or a copy of notification from the National Weather Service that the community has been recognized as a StormReady community.

#### G. Links to additional resources or examples

- NYS Division of Homeland Security & Emergency Services, NY-ALERT: http://marketing.nyalert.gov/index-1.html
- US National Weather Service, StormReady: http://www.stormready.noaa.gov
- USGS, Development of a Flood-Warning System and Flood-Inundation Mapping for the Blanchard River in Findlay, Ohio. http://pubs.usgs.gov/sir/2008/5234/

#### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## *Strategies to Address Drought*

## 7.23 IMPLEMENT A WATER CONSERVATION AND REUSE PROGRAM

**Action pathway phase:** Implement
**Eligibility timeline:** Currently active
**Total Possible Points:** 5

#### A. Why is this action important?

Although New York State is expected to receive on average more annual precipitation, this additional precipitation is likely to come at times when it is needed least, e.g., late winter, and the frequency of short-term summer droughts is expected to increase. Efforts to reduce water consumption and utilize water more efficiently provide an opportunity to reduce our demand on water resources, reduce our energy consumption, increase resiliency to short-term drought and enhance innovation. Simple actions like adjusting the timing of outdoor sprinkler systems or installation of low-flow showerheads can help to conserve water in dry summer months. Other actions require more investment, such as the investigation and repair of leaky underground water distribution systems. Water conservation often saves money and reduces the need to find new, likely more expensive, sources of freshwater in the future.

Climate-smart land-use policies can play an important role in ensuring that drinking water supplies are replenished and streams have sufficient baseflow.

### B. How to implement this action

To implement this measure, local communities can undertake the following:

- Create and implement a water conservation or reuse program within internal government operations.
- Create and implement a water conservation program within the residential, commercial and industrial stakeholders in the community. Incentivize identification and repair of underground water leaks and develop guidelines for efficient timing of sprinkler systems.
- Collaborate with water utilities to provide water conservation devices such as low-flow showerheads to residents.
- Implement a rainwater harvesting and reuse program, including the distribution of rain barrels and the promotion of cisterns and other water harvesting practices. Some water harvesting practices, especially those involving reuse of gray or black water, may be regulated by state or local codes, or industry standards. Local governments are advised to consult with appropriate code officials and other professionals before planning water harvesting and reuse programs. Any amendments to local building codes must be approved by the State fire Prevention and Building Code Council (http://www.dos.ny.gov/DCEA/code_council.html).
- Replenish groundwater supplies by using green infrastructure practices to infiltrate stormwater, using decentralized wastewater techniques and protecting natural areas.

Local governments can also implement this action by following the steps below to join EPA's WaterSense program as a promotional partner. Local governments can sign up for the WaterSense program relatively quickly, by signing the Promotional Partners Agreement. There is no cost to participate in the WaterSense program; however, local governments must demonstrate some annual promotional activities for the water efficiency. The EPA provides promotional resources and materials for the program, so there should be little or no cost to promote the program:

1. Review WaterSense program guidelines and eligibility requirements: http://www.epa.gov/watersense/partners/join.html
2. Complete and sign a Promotional Partners Agreement http://www.epa.gov/watersense/docs/ws_partnership_promo_508_2-1-13.pdf and agree to the partnership pledge, which requires the local government to educate residents, businesses, and institutions about water efficiency, undertake activities and events to achieve WaterSense goals, and provide data to the EPA on an annual basis about promotional activities.
3. Plan and develop marketing materials to promote water efficiency, WaterSense products, and the WaterSense program, using the EPA's materials
4. Hold 1 event per year in which water efficiency is promoted
5. Report to the EPA WaterSense program on an annual basis about promotional activities

### C. Timeframe, project costs, and resource needs

A local government can likely complete this action within six to nine months.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The water utility is most appropriate entity to undertake this action. If a local government does not have a water utility, the department or people with the responsibility for leading the climate and sustainability efforts are most appropriate to be responsible for this action. These responsibilities are typically led by the chief elected official's office and undertaken by the city manager's office, the department of the environment or planning or by a volunteer body, such as a CSC task force or conservation advisory council. Cross-department involvement and support are recommended, along with support and involvement from the interdisciplinary climate adaptation task force (as identified in PE 1.2). Stakeholder involvement from local organizations such as watershed groups is recommended.

