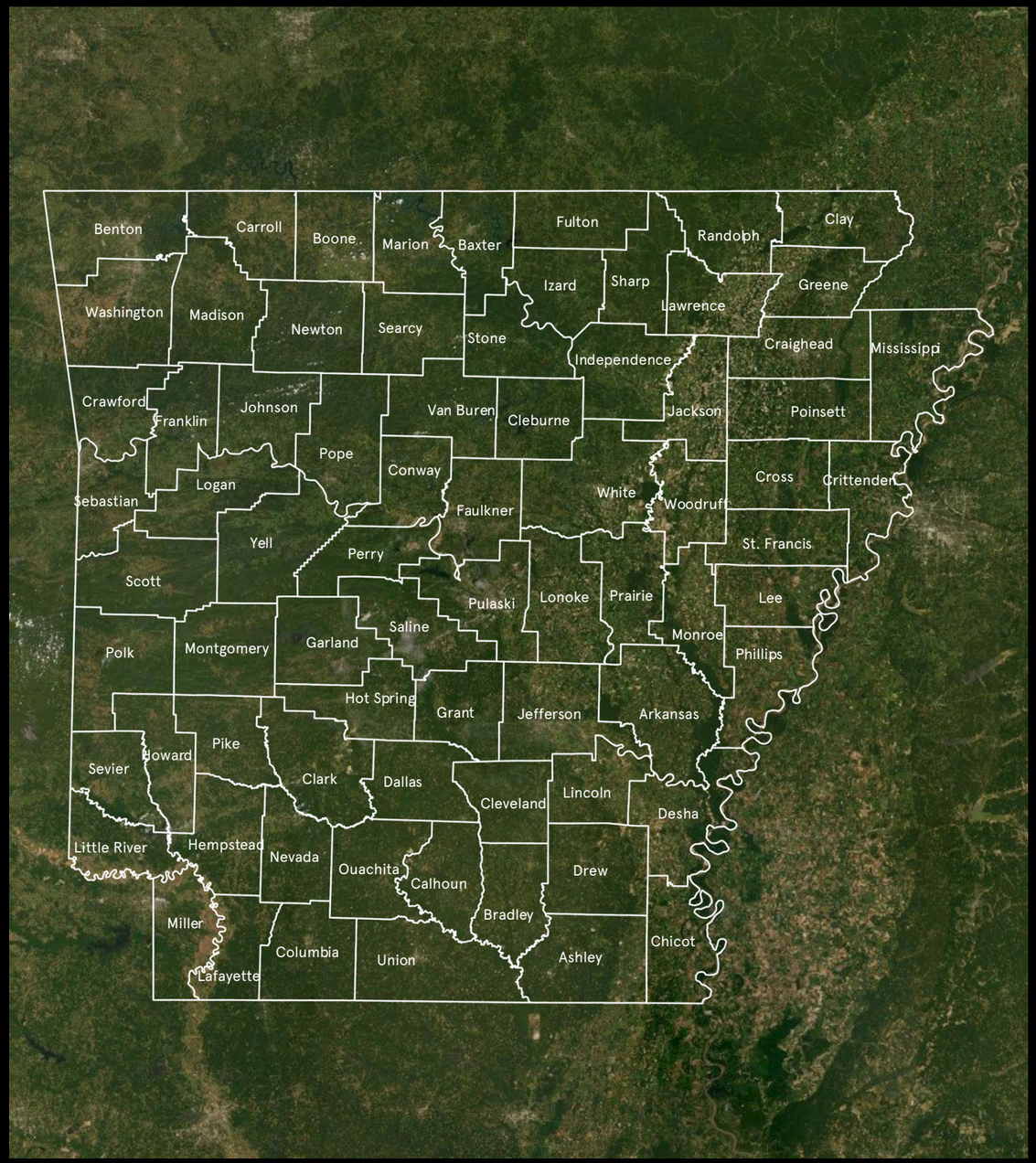
ARKANSAS



ARKANSAS STATISTICS SUMMARY (2011 - 2024)	
20	CLIMATE DISASTER DECLARATIONS
$407.5 MILLION	FEMA + HUD POST-DISASTER FUNDING
3.0 MILLION PEOPLE	POPULATION TOTAL
$135	PER CAPITA SPENDING ON CLIMATE DISASTERS
MADISON & SEARCY (8 DISASTERS)	COUNTY WITH THE HIGHEST DISASTER OCCURRENCES
33	COUNTIES HAVE HAD FIVE OR MORE DISASTERS
1.8 MILLION PEOPLE	LIVE IN AREAS WITH VERY HIGH SOCIAL VULNERABILITY (SVI > 0.75)
15.3 HOURS	TOTAL OUTAGE DURATION (HOURS PER CUSTOMER PER YEAR)
N/A	ASCE INFRASTRUCTURE REPORT CARD GRADE
17	SUPERFUND SITES
$2.4 BILLION	CLIMATE INFRASTRUCTURE SUPPORTED THROUGH SMALL INSURANCE SURCHARGE

