ALABAMA

ALABAMA STATISTICS SUMMARY (2011 – 2024)

19	CLIMATE DISASTER DECLARATIONS
$1.6 BILLION	FEMA + HUD POST-DISASTER FUNDING
5.0 MILLION PEOPLE	POPULATION TOTAL
$314	PER CAPITA SPENDING ON CLIMATE DISASTERS
MOBILE & PERRY (8 DISASTERS)	COUNTY WITH THE HIGHEST DISASTER OCCURRENCES
26 COUNTIES	COUNTIES HAVE HAD FIVE OR MORE DISASTERS
1.4 MILLION PEOPLE	LIVE IN AREAS WITH VERY HIGH SOCIAL VULNERABILITY (SVI > 0.75)
6.7 HOURS	TOTAL OUTAGE DURATION (HOURS PER CUSTOMER PER YEAR)
C- (2022)	ASCE INFRASTRUCTURE REPORT CARD GRADE
17	SUPERFUND SITES
$4.1 BILLION	CLIMATE INFRASTRUCTURE SUPPORTED THROUGH SMALL INSURANCE SURCHARGE

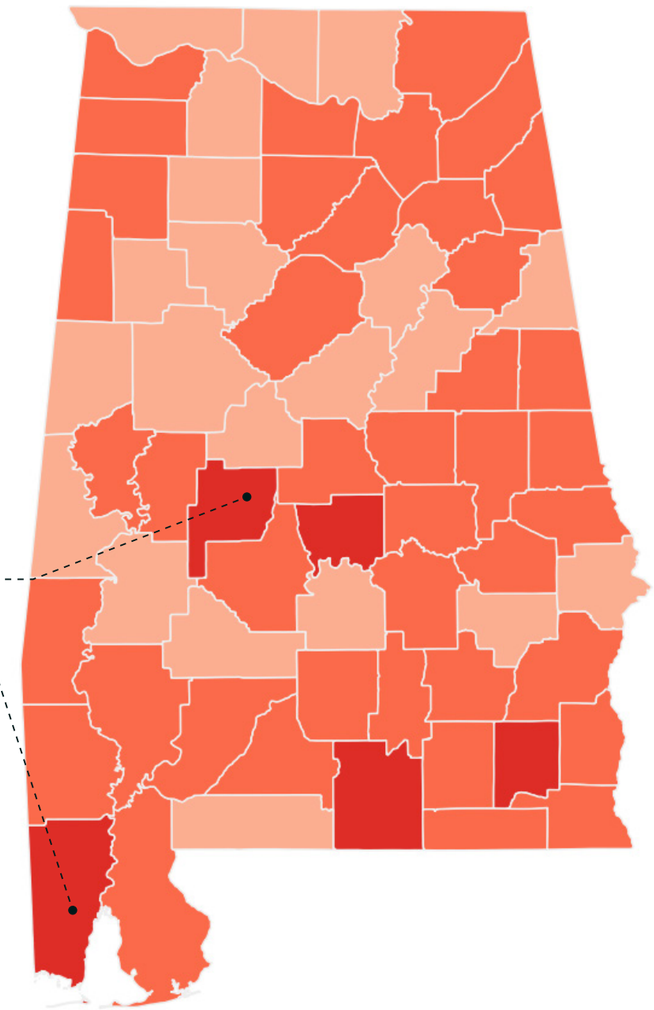
DISASTER OCCURRENCES 2011-2024

FEDERALLY DECLARED MAJOR DISASTERS BY COUNTY

19
disaster declarations

Every county in Alabama has had at least two recent disasters. 39% of counties have had 5 or more.

Mobile and Perry County have had the highest number of recent disasters in Alabama: 9 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

