New Jersey: Vulnerable Populations Exposure Snapshot

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Introduction

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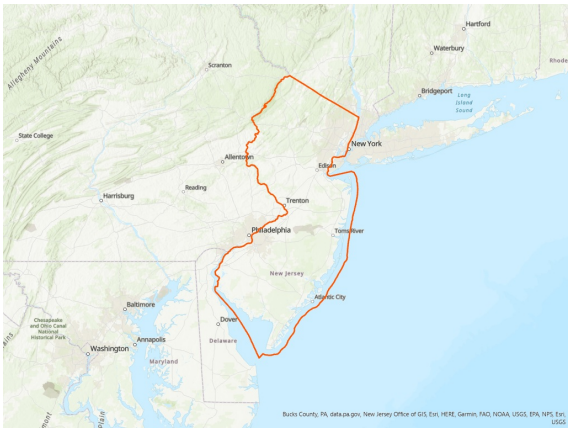

While all people living in the United States are affected by climate change, some communities and some populations are more vulnerable. Some populations and communities are subject to multiple stressors, making them disproportionately affected by changing climate conditions.

Vulnerability may vary by several factors:

- **Location** - such as living close to flood prone areas.
- **Physical status** - such as age, pre-existing health conditions and/or physical disability.
- **Social, economic and underlying community conditions** - such as the extent to which individuals have access to the services and results of long-standing societal factors (i.e., community underinvestment, racism, and poor representation in decision-making).

The United States Centers for Disease Control (CDC) and Prevention uses information from the U.S. Census to create an index (the Social Vulnerability Index) that ranks the social vulnerability of communities in the United States to hazardous events and disasters. The ability to recover from these events and disasters is much more difficult for socially vulnerable populations. The CDC index, which helps identify these populations, is at a census tract level and is comprised of 15 social factors that are organized according to four themes. These four themes are: Socioeconomic Status, Household Composition and Disability; Minority Status and Language; and Housing and Transportation.

Understanding where socially vulnerable populations are in relation to climate hazards, such as flooding, can help a community plan for impacts to those groups most vulnerable to such hazards.

There are 3 types of flood events:

1. Riverine (or ‘fluvial’) flood events occur when intense rain events cause rivers and streams to overtop their banks.

2. Flash (or ‘pluvial’) floods occur when intense rainfall causes a flood event that is not directly associated with a body of water. For example, flash flood events include floods in roadways from impaired stormwater management systems.

3. Coastal flood events occur when sea-level rise, high tides, and storm surge combine to create flood events that range from nuisance high-tide floods to destructive storm tides from seawater.

The Federal Emergency Management Agency (FEMA) models flood hazards, both riverine (1) and coastal (3), as part of the National Flood Insurance Program (NFIP) regulations and insurance requirements. FEMA does not model flash flood events (2) for their NFIP flood mapping.

In addition, coastal flood event exposures are assessed using a Total Water Level (TWL) approach for tidally influenced waters. The TWL approach combines sea-level rise and extreme water level information from NOAA to assess exposure to a variety of coastal flood events to complement FEMA flood mapping. The Appendix below provides additional background.

New Jersey: Vulnerable Populations Exposure Snapshot

Demographics

Total Population: 9,249,063

Total Housing Units: 3,756,340

Average State Household Income: $50,995

Total State Acres: 5,550,448

Total Urban Area (Acres): 1,569,530

- **Urban Area Impacted by 2 Ft. TWL:** 8,217 Acres (0.52%)
- **Urban Area Impacted by 5 Ft. TWL:** 54,139 Acres (3.45%)
- **Urban Area Impacted by 7 Ft. TWL:** 80,697 Acres (5.14%)
- **Urban Area Impacted by 1% Annual Chance Flood:** 106,435 Acres (6.78%)
- **Urban Area Impacted by 0.2% Annual Chance Flood:** 145,951 Acres (9.30%)
- **Urban Area Impacted by Regulatory Floodway:** 8,879 Acres (0.57%)
- **Urban Area Impacted by Area of Undetermined Flood Hazard:** 2,912 Acres (0.19%)

Impacted populations were calculated by determining the proportion of urban land use within the state impacted by inland and coastal flood hazards and applying that proportion to the total value of the indicator variable for that state.

