



Town of Ulster Climate Smart Resiliency Planning:

Gap Analysis



Spring 2021

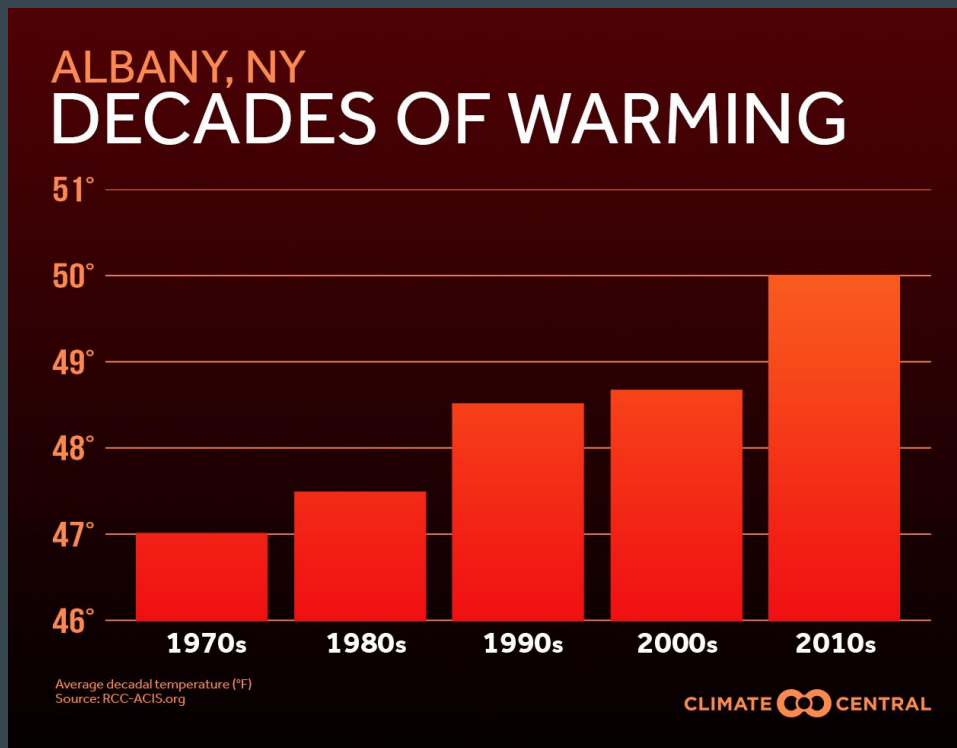
Prepared by Eli Goldstein, Howard Pollard & Ibrahim Mohamed

Bard College Center for Environmental Policy

Extreme weather events and mounting natural hazards are expected to cause, social, environmental and infrastructure damages and losses throughout the Hudson Valley.