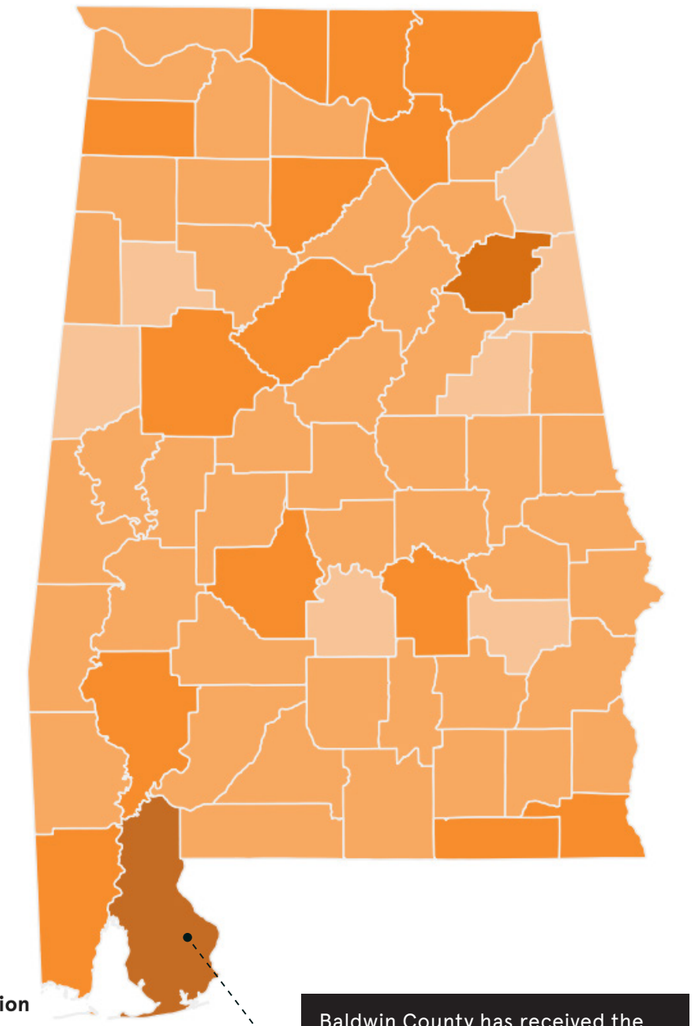
FEDERAL ASSISTANCE 2011-2024

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

$1.6B
post-disaster assstance

$891M	FEMA obligations
$688M	HUD CDBG-DR Funds
$1.6B	FEMA + HUD assistance
$314	per capita cost

Every county received a disaster declaration in 2011 due to severe storms, tornadoes, straight-line winds, and flooding, which cost over $271 million.



Baldwin County has received the most post-disaster assistance in Alabama: over $237 million.

FEMA Public Assistance and Hazard Mitigation

Federal Share Obligated (2011-2024)

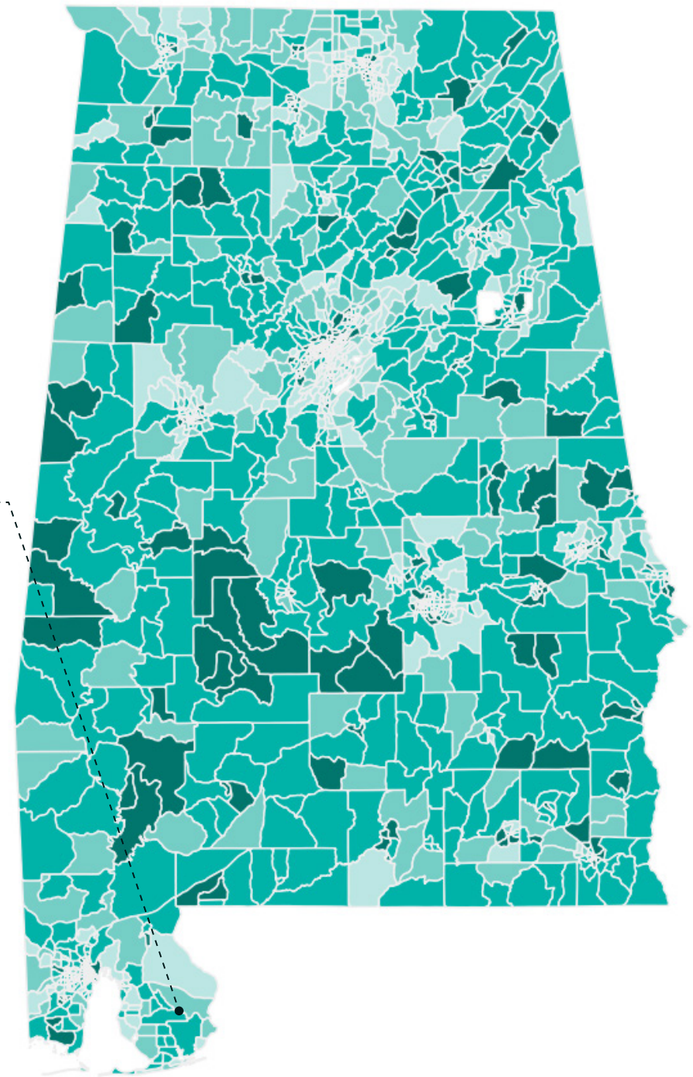
- $0 to $100K
- $100K to $1M
- $1M to $10M
- $10M to $50M
- $50M to $100M
- $100M to $500M

MAP MADE BY REBUILD BY DESIGN
FEMA DATA COURTESY OF IPARAMETRICS

SOCIAL VULNERABILITY INDEX 2022

AREAS OF GREATEST SOCIAL VULNERABILITY

Baldwin County has low social vulnerability and experienced the greatest population growth from 2010 to 2024, 28%, but it also had 6 federal disasters.