Population and Household values were retrieved from The U.S. Census Bureau, American Community Survey (2022 - ACS 5 Year) API

New Jersey: Vulnerable Populations Exposure Snapshot

Exposure Based on Socioeconomic Status

By Population (TWL)

Represents quartile of this census tract to other census tracts in New Jersey

Variable	Population Within Variable	% of Total Population	Population Exposed at 2ft TWL	Population Exposed at 5ft TWL	Population Exposed at 7ft TWL
Below Poverty	879,179	9.51%	4,603	30,326	45,203
Unemployed	307,824	3.33%	1,611	10,618	15,827
No High School Diploma	601,741	6.51%	3,150	20,756	30,938

By Population (FEMA Flood Zones)

Represents quartile of this census tract to other census tracts in New Jersey

	Population		# Exposed in ...			
Variable	Within Variable	% of Total	1% Annual Chance Flood	0.2% Annual Chance Flood	Regulatory Floodway	Area of Undetermined Flood Hazard
Below Poverty	879,179	9.51%	59,619	81,755	4,973	1,631
Unemployed	307,824	3.33%	20,874	28,624	1,741	571
No High School Diploma	601,741	6.51%	40,806	55,956	3,404	1,117

The FEMA National Flood Hazard Layer (NFHL) dataset represents the current effective flood data across the United States. Areas in the National Flood Hazard Layer are:

- Floodway: The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood height.
- 1% Annual Chance Flood: The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is that water-surface elevation of the 1% annual chance flood.
- 0.2% Annual Chance Flood: The 0.2% annual flood (500-year flood) is the flood that has a 0.2% chance of being equaled or exceeded in any given year.
- Areas of Undetermined Flood Hazard are areas with possible but undetermined flood hazards.
- FEMA Flood Zone exposure analyses are inclusive of lesser FEMA flood designations. The number exposed to 1% Annual Chance Flood includes those exposed in the Regulatory Floodway area in its

analysis and the 0.2% Annual Chance Flood includes those exposed in the 1% Annual Change Flood and in the Regulatory Floodway.

LINK TO SOCIO-ECONOMIC MAP

New Jersey: Vulnerable Populations Exposure Snapshot

Exposure Based on Household Composition & Disability

By Population (TWL)

Variable	Population Within Variable	% of Total Population	Population Exposed at 2ft TWL	Population Exposed at 5ft TWL	Population Exposed at 7ft TWL
Aged 65 or Over	1,532,614	16.57%	8,023	52,866	78,799
Aged 17 or Younger	2,015,561	21.79%	10,552	69,525	103,629
Civilian with a Disability	966,039	10.44%	5,057	33,323	49,668

By Population (FEMA Flood Zones)

Represents quartile of this census tract to other census tracts in New Jersey

	Population		# Exposed in ...			
Variable	Within Variable	% of Total	1% Annual Chance Flood	0.2% Annual Chance Flood	Regulatory Floodway	Area of Undetermined Flood Hazard
Aged 65 or Over	1,532,614	16.57%	103,931	142,519	8,670	2,844
Aged 17 or Younger	2,015,561	21.79%	136,681	187,428	11,402	3,740
Civilian with a Disability	966,039	10.44%	65,510	89,833	5,465	1,792

By Households (TWL)

Variable	Households Within Variable	% of Total Households	Households Exposed at 2ft TWL	Households Exposed at 5ft TWL	Households Exposed at 7ft TWL
Single-Parent Households	319,595	8.51%	1,673	11,024	16,432

By Households (FEMA Flood Zones)

Represents quartile of this census tract to other census tracts in New Jersey

	Households		# Exposed in ...			
Variable	Within Variable	% of Total	1% Annual Chance Flood	0.2% Annual Chance Flood	Regulatory Floodway	Area of Undetermined Flood Hazard
Single-Parent Households	319,595	8.51%	21,673	29,719	1,808	593

LINK TO HOUSEHOLD COMPOSITION & DISABILITY MAP

New Jersey: Vulnerable Populations Exposure Snapshot

Minority Status & Language

By Population (TWL)

