UTAH

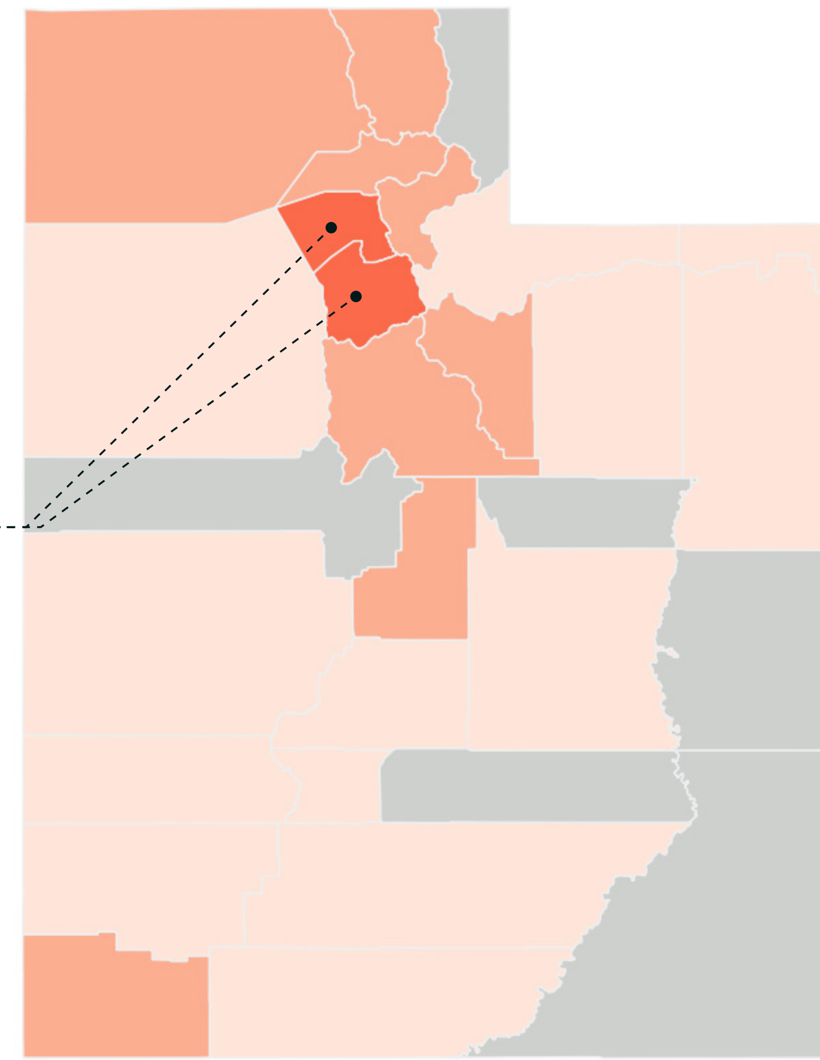
UTAH STATISTICS SUMMARY (2011 – 2024)	
8	CLIMATE DISASTER DECLARATIONS
$75.4 MILLION	FEMA + HUD POST-DISASTER FUNDING
3.3 MILLION PEOPLE	POPULATION TOTAL
$23	PER CAPITA SPENDING ON CLIMATE DISASTERS
DAVIS & SALT LAKE (4 DISASTERS)	COUNTY WITH THE HIGHEST DISASTER OCCURRENCES
0	COUNTIES HAVE HAD FIVE OR MORE DISASTERS
15K PEOPLE	LIVE IN AREAS WITH VERY HIGH SOCIAL VULNERABILITY (SVI > 0.75)
2.1 HOURS	TOTAL OUTAGE DURATION (HOURS PER CUSTOMER PER YEAR)
C+ (2025)	ASCE INFRASTRUCTURE REPORT CARD GRADE
25	SUPERFUND SITES
$2.2 BILLION	CLIMATE INFRASTRUCTURE SUPPORTED THROUGH SMALL INSURANCE SURCHARGE

DISASTER OCCURRENCES 2011–2024

FEDERALLY DECLARED CLIMATE DISASTERS BY COUNTY

8

disaster declarations



Davis County and Salt Lake County have each had 4 recent disaster declarations.

79% of counties have had recent disaster declarations.

Number of Disaster Events

Major Disaster Declarations (2011-2024)

- 0 occurences
- 1 occurrence
- 2-3 occurences
- 4-6 occurrences
- 7-9 occurrences
- 10+ occurrences

