



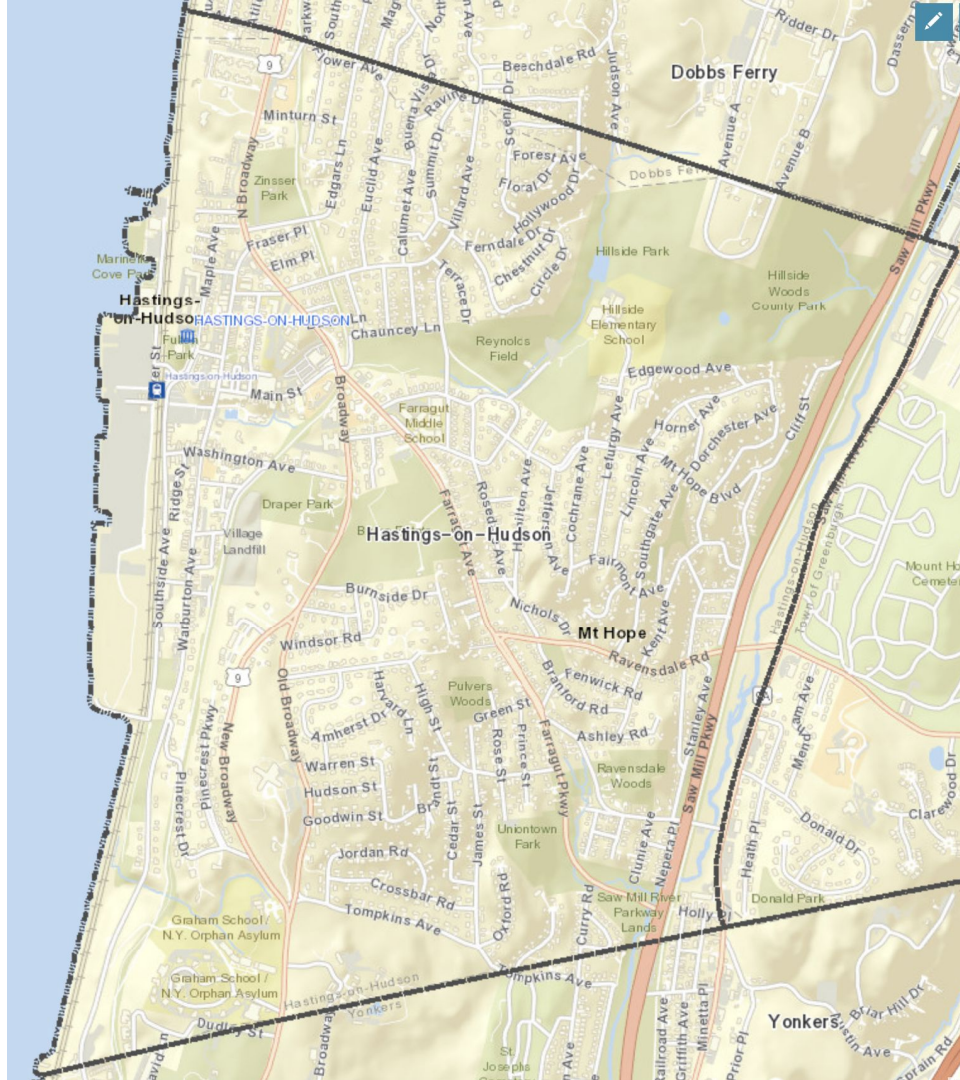
**Village of Hastings-on-Hudson
Climate Vulnerability Assessment**

Community Workshop Background Reading

Wednesday, June 3, 2020

Purpose

To review, discuss and identify the community assets in Hastings-on-Hudson that are most vulnerable to changing climate conditions so that action plans can be made to address them ahead of time.



Outline

To accomplish our goal, this 90-minute workshop will keep to a tight schedule:

- 1. Welcome from Trustee Mary Lambert** - 5 minutes
- 2. State of Local Climate Action from Kale Roberts** - 2 minutes
- 3. Top Climate Hazards + Q&A** - 18 minutes
- 4. Our Community Assets: Interactive Discussion and Polling** - 60 minutes
- 5. Closing** - 2 minutes

3. Top Climate Hazards

Residents' Concerns

Village Climate Vulnerability Survey

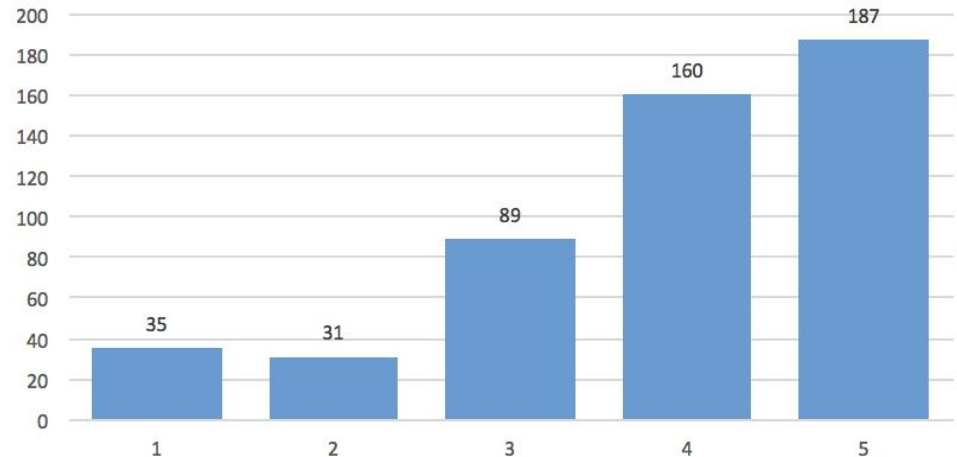
In March 2020, the Village conducted a public online survey to gauge residents' concerns about the impact that climate change may have on our community. A total of 535 people completed the survey, with the following summary of results.

How much of a threat is climate change to Hastings-on-Hudson?

(1 = minimal threat ; 5 = significant threat)

Result:

More than two-thirds (69%) answered "4" or "5"



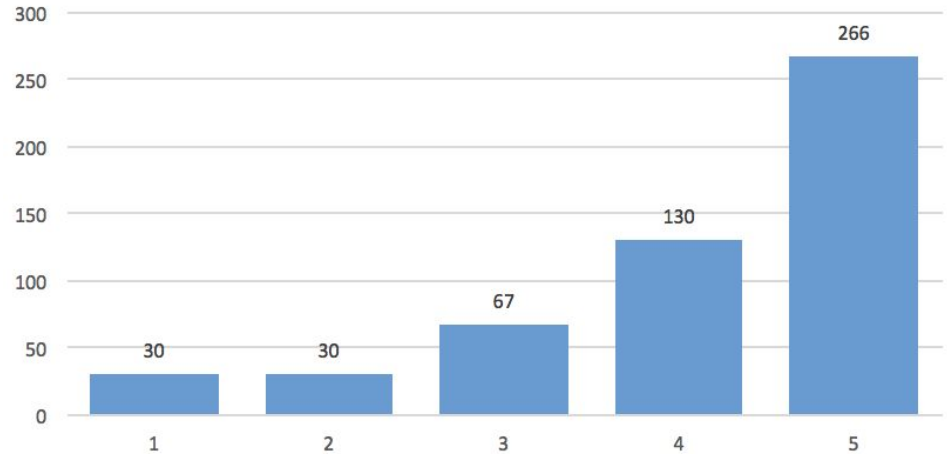
Village Climate Vulnerability Survey

How much focus should our community give to sustainability and adaptation to climate change?

(1 = minimal focus ; 5 = significant focus)

Result:

More than three-fourths (75%) answered “4” or “5”



Choose the top 5 climate hazards you believe will be most likely to have a future negative impact on our community.

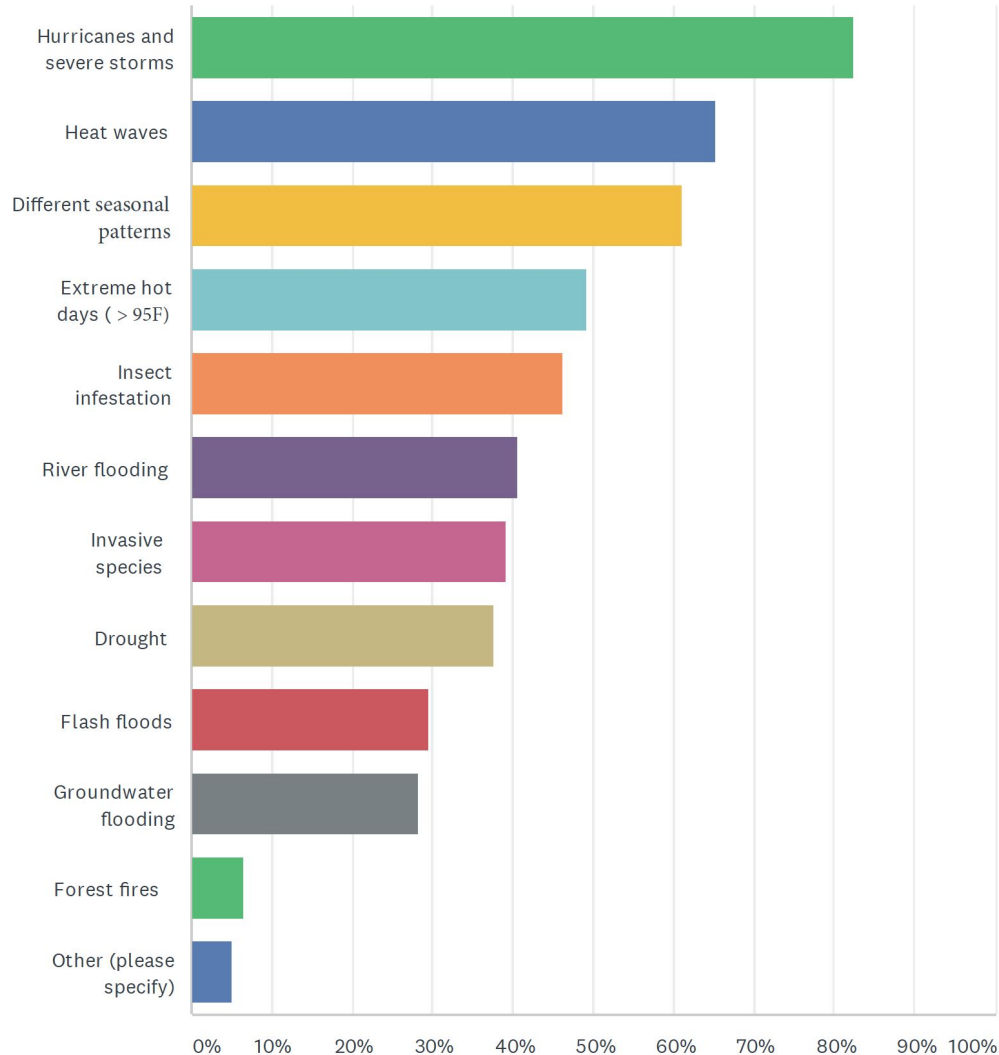
Results:

(Grouped into similar categories)

1. Severe storms and flooding
2. Heat waves and extreme heat
3. Insect infestation and invasive species

Top 3 “Other” responses:

- * Falling trees (from wind, age, disease)
- * Too many deer
- * Warm winters, no snow



