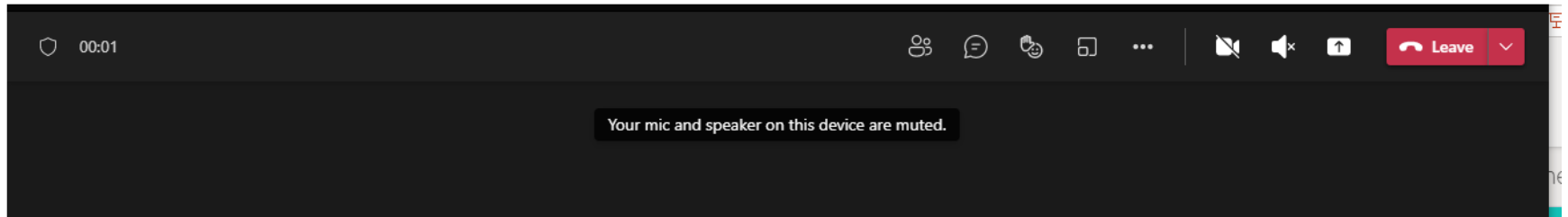


WELCOME TO THE Climate Change Vulnerability & Resiliency Plan Stakeholder Session - Identifying Priorities

The meeting will begin shortly

Engagement during this call

Please Note: This meeting is being recorded



Chat box – you can type comments or questions

Climate Change Vulnerability & Resiliency Plan Stakeholder Session – Identifying Priorities

February 15, 2023

Agenda

- Background Context
 - Importance of Studying Climate Change and Planning how to Adapt
- Timeline and Process Developing Study and Plan
- Today's Discussion
 - Current Reliability and Resiliency
 - Process of our Study and Plan
 - Climate data and models
 - Preliminary exposure analysis results
 - Vulnerabilities we are identifying to the electric system
 - Regional Concerns – Vulnerability Discussion
 - Working Group Overview

Meeting Purpose

New York State recently passed legislation requiring electric utilities to perform climate vulnerability studies designed to understand the impacts for the expected increase in severe weather due to climate change.

Following the study, utilities will prepare resilience plans detailing what changes are needed to prepare for harsher climate realities, including stronger storms, more flooding, temperature extremes.

The Resilience Plans will be reviewed and approved by the Public Service Commission.

The purpose of today's meeting is to tell you more about these new requirements and timeline as well as Central Hudson's efforts to respond.

An important part of our planning is to understand and incorporate local concerns and priorities. We will discuss with you today how we can organize those discussions.



NY Public Service Law §66(29) Effective 3/22/2022 and PSC Case 22-E-0222

Climate Change Vulnerability Study

- Establish “climate resilience working group” by 3/2023 to advise on Resilience Plan including municipalities, customer advocacy groups, and energy/environmental advocates
- Study Due September 2023
- Evaluate infrastructure, design specifications, and procedures to identify vulnerabilities
- Include adaptation measures to address vulnerabilities; feeds into Resilience Plan
- Study to be performed with supporting climate data from NYSERDA & Columbia University

