Appendix
Columbia County
CARP

Contents

Appendix A
Columbia County CARP

History of Extreme Events
Columbia County, NY

Table 1: Severe Storms in Columbia County, 2000-2015

Date	Location and Extent	Impact	Estimated Loss
20 April 2015	Windstorm in towns of Chatham, Canaan, New Lebanon, Ancram, Hillsdale, and Copake	Downed trees and powerlines	Columbia County: $10,000
26 August 2011	Severe storm (Hurricane Irene) caused countywide flooding	Impassable roads; roads, culverts, and bridge damage; flooding and debris. Erosion under Mountain and Weed Mine Roads (Town of Ancram), bridge and culvert washout on Near Road (Town of Gallatin)	Columbia County: $2,523,411.91
7 December 2008	Lightning storm in the Town of Livingston	Lightning strike caused damage from flying debris to nearby homes and cars	Livingston: $15,000
16 June 2007	Hailstorm in the Village of Kinderhook	Primary damage to tree fruits, berries, and vegetable crops	Kinderhook: $5,000,000
29 June 2007	Severe storm flooded the Towns of Ancram and Gallatin	Erosion and washouts on numerous roads. Erosion on Altenburg, Chase, Cottontail, Doodletown, Niver, Poole Hill, Rothvoss, Shepard, Skyline, Winchell Mountain, Westfall, Finkle and Dam roads (Town of Ancram)	Ancram: $30,100 Losses to Gallatin were not estimated
15 April 2007	Severe storm flooded Kinderhook	Unspecified impacts	Kinderhook: $2,000,000
2 April 2005	Severe storm flooded the Towns of Gallatin and Stuyvesant	Road erosion and debris removal	Stuyvesant: $51,308 Losses to Gallatin were not estimated

30 August 2004	Flooding and flash flooding	Erosion and flooding	Columbia County: $280,000
23 July 2002	Thunder and windstorm in the Town of Hillsdale	Downed trees and wires. Tree fell on a car	Hillsdale: $15,000
5 June 2002	Thunder and windstorm in the Village of Kinderhook	Downed trees and power lines	Kinderhook: $11,000
31 May 2002	Thunder and windstorms in the Town of Claverack	Downed telephone poles, wires, and tree limbs	Claverack: $12,000
30 June 2001	Hailstorm in the Town of Stockport	Two-inch hail and wind damage	Stockport: $20,000
3 June 2001	Thunder and windstorm in the Town of Clermont	High winds destroyed a 4,200 square foot shed and ripped roofs off of two barns.	Clermont: $100,000
28 May 2001	Hailstorm in the Town of Stockport	Unspecified impacts	Stockport: $11,000
9 August 2000	Thunder and windstorm in the Town of Gallatin	Unspecified impacts	Gallatin: $22,000
3 August 2000	Lightening in the Town of Kinderhook	Lightning struck a tree and set nearby structures on fire	Kinderhook: $40,000
25 June 2000	Thunderstorm in the Town of Livingston	Fallen trees and power outages	Livingston: $24,000
2 June 2000	Thunder and hailstorms In the Towns of Livingston and New Lebanon	A large number of trees were snapped or uprooted, four downed utility poles, roof peeled off one house, chimney destroyed, damage to fruit crops, and power outages	Livingston: $1,185,000 New Lebanon: $24,000
15 May 2000	Thunder and windstorm in the Towns of Austerlitz, Claverack, Gallatin, Livingston, and Taghkanic	Unspecified impacts	Austerlitz: $25,000 Claverack: $21,000 Gallatin: $95,000 Livingston: $20,000 Taghkanic: $15,000

Adopted from the Columbia County Multi-Jurisdictional Hazard Mitigation Plan (2018)-Appendix F

Table 2: Severe Winter Storms in Columbia County, NY

Date	Location and Extent	Impact	Estimated Loss
13 April 2011	Ice storm in the Town of Ancram and Gallatin	Downed trees and utility wires on roadways	Ancram: $15,107 *Losses to Gallatin were not estimated*
5 February 2011	Severe winter storm in the Town of Hillsdale	Roads impassable	Hillsdale: $22,000
26-27 December 2010	Severe winter storm in the Towns of Hillsdale, Stuyvesant, and Livingston	Road closures, snow removal, and power outages for two days	Hillsdale: $50,630.57 Stuyvesant: $17,727 Livingston: $60,000
16 February 2010	Severe winter storm in the Town of Hillsdale	Roads impassable	Hillsdale: $23,000
25 December 2009	Severe winter storm in the Town of Hillsdale	Roads impassable	Hillsdale: $17,000
11-31 December 2008	Snowstorm in the Towns of Ancram, Livingston, and Gallatin	Downed trees and utility wires on roadways caused power outages	Ancram: $25,250 Livingston: $72,166 *Losses to Gallatin were not estimated*
February 2008	Severe winter and ice storms in the Town of Hillsdale	Washed out and impassable roads	Hillsdale: $154,300
January 2008	Severe winter storms in the Town of Hillsdale	Roads impassable	Hillsdale: $39,000
24 December 2002	Snowstorm in the Town of Stuyvesant	Snow removal	Stuyvesant: $15,594

Adopted from the Columbia County Multi-Jurisdictional Hazard Mitigation Plan (2018)-Appendix F

Table 3: Tornados in Columbia County, 1990 – Current

Date	Location and Extent	Impact	Estimated Cost
17 November 2010	F1 tornado confirmed in Town of Ghent	Intermittent damage along 2 miles, including downed trees and damage to shingles and siding	unknown
21 July 2003	F2 tornado with two touchdowns confirmed in the Town of Kinderhook, the Newtown Hook section in the Town of Stuyvesant and the Town of Niverville	A barn, garage, and hay wagons were destroyed, cars were displaced, and roofs, trees, and utility lines were damaged. One resident was injured.	Kinderhook: $370,000 Stuyvesant: $10,000
3 July 1997	F1 and F2 tornado in the Town of Canaan and Copake Falls	Extensive damage to several residences between Beebe Pond and Berkshire County, Massachusetts.	Canaan: $720,000 Copake Falls: $60,000
29 May 1995	Tornado of unknown magnitude in the City of Hudson	Five injuries	Hudson: $10,000,000

Adopted from the Columbia County Multi-Jurisdictional Hazard Mitigation Plan (2018)-Appendix F

Table 4: Flooding Events in Columbia County, 2000-2015.

Date	Location and Extent	Impact	Estimated Loss
30 September 2015	Countywide flooding	Widespread heavy rain inundated roadways, and caused localized evacuations	Columbia County: Unknown
28 August 2011	Hurricane Irene caused countywide flooding	Heavy rains associated with Hurricane Irene resulted in widespread flooding, major transportation routes closed for approximately 1 month due to washouts and flooding	Columbia County: $2,523,411.91
29 July 2009	Flash flooding in the Town of Stuyvesant	Flash flooding over Kinderhook Creek, numerous roadways closed. Novak Road in Kinderhook and Reed Road in Ghent were washed out. Campers were stranded by high water.	Stuyvesant: $4,500,000
11 August 2008	Flooding in the Town of Chatham	Several roadways closed due to flooding	Chatham: $45,000
1 June 2007	Flooding in the Town of Ancram	Road erosion on Hall Hill Road	Ancram: $44,705
April 2007	Flooding in the Town of Stuyvesant	Debris and road damage	Stuyvesant: $50,040
15 April 2007	Flooding in the Village of Kinderhook	Widespread flooding of small streams led to numerous road closures, private basement flooding.	Kinderhook: $2,000,000
1 June 2006	Flooding in the Town of Canaan, Flat Brook	Roads washed out and fallen trees	Canaan: $24,000
2 April 2005	Flooding in western Columbia County	Claverack Creek overflowed banks,	Western Columbia County: $240,989

		road erosion on Dam Road in the Town of Ancram.	Ancram: $17,011
29 March 2005	Flooding in western Columbia County	Road closures due to flooding, private basement flooding	Western Columbia County: $100,000
30 August 2004	Flooding in the Town of Canaan	Washed out roads and fallen trees west of County Route 5 and portions of SR-295.	Canaan: $280,000
11 August 2003	Flash flooding in the Town of Ghent	Route 66 and Slateville Road flooded; the intersection of Route 9G and Merino Road flooded and closed for an extended period of time; and private basement flooding	Ghent: $20,000
27 May 2002	Flooding in the Town of Canaan, Flat brook	Roads washed out, fallen trees, and six injuries	Canaan: $78,800
30 March 2001	Flooding in the Town of Claverack	Rain and snow produced rapid runoff from the Claverack Creek flooding Webb Road	Claverack: $15,00
17 December 2000	Countywide flooding	Flooding throughout the region and local states of emergency declared in the Towns of Germantown and Canaan	Columbia County: $100,000
15 July 2000	Countywide flooding	Multiple streams overflowed causing wide-spread road and bridge closures. Residents became trapped by swift water. Flood waters damaged an animal hospital in Kinderhook as well as	Columbia County: $1,500,000

		houses, cars, and farms in Ghent and Austerlitz. In Chatham, flood waters washed away a commercial building and farm foundation and destroyed 5.5 miles of roadways. Four roads were washed out in Hillsdale	
6 June 2000	Countywide flooding	Route 9G, Spook Rock Road, County Route 7, Webb Road, Pine Wood, Lockwood Road, and many low-lying regions flooded	Columbia County: $75,000
2 June 2000	Flash flooding in the Town of New Lebanon	Unspecified flood damage	New Lebanon: $18,000

Adopted from the Columbia County Multi-Jurisdictional Hazard Mitigation Plan (2018)-Appendix F

Appendix A
Columbia County CARP

Leadership, Outreach and Process Questionnaire

COLUMBIA COUNTY CLIMATE ADAPTATION AND RESILIENCE PLAN (CARP)

Local Leadership, Outreach and Process Questionnaire Summary for the Town/Village/City of

Prepared by Cornell Cooperative Extensions

This questionnaire summary will be used to form the working organizational structure as well as the community outreach and engagement strategy for the Climate Adaptation and Resilience Plan. It is intended to establish the leadership team and identify the key stakeholder group that will be involved in the process. The leadership team will work with CCE facilitators and will be responsible for coordinating the planning process. This summary will serve to document identified stakeholders' contact information and facilitate direct outreach to these participants. Additionally, this summary will help to inform the analysis of existing plans and methods to be used for input gathering.

Town /Village/City of

1. SURVEY TAKERS INFORMATION

Name	
Email	
Phone	
Role in Municipality	

2. LEADERSHIP TEAM

The leadership team will provide the organizational structure to help coordinate and refine the planning process. This team includes people that will be involved in all steps of the plan development, be a point of contact for CCE, liaison with municipality and stakeholders, and help coordinate and do outreach for workshops and surveys.

Name	**Email**	**Phone**	**Role in Municipality**
1.			
2.			
3.			
4.			
5.			
6.			

3. MUNICIPAL STAFF STAKEHOLDER GROUP (fire, police, transportation, etc)

The municipal staff stakeholder group includes people that will be involved in the analysis of plans and policies (a 2-hour municipal meeting and follow-up communications), two workshops, a plan review, and/or developing implementation strategies.

Stakeholder Group	**Name**	**Email**	**Phone**	**Title**	**Plan Involvement**
Emergency Services/EMT/Ambulance					
Highway Department/Public Works					
Fire Department					
Police Department					
Code Enforcement Officer					

4. MUNICIPAL BOARDS/COMMITTEES STAKEHOLDER GROUP

The municipal boards/committees stakeholder group includes people that will be involved in the analysis of plans and policies (a 2-hour municipal meeting and follow-up communications), two workshops, a plan review, and/or developing implementation strategies. s

Name	**Email**	**Phone**	**Name of Board or Committee**	**Title**	**Plan Involvement**
1.					
2.					
3.					
4.					

5. COMMUNITY STAKEHOLDER GROUP

The community stakeholder group includes a diverse set of people from a broad cross section of your community. They could include business leaders, school/library representatives, minority leaders, impacted neighborhood representatives, farmer representatives, etc. This is a group of stakeholders that may participate in workshops and will receive direct outreach regarding development of the plan.

Name	**Email**	**Phone**	**Role in Community**
1.			
2.			
3.			

****Additional Information:**

6. LOCAL PLAN KNOWLEDGE

Each municipality will be assigned a CCE team member who will analyze the plans and begin filling out the climate smart resiliency planning tool used to identify strengths and gaps. The leadership team and knowledgeable municipal representatives will then meet with CCE to provide the local input needed to complete the tool.

Plan Name	**Aware of Having this Plan**	**Local or County Plan**	**Link**	**Notes**
1. Municipal Master Plan				
2. Zoning Ordinance				
3. Subdivision Ordinance				
4. Open Space Plan				
5. Natural Resources				

Conservation Plan/Inventory				
6. Stormwater Management Plan				
7. Coastal Plan or Element in Other Plan				
8. Shoreline Restoration Plan				
9. Floodplain Management Plan				
10. Flood Damage Prevention Ordinance				
11. Evacuation Plan				
12. Emergency Response & Short-term Recovery Plan				
13. Continuity of Operations Plan				
14. Disaster Recovery Plan				
15. Long-term Recovery Plan				
16. Economic Development Plan/Strategy				
17. Capital Improvements Plan				
18. Metropolitan Transportation Plan				
19. Historic Preservation Plan				
20. Local Waterfront Revitalization Plan				
21. Climate Action Plan				

****Additional Information:**

7. DISTRIBUTION METHOD IDEAS FOR UPCOMING PUBLIC SURVEYS

The CARP process will involve the distribution of two public surveys. The Story of Place & Vulnerability Survey (#1) will be to gather information about local conditions, story of place and vulnerability. It will be launched following a Public Educational Webinar. This webinar is intended to announce and describe the climate adaptation planning process. This presentation will include climate change effects and impacts as well as socioeconomic and ecosystem data/maps for Columbia County localities. The Adaptation Strategies & Community Vision Survey (#2) will be to prioritize adaptation strategies and resilience visions. It will be deployed following the two Vulnerability Assessment and Scenario Planning Workshops.