MAP MADE BY REBUILD BY DESIGN
FEMA DATA COURTESY OF IPARAMETRICS

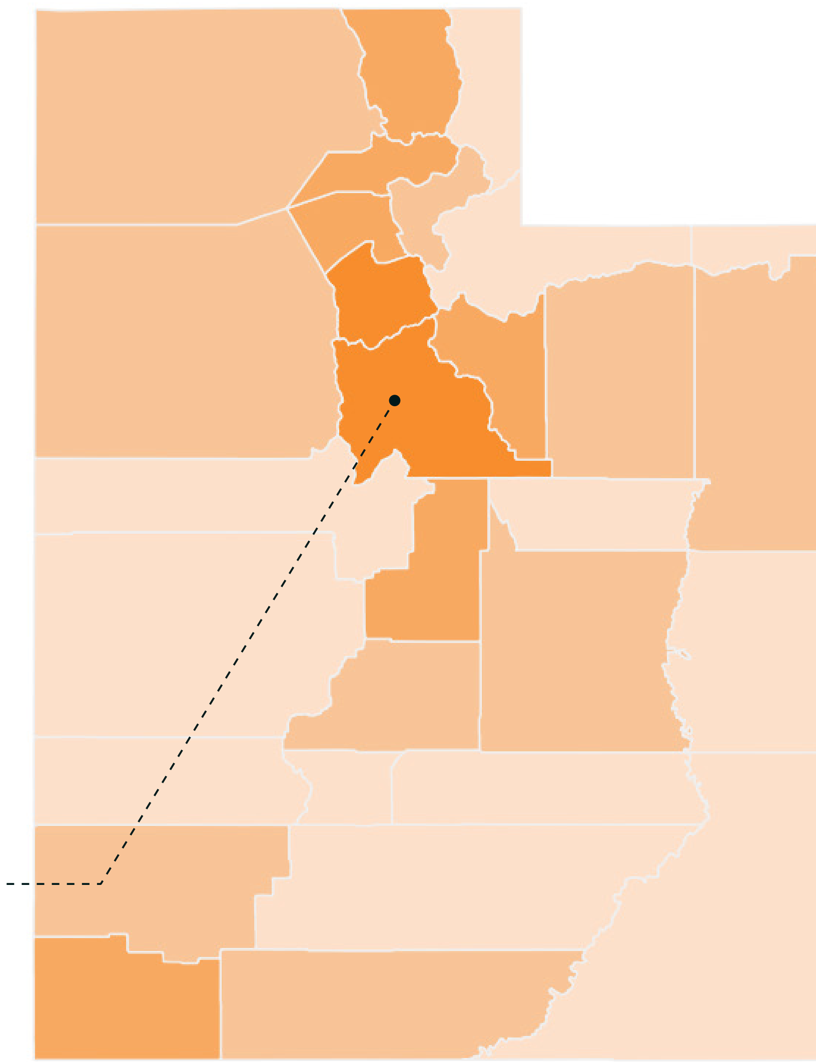
FEDERAL ASSISTANCE 2011–2024

POST-DISASTER PUBLIC ASSISTANCE AND HAZARD MITIGATION FUNDS OBLIGATED BY COUNTY FOR CLIMATE DISASTERS

$75.4M

post-disaster assistance

$75.4M	FEMA obligations
$0	HUD CDBG-DR Funds
$75.4M	FEMA + HUD assistance
$23	per capita cost



Salt Lake County has received the most post-disaster federal funds in the state: over $33 million.

FEMA Public Assistance and Hazard Mitigation

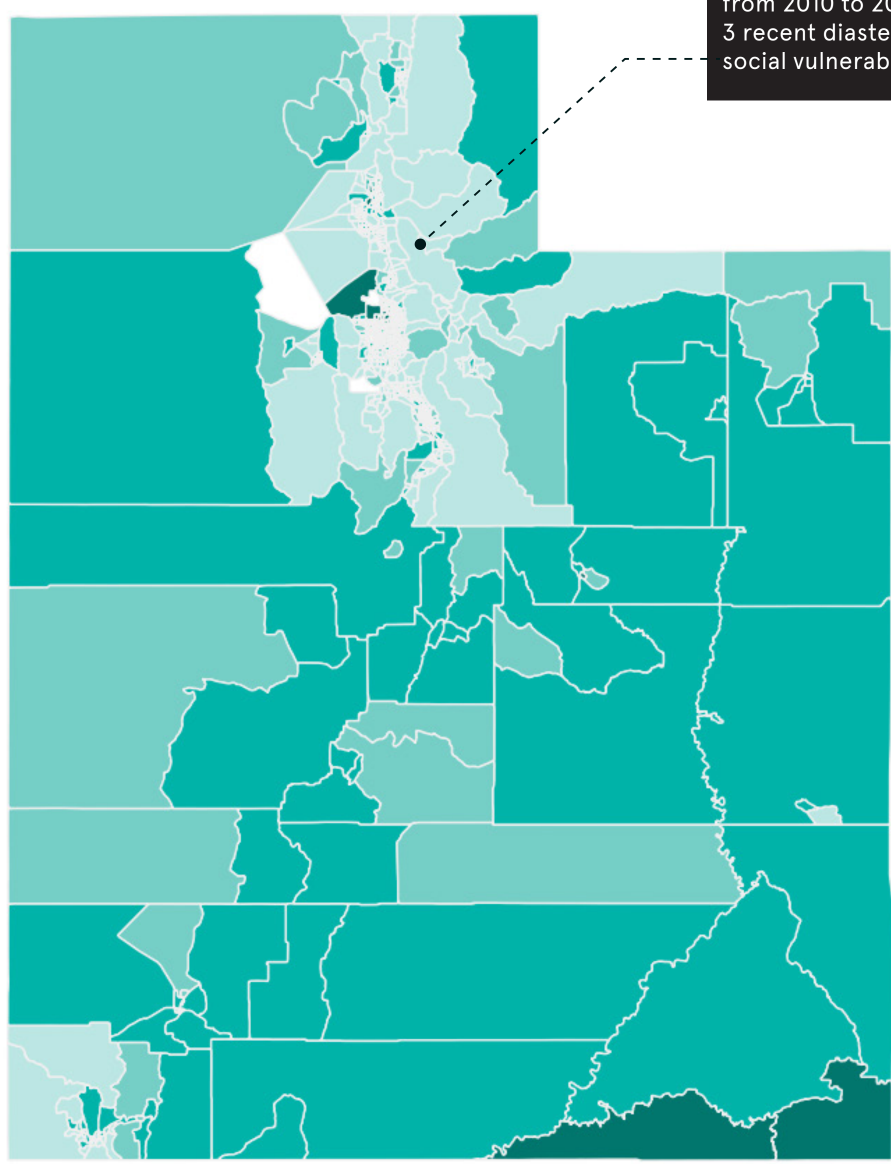
Federal Share Obligated (2011-2024)