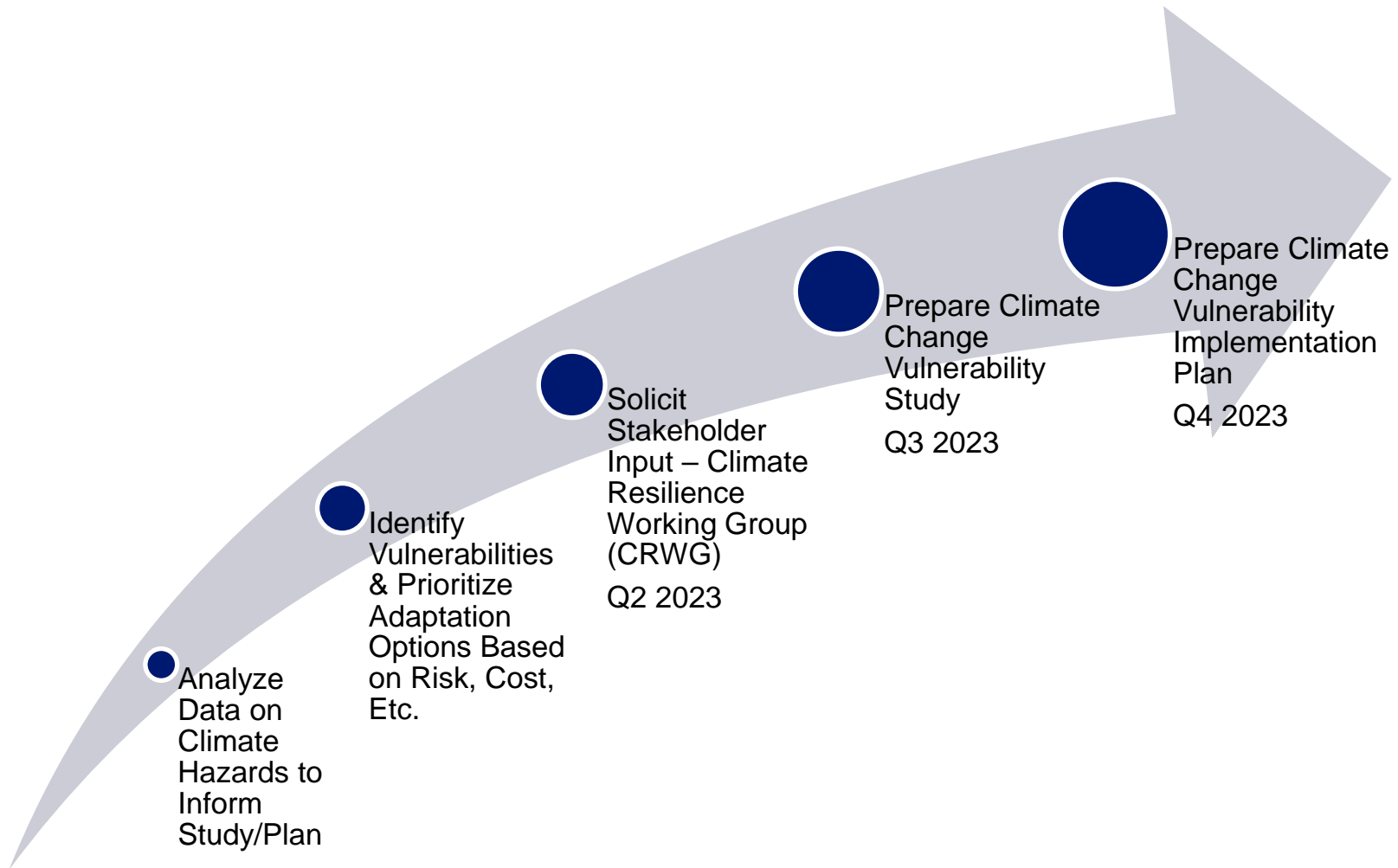
Climate Change Resilience Plan

- Due November 2023
- Propose storm hardening measures for next 10 and 20 years
- Detail how climate change reflected in planning, design, operations, & emergency response
- Address impacts on costs, outage times, potential for undergrounding lines, etc.
- Additional requirements the PSC may identify

PSC Review and Approval

- Within 11 Months of Filing Resilience Plan
- Stakeholder engagement into utility plans is an important component

Deliverable Timelines



A History of Strong Performance

- Reliability Performance – non-storm
 - 2022 Reliability Metrics:
 - Customers saw an average of 1.27 outages in 2022 during non-storm conditions versus target of 1.32.
 - Customers saw an average outage duration of 2.25 hours in 2022 during non-storm conditions versus target of 2.50 hours.

A History of Strong Performance

- Reliability Performance – 2022 storm activity:

Storm Date and Event Type		Impacted Central Hudson District					Customers Interrupted and Average Restoration Time:	
Date	Event Type	Catskill	Kingston	Pough-keepsie	Fishkill	Newburgh	Customers Interrupted	Average Restoration Time
2/4/2022	Ice		x	x		x	94,865	33 hours
3/7/2022	Wind	x	x				22,990	18 hours
7/12/2022	Wind/Rain	x					4,998	3 hours
7/13/2022	Thunderstorm/Tornado/Macroburst		x				13,300	21 hours
7/24/2022	Thunderstorm		x	x		x	39,067	16 hours
11/30/2022	Wind		x				1,716	8 hours
12/16/2022	Snow/Ice/Wind	x					3,586	6 hours
12/23/2022	Wind/Ice		x				4,123	9 hours

Current Reliability Initiatives

Reliability programs focus on upgrades to our infrastructure to make it less susceptible to storm damage resulting from high winds, icing and tree damage.