Data and Forecasting

ICLEI Temperate Tool



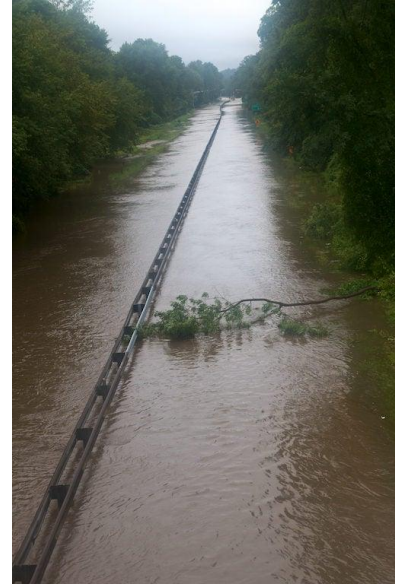
- International Council for Local Environmental Initiatives (ICLEI), now simply Local Governments for Sustainability
- Temperate accesses 22 temperature and precipitation climate indicators from:
 - NASA Earth Exchange Global Daily Downscaled Projections
 - University of California San Diego Localized Constructed Analogs
- Temperate averages 33 climate models from research institutions around the world
- Temperate suggests climate hazards based on the specific geographic location of Hastings-on-Hudson and findings from the 2014 National Climate Assessment

Our Top Climate Hazards

Top Climate Hazards for Hastings-on-Hudson

Between the results of the community survey and the data projections from ICLEI's Temperate tool, we've identified the following as the Village's top climate concerns:

- **Extreme Hot Days + Heat Waves**
- **Severe Storms + Flooding**
- **Insect Infestation + Invasive Species**



Climate Hazards: Extreme Hot Days + Heat Waves

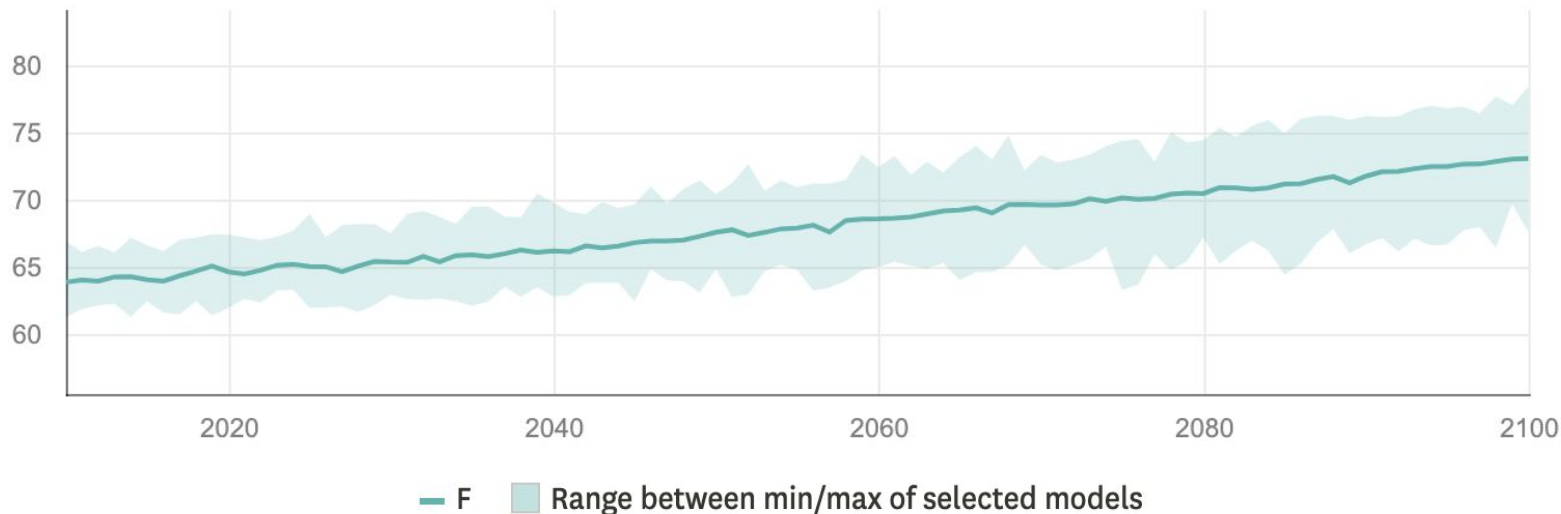
Relevant Temperature Indicators:

- Average High Temperature
- Maximum High Temperature
- Extreme Heat Events
- Heat Wave Incidents



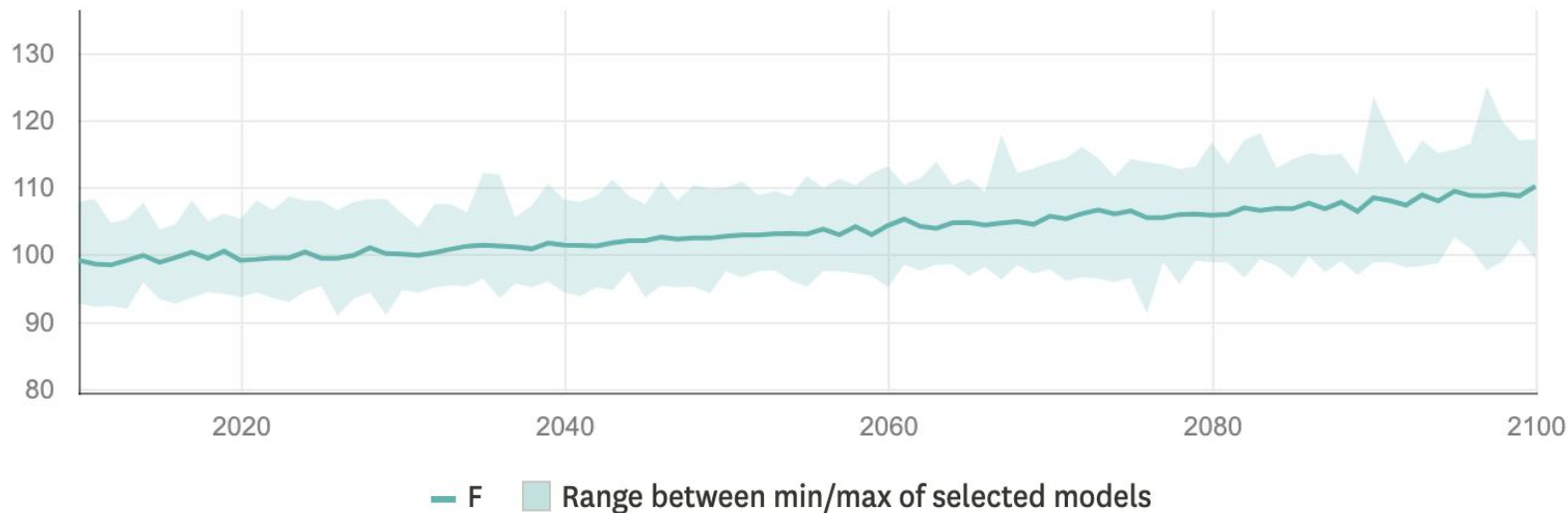
Climate Hazards: Extreme Hot Days + Heat Waves

- **Average High Temperature** — Aggregated average high temperature, generated from daily data using all requested models



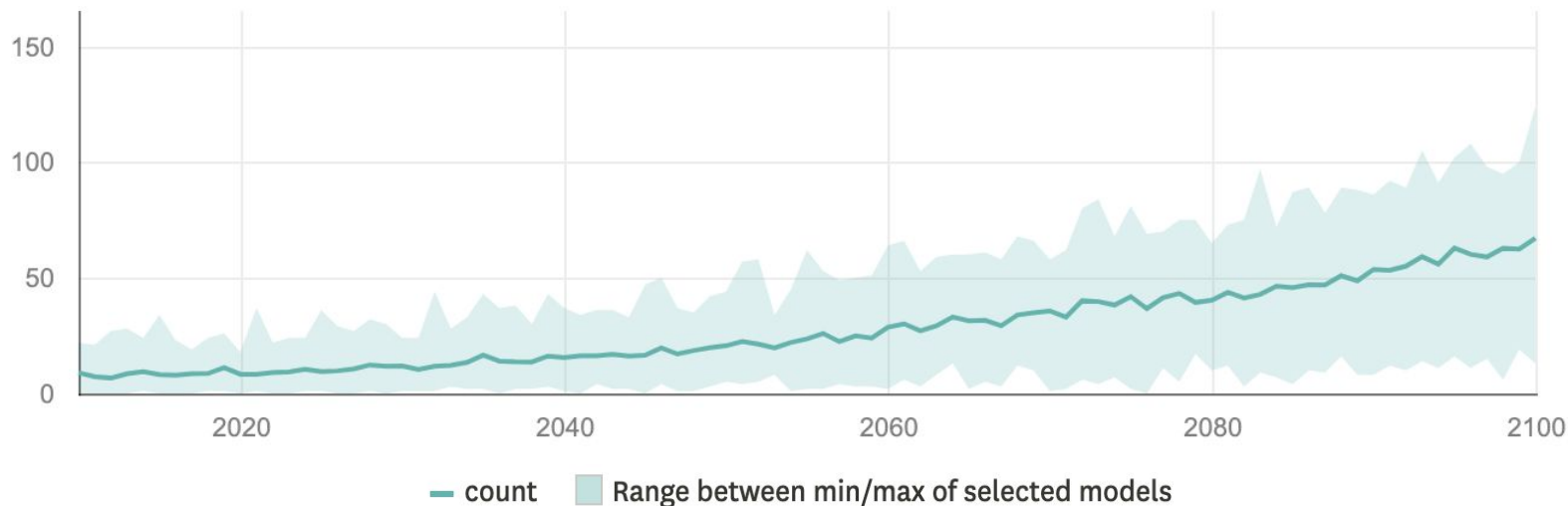
Climate Hazards: Extreme Hot Days + Heat Waves

- **Maximum High Temperature** — Maximum high temperature, generated from daily data using all requested models



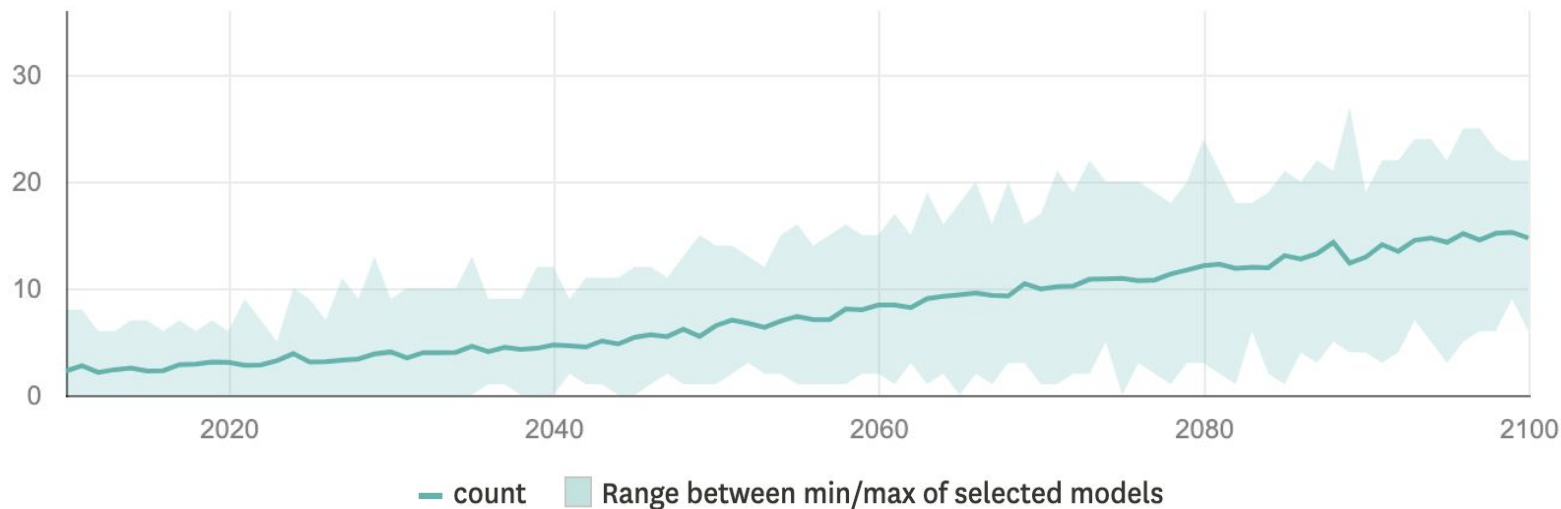
Climate Hazards: Extreme Hot Days + Heat Waves