Climate threats are affecting the Hudson Valley



Climate threats are affecting the Hudson Valley

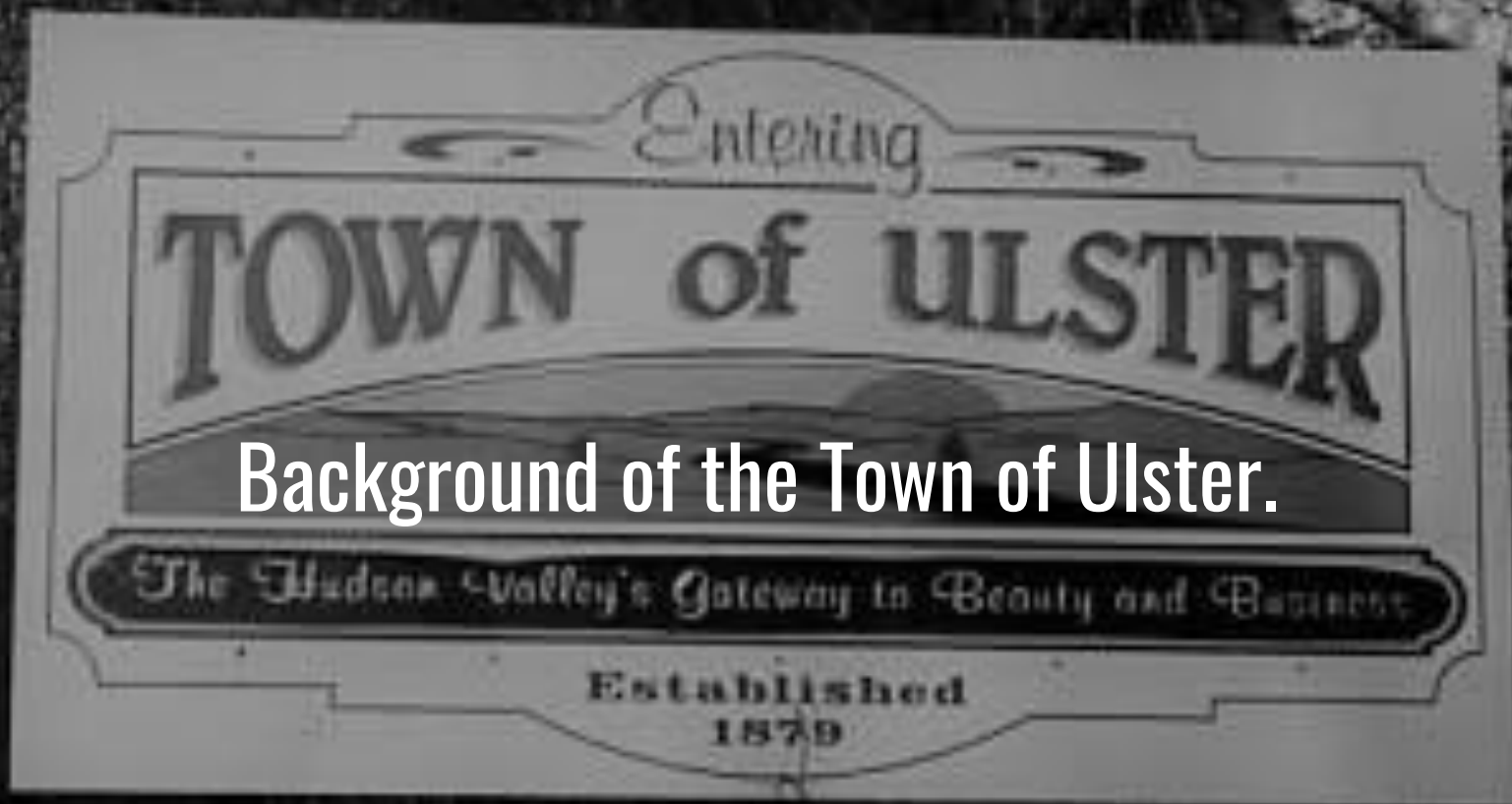


Flooding along the Lower Esopus Creek during Hurricane Irene (2011) was mitigated by the Ashokan Reservoir.



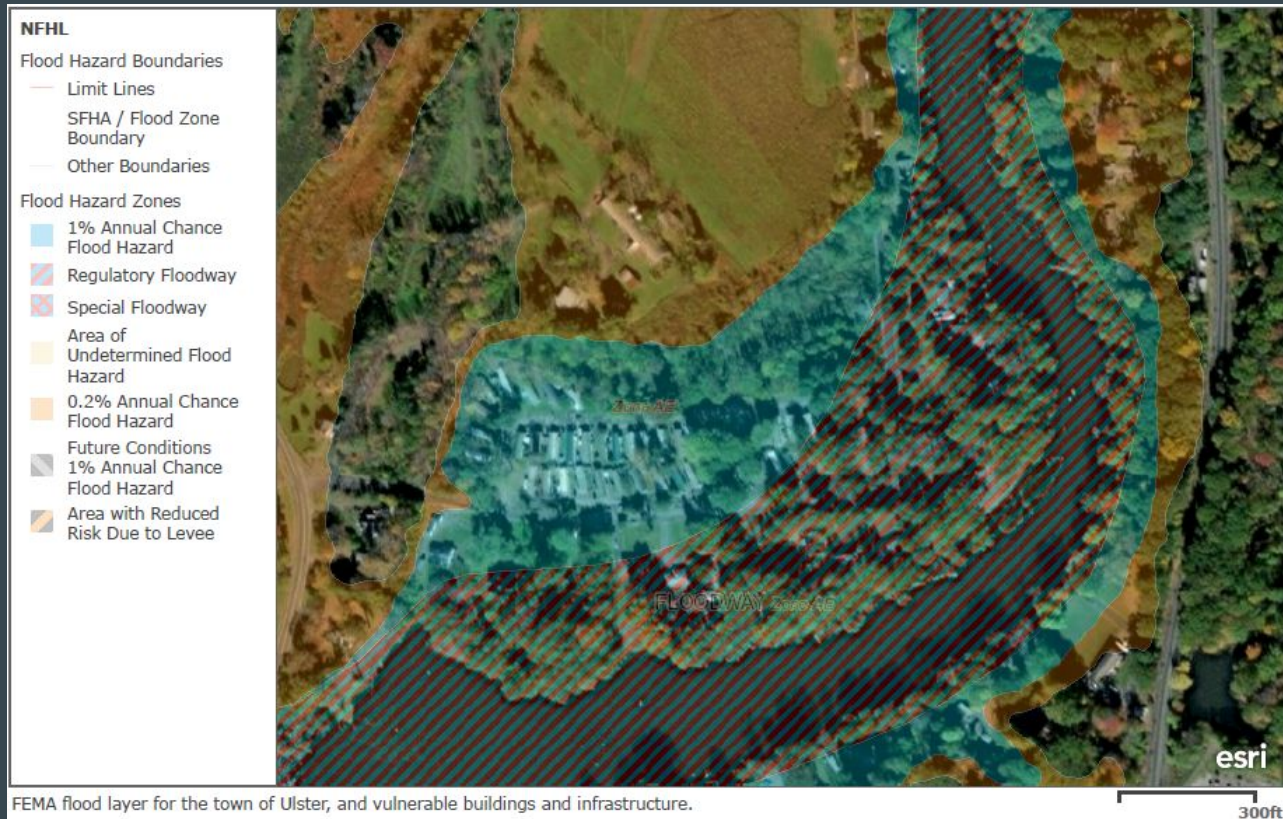
Photo Source:

<https://www.scenicHUDSON.org/explore-the-valley/outdoor-adventures/adventure/ashokan-reservoir-promenade/>



Background of the Town of Ulster.

FEMA flood maps show potential for flooding throughout the Town.



BACKGROUND

FEMA flood layer showing Esopus Creek in Lake Katrine, Ulster.

Projected assets at risk with various sea level rise scenarios and current 100-year storm in the Town of Ulster.

Potential Hudson River Flood Impacts for the Town of Ulster			
Type of Impact	24" of SLR with current 100 YR Storm	48" of SLR with current 100 YR Storm	72" of SLR with current 100 YR Storm
Infrastructure			
Total Damaged Buildings	54	62	65
Estimated Losses	\$1,346,536	\$1,912,761	\$2,454,926
Well, Dam, Bridge Damage	3	3	3
Roads (linear miles)	2	2	3
Environment			
Inundated Land Acres (acres)	185	191	200
Inundated Impervious Surface Area (acres)	5	6	7
Inundated NWI and Tidal Wetlands (Acres)	46	46	47
Social			
Social Vulnerability Index of Impacted Census	4 (Medium)	4 (Medium)	4 (Medium)
Social Vulnerability Index of Entire Municipality	5 (Medium)	5 (Medium)	5 (Medium)

The output was produced using Columbia University's Center for International Earth Science Information Network Hudson River Flood Decision Support Tool 2.0.