The CCE team will support the creation and development of the surveys along with the collection and analysis of results. However, distribution of the surveys using approaches listed in the next section will be the responsibility of each municipality.

Type of Distribution	**Coordinated and Completed by Municipality**	**Notes on Approach Specifics**
1. Paper Survey		
2. Events		
3. Direct Canvasing		
4. Website		
5. Social Media		
6. Email		
7. Public Meetings		
8. Over the Phone		
9. App / QR code		
10. Mail		

****Additional Information:**

Appendix A
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Climate Smart Resilient Policy Analysis
Report

Town of Austerlitz
Climate-Smart Resiliency Planning

Prepared by Lindsey Strehlau-Howay, Cornell Cooperative Extension Columbia-Greene County

Climate Smart Resiliency Planning Tool is a checklist to identify gaps in a community's planning process.

Cornell Cooperative Extension (CCE) evaluated opportunities for the Town of Austerlitz to improve its community's resilience to climate change with the Climate Smart Resiliency Planning Tool (CSRPT or Planning Tool). The Planning Tool reviews many long-term and short-term aspects of climate change and storm preparedness by reviewing Town and County planning documents, activities, and management. CCE staff reviewed the Town of Austerlitz and Columbia County planning documents and consulted municipal staff members to complete the Planning Tool and develop recommendations based on the Planning Tool results. There was ongoing communication with the Town and Town's Climate Smart Communities Task Force throughout the project. The recommendations for opportunities to improve Austerlitz's resilience to climate change and climate disasters will be outlined in the finalized CARP report.

Municipal staff engaged in the Town of Austerlitz Climate-Smart Planning assessment:

Kathryn Beilke, Coordinator CSC Task Force
James Oates, CSC Task Force
Jere Wrightsman, Town Board, Head of CSC Task Force
Johnathon Miller, CSC Task Force
Peter Fitzpatrick, Highway Superintendent
Chris Schober, Town board, CSC Task Force
David Harrison, Director of Emergency Management for Columbia County, Spencertown and Austerlitz Fire, Comprehensive Plan Committee

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The completed assessment and recommendations highlight areas of opportunity for the Town of Austerlitz to integrate storm and climate change preparedness into its municipal operations and planning.

Areas of Strength

- The Town has adopted the New York State Climate Smart Communities Pledge and received a bronze certification as a NYS Climate Smart Communities Program in 2023 by increasing their resiliency to climate change.
- The Town of Austerlitz has adopted the FEMA-approved Columbia County Multi-Jurisdictional Hazard Mitigation Plan (2018), which:
    - Successfully identifies and prioritizes climate hazards.
    - Describes the damage and cost of previous storms and disasters, past mitigation efforts, and estimates future financial losses that may result from flooding.
    - Includes municipal maps that indicate local hazard risks and identify critical facilities and infrastructure.
    - Includes adaptation strategies that have been evaluated and prioritized by cost, feasibility, timing, and efficacy.
- The Town is making great progress in creating an updated Comprehensive Plan. This new plan will be adopted in 2024 and includes climate and flood resiliency measures through land-use planning and development planning. **CSC PE6 Action: Comprehensive Plan with Sustainability Elements (3-21 pts).**
- Austerlitz created a government Climate Action Plan in 2023. The Town of Austerlitz's municipal Climate Action Plan (CAP) is a strategy document that sets goals and outlines a set of initiatives that reduce greenhouse gas (GHG) emissions resulting from government operations. **CSC PE2 Action: Government Operations Climate Action Plans (12-16 pts)** or **Community Climate Action Plan (16 pts).**
- The Town has created a Road Stream Crossing Management Plan that assessed road-stream crossings (culverts and bridges) to identify barriers to fish and wildlife passage and flood risks. The plan is designed to improve community and ecosystem resiliency by identifying high priority replacement projects that reconnect habitat and improve community flood resiliency and road infrastructure conditions. **CSC PE7 Action: Culverts and Dams (6 pts).**

Areas of Opportunity

- The Town of Austerlitz could continue the path to a silver certification with the Climate Smart Community Program by utilizing:
    - The Town can leverage completion of the Climate Smart Resiliency Planning Tool for points toward Climate Smart Communities (CSC) certification under **CSC PE7 Action: Evaluate Policies for Climate Resilience (6 pts).** For more information on

the Climate Smart Communities Program and the actions listed in this document, visit the Climate Smart Communities portal.[1]
    - The Town can leverage completion of the Climate Adaptation and Resilience Plan for points toward Climate Smart Communities (CSC) certification under **CSC PE7 Action: Climate Adaptation Plan (3-15pts).**
    - **PE7 Action: Climate Vulnerability Assessment (4-16 pts)** as part of the climate adaptation planning process.
    - **PE2 Action: Government Operations Climate Action Plan (12-16pts)** for the Climate Action Plan the Town recently completed and adopted in 2023.
- The Town could seek out training opportunities for municipal staff related to emergency management issues, such as the FEMA Emergency Management Institute and similar training available at the National Emergency Training Center.
- The Town website can be utilized in preparation for climate-related emergencies:
    - o Storm-preparedness and alerts
    - o Locations of emergency operations centers and storm and cooling shelters
    - o Emergency and evacuation kits and supply lists
    - o Expected inundation areas
    - o Inform people of the NY-Alert Program
- The Town of Austerlitz can create officially designated operations, cooling and heating centers. They currently have temporary locations in place but could utilize **PE7 Action: Cooling Centers (1-9 pts)** to create permanent centers. The Town can consider registering cooling centers on the NYS Department of Health's Cooling Center Finder Map.
- The Town of Austerlitz could consider developing a Natural Resources Inventory **CSC PE6 Action: Natural Resources Inventory (8-10 pts)**. This could be a useful tool for the Town to create an open space plan that incorporates climate resiliency measures. This plan could coordinate with the New York State Open Space Plan[2] **PE7 Action: Conservation of Natural Habitats (4-16 pts)**.
- The Town could participate in The Nature Conservancy Community Resilience Building Workshop[3], which helps community participants identify hazards, challenges, strengths, and priority actions for community resilience.
- The Town could seek out training opportunities for municipal staff related to emergency management issues, such as the FEMA Emergency Management Institute and similar training available at the National Emergency Training Center campus.

[1] Climate Smart Communities Portal: https://climatesmart.ny.gov/
[2] New York State Open Space Plan: https://dec.ny.gov/nature/open-space
[3] The Nature Conservancy Community Resilience Building Workshop Resilience | Community Resilience Building | United States

Recommendations

The following opportunities emerged under each of the sections of the Climate Smart Planning assessment:

Section 1- Plan Checklist

- The Town does not have an Evacuation Plan, Disaster Recovery Plan, or Long-term Recovery Plan. Consider encompassing Evacuation and Recovery Plans into an Emergency Preparedness Plan.

Section 2- Vulnerability and Risk Assessment

- Train municipal employees in risk mapping tools such as lake and overland surges, shoreline change analysis, cumulative risk assessments, HAZUS-MH, etc.
- Conduct a Build-Out Analysis, which could be carried out using zoning codes and compared to the extent of storm surge and sea-level rise scenarios.
- Conduct a full vulnerability assessment **CSC PE7 Action: Climate Vulnerability Assessment (4-16 pts)** detailing the magnitude of consequences associated with current and future climate hazards.
    - Include how these events will affect internal operations, people, public health, the environment, the economy, and capital and operating costs.
    - Consider using the Department of the State's Asset Inventory Worksheet and Risk Assessment Tool[4]. Ensure that vulnerability and risk assessments are shared with all relevant town officials and emergency managers.
- Adopt the projections of sea-level rise from the State Sea Level Rise Task Force report[5] or more recent studies for planning purposes.

Section 3- Public Outreach and Engagement

- Develop a Flood Preparedness Guide for Residents and Businesses in partnership with Cornell Cooperative Extension that provides information about expected inundation areas, evacuation routes, location of shelters, and location of pet shelters before the threat of a storm**.**
- Inform residents about available disaster resources through Town website links, television, radio, social media, etc. **CSC PE9 Action: Social Media (3pts)**. Additional resources to share with residents could include:
    - ASPCA's disaster preparedness steps for domesticated animals[6]
    - FEMA's "Are You Ready" guide[7]

[4] Department of the State's Asset Inventory Worksheet and Risk Assessment Tool: https://stormrecovery.ny.gov/community-regions/hudson-valley-and-westchester
[5] State Sea Level Rise Task Force report: Sea Level Rise Task Force Final Report (ny.gov)
[6] ASPCA's Disaster Preparedness for Domesticated Animals: Disaster Preparedness | ASPCA
[7] FEMA's "Are You Ready" Guide: https://www.fema.gov/media-library/assets/documents/7877

    - FEMA's Homeowner's Guide to Retrofitting[8]
    - Columbia County Department of Health's webpage on preparing for emergencies[9].
- 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).
- Consider installing high water mark signs at public locations.
- Take steps to ensure that information is shared using multilingual and culturally sensitive approaches.

Section 4- Integration of Municipal Plans

- The State of New York has regulations to protect wetlands that are 12.4 acres or larger. Consider going beyond the Land Conservation Overlay regulations and adopting an ordinance to protect wetlands that are less than 12.4 acres, with a minimum buffer of 100 feet. Look to Section 2.1 Wetland Protection of the New York State Department of State Model Local Laws to Increase Resilience[10] document for more guidance.
- Consider adopting the International Building Code or American Society of Civil Engineers (ASCE) standards that promote flood-resistant buildings.
- Ensure that the Town budgets include adequate funds for costs related to adapting infrastructure for greater flood and projected sea-level rise resiliency. Incorporating adaptation consideration into an asset management or capital improvement plan is an ideal method to build resiliency into routine maintenance and upgrades. **CSC PE8 Action: Green Economic Development Plans (4 pts).**
- Create floodplain management and stormwater management plans in addition to the local ordinances that are already in place.
- Define a plan for transportation and other needs of vulnerable populations (elderly, special needs, disabled, etc.) in event of an emergency.

[8] FEMA's Homeowner's Guide to Retrofitting: FEMA P-312, Homeowners Guide to Retrofitting – Six Ways to Protect Your Home from Floods, 3rd Edition | Building America Solution Center (pnnl.gov)
[9] Columbia County Department of Health Preparing for Emergencies: Prepare for Emergencies - Columbia County Department of Health (columbiacountynyhealth.com)
[10] New York State Department of State Model Local Laws to Increase Resilience: Model Local Laws to Increase Resilience | Department of State (ny.gov)

Section 5- Disaster Preparedness and Recovery

- Consider participating in the National Weather Service Storm Ready Community[11] program which helps communities take a proactive approach to prepare for extreme weather and natural disasters.
- Take advantage of programs like NY-Alert[12] and FEMA's Community Emergency Response Team (CERT)[13] training to better prepare for disasters.
- Encourage vulnerable residents to register on the Special Needs Registry for Columbia County.[14]
- Establish an evacuation plan that identifies a timeframe, multiple evacuation routes, and portions of the community with special circumstances or needs (schools, nursing homes, shelters, and those without personal transportation).

Section 6- Hazard Mitigation Implementation

- Engage in shoreline, wetland, or riparian buffer restoration and protection by encouraging sustainable enhanced methods of shoreline protection encouraged through incentives or regulation. **CSC PE7 Floodplain Restoration (1-10 pts)** or **PE7 Action: Nature-based Shoreline Protection.**
- Take part in FEMA's Community Rating System[15] **PE7 Action: National Flood Insurance Program Community Rating System (3-9 pts).**
- Provide training in retrofitting flood-prone residential buildings and NYDEC Post Flood Stream Intervention training for appropriate staff[16].
- Consider utilizing tools such as transfer/purchase of development rights, rolling easement, or buyouts of vulnerable properties to manage development in hazard prone areas.
- Support land-acquisition programs to purchase land conservation easements in hazard-prone areas. **CSC PE7 Action: Restoration of Floodplains and Riparian Buffers (2 pts)**.

Potential Funding Sources

- DEC Climate Smart Communities Grant Program
- DEC Grant Applications
- DEC Hudson River Estuary Program Grants
- FEMA Hazard Mitigation Grant Program
- FEMA Building Resilient Infrastructure and Communities Program

[11] National Weather Service Storm Ready Community: StormReady (weather.gov)
[12] NY-Alert: NY Alert | NY Alert
[13] FEMA's Community Emergency Response Team (CERT): Community Emergency Response Team (CERT) | FEMA.gov
[14] Special Needs Registry for Columbia County Residents: Special Needs Registry - Columbia County Department of Health (columbiacountynyhealth.com)
[15] FEMA's Community Rating System: Community Rating System | FEMA.gov
[16] NYDEC Post Flood Stream Intervention Training: Post-Flood Emergency Stream Intervention Trainings - NYDEC

- FEMA Flood Mitigation Assistance Grant Program
- HUD Community Development Block Grants
- NYS Department of State Grants (including Local Waterfront Revitalization Program)
- NYS Local Waterfront Revitalization Program (LWRP)

Contact Us

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Appendix A
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Vulnerability Assessment and Story of Place
Public Survey

Columbia County and 17 of its municipalities are creating Climate Change Adaptation and Resilience Plans

These plans will establish a vision and set of strategies to improve your community's resilience to climate change based on its vulnerabilities. Please tell us how your community might be at risk due to extreme weather and climate hazards and what you value about your community.

❑ **Which town/village/city do you live in? _____**

Climate Change Impacts

Please indicate how threatening each potential climate hazard might be to your community.