- **Extreme Heat Events** — Total number of times per year daily maximum temperature exceeds the 99th percentile of historic observations, with historic base range year of 1971



Climate Hazards: Extreme Hot Days + Heat Waves

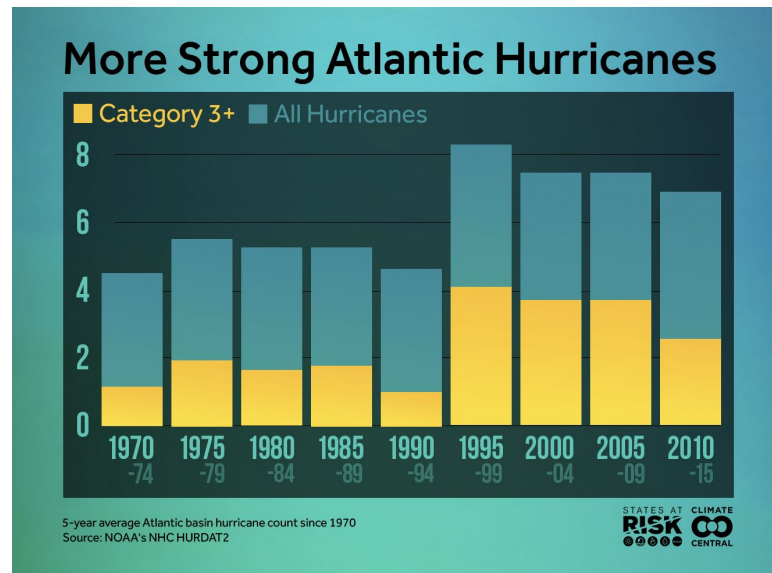
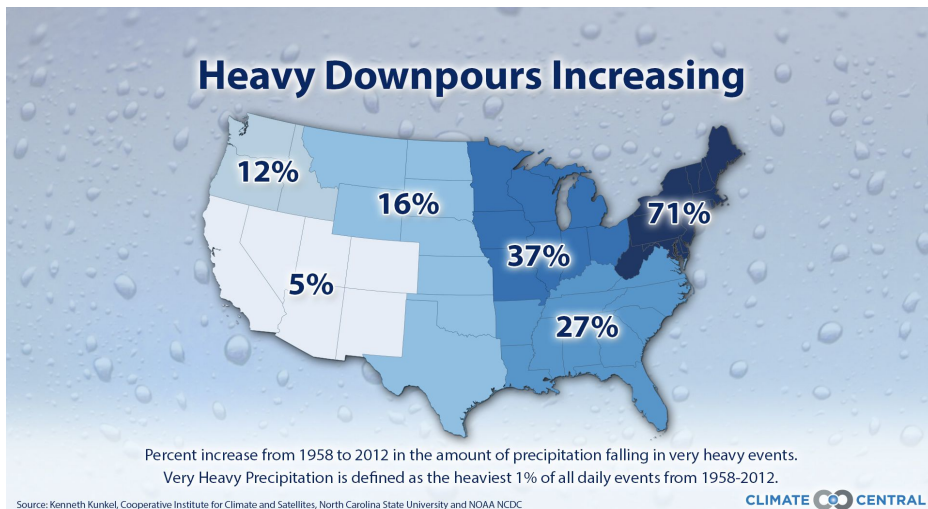
- **Heat Wave Incidents** — Number of times daily high temperature exceeds 90 degrees F for at least 5 consecutive days.



Climate Hazards: Severe Storms + Flooding

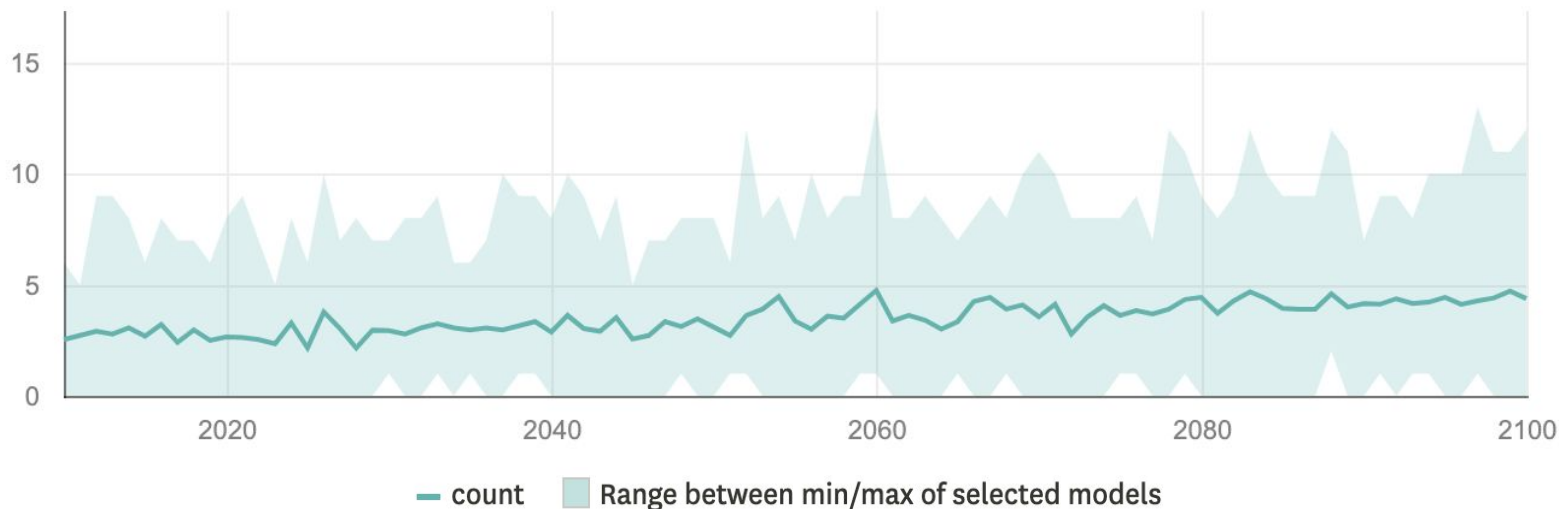
Relevant Precipitation Indicators in Temperate:

- Extreme Precipitation Events
- Precipitation Threshold



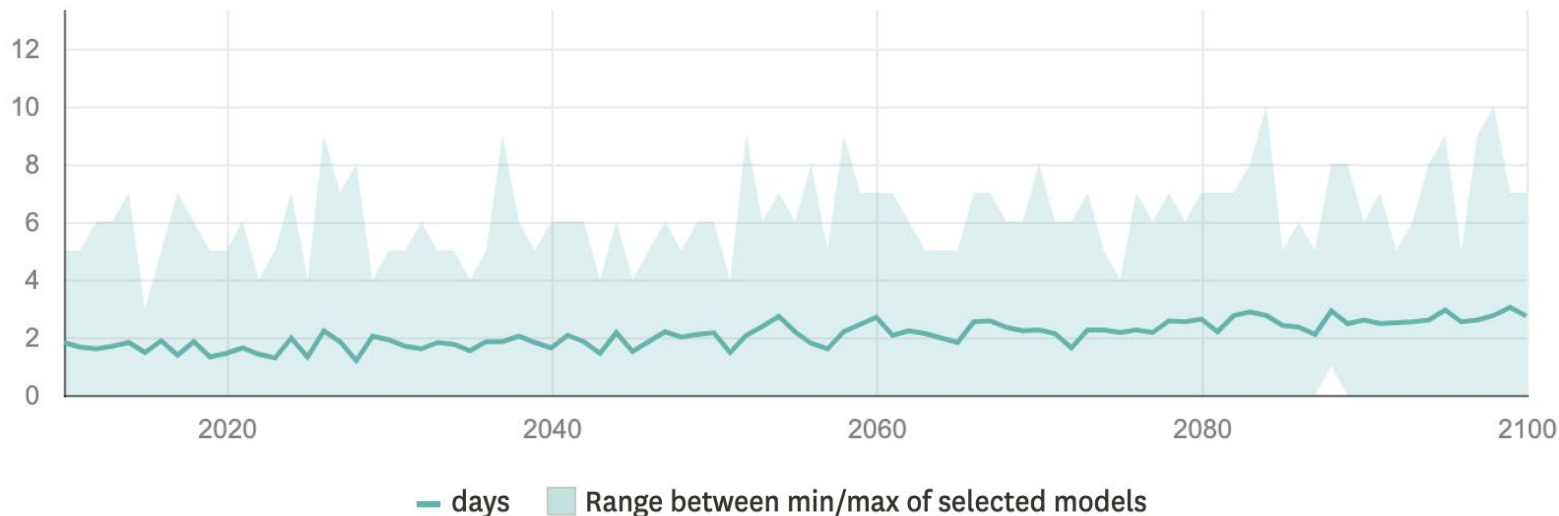
Climate Hazards: Severe Storms + Flooding

- **Extreme Precipitation Events** — Total number of times per year daily average precipitation rate exceeds the 99th percentile of historic observations, with historic base range year of 1971



Climate Hazards: Severe Storms + Flooding

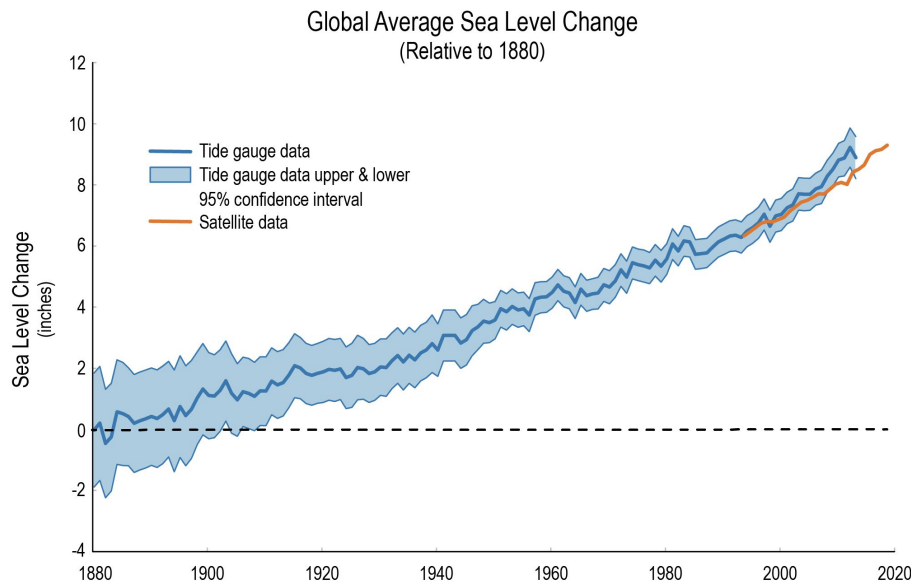
- **Precipitation Threshold** — Number of days where precipitation rate, generated from daily data using all requested models, is greater than or equal to 50 millimeters per day