Social Vulnerability Index
CDC (2022)

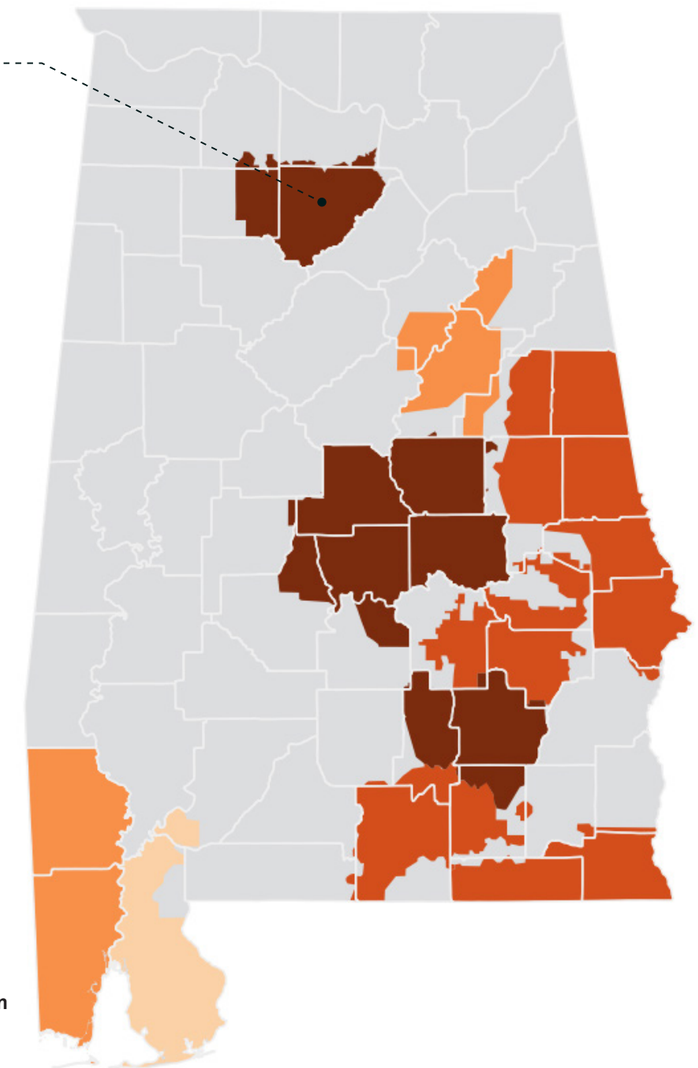
- No Value
- 0.0 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1.0

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

ENERGY RELIABILITY 2023

COUNTIES AT GREATEST RISK OF POWER OUTAGES

Cullman County has the largest area with the second longest service interruptions in the state, 1,155 minutes total, but it grew 10% in population from 2010 to 2024.



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: 19 DISASTERS
FEMA PA + HM: $891.0 M
HUD CDBG-DR: $688.4 M
FEMA + HUD ASSISTANCE: $1.6 B