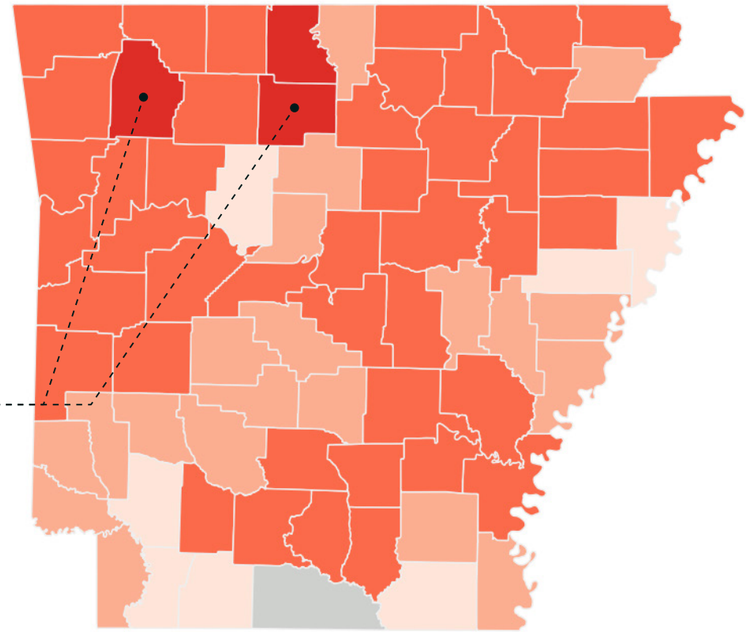
DISASTER OCCURRENCES 2011–2024

FEDERALLY DECLARED MAJOR DISASTERS BY COUNTY

20
disaster declarations

44% of counties in Arkansas have had 5 or more recent disasters.

Madison and Searcy County have had the highest number of recent disasters: 8 disasters each.



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

$408M
post-disaster assistance

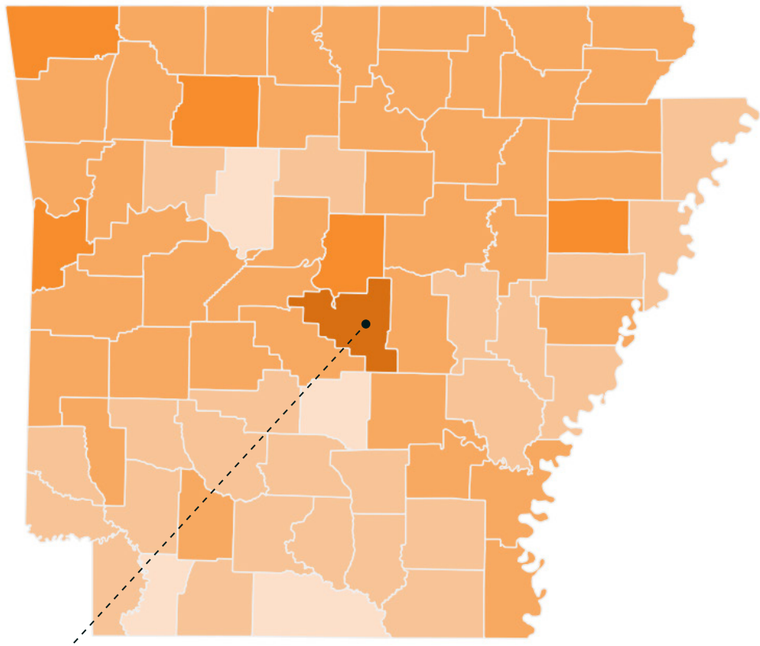
$340M FEMA obligations

$68M HUD CDBG-DR Funds

$408M FEMA + HUD assistance

$135 per capita cost

Pulaski County has received the most post-disaster assistance in the state: over $69.6 million.



