

# The Vulnerability of New Jersey to Climate Change

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## Introduction

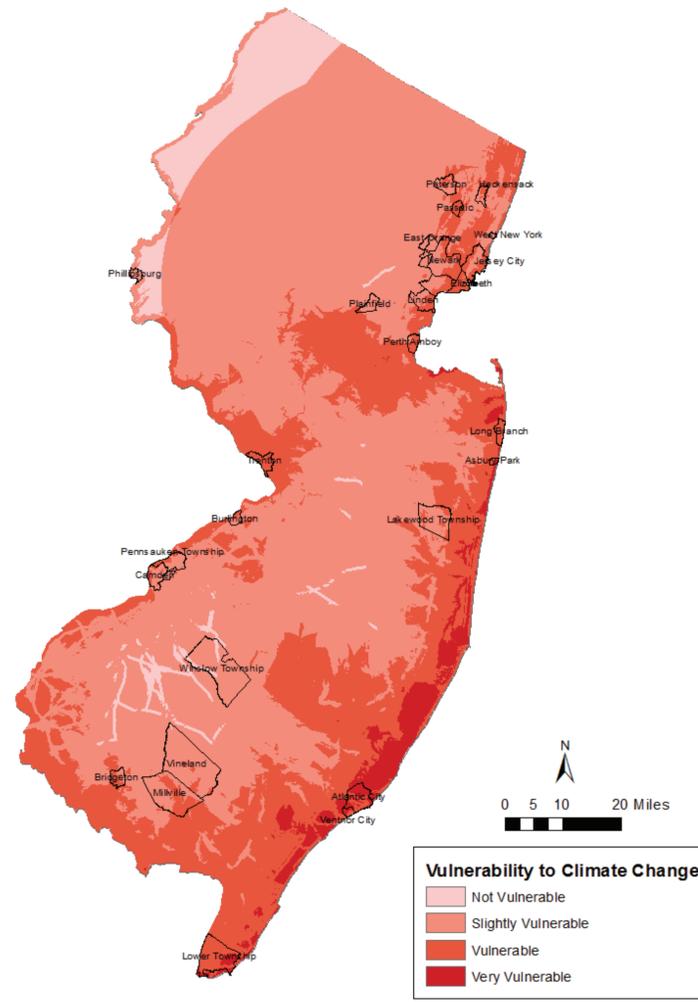
Climate change, otherwise known as global warming, is the idea that greenhouse gases, predominantly produced by man, are being released into the atmosphere at record rates, and are causing the Earth to warm. Warming Earth leads to a number of climatic impacts, including a rise in sea levels and more frequent and more severe weather systems. While everyone will be impacted by these climatic events to some degree, often the people who bear the brunt are those who are the least resilient to those types of impacts. These vulnerable populations take many forms, but for our purposes here we have divided them into four categories: 1) People Living in population dense areas, 2) Seniors Living Alone, 3) Female Headed Households with Children under 18, and 4) Households that are below the poverty line. By looking at where these vulnerable populations intersect with over climate change vulnerability in New Jersey, we can see which areas are most in need of assistance to build resilience against climate change.

## Methodology

The Methodology for this project was two-fold. The first step was to create a map that showed what geographic areas in the State of New Jersey were most vulnerable to climate change. To create a vulnerability overlay, 4 types of areas were identified as vulnerable regions, and then ranked on a scale from 1 to 6 within those regions. The four areas of vulnerability are 1) Elevation, 2) Distance from High-Hazard flood zones, 3) Distance from hurricane evacuation routes, and 4) Distance from the Coastline. The range, from 1 to 6, of these four criteria were calculated and then rasterized to show the areas in New Jersey most vulnerable to climate change.

The second set of criteria concerned the four types of vulnerable populations mentioned in the Introduction. Each type of vulnerability was separated into 5 different categories and applied to a map of the census tracks in the New Jersey. Next, the highest scoring census tracks (those that scored a 3 or higher on the 1 to 5 scale) were selected and then intersected to determine which census tracks are most vulnerable in terms of their respective population traits. That intersected data layer was then joined to a map of the towns and cities in New Jersey, and the whole file was overlaid on the map of geographic vulnerabilities in order to show which towns in New Jersey are most vulnerable to climatic impacts, and thus require the most assistance.