				Total		2011		2012				2014		2016		2017		2018				2019				2020						2021				2023			
						1971: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4052: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4082: HURRICANE ISAAC		4176: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4251: SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING		4349: HURRICANE NATE		4362: SEVERE STORMS AND TORNADOES		4406: HURRICANE MICHAEL		4419: SEVERE STORMS, STRAIGHT-LINE WINDS, AND TORNADOES		4426: SEVERE STORMS, STRAIGHT-LINE WINDS, TORNADOES, AND FLOODING		4546: SEVERE STORMS AND FLOODING		4554: SEVERE STORMS, STRAIGHT-LINE WINDS, AND TORNADOES		4555: SEVERE THUNDERSTORMS		4563: HURRICANE SALLY		4573: HURRICANE ZETA		4596: SEVERE STORMS, STRAIGHT-LINE WINDS, AND TORNADOES		4632: SEVERE STORMS AND FLOODING		4684: SEVERE STORMS, STRAIGHT-LINE WINDS, AND TORNADOES		4716: SEVERE STORMS, STRAIGHT-LINE WINDS, AND TORNADOES	
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
01000	01000: Statewide	17	$145,701,988.02	$138,506,573.88	$7,195,414.14	$64,495,901.42	$4,493,449.42			$345,162.84	$46,230.00			$3,264,574.47	$1,196,489.00	$2,131,421.32	$296,706.00	$1,004,267.07	$222,861.00	$280,619.05	$27,552.00	$2,036,699.02	$84,423.17	$446,474.25	$66,124.55	$511,108.67	$79,065.00	$638,328.66	$29,089.00	$847,456.23	$31,181.00	$809,195.36	$30,235.00	$37,555,966.91	$592,009.00	$17,607,510.85	$0.00	$2,858,756.55	$0.00			$2,485,506.04	$0.00	$1,187,625.17	$0.00
01001	01001: Autauga County	7	$7,755,283.99	$7,556,904.38	$198,379.61	$34,140.69	$169,157.00							$215,979.69	$29,222.61	$5,261.89	$0.00													$918,350.82	$0.00					$3,919,420.75	$0.00					$2,311,467.84	$0.00	$152,282.70	$0.00
01003	01003: Baldwin County	6	$237,323,840.97	$225,274,959.05	$12,048,881.92	$0.00	$712,775.00			$2,836,049.55	$0.00	$10,124,188.69	$1,846,674.49			$9,790,537.40	$1,648,957.02																	$202,432,809.33	$7,840,475.41	$91,374.08	$0.00							
01005	01005: Barbour County	5	$2,151,003.92	$2,151,003.92	$0.00	$0.00	$0.00							$699,118.87	$0.00															$79,425.23	$0.00			$1,372,459.82	$0.00					$0.00	$0.00		
01007	01007: Bibb County	2	$5,331,854.65	$4,644,876.62	$686,978.03	$622,951.31	$503,539.13																															$4,021,925.31	$183,438.90						
01009	01009: Blount County	6	$4,567,731.80	$3,822,705.72	$745,026.08	$246,350.68	$382,059.64					$1,620,148.06	$250,466.44	$723,138.10	$0.00											$83,069.59	$0.00	$286,450.39	$0.00			$863,548.90	$112,500.00										
01011	01011: Bullock County	3	$322,443.54	$310,443.54	$12,000.00	$0.00	$12,000.00					$132,923.92	$0.00	$177,519.62	$0.00																												
01013	01013: Butler County	6	$1,135,564.76	$1,011,294.76	$124,270.00	$98,805.98	$84,295.00					$140,949.66	$31,975.00	$251,065.38	$8,000.00													$248,993.97	$0.00					$135,016.18	$0.00	$136,463.59	$0.00							
01015	01015: Calhoun County	4	$52,906,638.03	$47,152,955.83	$5,753,682.20	$7,395,898.89	$934,872.03											$36,396,393.78	$4,818,810.17																	$347,483.69	$0.00	$3,013,179.47	$0.00						
01017	01017: Chambers County	5	$2,363,147.14	$2,241,537.14	$121,610.00	$16,197.92	$121,610.00							$679,724.09	$0.00													$174,271.92	$0.00											$189,799.65	$0.00	$1,181,543.56	$0.00
01019	01019: Cherokee County	4	$687,180.10	$390,285.10	$296,895.00	$168,710.23	$226,773.75							$108,181.85	$70,121.25											$113,393.02	$0.00									$0.00	$0.00						
01021	01021: Chilton County	4	$1,624,156.38	$599,662.72	$1,024,493.66	$0.00	$1,024,493.66	$0.00	$0.00																					$280,177.31	$0.00					$319,485.41	$0.00						
01023	01023: Choctaw County	4	$1,427,837.80	$409,549.16	$1,018,288.64	$305,814.47	$995,788.64									$0.00	$22,500.00											$103,734.69	$0.00							$0.00	$0.00						
01025	01025: Clarke County	4	$12,912,999.69	$12,335,054.03	$577,945.66	$10,540.22	$577,945.66									$12,403.36	$0.00																	$212,049.04	$0.00	$12,100,061.41	$0.00						
01027	01027: Clay County	4	$404,543.03	$246,258.08	$158,284.95	$17,206.33	$158,284.95							$33,627.53	$0.00																					$172,287.36	$0.00	$23,136.86	$0.00						
01029	01029: Cleburne County	2	$107,185.15	$43,691.15	$63,494.00	$0.00	$63,494.00							$43,691.15	$0.00																												
01031	01031: Coffee County	4	$6,495,788.99	$3,128,022.53	$3,367,766.46	$0.00	$434,871.00							$2,485,176.11	$2,932,895.46															$77,556.37	$0.00			$565,290.05	$0.00									
01033	01033: Colbert County	5	$5,143,329.65	$3,556,903.13	$1,586,426.52	$1,382,797.53	$1,500,251.52							$156,535.54	$0.00											$833,055.49	$86,175.00	$165,166.34	$0.00														$1,019,348.23	$0.00
01035	01035: Conecuh County	4	$1,175,300.70	$1,071,075.70	$104,225.00	$0.00	$104,225.00							$526,890.43	$0.00																			$491,252.68	$0.00					$52,932.59	$0.00		