Represents quartile of this census tract to other census tracts in New Jersey

Variable	Population Within Variable	% of Total Population	Population Exposed at 2ft TWL	Population Exposed at 5ft TWL	Population Exposed at 7ft TWL
Minority	4,348,648	47.02%	22,765	150,002	223,584
Black or African American	1,147,770	12.41%	6,009	39,591	59,012
AIAN[1]	7,905	0.09%	41	273	406
Asian	905,752	9.79%	4,742	31,243	46,569
NHPI[2]	1,799	0.02%	9	62	92
Other	63,188	0.68%	331	2,180	3,249
Two or More Races	258,811	2.80%	1,355	8,927	13,307
Hispanic or Latino	1,963,423	21.23%	10,279	67,726	100,948
Speak English “Less than Well”	536,255	5.80%	2,807	18,498	27,571

[1] American Indian and Alaska Native
[2] Native Hawaiian and Other Pacific Islander

By Population (FEMA Flood Zones)

Represents quartile of this census tract to other census tracts in New Jersey

	Population		# Exposed in ...			
Variable	**Within Variable**	**% of Total**	**1% Annual Chance Flood**	**0.2% Annual Chance Flood**	**Regulatory Floodway**	**Area of Undetermined Flood Hazard**
Minority	4,348,648	47.02%	294,895	404,383	24,600	8,069
Black or African American	1,147,770	12.41%	77,834	106,732	6,493	2,130
AIAN[1]	7,905	0.09%	536	735	45	15
Asian	905,752	9.79%	61,422	84,226	5,124	1,681
NHPI[2]	1,799	0.02%	122	167	10	3
Other	63,188	0.68%	4,285	5,875	357	117
Two or More Races	258,811	2.80%	17,551	24,067	1,464	480
Hispanic or Latino	1,963,423	21.23%	133,146	182,580	11,107	3,643
Speak English “Less than Well”	536,255	5.80%	36,366	49,867	3,034	995

[1] American Indian and Alaska Native

[2] Native Hawaiian and Other Pacific Islander

LINK TO MINORITY STATUS & LANGUAGE MAP

New Jersey: Vulnerable Populations Exposure Snapshot

Housing & Transportation

By Households (TWL)

Variable	Households Within Variable	% of Total Households	Households Exposed at 2ft TWL	Households Exposed at 5ft TWL	Households Exposed at 7ft TWL
Multi-Unit Structures[1]	625,486	16.65%	3,274	21,576	32,159
Mobile Homes	34,816	0.93%	182	1,201	1,790
Crowding[2]	122,679	3.27%	642	4,232	6,307
No Vehicle	387,802	10.32%	2,030	13,377	19,939

By Households (FEMA Flood Zones)

	Households		# Exposed in ...			
Variable	Within Variable	% of Total	1% Annual Chance Flood	0.2% Annual Chance Flood	Regulatory Floodway	Area of Undetermined Flood Hazard
Multi-Unit Structures[1]	625,486	16.65%	42,416	58,164	3,538	1,161
Mobile Homes	34,816	0.93%	2,361	3,238	197	65
Crowding[2]	122,679	3.27%	8,319	11,408	694	228
No Vehicle	387,802	10.32%	26,298	36,062	2,194	720

[1] Multi-unit structures is defined here as 10 or more housing units in a structure.

[2] Crowding is defined here as the number of households that have more people than rooms.

By Population (TWL)

Variable	Population Within Variable	% of Total Population	Population Exposed at 2ft TWL	Population Exposed at 5ft TWL	Population Exposed at 7ft TWL
Group Quarters[3]	176,581	1.91%	924	6,091	9,079

By Population (FEMA Flood Zones)

Represents quartile of this census tract to other census tracts in New Jersey

	Population			# Exposed in ...		
Variable	Within Variable	% of Total	1% Annual Chance Flood	0.2% Annual Chance Flood	Regulatory Floodway	Area of Undetermined Flood Hazard
Group Quarters[3]	176,581	1.91%	11,975	16,420	999	328

[3] Group Quarters is defined as persons who are in institutionalized group quarters (e.g., correctional institutions, nursing homes) and non-institutionalized group quarters (e.g., college dormitories, military quarters).