**We are a team of graduate students at Bard's
Center for Environmental Policy.**

This Gap Analysis provides an overview of the Town's strengths and opportunities, as well as specific recommendations and funding sources.

Key Objectives

- Define natural and climate-related hazards.
- Identify strengths and opportunities.
- Make recommendations.
- Layout potential funding sources.

The analysis is based on our work completing the Climate Smart Community Planning (CSRP) Tool for the Town.

	B	C	D	E	F	G	H	I	J
2	Yes	No	Adoption Year	Update Frequency	Link (to Town Plans)	NOTES	Potential Funding/Support	Ulster County Plans, Notes, Etc.	Link2
3	X		July 2, 2007		https://ulstercounty.ny.gov/sites/default/files/documents/ulster-comp_plan.pdf	Downloaded	NYSDEC CSC PROGRAM GRANTS	The Ulster County Planning Department is responsible for managing the County's Comprehensive Plan Document. The department has and continues to accomplish this task through the adoption of four individual Plans:	https://ulstercountyny.gov/planning/land-use
4	X		Enacted 9/3/1991	Amended 8/7/2014	https://townulster.digitallowpath.org:10023/content/Laws/View/9:field=documents/content/Document/File/2561.pdf	Downloaded		~N/A for County ~In addition to your Town/Village website, this may be searchable (by your municipality) in eCode as well.	https://www.generalcode.com/library/#NY
5	X		Enacted 8/25/1991	Amended 12/20/2012	https://townulster.digitallowpath.org:10023/content/Laws/View/10:field=documents/content/Document/File/2201.pdf	Downloaded		*See row 4 note	
6				N/A	N/A	No Plan, but see reference to In Subdivision of Land (linked above) Pg 22	NYSDEC HREP GRANTS	ULSTER COUNTY OPEN SPACE PLAN	https://ulstercountyny.gov/planning/open-space-plan
7				N/A	N/A	No Town Plan	NYSDEC HREP GRANTS	No County Plan	
8				N/A	N/A	Law downloaded, no Town Management Plan.		ULSTER COUNTY STORMWATER MANAGEMENT PROGRAM PLAN	https://ulstercountyny.gov/environment/stormwater-management
9				N/A	N/A	No Town Plan		No County Plan	
10				N/A	N/A	No Town Plan		No County Plan	
11				N/A	N/A	Not in Coastal Erosion Area		N/A for County	
12			2017 (County Plan, Town participated in)		In the "CSRP Resources" Google Drive subfolders, in "UC HazMitPlan"	County Plan / see Town participation information, project documents & list in Google Drive folder	Partner with County on 2022 update	~See the ULSTER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN ~FEMA approved / The County and 16 of its 24 jurisdictions participated. ~Refer to the Jurisdictional Annexes documents for your Town/Village, saved in the Resources subfolders	https://ulstercountyny.gov/emergency-services/hazard-mitigation/draft-plan-update
13				N/A	N/A	No Plan, see Flood Damage Prevention Law reference below		N/A for County	
14				In the Town Code, pg. 8701	https://townulster.digitallowpath.org:10023/content/Laws/View/41	Downloaded. In the Town Code, pg. 8701. This is for FEMA NFIP participating municipalities / regulates development in floodplains		N/A for County	https://www.fema.gov/floodplain-management/manage-risk/local
15				N/A	N/A	No Town Plan - see County Plan		ULSTER COUNTY EMERGENCY EVACUATION / DETOUR ROUTE ANNEX	https://ulstercountyny.gov/sites/default/files/documents/EvacuationAnnex.pdf
16				N/A	N/A	See County Plan / included in the County CSRP's Gap Analysis report	N/A	ULSTER COUNTY COMPREHENSIVE EMERGENCY MANAGEMENT PLAN (CEMP)	https://ulstercountyny.gov/emergency-services/management/plan.html
17				N/A	N/A	See County Plan / included in the County	N/A	No County Plan	

The analysis is based on our work completing the Climate Smart Community Planning (CSRP) Tool for the Town.

- Documents reviewed:
 - Town of Ulster Comprehensive Plan (2007)
 - Town of Ulster Zoning Code (1991, updated 2014)
 - Town of Ulster Subdivision of Land (1991, updated 2012)
 - Town of Ulster Flood Damage Prevention Law (2009, updated 2018)
 - Town of Ulster Stormwater Management Law
 - Town of Ulster 9W Corridor Enhancement Plan
 - Ulster County Multi-Jurisdictional Hazard Mitigation Plan (Updated 2017)
 - Jurisdictional Annex 1.2.23, Town of Ulster (Updated 2013)
 - Ulster County Comprehensive Emergency Management Plan (2014)