- $0 to $100K
- $100K to $1M
- $1M to $10M
- $10M to $50M
- $50M to $100M
- $100M to $500M

MAP MADE BY REBUILD BY DESIGN
FEMA DATA COURTESY OF IPARAMETRICS

SOCIAL VULNERABILITY INDEX 2022

AREAS OF GREATEST SOCIAL VULNERABILITY



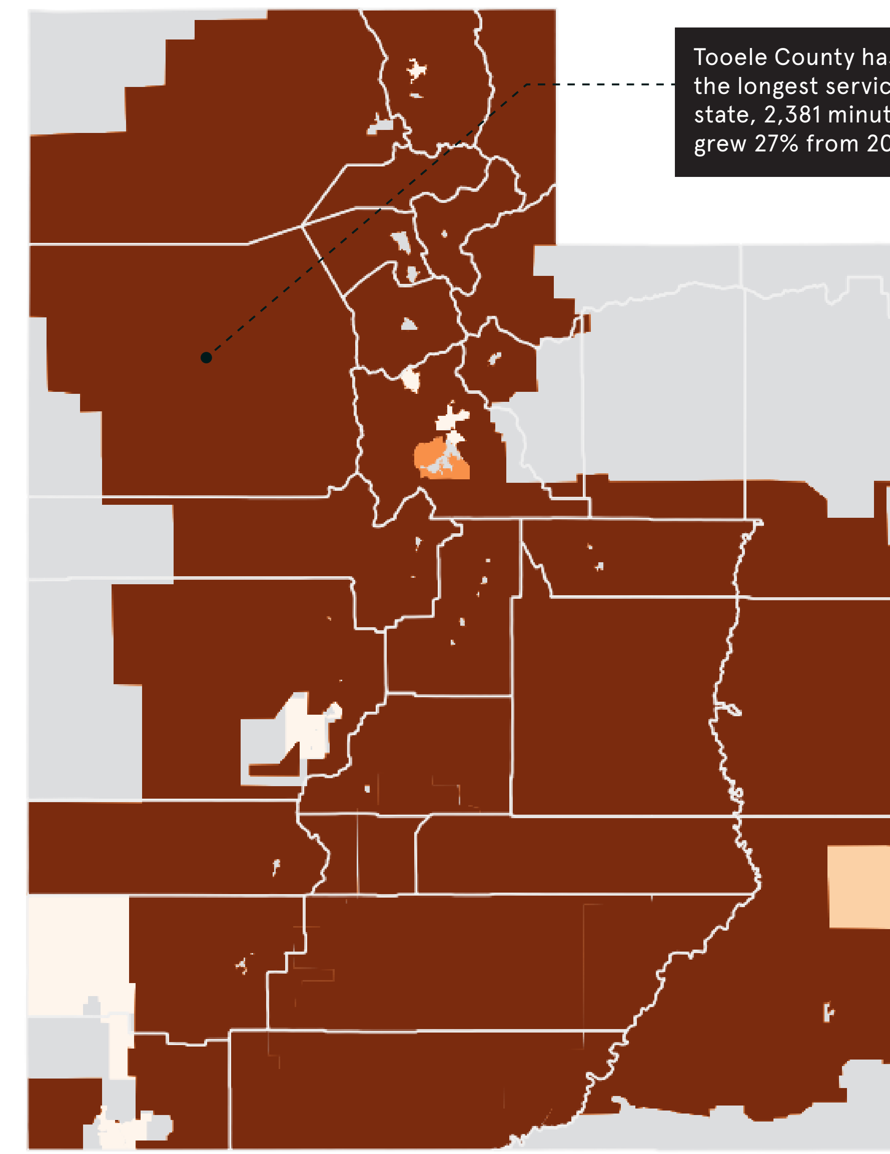
Social Vulnerability Index
CDC (2022)