Climate Hazards: Severe Storms + Flooding

Other Relevant Climate Indicators:

- Sea-level Rise
- Storm Surges



Climate Hazards: Insect Infestation + Invasive Species

- With warmer and wetter climate, Hastings-on-Hudson residents will face elevated risk of vector-borne illnesses such as **Lyme Disease, West Nile and Zika.**
- Homes, gardens, and overall ecosystem will face disruption from invasive species that thrive in a changing climate.
- Although numerous species pose potential threats to our health and habitat, this report will consider the four top concerns identified in our community survey:
 - **Deer Ticks**
 - **Mosquitoes (*Aedes* family)**
 - **Brown Marmorated Stink Bugs**
 - **Kudzu**

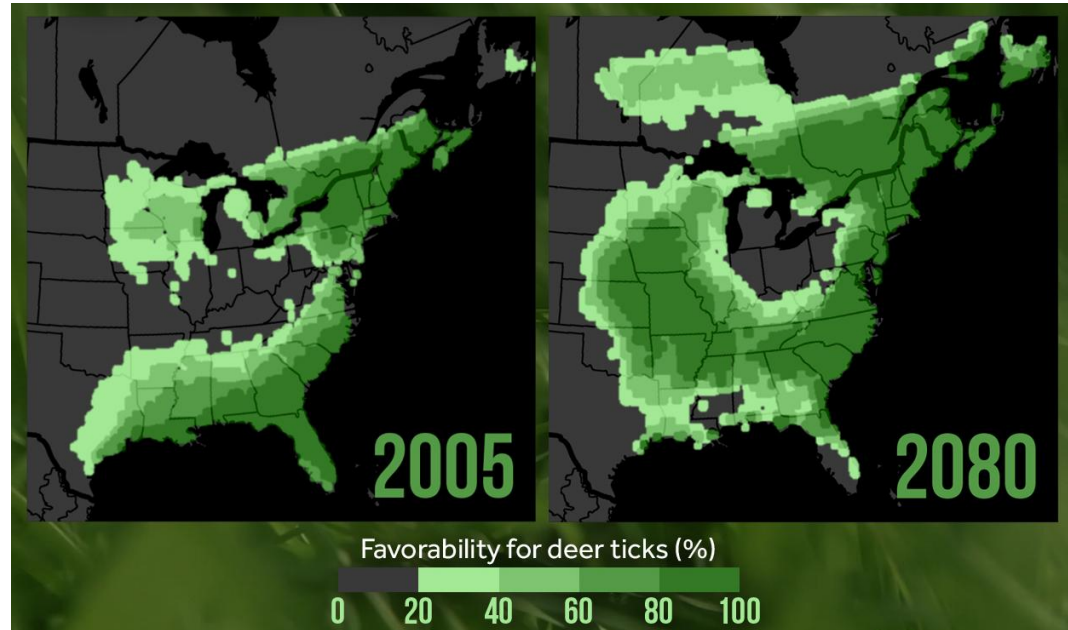


Climate Hazards: Insect Infestation + Invasive Species

Deer Ticks

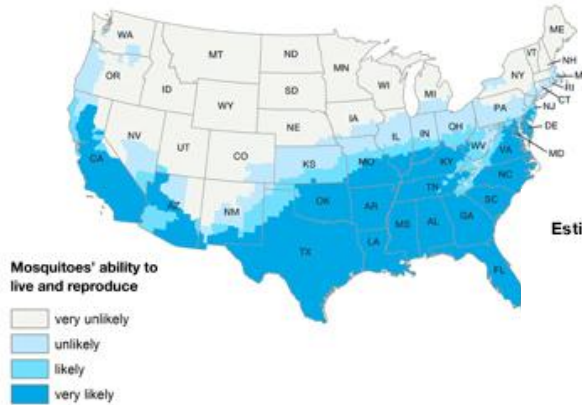
- Ticks that transmit Lyme Disease (LD) are active when temps are over 45°F; warmer winters will likely lengthen the tick season.
- By 2065–2080, it is projected that the period of elevated risk of LD in Hastings-on-Hudson will begin 0.9–2.8 weeks earlier than at present.
- LD produces a wide range of symptoms, such as fever, rash, facial paralysis, and arthritis. About 10 to 20% of people develop joint pains, memory problems, and extreme exhaustion.
- Living near wooded or brushy areas can increase risk.
- **Children under 15 and adults 25-44** experience the most cases (because they tend to spend more time outdoors).

Projections in Deer Tick Habitat



Climate Hazards: Insect Infestation + Invasive Species

Estimated Potential Range of *Aedes aegypti* in the United States, 2017



Estimated Potential Range of *Aedes albopictus* in the United States, 2017



Mosquitoes (*Aedes* family)

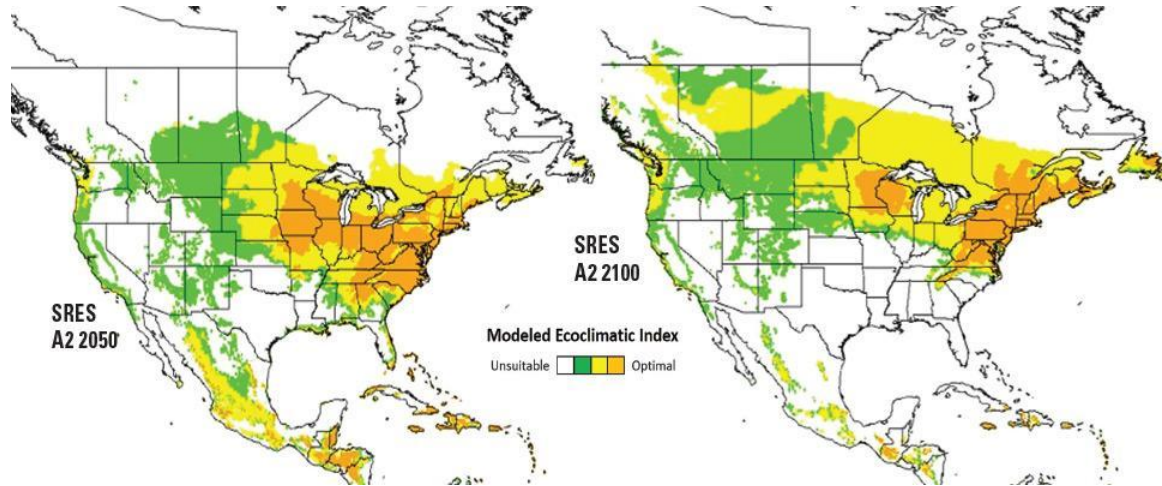
- Mosquitoes spread West Nile, Zika, Eastern Equine Encephalitis, and other vector-borne viruses.
- Mosquito activity is increased when night temps are $\geq 50^{\circ}\text{F}$.
- Mosquitoes' habitat is expected to increase in the Hudson Valley region from the current 5% to 16% in the next two decades, and from 43% to 49% by the end of the century.
- The populations at greatest risk are those **younger than 5 or older than 50**.
- People who live in areas with greater amounts of vegetation, in older homes, or people who are older Caucasians are also more vulnerable to infection.

Climate Hazards: Insect Infestation + Invasive Species

Brown Marmorated Stink Bugs

- Since its first appearance in Pennsylvania in 1996, this highly invasive species from Asia has spread rapidly throughout the Mid- Atlantic region
- With no indigenous predators, these bugs pose a significant nuisance to homeowners. Once established — and if left unchecked — an infestation can grow to **thousands of bugs in a single home.**
- When they emerge in the spring, they eat ornamental plants, fruit trees, and vegetable gardens.
- Stink bugs are projected to be firmly established in Hastings-on-Hudson by 2050.

Projections in Stink Bug Habitat

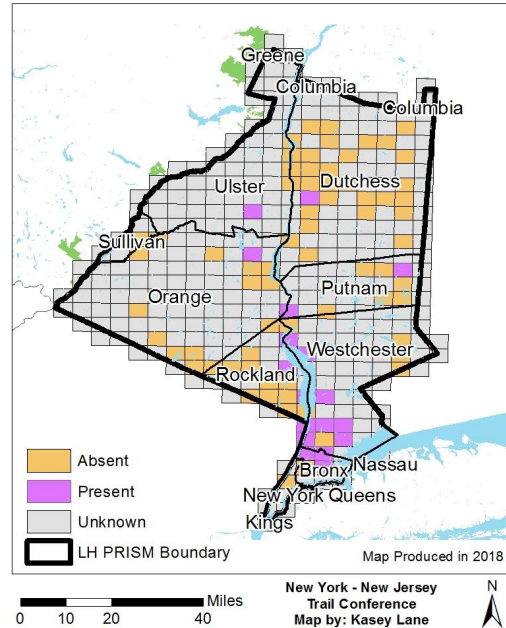


Climate Hazards: Insect Infestation + Invasive Species

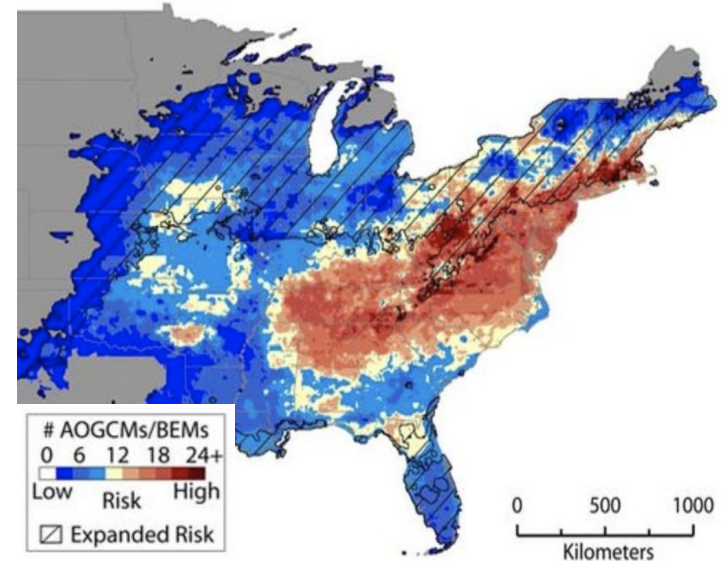
Kudzu

- Kudzu, aka “The Vine That Ate the South,” is a semi-woody perennial vine that is invasive to North America.
- The vine can trail and climb on a variety of surfaces, including trees, shrubs, ground vegetation, buildings and bare surfaces.
- Kudzu can **grow up to one foot per day**, enabling it to quickly engulf large areas and strangle native plant-life.
- Kudzu has already been detected in lower Westchester (right), and by 2100 is expected to be entrenched throughout the Northeast and Mid-Atlantic regions (far right).

