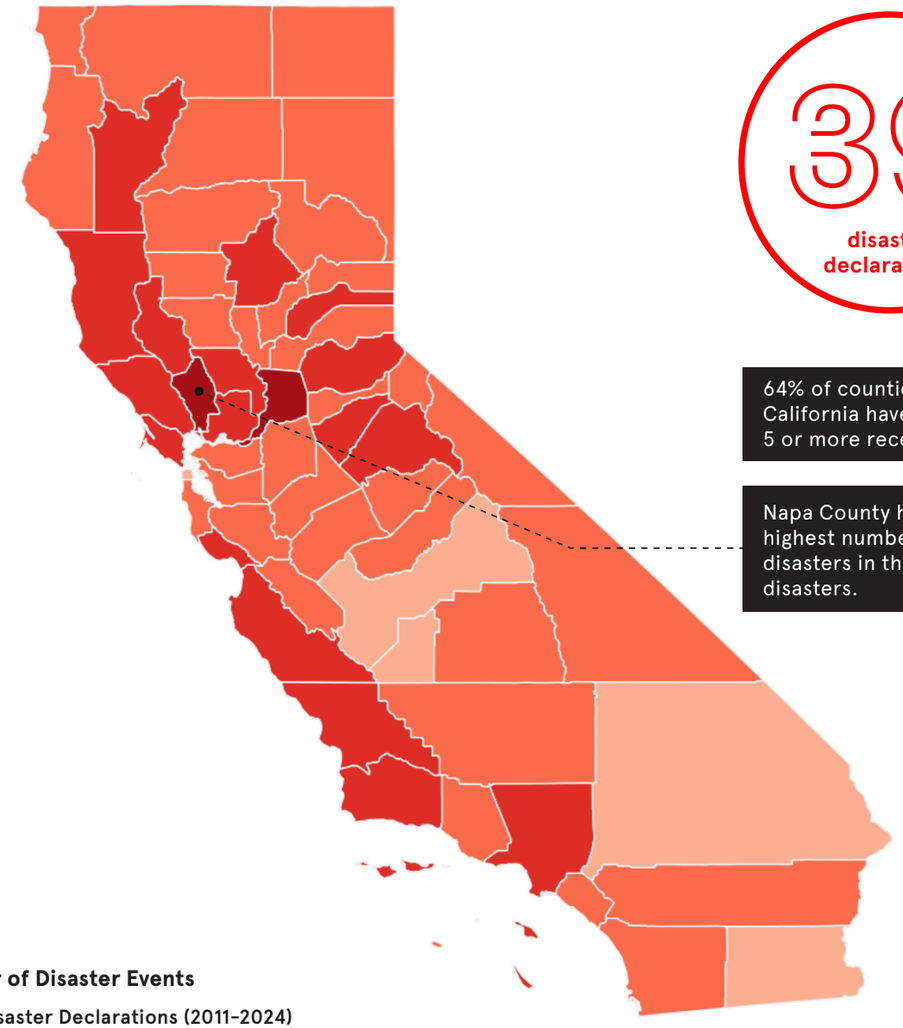
CALIFORNIA

CALIFORNIA STATISTICS SUMMARY (2011 – 2024)	
39	CLIMATE DISASTER DECLARATIONS
$8.9 BILLION	FEMA + HUD POST-DISASTER FUNDING
39.5 MILLION PEOPLE	POPULATION TOTAL
$224	PER CAPITA SPENDING ON CLIMATE DISASTERS
NAPA (11 DISASTERS)	COUNTY WITH THE HIGHEST DISASTER OCCURRENCES
37	COUNTIES HAVE HAD FIVE OR MORE DISASTERS
2.3 MILLION PEOPLE	LIVE IN AREAS WITH VERY HIGH SOCIAL VULNERABILITY (SVI > 0.75)
5.9 HOURS	TOTAL OUTAGE DURATION (HOURS PER CUSTOMER PER YEAR)
C- (2019)	ASCE INFRASTRUCTURE REPORT CARD GRADE
116	SUPERFUND SITES
$32.9 BILLION	CLIMATE INFRASTRUCTURE SUPPORTED THROUGH SMALL INSURANCE SURCHARGE
1ST HIGHEST	RANK IN TOP 10 STATES WITH HIGHEST NUMBER OF DISASTER DECLARATIONS

DISASTER OCCURRENCES 2011–2024

FEDERALLY DECLARED MAJOR DISASTERS BY COUNTY



39
disaster declarations

64% of counties in California have experienced 5 or more recent disasters.