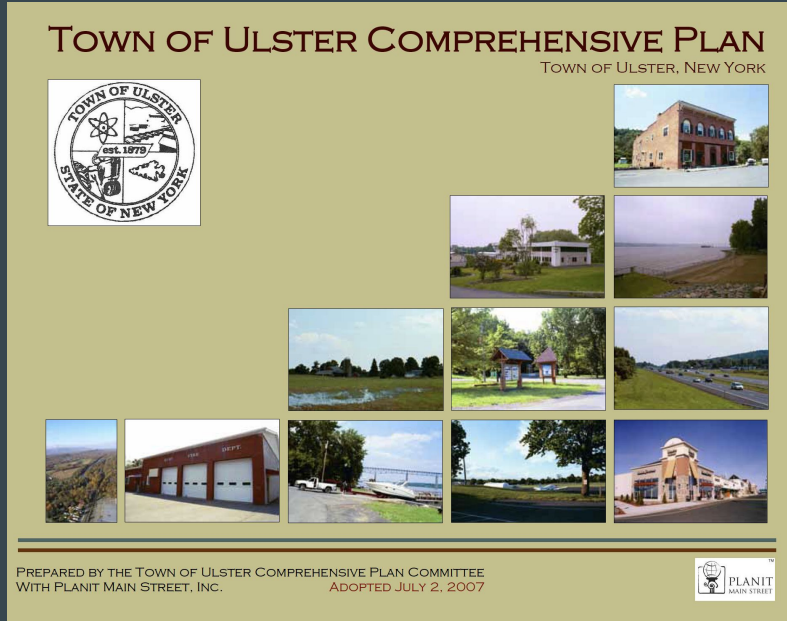
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Section 5: Disaster Preparedness and Recovery	Yes	No	Notes	References
5.1 Is the municipality recognized as a Storm Ready Community ?		x		https://www.weather.gov/stormready/
5.2 Does the community have a general emergency warning system?	x		Emergency Alert System, NOAA Weather Radio, Stationary Fire Sirens, Emergency Service Vehicles, Door-to-door	See section "E" - page 4 and 5- of the TOREmergency Plan
5.3 If the community is located along a river, does it have an early flood-warning system?	x		general emergency system is in place (5.2) but most of the community is not located along a river bank	
5.4 Are emergency responders aware of real-time ocean and estuarine observing systems and stream gauging information?		x	n/a	
5.5 Does the community relay weather related threats to the public in at least two forms of communication?	x		see notes on 5.2	(See section "E" - page 4 and 5- of the TOREmergency Plan
5.6 Does the community have an emergency response and short-term recovery plan and/or a flood response plan that includes coastal flooding?	x		yes but not a coastal community	TOREmergency Plan Appendix i of the TOREmergency Plan



Key Areas of Strength.

The Town Comprehensive Plan has multiple areas of strength.



- Protecting natural resources.
- Housing, transportation and community support.
- Land use and zoning.

The Town has multiple renewable energy and energy storage projects completed or underway.



Source: GlidePath Website

GlidePath's Lincoln Park Project



Source: Cypress Creek Renewables Website

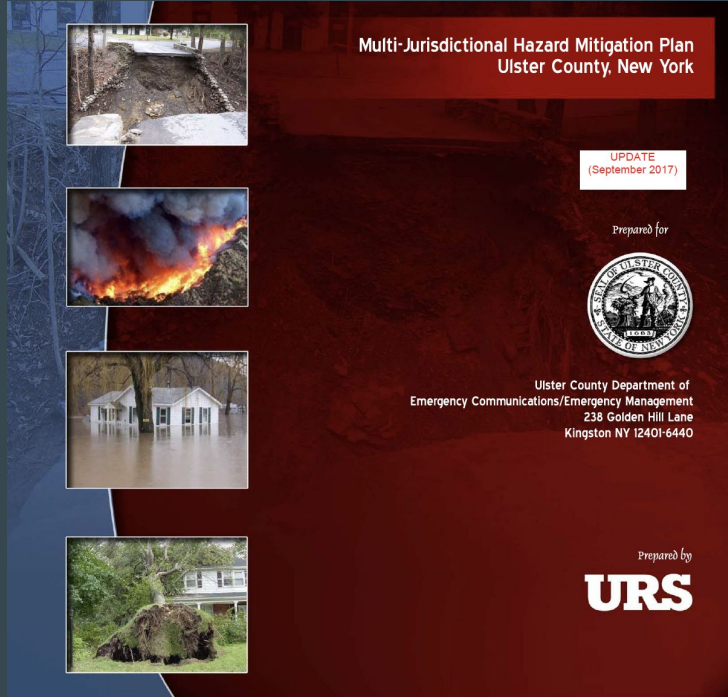
Cypress Creek Renewables/Landau Solar Farm in Eddyville

The Town has taken action to mitigate some risks from flooding.

- Flood Damage Prevention Law.
- FEMA National Flood Insurance Program (NFIP).
- FEMA training programs.
- Flood awareness signage.



Other Areas of Strength.



- Zoning Law.
- Stormwater Management Law.
- Rt. 9W Corridor Enhancement Plan.
- Participation in the **Ulster County Hazard Mitigation Plan.**
- Highway Department.



Key Areas of Opportunity

Utilize state and non-profit resources for resiliency planning.

- Join the **NY Climate Smart Communities** certification program.
- Organize a **Community Resilience Building Workshop** funded by the Nature Conservancy.



Focus on the Town Comprehensive Plan.

TOWN OF ULSTER COMPREHENSIVE PLAN

TOWN OF ULSTER, NEW YORK



PREPARED BY THE TOWN OF ULSTER COMPREHENSIVE PLAN COMMITTEE
WITH PLANIT MAIN STREET, INC. ADOPTED JULY 2, 2007



- Implement existing recommendations
- Update plan with more sustainability elements.

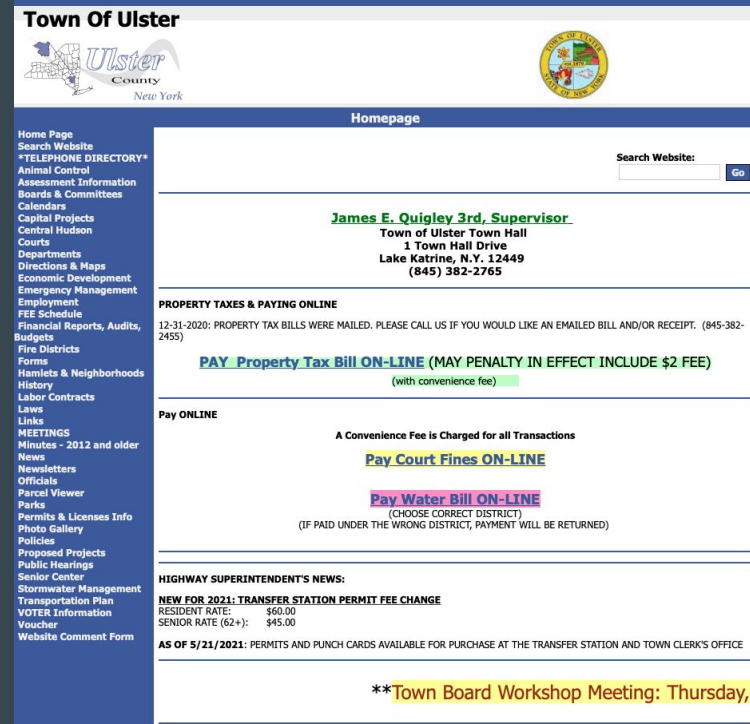
Improve floodplain resilience & expand green development.