- No Value
- 0.0 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1.0

MAP MADE BY REBUILD BY DESIGN
DATA SOURCE: CDC/ATSDR 2022 SVI

ENERGY RELIABILITY 2023

COUNTIES AT GREATEST RISK OF POWER OUTAGES



Aggregated Annual Electric Outage Duration
Including major events - SAIDI_W_MED

- missing electric outage data
- 0 - 60 minutes
- 60 - 120 minutes
- 120 - 240 minutes
- 240 - 456 minutes
- 456- 7,700 minutes

MAP MADE BY REBUILD BY DESIGN
SOURCE: U.S. ENERGY INFORMATION ADMINISTRATION 2023

TOTAL: 8 DISASTERS
FEMA PA + HM: $75.4 M
HUD CDBG-DR: $0
FEMA + HUD ASSISTANCE: $75.4 M

				Total		2011				2012				2017		2020		2021		2023	
						1955: SEVERE WINTER STORM AND FLOODING		4011: FLOODING		4053: SEVERE STORM		4088: SEVERE STORM AND FLOODING		4311: SEVERE WINTER STORMS AND FLOODING		4548: EARTHQUAKE AND AFTERSHOCKS		4578: STRAIGHT-LINE WINDS		4752: FLOODING	
GEOID	COUNTY NAME	# OF DISASTERS	FEMA TOTAL	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations
49000	49000: Statewide	7	$3,892,725.38	$3,099,519.37	$793,206.01	$1,125,458.44	$66,545.00	$587,306.93	$62,093.00	$169,058.09	$21,000.00	$49,020.22	$25,500.00	$153,011.76	$41,649.19	$335,706.48	$467,017.00	$679,957.45	$109,401.82		
49001	49001: Beaver County	1	$70,395.09	$70,395.09	$0.00			$70,395.09	$0.00												
49003	49003: Box Elder County	2	$820,993.22	$820,993.22	$0.00			$92,045.85	$0.00					$728,947.37	$0.00						
49005	49005: Cache County	3	$2,954,941.34	$2,954,941.34	$0.00			$688,894.19	$0.00					$2,244,390.77	$0.00			$21,656.38	$0.00		
49009	49009: Daggett County	1	$7,661.48	$7,661.48	$0.00			$7,661.48	$0.00												
49011	49011: Davis County	4	$6,850,347.55	$5,653,144.55	$1,197,203.00			$752,950.83	$233,012.00	$2,192,489.75	$0.00					$0.00	$964,191.00	$2,707,703.97	$0.00		
49013	49013: Duchesne County	1	$178,324.39	$178,324.39	$0.00			$178,324.39	$0.00												
49015	49015: Emery County	1	$109,590.27	$109,590.27	$0.00			$109,590.27	$0.00												
49017	49017: Garfield County	1	$59,331.15	$59,331.15	$0.00	$59,331.15	$0.00														
49021	49021: Iron County	1	$391,907.11	$391,907.11	$0.00															$391,907.11	$0.00
49025	49025: Kane County	1	$244,036.16	$244,036.16	$0.00	$244,036.16	$0.00														
49027	49027: Millard County	1	$46,297.96	$46,297.96	$0.00			$46,297.96	$0.00												
49029	49029: Morgan County	3	$652,447.34	$285,310.34	$367,137.00			$157,404.34	$0.00									$96,743.50	$367,137.00	$31,162.50	$0.00
49031	49031: Piute County	1	$23,597.48	$23,597.48	$0.00			$23,597.48	$0.00												
49035	49035: Salt Lake County	4	$33,554,214.94	$32,560,029.94	$994,185.00			$1,367,180.76	$973,738.00	$203,135.88	$20,447.00					$25,311,668.65	$0.00	$5,678,044.65	$0.00		
49039	49039: Sanpete County	2	$1,012,093.73	$1,012,093.73	$0.00			$381,061.97	$0.00											$631,031.76	$0.00
49041	49041: Sevier County	1	$109,438.00	$109,438.00	$0.00			$109,438.00	$0.00												
49043	49043: Summit County	1	$73,479.32	$73,479.32	$0.00			$73,479.32	$0.00												
49045	49045: Tooele County	1	$140,925.54	$140,925.54	$0.00			$140,925.54	$0.00												
49047	49047: Uintah County	1	$237,858.85	$237,858.85	$0.00			$237,858.85	$0.00												
49049	49049: Utah County	2	$10,498,878.21	$10,498,878.21	$0.00			$541,628.50	$0.00											$9,957,249.71	$0.00
49051	49051: Wasatch County	2	$1,506,315.74	$1,506,315.74	$0.00			$499,729.24	$0.00											$1,006,586.50	$0.00
49053	49053: Washington County	2	$9,477,411.35	$8,877,293.35	$600,118.00	$7,272,516.80	$600,118.00					$1,604,776.55	$0.00								
49057	49057: Weber County	2	$2,446,670.98	$2,446,670.98	$0.00			$1,672,998.58	$0.00									$773,672.40	$0.00		
Total	Total	8	$75,359,882.58	$71,408,033.57	$3,951,849.01	$8,701,342.55	$666,663.00	$7,738,769.57	$1,268,843.00	$2,564,683.72	$41,447.00	$1,653,796.77	$25,500.00	$3,126,349.90	$41,649.19	$25,647,375.13	$1,431,208.00	$9,957,778.35	$476,538.82	$12,017,937.58	$0.00