Napa County has had the highest number of recent disasters in the state: 11 disasters.

Number of Disaster Events

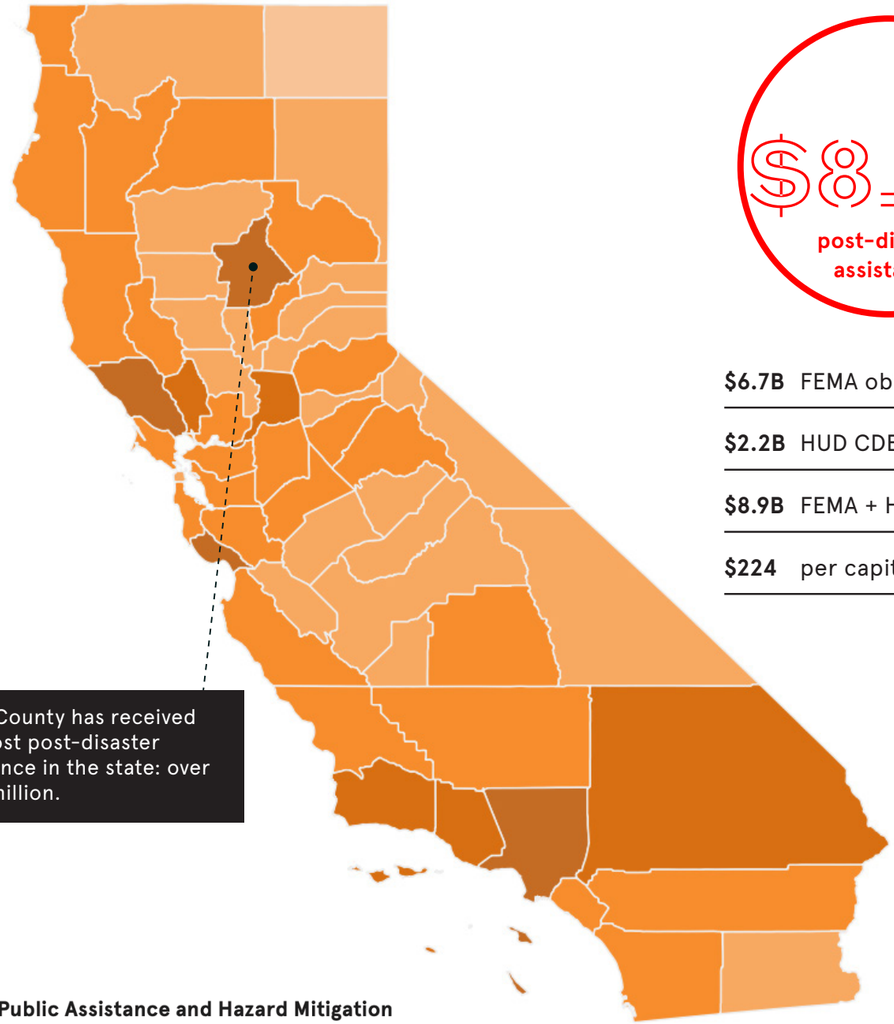
Major Disaster Declarations (2011–2024)

- 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



$8–9B
post-disaster assistance

$6.7B FEMA obligations

$2.2B HUD CDBG-DR Funds

$8.9B FEMA + HUD assistance

$224 per capita cost

Butte County has received the most post-disaster assistance in the state: over $208 million.

