

Environmental Justice Mapping Tools for New York State Communities



This guide compiles a series of free, publicly available mapping tools that can be used by communities, educators, students, and environmental practitioners to help investigate and define their context and plan projects. As we explored each tool, we were guided by environmental justice concepts and how mapping can be a resource for communities to approach environmental issues that matter to them. Inclusion in this guide does not constitute an endorsement and NYSG cannot vouch for the accuracy of data within each tool.

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys: 1) the same degree of protection from environmental and health hazards, and 2) equal access to the decision-making process to have a healthy environment in which to live, learn, and work. (US EPA definition)

Why EJ?

- Directly connects people to the environment while centering the complex ways in which humans are impacted by their environments (i.e., human health, access to green spaces, quality of life)
- Recognizes that Black, Indigenous, and People of Color (BIPOC) and low-income populations are associated with higher exposure to environmental risks, such as exposure to pollutants, and have less capacity to adapt to climate risks, such as moving to another area or investing in adaptive measures.
- Empowers communities to have a voice in the decision-making processes that impact them.

Building context: EJ work must be contextualized at a local level by considering a variety of data including history and the lived experience of impacted groups. These tools provide access to different categories of data to help build that context. The tools described in this guide are organized by data category (i.e. EJ-focus, environmental, demographics, etc) based on the table on Page 2. Many of these tools contain several data categories but they were organized based on their primary intended use. Note that several tools contain data categories beyond what are listed in the table and this list is not exhaustive. Use these tools to explore and generate your own questions.

Demographics: Demographic information is key for identifying low income and minority communities. Several of these mapping tools use demographic information provided by the U.S. Census Bureau, which conducts the U.S. Census every 10 years to count and report characteristics of the entire population. The U.S Census Bureau also conducts the American Community Survey (ACS) every year for a smaller sample size to supplement Census data. Data is reported by geography. Tracts and block groups are reported in the tools listed below, and block groups are generally at a fine enough resolution to visualize how EJ show is up in different neighborhoods. While useful, the U.S. Census does have well-documented limitations that include undercounting BIPOC, revising racial categories over time, and a controversial history of racist policies (ex: [three-fifths compromise](#)).

Data quality and limitations: More detailed information for each mapping tool is available on the tool's website. When using online interactive mapping tools, it is important to consider the following questions:

- What is the resolution of the data and is it useful for my purposes?
- What organization is providing the data and are they credible?
- When and how was this data collected and/or what methods were used to produce this information?
- How can this information be combined with local and traditional ecological knowledge and understanding?
- What other data would be useful but is currently not available or accessible?

Tool	Data Coverage	Source Type	Data Category to Help Build Context							
			Has EJ component?	Environmental	Facilities Monitoring	Demographic	Native American	Health	Housing	Climate Projections
Environmental Justice (pg 3)										
EJSCREEN	National	US agency	X	X	X	X		X		
NY Potential EJ Area Maps	NYS	State agency	X			X				
Racial Equity GIS Hub	National	Private company	X	X		X		X	X	
Environmental and/or Facilities Monitoring data (pgs 4-5)										
DECInfoLocator	NYS	State agency	X	X	X					
Environmental Resource Mapper	NYS	State agency		X						
WATERS GeoViewer	National	US agency		X	X					
How's My Waterway?	National	US agency		X						
MyEnvironment	National	US agency		X	X			X		X
EnviroAtlas	National	US agency	X	X	X	X				X
Demographic Data (pg 6)										
Social Vulnerability Index (SVI)	National	US agency				X				
Racial Dot Map	National	Academic				X				
Cornell Program on Applied Demographics (various tools)	NYS	Academic				X		X		
Native American Territories (pg 7)										
Native Land	International	Nonprofit					X			
Tribal Directory Assessment Tool	National	US agency					X			
Health Data (pg 7-8)										
Asthma Emergency Department (ED) Visits and Hospitalizations	NYS	State agency						X		
NYS Heat Vulnerability Index	NYS	State agency		X				X		
Housing Data (pg 8-9)										
HUD-eGIS Open Data Storefront	National	US agency				X	X		X	
Mapping Inequality – Redlining in New Deal America	National	Academic							X	
Out of Reach	National	Nonprofit				X			X	
Climate Change and Resilience (pgs 9-10)										
Neighborhoods at Risk	National	Nonprofit				X				X
Flood Factor	National	Foundation								X
Climate Voyager	National	State agency								X
NY Climate Change Science Clearinghouse	NYS and National	Agency - academic	X	X	X	X				X
Local and Regional Tools (pg 11)										

