



Understanding New Jersey's Vulnerability to Climate Change



New Jersey residents are no strangers to the escalating impacts of climate change. Rising sea levels mean future hurricanes will produce more severe damage,⁵ such as the damage produced by Hurricane Sandy. More frequent extreme weather events, heat waves, and inland flooding from heavier rains also present a growing challenge to the region's economy, environment, and everyday way of life.

Threats from Extreme Storms

- Images left behind in Sandy's wake are powerful reminders of the state's increasing vulnerability to extremes. The storm and its immediate aftermath resulted in 34 deaths⁶ and cost New Jersey an estimated \$37 billion.⁷ Nationally, the storm and its impacts claimed more than 150 lives and exceeded \$50 billion in damage.⁸ In New Jersey, nearly 7 million people and 1,000 schools lost power, transit systems and streets were completely flooded, and more than 8,000 jobs were lost in the month after the storm.⁹
- Power interruptions due to extreme weather, such as hurricanes, thunderstorms, and ice storms, are 10 times worse in New Jersey today than 20 years ago.¹⁰
- The majority of lives lost in hurricanes are due to flooding.¹¹ Unfortunately, climate change is likely to result in more intense storms in the future¹² – with life threatening flooding made worse by rising seas and heavier rainfall.
- Heavy precipitation events in the Northeast have increased dramatically in the past two decades, occurring more than twice as often in recent years than during the past century. This trend is expected to continue,¹³ increasing flood risks.

Threats from Rising Seas

- Scientists consider New Jersey a hotspot for sea-level rise, as waters along New Jersey's coast are rising faster than the global average.¹⁴ Best estimates for sea-level rise along New Jersey's coast show an increase of 10 inches by 2030 and by 1.5 feet by 2050.¹⁵
- Scientists are highly confident that future storms will have greater impacts because of rising sea levels.¹⁶ Storm surge combined with higher water levels will make severe coastal flooding more frequent in the future.¹⁷

Vulnerable NJ by the Numbers:

- Hurricane Sandy displaced more than **116,000 people** and damaged or destroyed **346,000 homes** in New Jersey.¹
- By mid-century, about **70 percent of summers in New Jersey will be warmer than the state's warmest summer** on record, according to a recent analysis.²
- **70 percent of New Jersey residents** are concerned about the impacts of climate change.³
- **64 percent of New Jersey residents** see climate change as a risk to themselves, their families, and friends.⁴

- Even under the most conservative sea-level rise projections, the implications for coastal flooding are substantial.¹⁸ With 10 inches of sea-level rise by 2050, the chance of extreme flood losses occurring will nearly double.¹⁹
- New Jersey's coastal areas are responsible for 70 percent of the state's tourism dollars.²⁰ The Jersey shoreline is especially vulnerable to erosion, and the loss of beaches from sea-level rise threatens to impact recreation and tourism income for the state.

Threats from Extreme Heat

- More hot days are coming to the Garden State. Summer temperatures are expected to regularly surpass the current hottest temperatures on record by mid-century,²¹ making the state feel more like Birmingham, Alabama.²²
- This extremely hot weather will increase health risks for the elderly and young children, stress rail lines and major roadways, and pose threats to agriculture.²³
- Extreme heat is a major driver of climate-related deaths. More than 5,200 people died from exposure to excessive heat in the U.S. from 1999-2009.²⁴ The elderly and the very young are especially vulnerable to health impacts from high temperatures, and extreme heat can worsen cardiovascular and respiratory disease.²⁵
- Urban areas typically experience higher temperatures because the pavement, buildings, and other infrastructure retain heat and remove sources of shade.²⁶ With 95 percent of New Jersey residents living in urban areas,²⁷ our state is particularly vulnerable to intense heat waves. During heat waves, nighttime temperatures remain high, especially in cities, limiting people's ability to recover from the heat of the day.²⁸ Heat stress is often combined with poor air quality, presenting major health concerns to the most vulnerable, including young children, the elderly, and those with pre-existing health conditions like asthma.²⁹
- New Jersey's \$1 billion farming industry faces increasing threats from invasive insects, weeds, and diseases expected to be made worse by hotter temperatures. Left unchecked, the costs could be substantial to protect the Garden State's 10,000 farms that produce more than 100 different fruits and vegetables.³⁰
- Hotter, drier conditions affect New Jersey forests like the Pine Barrens, which is increasingly at risk of wildfires that can put nearby communities in harm's way. In 2007, a forest fire in the Pine Barrens scorched more than 15,500 acres, damaged homes, and forced more than 1,000 residents to evacuate.³¹

“Recent storms such as Irene and Sandy have made New Jersey residents realize that they are vulnerable to extreme weather events and their costly impacts on our communities. Unfortunately, many of these impacts will worsen because climate change is causing rising sea levels, higher temperatures, and heavier precipitation.”

– Dr. Anthony J. Broccoli
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Citations

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- ²² These values are based on a recent analysis conducted by a scientist from the National Center for Atmospheric Research (NCAR) for the Georgetown Climate Center. The projected temperature increase for New Jersey uses the approximate value of 2.5C (or 4.5F) from Figure 5a on page 47 of C. Deser, A. S. Phillips, M. A. Alexander, and B. V. Smoliak, Projecting North American Climate over the next 50 years: Uncertainty due to internal variability. *Journal of Climate*, revised (Oct 22, 2013) http://www.cgd.ucar.edu/staff/cdeser/docs/submitted.deser.projected_climate.jul13.pdf. This figure shows the ensemble mean temperature trend in degrees Celsius per 51 years. That can be thought of as the increase in temperature over 51 years from 2010 to 2060. Using temperature data from National Oceanic and Atmospheric Administration, Earth System Research Laboratory, Physical Science Division, US Station Daily Data, <http://www.esrl.noaa.gov/psd/data/usstation/>, the mean July max temperature for New Jersey, plus 4.5F, exceeds the mean July max temperature for Birmingham, Alabama.
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