01037	01037: Coosa County	5	$1,320,140.67	$1,320,140.67	$0.00	$16,838.89	$0.00																							$713,002.91	$0.00					$84,432.19	$0.00			$67,635.25	$0.00	$438,231.43	$0.00
01039	01039: Covington County	7	$8,476,306.28	$7,786,189.03	$690,117.25	$4,260.24	$486,332.25			$789,568.94	$176,522.00	$481,455.73	$27,263.00	$4,022,256.10	$0.00													$0.00	$0.00	$1,033,820.43	$0.00			$1,454,827.59	$0.00									
01041	01041: Crenshaw County	6	$3,824,403.38	$3,814,163.38	$10,240.00	$0.00	$0.00					$253,665.55	$10,240.00	$2,561,893.19	$0.00													$374,830.59	$0.00	$290,766.56	$0.00			$333,007.49	$0.00									
01043	01043: Cullman County	5	$18,224,797.14	$15,451,098.57	$2,773,698.57	$9,881,900.86	$2,225,982.65							$3,578,514.10	$547,715.92			$749,231.95	$0.00									$290,654.10	$0.00			$950,797.56	$0.00										
01045	01045: Dale County	7	$2,335,362.80	$2,249,699.80	$85,663.00	$0.00	$85,663.00					$71,236.16	$0.00	$1,041,603.41	$0.00					$423,749.51	$0.00									$583,002.60	$0.00			$31,668.35	$0.00					$98,439.77	$0.00		
01047	01047: Dallas County	6	$14,308,860.66	$14,022,521.72	$286,338.94	$20,752.29	$286,338.94			$308,789.36	$0.00					$3,236.42	$0.00											$320,128.42	$0.00							$4,825,548.96	$0.00			$8,544,066.27	$0.00		
01049	01049: DeKalb County	5	$7,627,636.29	$5,693,972.39	$1,933,663.90	$3,167,730.03	$1,933,663.90					$773,510.77	$0.00	$501,167.46	$0.00											$220,743.09	$0.00					$1,030,821.04	$0.00										
01051	01051: Elmore County	5	$3,044,617.00	$2,245,359.28	$799,257.72	$528,799.64	$743,157.72							$777,462.23	$56,100.00																			$156,413.61	$0.00					$673,612.58	$0.00	$109,071.22	$0.00
01053	01053: Escambia County	3	$5,673,657.22	$5,482,993.91	$190,663.31	$0.00	$120,405.00							$508,237.00	$70,258.31																			$4,974,756.91	$0.00									
01055	01055: Etowah County	4	$4,224,270.39	$2,914,992.89	$1,309,277.50	$175,680.95	$602,567.58					$638,887.94	$706,709.92					$971,185.92	$0.00													$1,129,238.08	$0.00										
01057	01057: Fayette County	3	$662,148.25	$484,930.92	$177,217.33	$368,441.39	$177,217.33							$64,170.57	$0.00													$52,318.96	$0.00														
01059	01059: Franklin County	4	$21,854,513.22	$20,390,119.75	$1,464,393.47	$19,018,059.83	$1,451,343.47					$130,518.62	$0.00	$307,077.41	$13,050.00											$934,463.89	$0.00																
01061	01061: Geneva County	6	$11,634,156.87	$10,761,932.78	$872,224.09	$0.00	$204,750.00			$464,370.02	$33,532.00	$1,275,873.79	$33,039.00	$718,474.32	$0.00					$6,304,381.65	$522,337.50													$1,998,833.00	$78,565.59									
01063	01063: Greene County	4	$1,597,941.01	$1,100,352.75	$497,588.26	$86,805.48	$497,588.26																			$179,103.09	$0.00	$441,531.31	$0.00											$392,912.87	$0.00		
01065	01065: Hale County	4	$1,388,795.72	$1,218,789.97	$170,005.75	$843,148.09	$170,005.75																													$0.00	$0.00	$93,008.16	$0.00	$282,633.72	$0.00		
01067	01067: Henry County	4	$1,193,034.32	$1,193,034.32	$0.00	$0.00	$0.00							$397,952.28	$0.00					$567,734.52	$0.00									$227,347.52	$0.00												
01069	01069: Houston County	5	$12,851,838.34	$12,496,940.34	$354,898.00	$0.00	$89,908.00					$911,266.60	$0.00	$1,127,765.16	$264,990.00					$8,647,048.34	$0.00													$1,810,860.24	$0.00									
01071	01071: Jackson County	4	$11,947,835.20	$8,720,382.14	$3,227,453.06	$503,123.26	$2,713,677.26							$244,340.76	$65,654.55											$7,687,602.15	$448,121.25					$285,315.97	$0.00										
01073	01073: Jefferson County	5	$47,728,507.95	$39,096,596.15	$8,631,911.80	$33,004,555.85	$6,892,643.16	$0.00	$146,221.00			$6,092,040.30	$1,593,047.64																									$0.00	$0.00	$0.00	$0.00		
01075	01075: Lamar County	5	$2,674,665.80	$2,104,889.67	$569,776.13	$1,108,163.27	$478,533.00					$231,962.98	$0.00	$284,180.56	$18,763.88											$119,575.26	$13,434.75	$361,007.60	$59,044.50														
01077	01077: Lauderdale County	2	$5,889,152.74	$5,406,994.99	$482,157.75	$2,021,700.51	$482,157.75																																			$3,385,294.48	$0.00
01079	01079: Lawrence County	2	$4,346,160.25	$969,948.50	$3,376,211.75	$741,860.01	$3,376,211.75							$228,088.49	$0.00																												
01081	01081: Lee County	4	$5,254,091.87	$4,716,759.72	$537,332.15	$0.00	$41,506.00					$637,110.81	$0.00	$498,902.75	$0.00							$3,580,746.16	$495,826.15																				
01083	01083: Limestone County	3	$10,335,163.91	$9,368,014.72	$967,149.19	$4,632,177.50	$928,587.00					$4,356,009.68	$38,562.19															$379,827.54	$0.00														
01085	01085: Lowndes County	3	$273,087.70	$273,087.70	$0.00	$0.00	$0.00							$261,434.09	$0.00																					$11,653.61	$0.00						
01087	01087: Macon County	5	$7,787,567.49	$7,297,134.91	$490,432.58	$0.00	$292,425.43							$5,017,878.55	$198,007.15	$2,650.49	$0.00											$2,196,836.78	$0.00													$79,769.09	$0.00