Climate Hazard	Very Threatening	Somewhat Threatening	Not Very Threatening	Not a Threat
Increased flooding				
Sea-level rise				
Increased extreme heat				
Increased drought				
Increase in severe storms				
Increase in winter storms				
Increase of wildfires				
Increased windstorms				
Increase in heavy precipitation				
Changing seasonal temperatures				
Reduced snowfall and accumulation				

❑ **Please describe extreme weather events or climate hazards you have experienced. Where are the high-risk areas?**

Community Assets

Which community assets are important to protect from the impacts of extreme weather events and climate hazards?

Community Asset (Potential Risks)	Very Important	Somewhat Important	Not Very Important	Not Important
People (Loss of life, health, injuries)				
Economy (Business interruptions/closures, job losses, energy disruptions, etc.)				
Infrastructure (Damage or loss of libraries, museums, historic properties, etc.)				
Environment (Damage or loss to forest, waterways, air quality etc.)				
Governance (maintain order and/or provide public amenities and services)				
Agricultural (Damage or loss of farms, supply chain disruption, food security)				
Culture (Ability to maintain traditions, social networks, and support systems)				

❑ **What is unique about your community?**

❑ **What are the most important/influential institutions, organizations, or businesses in your community?**

Community Risks

How vulnerable are the following risk categories to the impacts of extreme weather events and climate hazards?

Community Risk	Very Vulnerable	Somewhat Vulnerable	Not very Vulnerable	Not Vulnerable
Private property				
Critical facilities (transportation, communications, shelters etc.)				
Natural assets and open spaces (streams, wetlands, beaches, etc.)				
Historic and cultural landmarks				
Utilities (electric infrastructure, renewable energy, water/sewer)				
Emergency services (police, fire, etc.)				
Community services (food pantries, libraries, public agencies)				
Farms and agriculture				
Public health and healthcare				
Employment and childcare				

❑ **Which infrastructure, facilities, and services in your community are exposed to climate hazards and extreme weather? How is it vulnerable? (e.g. location, age, building codes, type of building)?**

❑ **What populations are living in high-risk areas (e.g. age demographics, income level, special needs, languages spoken)?**

Environmental Impacts

Please indicate how important are the following potential impacts to your community.

Environmental Impacts	Very Important	Somewhat Important	Not Very Important	Not Important
Loss of natural resources				
Decreased waterway and surface water quality				
Decreased air quality				
Decreased drinking water availability and quality				
Decreased food security				
Loss of plant and animal habitat and biodiversity				
Increased invasive species presence				

❑ **Which natural resources are exposed to climate hazards and what effects have they had?**

❑ **What are the prominent geographic features of your community?**

***Do you have pictures of extreme weather, flooding, or damage from storms in your community? If you'd like to share them with us to potentially include in a plan, please provide your email address below.**

Thank You For Sharing

Cornell Cooperative Extension

This survey will be active until September 4, 2023

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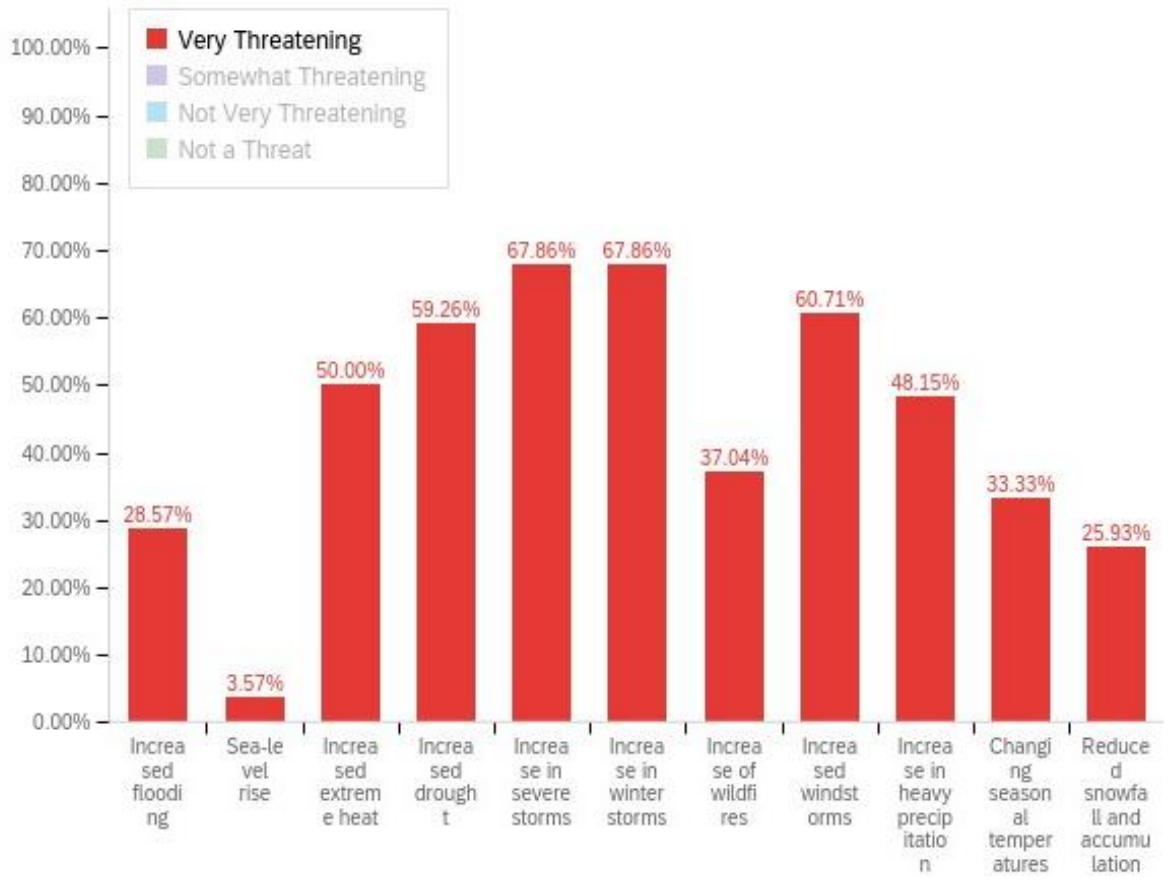
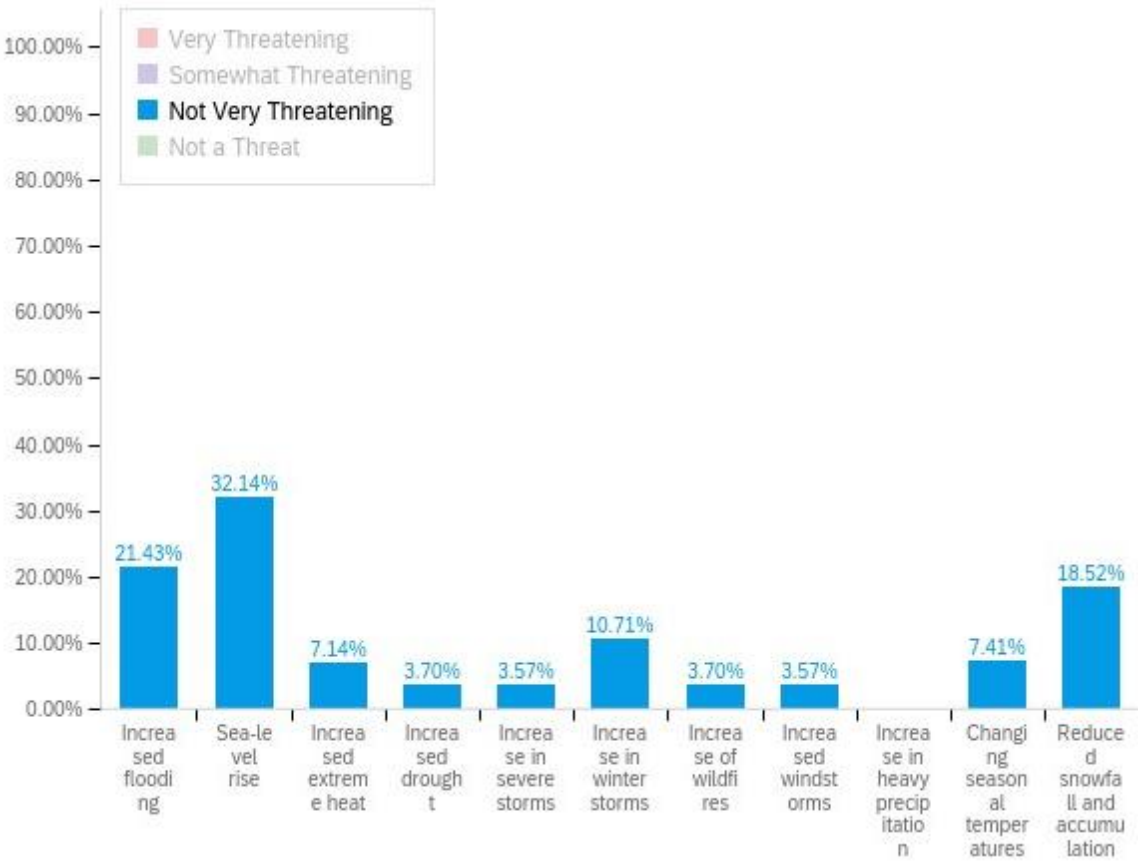
Vulnerability Assessment and Story of Place
Public Survey Results
(Charts and Graphs)

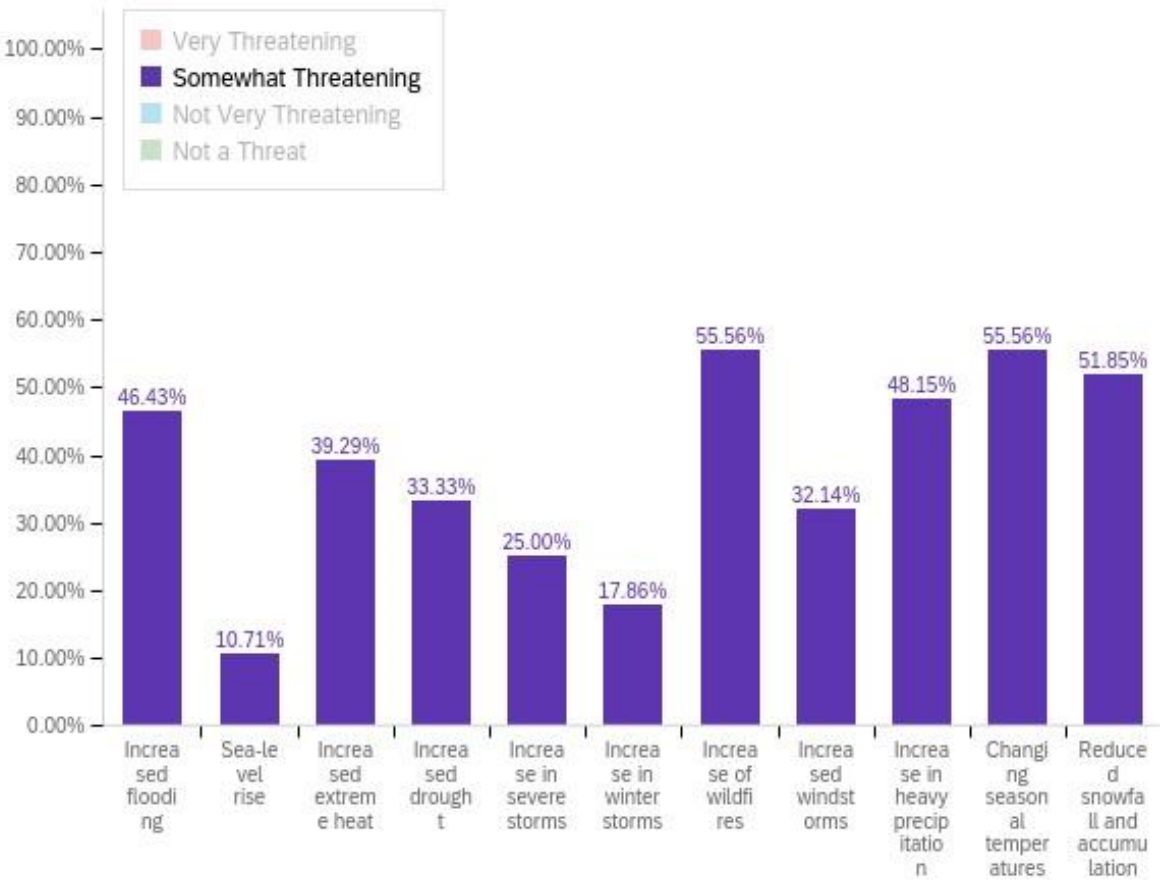
Austerlitz Results 1/4

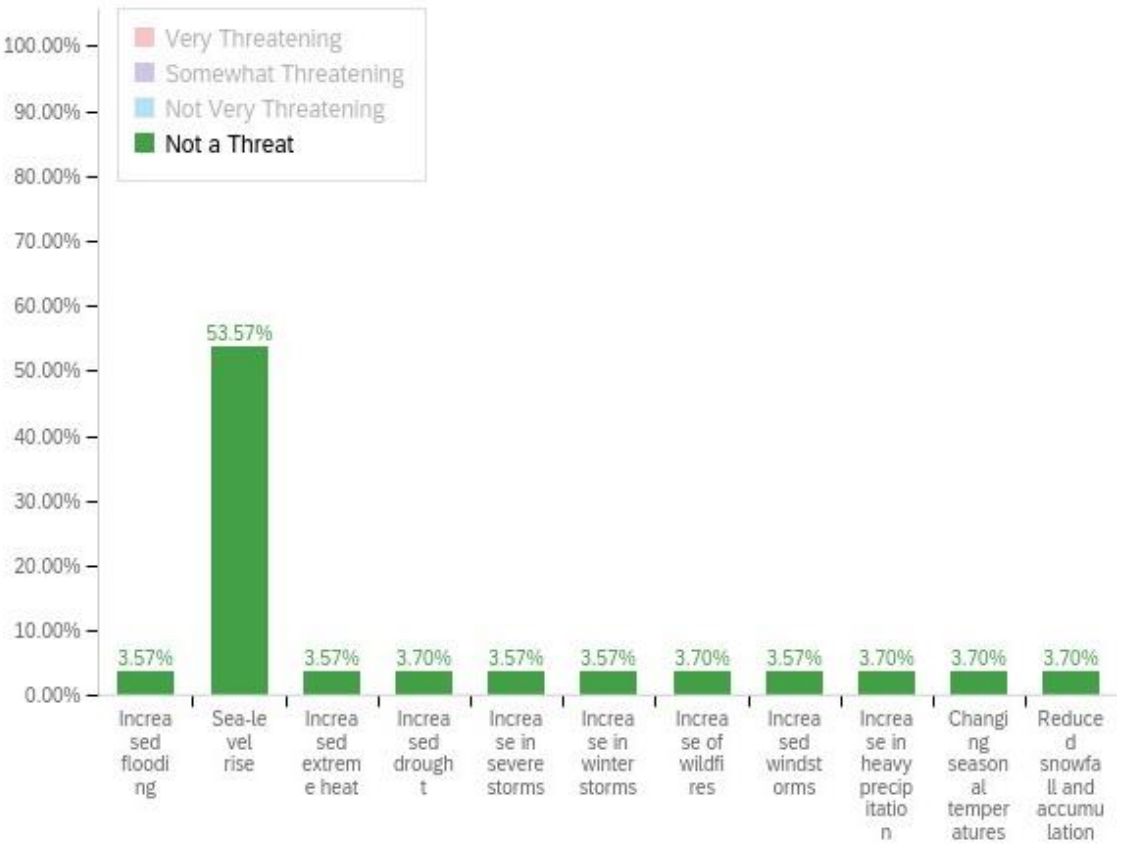
How Threatening Each Potential Climate Hazard Might Be To Your Community