- Retrofit and/or move public buildings.
- Plan for green development (e.g. parks, river-based recreation).

Develop strategies for public outreach & engagement.

- Update the Town Website.
- Implement a text/email messaging system.
- Install additional flood and other disaster awareness signage.



Other Key Areas of Opportunity.

- Complete a **Ulster County Multi-Jurisdictional Hazard Mitigation Plan Update** (See Jurisdictional Annex 1.2.23).
- Utilize additional **free training opportunities** for municipal staff related to floodplain and emergency management issues.
- There are a number of potential **grants and other sources of funding** for resiliency planning.



Recommendations & Sources of Funding

Participate in the NY Climate Smart Communities (CSC) Program.

- Pass a municipal resolution to become a Registered Climate Smart Community.
- Take specific actions to become a Certified Climate Smart Community.
- Access grants to fund the CSC Certification process & CSC Actions.
- Utilize resources, consulting and expertise from NY State and environmental orgs.



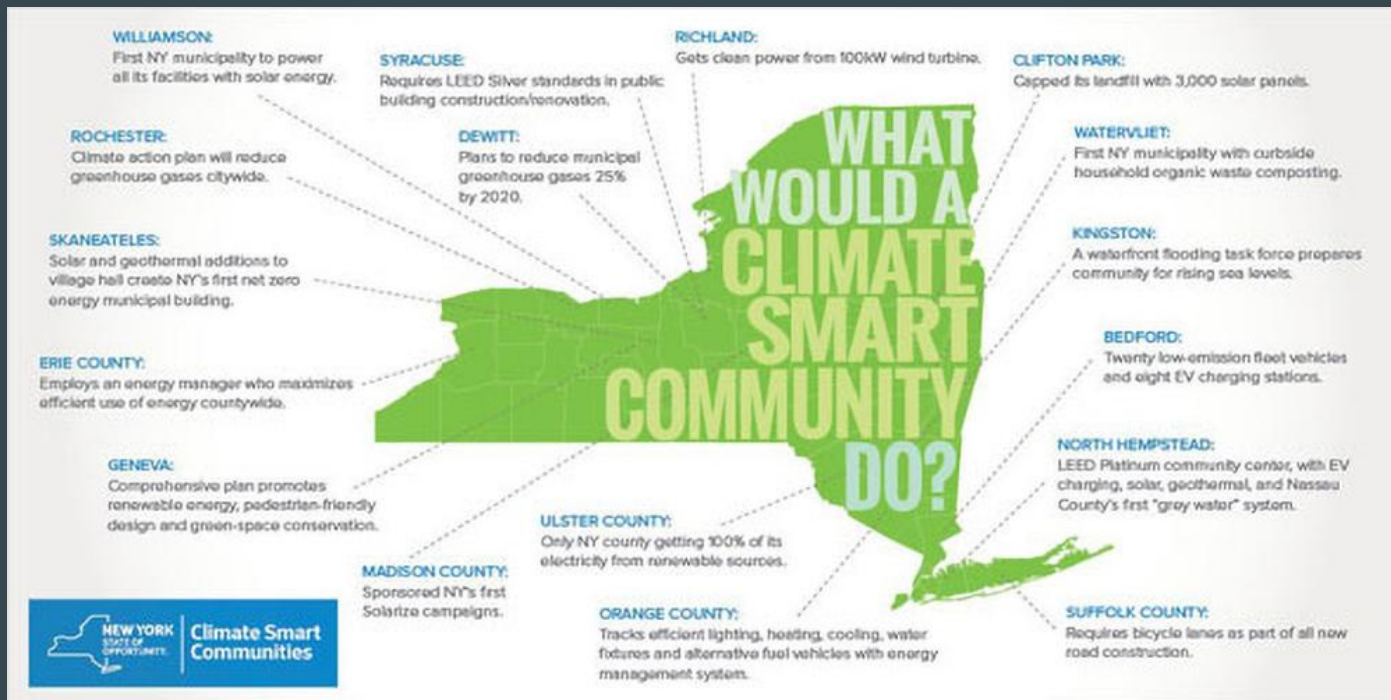
Participate in the NY Climate Smart Communities (CSC) Program.

There are numerous benefits for communities participating in the CSC Program:

- Economic development
- Community engagement
- Energy & climate resilience
- Clean air & water



Participate in the NY Climate Smart Communities (CSC) Program.



Participate in the NY Climate Smart Communities (CSC) Program.

CSC Actions are broken into different categories, such as:

- PE3: Decrease energy use.
- PE4: Shift to clean, renewable energy.
- PE5: Use climate smart materials management.
- PE6: Implement climate-smart land use.
- PE7: Enhance community resilience to climate change.
- PE8: Support a green innovation economy.
- PE9: Inform and inspire the public.

Participate in the NY Climate Smart Communities (CSC) Program.

CSC Actions associated with existing Town initiatives and priorities:

- PE3: Various actions to Decrease Energy Use
- PE6: Comprehensive Plan with Sustainability Elements
- PE6: Preserve Natural Areas Through Zoning or Other Regulation
- PE6: Develop a Local Forestry or Tree Planting Program
- PE7: Renewable Energy Feasibility Studies
- PE7: Solar Energy Installation
- PE7: Conserve Natural Areas
- PE7: Culverts and Dams
- PE7: Riparian Buffers
- PE7: Strategic Relocation
- PE7: National Flood Insurance Program Community Rating System

Participate in the NY Climate Smart Communities (CSC) Program.