Kudzu Regional Distribution



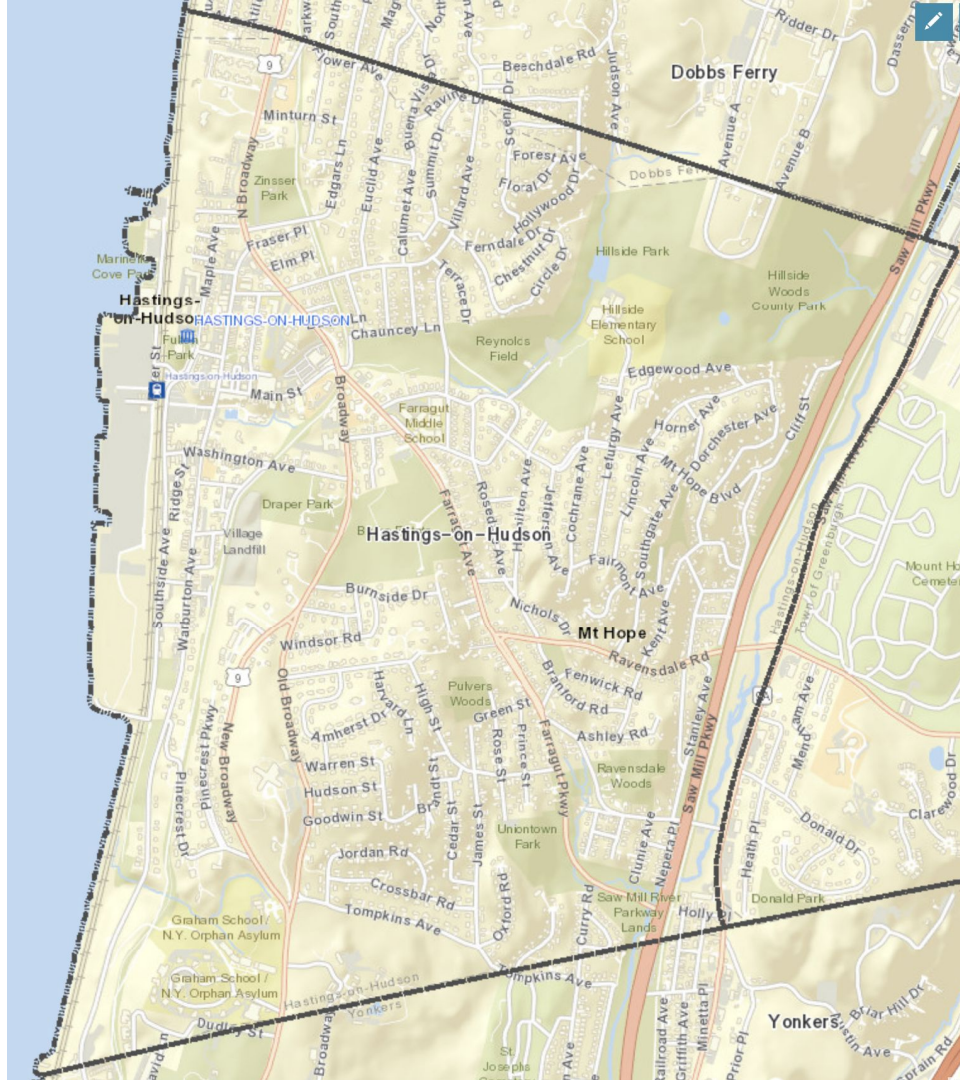
Projections of Kudzu Habitat by 2100



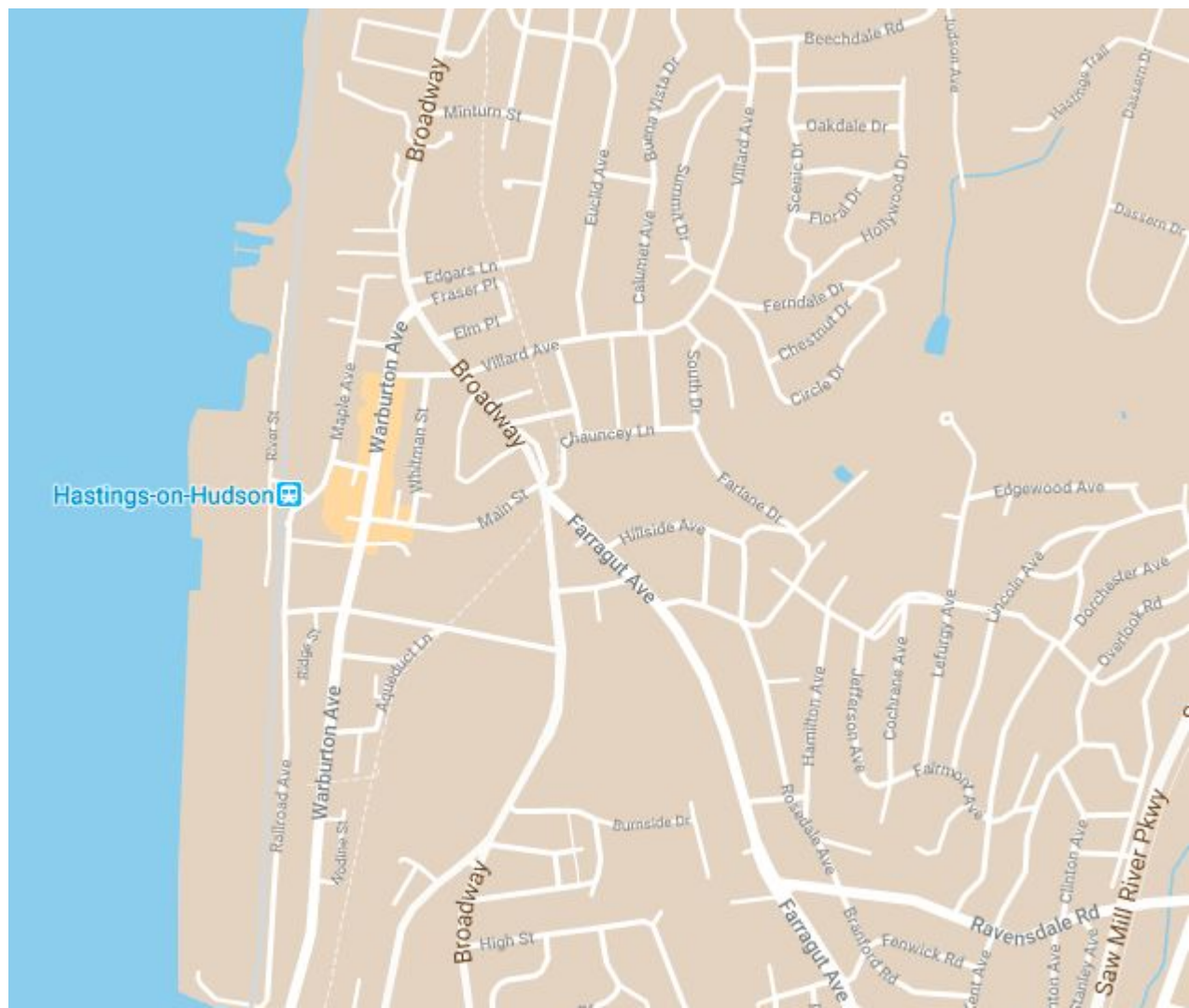
4. Our Community Assets

Community Assets

- The purpose of the Climate Vulnerability Assessment is to **identify community assets** that are most at risk so that action plans may be created to address them ahead of time.
- The climate hazards identified previously are likely to pose significant challenges in the coming years to several community assets in our Village.
- A preliminary list of these assets on the following pages will serve as a launching point for discussing threats to these assets; both the **magnitude** of the impact and **likelihood** of that effect taking place.