Environmental Justice

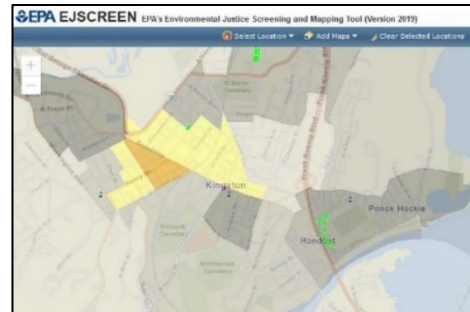
EJSCREEN: Environmental Justice Screening and Mapping Tool

Website: <https://www.epa.gov/ejscreen>

Organization: US EPA

Data: Demographic, environmental, and other

Overview: National environmental justice screening tool that combines demographic information (census block resolution) and environmental data to highlight potential places for further review. A Demographic Index is created by averaging minority and low-income variables. Environmental indicators are selected based on datasets collected by the EPA related to potential health effects and exposure to air pollution, lead paint, and proximity to waste and hazardous chemical facilities and wastewater discharge.



→ **Tips for use:** A great way to introduce EJ and start making connections between demographics, human health, and the environment. Explore map layers under 'Add maps.' 'Additional Layers' include location of schools, prisons, and public housing. Use the 'Select Location' function then 'select by census block group' to access statistical reports that can be used as a teaching tool, to raise awareness, and as supplemental data for grant applications. Export images of maps with a legend by selecting the 'Print' function. Check out EJSCREEN videos and technical documentation from the EJSCREEN website for more detailed information.

→ **Question to explore:** What locations might be good for planting trees based on what we know about the health impacts of poor air quality?

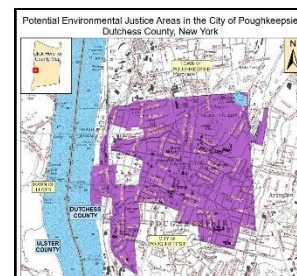
DEC Potential EJ Area Maps

Website: <https://www.dec.ny.gov/public/911.html>

Organization: NY DEC Office of Environmental Justice

Data: Demographic

Overview: Static PDF maps by county that delineate census block groups that meet set thresholds on race and household income in urban and rural settings. Note that maps use data from the 2000 Census.



→ **Tips for use:** These maps can be accessed online alongside other data using the interactive DECinfoLocator tool.

→ **Question to explore:** Do I live in an environmental justice community?

Racial Equity GIS Hub

Website: <https://gis-for-raciaequity.hub.arcgis.com/>

Organization: Esri

Data: Demographic, Health, Housing, other

Overview: Explore a growing collection of geospatial data sourced from the global GIS community and Esri's partners.

→ **Tips for use:** Lots of data and resources to explore, updated regularly. Internet Access map layers are very useful and at block group (high) resolution. Downsides are that only one layer can be viewed at a time, often at the county level (low resolution). You can draw many of the same conclusions from the other tools listed in this document. The [Health, Racial, and Economic Equity Data Viewer](#), organizes maps by useful "Group Categories" that include things like Health, Housing, Socioeconomic Risk Variables, and Transportation Access.

→ **Question to explore:** What non-government resources are available?

