

CLIMATE CONDITIONS AND PROJECTIONS

county's *Centers and Greenspaces Plan*. Recognizing that many ecologically significant areas occur beyond the areas traditionally considered unsuitable for building, the county developed a methodology for identifying agricultural lands or soils, scenic views, historic sites, forests, and wetlands, and then buffered these areas to account for zones of human disturbance from development and roadways. The width of buffers varies depending on development type and traffic volume data. The resulting *biodiversity blocks* measuring over 1,000 acres are a starting point for municipal planning efforts and can be supplemented with more detailed biological information from local sources.

Note that communities can also derive unfragmented habitat blocks from GIS data for habitats mapped during a biodiversity assessment study, such as those completed by Hudsonia Ltd. and many volunteer training groups. See [Appendix E](#), Biodiversity Assessment, for more information about habitat mapping methods.

Where to find help

See [Appendix A](#) for organization contact information, [Appendix B](#) for publications and web resources, and [Appendix C](#) for sources of GIS data.

[Green Infrastructure Center, Inc.](#)

[Evaluating and Conserving Green Infrastructure Across the Landscape: A Practitioner's Guide. New York Guide.](#) Outlines methodology for Ulster County intact habitat cores.

[Ulster County Department of the Environment](#)
Green infrastructure intact habitat cores data

[Dutchess County Department of Planning and Development](#)
Biodiversity block data

Background

Climate in the Hudson Valley region is temperate and variable, from warm summers bringing occasional heat waves and droughts to cold, snowy winters. Climate change has already affected the normal variability in weather patterns, and is projected to continue to significantly alter climate conditions in the future. It is important for municipalities to understand the risks posed by changing climate conditions, and how they relate to local natural resources and human health, as well as to the built environment. Increasing temperature, sea level rise, and variability in precipitation are the primary climate change-related hazards in the Northeast region. These hazards may pose significant risks to natural resources and human communities, namely through heat waves, drought, flooding, and poor air quality. Recognizing the value of natural resources as “green infrastructure” in devising climate adaptation strategies is essential.

Air temperature, sea level, and the frequency and intensity of extreme precipitation events are projected to increase through 2100 in the Hudson Valley region. For example, New York's annual average temperature has risen nearly two degrees Fahrenheit and winter temperature almost 5 degrees since 1970 ([Rosenzweig et al. 2011](#)). Sea level, which influences the Hudson River, has risen 15 inches in New York Harbor over the last 150 years. The Northeast has also experienced a 74% increase in the amount of precipitation occurring in heavy rainfall events between the periods of 1950-1979 and 1980-2009. These factors combine to create more frequent and severe heat waves, short-term drought, and flooding.

[Appendix F](#) provides projections for climate hazards and risks and an overview of how the NRI can contribute to strategies for building climate resilience at the local level.

What to include

Current and future climate conditions, including:

Air temperature: annual average and increase in annual average.

Sea level rise (if a Hudson riverfront community): inches of sea level rise and a map of sea level rise.

Precipitation: total annual precipitation, days with precipitation exceeding 1 inch, and days with precipitation exceeding 2 inches.

Extreme temperatures: days per year above 90 degrees F, days per year above 95 degrees F, number of heat waves per year, average length of heat waves, and days below 32 degrees F.



Slow-moving wildlife are especially vulnerable when crossing roads. © L. Heady



Sea level rise and storm surge threaten to increase flood risk along the tidal Hudson River and its tributaries. © C. Bowser

Air pollution sources can be mapped where relevant. There are three types of air pollution sources to include:

Stationary sources: incinerators, power plants, and many types of industrial and commercial facilities.

Mobile sources: cars, trucks, buses and planes.

Indirect sources: airlines or major highways that cause air pollution by bringing multiple mobile sources into a limited area.

Climate risks of specific importance to the municipality can be explained in the NRI report. For example, heat waves and short-term drought could be of particular concern for communities with significant agricultural activities or vulnerable populations such as elderly citizens. The NRI can include a section on strategies to manage natural resources in a way that mitigates these risks.

Where to find help

See [Appendix A](#) for organization contact information, [Appendix B](#) for publications and web resources, and [Appendix C](#) for sources of GIS data.