FEMA Public Assistance and Hazard Mitigation

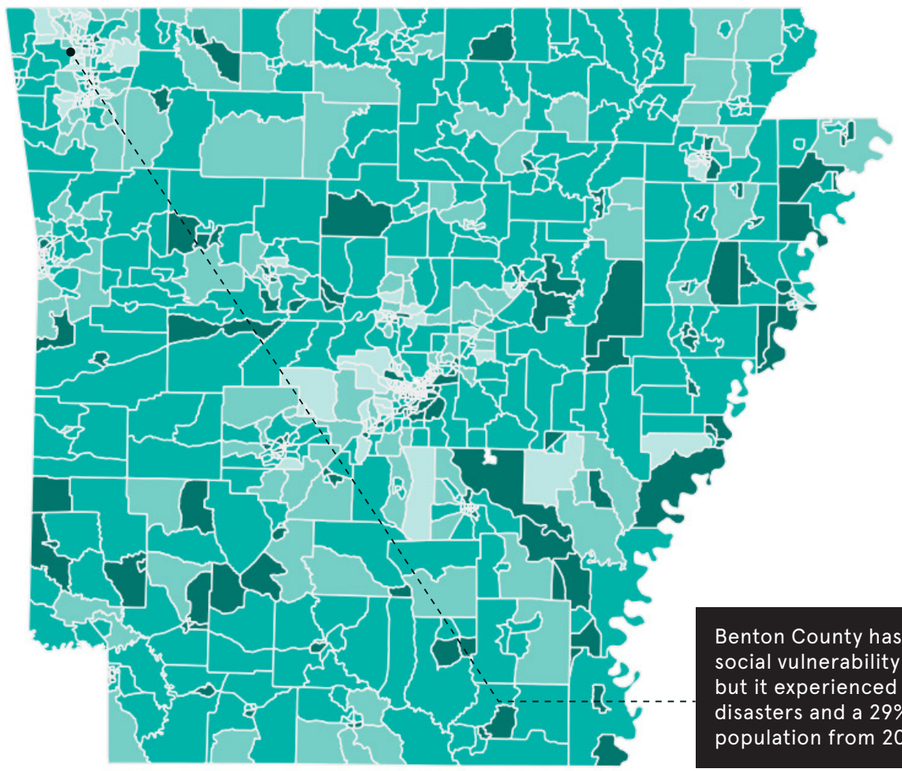
Federal Share Obligated (2011–2024)

- $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



Benton County has a low social vulnerability of 0.33, but it experienced 5 recent disasters and a 29% increase in population from 2010 to 2024.

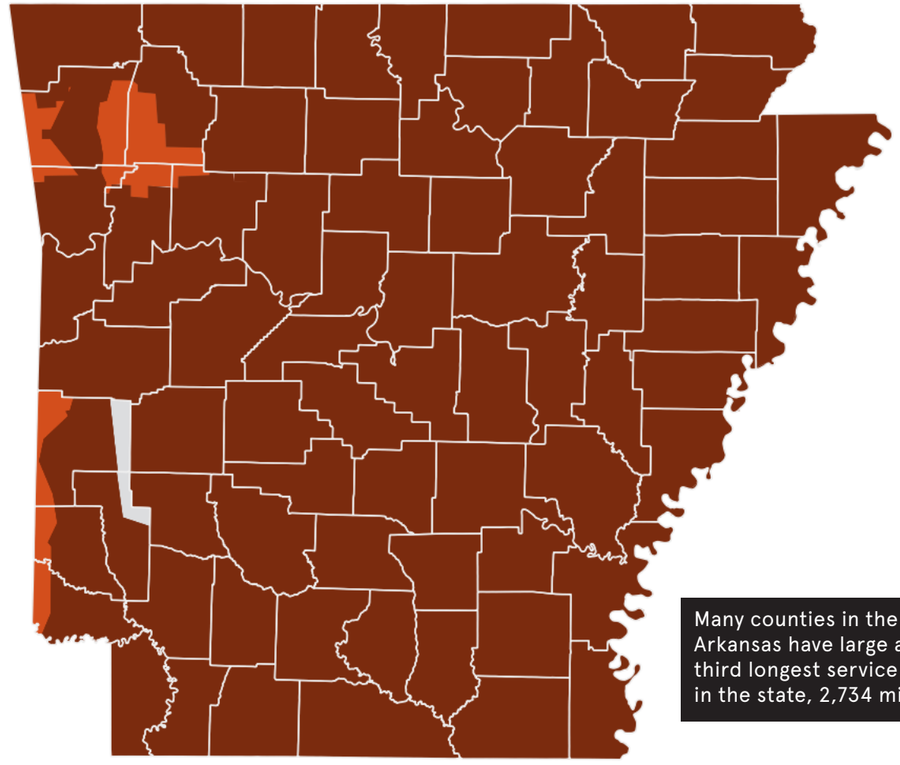
Social Vulnerability Index
CDC (2022)

- 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



Many counties in the west of Arkansas have large areas with the third longest service interruptions in the state, 2,734 minutes total.

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: 20 DISASTERS
FEMA PA + HM: $339.5 M
HUD CDBG-DR: $68.0 M
FEMA + HUD ASSISTANCE: $407.5 M