Transportation



MTA Station, Tracks and Parking Lot

Hastings-on-Hudson

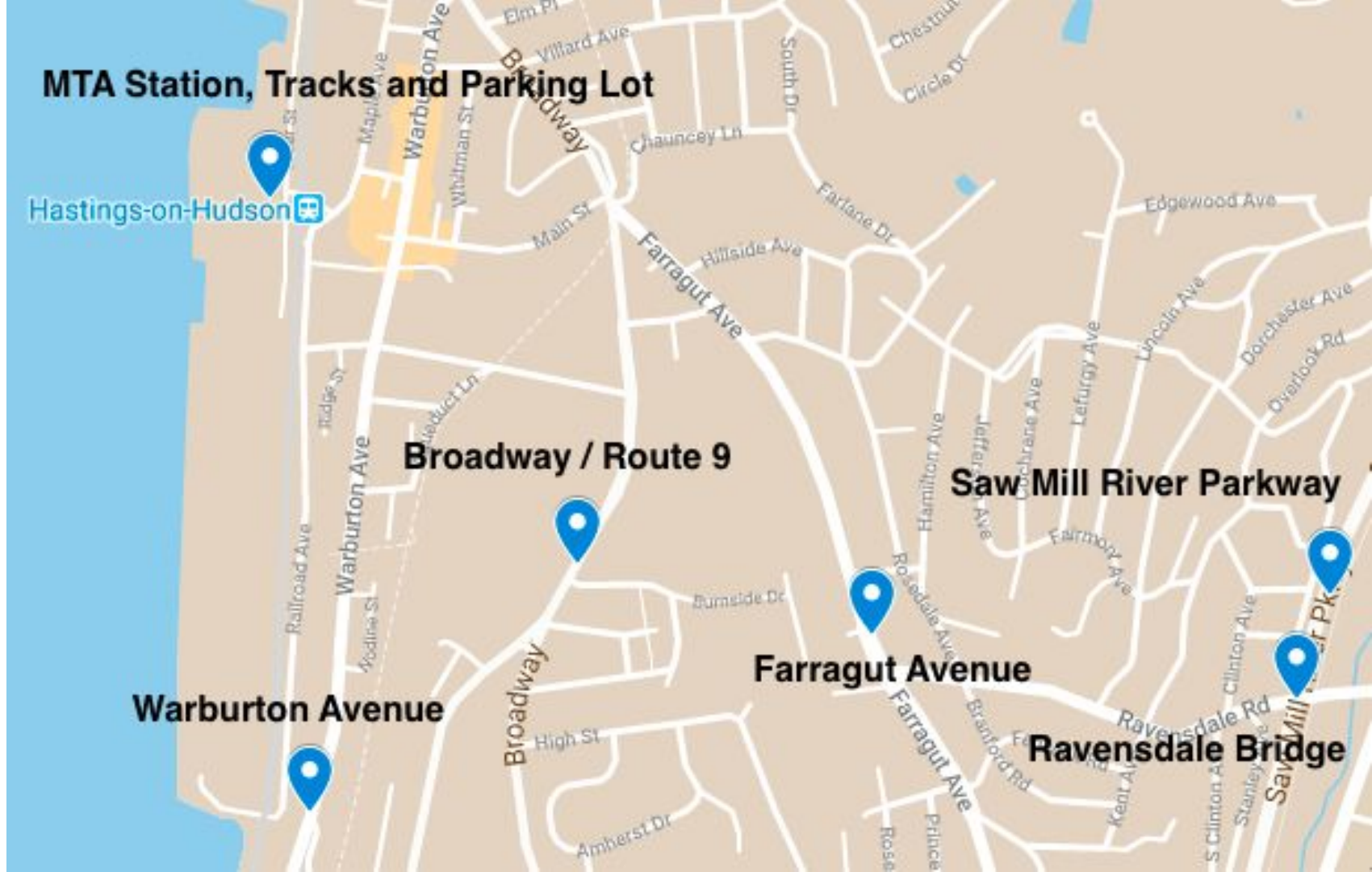
Broadway / Route 9

Saw Mill River Parkway

Warburton Avenue

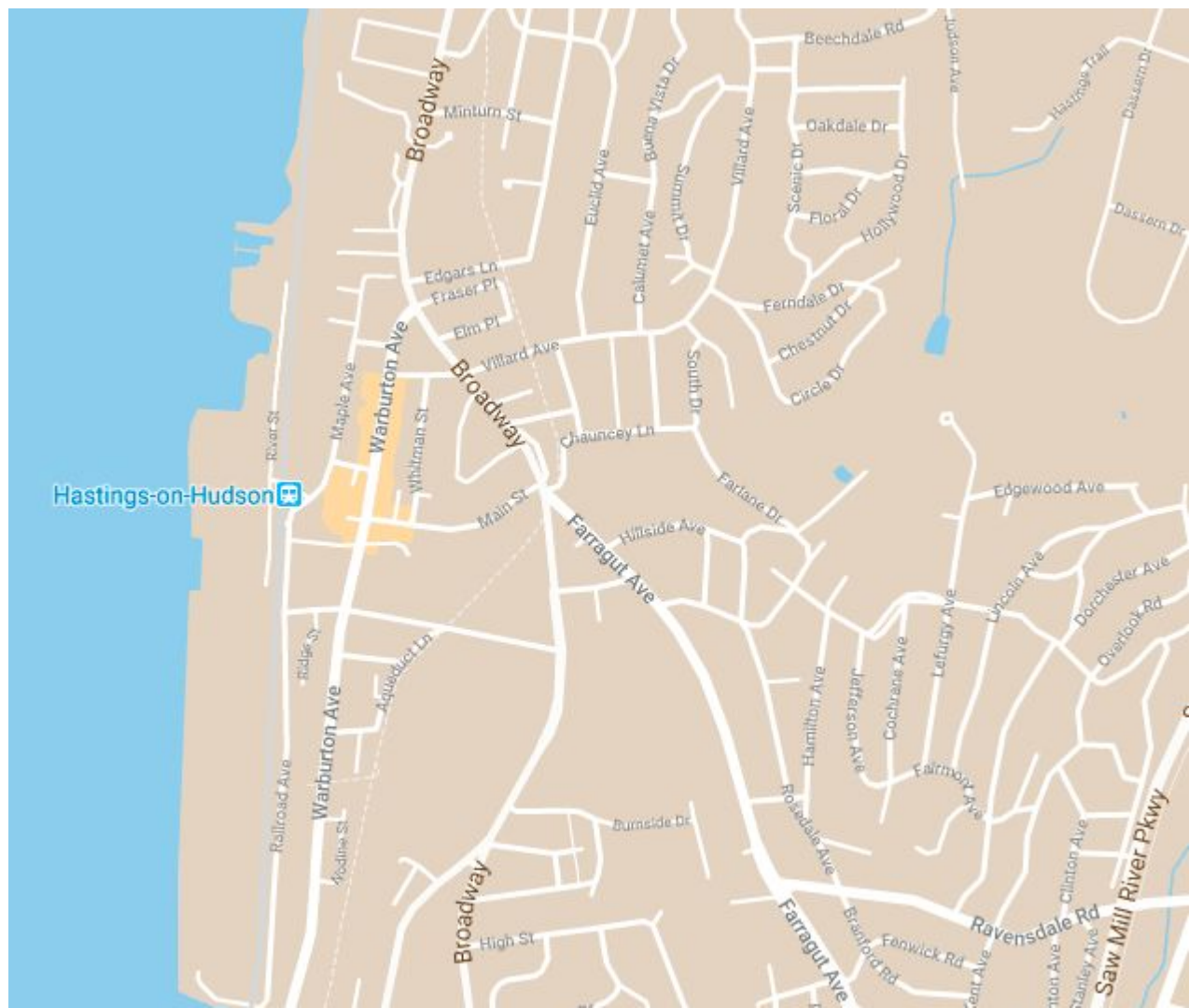
Farragut Avenue

Ravensdale Bridge

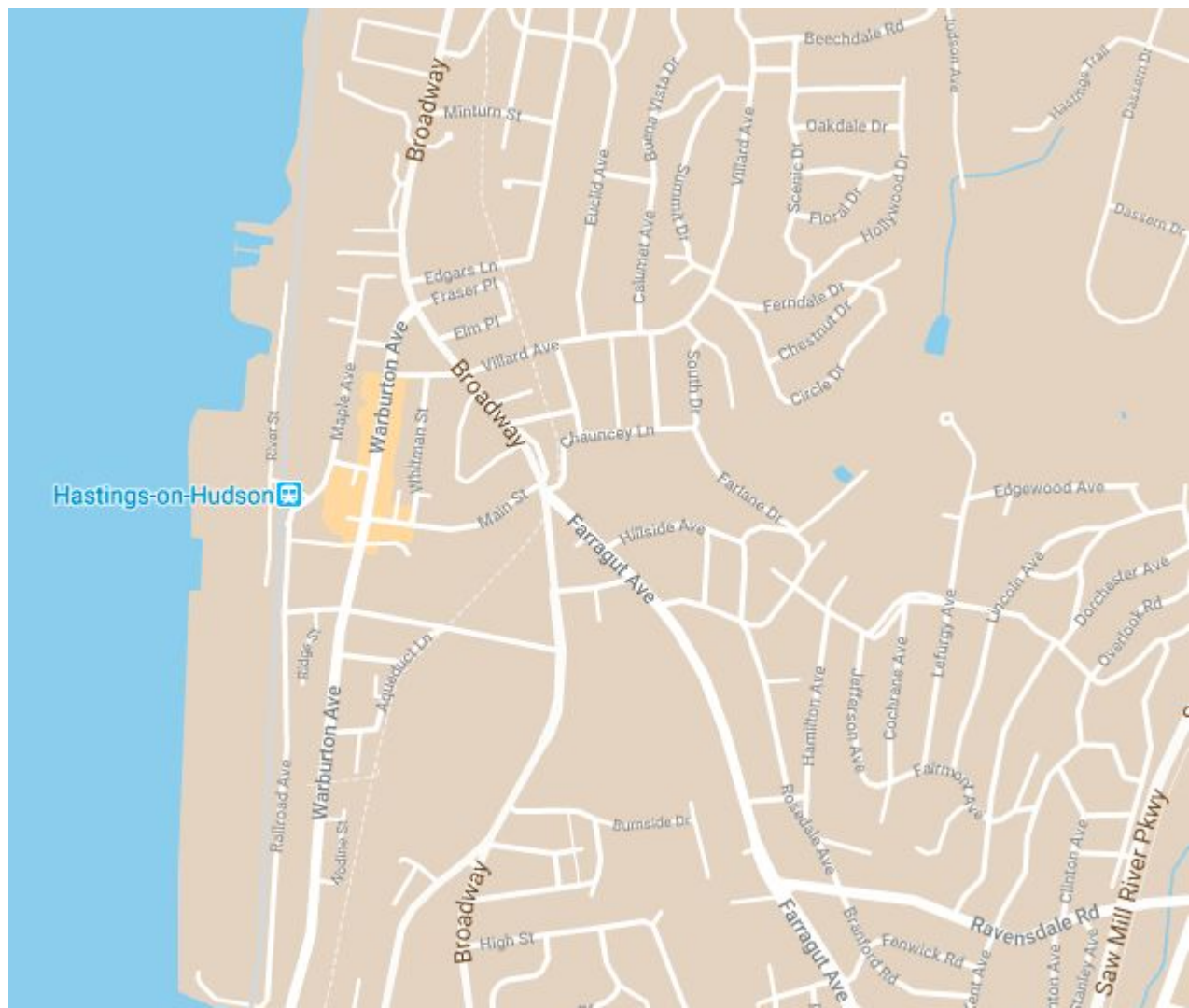


Systems Infrastructure

1. Power supply systems
2. Municipal water supply systems
3. Wastewater and sewer infrastructure
4. Communications systems
5. Other