[DEC Office of Climate Change](#)
Climate Smart Communities Program

[DEC Hudson River Estuary Program](#)
Technical assistance

[DEC Regional Office](#)
Information on current air quality and standards

[Scenic Hudson](#)
Sea Level Rise Mapper

CULTURAL RESOURCES

Historical Resources

Background

Local history is intimately linked with natural heritage. Historic districts and individual sites often reflect the availability of natural resources that supported economic activities and a way of life that may or may not continue to exist. Many times, they are associated with significant natural areas or open spaces. Documentation of historic resources in an NRI can broaden understanding of how a community developed, what makes it interesting from a historical perspective, and illuminate how land-use patterns today reflect patterns of growth in the past.

The rural Hudson Valley landscape has many examples of historic features: prehistoric Native American settlements, colonial estates, Revolutionary War battlefields, bluestone quarries, parks and gardens designed by noted landscape architects, and vernacular barns, stonewalls, and other reminders of rural livelihoods in the past. Historic districts and sites establish a link with the past and help to provide a community’s sense of identity and stability.

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Hudson River lighthouse. © L. Heady

Guidance on conducting a historic resources survey is available from the New York State Historic Preservation Office (SHPO). Town libraries and historians are often excellent sources of historic resource information. Communities may have a municipal historical commission, historical society, or local preservation organization that maintains archives. Historical tax records and old maps can give clues to features of potential significance. The National Register of Historic Places and SHPO document historic districts and individual sites of local, state, and national importance.

What to include

Historic districts and individual sites listed on the New York State and National Registers of Historic Places, New York State Heritage Areas, National Heritage Corridors/Areas, and New York State Archaeological Sensitivity Zones are available in GIS

format on the SHPO website and can be viewed using the interactive web map. Significant historic sites can be listed and briefly described in the inventory report.

Historical maps can complement a current map of historic resources in the community. Historical USGS maps are available for download from the [Dimond Library](#) at the University of New Hampshire or can be viewed using USGS TopoView. Panoramic historical maps are available for download from the Library of Congress Panoramic Map Collection.

Detailed inventory studies

Historical features that relate to human use of natural resources, such as industrial sites and farms, can be identified and included in the NRI along with more traditional historical sites. Involve the local historical society in this aspect of the inventory. The results can be digitized or manually added to the inventory maps and described in the inventory. The Preservation League of New York State has funding for cultural resource surveys.

Where to find help

See [Appendix A](#) for organization contact information, [Appendix B](#) for publications and web resources, and [Appendix C](#) for sources of GIS data.

[New York State Historic Preservation Office](#)
State and National Registers of Historic Places
Archaeological information

[NYS Archives and Museum](#)

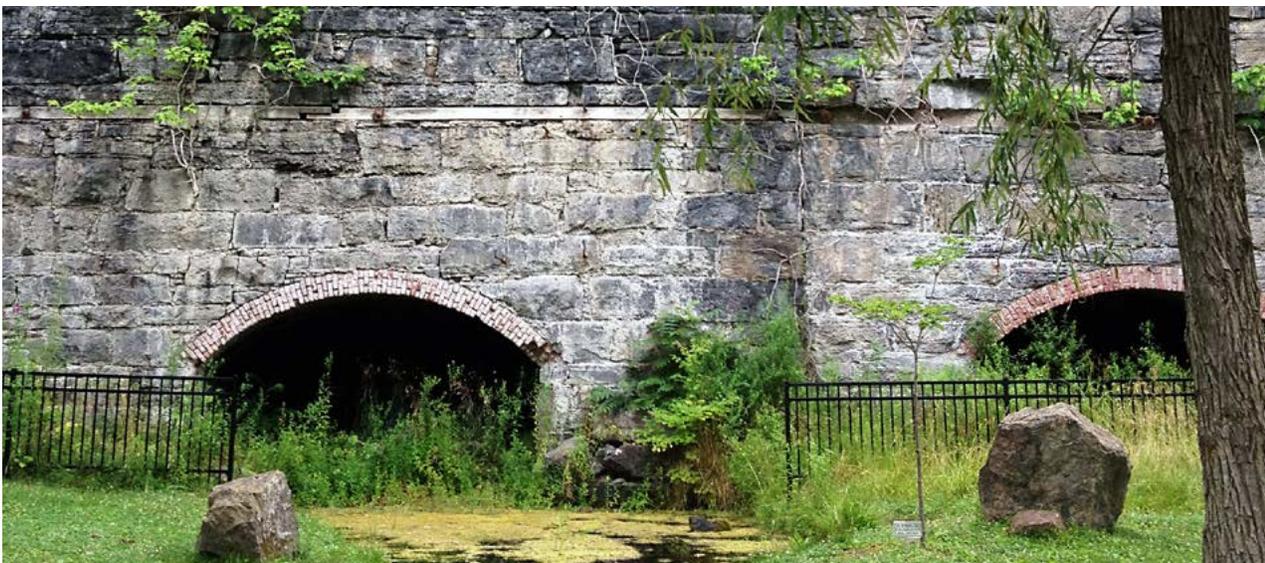
[Preservation League of New York State](#)
Technical assistance, grants