Climate Hazards	Very Threatening	Somewhat Threatening	Not Very Threatening	Not a Threat
Increase in severe storms	67.86%	25.00%	3.57%	3.57%
Increase in winter storms	67.86%	17.86%	10.71%	3.57%
Increased windstorms	60.71%	32.14%	3.57%	3.57%
Increased drought	59.26%	33.33%	3.70%	3.70%
Increased extreme heat	50.00%	39.29%	7.14%	3.57%
Increase in heavy precipitation	48.15%	48.15%	0.00%	3.70%
Increase of wildfires	37.04%	55.56%	3.70%	3.70%
Changing seasonal temperatures	33.33%	55.56%	7.41%	3.70%
Increased flooding	28.57%	46.43%	21.43%	3.57%
Reduced snowfall and accumulation	25.93%	51.85%	18.52%	3.70%
Sea-level rise	3.57%	10.71%	32.14%	53.57%





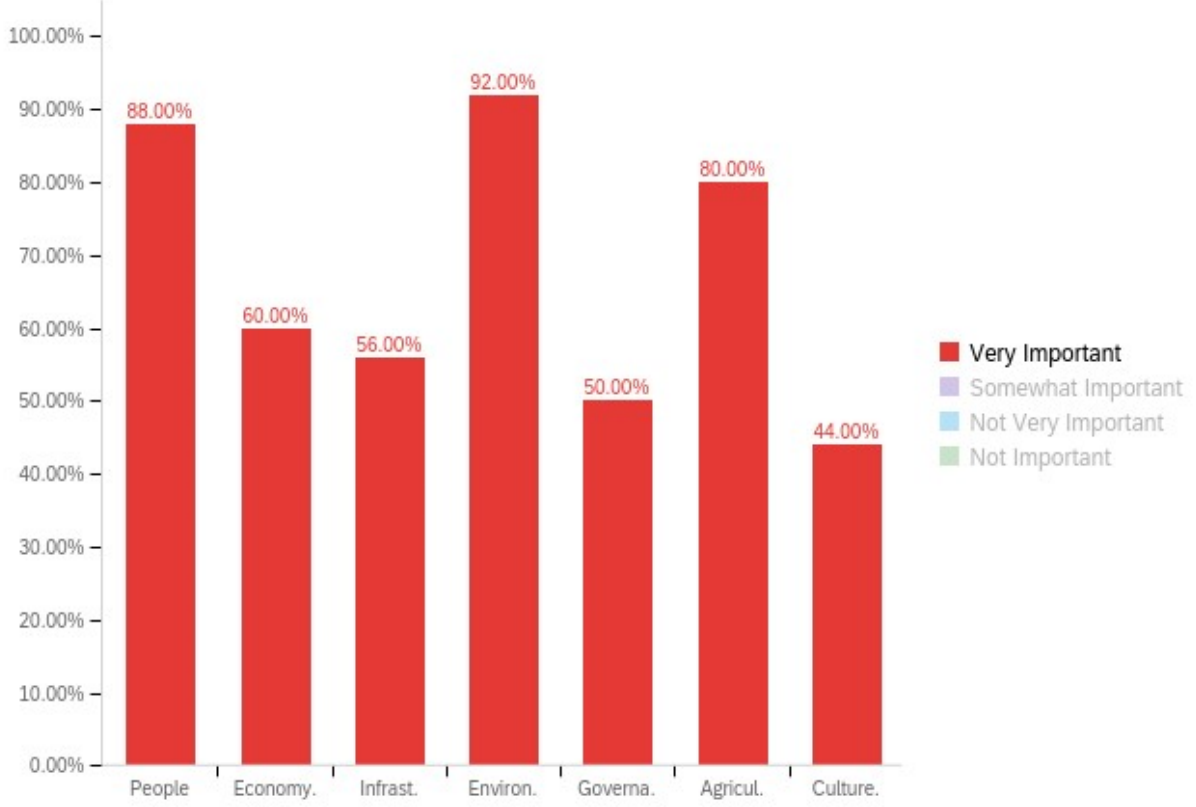


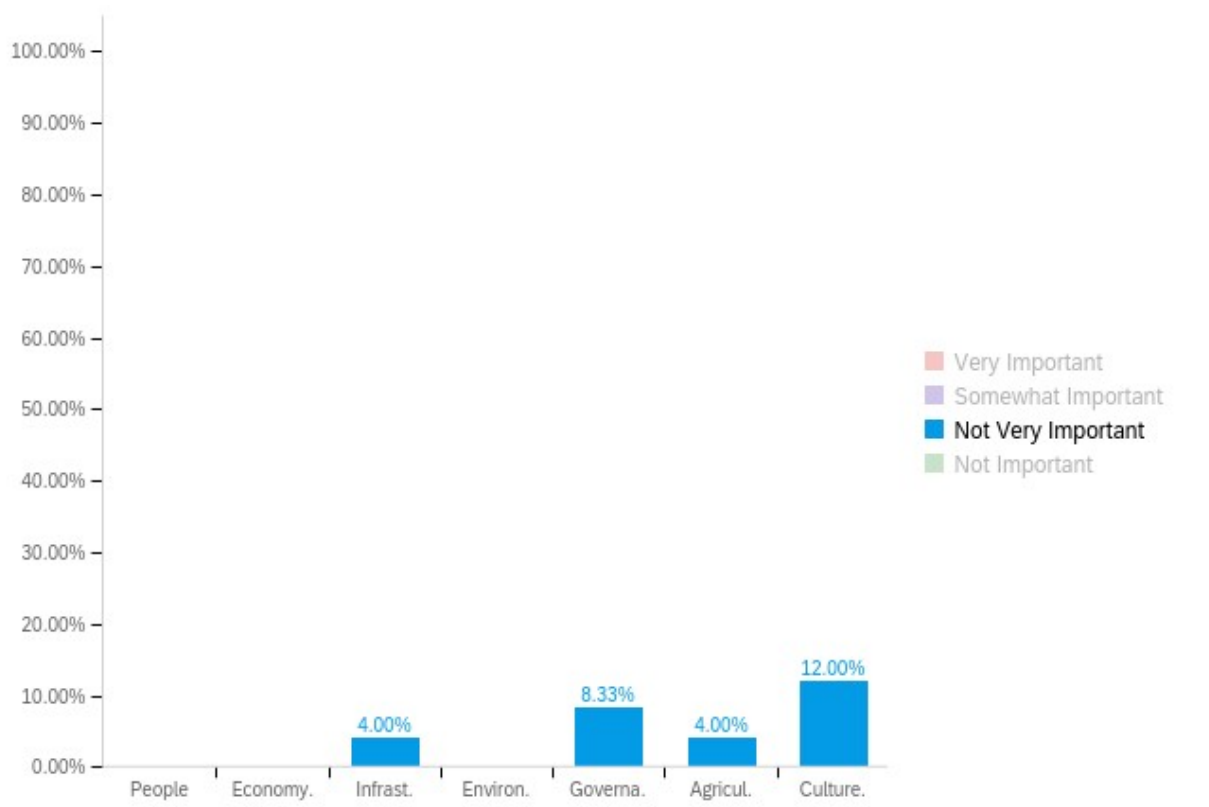


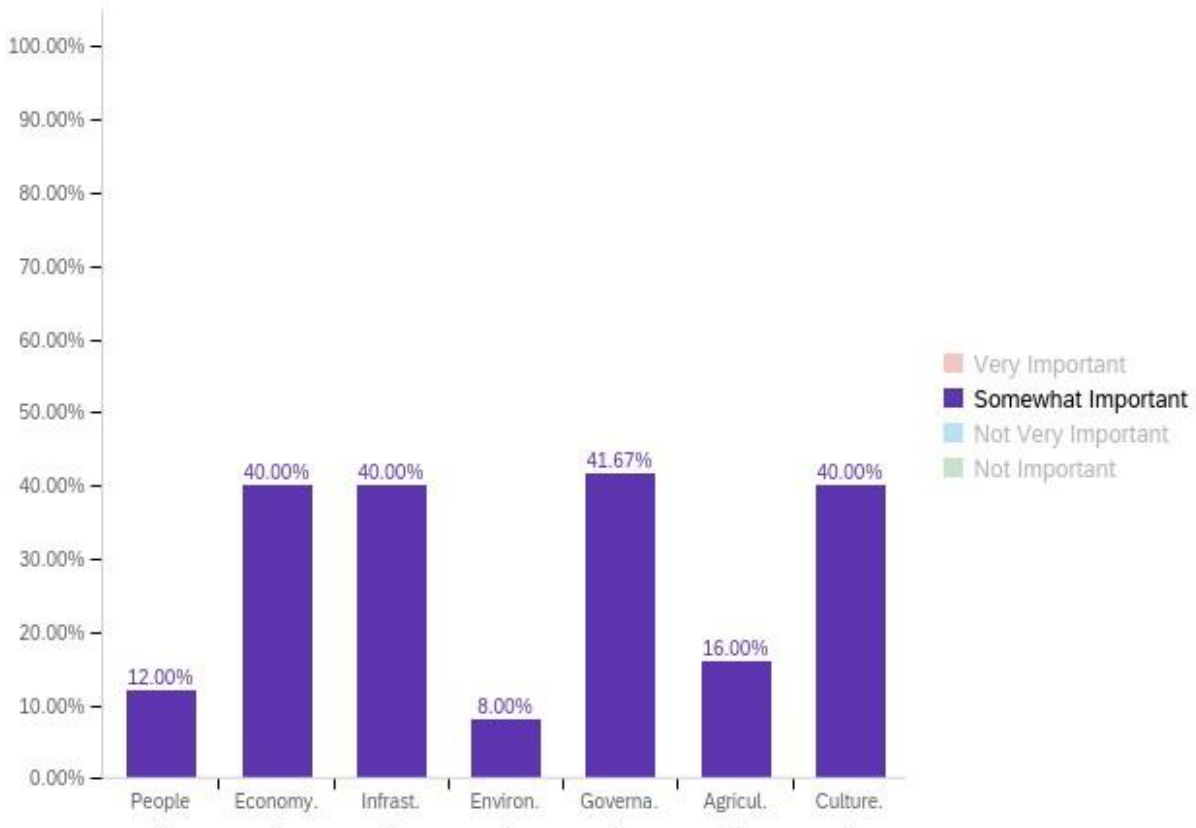
Austerlitz Results 2/4

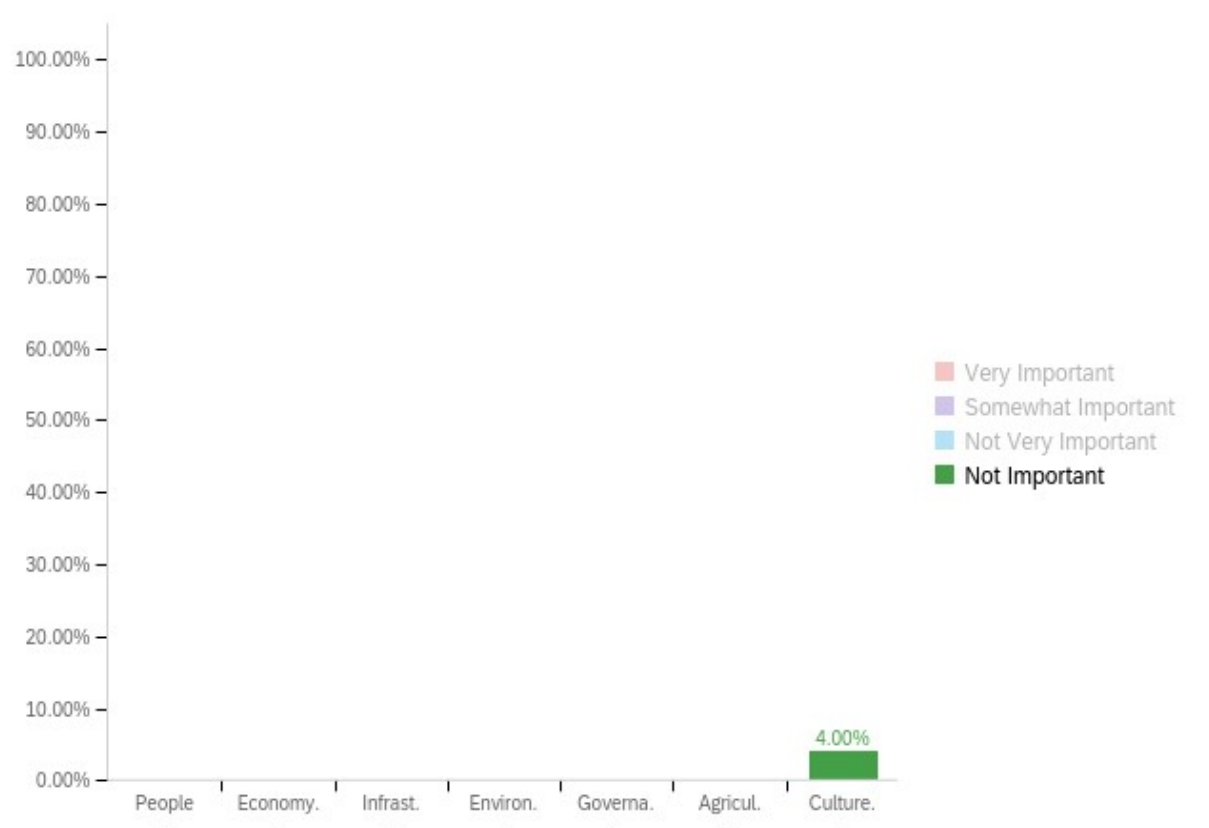
Community Assets That Are Important To Protect From The Impacts Of Extreme Weather Events And Climate Hazards