- Inspections and Maintenance – all assets inspected on a five-year cycle to identify damaged/weakened assets for maintenance or replacement
- Vegetation Management – addresses trees and limbs that have the potential to make contact with our electric lines; proactive program to address dead and dying vegetation affected by the Emerald Ash Borer and other tree diseases.
- Other significant reliability programs include: 10X Program/Customers Experiencing Multiple Interruptions (CEMI), Distribution Line Infrared Survey Program, Copper Wire Replacement Program, 4800V Delta Circuitry Upgrade Program.



Current Resiliency/Storm Hardening Initiatives



Resiliency/Storm Hardening Programs are designed to target the ability to continue to operate after interruptions and to recover more quickly following large outages.

- Distribution Automation Program, including Fault Location, Isolation and Service Restoration (FLISR)
- First-zone circuit hardening program
- Micro-grid technology

Study Approach and Plan Development

- **With the help of Utility Consultants and Climate Scientists**
- **With input from Stakeholder Engagement and Working Groups**
- **With Review and Approval by the Public Service Commission**



System Asset Exposure



Assess Asset Sensitivity



Determine Negative Asset Impact



Identify System or Asset Vulnerability



Recommend Measures to Address Impact



Perform Benefit/Cost Analysis

Forecasts and Inputs

Use of Consistent Data Sources

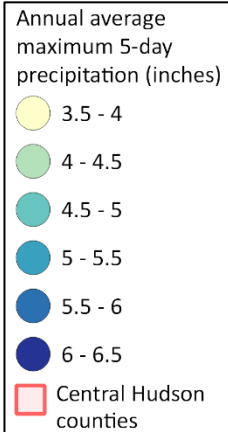
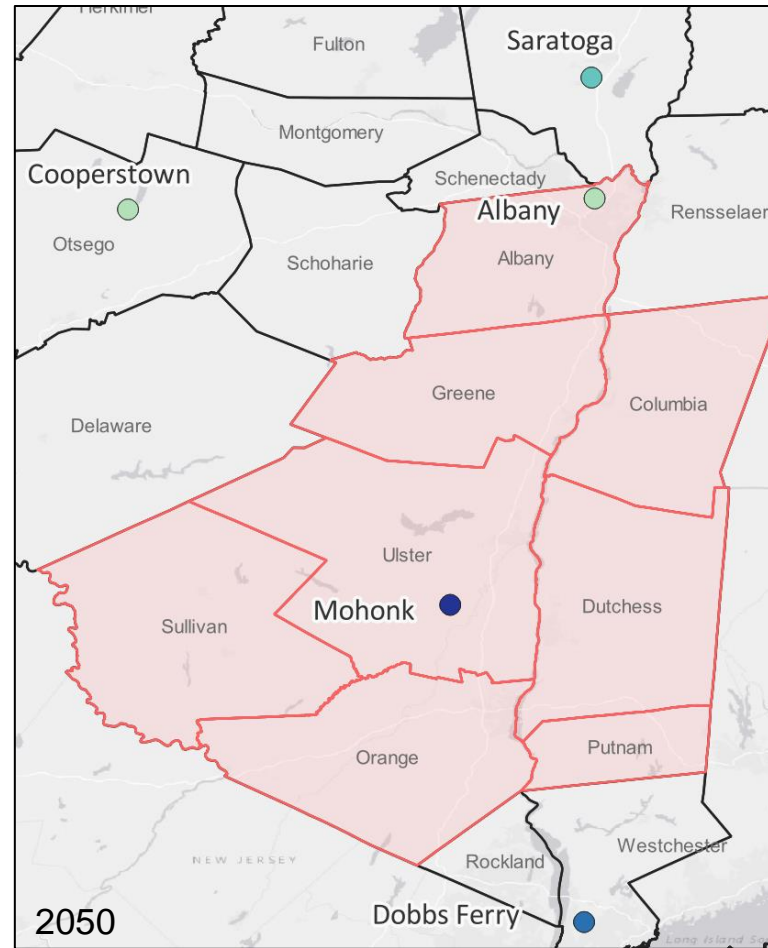
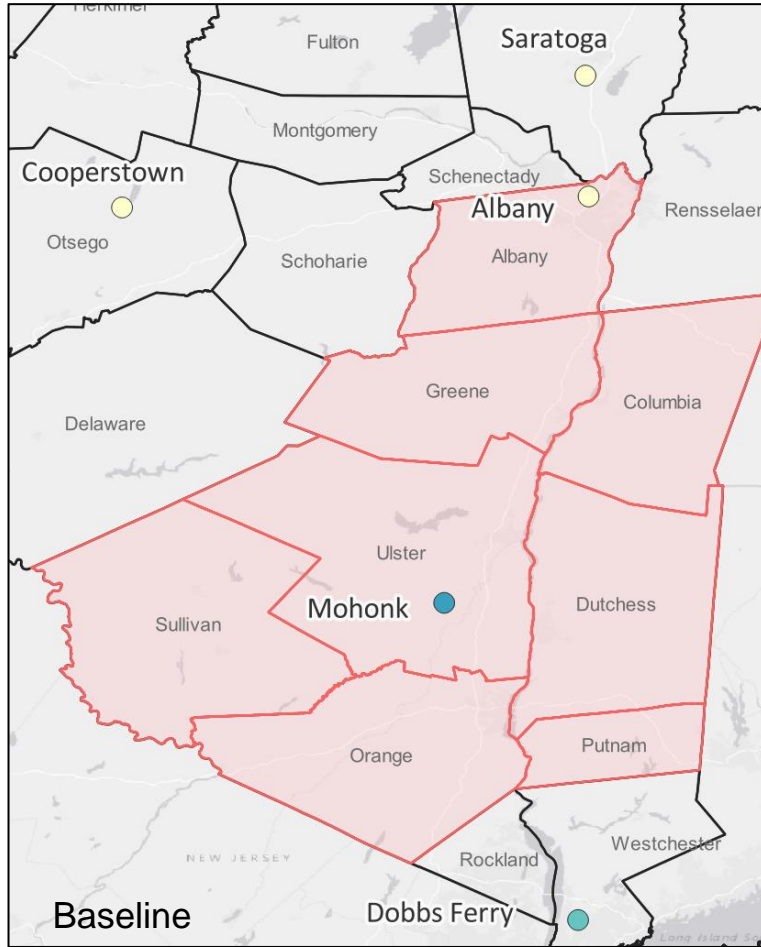
- Climate Data and Forecasted Changes
 - Support from Columbia University and NYSERDA
 - Central Hudson weather station data
- Existing Design Standards
- System Topology/Physical Locations