				Total												2014				2015								2019				2020				2021		2023						2024	
						1975: SEVERE STORMS, TORNADOES, AND ASSOCIATED FLOODING		4000: SEVERE STORMS, TORNADOES, AND FLOODING		4100: SEVERE WINTER STORM		4124: SEVERE STORMS, TORNADOES, AND FLOODING		4143: SEVERE STORMS AND FLOODING		4160: SEVERE WINTER STORM		4174: SEVERE STORMS,TORNADOES, AND FLOODING		4226: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4254: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4270: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4318: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4441: SEVERE STORMS AND FLOODING		4460: SEVERE STORMS, STRAIGHT-LINE WINDS, TORNADOES, AND FLOODING		4544: SEVERE STORMS, TORNADOES, AND STRAIGHT-LINE WINDS		4556: SEVERE STORMS AND STRAIGHT-LINE WINDS		4633: SEVERE STORMS AND TORNADOES		4698: SEVERE STORMS AND TORNADOES		4700: SEVERE WINTER STORM		4748: SEVERE STORMS, STRAIGHT-LINE WINDS, AND TORNADOES		4788: SEVERE STORMS, STRAIGHT-LINE WINDS, TORNADOES, AND FLOODING	
GEOID	County Name	# of Disasters	TOTAL FEMA	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	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	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations
05000	05000: Statewide	19	$53,842,756.99	$51,846,122.07	$1,996,634.92	$8,522,089.70	$317,221.93	$1,347,182.42	$23,036.00	$1,727,751.06	$63,921.00	$110,877.97	$34,441.03	$123,766.39	$18,787.59	$3,199,584.20	$29,108.73	$760,903.26	$79,450.06	$1,020,082.96	$213,009.14	$611,882.59	$124,315.04	$314,587.25	$19,986.00	$3,676,886.57	$230,618.00	$6,021,720.56	$484,030.00	$538,103.38	$143,361.09	$366,359.89	$80,123.55	$8,035,973.15	$135,225.76			$6,726,040.57	$0.00	$5,932,837.45	$0.00	$1,763,869.38	$0.00	$1,045,623.32	$0.00
05001	05001: Arkansas County	5	$786,025.47	$786,025.47	$0.00	$61,144.81	$0.00																	$214,938.43	$0.00			$0.00	$0.00					$238,569.59	$0.00							$271,372.64	$0.00		
05003	05003: Ashley County	1	$236,060.62	$236,060.62	$0.00																			$236,060.62	$0.00																				
05005	05005: Baxter County	3	$4,336,760.28	$3,436,760.28	$900,000.00	$176,591.64	$0.00																			$263,784.53	$900,000.00																	$2,996,384.11	$0.00
05007	05007: Benton County	5	$21,943,146.28	$21,077,179.28	$865,967.00	$4,192,237.18	$832,217.00							$3,251,874.95	$33,750.00							$2,186,771.67	$0.00			$5,430,660.18	$0.00																	$6,015,635.30	$0.00
05009	05009: Boone County	5	$3,555,046.13	$3,555,046.13	$0.00	$1,568,000.65	$0.00							$484,443.93	$0.00							$379,752.18	$0.00			$819,919.03	$0.00																	$302,930.34	$0.00
05011	05011: Bradley County	5	$381,167.09	$354,917.09	$26,250.00	$122,402.98	$0.00															$63,489.06	$0.00	$114,679.60	$0.00									$54,345.45	$26,250.00					$0.00	$0.00				
05013	05013: Calhoun County	4	$733,076.13	$733,076.13	$0.00	$353,547.79	$0.00															$190,445.10	$0.00	$116,033.60	$0.00															$73,049.64	$0.00				
05015	05015: Carroll County	5	$2,925,085.78	$2,906,335.78	$18,750.00	$818,529.12	$0.00							$404,410.98	$0.00							$412,007.99	$0.00			$1,140,343.02	$18,750.00																	$131,044.67	$0.00
05017	05017: Chicot County	3	$1,650,232.08	$1,650,232.08	$0.00	$1,171,221.13	$0.00																	$479,010.95	$0.00			$0.00	$0.00																
05019	05019: Clark County	3	$133,274.45	$107,024.45	$26,250.00	$0.00	$0.00			$0.00	$26,250.00									$107,024.45	$0.00																								
05021	05021: Clay County	4	$1,123,295.20	$495,170.20	$628,125.00	$127,292.11	$0.00											$109,967.38	$0.00			$77,395.83	$628,125.00			$180,514.88	$0.00																		
05023	05023: Cleburne County	4	$4,778,177.82	$4,778,177.82	$0.00	$1,329,100.75	$0.00					$1,031,179.20	$0.00					$721,676.94	$0.00							$1,696,220.93	$0.00																		
05025	05025: Cleveland County	4	$627,208.36	$627,208.36	$0.00	$315,876.49	$0.00																	$130,769.50	$0.00									$0.00	$0.00					$180,562.37	$0.00				
05027	05027: Columbia County	1	$379,663.50	$379,663.50	$0.00																			$379,663.50	$0.00																				
05029	05029: Conway County	3	$1,115,704.92	$1,059,454.92	$56,250.00	$124,511.59	$30,000.00																			$329,278.64	$0.00	$605,664.69	$26,250.00																
05031	05031: Craighead County	5	$5,254,106.90	$4,634,594.90	$619,512.00	$325,389.19	$0.00																			$329,412.83	$0.00					$3,535,297.93	$619,512.00			$0.00	$0.00					$444,494.95	$0.00		
05033	05033: Crawford County	6	$6,132,186.79	$4,443,642.79	$1,688,544.00	$1,288,737.16	$701,250.00	$13,317.24	$0.00							$175,973.92	$0.00			$1,154,461.78	$987,294.00	$260,006.09	$0.00					$1,551,146.60	$0.00																
05035	05035: Crittenden County	1	$734,483.33	$734,483.33	$0.00	$734,483.33	$0.00																																						
05037	05037: Cross County	4	$20,108,776.06	$20,108,776.06	$0.00	$95,352.47	$0.00					$127,658.70	$0.00													$111,032.13	$0.00											$19,774,732.76	$0.00						