FEMA Public Assistance and Hazard Mitigation

Federal Share Obligated (2011–2024)

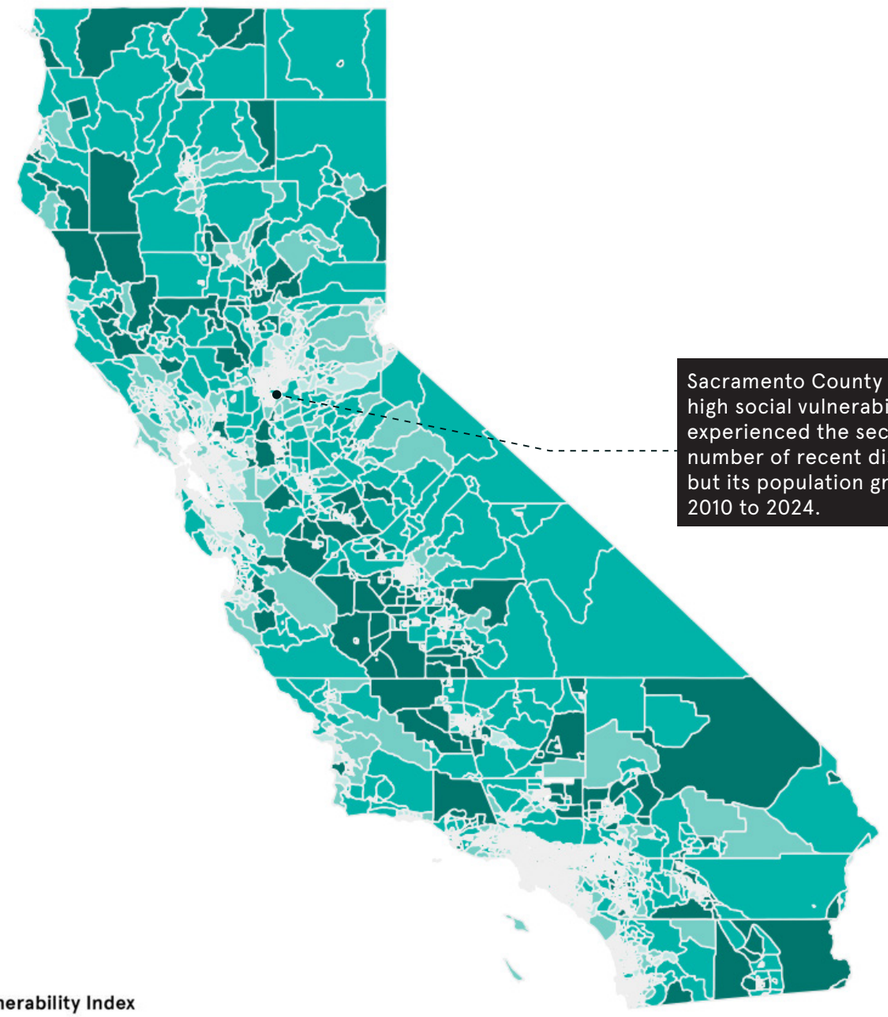
- $0 to $100K
- $100K to $1M
- $1M to $10M
- $10M to $50M
- $50M to $100M
- $100M to $500M

In 2018, California received $2 billion in post-disaster FEMA assistance across three wildfire disasters.

MAP MADE BY REBUILD BY DESIGN
FEMA DATA COURTESY OF IPARAMETRICS

SOCIAL VULNERABILITY INDEX 2022

AREAS OF GREATEST SOCIAL VULNERABILITY



Sacramento County has a high social vulnerability and experienced the second highest number of recent disasters, 10, but its population grew 11% from 2010 to 2024.