Elements of Climate Change

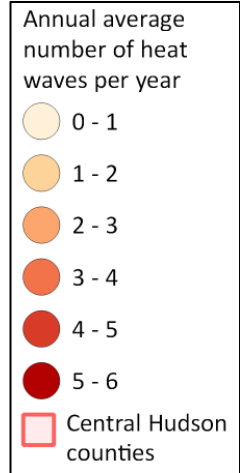
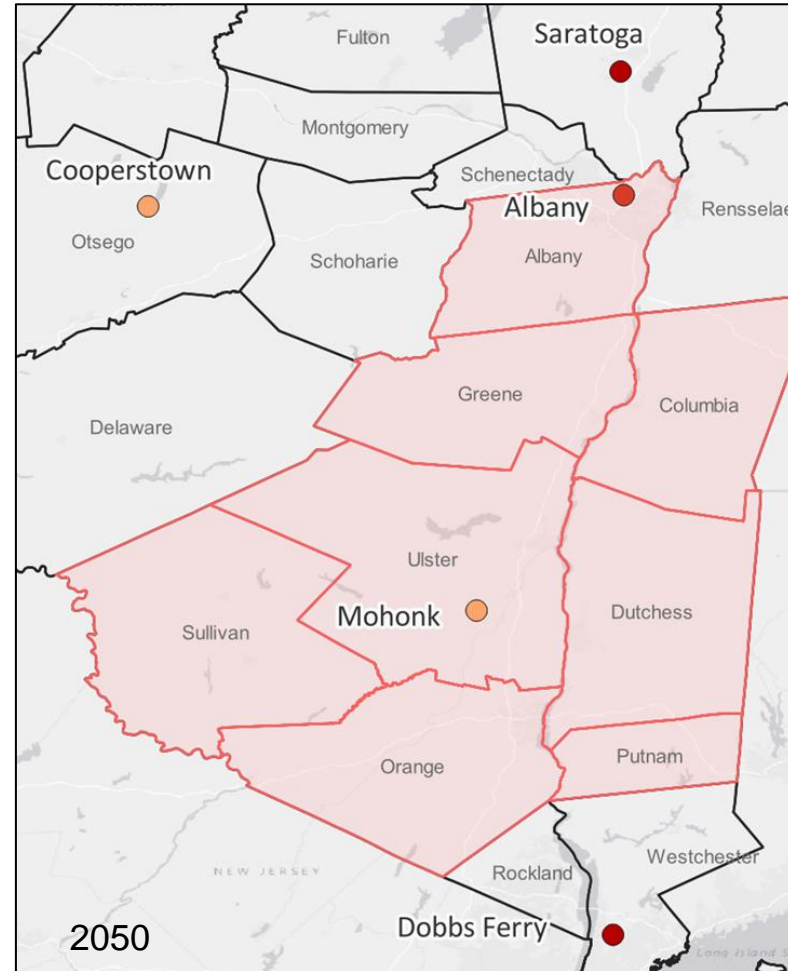
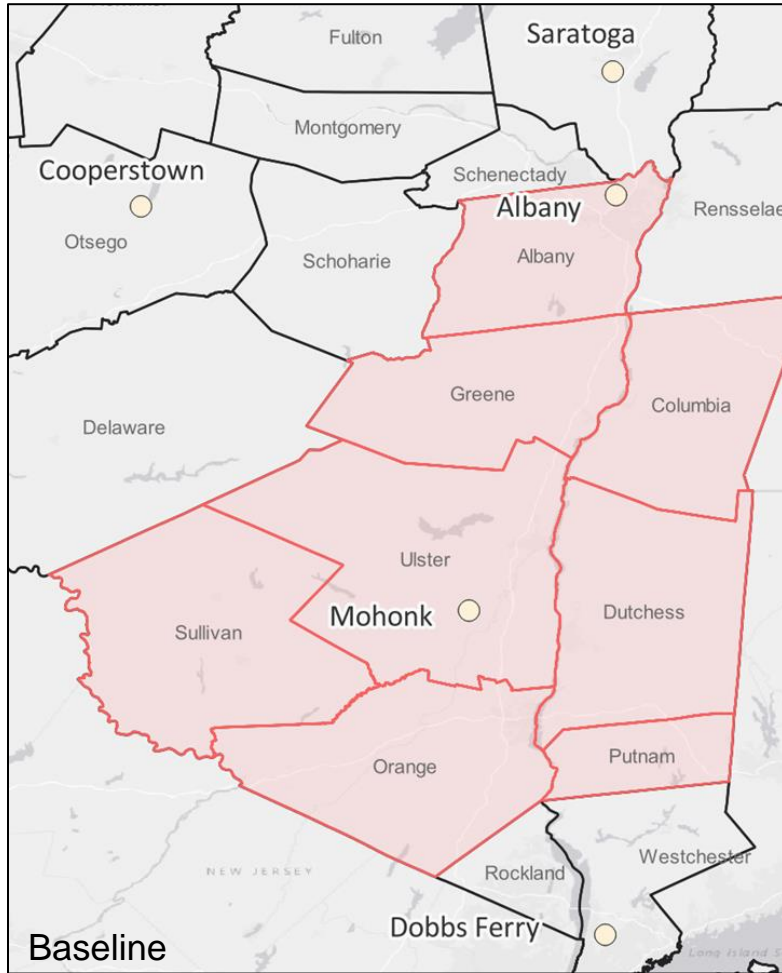
This is a New Type of Study Looking at

- Temperature Changes
 - Extreme heat/heat waves
 - Extreme cold
 - Monthly mean temperatures
- Precipitation Changes
 - Average rainfall
 - Coastal flooding/Storm surge
 - Icing
 - Drought
- Wind/Compound Storm Events
 - Frequency
 - Severity