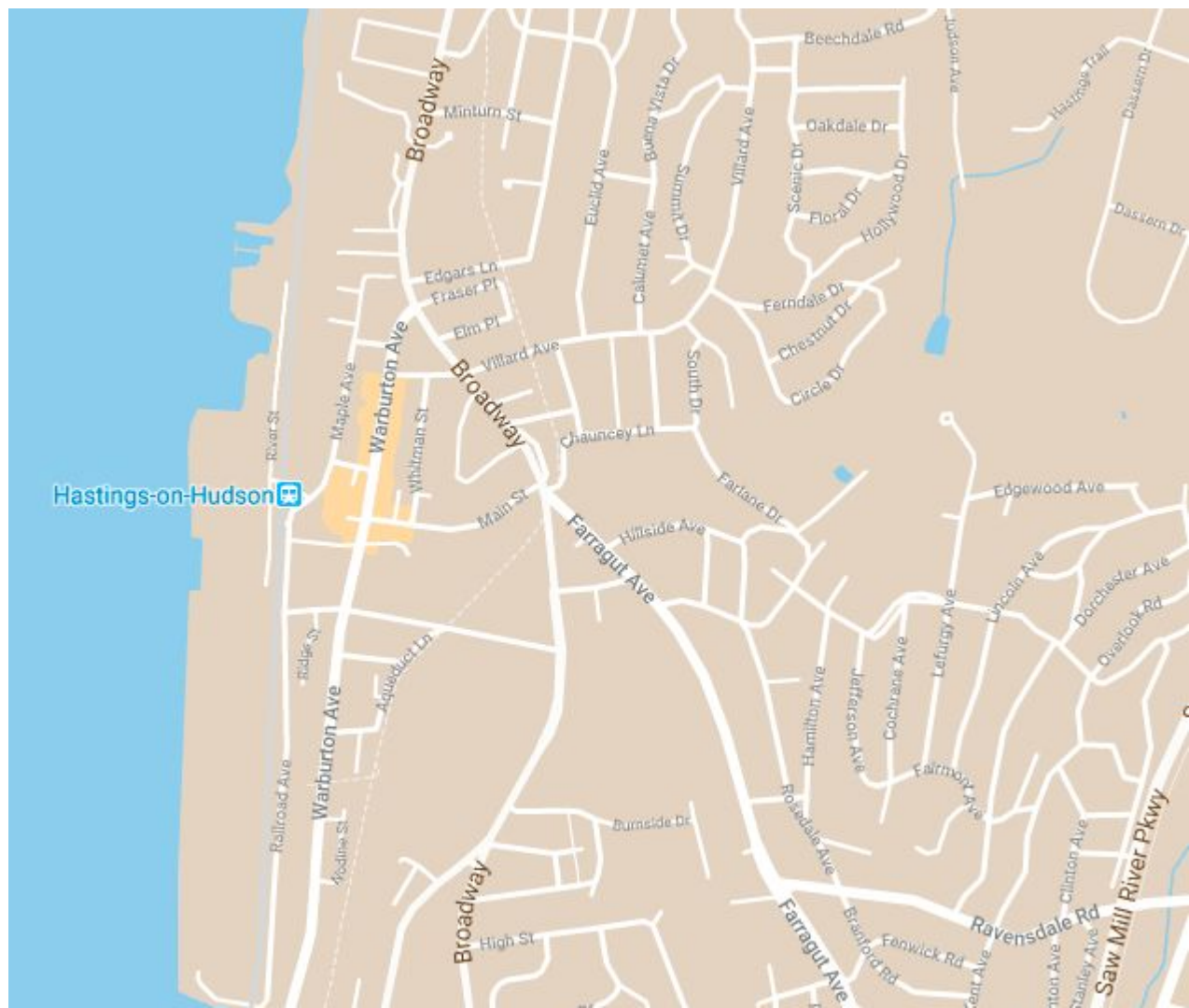
Municipal Structures



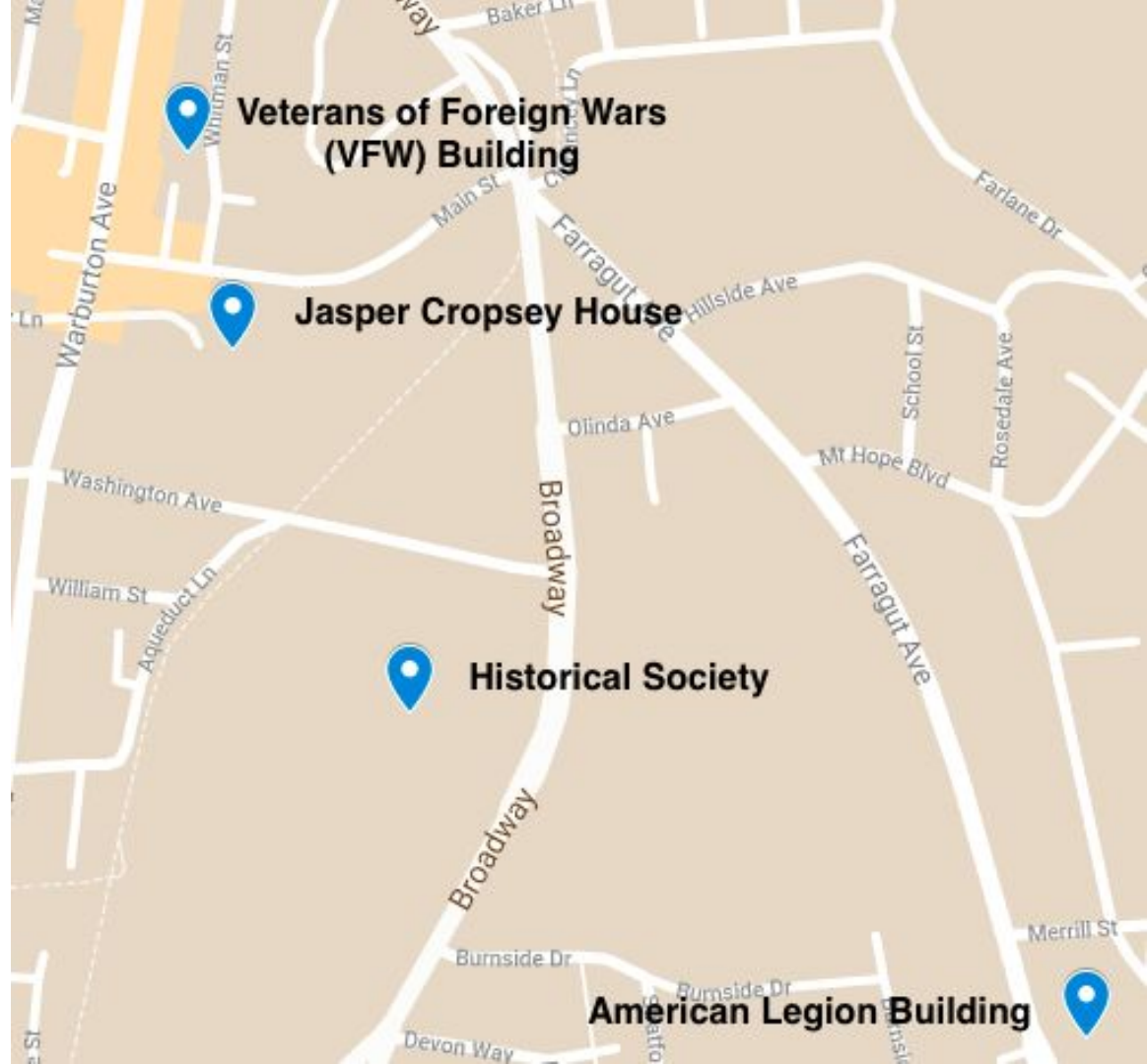
Municipal Structures



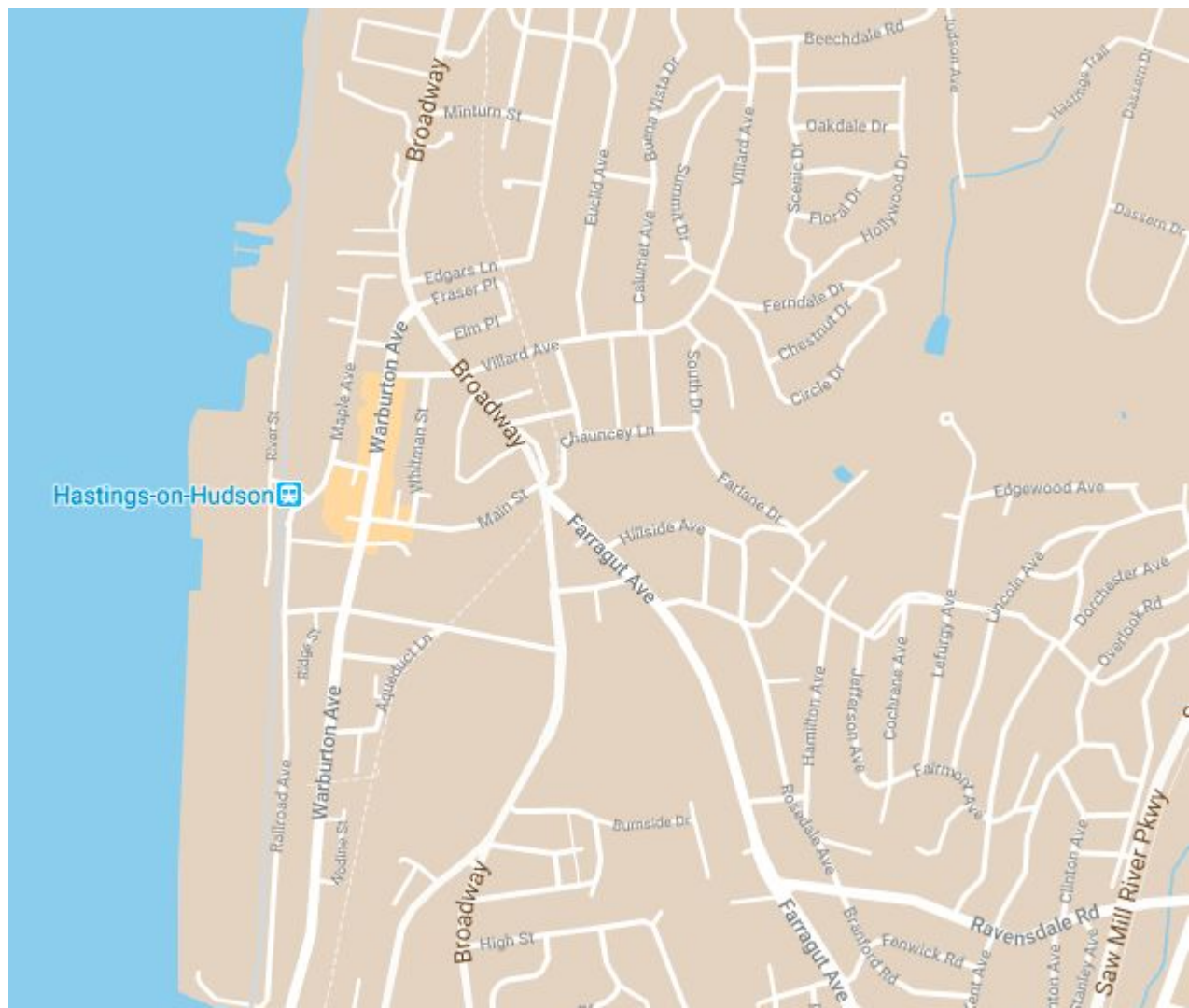
Other Structures



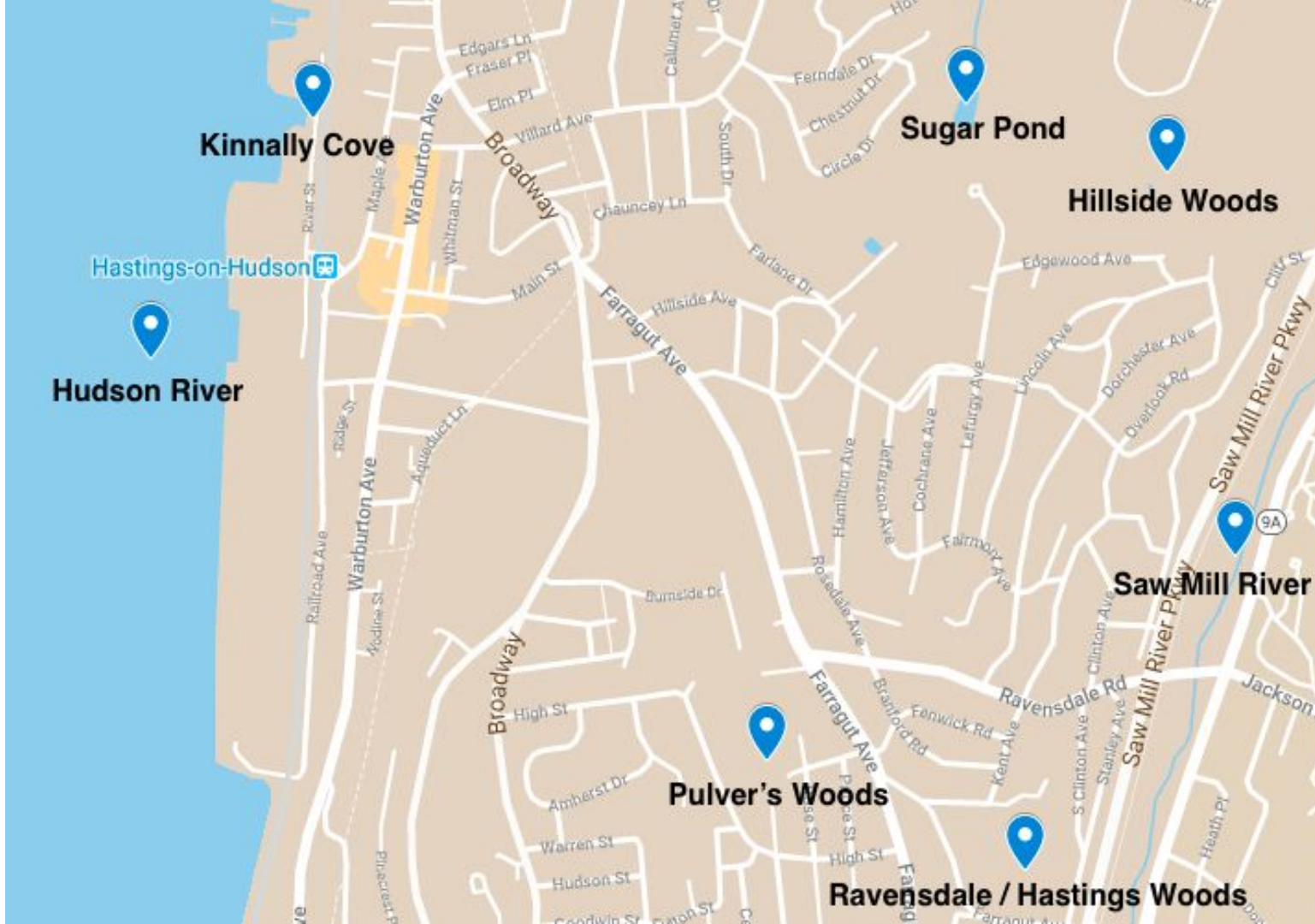
Other Structures



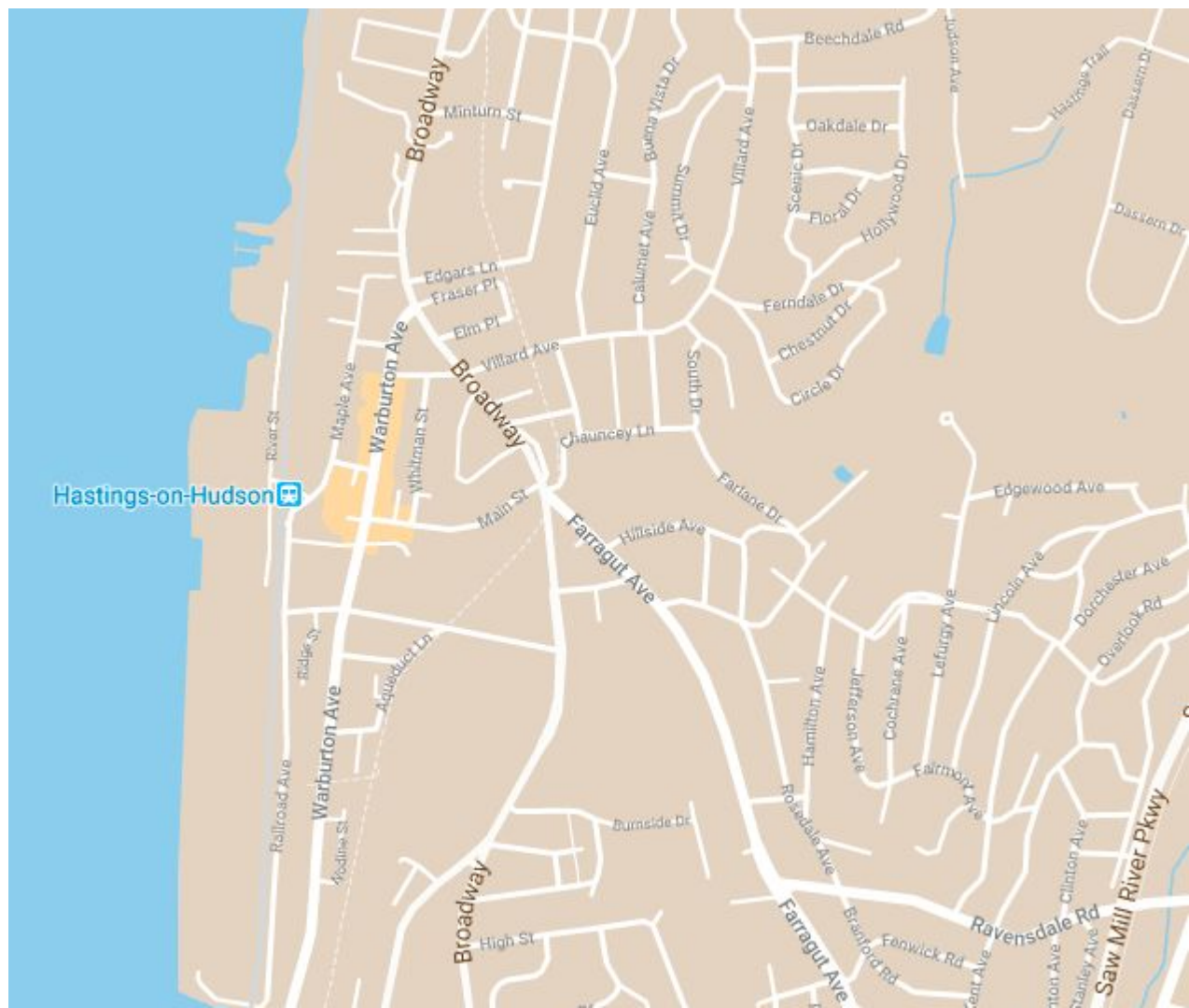