[US Geological Survey](#)
Historical topographic maps

[Library of Congress](#)
Online Panoramic Map Collection

Local sources

Historical societies, local preservation organizations, libraries, landowners



Kilns in Ulster County provide a reminder of the area's historical natural cement industry. © L. Heady



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Scenic Resources

Background

A community’s landscape defines its cultural, natural, and historic heritage. Scenic roads, waterfronts, prominent high points, river trails, special landscape features, and vistas of all kinds contribute to a community’s sense of place and aesthetic quality. They can also provide tourism-related economic opportunities for communities. Poorly-planned development can impact and undermine these values.

Preserving the integrity of scenic vistas requires consideration of both scenic views and the areas visible from them, which together comprise “the viewshed.” Identifying the full suite of scenic resources is the first step toward assessing potential impacts from development and determining strategies for protection.

What to include

Scenic Areas of Statewide Significance were developed by the NYS Department of State using a rigorous process to identify scenic resources in several Hudson Valley counties. The data are available on the [NYS GIS Clearinghouse](#).

The *New York State and National Registers of Historic Places* lists some scenic resources in the region. These often include unpaved roads and byways (e.g., Old Albany Post Road in Putnam County).

The *Scenic Byway Program* led by the New York State Department of Transportation recognizes significant scenic roadways, such as the Shawangunk Mountains Scenic Byway.

Information on regional and local scenic resources is available from a number of sources. Landscape Hudson Valley is an online mapping tool that includes selected scenic resources, developed by Hudson River Valley Greenway, Hudson River Valley National Heritage Area, and the DEC Hudson River Estuary Program.

Critical scenic resources often overlap with conserved areas such as state, county, and municipal parks, other

publicly owned land, and areas conserved by private groups such as land trusts. See the [Conservation and Public Lands](#) section.

At the local scale, municipal comprehensive plans sometimes describe specific scenic resources, such as agricultural fields, villages and their approaches, scenic roads, forests, etc. Locally-identified scenic resources will likely need to be digitized or manually added to maps.

Some municipalities have defined scenic resources by elevation, designating such areas for closer examination during SEQR reviews, based upon the assumption that ridgelines and other high spots are generally more visible and more vulnerable to potential erosion and other impacts from development.

Detailed inventory studies

A comprehensive inventory of local scenic resources can begin the process of prioritizing and protecting areas with scenic value or serve to update previous scenic resource identification efforts. Many methods exist to inventory and evaluate scenic resources according to a wide range of attributes, including physical features (e.g., farm structures), as well as measures of the diversity, pattern, disturbance, contrast, access, and other important aspects of scenic views. Community-led scenic resources inventories can be challenging because views are complex and their values are subjective and often elicit emotional reactions. However, priorities usually emerge as the community begins the process of identifying important scenic attributes.

The work group should determine the most appropriate criteria for assessing local scenic values and fully document methods. A survey of community residents can



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help identify important scenic viewpoints and their vistas or viewsheds. Consultants can help to carry out surveys, conduct viewshed analyses in GIS, or undertake the entire scenic resources inventory.

Scenic information can be added manually to an existing map or digitized for use in GIS. Scenic vistas can be marked as numbered point locations and listed in an accompanying descriptive table. Designated scenic roads can be shown by highlighting the appropriate section of road on the map. Photographs are useful components of scenic resources inventories, and can be included in the report that accompanies the inventory maps. Using GIS data layers, GIS providers can conduct a viewshed analysis from key vistas or multiple vantage points to determine the most visible areas.