Environmental and/or Facilities Monitoring Data

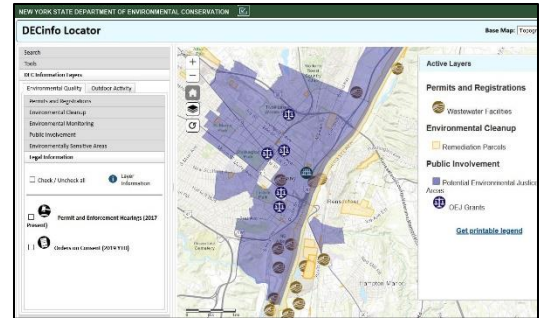
DECinfoLocator

Website: <https://www.dec.ny.gov/pubs/109457.html>

Organization: NYS DEC

Data: Environmental, Facilities Monitoring, Legal, Recreation

Overview: Provides enhanced access to DEC documents and public data about the environment and outdoor recreation resources. Contains over 65 data layers with more on the way. Layers include information on permits & registration, environmental cleanup & monitoring, public involvement, and locations for a variety of outdoor activities.



→ **Tips for use:** With the 'Public Involvement' Information layer, you can overlay DEC Potential EJ areas with other types of environmental quality and outdoor activity information in your area, and view all Office of Environmental Justice grants (OEJ Grants) layer.

→ **Question to explore:** What New York State-specific geospatial information can I use to understand and promote awareness about issues in my community?

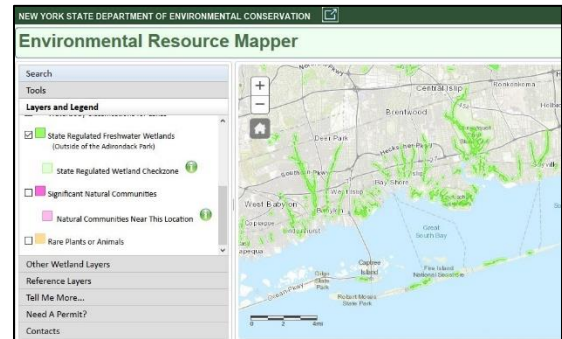
Environmental Resource Mapper

Website: <https://www.dec.ny.gov/animals/38801.html>

Organization: NY DEC

Data: Environmental, conservation-focused

Overview: Interactive mapping application that can be used to identify some of New York State's natural resources and environmental features that are state or federally protected, or of conservation concern.



→ **Tips for use:** A great way to learn about natural resources in your area that relate to water quality and habitat, including the locations of state regulated freshwater wetlands, and rare plants and animals. Reference layers contain political boundaries.

→ **Questions to explore:** Are there any state-regulated wetlands near me? Are there any in my watershed? (see 'How's My Waterway'?)

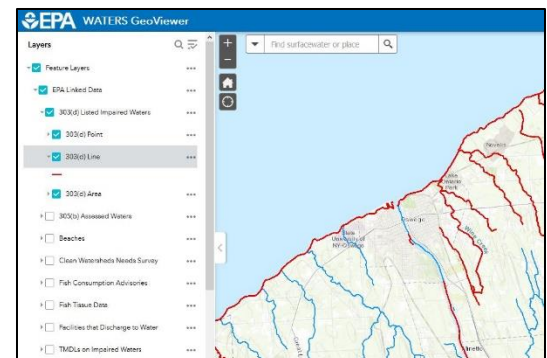
WATERS GeoViewer

Website: <https://www.epa.gov/waterdata/waters-geoviewer>

Organization: US EPA

Data: Environmental, water-focused

Overview: Interactive map that integrates water-related information such as local water features (from streams to hydrologic units) and access to EPA data, including: water monitoring sites, facilities that discharge to water, and fish consumption advisories.



→ **Tips for use:** Expand and turn on the 'EPA Linked Data' under 'Feature Layers' to start exploring. Expand and turn on the 'Surface Water Features' data to visualize how water flows through your watershed using 'Catchments' and 'Flow Direction'

→ **Question to explore:** Are there any 303(d) listed impaired waters near me?