## Towns Vulnerable to Climate Change



## Analysis

The areas most vulnerable to climate change are mainly concentrated along the Jersey Shore, especially around Atlantic City. Since one of the vulnerability variables was distance from the Coast, it makes sense that the geographic vulnerabilities would be concentrated there. The rest of the state is vulnerable to a lesser degree, although there is another concentration of vulnerability in the western part of the state centered around Trenton, and another in the central north-east part of the state. What is interesting is where the vulnerable populations are gathered.

The most vulnerable populations are clustered around the major cities of New Jersey, Trenton, Atlantic City, and Newark. Of these, Atlantic City is by far the area of the state most vulnerable to climate change and sea level rise, as well as the area with the highest population of vulnerable communities. This means that Atlantic City, which is still recovering from the impacts of Hurricane Sandy, should be a priority for redevelopment and resilience building to make both the city and its vulnerable populations better able to weather the storm of climate change.

## Conclusions

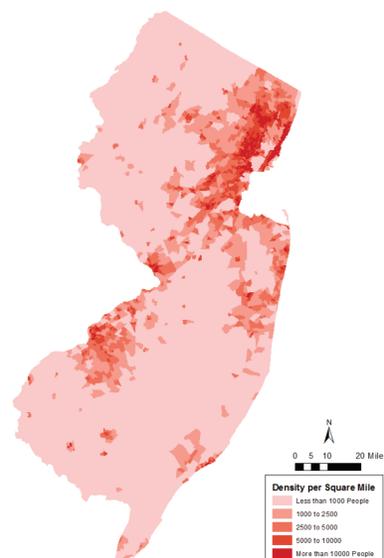
As a state, New Jersey is surprisingly vulnerable to the possible impacts of climate change and sea level rise. Although Hurricane Sandy and Atlantic City is a telling case in point, the entire state has areas of high vulnerability. Many of the major cities are built in river floodplains, and the highest point in the state is only 1800 feet. Hurricane Sandy was not an abnormality, and the state will continue to be battered by stronger and stronger hurricanes as the climatic shifts worsen.

The responsibility of the state is to see to the health and livelihood of all of its people, and nowhere is that more true than with its most vulnerable populations. New Jersey will have to pay special attention to them moving forward, as they lie squarely in the path of the oncoming storm.

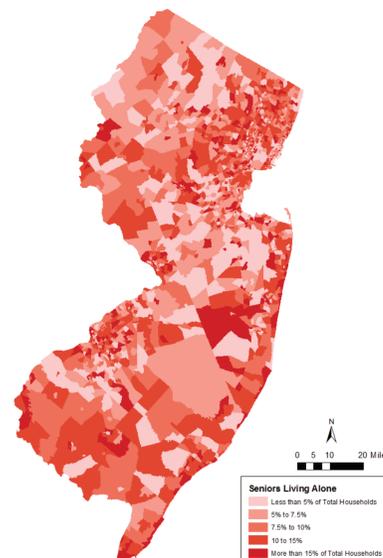
## Data Sources

Data for this poster comes from three sources: the New Jersey State Department of Environmental Protection ([www.state.nj.us/dep/gis/stateshp.html](http://www.state.nj.us/dep/gis/stateshp.html)), the New Jersey Geographic Information Network ([https://njgin.state.nj.us/NJ\\_NJGINExplorer/index.jsp](https://njgin.state.nj.us/NJ_NJGINExplorer/index.jsp)), and the ACS 5 year survey for 2011.

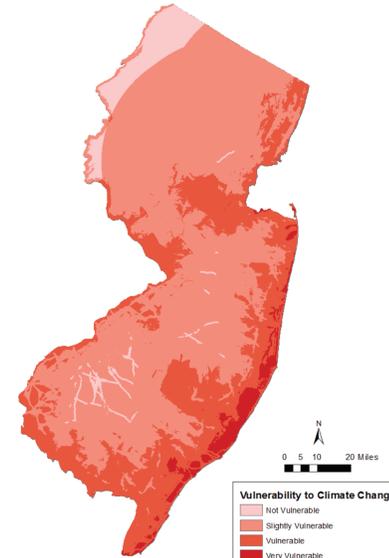
Vulnerable Populations 1:  
People Living in Dense Areas



Vulnerable Populations 2:  
Seniors Living Alone



Vulnerability to Climate Change  
in New Jersey



Vulnerable Populations 3: Female Headed  
Households with Children Under 18



Vulnerable Populations 4:  
Households Below the Poverty Line