APPENDIX

MAPPING THE IMPACT

DATA VISUALIZATION TOOLS

It is evident the U.S. is already paying a steep price for this challenge. Rebuild by Design partnered with APTIM and iParametrics to create the following visual tools to demonstrate how climate events have affected each state. The set of six maps depicts which areas have been hit the hardest by recent climate events, where recovery funds are focused, where those individuals with high social vulnerabilities live, and which areas have the least energy reliability.

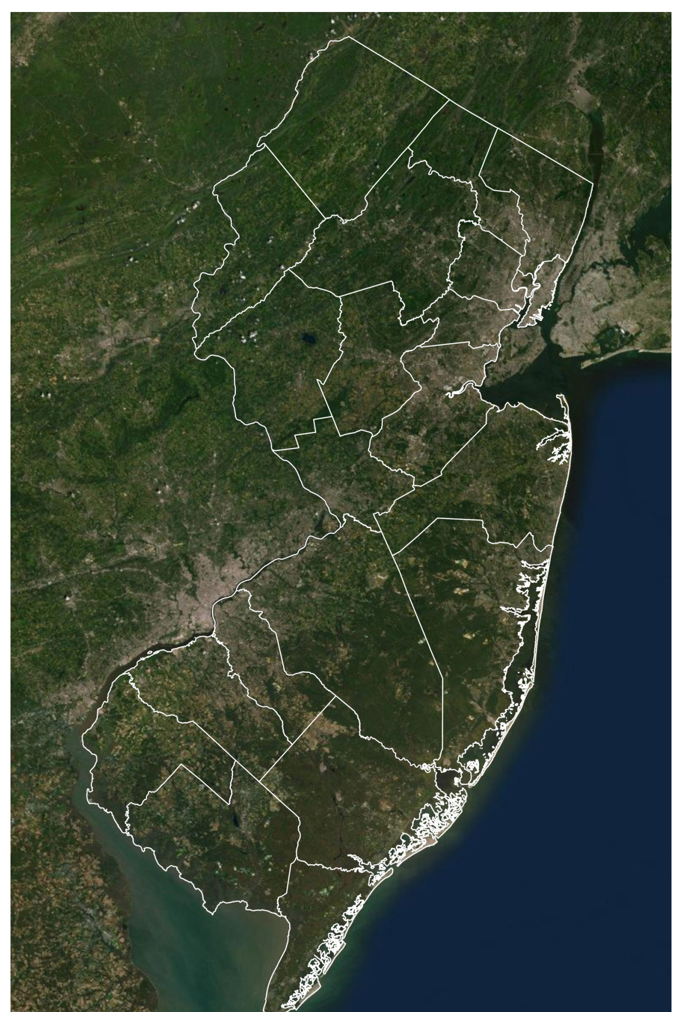
The U.S. needs to change the way it is making funding decisions. Where we make priority investments is equally important to what we invest in. Returns on investments (ROI) in the form of social benefits to communities needs to be part of grant evaluations. The U.S. need to utilize new decision-making frameworks that are forward-looking. The final map in the set includes an example of a new decision-making framework that takes into account current vulnerabilities and future climate risks. This is one example of how physical and social vulnerability indicators could inform where investments in adaptation infrastructure can yield high returns in social benefits to the most impacted communities. Our team recognizes, however, that there are other decision-making frameworks to explore, and further research is needed to understand which indicators should be included in any state-specific model. Given the ever-present constraints on funding availability, the intent of presenting these maps together is to prompt investments that address multiple known vulnerabilities simultaneously within projects, furthering comprehensive climate adaptation planning.

The following data are designed as a tool to help communities understand their risks to make better-informed choices with higher returns on investment, though each state should determine their own framework for investment.

There are always many ways to present these data. For the purposes of this report, we chose to analyze the years 2011-2024. The following six maps and two tables are presented in this format with the following considerations and limitations:

GEOGRAPHIC MAP

The map provides topographic and geographic context for each state and its surrounding areas, indicating whether the state encompasses coastal, riverine, lake, alpine, or desert land.