Community Assets	Very Important	Somewhat Important	Not Very Important	Not Important
Environment (damage or loss to forest, waterways, air quality, etc.)	92.00%	8.00%	0.00%	0.00%
People (loss of life, health, injuries)	88.00%	12.00%	0.00%	0.00%
Agricultural (damage or loss of farms, supply chain disruption, food security)	80.00%	16.00%	4.00%	0.00%
Economy (business interruptions/closures, job losses, energy disruptions, etc.)	60.00%	40.00%	0.00%	0.00%
Infrastructure (damage or loss of libraries, museums, historic properties, etc.)	56.00%	40.00%	4.00%	0.00%
Governance (maintain order and/or provide public amenities and services)	50.00%	41.67%	8.33%	0.00%
Culture (ability to maintain traditions, social networks, and support systems)	44.00%	40.00%	12.00%	4.00%





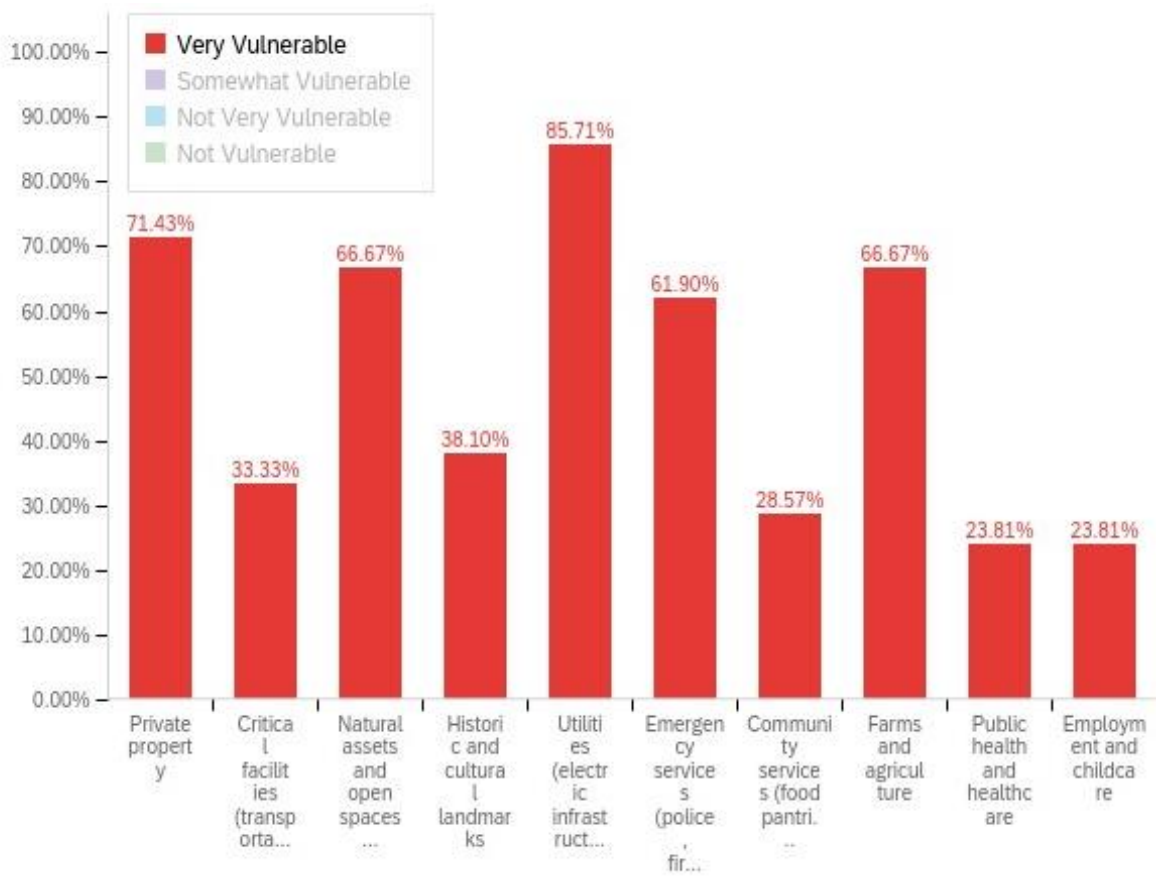


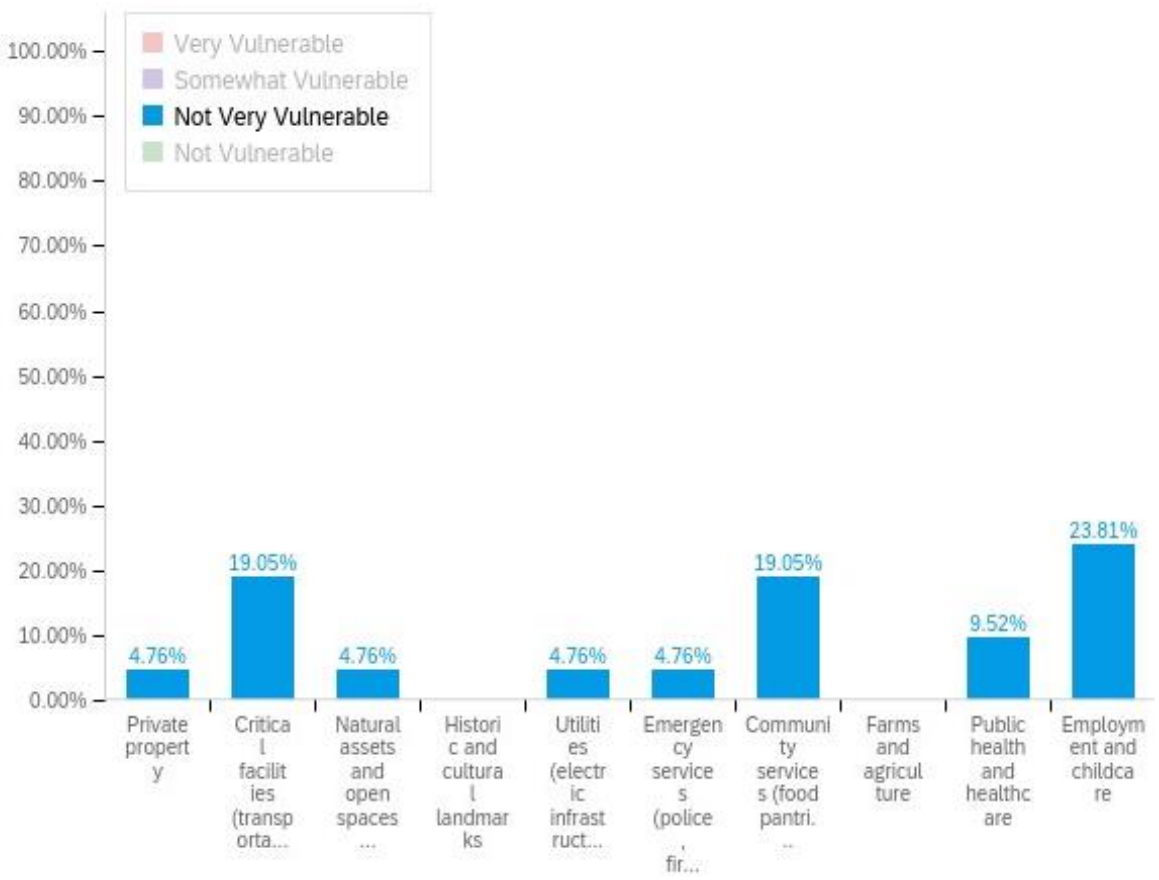


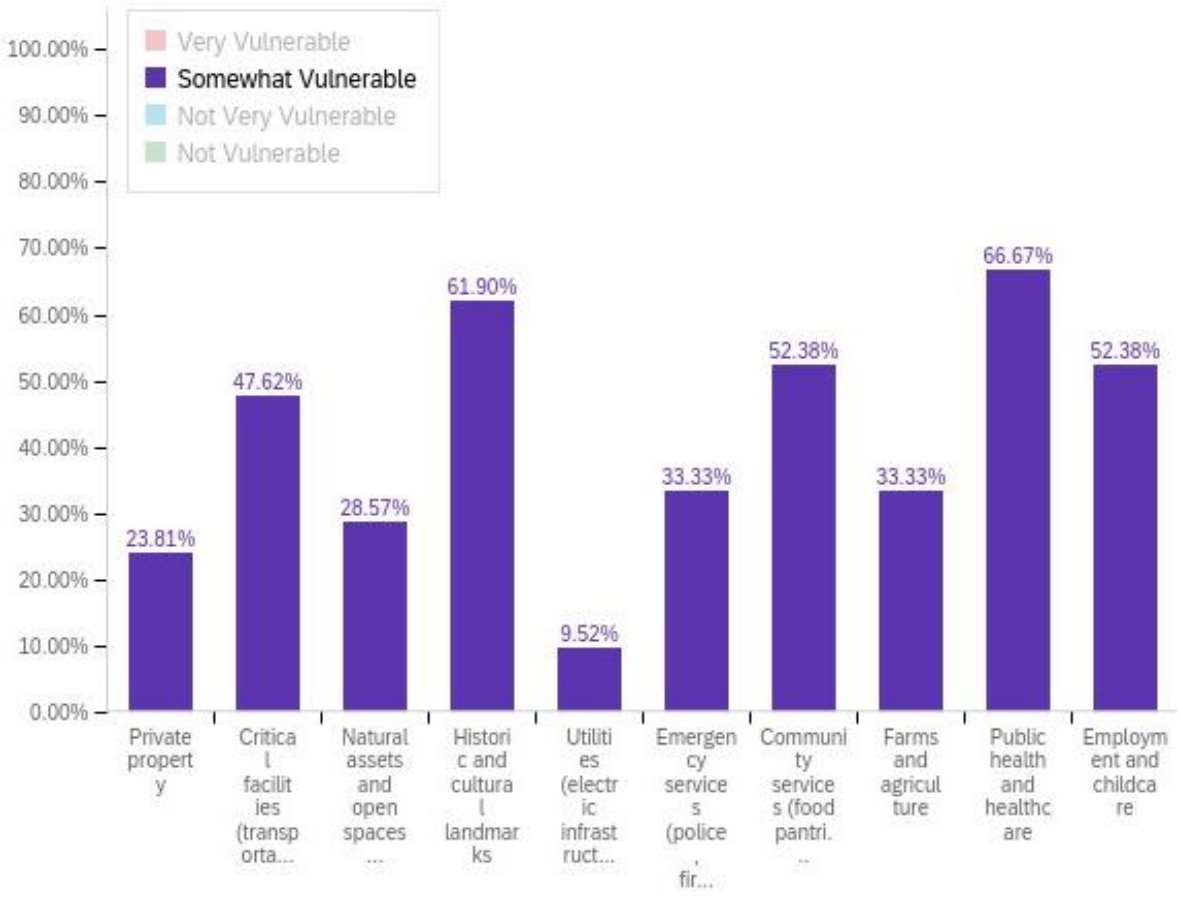
Austerlitz Results 3/4

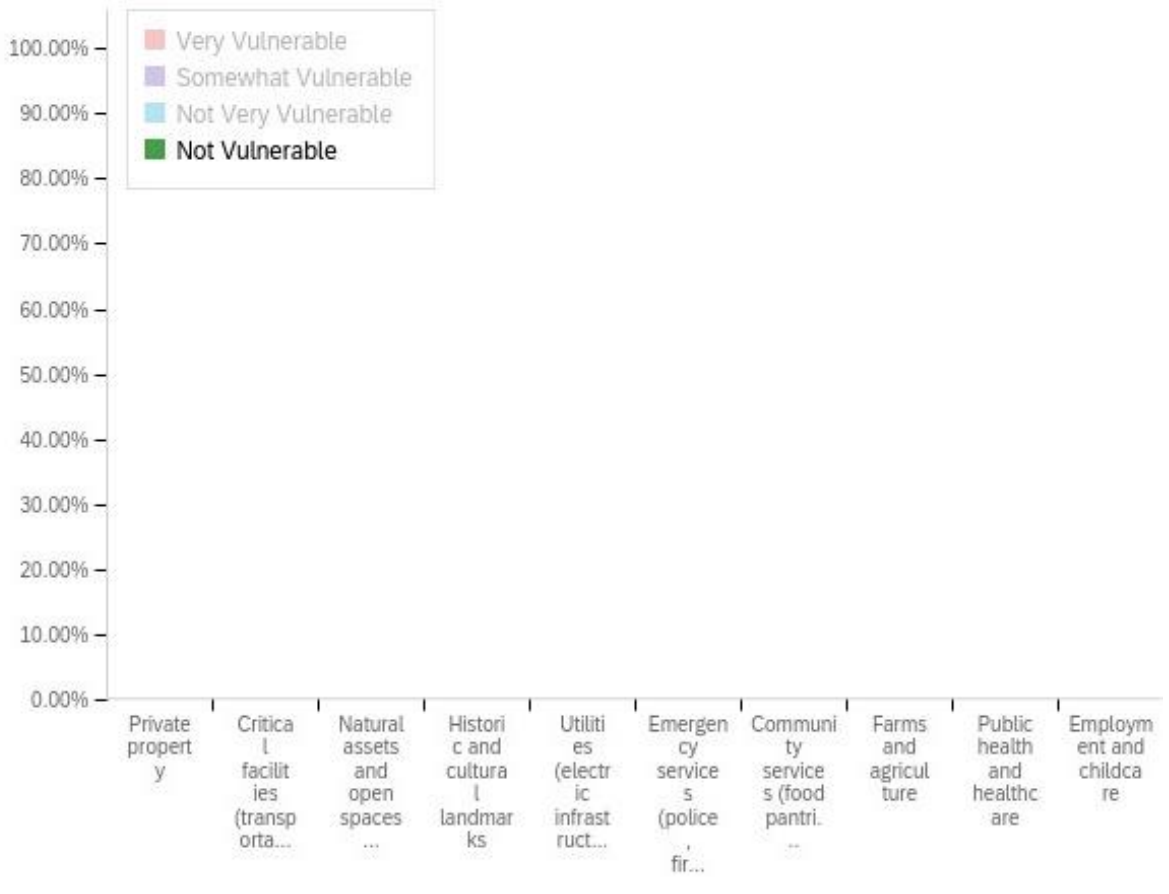
How Vulnerable Risk Categories Are To The Impacts Of Extreme Weather Events And Climate Hazards

