

Climate Change

Climate change is a shift in long-term weather patterns. Climate change is a reality of Ulster County’s future. Long-term data documents a significant increase in average temperature, and a significant rise in sea level that is consistent with observed and predicted global trends. While incremental rises in temperature and sea level over a one-year planning window are virtually undetectable, their cumulative impacts over perhaps several decades are expected to be virtually impossible to ignore.

Earth’s climate is warming as a result of three main factors: (1) increased emissions of greenhouses gases, (2) burning of fossil fuels, and (3) land use change. This warmer climate, in turn, melts ice sheets, ice caps, and glaciers; and warms ocean waters which expand with the elevated temperature thus increasing overall ocean volumes. Future projections of sea-level rise for the twenty-first century vary widely, ranging from several centimeters to more than a meter.

Climate change is not a hazard in and of itself; rather, it is a condition that will exacerbate the impacts of hazards. Climate change is expected to increase the frequency and intensity of natural hazards such as flooding, drought, wind, and wildfires. For each hazard profiled in Section 3a, the “probability of occurrence” subsections included information on climate change impacts on probability of occurrence. Impacts of the hazards themselves are discussed earlier in this Section 3c.

The New York State Hazard Mitigation Plan discusses climate change in *Section 3.4: Climate Change* (see **Appendix 3e.2**). Environmental variables vulnerable to climate change include: temperature (air, water, and ground), precipitation, water quantity/quality, snow/ice, sea level rise, storm frequency and intensity, humidity, evaporation, wind speed and direction. The plan states:

“Conditions related to climate change are expected to alter both average climate and the frequency and intensity of extreme weather events in New York State, which will, in turn, exacerbate what in the past were considered to be “expected” impacts and consequences of weather events. These conditions will significantly increase the risk to people, property, environment, and the economy.”

Governor Cuomo signed the Community Risk and Resiliency Act (CRRA) in September 2014. CRRA requires applicants for certain permit and funding programs to demonstrate consideration of future physical risks due to sea-level rise, flooding and storm surge. DEC is required by CRRA to adopt state sea-level rise projections. DEC proposed sea level rise projections in October 2015. Public comments were accepted through December 28, 2015. Finalization of the projections was still pending at the time of this draft (May 2016). While Ulster County is many miles inland from the Atlantic Ocean, its eastern border lands along the Hudson River are susceptible to the impacts of sea level rise because the river is still tidally influenced (all the way up to Troy, NY, in northern Rensselaer County). The Ulster County plan should incorporate more quantitative assessments of sea level rise impacts in future plan updates after state sea level rise projections become available.

The remainder of this subsection includes a qualitative discussion of climate change in Ulster County.

Impacts. Impacts of climate change and sea level rise are likely to be varied and widespread. In the years to come, it is anticipated that Ulster County will observe drastic changes in storm character, intensity, frequency, and storm tracking. Hurricanes are likely to become more intense with rising sea water temperatures. The following types of impacts can be anticipated in Ulster County’s future as a result of climate change and sea level rise:

- More frequent inundation of low-lying areas
- Increased frequency and extent of storm-related flooding
- Wetland loss
- Land loss through submergence and erosion of lands along the Hudson River due to sea level rise
- Increased salinity in estuaries and coastal fresh
- Impacts to human populations (property losses, more frequent flood damage, more frequent flooding of roadways and urban centers, risks to people as the population of coastal areas increases)
- More buildings and infrastructure exposed
- Currently exposed buildings and infrastructure could be subject to potentially greater losses as water levels increase, and continued rapid coastal development exacerbates the impacts of sea level rise
- Impacts on gravity flow stormwater systems
- Impacts on non-coastal areas

Impacts of climate change and sea level rise can affect all parts of a community, including: transportation infrastructure (ports, marinas, airports, roads, bridges, railways); public infrastructure (stormwater and wastewater management systems, drinking water supply and distribution systems, power utility systems, communications systems); public facilities (i.e., police, fire, ambulance, hospitals, schools, daycare centers, adult living facilities, historic landmarks, government buildings, libraries, parks, etc.); economic viability of a community – particularly for communities where tourism tends to drive local economies, as is the case in many of Ulster County’s Hudson River communities. Climate change and sea level rise could lead to a potential loss of assets that support tourism (i.e., Hudson River beaches themselves as well beach access points, lodging, restaurants, marinas, fishing habitats, ecotourism, etc.).