LINK TO HOUSEHOLD COMPOSITION & DISABILITY MAP

New Jersey: Vulnerable Populations Exposure Snapshot

Other Data Sets

In addition to the CDC SVI data, several other sets of data are available that can be used to reflect the social vulnerability of populations and communities:

Municipal Revitalization Index

Managed by the state Department of Community Affairs, the Municipal Revitalization Index (MRI) serves as the State's official measure and ranking of municipal distress. This index is linked to economic, housing, and labor market data.

LINK TO MUNICIPAL REVITALIZATION MAP

Asset Limited, Income Constrained, Employed

https://www.unitedforalice.org/new-jersey

ALICE, an acronym for Asset Limited, Income Constrained, Employed (ALICE), represents the growing number of individuals and families who are working, but are unable to afford the basic necessities of housing, child care, food, transportation, energy, and health care.

LINK TO ALICE MAP

NJCounts Point-in-Time

The Federal Department of Housing and Urban Development (HUD) requires each state to conduct an assessment in January of each year to identify individuals residing in emergency shelters, transitional housing programs, safe havens and living on the streets or other locations not fit for dwelling. For NJ, this data is known as NJCounts.

LINK TO NJCOUNTS POINT-IN-TIME MAP

Veterans

The U.S. Census Bureau, American Community Survey maintains data regarding demographic, social and economic data on veterans.

LINK TO VETERANS MAP

Housing Stock Age

Maintained by the United States Census Bureau, American Community Survey, the Housing Stock Age reflects the number of housing units built in the municipality prior to 1970. These homes may be more vulnerable and less resilient to changing climate conditions.

LINK TO HOUSING STOCK AGE MAP

Landscan

Landscan provides a relative assessment of population density measured on a "people per cell" indicator basis. While this is not a measure of social vulnerability, it is provided to better understand where populations reside.

LINK TO LANDSCAN MAP

New Jersey: Built Infrastructure Assets Exposure Snapshot

Appendix: Background Information Regarding the Total Water Level Approach

This Appendix provides additional background on sea-level rise and the Total Water Level approach for assessing vulnerability of people, places, and assets in New Jersey to sea-level rise and sea-level rise combined with storm events.

Sea level Rise and Total Water Level: From 1911 to 2019, the mean sea-level rose 1.5 feet along the New Jersey coast, compared to a 0.6 feet rise in the global mean sea-level. New Jersey coastal areas are likely to experience sea-level rise of 0.5 to 1.1 feet between 2000 and 2030, and 0.9 to 2.1 feet between 2000 and 2050.

The number of days that New Jersey residents have experienced high-tide floods has also increased. From 2007 through 2016, there was an average of 8 high-tide flood events in Atlantic City each year. Based on the likely range of sea-level rise projections, Atlantic City will experience 17-75 days of expected high-tide flooding per year in 2030, and 45-255 days per year of expected high-tide flooding in 2050.

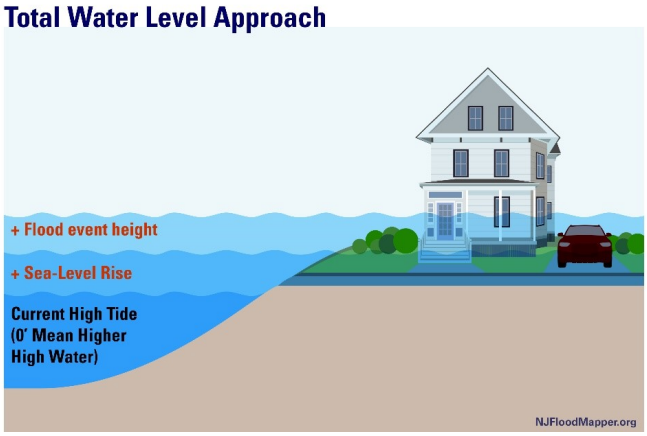

Figure A-1. Total Water Level reflecting combined inundation from future sea-level rise and flood events.

For the purposes of the exposure snapshots, different flood events are defined by total water levels (TWLs). TWLs present a height above high tide (See Figure A-1) that reflects the combined inundation from future sea-level rise and current flood events projected into the future from the year 2000 (Kopp et al., 2019).