Vulnerable Risk	Very Threatening	Somewhat Threatening	Not Very Threatening	Not a Threat
Utilities (electric infrastructure, renewable energy, water/sewer)	85.71%	9.52%	4.76%	0.00%
Private property	71.43%	23.81%	4.76%	0.00%
Farms and agriculture	66.67%	33.33%	0.00%	0.00%
Natural assets and open spaces (streams, wetlands, beaches, etc.)	66.67%	28.57%	4.76%	0.00%
Emergency services (police, fire, etc.)	61.90%	33.33%	4.76%	0.00%
Historic and cultural landmarks	38.10%	61.90%	0.00%	0.00%
Critical facilities (transportation, communications, shelters, etc.)	33.33%	47.62%	19.05%	0.00%
Community services (food pantries, libraries, public agencies)	28.57%	52.38%	19.05%	0.00%
Public health and healthcare	23.81%	66.67%	9.52%	0.00%
Employment and childcare	23.81%	52.38%	23.81%	0.00%





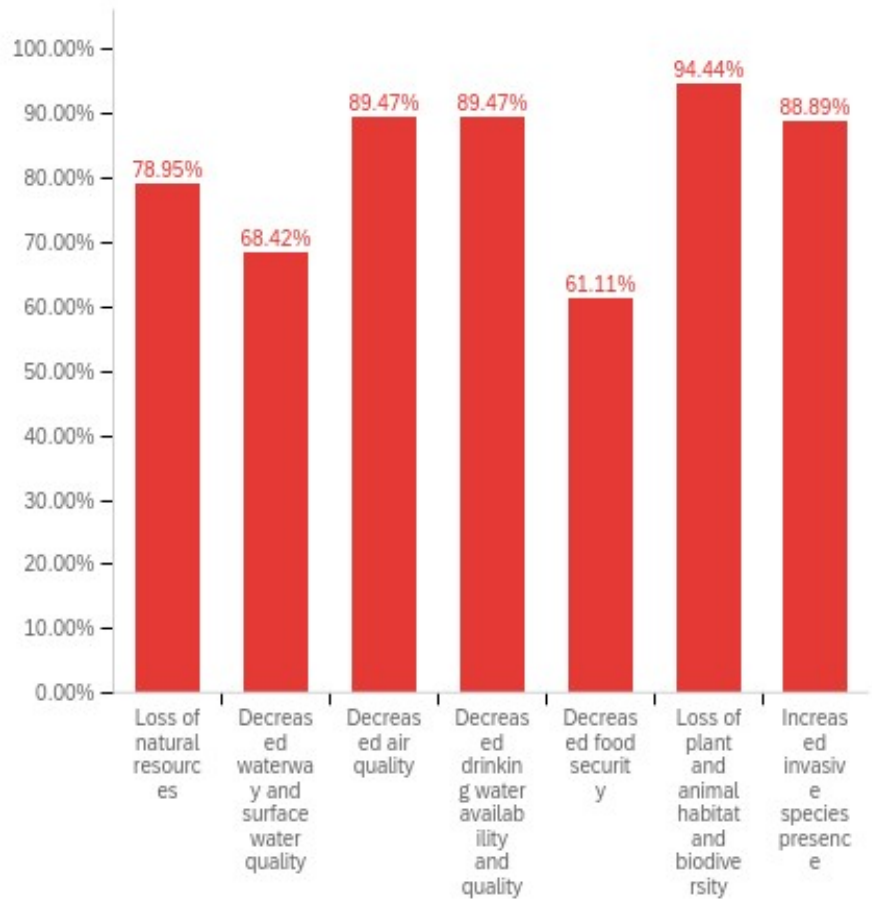


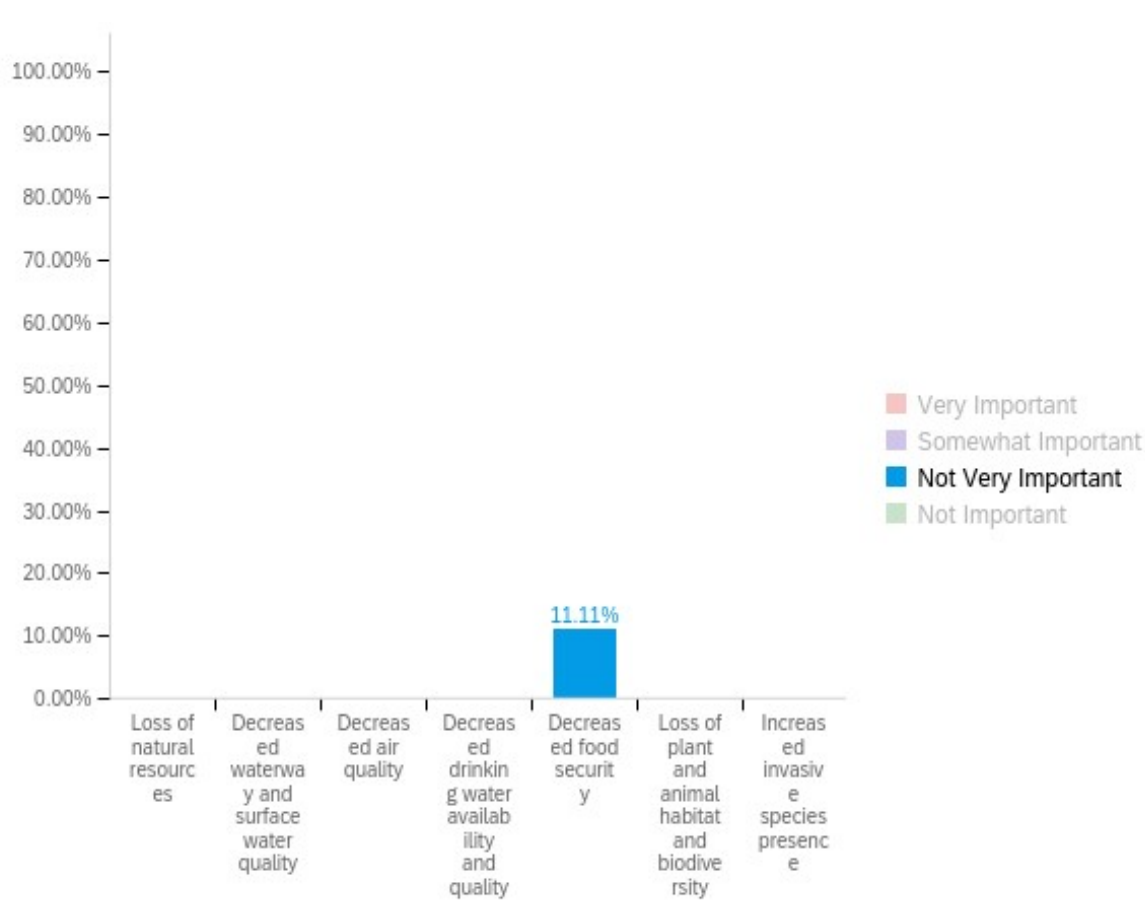


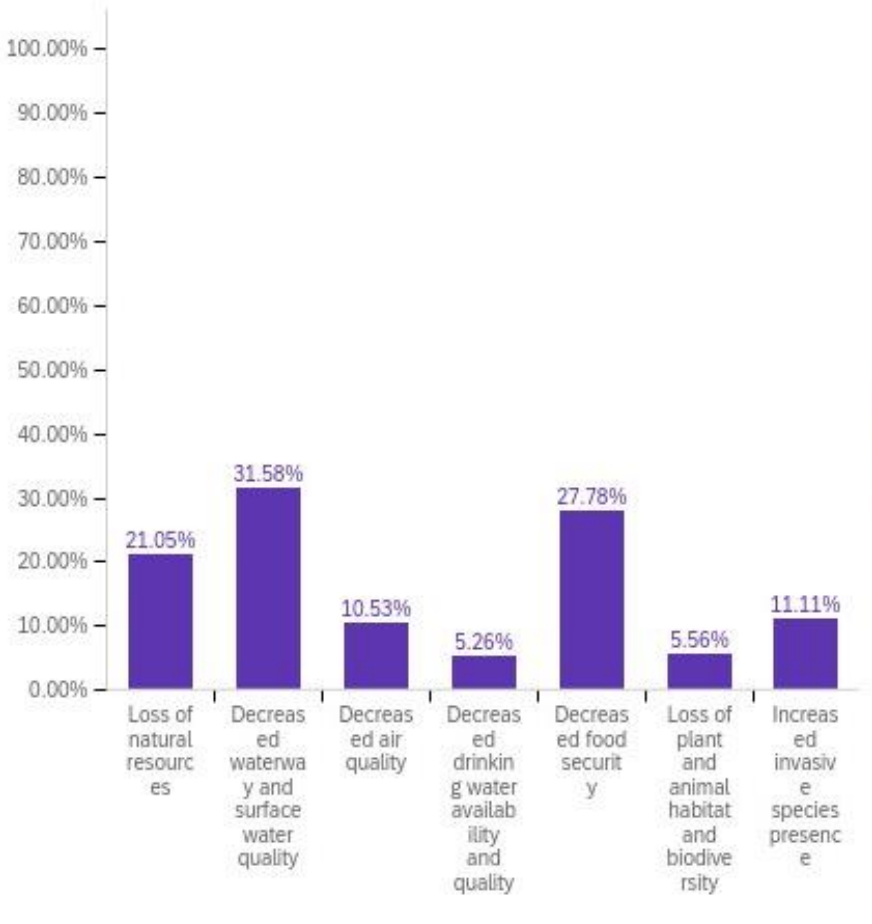
Austerlitz Results 4/4

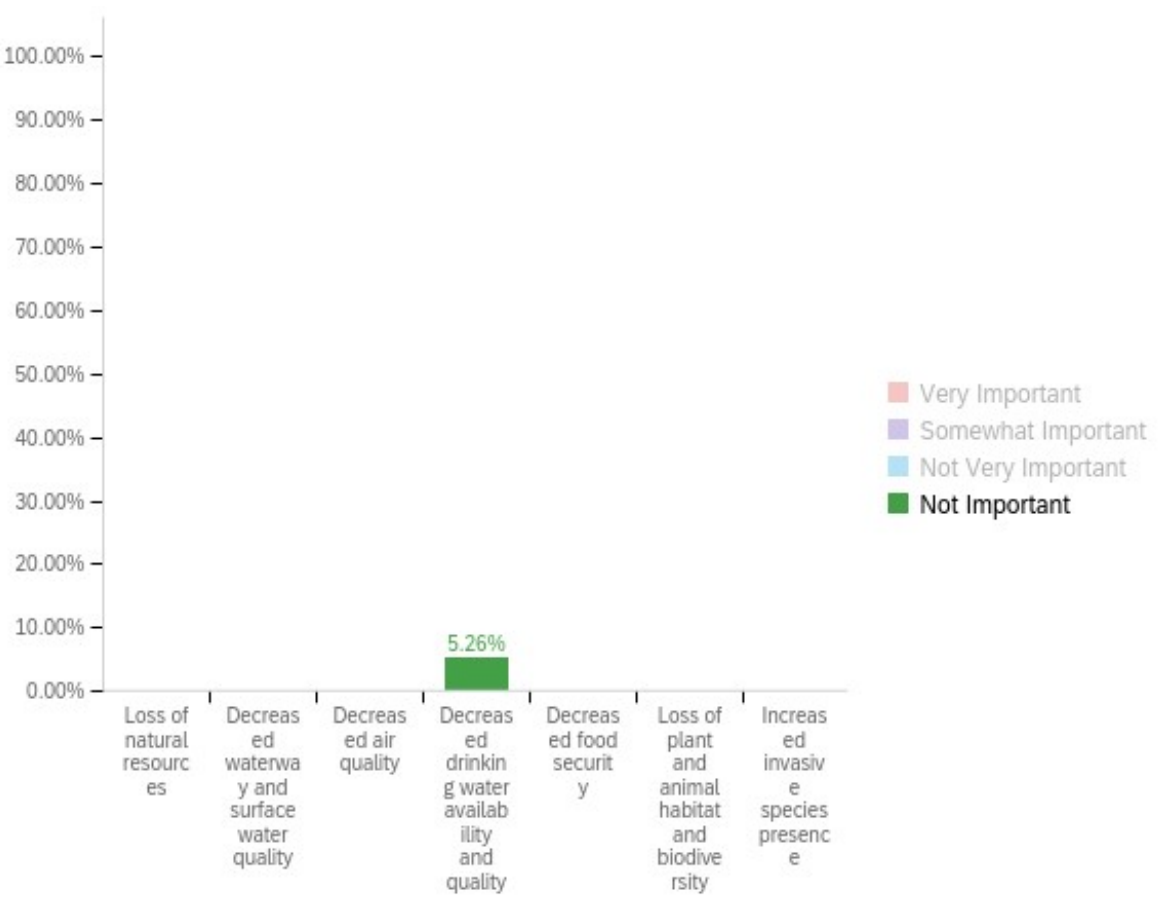
How Important Potential Impacts Are To Your Community