01089	01089: Madison County	2	$13,873,748.67	$12,662,717.94	$1,211,030.73	$10,337,865.67	$1,211,030.73																			$2,324,852.27	$0.00																
01091	01091: Marengo County	2	$2,245,074.10	$2,154,306.35	$90,767.75	$341,259.56	$90,767.75																													$1,813,046.79	$0.00						
01093	01093: Marion County	5	$8,879,358.11	$8,197,342.97	$682,015.14	$6,845,784.70	$643,667.72							$491,070.09	$38,347.42											$239,256.03	$0.00	$621,232.15	$0.00													$0.00	$0.00
01095	01095: Marshall County	4	$10,878,188.31	$9,268,278.07	$1,609,910.24	$8,169,866.17	$1,609,910.24							$498,575.54	$0.00																	$581,786.71	$0.00									$18,049.65	$0.00
01097	01097: Mobile County	8	$49,028,545.98	$41,746,950.21	$7,281,595.77	$0.00	$2,135,854.29			$1,336,487.71	$0.00	$1,220,793.29	$1,382,763.30			$3,936,696.13	$0.00			$287,654.36	$45,563.01													$20,860,323.85	$3,717,415.17	$14,104,994.87	$0.00			$0.00	$0.00		
01099	01099: Monroe County	5	$1,050,574.05	$406,220.05	$644,354.00	$10,143.13	$620,617.00			$105,741.40	$23,737.00			$182,711.83	$0.00																			$59,573.81	$0.00	$48,049.88	$0.00						
01101	01101: Montgomery County	6	$18,661,998.14	$18,582,875.14	$79,123.00	$0.00	$79,123.00			$209,946.74	$0.00					$976,054.46	$0.00													$28,020.02	$0.00			$17,347,703.92	$0.00	$21,150.00	$0.00						
01103	01103: Morgan County	4	$2,434,117.25	$1,694,896.29	$739,220.96	$953,329.92	$739,220.96																			$297,362.38	$0.00													$0.00	$0.00	$444,203.99	$0.00
01105	01105: Perry County	8	$3,044,062.34	$2,762,715.34	$281,347.00	$155,833.04	$32,380.00	$0.00	$0.00	$91,590.69	$13,853.00	$210,397.89	$57,416.00	$359,821.80	$55,865.00													$880,161.12	$121,833.00							$397,737.57	$0.00	$667,173.23	$0.00						
01107	01107: Pickens County	3	$786,020.90	$237,773.49	$548,247.41	$23,984.69	$458,359.41			$153,120.17	$58,739.00	$60,668.63	$31,149.00																														
01109	01109: Pike County	4	$6,327,729.26	$6,083,679.54	$244,049.72	$0.00	$58,033.00							$2,479,507.09	$176,577.52															$2,994,787.26	$9,439.20			$609,385.19	$0.00									
01111	01111: Randolph County	5	$1,663,510.48	$1,403,153.23	$260,357.25	$0.00	$142,115.25																					$1,055,137.74	$118,242.00							$48,137.52	$0.00	$174,259.75	$0.00					$125,618.22	$0.00
01113	01113: Russell County	2	$1,137,303.05	$772,532.05	$364,771.00	$0.00	$93,443.00							$772,532.05	$271,328.00																												
01115	01115: St. Clair County	3	$5,286,647.46	$2,573,730.07	$2,712,917.39	$2,064,433.36	$2,416,450.13							$179,966.62	$174,872.01			$329,330.09	$121,595.25																								
01117	01117: Shelby County	3	$1,952,699.55	$1,597,516.71	$355,182.84	$74,243.40	$355,182.84																															$1,523,273.31	$0.00	$0.00	$0.00		
01119	01119: Sumter County	2	$1,001,601.67	$486,047.47	$515,554.20	$399,942.01	$515,554.20																																	$86,105.46	$0.00		
01121	01121: Talladega County	2	$2,080,180.97	$852,419.82	$1,227,761.15	$266,122.99	$1,227,761.15																													$586,296.83	$0.00						
01123	01123: Tallapoosa County	4	$6,720,098.73	$5,967,223.67	$752,875.06	$400,847.51	$307,632.66																							$1,157,232.35	$343,992.40									$250,975.13	$101,250.00	$4,158,168.68	$0.00
01125	01125: Tuscaloosa County	3	$36,500,331.26	$22,975,922.10	$13,524,409.16	$17,569,177.75	$10,717,337.21					$2,269,995.03	$1,006,339.06															$3,136,749.32	$1,800,732.89														
01127	01127: Walker County	3	$4,604,762.21	$2,817,320.82	$1,787,441.39	$2,255,282.71	$1,674,941.39							$299,471.63	$0.00																	$262,566.48	$112,500.00										
01129	01129: Washington County	4	$3,572,217.10	$2,988,042.10	$584,175.00	$17,035.79	$584,175.00					$15,864.46	$0.00			$12,634.14	$0.00																			$2,942,507.71	$0.00						
01131	01131: Wilcox County	3	$1,199,151.71	$1,195,151.71	$4,000.00	$0.00	$4,000.00																					$141,030.76	$0.00							$1,054,120.95	$0.00						
01133	01133: Winston County	3	$2,034,622.94	$979,804.58	$1,054,818.36	$238,928.56	$848,174.61							$564,761.48	$160,743.75											$176,114.54	$45,900.00																
Total	Total	19	$890,979,075.02	$789,441,417.13	$101,537,657.89	$201,043,394.72	$63,346,282.14	$0.00	$146,221.00	$6,640,827.42	$352,613.00	$34,914,043.03	$8,212,134.04	$36,201,886.24	$5,449,218.83	$15,743,741.36	$1,894,318.02	$38,726,760.79	$4,967,957.42	$18,267,267.40	$652,323.68	$4,027,220.41	$561,950.70	$13,719,699.47	$672,696.00	$11,868,392.36	$2,128,941.39	$9,230,945.61	$384,612.60	$5,913,270.10	$255,235.00	$292,245,784.36	$12,228,465.17	$60,788,177.63	$0.00	$12,374,712.64	$183,438.90	$0.00	$0.00	$15,436,087.17	$101,250.00	$12,299,206.42	$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.