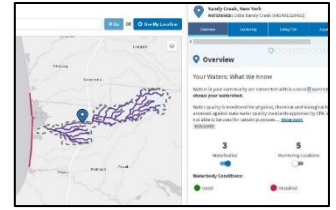
How's My Waterway

Website: <https://mywaterway.epa.gov/>

Organization: US EPA

Data: Environmental, water-focused

Overview: Designed to provide the public with information about the condition of their local waters based on data that states, federal, tribal, local agencies and others have provided to EPA. Water quality information is displayed on 3 scales: community, state and national and organized by topics that include swimming, eating fish, and drinking water.



→ **Tips for use:** The community scale is the most useful and provides a visualization of watershed by location.

→ **Questions to explore:** Where are boundaries of the watershed that I live in? Are there any impaired water bodies? Where do I draw my drinking water?

MyEnvironment

Website: <https://www3.epa.gov/myem/envmap/find.html>

Organization: US EPA

Data: Environmental, monitoring, health data, other

Overview: Designed to provide a cross-section of environmental information based on the user's location of monitoring related to facilities monitoring, air quality, surface water conditions, energy use, health data, greenhouse gas (GHG) emissions, climate impacts, and contamination sites.



→ **Tips for use:** Click through the icons at the top of the interface to dive deeper into each data category. Health data includes information on low birth weight, mortality, cancer risk. Climate data links to national reports and GHG calculators.

→ **Question to explore:** Is there a high rate of cancer or health issues related to the environment in my area?

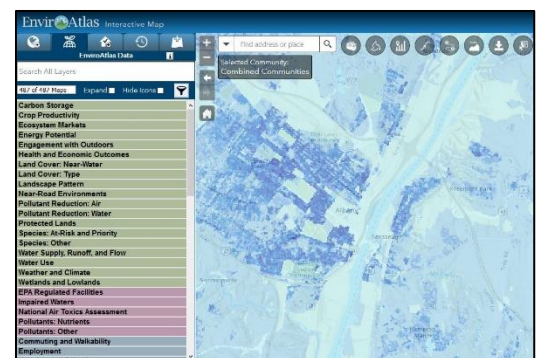
EnviroAtlas

Website: <https://www.epa.gov/enviroatlas>

Organization: US EPA

Data: Demographic, environmental, and other

Overview: Provides a suite of geospatial data, easy-to-use tools, and other resources related to ecosystem services, their chemical and non-chemical stressors, and human health. Includes EJSCREEN data plus collections for select locations, a range of data layers, demographic layers, climate change time series layers, and thousands of other datasets.



→ **Tips for use:** Works best in Mozilla Firefox browser and may take a few minutes to load. A huge amount of data has been consolidated into one place. Some useful layers under 'Add data' include EnviroFacts Facility Locations for in-depth EPA facilities monitoring information, EJSCREEN layers, National Land Cover Dataset (NLCD), USGS 3D Elevation (3DEP).

EnviroAtlas Data layers are organized by categories. Icons provide information about each layer with the ability to filter. Note that for most NY communities, it would be useful to filter for N - National dataset, as C - Community dataset is only available in large select cities (including NYC). Data type icon describes how data is summarized (aka resolution). Note that 12-digit HUC is not that useful for many types of data.

→ **Question to explore:** What can I learn about people, health, nature, and the economy in my community?