05039	05039: Dallas County	5	$637,263.06	$637,263.06	$0.00	$183,030.71	$0.00													$28,395.85	$0.00	$0.00	$0.00											$0.00	$0.00					$425,836.50	$0.00				
05041	05041: Desha County	5	$1,477,867.38	$967,793.13	$510,074.25	$0.00	$0.00																	$114,188.82	$0.00			$742,400.39	$483,824.25					$0.00	$26,250.00					$111,203.92	$0.00				
05043	05043: Drew County	3	$166,141.22	$166,141.22	$0.00																	$42,964.29	$0.00											$75,924.00	$0.00					$47,252.93	$0.00				
05045	05045: Faulkner County	6	$15,187,276.53	$8,637,067.08	$6,550,209.45	$1,220,762.88	$0.00											$3,760,632.77	$1,609,362.00			$0.00	$0.00			$968,831.23	$2,544,856.24	$1,523,921.95	$2,395,991.21													$1,162,918.25	$0.00		
05047	05047: Franklin County	6	$2,221,854.73	$2,221,854.73	$0.00	$149,619.65	$0.00	$633,854.24	$0.00							$114,230.90	$0.00			$635,715.62	$0.00	$186,149.52	$0.00					$502,284.80	$0.00																
05049	05049: Fulton County	5	$1,699,241.07	$1,699,241.07	$0.00	$1,013,956.49	$0.00									$483,980.07	$0.00	$108,612.14	$0.00							$0.00	$0.00																	$92,692.37	$0.00
05051	05051: Garland County	3	$1,820,605.25	$1,801,605.25	$19,000.00	$781,871.11	$0.00			$662,065.73	$19,000.00									$357,668.41	$0.00																								
05053	05053: Grant County	3	$1,943.74	$1,943.74	$0.00					$1,943.74	$0.00																							$0.00	$0.00					$0.00	$0.00				
05055	05055: Greene County	3	$2,523,191.75	$2,523,191.75	$0.00	$2,246,149.12	$0.00															$277,042.63	$0.00																					$0.00	$0.00
05057	05057: Hempstead County	1	$136,454.32	$136,454.32	$0.00															$136,454.32	$0.00																								
05059	05059: Hot Spring County	2	$891,173.89	$286,591.89	$604,582.00	$85,162.45	$582,082.00			$201,429.44	$22,500.00																																		
05061	05061: Howard County	2	$1,259,802.08	$620,538.24	$639,263.84	$175,149.16	$639,263.84													$445,389.08	$0.00																								
05063	05063: Independence County	6	$2,331,052.23	$2,293,552.23	$37,500.00	$712,694.13	$0.00					$220,606.22	$37,500.00					$784,915.24	$0.00	$85,914.66	$0.00	$243,857.01	$0.00			$245,564.97	$0.00																		
05065	05065: Izard County	5	$1,669,684.30	$1,639,684.30	$30,000.00	$754,313.00	$0.00											$239,679.38	$0.00	$287,426.33	$0.00	$187,736.57	$0.00			$170,529.02	$30,000.00																		
05067	05067: Jackson County	5	$1,259,205.60	$1,117,225.51	$141,980.09	$601,207.59	$0.00											$298,700.58	$0.00			$0.00	$0.00			$217,317.34	$0.00									$0.00	$141,980.09								
05069	05069: Jefferson County	6	$3,886,674.74	$3,027,559.04	$859,115.70	$0.00	$0.00													$136,240.16	$0.00	$0.00	$0.00					$1,728,628.89	$859,115.70					$590,375.96	$0.00					$572,314.03	$0.00				
05071	05071: Johnson County	5	$798,188.15	$772,337.15	$25,851.00	$103,631.27	$0.00	$668,705.88	$0.00							$0.00	$25,851.00			$0.00	$0.00							$0.00	$0.00																
05073	05073: Lafayette County	1	$54,621.25	$54,621.25	$0.00															$54,621.25	$0.00																								
05075	05075: Lawrence County	4	$1,046,005.32	$1,008,505.32	$37,500.00	$333,061.88	$0.00											$149,102.88	$37,500.00			$88,808.50	$0.00			$437,532.06	$0.00																		
05077	05077: Lee County	2	$2,484,706.80	$2,484,706.80	$0.00	$2,484,706.80	$0.00															$0.00	$0.00																						
05079	05079: Lincoln County	5	$1,640,281.80	$1,640,281.80	$0.00	$899,058.31	$0.00																	$80,603.45	$0.00			$0.00	$0.00					$319,791.71	$0.00					$340,828.33	$0.00				
05081	05081: Little River County	2	$379,791.11	$379,791.11	$0.00															$319,427.39	$0.00	$60,363.72	$0.00																						
05083	05083: Logan County	4	$2,597,666.61	$1,919,723.07	$677,943.54											$81,291.05	$0.00			$347,939.24	$0.00	$384,641.75	$665,487.00					$1,105,851.03	$12,456.54																
05085	05085: Lonoke County	5	$1,334,942.29	$1,109,942.29	$225,000.00	$315,922.94	$0.00			$157,725.39	$225,000.00																	$107,178.66	$0.00									$314,992.65	$0.00			$214,122.65	$0.00		
05087	05087: Madison County	8	$5,208,457.19	$5,208,457.19	$0.00	$1,498,908.88	$0.00							$503,524.72	$0.00	$0.00	$0.00			$578,586.23	$0.00	$548,000.46	$0.00			$1,314,121.66	$0.00			$597,993.18	$0.00													$167,322.06	$0.00
05089	05089: Marion County	7	$4,551,483.16	$3,469,555.16	$1,081,928.00	$290,236.82	$0.00							$790,779.04	$1,081,928.00	$15,489.70	$0.00			$21,493.72	$0.00	$853,982.19	$0.00			$1,450,127.38	$0.00																	$47,446.31	$0.00
05091	05091: Miller County	2	$871,839.19	$871,839.19	$0.00															$806,229.55	$0.00	$65,609.64	$0.00																						
05093	05093: Mississippi County	4	$941,326.12	$941,326.12	$0.00	$288,920.63	$0.00															$329,456.86	$0.00			$322,948.63	$0.00									$0.00	$0.00								
05095	05095: Monroe County	2	$256,538.01	$256,538.01	$0.00	$256,538.01	$0.00																											$0.00	$0.00										
05097	05097: Montgomery County	5	$1,242,241.12	$1,215,991.12	$26,250.00	$269,098.31	$0.00					$289,417.62	$26,250.00							$167,538.06	$0.00	$199,766.39	$0.00			$290,170.74	$0.00																		