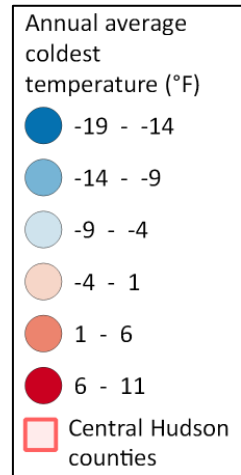
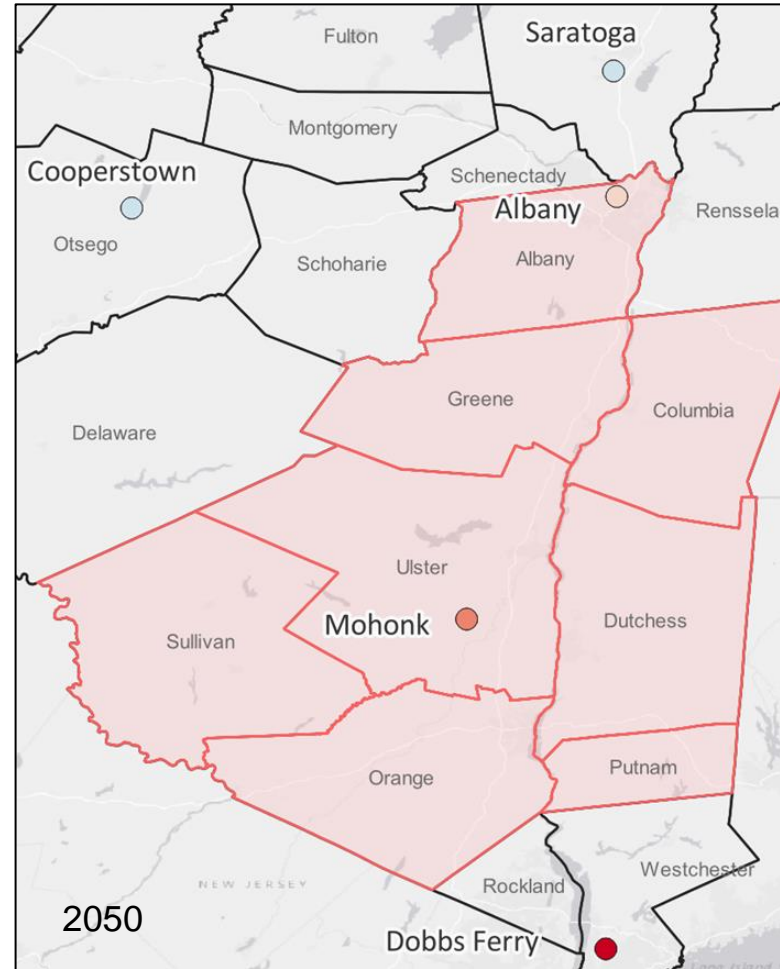
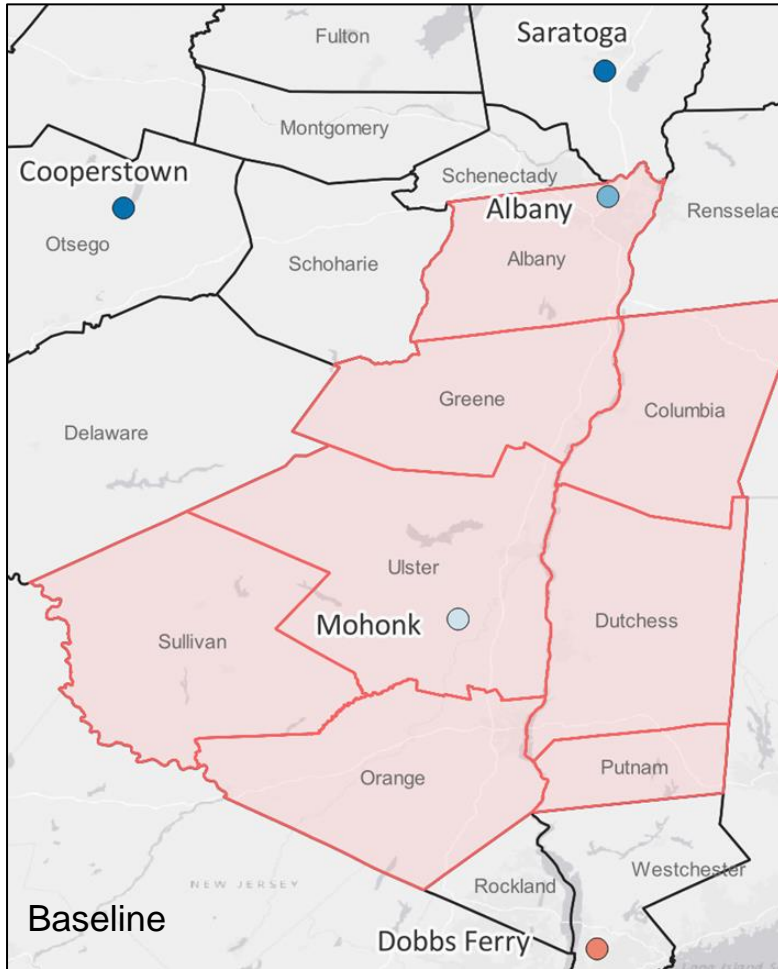
Preliminary Exposure Analysis Results: Intensified Precipitation