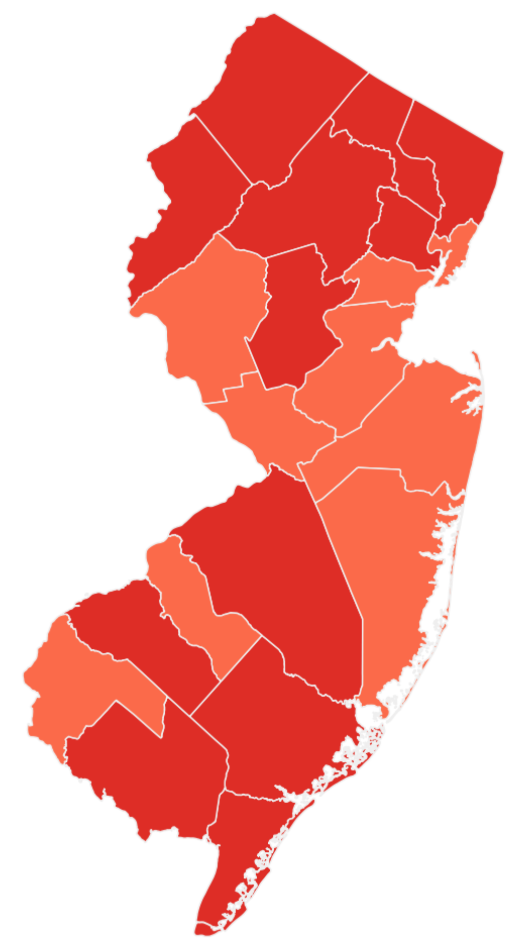


GEOGRAPHIC MAP. SOURCE: ESRI WORLD IMAGERY BASEMAP

DISASTER DECLARATIONS (RED)

This map shows federally declared climate disasters by county from 2011-2024 – providing a snapshot of the magnitude of climate disasters across the country in recent history. This report only identifies federally declared disasters, as there is no entity that collects and publishes state disaster declarations. It should be noted that the declarations shown in this report do not reflect every climate event that has occurred between 2011-2024; the report instead only shows those which have met the cost threshold for a federal disaster declaration. Therefore, the findings overall underestimate the number of occurrences and the suffering that some communities have experienced.

According to the Stafford Act, as amended in May 2021, a "major disaster" includes "any natural catastrophe (including any hurricane, tornado, storm, high water, winddriven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought), or, regardless of cause, any fire, flood, or explosion, in any part of the United States, which in the determination of the President causes damage of sufficient severity and magnitude to warrant major disaster assistance under this Act to supplement the efforts and available resources of States, local governments, and disaster relief organizations in alleviating the damage, loss, hardship, or suffering caused thereby."



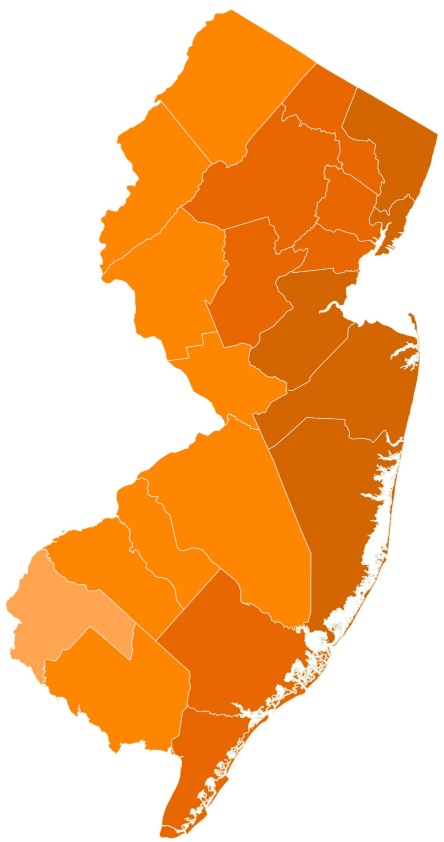
DISASTER OCCURRENCES
SOURCE: FEMA 2011-2024
MAP MADE BY REBUILD BY DESIGN

Importantly, extreme heat waves do not fit the criteria for federal disaster declarations despite being the leading cause of deaths among climate hazards. Likewise, sea level rise is not included in this definition despite the threat it poses to numerous communities, including damage to property, loss of land, and displacement.

It should be noted that while most disaster declarations are due to climate events, there are a few instances of disasters due to other natural hazards, such as earthquakes and volcanic eruptions. Though these events are not increasing in magnitude or frequency due to climate change, the severity of their impact may be connected. As climate impacts degrade household and critical infrastructure, communities may become more vulnerable to other natural hazards. Retrofitting infrastructure after these events often requires the same measures as floods, tornadoes, fires, etc., so these events were included in the report to demonstrate the need to prioritize multi hazard adaptation approaches.

FEDERAL ASSISTANCE (ORANGE)

The map shows the amount of federal dollars allocated to counties through FEMA's Public Assistance and Hazard Mitigation Grant Programs between 2011-2024 which allocates funding to individual counties and statewide. The map does not show where "statewide" allocations were spent within the state, but rather only shows county allocations. However, these statewide allocation amounts are included in the Disaster Declaration table at the end of each chapter and included in the "FEMA Total" provided next to the map. The adjacent table adds HUD's Community Development Block Grant Disaster Recovery funds – which are only available to states after a disaster – to the FEMA Total for an estimate of federal post-disaster spending in each state.