05099	05099: Nevada County	4	$2,139,143.67	$2,139,143.67	$0.00	$84,350.33	$0.00													$225,312.59	$0.00																			$1,769,546.49	$0.00			$59,934.26	$0.00
05101	05101: Newton County	6	$10,475,734.33	$10,475,734.33	$0.00	$1,093,198.96	$0.00							$2,222,624.56	$0.00	$12,081.29	$0.00			$2,642,728.73	$0.00					$1,648,163.04	$0.00			$2,856,937.75	$0.00														
05103	05103: Ouachita County	6	$688,657.40	$688,657.40	$0.00															$49,588.52	$0.00	$25,977.23	$0.00	$43,950.26	$0.00	$125,601.04	$0.00							$267,646.86	$0.00					$175,893.49	$0.00				
05105	05105: Perry County	6	$1,835,763.96	$1,440,551.38	$395,212.58	$119,757.83	$0.00			$15,403.73	$0.00									$187,926.94	$0.00	$35,780.17	$0.00			$104,014.67	$0.00	$977,668.04	$395,212.58																
05107	05107: Phillips County	3	$712,631.58	$712,631.58	$0.00	$468,655.04	$0.00																	$94,440.81	$0.00									$149,535.73	$0.00										
05109	05109: Pike County	3	$600,206.74	$600,206.74	$0.00	$319,875.65	$0.00													$120,866.57	$0.00	$159,464.52	$0.00																						
05111	05111: Poinsett County	5	$1,448,930.63	$1,448,930.63	$0.00	$96,628.32	$0.00					$398,469.59	$0.00													$581,775.02	$0.00									$0.00	$0.00					$372,057.70	$0.00		
05113	05113: Polk County	5	$1,917,330.47	$1,917,330.47	$0.00	$68,926.09	$0.00					$879,971.50	$0.00			$332,878.57	$0.00			$326,600.20	$0.00	$308,954.11	$0.00																						
05115	05115: Pope County	1	$0.00	$0.00	$0.00																							$0.00	$0.00																
05117	05117: Prairie County	3	$806,399.68	$806,399.68	$0.00	$549,152.15	$0.00																	$99,846.69	$0.00	$157,400.84	$0.00																		
05119	05119: Pulaski County	6	$69,638,985.84	$69,612,735.84	$26,250.00	$2,254,399.99	$0.00			$3,261,218.07	$0.00							$0.00	$0.00							$0.00	$26,250.00	$22,129,919.97	$0.00									$41,967,197.81	$0.00						
05121	05121: Randolph County	5	$3,796,637.79	$3,796,637.79	$0.00	$1,087,050.99	$0.00											$622,874.64	$0.00			$223,092.38	$0.00			$1,791,194.31	$0.00																	$72,425.47	$0.00
05123	05123: St. Francis County	1	$280,624.65	$280,624.65	$0.00	$280,624.65	$0.00																																						
05125	05125: Saline County	3	$4,243,117.01	$3,189,554.01	$1,053,563.00	$446,982.70	$0.00			$2,265,864.14	$1,053,563.00															$476,707.17	$0.00																		
05127	05127: Scott County	4	$3,026,496.24	$2,576,496.24	$450,000.00							$2,192,616.13	$450,000.00			$143,416.21	$0.00			$207,602.09	$0.00	$32,861.81	$0.00																						
05129	05129: Searcy County	8	$3,647,469.88	$2,944,157.88	$703,312.00	$747,631.54	$703,312.00					$421,245.27	$0.00			$3,125.14	$0.00			$338,857.51	$0.00	$317,484.59	$0.00			$236,002.47	$0.00	$651,084.18	$0.00											$228,727.18	$0.00				
05131	05131: Sebastian County	4	$18,066,014.24	$17,355,931.40	$710,082.84											$788,242.20	$710,082.84			$0.00	$0.00	$70,479.16	$0.00					$16,497,210.04	$0.00																
05133	05133: Sevier County	2	$252,840.40	$252,840.40	$0.00															$252,840.40	$0.00	$0.00	$0.00																						
05135	05135: Sharp County	4	$3,870,927.28	$3,840,927.28	$30,000.00	$1,978,061.61	$0.00									$35,566.51	$30,000.00	$1,794,517.14	$0.00																									$32,782.02	$0.00
05137	05137: Stone County	4	$2,061,173.80	$2,061,173.80	$0.00	$769,519.92	$0.00					$650,697.97	$0.00									$374,181.79	$0.00																	$266,774.12	$0.00				
05141	05141: Van Buren County	3	$701,737.84	$701,737.84	$0.00	$471,471.51	$0.00					$114,923.40	$0.00			$115,342.93	$0.00																												
05143	05143: Washington County	4	$9,170,461.19	$8,246,774.73	$923,686.46	$2,027,144.60	$886,186.46															$1,800,709.86	$0.00			$2,534,655.07	$0.00			$1,884,265.20	$37,500.00														
05145	05145: White County	5	$5,788,468.63	$1,092,302.63	$4,696,166.00	$589,424.17	$4,133,666.00					$41,425.85	$0.00					$58,433.87	$0.00			$156,608.62	$562,500.00			$246,410.12	$0.00																		
05147	05147: Woodruff County	5	$1,038,820.35	$607,570.35	$431,250.00	$371,606.50	$0.00					$114,063.79	$431,250.00									$28,481.15	$0.00			$93,418.91	$0.00									$0.00	$0.00								
05149	05149: Yell County	5	$1,976,847.29	$1,301,847.29	$675,000.00	$170,289.93	$0.00													$109,504.31	$675,000.00	$179,223.10	$0.00			$0.00	$0.00	$842,829.95	$0.00																
	Total	20	$339,539,175.08	$311,152,171.41	$28,387,003.67	$49,985,260.71	$8,825,199.23	$2,663,059.78	$23,036.00	$8,293,401.30	$1,410,234.00	$6,593,153.21	$979,441.03	$7,781,424.57	$1,134,465.59	$5,501,202.69	$795,042.57	$9,410,016.22	$1,726,312.06	$11,152,436.92	$1,875,303.14	$11,363,428.53	$1,980,427.04	$2,418,773.48	$19,986.00	$27,390,538.43	$3,750,474.24	$54,987,509.75	$4,656,880.28	$5,877,299.51	$180,861.09	$3,901,657.82	$699,635.55	$9,732,162.45	$187,725.76	$0.00	$141,980.09	$68,782,963.79	$0.00	$10,124,826.45	$0.00	$4,228,835.57	$0.00	$10,964,220.23	$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.