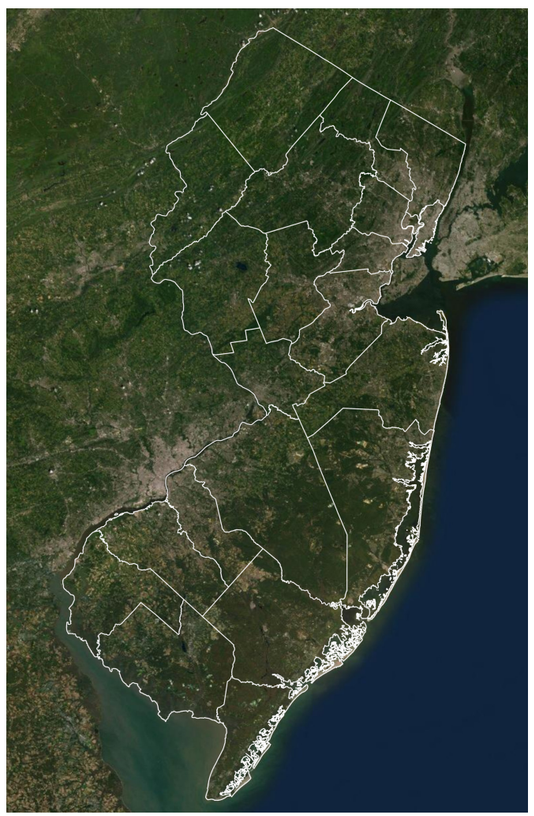
The U.S. needs to change the way it is making funding decisions. Where we make priority investments is equally important to what we invest in. Returns on investments (ROI) in the form of social benefits to communities needs to be part of grant evaluations. The U.S. need to utilize new decision-making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