### E. How to obtain points for this action

Points are obtained for this action by demonstrating the creation of or enhancement of an existing water conservation program. CSCs can also earn points by demonstrating participation in the EPA WaterSense program as a promotional partner, or committing to purchase only WaterSense labeled products for municipal facilities and operations. CSCs applying for points for participation in the WaterSense program will only be awarded points for development of additional water conservation programs that substantially exceed the requirements of the WaterSense program.

| | Possible Points |
|---|---|
| • Promote water efficiency by participating in the EPA WaterSense program as a promotional partner | 2 |
| • Commit to purchasing only WaterSense-labeled products for municipal facilities. | 2 |
| • Develop a water conservation program for government facilities | 1 |
| • Develop a water conservation program for the community | 1 |

### F. What to submit

Progress reports indicating the number and types of water conservation strategies underway and any metrics on the amount of water reduced. In addition, community outreach materials related to water conservation should be submitted as part of this element. The water conservation program must be currently active to be eligible for points. To demonstrate participation in the WaterSense program, submit a copy of the completed Promotional Partnership Agreement (http://www.epa.gov/watersense/partners/partnership_agreement.html) and of the most recent WaterSense partner annual report (http://www.epa.gov/watersense/partners/annual_reporting.html).

### G. Links to additional resources or examples

- DEC, Water Use & Conservation: http://www.dec.ny.gov/lands/67073.html
- US EPA, Water Sense program: http://www.epa.gov/watersense/
- New York, NY, Water Conservation Programs: http://www.nyc.gov/html/dep/html/ways_to_save_water/index.shtml

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements. To obtain recertification credit for participation in the WaterSense program, CSCs must provide the WaterSense annual report for the most recent calendar year.

## 7.24 ENCOURAGE XERISCAPING

**Action pathway phase:** Assess, plan, and govern
**Eligibility timeline:** Currently active
**Total Possible Points:** 2

### A. Why is this action important?

A changing climate will mean changes in the quality and quantity of available water supplies, with more frequent summer droughts. This will likely mean increased competition for more limited supplies of freshwater. Xeriscaping entails landscaping and gardening practices that utilize native drought-resistant vegetation and reduce or eliminate the need for supplemental water from irrigation. By ensuring that only native plants or plants that are appropriate for our climate zone are planted, we will be helping to ensure that a sustainable amount of water is used for home and business landscaping, thereby reducing competition between this and other sources of water demand. Native plant species also benefit wildlife.

### B. How to implement this action

To implement this measure, local governments should do the following:

1. Provide planning and zoning board, building department staff and citizens with educational material about what xeriscaping is and what types of plants are suitable for the New York region
2. Pass an ordinance requiring xeriscaping in site plans and subdivision regulations for new residential and commercial properties

### C. Timeframe, project costs, and resource needs

The costs associated with implementing this action, as well as the additional staff time needed, are minimal. A local government can likely complete this action within 6 to 9 months

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The department or people with the responsibility for leading climate and sustainability efforts are likely to be responsible for this action. These responsibilities are typically led by the chief elected official's office and undertaken by the city manager's office, the department of the environment or planning or by a volunteer body, such as a Conservation Advisory Council. Cross-department involvement and support are recommended, along with support and involvement from the interdisciplinary climate adaptation task force (as identified in PE 1.2). Stakeholder involvement from local organizations or watershed groups is recommended.

### E. How to obtain points for this action

Points are obtained for this action developing educational materials related to the benefits of xeriscaping or adopting and ordinance or regulation requiring or promoting xeriscaping.

| | Possible Points |
|---|---|
| • Adopt an ordinance or regulation requiring or promoting xeriscaping | 1 |
| • Educate the public about the benefits of xeriscaping | 1 |

### F. What to submit

Local governments must submit certified copies of adopted ordinances or regulations requiring or promoting xeriscaping or educational materials. The ordinance may have been adopted at any time and be actively in use, and the educational materials must be actively in use.

