

Climate Resilient Communities Initiative Case Study: Albany County, New York

Overview

Albany County, situated in upstate New York, is bordered by the Hudson River to the east and the Mohawk River to the north, with several lakes throughout. The area has a humid continental climate, typical of the northeastern interior of the United States, with hot, humid summers and cold winters that bring significant snowfall. These conditions pose challenges, such as severe flooding, rising temperatures and landslides, that could increase in severity because of climate change. To address these issues, Albany County is actively working to mitigate climate-related risks and vulnerabilities.

To supplement the great efforts Albany County already has underway, AT&T saw a chance to contribute by sharing data from the Climate Risk and Resilience Portal (ClimRR).

Approach

In collaboration with Albany County, the AT&T and Project IN-CORE team visualized projections for increased risks from flooding, severe winter storms and landslides. These risks are amplified by rising precipitation, temperature fluctuations and topographical vulnerabilities. The team also identified targeted mitigation strategies to address the impacts of these climate changes. The analysis employed two forward-looking climate models: RCP 4.5, which represents a

Background: ClimRR and the Climate Resilient Communities Initiative

The [Climate Risk and Resilience Portal \(ClimRR\)](#) is a collaboration between AT&T, the Federal Emergency Management Agency (FEMA) and the U.S. Department of Energy's Argonne National Laboratory. The portal offers free, dynamically downscaled climate projections produced using Argonne's supercomputer.

ClimRR is based on peer-reviewed climate datasets and gives users highly localized future projections for temperature, heat index, precipitation/drought, wind, fire and flooding.

The Climate Resilient Communities Initiative puts ClimRR into action. Albany County is one of the communities selected to work with AT&T and a climate risk analyst at Project IN-CORE, an expert third-party organization. Through this program, Albany County received actionable insights on climate risks and mitigation strategies—tailored to their specific needs and vulnerabilities. Participants in AT&T's initiative receive an insights report describing local-level climate risks and mitigation strategies (which can be used to update a Hazard Mitigation Plan or similar documentation), tailored training on the ClimRR portal and communications support to spotlight their work integrating climate change into hazard planning.

scenario where human greenhouse gas emissions peak around 2040 and then decline, and RCP 8.5, which represents a worst-case scenario where emissions continue to rise throughout the 21st century.

Going beyond climate data, the analysis incorporated social and economic factors that influence a neighborhood's capacity to respond to identified climate hazards. ClimRR is designed for seamless integration with FEMA's Resilience Analysis and Planning Tool (RAPT), enabling users to access comprehensive data on community characteristics and social vulnerabilities. For instance, users can tailor an extreme heat analysis to focus on populations with disabilities, low-income communities or individuals over 65. The mitigation and response strategies are then customized based on the specific characteristics of the community that is being protected.

AT&T also offered training to Albany County on how to use the ClimRR portal.

Key Findings

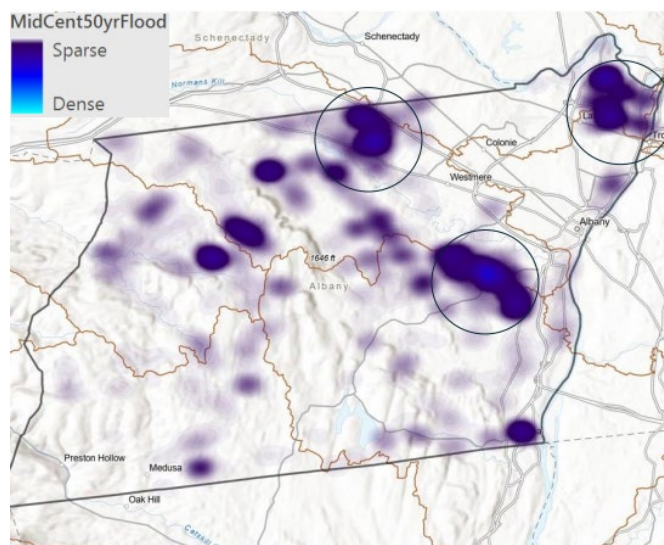
The [analysis](#) using the ClimRR data showed a mid-century projection (2045-2050) of climate scenarios modeled under different greenhouse gas emissions pathways (RCP 4.5 and RCP 8.5). Albany County is projected to experience a heightened risk from flooding, more severe winter storms and landslides.