Demographic Data

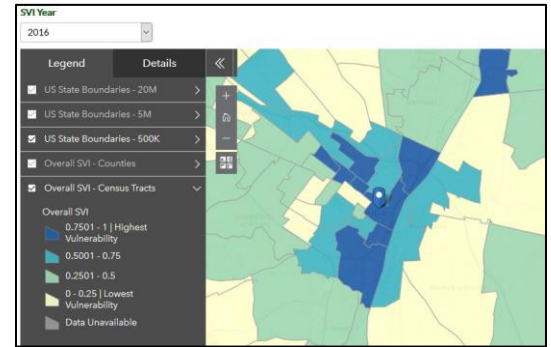
Social Vulnerability Index (SVI)

Website: <https://svi.cdc.gov/>

Organization: US CDC

Data: Demographic

Overview: Social vulnerability refers to the resilience of communities when confronted by external stresses on human health, stresses such as natural or human-caused disasters, or disease outbreaks. The SVI uses 15 census variables at tract level to help public health officials and local planners identify communities that may need support in preparing for hazards or recovering from disaster.



→ **Tips for use:** Zoom in to see data by census tract. In addition to an Overall SVI map, variables are grouped into 4 themes that can be viewed as separate maps: Socioeconomic Status, Household Composition and Disability, Minority Status & Language, Housing and Transportation.

→ **Questions to explore:** In the event of an evacuation, which neighborhoods might have less access to transportation? Which neighborhoods might need information in languages other than English?

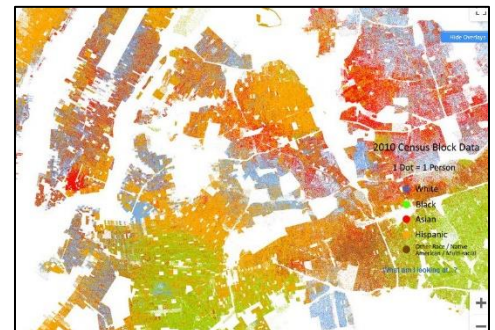
Racial Dot Map

Website: <http://racialdotmap.demographics.coopercenter.org/>

Organization: University of Virginia, Weldon Cooper Center for Public Service

Data: Demographic, race/ethnicity only

Overview: A quick and effective visualization of geographic distribution, population density, and racial diversity of the American people in every neighborhood in the entire country. Displays one dot for each person residing in the United States at the location they were counted during the 2010 Census. Each dot is color-coded by the individual's race and ethnicity.



→ **Tips for use:** This tool is simple and easy to use for a quick assessment.

→ **Question to explore:** Which areas are more racially/ethnically diverse in my community or region?

Cornell Program on Applied Demographics (multiple tools)

Website: <https://pad.human.cornell.edu/counties/index.cfm>

Organization: Cornell Program on Applied Demographics

Data: Demographic, health

Overview: The Program on Applied Demographics (PAD) brings skills in demographics, economics, statistics, data gathering and data analysis together to provide a variety of organizations with data, information, and advice.

→ **Tips for use:** Select 'Covid-19 Vulnerability' under 'Publications' for demographic vulnerability and health data. Select 'Maps' for displaying county statistics. Select 'NY County Profiles' under 'Publications' for more in-depth reports by county.

→ **Question to explore:** Is my community at a higher risk from COVID-19 impacts?

Native American Territories

Note: The following mapping tools are provided for educational purposes to help acknowledge and raise awareness of pre-settlement history. These maps likely contain inaccuracies and do not account for migrations and movements of native people. Native Americans continue to play a crucial role in the Environmental Justice Movement. There are 574 federally recognized Native American or Indigenous tribes in the United States.

Native Land

Website: <https://native-land.ca/>

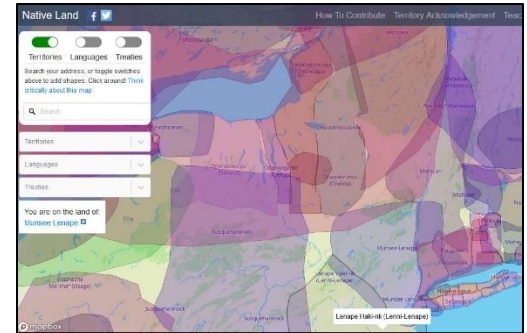
Organization: Native Land Digital

Data: Native American territory boundaries

Overview: An Indigenous led compilation of territory maps, language, and treaties information according to indigenous nations. Map does not represent or intend to represent official or legal boundaries of any Indigenous nations.