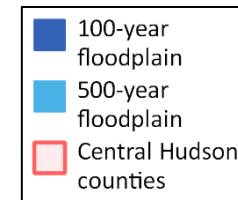
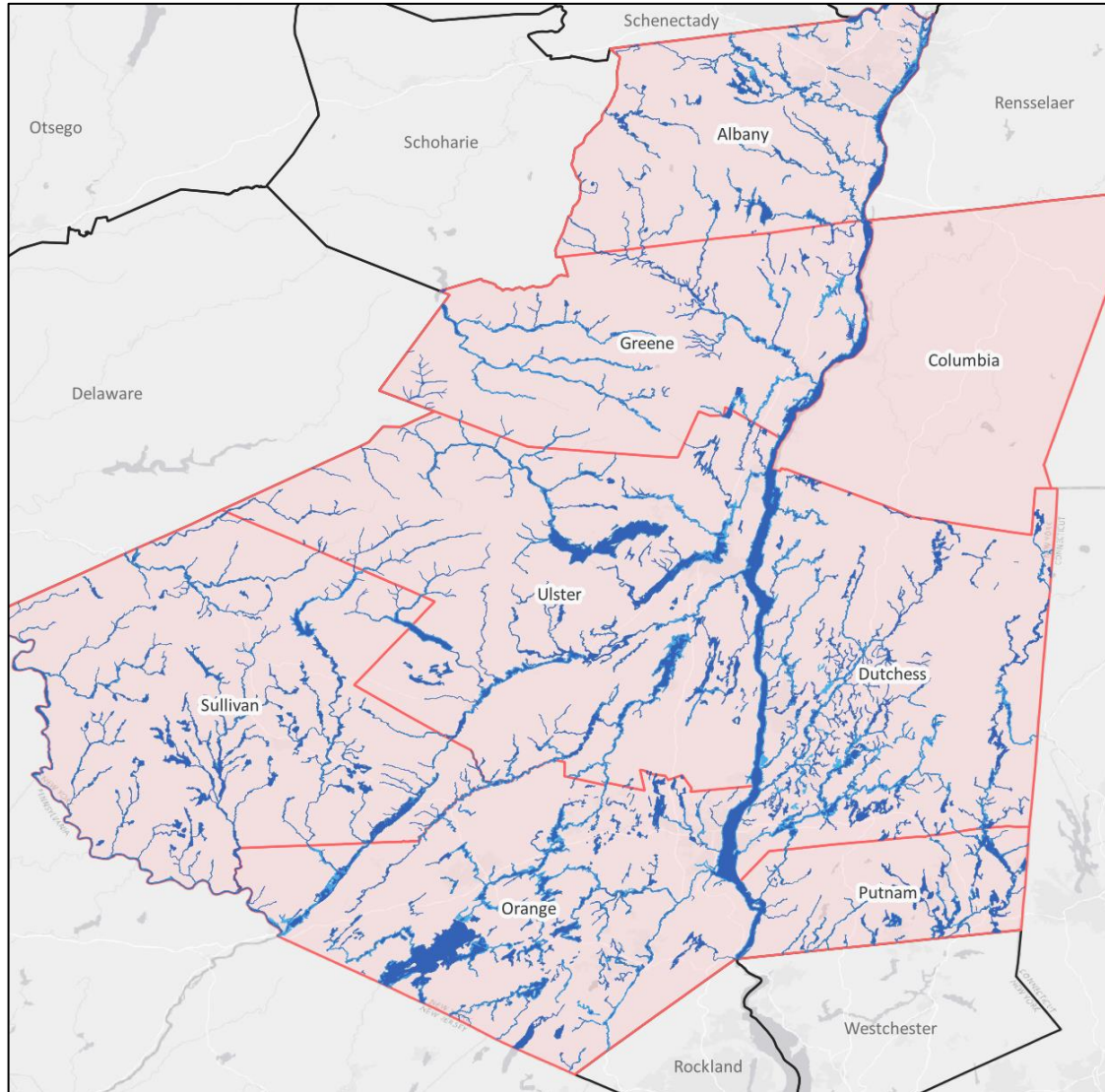
Preliminary Exposure Analysis Results: More Heat Waves