Albany County will need a multifaceted approach to address these changing climate conditions in the future. Potential mitigation strategies could include:

Investing in upland water storage:

Riverine and pluvial flooding are expected to increase, particularly near the Hudson and Mohawk Rivers and around steep hills in western Albany County. The region faces increased precipitation under future climate scenarios, which could overwhelm water systems and lead to damaging floods in urban areas. To mitigate flood risk, Albany County should consider investing in upland water storage near river headwaters. This approach will help capture excess rainfall during heavy precipitation events, which will go a long way to reduce the volume and velocity of water flowing into downstream urban areas and help reduce flash flooding. Solutions like this will require inter-municipality collaboration for successful planning and execution as rivers that flow through urban areas often originate in a different municipality.

Flood Risk Areas

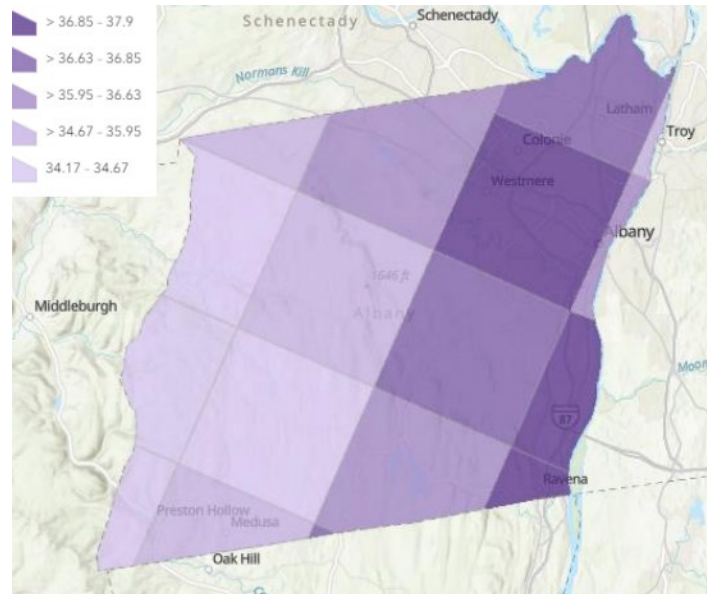


This map shows flood risk areas under the RCP 8.5 climate scenario for mid-century projections. Purple zones indicate high flood risk, particularly around the urban areas near the Hudson and Mohawk Rivers.

Enhancing winter road maintenance strategies and investing in infrastructure:

Albany County is prone to severe winter weather, and future projections indicate an increase in both frequency and intensity of winter precipitation. This is due to its location between air masses of polar and tropic air that collide around the county and form East Coast Nor'easters. Maximum temperatures will pass the freezing point while minimum temperatures will stay below the freezing point, which may lead to more freeze-thaw cycles and ultimately result in flood increases, higher frost weathering and more dangerous driving conditions through increased road ice. Enhanced winter road maintenance strategies, including plowing, de-icing and early snowmelt management, will be critical to ensure road safety. Investing in infrastructure, such as improved drainage systems, roadbed insulation and heated pavements to withstand the fluctuating freeze-thaw cycles, will help mitigate road damage and ensure continued transportation resilience.

Maximum Daily Temperatures in Mid-Century Model

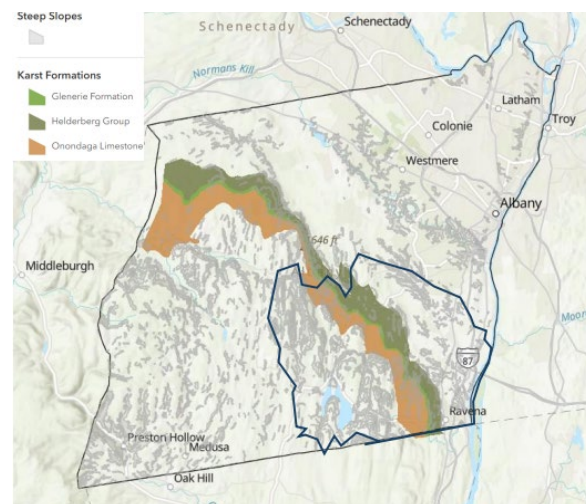


This map shows the maximum daily winter temperatures as Albany County approaches the mid-century mark and helps demonstrate how freeze-thaw cycle frequency is expected to increase in Albany County. Areas with higher increases in temperature are shown in darker shades.