Adaptation Strategies. Implementing climate adaptation strategies in project design and routine permit and funding decision making will result in more resilient projects and safer communities to live, work and conduct business in. Types of actions to offset impacts come in four basic categories: protection, accommodation, adaptation, and retreat.

- **Protection** - structurally defensive measures that provide protection by preventing flooding/inundation (i.e., shoreline armoring, beach re-nourishment, streambank stabilization, dunes, dikes, levees)
- **Accommodation** - strategies that provide protection via altered design measures to accommodate water (i.e., building elevation, bridge elevation, stormwater improvements, floodproofing)
- **Adaptation** – modifying design standards, building codes
- **Retreat** - strategies that provide protection via the removal of existing, at-risk development and possible relocation to other areas that are not flood-prone (i.e., acquisition of vulnerable land for public ownership, transfer of development rights, purchase of development rights, rolling easements, conservation easements, zoning laws, disincentives to building in hazard areas, incentives to building in low risk areas, designating at-risk land as open space, or requiring critical facilities to be located outside of hazard areas.

While climate change and sea level rise are inevitable realities, there are ways that jurisdictions can plan ahead and take action to mitigate impacts.

- Prepare for more severe storms to be the new norm. Take this into account when implementing local ordinances and zoning changes, as well as when planning for emergency management
- Encourage development away from coastal areas that are at the greatest risk for being impacted by sea level rise due to climate change.
- Encourage the implementation of more natural mitigation techniques along the coast such as dune stabilization, while discouraging the use of, or designing ways to phase out the use of hard structures that ultimately increase beach erosion such as jetties, groins, and seawalls
- Encourage the use of permeable ground cover and stormwater management in planning designs
- Require buildings in floodplains to be on higher foundations (freeboard)
- Recognize increased flooding through 2050 by adopting a ‘floodplain planning zone’
- Adopt Coastal A Zone requirements in areas where waves may be 1.5 feet or higher
- Redelineate the landward boundary of Conservation Zone to coincide with the 2050 inundation area and reduce the allowed density (retain current zoning for existing villages)
- Recognize that wetlands will migrate inland, groundwater levels will rise, and saltwater intrusion will increase
- Modify on-site septic requirements to anticipate impaired performance as water table levels rise
- Require stream/tributary buffers or conservation easements
- Require planning for certain roads to anticipate more frequent flooding
- Anticipate that some buildings will need to be relocated, elevated on higher foundations, or abandoned

Re-evaluation. Mitigation strategies regarding development and redevelopment (particularly in the post-disaster scenario) presents an opportunity to rebuild in a stronger, more sustainable, and more resilient manner. Climate change adaptation strategies, particularly with regard to sea level rise, should be re-evaluated on a regular basis over the course of the plan maintenance phase - particularly when a community is devastated by a disaster, as strategies which may not have been economically, politically, or socially feasible in the pre-disaster scenario may have markedly different levels of community support.

Ulster County’s Climate Change Initiatives

Ulster County is committed to combating the effects of climate change through its sustainability initiatives, policies, and programs – which are among the most forward-thinking and aggressive in New York State. The County continues to pave the way for municipal governments in adapting in order to become more resilient and less dependent upon fossil fuels in the face of a changing climate. The County of Ulster is unique compared with the majority of counties within New York State in the fact that it has a “Department of the Environment”, which was formed in 2009. For more information on the Department, visit: <http://ulstercountyny.gov/environment/department-environment>

In 2015, Ulster County was nationally recognized by the USEPA for its commitment to the environment. Ulster County was awarded the “Green Power Leadership Award” for its obligation to green power use,

making it one of only eleven organizations nationwide to receive a Leadership Award for its green power purchase. Currently, Ulster County purchases 139 percent, or nearly 19 million kilowatt-hours (kWh), of green electricity from sustainable sources annually through a combination of renewable energy certificates and utility green power products. Ulster County's green electricity purchases yield an environmental benefit of avoiding the greenhouse gas emissions equivalent to burning 14 million pounds of coal or 30,469 barrels of oil. It was the first county in New York State to be net carbon neutral. Green power is zero-emissions electricity that is generated from environmentally preferable renewable resources, such as wind, solar, geothermal, biogas, eligible biomass, and low-impact hydro. Using green power helps accelerate the development of new renewable energy capacity nationwide and helps users reduce their carbon footprints (<http://www.epa.gov/greenpower/awards/>).