Where to find help

See [Appendix A](#) for organization contact information, [Appendix B](#) for publications and web resources, and [Appendix C](#) for sources of GIS data.

[NYS Department of State](#)

[Scenic Areas of Statewide Significance data and website](#)

[NYS Department of Transportation](#)

[Scenic Byway Program](#)

[NYS Office of Parks, Recreation, and Historic Preservation](#)

[NYS and National Registers of Historic Places](#)

[Hudson River Valley Greenway, Hudson River Valley National Heritage Area, DEC Hudson River Estuary Program](#)

[Landscape Hudson Valley](#) (online map application)

[County planning departments and local land trusts](#)

Scenic resource identification

[Municipal comprehensive plans](#)

Scenic resource identification

Recreation Resources

Background

The Hudson Valley is well-known for the quality and variety of its recreational resources, which include hiking trails, camping areas, trout streams, mountains, white-water, rock-climbing, ski areas, lakes, ponds, wetlands, and the Hudson River estuary. Public lands such as the Catskill Park, state parks, county parks, and municipal parks, as well as private nonprofit conservation areas provide important recreational opportunities. In addition, some private landowners allow public access to their land for recreational purposes, e.g., snowmobile and hiking trails. Land-use changes, ownership changes, and misuse of recreational areas can threaten the availability of privately owned land for recreational use. Conversely, the expansion or creation of new parks and conservation areas and the rails-to-trails movement can expand access to public and private lands, provide new recreational opportunities, and help generate local tourism and economic growth.



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What to include

A base map showing publicly accessible conservation lands, municipal parks, and other recreation areas. See the [Conservation and Public Lands](#) section for mapping information.

New York State recreation amenities, including facilities, trails, and recommended public fishing access sites are available on the [NYS GIS Clearinghouse](#). Contact the DEC Bureau of Fisheries, Public Use Section for up-to-date information on DEC boat launches and the NYS Office of Parks, Recreation, and Historic Preservation for snowmobile trail data. These data can be supplemented with local information that can be digitized or manually added to the inventory maps.

Bicycle trails and routes are available from the New York State Department of Transportation website.

A tabulated list of recreation areas can be included in the written NRI report. Communities may have a local recreation commission that has documented information and county planning departments may have local recreation resources data.



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Detailed inventory studies

Local information. Recreation groups can be a valuable source of knowledge about the location of popular cycling routes, swimming holes, fishing spots, and other recreation resources. Trails for hiking, skiing, snowmobiling, and horseback riding may be maintained by local or regional groups that can supply maps and other information (e.g., snowmobile clubs). This information can be digitized or manually added to maps.

Unmapped local trails. Using a geographic positioning system (GPS), volunteers can walk, hike, or bike local trail networks to document their geographic coordinates and add the information to inventory maps.

Old and abandoned roads are often used for recreation, such as Class VI and discontinued roads. Topographic maps and aerial photographs can be used to map their locations. Some roads and railroad corridors are listed on the NYS and National Registers of Historic Places. It may be useful to record whether these roads are closed by gates, abandoned, or of unknown status.

Where to find help

See [Appendix A](#) for organization contact information, [Appendix B](#) for publications and web resources, and [Appendix C](#) for sources of GIS data.

[NYS Office of Parks, Recreation, and Historic Preservation](#)

State Parks, trails, snowmobile trails, and other amenities; roads and railroad corridors listed on the NYS and National Registers of Historic Places

[NYS Department of Environmental Conservation](#)

Trails in State Forests, Wildlife Management Areas, Unique Areas, Forest Preserve land, boat launches, and public fishing access sites

[NYS Department of Transportation](#)

[Bicycling in New York website](#)

[Hudson River Valley Greenway](#)

Technical assistance, grants

[NY/NJ Trails Conference, Rails-to-Trails Conservancy](#)

Trail information and assistance with planning trails

[New York Snowmobile Association](#)

Trail networks, list of local clubs

County planning department

Local data

Local recreation organizations and recreation commissions

LAND USE

Zoning and Tax Maps

Background

Local governments have the authority to enact zoning regulations to promote the public health, safety, and general welfare of their communities, among other purposes. Zoning is primarily enacted to control the use of land and the density of those uses, as deemed appropriate for the community. Zoning can encourage a variety of uses that are desirable, strictly regulate those that may



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