Identifying and stabilizing vulnerable slopes through effective soil management:

Landslides are a growing concern in Albany County, especially in regions with steep slopes and unstable soil, such as areas containing karst formations (topography caused by the dissolution of carbonate-based rocks that form sinkholes and reservoirs) or clay-heavy soil. To reduce landslide risk, it will be prudent for Albany County to focus on identifying and stabilizing vulnerable slopes in clay-heavy areas. Strengthening soil retention and water management systems in these regions and monitoring for ground disturbances will help mitigate the risk of landslides triggered by heavy rain.

Landslide Risk Areas

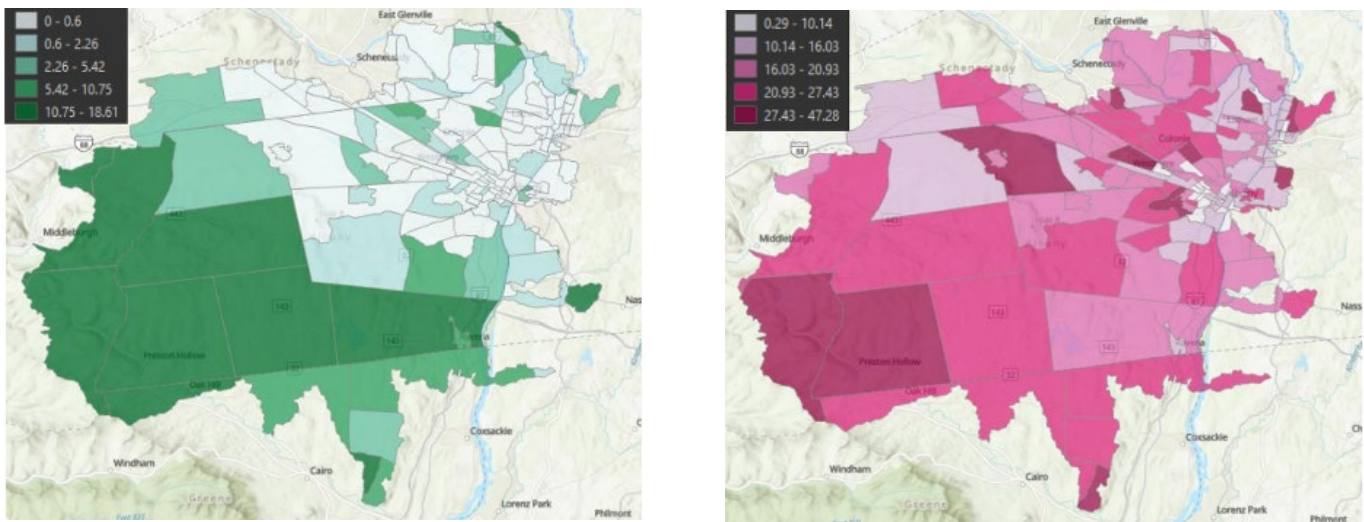


This map shows areas prone to landslides. Green and orange areas indicate areas with karst formations and grey areas indicate steep slopes and high landslide risk.

Protecting vulnerable communities:

Vulnerable communities—such as those living in mobile homes or those who are aged 65 or older—face heightened risk during flooding events and other severe weather events. These populations might face difficulties in evacuating during emergency events or lack the structural protection of more permanent housing. Albany County should consider social vulnerabilities in emergency response planning. This could include developing targeted evacuation strategies for older populations and reinforcing mobile home communities to withstand floods. Expanding community outreach and preparedness efforts will help ensure these populations are better equipped to handle extreme weather events.

Population in Mobile Housing / Population Age 65+



These maps show the percentage of mobile housing (green) and the percentage of the population aged 65 or over (pink) by U.S. census tracts

Testimonial

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“AT&T was able to provide Albany County with in-depth analysis and data sets that the County previously did not have the capability to produce. They focused in areas of the County’s Hazard Mitigation Plan update that were not emphasized prior to working with AT&T. Having this analysis and data will be tremendously useful when implementing hazard mitigation action items. The County will use the insights and data to work with municipalities and make them aware of the hazards that could put their communities at risk. Having concrete data sets that outline the risks and create the opportunity to mitigate these risks will be vital when urging municipalities to adopt and grow their mitigation efforts.”

Patrick Curran

Senior Sustainability Policy Analyst, Albany County, NY

About Project IN-CORE

Project IN-CORE (Interdependent Networked Community Resilience Modeling Environment) is a non-profit organization that provides technical support and consultation services for community resilience planning. The IN-CORE platform models the interconnected impacts of natural hazards to help communities make science-informed planning and policy decisions to lessen the impacts of hazards and enhance community resilience.