CSC Actions associated with recommendations laid out in the Gap Analysis:

- PE6: Planning and Infrastructure for Bicycling and Walking
- PE6: Natural Resources Inventory
- PE8: Green Economic Development Plans
- PE8: Brownfield Clean-up and Redevelopment
- PE8: Incentives for Green Business.
- PE7: Climate Vulnerability Assessment
- PE7: Evaluate Policies for Climate Resiliency
- PE7: Watershed-based Flood Mitigation Plan
- PE7: Design Flood Elevation & Flood Maps
- PE7: Source Water Protection

Participate in the NY Climate Smart Communities (CSC) Program.

- CSC related grants include:
 - Partners For Climate Action Hudson Valley offers a Local Champions Grant to fund a Town CSC Task Force Coordinator.
 - The NYSDEC CSC Grant Program offers funding for achieving specific CSC Actions.
 - NYSERDA & NYDOS also offer funding for completing CSC Actions.
 - Applications from Climate Smart Communities earn higher scores for some NY grants.

Improve floodplain resilience & expand green development.

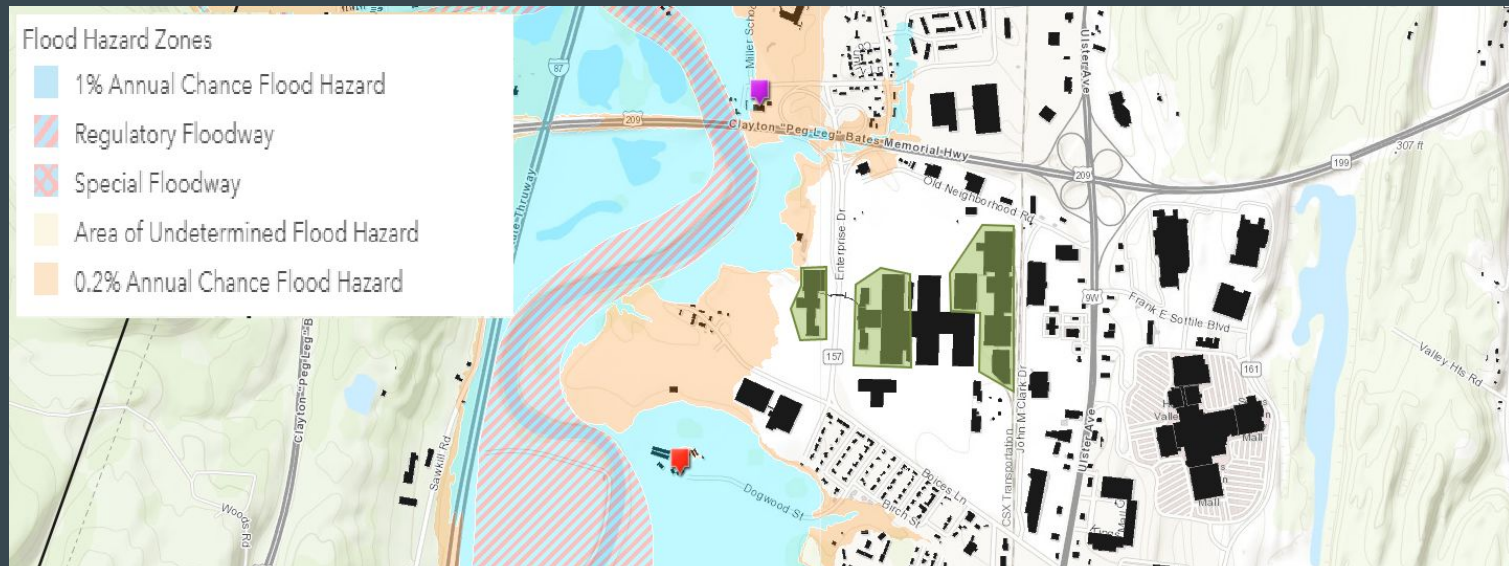
- Relocate and/or retrofit municipal buildings and roads potentially at risk for flooding.
- Plan for public green space that improves access to nature, and may also mitigate flood risks
- Plan for green economic development

Improve floodplain resilience & expand green development.

Retrofit and/or move public buildings:

- **Town hall & police station**
- **Wastewater treatment plant**

Tech City is outside the floodplain and could be a potential site relocation.



Improve floodplain resilience & expand green development.

Plan for public green space along water features like the Esopus Creek, Hudson River and Rondout Creek that can help connect people to water AND mitigate flood risks.



Map highlighting two possible park sites that can help protect a flood prone area & a photo of one of the sites.

Improve floodplain resilience & expand green development.

Establish a Green Economic Development Plan.

- **Green industries** are businesses whose goods or services benefit the environment, conserve natural resources, and/or mitigate climate change.
- Local governments can incorporate specific plans for development of green industries into their **short-term and long-term economic development plans**.

The former Tech City site offers a number of potential opportunities for attracting green business and development to the Town.



Improve floodplain resilience & expand green development.

Preserve and create open spaces, parks, green spaces and recreational areas.

- **Working with land trusts or other conservation organizations can potentially provide funding sources for these project.**
- Parts of Tech City can be converted into park space to access funding for developing the site and as an added amenity to attract business **(PE8 Action: Green Economic Development Plans).**
- The current DEC Tree Nursery site next to Esopus Creek on Buckley St. can be expanded into a park with community access to the water **(PE6 Action: Develop a Local Forestry or Tree Planting Program).**
- The flood prone area of **Rondout Creek along Creek Locks Rd.** can be developed for pedestrian access and flood mitigation **(PE6 Action: Planning Infrastructure for Bicycling and Walking).**
- The original **GlidePath site** can be protected either via zoning or by partnering with a land trust or conservation organization that could provide funding for the project.

Improve floodplain resilience & expand green development.