→ Tips for use: Check out the Teacher's Guide and Territory Acknowledgement. The territories represented here are at a fine resolution and contain overlapping boundaries.

→ Question to explore: Who lived here before European settlement?



Tribal Directory Assessment Tool (TDAT)

Website: <https://egis.hud.gov/tdat/>

Organization: US Department of Housing and Urban Development (HUD) and Office of Environment and Energy (OEE)

Data: Tribal contact information

Overview: Links tribes' geographic areas of current and ancestral interest down to the county level. Links to tribal website. It is helpful to know the territories in advance of using.

→ Question to explore: Is there a local tribal representative that I can reach out to?

Health Data

Asthma Emergency Department (ED) Visits and Hospitalizations

Website:

https://apps.health.ny.gov/statistics/environmental/public_health_tracking/tracker/index.html#/asthmaCounty

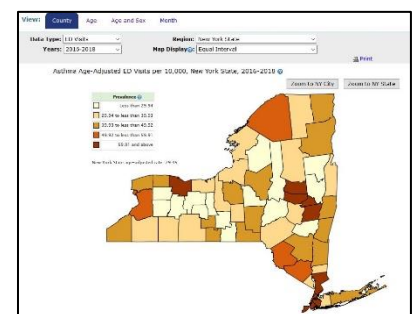
Organization: NYS Department of Health

Data: ED visits and hospital data

Overview: Asthma ED visits and hospitalization data identify a small percentage of people with asthma, those with the condition serious enough to require an emergency department visit or hospital stay.

→ Tips for use: Viewable at county level resolution only, so it is not that useful for understanding asthma rates at the municipal or neighborhood scale.

→ Question to explore: What is the asthma rate in my county?



NYS Heat Vulnerability Index

Website: https://www.health.ny.gov/environmental/weather/vulnerability_index/nys_maps.htm

Organization: NYS Department of Health

Data: Environmental, health-related

Overview: Static PDF maps by NYS municipalities

→ Tips for use: Viewable at municipal level resolution only and the index uses very low-resolution data. Are there better maps available for your area of interest?

→ Question to explore: What are some of the limitations of using data at this resolution?

Housing Data

Mapping Inequality – Redlining in New Deal America

Website: <https://dsl.richmond.edu/panorama/redlining>

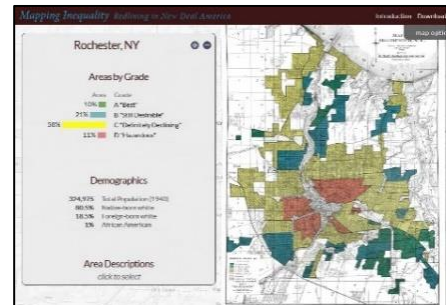
Organization: Collaboration of three teams and four universities

Data: Map archive

Overview: Archive of federal government Home Owners' Loan Corporation (HOLC) maps and documents. Maps were created between 1935 and 1940 and are georeferenced to an interactive map for major cities.

→ Tips for use: Compare historic redlined neighborhoods to potential EJ areas of today. Website contains several resources for further reading. For more precise digitized maps, check out the Esri version: [Home Owners' Loan Corporation \(HOLC\) Neighborhood Redlining Grade](#).

→ Question to explore: How does historic, race-based land use planning impact communities today?



HUD-eGIS Open Data Storefront

Website: <http://hudgis-hud.opendata.arcgis.com/>

Organization: US Department of Housing and Urban Development (HUD)

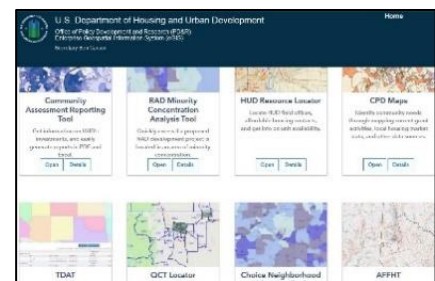
Data: HUD Housing Data

Overview: One-stop shop where users can search for and discover HUD's geospatial datasets, web-based mapping tools, and application programming interfaces (APIs).