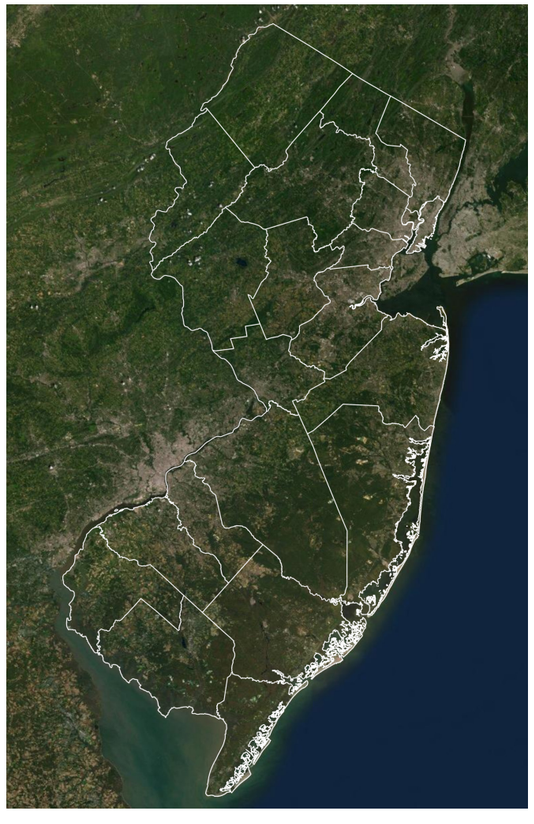
The U.S. needs to change the way it is making funding decisions. Where we make priority investments is equally important to what we invest in. Returns on investments (ROI) in the form of social benefits to communities needs to be part of grant evaluations. The U.S. need to utilize new decision-making 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.