Potential Impacts	Very Important	Somewhat Important	Not Very Important	Not Important
Loss of plant and animal habitat and biodiversity	94.44%	5.56%	0.00%	0.00%
Decreased air quality	89.47%	10.53%	0.00%	0.00%
Decreased drinking water availability and quality	89.47%	5.26%	0.00%	5.26%
Increased invasive species presence	88.89%	11.11%	0.00%	0.00%
Loss of natural resources	78.95%	21.05%	0.00%	0.00%
Decreased waterway and surface water quality	68.42%	31.58%	0.00%	0.00%
Decreased food security	61.11%	27.78%	11.11%	0.00%









Appendix A
Columbia County CARP

Vulnerability Assessment and Story of Place Workshop Results (Map)

Columbia County
Climate Adaptation and Resiliency Plan

This map was produced for a workshop exercise. It is not meant to be used to accurately locate features in the field. It is not a survey map.

The data shown was obtained from a variety of sources including but not limited to:
Columbia County Real Property Tax Service, Columbia County Emergency Management Services, NYS DEC, NYS DOT, NYS Geospatial Services, Scenic Hudson, US Federal Emergency Management Agency, and USDA Natural Resources Inventory

Columbia County
Planning Department

Vulnerability Workshop
Ghent & Austerlitz

- County Boundary
- Town, City, & Village Boundaries
- Water
- Streams
- Future Open Water w/30" SLR
- Current Flood Risk
- Future Flood Risk
- Town/Village/City Halls
- Firehouses
- EMS Locations
- Schools
- NYS Regulated Wetlands
- Federal Wetlands (NWI)
- State Owned Lands
- Conservation Areas and Preserved Properties

Appendix A
Columbia County CARP

Adaptation and Vision Public Survey

Columbia County and 17 of its municipalities are creating Climate Change Adaptation and Resilience Plans

These plans will establish a vision and set of strategies to improve your community's resilience to climate change based on its vulnerabilities.

Climate Resilience Vision

A climate resilience vision is a brief, inspirational statement that investigates the future and creates a mental image of the ideal state that a community wants to achieve. The vision should reflect the community's aspirations and values as they relate to adapting to climate change and building local resilience. It should serve to unify the community, guide community climate adaptation actions, and remain viable under various possible future climate change conditions.

- **Which town/village/city do you live in? _____**
- **What does a climate-resilient community look like to you?**

Adaptation Strategies

Extreme storms, extreme heat, drought, flooding, and heavy precipitation are all climate hazards that Columbia County is projected to face in the coming years. Below are potential adaptation actions that the county could take to adapt to these conditions. Please indicate whether you think these actions should be a high priority, medium priority, low priority, or not a priority in your community by checking the corresponding box.

Emergency Communication and Management	**High Priority**	**Medium Priority**	**Low Priority**	**Not a Priority**
1. Implement and promote an emergency communication and warning system				
2. Organize neighborhood networks for emergency preparedness, planning, and training				
3. Review, revise, or create an emergency plan or evacuation plan				
Public Outreach and Social Resilience	**High Priority**	**Medium Priority**	**Low Priority**	**Not a Priority**
1. Invite agencies and experts to give public presentations on flood preparedness				
2. Create a Flood Guide for residents and businesses				
3. Post info on the municipal website and social media accounts				
4. Collaborate with other municipalities				
5. Encourage homeowners, renters, and businesses to purchase public or private flood insurance				
6. Install high water mark signs on the waterfront				
7. Mitigate green gentrification by protecting existing families and renters				
Municipal Planning and Operations	**High Priority**	**Medium Priority**	**Low Priority**	**Not a Priority**
1. Establish or assign a resilience committee				
2. Participate in your County's Multi-Hazard Mitigation Plan updates to include climate risks and resiliency projects				
3. Revisit and update vulnerability assessment				
4. Train municipal staff to be able to incorporate flooding, coastal hazards, sea-level rise, etc. into their daily work, as well as in the use of planning tools for these purposes"				
5. Become a Certified NYS Climate Smart Community				
6. Conduct a risk and engineering review of municipal infrastructure to analyze adaptation needs				

7. Consider applying for annual NYS grants				
8. Protect non-homeowning residents through rent stability regulations				
9. Incorporate resilience into future Comprehensive Plan updates				
10. Create or update your Local Waterfront Revitalization Plan to incorporate resilience				
11. Work with local utilities, in particular electric, gas, water, sewer, and telecommunications, to improve resilience				
12. Incorporate resilience into asset management or capital improvement plan				
13. Create a heat emergency plan				
14. Conserve public river access over the long term				
15. Reduce municipal greenhouse gas emissions and contributions to sea-level rise with a Climate Action Plan				
16. Encourage shade structures in public areas for cooling				
Zoning & Coding	**High Priority**	**Medium Priority**	**Low Priority**	**Not a Priority**
1. Create or update a waterfront or flood hazard zoning overlay				
2. Adopt innovative waterfront zoning				
3. Protect the Tidal Wetland Pathways				
4. Create a buyout plan for vulnerable properties				
5. Exceed NY's 2 feet freeboard requirement				
6. Require green infrastructure for stormwater management				
7. Require sustainable shorelines				
8. Require home-owners in flood-prone areas to include additional flood-proofing and adaptive measures for new substantially damaged or improved structures above the FEMA standard				
9. Extend the Flood Hazard Overlay District to include future sea-level rise				
10. Require proposals for new development in the Flood Hazard Overlay District to take flood risk into account				
11. Ensure opportunities exist for open space and recreation over the long term				
12. Relocations and buy-out programs, identify key properties and assess feasibility. These recommendations are located in the site-specific recs and reference-specific locations."				
13. Regulate floating/potentially floating assets (e.g. boats, docks, tanks) that may pose a hazard during floods				

- **Please add any comments for a particular section and/or action here:**

Appendix A
Columbia County CARP

Exploratory Future Scenario Planning Description

Exploratory Scenario Planning Exercise

In the four smaller breakout groups following the County Level Vision Exercise, communities were led through an Exploratory Scenario Planning Exercise that explored what a future "world" might look like given two critical uncertainties or hazards. An exploratory scenario planning (XSP) process in general helps participants envision and define multiple possible futures, prepare for uncertainties, pursue an overarching vision, gather input from diverse stakeholders and data, and brainstorm strategies that work for all future scenarios while providing framework to address diverse viewpoints and differing assumptions.

For this workshop, a standard XSP process was abridged to focus on one possible future versus multiple which is further explained within this section. A two-by-two matrix (see figure below) was first created to include the two hazards or critical uncertainties that each municipality voted on at the end of the first workshop. These two hazards were labeled on the axes of their two-by-two matrix thus creating four "worlds" where the hazards were either both increasing, both decreasing, or worlds where one hazard was decreasing while the other one was increasing. Due to time and group size, the section of the matrix or "world" that was focused on by all groups was one where both hazards were increasing. To set the stage for the exercise, each breakout group, individual, or municipality (depending on how the group chose to work) read a brief narrative describing Columbia County. They then crafted a fill-in-the-blank worksheet (see Appendix A) keeping in mind the "world" where the two hazards are both increasing on the matrix, a timeline of seven years in the future, and a focus question of "How might we create a more adaptive and resilient community to climate change?" Facilitators had the additional option of posing the following prompt questions:

- What global trends impact this world the most?
- What does life in 2030 look like in this world?
- What role would (government/ private sector/nonprofits) need to play in this world?
- What "title" would you give to your world? How would you describe what's happening in it?

The purpose of this exercise was to break participants out of their normal thinking, therefore worksheets used during this exercise were for inspiration only and not for results.

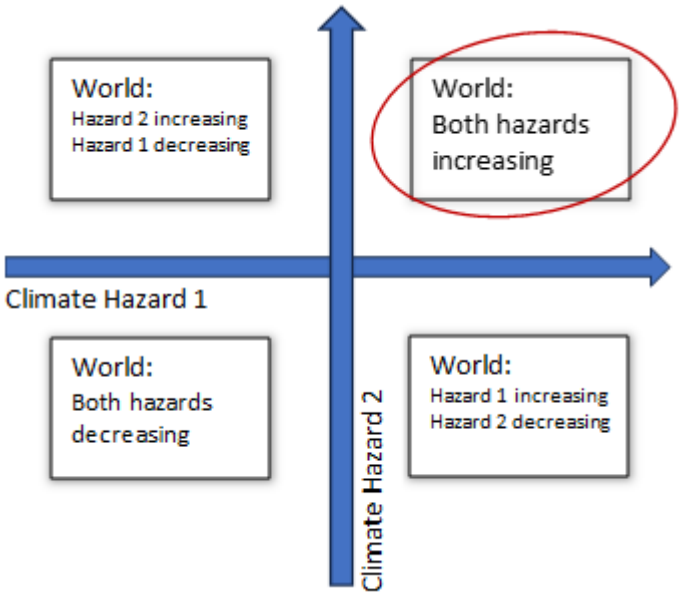


Figure 1: XSP 2x2 Matrix (Created by Lindsey Strehlau-Howay of CCE Columbia-Greene)

Appendix A
Columbia County CARP

Exploratory Future Scenario Planning &

Vision Development

Worksheets #1, #2 and #3

Exploratory Scenario Planning Worksheet

Exploratory Scenario Planning is a tool for collectively envisioning potential and uncertain futures. Multi-stakeholder platforms in particular are critical spaces where actors can break out of silos, share perspectives, and build shared understanding.

Read through the narrative below of life in Columbia County around 2030. Consider how increasing hazards will influence all aspects of life and environment at this time. Keep in mind the focal question as you work with your group to fill in the blanks at the bottom and on the back of the worksheet.

Focal Question

How might we create a more adaptive and resilient community to climate change?

Timeline

7 years (2030)

Narrative Template

Columbia County is a part of the Hudson Valley region in New York State, is home to just over 60,000 people, borders the Hudson River, and is directly north of New York City to which it is a foodshed. The County has distinctive landscapes and biodiverse environments across the area, including the Hudson River Tidal Wetlands, the Taconic Ridge, and the Harlem Valley. Columbia County features over 50 public heritage sites, direct train access to the Capital region, Hudson Valley and NYC, multiple conservation and recreation areas, and diverse characteristics amongst its 22 municipalities from extremely rural to a bustling city, attracting tourists and diverse residents. The County also has a history in Western agriculture and is notable for its large number of small farms and CSAs.

In general, the climate is humid continental, however, latitude, elevation, and proximity to the Hudson River make large differences in local climates within the County. Snowfall patterns have been changing noticeably over the past 20 years. Hurricanes and storms (wind, ice, snow, rain) have become more frequent and intense, producing record setting floods, heavy downpours, and significant damage. Seasonality has also continued to shift and summer months have produced record setting heat waves and variability in rainfall, threatening drought conditions.

In 2030, pressures from climate change are pushing Columbia County and its municipalities into an uncertain future. All three of the biodiverse areas in the County are in peril from the weather-related extremes as well as invasive species. Increasing costs and aging infrastructures are straining municipalities and residents' financial capacity to recover from storms. Key industries in the County are impacted and threatened by the climate crisis including agriculture and tourism. Demand on ground water supplies continues to rise due to rain and snowfall irregularity and the increase of in-migration from NYC and outside states. Health issues from increasing temperatures, insect-borne diseases, and decreased air quality from wildfires also climb. Rising land, housing, rental, and food prices are affecting more residents' ability to live, work, and contribute to their local area while historically marginalized populations as well as an aging population continue to remain vulnerable.

Exploratory Scenario Planning Worksheet

In 2030, *[critical uncertainty 1]*_____ *increases* and *[critical uncertainty 2]*_____ *increases*.

The *rise/collapse* of the _____
could not have come at a *better/worse* time for [PLACE]_____. Residents feel impacts in
_____
_____.

The impact on the local socioeconomic systems is _____

_____. Access to _____

is now _____.

Large businesses *continue to/have changed to* _____

_____,

while small businesses *continue to/have changed to* _____

_____.

The impact on consumers is _____.