Environmental or Natural Assets



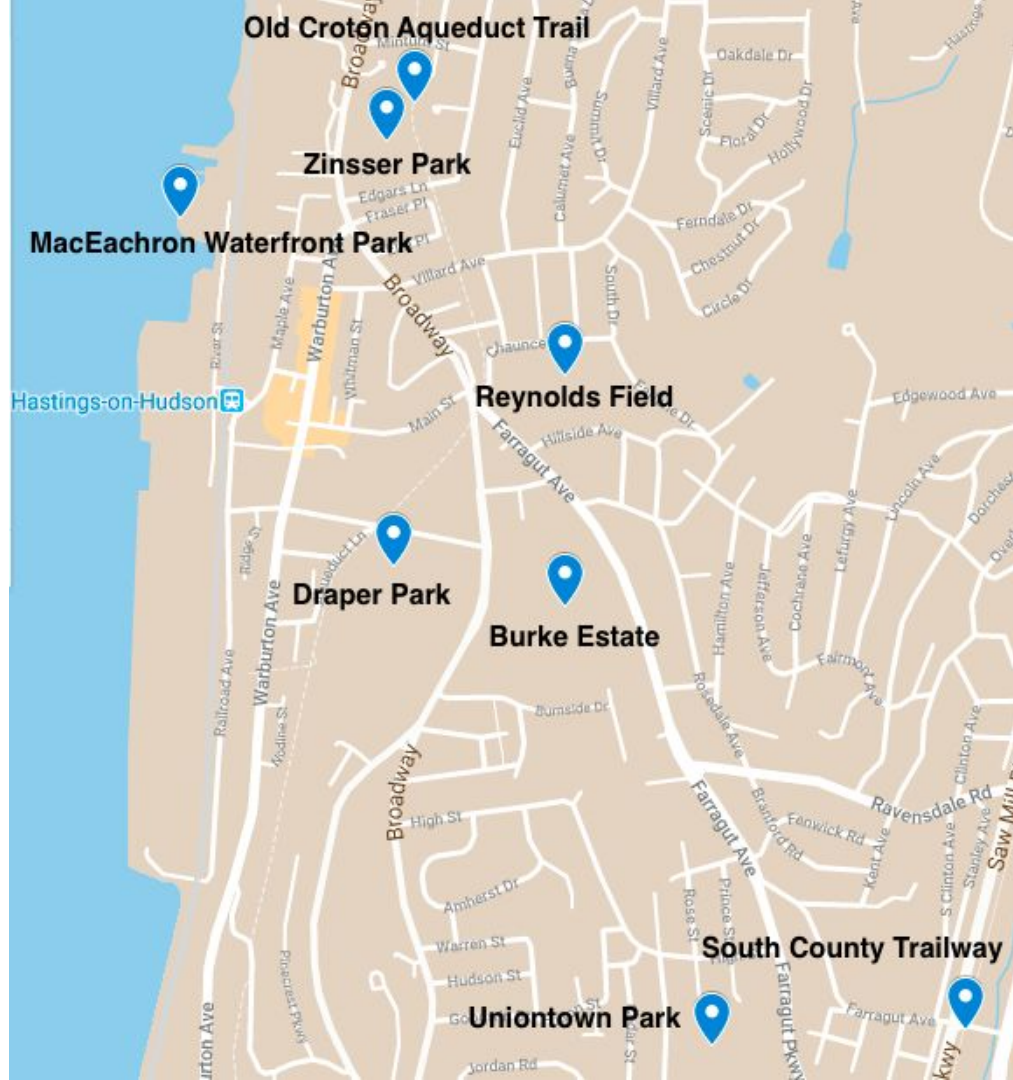
Environmental or Natural Assets



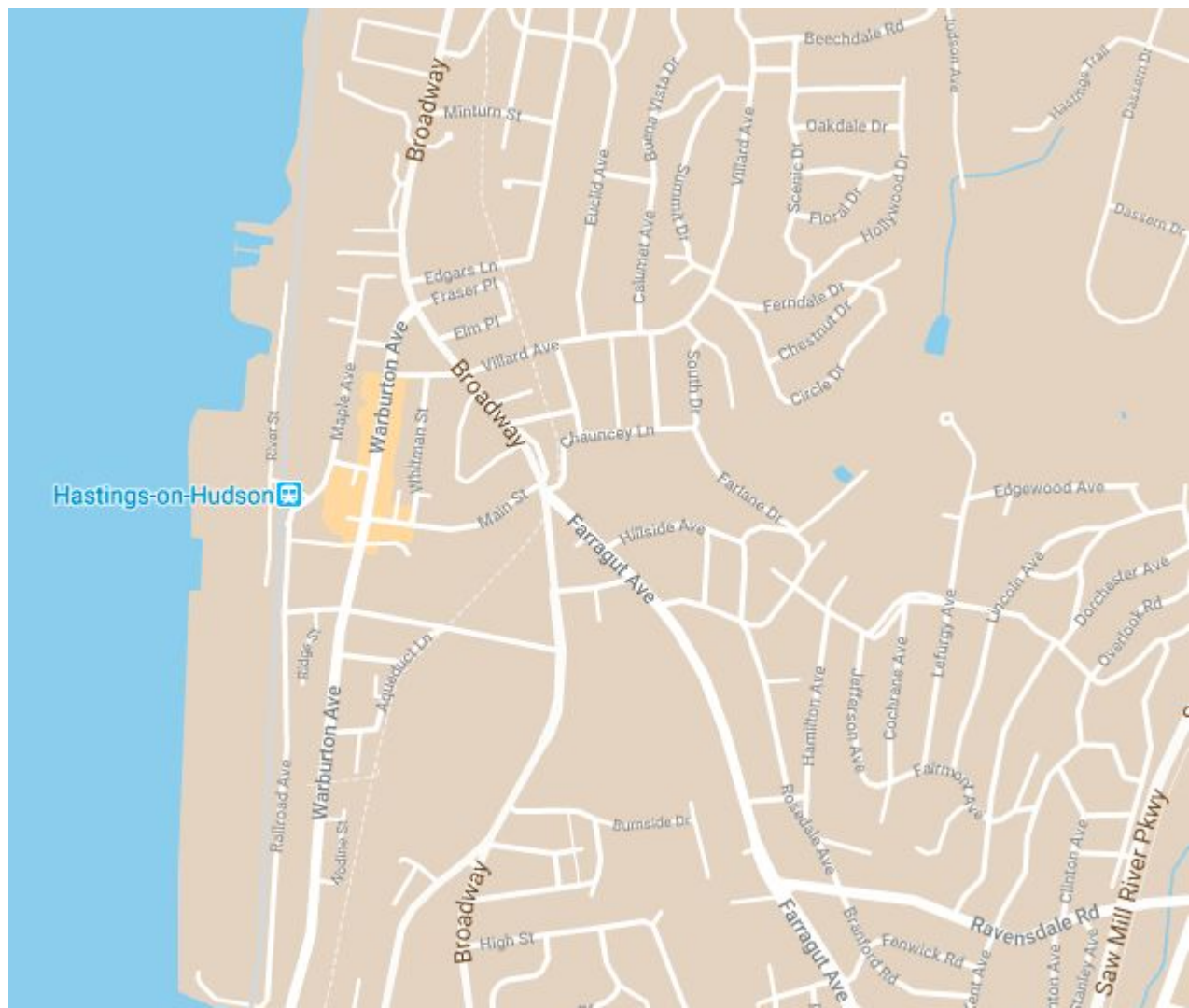
Public Parks and Recreation Areas



Public Parks and Recreation Areas



Vulnerable Communities and Food Security



Vulnerable Communities and Food Security