Flood events[1] can occur from surge created by a coastal storm (such as a hurricane or nor'easter) or from high tide each day as sea levels rise. For example, a 2-foot flood event along the New Jersey coast today can occur because of seasonal 'high-tide flood' conditions. By 2050, the same 2-foot flood events will become more frequent, occurring under normal high-tide conditions and inundating the affected areas[2]. While flood events resulting from daily tides will result in permanent inundation (i.e., the water will not recede), coastal storm induced flood events last only for the duration of a storm. A 7-foot flood event along the New Jersey coast that approximates potential hurricane storm tides today will become more likely in the future as coastal storm surge occurs on top of an increased baseline of sea-level to create higher storm tides. You can use our tools at (NJADAPT / NJFLOODMAPPER) to develop custom water levels for your region.

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[1]Flood events referenced in this document as examples reflect 'total water level' heights above Year 2000 Mean Higher High Water, consistent with the sea-level baseline datum. See Kopp et al., 2019.

[2]See Kopp et al., 2019 Appendix B for region specific high-tide flood frequency projections.

Metadata / Sources - Flood Hazards

		Where to Get It	
Name	**Description**	**Map Service**	**Authoritative Source**
FEMA Flood Zones	This FIRM data service allows users to view FIRMs for NJ. Counties were combined using the data downloaded from FEMA's Region II office.	FEMA Flood Zones Map Service	Federal Emergency Management Agency(FEMA)
Total Water Level (0 - 20 ft)	This dataset illustrates the scale of potential flooding, not the exact location, and does not account for erosion, subsidence, or future construction. Inundation is shown as it would appear during the highest high tides (excludes wind driven tides). The dataset should be used only as a screening-level tool for management decisions. As with all remotely sensed data, all features should be verified with a site visit.	Total Water Level Map Service	
Sea Level Rise (0 - 10 ft.)	This dataset was created as part of the National Oceanic and Atmospheric Administration Office for Coastal Management's efforts to depict potential sea level rise and its associated impacts on the nation's coastal areas. The purpose of the mapping viewer is to provide coastal managers and scientists with a preliminary look at sea level rise and coastal flooding impacts. The purpose of this dataset is to show potential sea level rise inundation above current Mean Higher High Water (MHHW) for the area.This dataset illustrates the scale of potential flooding, not the exact location, and does not account for erosion, subsidence, or future construction. Inundation is shown as it would appear during the highest high tides (excludes wind driven tides) with the sea level rise amount. The dataset should be used only as a screening-level tool for management decisions.	Sea Level Rise Map Services	NOAA Office for Coastal Management
SLR Mapping Confidence (0 - 10 ft.)	Inundation Uncertainty Associated with Elevation Data and Tidal Datum Conversion for Sea Level Rise. The purpose of this dataset is to depict errors that are directly related to elevation and water height data. These errors can be used to begin defining areas with mapped inundation that do not have the same level of confidence as other areas. For a detailed explanation of mapping methods, see https://meridian.allenpress.com/jcr/article-abstract/30/3/548/202407/Mapping-and-Portraying-Inundation-Uncertainty-of?redirectedFrom=fulltext	SLR Mapping Confidence Map Services	NOAA Office for Coastal Management