→ Tips for Use: Explore communities with HUD Enterprise Applications.

These interactive tools are specific to HUD and contain a lot of jargon but may be helpful for communities to understand how they are tracked and provides local HUD-related housing resources. Registration required for some tools.

→ Questions to explore: Has my community been awarded HUD funding? Are they eligible for HUD resources?



Out of Reach

Website: <https://reports.nlihc.org/oor>

Organization: National Low Income Housing Coalition

Data: Housing and wage data

Overview: Out of Reach documents the gap between renters' wages and the cost of rental housing across the United States. The report's central statistic, the Housing Wage, is an estimate of the hourly wage a full-time worker must earn to afford a modest rental home at HUD's fair market rent (FMR) without spending more than 30% of his or her income on housing costs, the accepted standard of affordability. The FMR is an estimate of what a family moving today can expect to pay for a modestly priced rental home in a given area.

→ **Tips for Use:** From the homepage, scroll down to enter a zip code and learn the dollar amount for a two-bedroom Housing Wage. View New York state data for an in-depth look. Download state report for quick facts and county level data.

→ **Question to explore:** What is the two-bedroom Housing Wage for my zip code? What percentage of total households are renters in my county?

Climate Change and Resilience

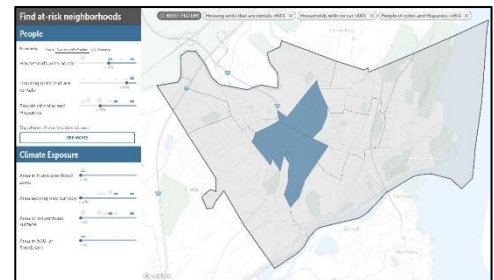
Neighborhoods at Risk

Website: <https://headwaterseconomics.org/apps/neighborhoods-at-risk/>

Organization: Headwaters Economics

Data: Demographics, climate exposure, climate projections

Overview: Designed to meet community planning needs, this tool generates customized, interactive maps and reports that describe characteristics of potentially vulnerable neighborhoods (by census tract). Additionally, Neighborhoods at Risk provides community-level climate projections for temperature and precipitation.



→ **Tips for Use:** The tool opens on the 'Explore neighborhoods' tab. The default shaded census tracts on the map represent tracts above the community median for the indicators selected on the left side of the screen. Add or remove demographic indicators under 'People' by selecting 'See More.' Adjust these along with 'Climate Exposure' indicators by using the sliders to filter the results based on which percentage of each census tract represents the indicator (ex: Show me the census block groups where > 50% of people are over 65 years.) Download a detailed socioeconomic report once you have the data filtered the way you want it.

On the 'Climate Projections' tab, high level climate information for temperature and precipitation is provided with a default of 25 years under Emission Scenario 8.5 (highest). Adjust these values as needed. Use the descriptions to communicate climate projections for your community.

→ **Question to explore:** Which census tracts in my community are above the community median in lacking tree cover and impervious surface? What is the sociodemographic make-up for these census tracts? What is the expected increase in extremely hot days in my community over the next 25 years under the higher emissions scenario?

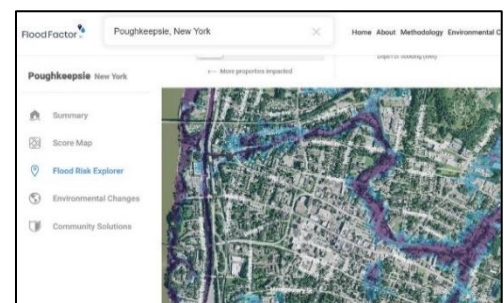
Flood Factor

Website: <https://floodfactor.com/>

Organization: First Street Foundation

Data: Climate projections, flood-focused

Overview: The first widely available online tool showing current and future flood risk at the property level, filling an important gap. Note that there is a lot of uncertainty that comes with a national environmental dataset that is reported at the property level. More detailed analysis should always be done on the local level to determine more accurate flood risk.