Update the Town Zoning Law to include more recommendations from the Town Comprehensive Plan.

- Create a Ridgeline Protection Overlay District.
- Encourage the use of retention/detention basins that are an integral part of the overall site plan or subdivision plan; and „ Identify important aquifer recharge areas and create aquifer protection overlay districts.
- Strictly enforce NYSDEC requirements for a 100-foot buffer between development and watercourses.
- Restrict the development of buildings and other impervious surfaces within the 100-year floodplain.
- Require Stormwater Pollution Prevention Plans (SWPPP) in accordance with the NYSDEC State Pollution Discharge Elimination System (SPDES) general permit for commercial/industrial developments or major subdivision applications.
- All these recommendations align with **CSC PE6 Action: Preserve Natural Areas Through Zoning or Other Regulation.**

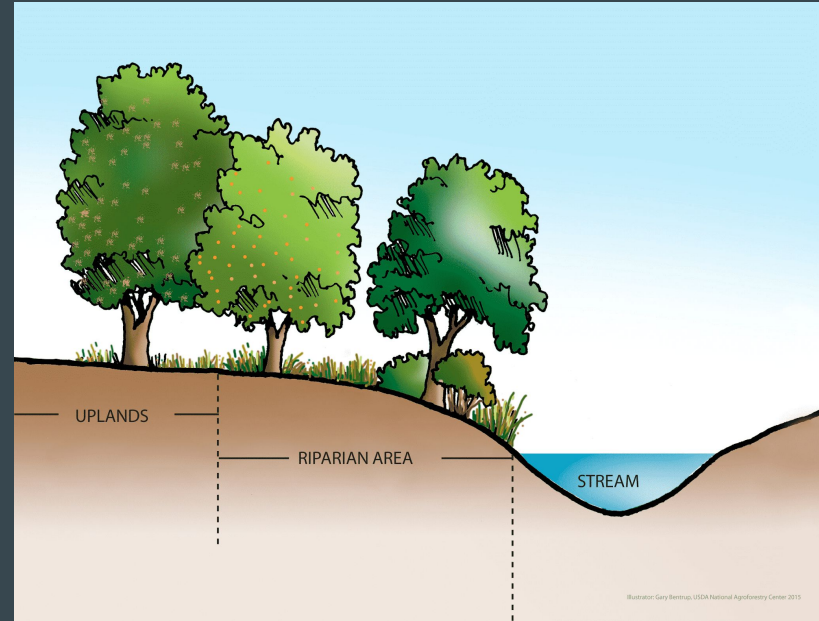
Improve floodplain resilience & expand green development.

Funding opportunities for floodplain resilience and green development.

- Hudson River Estuary Local Stewardship Planning Grant is designed to help local orgs and communities advance water projects and programs through planning, feasibility studies, and/or design.
- NY Department of State has funding available for design and implementation of a Local Waterfront Revitalization Plan.
- NOAA run website climate.gov offers a toolkit with strategies for funding municipal flood mitigation projects.
- The U.S. Climate Resilience Toolkit web page provides a list of federal grants for climate resiliency projects. Including grants from: FEMA, The Wildlife Conservation Society, EPA, USDA and non-governmental organizations.
- FEMA offers a number of potential grants for floodplain resilience, including: FEMA Hazard Mitigation Grant Program, FEMA pre-disaster Mitigation Grant Program, FEMA Flood Mitigation Assistance Program, and FEMA Building Resilient Infrastructure and Communities Program to implement floodplain resilience projects.
- There are also a number of local organizations that provide funding and resources for watershed related projects, such as: Scenic Hudson, Hudson River Watershed Alliance, Lower Esopus Watershed Alliance, Riverkeeper.

Implement existing recommendations from the Town Comprehensive Plan.

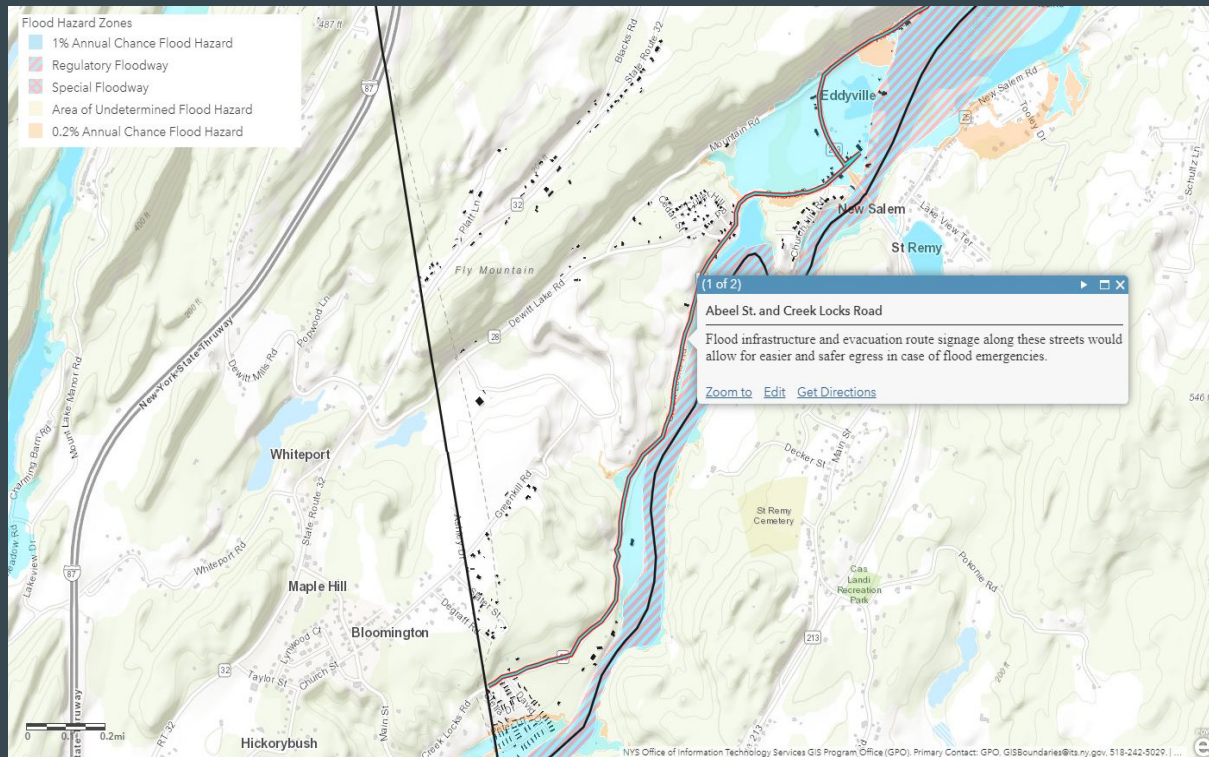
- Update Town zoning law.
- Local Waterfront Revitalization Plans (LWRP).
- Leadership in Energy and Environmental Design (LEED).
- Riparian Protection Zones.