FEDERAL ASSISTANCE
SOURCE: FEMA (HA+PM) 2011-2024
MAP MADE BY REBUILD BY DESIGN

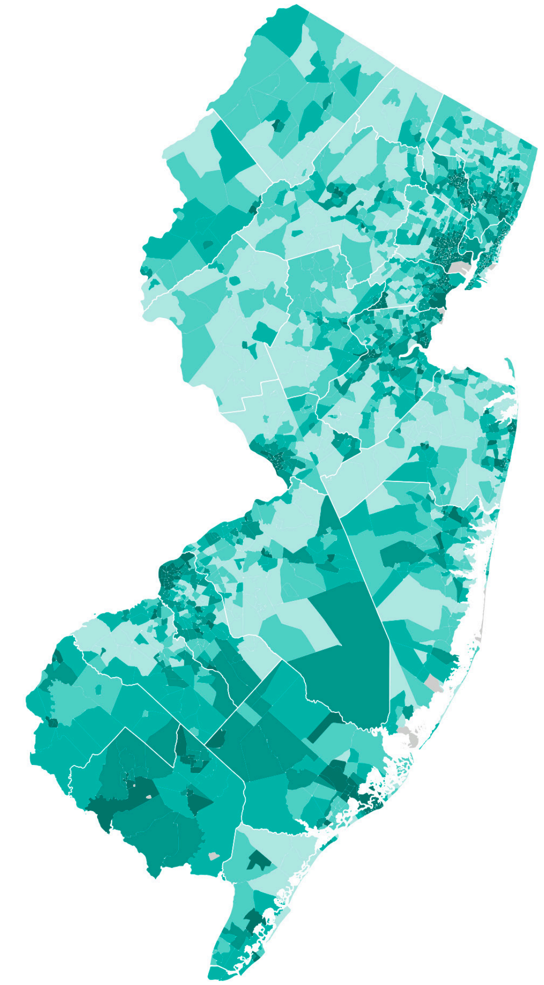
The Disaster Declaration tables provided at the end of each chapter show all federal Disaster Declarations declared between 2011-2024 and the corresponding FEMA obligations associated with those events. **However, in some instances, FEMA continues to obligate funds for years following a declaration. Some states have received funds for events that took place between 2011-2024 after 2024, so the total sum of funds associated with that event are not captured.** All FEMA funds allocated to counties between 2011-2024 are shown in the federal assistance map; however, they do not show up in the Disaster Declaration table if their corresponding event took place prior to 2011. For example, counties in the State of Illinois are still receiving funds from a 1960s storm. The funds obligated to those counties are included in the map, but that event is not included in the Disaster Declaration table at the end of the chapter.

There are additional sources of federal funding made available to governments or individuals in response to disasters, such as the U.S. Army Corp of Engineers (USACE) projects, Small Business Administration (SBA) loans, and private insurance payouts, which are not included in this report because they are harder to uniformly track and/or must be paid back. Therefore, our findings underestimate the total support available to states and individuals post-disaster.

Since disaster aid is allocated to repair physical damage to property, events such as extreme heat, which largely creates physical damage to persons and not property, rarely qualify for federal disaster recovery aid. Additionally, there is only a shallow understanding of the economic impact of social and health-related costs and environmental degradation after a disaster.

SOCIAL VULNERABILITY INDEX (GREEN)

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human well-being. Such stresses include natural or human-caused disasters or disease outbreaks. The factors that determine social vulnerability are directly tied to social determinants of health or the social, economic, and physical factors – such as race, socioeconomic status, and environmental conditions – that influence health. Socially vulnerable populations fare the worst during a disaster and often take longer to recover. The Center for Disease Control/Agency for Toxic Substance and Disease Registry Social Vulnerability Index (CDC/ATSDR SVI) uses 1**5 U.S. census variables** to help local officials identify communities that may need support before, during, or after disasters. The map presents the SVI on a census block



SOCIAL VULNERABILITY
SOURCE: CDC/ATSDR 2022
MAP MADE BY REBUILD BY DESIGN

level, indicating where the most socially vulnerable populations within each county live. The 15 indicators are grouped into four themes:

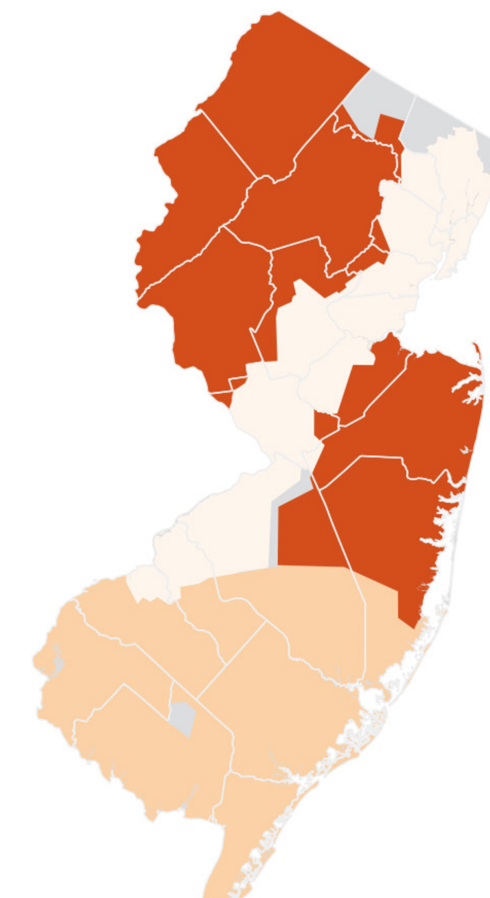
- **Socioeconomic Status** (below poverty, unemployed, income, no high school diploma);
- **Household Composition & Disability** (aged 65 or older, aged 17 or younger, older than age 5 with a disability, single-parent households);
- **Minority Status & Language** (minority, speak English "less than well"); and
- **Housing Type & Transportation** (multi-unit structures, mobile homes, crowding, no vehicle, group quarters).