→ **Tips for Use:** Excellent potential as an educational tool at the community level and to learn about flooding and climate change. Provides helpful background information and offers community solutions.

→ **Questions to explore:** What geographic features might be contributing to future flood risk in your area? How can I access demographic data for these areas using other tools in this guide? (ie: EJSCREEN, Neighborhoods at Risk, SVI)

NY Climate Change Science Clearinghouse

Website: <https://nyclimatescience.org/highlights/maps>

Organizations: NYSERDA, NESCAUM, Cornell University Mann Library, NRCC, SUNY ESF, PRI, NOAA

Data: Various

Overview: A collection of interactive maps and climate change and related data for New York State.

→ Tips for Use: In the Interactive Map and GIS Viewer, users can select data layers to display from a menu. Suggest searching 'Featured Maps' by category. Several of the NYS and National coverage maps are part of this Clearinghouse. Enter a location into Advanced Search to find climate related planning documents.

→ Question to explore: How can my community plan for climate change?

Climate Voyager

Website: <http://climate.ncsu.edu/voyager/index.php>

Organization: State Climate Office of North Carolina

Data: Climate Projections

Overview: Explore historical temperature, precipitation, and drought data and future projections for your location under two different emissions scenarios. A three-map layout shows lowest likely to highest likely change with a time series below.

→ Tips for Use: View current and projected change in plant hardiness zones

→ Questions to explore: How do the different 'Layer options' that represent natural features (Ecoregions, HUC boundaries) relate to climate data and what I know of my location? How can this data be combined with other data to think about climate justice?



Other Climate Change Planning Tools

- Equity in Building Resilience in Adaption Planning (NAACP) Report: https://www.naacp.org/wp-content/uploads/2016/04/Equity_in_Resilience_Building_Climate_Adaptation_Indicators_FINAL.pdf
- The US Climate Resilience Toolkit: The Climate Explorer (NOAA Climate Program Office): <https://crt-climate-explorer.nemac.org/>
- The Climate Change Adaption Resource Center: Arc-X (US EPA): <https://www.epa.gov/arc-x>

Local and Regional Tools

New York City

- Waterfront Justice Project (NYC EJ Alliance): <https://www.nyc-eja.org/waterfront-map/>

Long Island

- Suffolk County, NY COVID-19 Community Impact Planning (Suffolk County Dept of Information Technology): <https://gis.suffolkcountyny.gov/portal/apps/opdashboard/index.html#/dafc9442e5284d6aa87155f8a834be5f>

Hudson Valley

- Hudson River Flood Impact Decision Support System Version 2 (CIESIN, Columbia University): <http://www.ciesin.columbia.edu/udson-river-flood-map/>
- Scenic Hudson Sea Level Rise Mapper: <https://scenichudson.maps.arcgis.com/apps/MapJournal/index.html?appid=3a3d0dc3884c4637ad0a51f4aa912189>
- Riverkeeper Water Quality Reports and Research Tools: <https://www.riverkeeper.org/water-quality/tools-databases/>

Great Lakes

- Great Lakes Lake Level Viewer: <https://coast.noaa.gov/llv/>
- Ecosystem Services and Economic Data in the Great Lakes: <https://coast.noaa.gov/digitalcoast/stories/gleam.html>

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Recommended Citation:
Kuonen, J; Miles, M. 2020. Environmental Justice
Mapping Tools for New York State Communities

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Please take a moment to complete our anonymous
survey to provide feedback and let us know how you are
using this guide.

[EJ Mapping Tools Survey](#)