A riparian buffer zone.
Source: natureworkspark.org

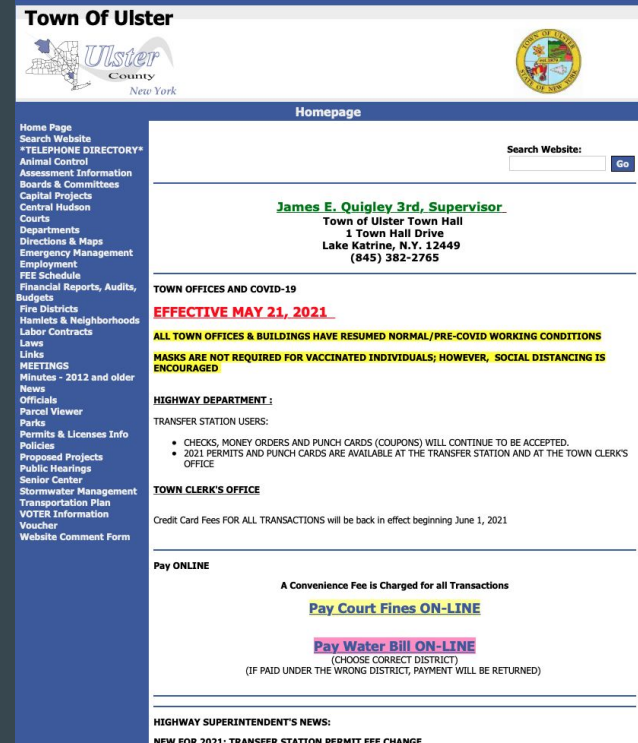
Implement existing recommendations from the Town Comprehensive Plan.

Map of potential locations for buffer zones along frequently flooded Creeks Locks Rd.



Develop strategies for public outreach & engagement.

- Update the Town website and include climate actions and resources recommended by the CSRP Tool:
 - ASPCA's disaster preparedness steps for domesticated animals.
 - FEMA's "Are You Ready" guide.
 - FEMA's Homeowner's Guide to Retrofitting.
 - Provide residents with guidance on the development of personal and family evacuation plans or what to include in emergency or evacuation kits (FEMA's Ready.gov checklist).
- Implement a text / emailing messaging systems.
- Inform the public of the NY-Alert Program and how to sign up.



Update the Town Comprehensive Plan to include more sustainability elements.

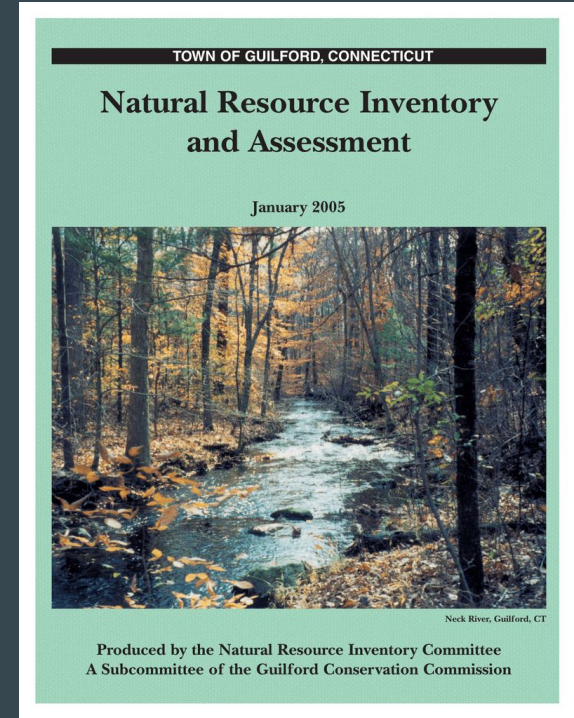


Image from the Town 9W Enhancement Plan

- Support alternative modes of transportation.
- Designate open space and protect it from development.
- Foster green economic development.
- Support energy efficiency and renewable energy production.
- Protect drinking water sources from pollution.

Assess vulnerability & risks while planning for disaster & recovery.

- Establish a localized hazard risk and vulnerability assessment.
- Create a Natural Resource Inventory.
- Flood proof critical infrastructure.
- Create a formal town evacuation plan & install additional hazard and evacuation signage.
- Design flood elevation & flood maps
- Perform maintenance on Town culverts and dams.



Engage in free training programs for town officials & employees.

- FEMA Emergency Management Institute
 - Training on the Community Rating System and Advanced Floodplain Management.
- FEMA Community Emergency Response Team (CERT)
 - Training first responders in disaster preparedness.
- FEMA also offers training programs for retrofitting flood-prone residential buildings and the Coastal Construction Manual
- NYSDEC offers Post Flood Stream Intervention Training.



**We hope these findings help support the Town of Ulster's path
to becoming a more resilient community.**



Thank you for your time and attention.