Preliminary Exposure Analysis Results: Warmer Winters



Preliminary Exposure Analysis Results: More Frequent Flooding



Vulnerabilities to Central Hudson's Electric System

❖ Transmission:

- Line structures (poles/towers)
- Conductors (overhead)
- Conductors (underground)
- Switching devices

❖ Substation:

- Transformers
- Voltage regulators
- Circuit breakers
- Instrument transformers (CTs and PTs)
- Reactors
- Controllers for regulators and LTCs
- Switching Devices
- Surge Arrestors

❖ Distribution:

- Poles
- Conductors (overhead)
- Conductors (underground)
- Transformers (overhead)
- Transformers (padmount)
- Voltage regulators
- Capacitors
- Switching devices
- Surge arrestors
- Reclosers
- Manholes



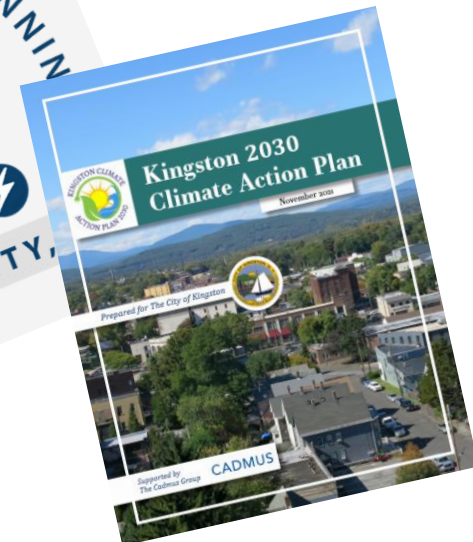
Word Cloud Poll

- We have initiated a poll in the Chat – in the poll – Write the Key Word or Phase that best describes your greatest concern related to climate change and community vulnerability.

A review of local concerns and priorities

- The Communities and Organizations have already made great strides in their study of Climate Change and Resilience.
- From the plans we have discerned the various hazards and concerns.
- Also, from the plans we highlighted potential vulnerabilities.

OPEN DISCUSSION



What we have seen from local and regional Climate Studies and Hazard Mitigation Plans – OPEN DISCUSSION

- Climate Concerns
 - Upland Flooding
 - Severe Windstorm
 - Severe Winter Storm
 - Hotter Summer Temps
 - Coastal Flooding
 - Short Term Drought
 - Rising Sea Level
 - Algal Blooms
 - Air Quality
- Vulnerabilities
 - Water Treatment
 - EMS facilities
 - Transportation Corridors/Bridges
 - Power Outages
 - Elderly Population
 - Water Supply
 - Manufacturing
 - Agriculture/Food Security

Climate Concerns Priority Poll

Of the common climate change threats – please identify the top four threats to your community or business

- Wind/severe storm
- Coastal flooding
- Storm surge/tidal
- Upstream/local flooding
- Extreme heat
- Extreme cold
- Icing

Stakeholder Engagement Roadmap



September 2022

- Initial Outreach to Create Awareness and Seek Preliminary Input

February 2023

- Local Community Feedback to Identify Priorities

Spring 2023

- Creation of the Utility Climate Resilience Working Group

Spring 2023

- Development of Stakeholder Feedback Loop in Draft Study and Plan

Fall 2024 and Beyond

- Reporting to Stakeholders on Plan Approval and Execution

Working Group Overview

- Provide a platform for open and constructive discussion of key issues affecting Central Hudson's climate resilience planning
 - Gather input and insights from external stakeholders and subject matter experts on strengths and gaps
 - Learn about parallel efforts and connection points
- This Working Group will meet at each step of the process through the fall of 2023

Working Group Next Steps

Kick off Climate Resiliency Working Group

- Looking ahead, we will be standing up Central Hudson's Climate Resilience Working Group in March 2023 to advise and make recommendations on the development and implementation of our resilience plan.
 - Feedback from this meeting and follow-up surveys will be the used as the basis for discussion in the Working Group meetings
 - I will be sending an invite, if you would like to participate in the Working Group, please let me or Jennifer know.
 - Also, if you would like to be taken off the list please let me know.

Additionally, if you or your organization would like to make your voice heard in the statewide proceeding, you can submit comments directly to the PSC by filing comments in the case number 22-E-0222.

Thank You



- Please watch your email the invitation to the Working Group effort
- Let us know any additional questions or contact us if you would like to discuss local or regional concerns
- Working together is crucial to our mutual success.