Earlier in 2015, USEPA ranked Ulster County 23rd nationally among local governments for green power use, and also recognized Ulster County as the only county in New York to obtain all of its electricity from renewable sources.

In addition to the recognition, Ulster County continues to lead the way in environmental stewardship by: being one of the first to ban the use of fracking fluid, prohibiting the use of polystyrene food containers to reduce impact on landfills, mandating the purchase of all County electricity from renewable sources, transitioning the entire Ulster County Area Transportation (UCAT) bus fleet to biodiesel fuel, installing electric car charging stations at County facilities for use by the public free of charge, and planning two utility-scale solar projects at the site of a former landfill and SUNY Ulster that will offset 27 percent of the total electricity usage of County government operations.

Additionally, Ulster County received the 2015 Achievement Award from the National Association of Counties (NACo) in the category of County Resiliency and Sustainability for the "Carbon Footprint Reduction Program." The program serves as an important model for other municipalities who wish to decrease energy consumption and reduce greenhouse gas emissions.

Recently, Ulster County established a "Green Fleet" policy to address the vehicles of the fleet under the control of the County in order to improve vehicle fuel efficiency and reduce greenhouse gas emissions. The Policy involves a number of different steps to reduce emissions, decrease costs, and increase efficiency. These include downsizing vehicles, optimizing vehicle use, incorporating efficiency into bid specifications, maximizing vehicle efficiency through maintenance and operation, eliminating vehicles; and, where possible, encouraging the use of transit systems, bike riding, walking, and telecommuting. Ulster County is committed to using electric, hybrid-electric, hybrid and sustainable green vehicles across the fleet.

As a result, Ulster County worked with 511NY Rideshare to develop "Ulster County Greener Commuting", a rideshare program for Ulster County employees, and used a NYSERDA grant to install nine Electric Vehicle Charging Stations at County facilities. Ulster County now hosts the largest network of municipally-sponsored charging stations in New York State. Charging stations are used by County fleet vehicles (electric and plug-in hybrids continue to be purchased) as well as by employees and the general public. Currently, 97 percent of Ulster County employees have access to electric vehicle charging at their workplace.

A list of significant resolutions and policies that have been adopted by the Ulster County Legislature and approved by the County Executive related to combating climate change at the local level include:

- Energy Smart Community Resolution- Resolution No. 218, June 10, 2004: Resolution Designating Ulster County as an Energy Smart Community

- Green Building Standards- Resolution No. 383, November 8, 2006: Establishing High Performance Green Building Standards for County of Ulster New Construction Projects
- Energy Efficient Office Procedures- SOP B.7.: “Energy Smart” Office Procedures from County of Ulster Standard Operating Procedures (SOP) Manual
- Climate Smart Community Pledge- No. 184, August 16, 2011: Climate Smart Community Pledge for the County Of Ulster
- Establishing a Green Fleet Policy – Resolution No. 296, August 18, 2015, Local Law No. 3 - Establishing A Sustainable Green Fleet Policy

In 2013, Ulster County unveiled the “Ulster County Government Energy Policy & Implementation Guidebook”, a collection of sustainability initiatives that was compiled to serve as guidance to all twenty-four (24) of Ulster County’s municipal governments while reviewing its own operations and considering ways to improve sustainability and combat climate change. The Executive Orders, laws, resolutions and procedures in the guide are meant to be used as templates, “first drafts” or as starting points for discussions among local law makers. Ulster County’s sustainability initiatives included in the guide cover green procurement, energy use and conservation efforts, nontoxic (or least toxic) landscape and building maintenance activities, integrative pest management, recycling and waste reduction efforts, fuel efficient vehicle purchase procedures, and transportation. The guide can be accessed online at: <http://ulstercountyny.gov/sites/default/files/documents/Ulster-County-Sustainability-Guide.pdf>

All the necessary paperwork has been submitted to the State so that within the next year, Ulster County will become a “Certified Climate Smart Community”. Additionally, the County Department of Environment will complete a Climate Action Plan for County Government, similar to the City of Kingston. These previous actions and future plans indicate the County’s strong commitment to combating climate change, becoming more efficient, and becoming more accountable to the taxpayers within Ulster County, NY.