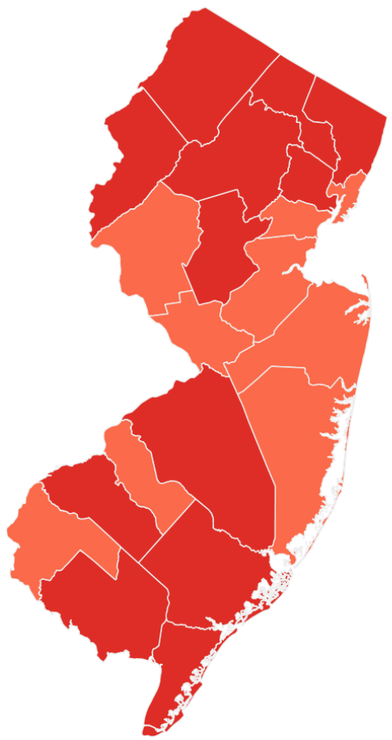


GEOGRAPHIC MAP. SOURCE: ESRI
WORLD IMAGERY BASEMAP

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."



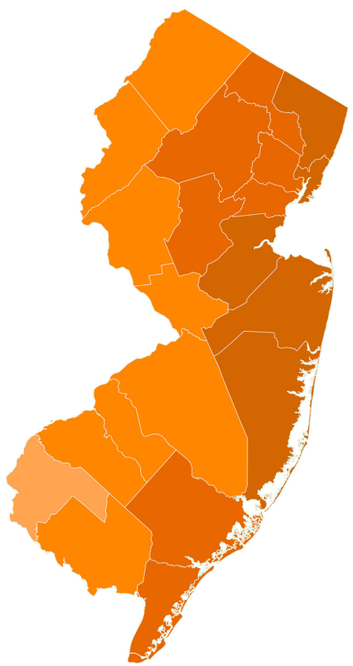
DISASTER OCCURRENCES
SOURCE: FEMA 2011-2024
MAP MADE BY REBUILD BY DESIGN

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

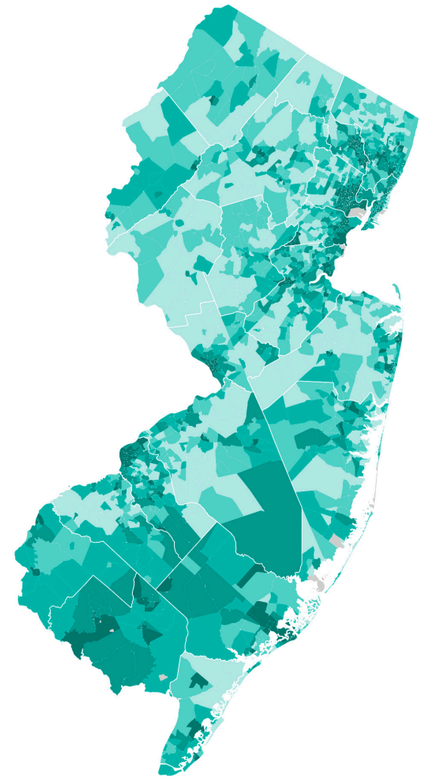
The Disaster Declaration tables provided at the end of each chapter show all federal Disaster Declarations declared between 2011-2024 and the corresponding FEMA obligations associated with those events. **However, in some instances, FEMA continues to obligate funds for years following a declaration.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

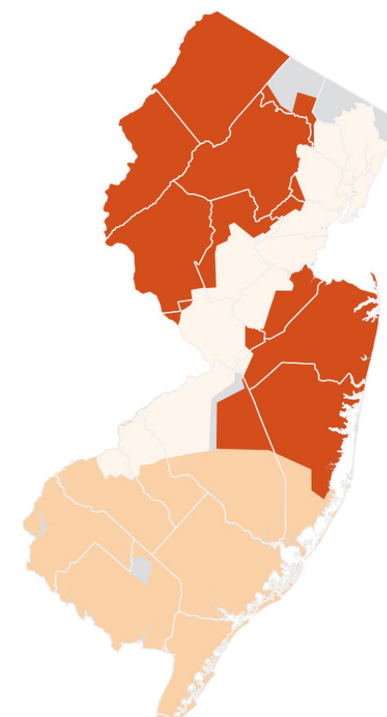
- **Socioeconomic Status** (below poverty, unemployed, income, no high school diploma);
- **Household Composition & Disability** (aged 65 or older, aged 17 or younger, older than age 5 with a disability, single-parent households);
- **Minority Status & Language** (minority, speak English "less than well");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