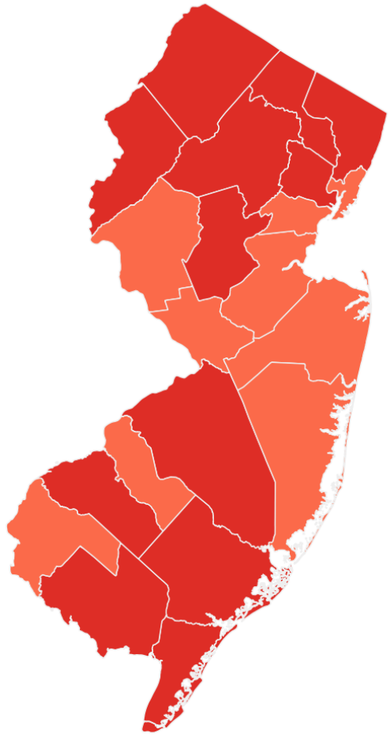


GEOGRAPHIC MAP. SOURCE: ESRI
WORLD IMAGERY BASEMAP

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."



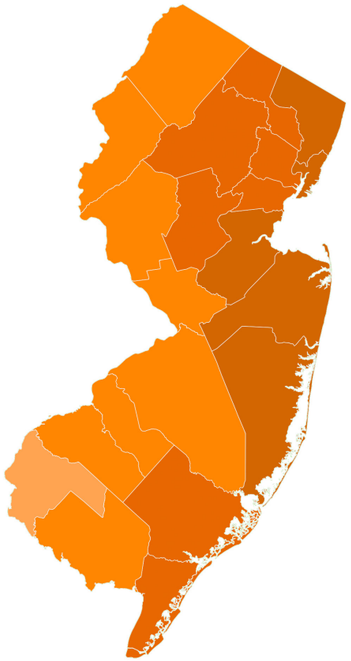
DISASTER OCCURRENCES
SOURCE: FEMA 2011-2024
MAP MADE BY REBUILD BY DESIGN

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

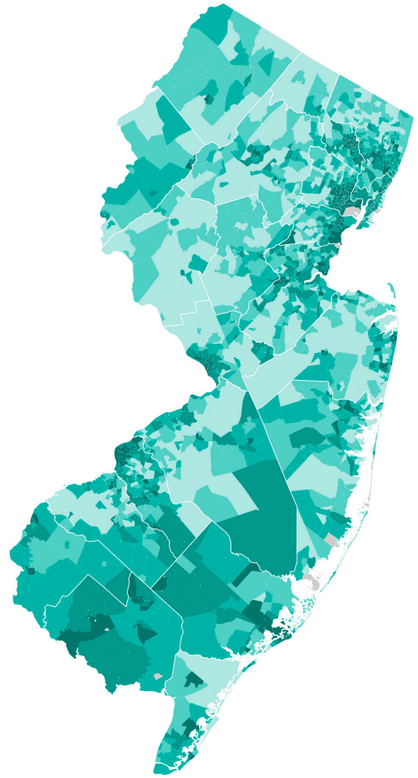
The Disaster Declaration tables provided at the end of each chapter show all federal Disaster Declarations declared between 2011-2024 and the corresponding FEMA obligations associated with those events. **However, in some instances, FEMA continues to obligate funds for years following a declaration. 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:

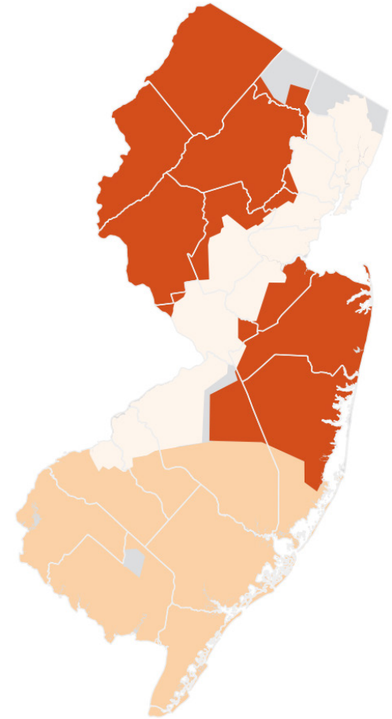
- **Socioeconomic Status** (below poverty, unemployed, income, no high school diploma);
- **Household Composition & Disability** (aged 65 or older, aged 17 or younger, older than age 5 with a disability, single-parent households);
- **Minority Status & Language** (minority, speak English "less than well"); 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.