### G. Links to additional resources or examples

- United Water New York, Gardening with Less Water: http://www.unitedwater.com/newyork/ny-xeriscape.aspx
- Cornell University, *Conserve Water with Xeriscape Landscaping*: http://emergencypreparedness.cce.cornell.edu/disasters/Documents/Hort%20012%20Conserve%20Water%20with%20Xeriscape%20Gardening%20Sep%2009.pdf

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.

## 7.25 IMPLEMENT A SOURCE WATER PROTECTION PROGRAM

**Action pathway phase:** Implement
**Eligibility timeline:** Currently active
**Total Possible Points:** 6

### A. Why is this action important?

Maintaining the long-term viability of water supply and water quality is critical to ensuring public health and safety, and to maintaining a viable local economy. Climate change will likely stress existing water supplies, necessitating strategic planning, conservation, and source water protection programs. It is critical to identify current sources of water and assess their watersheds or recharge areas to identify potential vulnerabilities (for both quality and quantity) over time.

### B. How to implement this action

To implement this measure, local governments should undertake the following:

1. Identify the sources of the local public water supply, along with watersheds or recharge areas.
2. Identify climate vulnerabilities for local water supplies.
3. Work with other jurisdictions that also draw water from the water source and with communities within the source water's watershed or recharge area, to collectively identify strategies to protect source waters.

4. Create a strategy or source water protection plan considering a watershed perspective. Also, consider changes in population and development, in addition to climate change. The plan should outline specific projects to improve source protection.
5. Identify interbasin transfers (taking water from one watershed and discharging it into another) by assessing municipal, commercial, and industrial water intakes and discharge locations; limit interbasin transfers were possible.
6. Implement the plan's projects and track key indicators such as water supply and water quality.

### C. Timeframe, project costs, and resource needs

A local government can likely complete the planning element of this action within 1 to 2 years. Implementation and monitoring of this action are ongoing efforts.

### D. Which local governments implement this action? Which departments within the local government are most likely to have responsibility for this action?

This action is applicable to all types of local governments. The department or people with the responsibility for managing water issues are most likely to be responsible for this action. Cross-department involvement and support are recommended, along with support and involvement from the interdisciplinary climate adaptation task force (as identified in PE 1.2). Stakeholder involvement from local organizations and watershed groups is recommended. If the sources or their watersheds/recharge areas cross municipal boundaries, communities should work with other municipalities as well.

### E. How to obtain points for this action

Points are obtained for this action by submitting documentation of a source water protection plan and documentation demonstrating how the plan has been implemented. This includes specific details on the actions implemented and any metrics of success. To be eligible for points for this action, local governments are not required to incorporate these policies into their zoning or comprehensive plans; however, they are encouraged to do so to establish the legal basis for implementation.

| | Possible Points |
|---|---|
| • Create a source water assessment or update existing assessments | 1 |
| • Create a source water protection strategy or plan | 1 |
| • Implement actions from the strategy or plan | 3 |
| • Track key indicators, such as water supply and quality | 1 |

### F. What to submit

Local governments should submit copies of a successfully passed source water protection plan and any documentation highlighting successfully implemented strategies identified in the source water protection plan. Local governments should also submit reports on key indicators and historical trends.

### G. Links to additional resources or examples

- US EPA, Source Water Protection: http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/index.cfm

- DOH, Drinking Water Protection Program : http://www.health.ny.gov/environmental/water/drinking/
- DOH, Source Water Assessment Program: http://www.health.ny.gov/environmental/water/drinking/swap.htm
- DOH, Source Water Assessment Program Plan: http://www.health.ny.gov/environmental/water/drinking/swapp.pdf
- Trust for Public Land, Source Protection Handbook: http://www.tpl.org/publications/books-reports/the-source-protection.html
- New York Rural Water Association: http://www.nyruralwater.org/

### H. Recertification Requirements

The recertification requirements are the same as the initial certification requirements.