Metadata / Sources - Social Vulnerability

		Where to Get It	
Name	**Description**	**Map Service**	**Authoritative Source**
Social Vulnerability Index - Overall	The Social Vulnerabiltiy Index combines percentile rankings of US Census American Community Survey (ACS) 2014-2018 variables, for the state, at the census tract level and highlight the location of a community's most vulnerable people.	Overall Social Vulnerability Map Service	Center for Disease Control -Agency for Toxic Substances and Disease Registry (ATSDR)
Social Vulnerability Index - Socio-Economic	The Social Vulnerabiltiy Index combines percentile rankings of US Census American Community Survey (ACS) 2014-2018 variables, for the state, at the census tract level and highlight the location of a community's most vulnerable people. Socioeconomic Status: Poverty, Unemployed, Per Capita Income, No High School Diploma.	SVI Socio-Economic Map Service	Center for Disease Control -Agency for Toxic Substances and Disease Registry (ATSDR)
Social Vulnerability Index - Household Composition	The Social Vulnerabiltiy Index combines percentile rankings of US Census American Community Survey (ACS) 2014-2018 variables, for the state, at the census tract level and highlight the location of a community's most vulnerable people. Household Composition/Disability: Aged 65 and Over, Aged 17 and Younger, Single-parent Household, Aged 5 and over with a Disability.	SVI Household Composition Map Service	Center for Disease Control -Agency for Toxic Substances and Disease Registry (ATSDR)
Social Vulnerability Index - Race / Ethnicity / Language	The Social Vulnerabiltiy Index combines percentile rankings of US Census American Community Survey (ACS) 2014-2018 variables, for the state, at the census tract level and highlight the location of a community's most vulnerable people. Race/Ethnicity/Language: Minority, English Language Ability.	SVI Race/Ethnicity/Language Map Service	Center for Disease Control -Agency for Toxic Substances and Disease Registry (ATSDR)
Social Vulnerability Index - Housing / Transportation	The Social Vulnerabiltiy Index combines percentile rankings of US Census American Community Survey (ACS) 2014-2018 variables, for the state, at the census tract level and highlight the location of a community's most vulnerable people. Housing/Transportation: Multi-unit, Mobile Homes, Crowding, No Vehicle, Group Quarters.	SVI Housing/Transportation Map Service	Center for Disease Control -Agency for Toxic Substances and Disease Registry (ATSDR)
ALICE	ALICE represents working households unable to afford basic necessities. ALICE households have incomes above the Federal Poverty Level, but below the Household Survival Budget (HSB). The HSB calculates the actual cost of basic necessities - housing, child care, food, transportation, health care, technology (smartphones), and taxes - in New Jersey, adjusted for different counties and household types.	ALICE Map Service	United Way of Northern New Jersey

		Where to Get It	
Name	**Description**	**Map Service**	**Authoritative Source**
Homeless Population	The homeless population is calculated via a Point-in-Time (PIT) count of sheltered and unsheltered people experiencing homelessness on a single night in January. This dataset was gathered in January 2018. The count is based on Continuum of Care program geographies. Some Continuum of Care programs cover one county in New Jersey, while other programs cover multiple counties. Map boundaries have been dissolved to show Continuum of Care geographic coverage.	Homeless Population Map Service	U.S. Department of Housing and Urban Development
Age of Housing Stock	Housing units built prior to the year 1970	Housing Stock Map Service	U.S. Census Bureau, American Community Survey
MRI Distress Score	The Municipal Revitalization Index (MRI) ranks New Jersey's municipalities according to eight separate indicators that measure diverse aspects of social, economic, physical, and fiscal conditions in each locality. These indicators are: Average annual population change; Children on Temporary Assistance for Needy Families; Unemployment rate; Equalized 3-year effective tax rate; Equalized valuation per capita; Per capita income; Substandard housing percentage; Pre-1960 housing percentage. The distress score ranges from 0 to 100, with 100 indicating maximum distress.	MRI Distress Score Map Service	New Jersey Department of Community Affairs
Veteran Population	Veteran status for the civilian population 18 years and older	Veteran Population Map Service	U.S. Census Bureau, American Community Survey
NJDEP Environmental Justice Overburdened Communities	In September 2020, New Jersey adopted a new law (N.J.S.A. 13:1D-157) that requires the New Jersey Department of Environmental Protection to evaluate the contributions of certain commercial and industrial facilities to existing environmental and public health stressors in overburdened communities when reviewing certain permit applications. The law also directs the Department to publish a list of overburdened communities, at a census block level, based on the following criteria: ◦ At least 35 percent of the households qualify as low-income households (at or below twice the poverty threshold as determined by the U.S. Census Bureau); ◦ At least 40 percent of the residents identify as minority or as members of a State recognized tribal community; or ◦ At least 40 percent of the households have limited English proficiency according to the U.S. Census Bureau. This data layer represents the New Jersey Department of Environmental Protection's published list of overburdened communities. More information can be found at: https://www.nj.gov/dep/ej/communities.html	Overburdened Communities Feature Service	NJDEP Office of Environmental Justice