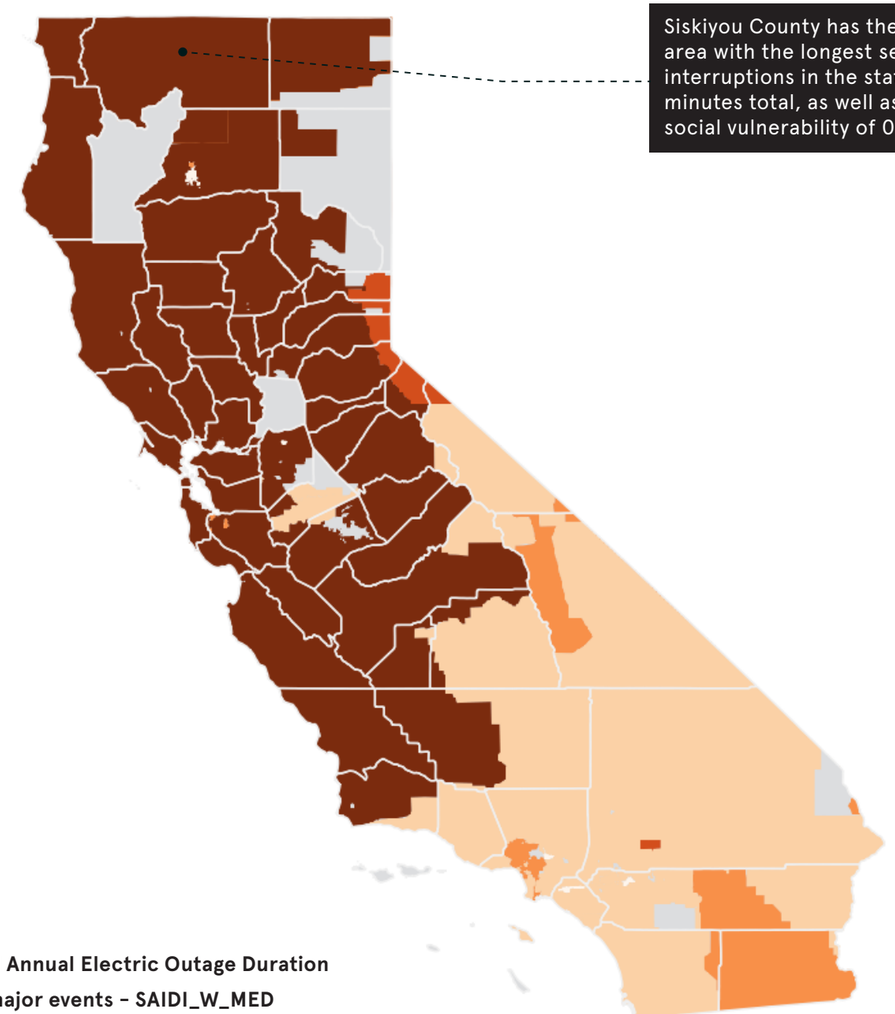
Social Vulnerability Index
CDC (2022)

- 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



Siskiyou County has the largest area with the longest service interruptions in the state, 2,381 minutes total, as well as a high social vulnerability of 0.79.

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: 39 DISASTERS
FEMA PA + HM: $6.7 B
HUD CDBG-DR: $2.2 B
FEMA + HUD ASSISTANCE: $8.9 B