Social Vulnerability Index data are not being used to make post-disaster assistance funding decisions. HUD only requires Low and Moderate Income for a portion of their funding. FEMA does not consider it in their allocations.

ENERGY RELIABILITY (BROWN)

Climate events often lead to energy disruptions for hours, days, or weeks. This map shows the annual average interruption time (in minutes) across the different energy utility providers within a state. Regions (or utility territories) in the darkest shade, on average, experience longer energy outages. These data are aggregated by utility territory, not county, meaning more than one provider can serve a county or group of counties.

Viewing the Energy Reliability Map next to the SVI Map, one can begin to infer which regions have the most socially vulnerable residents and are served by the least reliable energy providers. Energy reliability is increasingly becoming related to climate disasters and weather events. Inclusion of these maps is to support evaluation of need for concurrent flood and energy resilience projects.



ENERGY RELIABILITY
SOURCE: US ENERGY INFORMATION ADMINISTRATION 2023
MAP MADE BY REBUILD BY DESIGN

System Average Interruption Duration Index (SAIDI) is one of the performance metrics used to measure the reliability of an electric utility's service. This metric measures the total time (in minutes) an average customer experiences a non-momentary power interruption over a one-year (calendar) period.

A Major Event Day (MED) is another metric which occurs when the SAIDI exceeds a specific threshold within a given day and tends to reflect outages on the longer end of the spectrum. The data presented in this report shows a metric of SAIDI combined with MED to highlight and report electric reliability in areas (utility territories) irrespective of the root cause of the interruption. The Energy Reliability Map displays the SAIDI_W_MED metric for utility territories and highlights areas that are susceptible to electric system vulnerabilities based on reliability performances. These vulnerabilities serve as an indicator as to where investments and improvements in the distribution grid should be focused.

Electric utilities experience power interruptions due to a variety of issues. Those issues include inclement weather, vegetation management practices, utility practices, maintenance patterns, and capital investment strategy, among others, which all play a part in a utility's overall reliability performance. The U.S. Energy Information Administration produces an Annual Electric Power Industry Report which utilizes data collected from U.S. electric utilities reflecting their reliability performance against certain industry standards and performance metrics. Utilities have the flexibility to report interruptions according to duration and frequency either with major events, without major events, or both.

The annual SAIDI is the summation of the individual SAIDIs for each non-momentary interruption event over the entire year (2023):

$$\text{SAIDI} = \frac{\sum(\text{Duration of Interruption} \times \text{No. of Sustained Customer Interruptions})}{\text{Total No. of Customers Served}}$$

For utilities that report SAIDI metrics using the Institute of Electrical and Electronics Engineers (IEEE) standards, "non-momentary" interruptions are those lasting longer than five minutes. A Major Event Day (MED) is another metric which occurs when the SAIDI exceeds a specific threshold within a given day and tends to reflect outages on the longer end of the spectrum.

Utilities have certain flexibilities when reporting with these metrics. Including MED in the SAIDI metric (SAIDI_W_MED) provides an overall picture of the electric reliability experienced by customers. Excluding MED from the SAIDI metrics (SAIDI_WO_MED) tends to separate power interruption events by their durations, which provides an indicator of the source of the power interruption (i.e., distinguishes a Major Event vs. Systematic Operation interruption).

Our methodology utilizes SAIDI_W_MED as the primary measurement indicator for the electric reliability experience of the end user (customer). Our SAIDI_W_MED metric highlights the reported electric reliability in areas (utility territories, counties, and states) irrespective of the root cause of the interruption. Our metric does not exclude interruptions categorized as MEDs.

This report endeavors to highlight areas across the national electric distribution network (utility territories) that are susceptible to electric system vulnerabilities based on historical reliability of performance. We view vulnerabilities caused by major events (longer duration outages) on par with vulnerabilities caused by systematic failures (shorter duration outages) and believe they should equally drive electric grid investment and improvement decisions. These investments should also incorporate solutions aimed at mitigating systemic vulnerabilities that stem from issues like vegetation management practices, distribution automation improvements to major event vulnerabilities with root causes embedded in grid hardening, distribution generation schemes, and Automated Metering Infrastructure (AMI) upgrades aimed at minimizing customer interruption numbers and durations.

WE CANNOT WAIT ANY LONGER . . .