The environment and agricultural sectors have also been impacted heavily. Ecosystem impacts have been _____

_____

and agriculture has experienced an *increase/decline* in _____

_____.

New government policy is introduced to_____

_____.

Major policy *wins/failures* have been_____

_____.

The effect on residents is _____

_____.

Civil society and NGOs are directing their attention and efforts to address _____

_____.

They *are/are not* able to _____

_____.

Create a title for your world: _____

Local Vision Development Worksheet

A vision is a brief, inspirational statement that investigates the future and creates a mental image of the ideal state that a community wants to achieve. The vision should reflect the community's aspirations and values as they relate to adapting to climate change and building local resilience. It should serve to unify the community, guide community climate adaptation actions and remain viable under various possible future climate change conditions.

Review the sample vision statements and survey question word clouds provided. Consider the questions, talking points, key values and actions we just discussed. Work with the group to develop phrases that reflect a future vision for your community in each of the following categories.

Infrastructure

Society

Environmental

Economic

In general, resilient communities are communities that take care of their critical systems that support life, protect clean water, air and the environment, and promote economic vitality in an equitable way. Approaches that enhance community resilience include: long term thinking and planning, collaboration, diversity of strategies, decentralized efforts, flexibility, and redundancy. It is simultaneously an opportunity to stop reacting to devastating storms and begin planning for them – to avoid costs of the future.

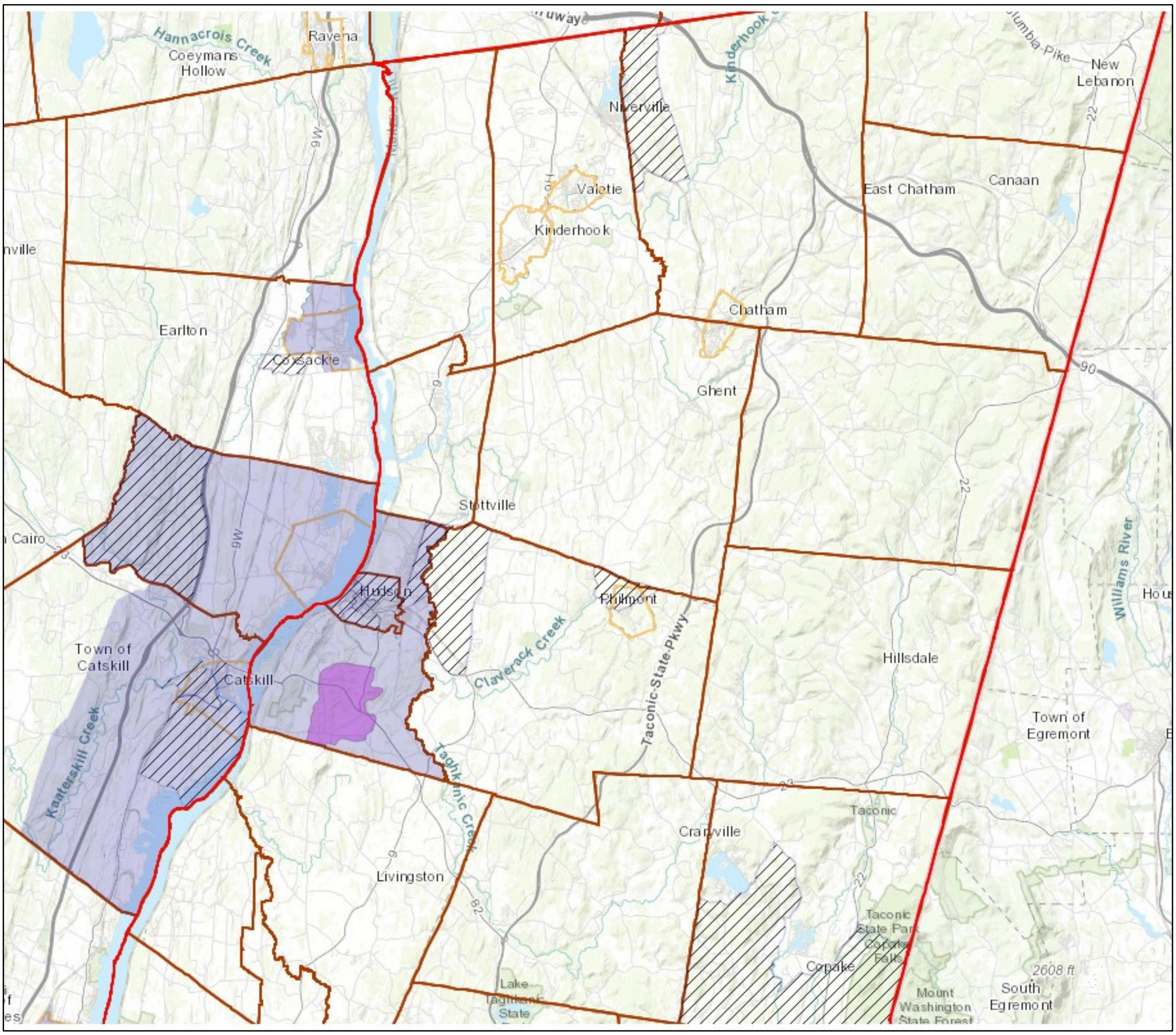
Appendix A
Columbia County CARP

Diversity, Equity, Justice and Inclusion Map

Diversity, Equity and Justice and Inclusion

Columbia County

(Zoomed in to NYS DAC or EJ areas)



Potential Environmental Justice Areas

Disadvantaged Communities (DAC)

Environmentally Sensitive Areas

Critical Environmental Areas

Reference Layers

Towns

Villages

County Boundaries

Appendix A
Columbia County CARP

Adaptation Vision and Strategies Examples

Visions and Principles for a Climate Resilient Athens

The Village of Athens envisions a community that strives for resilience while maintaining the historic, “small town”, and waterfront characteristics that make it unique. A resilient Athens would be prepared for climate hazards that threaten these features. The following principles, developed with public input in mind, serve to conserve, promote, and enhance resilience in the community.

A future Climate resilient Athens would:

1. Be prepared for future climate hazards
2. Mitigate and adapt to climate change
3. Protect air and water quality
4. Maintain a resilient Hudson River Waterfront that serves community needs
5. Invest in resilient infrastructure and services
6. Foster the sustainable use of natural resources
7. Conserve open space and scenic views
8. Encourage alternative transportation
9. Increase energy efficiency and use of renewable energy
10. Encourage local food systems

Visions and Principles for a Sustainable, Resilient Beacon

Residents from the City of Beacon envision a community that is not only resilient to climate change but is also socially and economically resilient. A resilient and sustainable Beacon would preserve and enhance social, economic, and natural characteristics of the City while preparing for climate hazards that threaten these features. When participants were asked to complete these sentences, “A future climate-resilient Beacon would…” and “A future sustainable Beacon would…”, answers for both questions spanned similar themes, which were translated into the following guiding principles:

A future climate-resilient and sustainable Beacon would:

1) Be socially resilient
2) Invest in resilient infrastructure
3) Have an informed and educated populace and municipal staff
4) Be prepared for future climate hazards
5) Encourage local food and business
6) Mitigate and adapt to climate change
7) Encourage alternative transportation
8) Invest in renewable energy
9) Preserve natural resources
10) Have a resilient waterfront

“A future flood-resilient waterfront in Kingston would:

▸ *allow for Kingston to use the waterfront for economic revitalization.”*

▸ *protect public health, avoid sewage spills and sewage treatment plant downtime.”*

▸ *create a peaceful, safe, sound environment for the Rondout community as well as the waterfront businesses.”*

▸ *[be] willing to make the harder more expensive decision if it’s better in the long run.”*

▸ *[be] a wash and wear waterfront.”*

▸ *be an inspiration to people everywhere.”*

Climate Adaptation Strategies

A checklist for your community's Climate Adaptation & Resilience Plan

***bold items are strongly encouraged for your plan**

	Action
Emergency communication + management	**Implement and promote an emergency communication and warning system**
	Organize neighborhood networks for emergency preparedness, planning, and training
	Review, revise or create an emergency plan or evacuation plan
Public outreach + social resilience	Invite agencies and experts to give public presentations on flood preparedness
	Flood guide for residents + businesses
	Post info on muni website and social accounts
	Collaborate with other municipalities
	Encourage homeowners, renters and businesses to purchase public or private flood insurance
	Install high water mark signs in waterfront
	Mitigate green gentrification by protecting existing families and renters
Municipal planning + operations	**Establish or assign resilience committee**
	Participate in your County's Multi-Hazard Mitigation Plan updates to include climate risks and resiliency projects
	Revisit and update vulnerability assessment
	"Train municipal staff to be able to incorporate flooding, coastal hazards, sea-level rise, etc. into their daily work, as well as in the use of planning tools for these purposes"
	Become a Certified NYS Climate Smart community
	"Conduct a risk and engineering review of municipal infrastructure to analyze adaptation needs"
	Consider applying for annual NYS grants
	Protect non-homeowning residents through rent stability regulations
	Incorporate resilience into future Comprehensive Plan updates
	Create or update your Local Waterfront Revitalization Plan to incorporate resilience
	"Work with local utilities, in particular electric, gas, water, sewer, and telecommunications, to improve resilience"
	Incorporate resilience into asset management or capital improvement plan
	Create a heat emergency plan
	Conserve public river access over the long term
	Reduce municipal greenhouse gas emissions and contributions to sea-level rise with a Climate Action Plan
	Encourage shade structures in public areas for cooling
Zoning + code	**Create or update a waterfront or flood hazard zoning overlay**
	Adopt innovative waterfront zoning
	Protect the Tidal Wetland Pathways
	Create a buyout plan
	Exceed NY's 2 feet freeboard
	Require green infrastructure for storm water management
	Require sustainable shorelines
	"require home-owners in flood-prone areas to include additional flood-proofing and adaptive measure for new substantially damaged or improved structures above the FEMA standard"
	Extend the Flood Hazard Overlay District to include future sea-level rise
	"require proposals for new development in the Flood Hazard Overlay District take flood risk into account"
	"Ensure opportunities exist for open space and recreation over the long term" ..(NRI -> OSP -> land trust/community preservation fund) .
	"Relocations and buy-out programs, identify key properties, assess feasibility. These recommendations are located in the site specific recs and reference specific locations."
	Regulate floating/potentially floating assets (e.g. boats, docks, tanks) that may pose a hazard during flood events

Potential Funding for Climate Adaptation Strategies

Eastern Brook Trout Joint Venture: Brook Trout Project

Federal Transit Administration: Buses and Bus Facilities Program

Federal Transit Administration: Low or No Emission Program

FEMA: Hazard Mitigation Assistance Pre-Hazard Mitigation Assistance BRIC Program

Hudson River Valley Greenway: Hudson River Valley Greenway Grant Program

IRS: Elective Pay Credits Portal

Northern Boarder Regional Commission: Catalyst Program

NY ConnectALL: Municipal Infrastructure Program

NY Empire State Development: Mid-Hudson Momentum Fund

NYS DEC : Tidal Hudson River Communities

NYS DEC: Climate Smart Communities Grant

NYS DEC: Non-Agricultural Nonpoint Source Planning Grant

NYS DEC: Community Waterfront Resiliency Design and Permitting

NYS DEC: Tributary Restoration for Culverts and Road Stream Crossings

NYS DEC: Hudson River Estuary Program, Local Stewardship Planning Grants

NYS DEC: Trees for Tribs

NYS DEC: Water Quality Improvement Project (WQIP)

NYS DOS: Local Waterfront Revitalization Program

NYS DOT: BRIDGE NY program

NYS DOT: CHIPs: Consolidated Highway Improvement Program

NYS EFC: Intermunicipal Grant (IMG)

NYS EFC: Water Infrastructure Improvement (WIIA) Grant

NYS EFC: Community Assistance Teams

NYS EFC: Clean Water State Revolving Fund

NYS EFC: Wastewater Infrastructure Engineering Planning Grant (WIEP)

NYS EFC : Green Innovation Grant Program

NYS OPRHP Community Development Block Grant Program

NYS Pollution Prevention Institute: Community Grants Program

NYSERDA: New York Truck Voucher Incentive Program

NYSERDA: NY School Bus Incentive Program

NYSERDA: School Bus Charging Voucher Applications

NYSERDA: Affordable Solar and Storage Predevelopment and Technical Assistance

NYSERDA: Charge Ready NY 2.0

NYSERDA: Clean Green Schools

NYSERDA: Clean Green Schools Initiative - Track I

NYSERDA: Just Transition Site Reuse Planning Program

NYSERDA: NYS Clean Energy Internship Program

NYSERDA: Clean Energy Communities (CEC) Program

Trout Unlimited Embrace a Stream (EAS)

US Department of Energy: Federal Low-Income Communities Bonus Credit Program

US Department of Energy: Assistance for the Adoption of Zero Building Energy Codes

US Department of Energy: Electronics Scrap Recycling Advancement Prize

US Department of Energy: Federal Low-Income Communities Bonus Credit Program

US Dept. of Commerce EDA: FY 2023 Disaster Supplemental Grant Program

US Dept. of Commerce EDA: FY 2021 - 2023 Economic Development Research and National Technical Assistance

US Dept. of Commerce EDA: Public Works and Economic Adjustment Assistance Programs

US Dept. of Transportation: Bridge Investment Program – Planning and Bridge Project Grants

US Dept. of Transportation: Capital Investment Grants (CIG) Program - Small Starts

US Dept. of Transportation: Congestion Mitigation and Air Quality (CMAQ) Improvement Program

US Dept. of Transportation: Safe Streets and Roads for All – Planning and Demonstration Grants

US EPA: Climate Pollution Reduction Grants – Implementation Grants

US EPA: Grant Funding to Address Indoor Air Pollution at Schools

US EPA: IRA Community Change Grants Program

US HUD Community Development Block Grant Program