				Total		2011				2013				2014		2015			
						1952: SEVERE WINTER STORMS, FLOODING, AND DEBRIS AND MUD FLOWS		1968: TSUNAMI WAVES		4142: WILDFIRE		4158: RIM FIRE		4193: EARTHQUAKE		4206: SEVERE STORMS, FLOODING, AND MUDSLIDES		4240: VALLEY FIRE AND BUTTE FIRE	
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
06000	06000: Statewide	38	$5,077,172,732.77	$4,914,621,590.72	$162,551,142.05	$8,686,951.31	$1,678,298.60	$1,284,364.24	$1,172,333.97	$444,517.27	$0.00	$22,926,707.05	$273,203.68	$5,571,620.92	$310,972.00	$924,687.91	$0.00	$188,047,951.46	$2,532,282.74
06001	06001: Alameda County	6	$33,224,781.31	$26,323,021.96	$6,901,759.35							$559,848.71	$0.00						
06003	06003: Alpine County	4	$1,130,104.53	$1,130,104.53	$0.00														
06005	06005: Amador County	5	$3,769,333.15	$3,769,333.15	$0.00														
06007	06007: Butte County	9	$208,781,793.21	$168,830,232.92	$39,951,560.29														
06009	06009: Calaveras County	7	$23,943,254.01	$18,034,401.76	$5,908,852.25													$12,441,056.76	$3,411,750.00
06011	06011: Colusa County	5	$3,465,959.35	$3,465,959.35	$0.00														
06013	06013: Contra Costa County	4	$38,909,254.49	$31,065,036.89	$7,844,217.60														
06015	06015: Del Norte County	6	$21,572,515.84	$20,585,549.84	$986,966.00			$18,646,214.24	$686,966.00										
06017	06017: El Dorado County	7	$35,808,375.18	$34,616,345.14	$1,192,030.04														
06019	06019: Fresno County	3	$9,942,901.38	$9,702,466.38	$240,435.00														
06021	06021: Glenn County	5	$3,330,072.72	$3,330,072.72	$0.00														
06023	06023: Humboldt County	6	$32,470,096.93	$28,278,935.73	$4,191,161.20														
06025	06025: Imperial County	3	$4,124,881.30	$4,124,881.30	$0.00														
06027	06027: Inyo County	6	$1,005,661.16	$1,005,661.16	$0.00	$304,067.11	$0.00												
06029	06029: Kern County	4	$14,452,212.11	$14,452,212.11	$0.00	$4,094,309.60	$0.00												
06031	06031: Kings County	3	$2,461,604.72	$2,461,604.72	$0.00	$84,569.33	$0.00												
06033	06033: Lake County	9	$26,278,197.37	$21,713,434.37	$4,564,763.00													$10,843,789.42	$897,881.25
06035	06035: Lassen County	4	$3,089,875.77	$3,089,875.77	$0.00														
06037	06037: Los Angeles County	9	$134,151,126.95	$84,550,959.32	$49,600,167.63														
06039	06039: Madera County	4	$2,805,436.04	$2,805,436.04	$0.00	$350,913.66	$0.00												
06041	06041: Marin County	7	$16,044,577.33	$11,093,089.62	$4,951,487.71														
06043	06043: Mariposa County	6	$1,698,890.32	$1,548,890.32	$150,000.00	$103,993.94	$0.00												
06045	06045: Mendocino County	9	$20,841,863.53	$17,394,365.36	$3,447,498.17														
06047	06047: Merced County	4	$6,653,030.19	$6,653,030.19	$0.00														
06049	06049: Modoc County	4	$665,985.85	$665,985.85	$0.00														
06051	06051: Mono County	4	$3,346,322.99	$3,346,322.99	$0.00														
06053	06053: Monterey County	8	$37,461,400.37	$37,461,400.37	$0.00			$3,107,906.35	$0.00										
06055	06055: Napa County	11	$59,233,773.26	$48,571,087.52	$10,662,685.74									$21,126,414.30	$2,247,438.00				
06057	06057: Nevada County	7	$6,834,135.58	$4,518,778.32	$2,315,357.26														
06059	06059: Orange County	4	$19,542,352.49	$15,956,745.28	$3,585,607.21	$8,912,552.35	$0.00												
06061	06061: Placer County	6	$7,015,260.94	$6,882,376.94	$132,884.00													$374,247.21	$132,884.00
06063	06063: Plumas County	5	$21,829,067.08	$21,829,067.08	$0.00														
06065	06065: Riverside County	5	$38,165,713.92	$38,032,513.92	$133,200.00	$4,106,704.87	$133,200.00												
06067	06067: Sacramento County	10	$63,293,526.41	$55,851,435.41	$7,442,091.00													$9,866,282.45	$1,080,229.38
06069	06069: San Benito County	4	$3,218,161.85	$3,218,161.85	$0.00														
06071	06071: San Bernardino County	3	$50,327,801.13	$48,821,448.13	$1,506,353.00	$43,093,689.56	$217,028.00												
06073	06073: San Diego County	6	$18,392,763.24	$17,325,717.24	$1,067,046.00	$7,800,776.22	$736,983.00												
06075	06075: San Francisco County	3	$8,044,149.06	$7,854,591.06	$189,558.00														
06077	06077: San Joaquin County	4	$10,465,580.41	$9,310,619.06	$1,154,961.35														
06079	06079: San Luis Obispo County	7	$17,555,662.55	$10,245,238.68	$7,310,423.87	$621,522.29	$2,395,018.91												
06081	06081: San Mateo County	6	$25,571,870.63	$19,092,437.23	$6,479,433.40														
06083	06083: Santa Barbara County	8	$84,871,272.67	$72,939,833.05	$11,931,439.62	$1,207,246.77	$931,373.00												
06085	06085: Santa Clara County	6	$34,383,101.99	$29,112,718.99	$5,270,383.00							$263,051.27	$2,720,383.00						
06087	06087: Santa Cruz County	8	$118,996,992.80	$115,977,482.05	$3,019,510.75			$14,665,228.69	$601,692.00										
06089	06089: Shasta County	6	$42,185,719.57	$31,936,041.67	$10,249,677.90														
06091	06091: Sierra County	4	$6,052,143.15	$6,052,143.15	$0.00														
06093	06093: Siskiyou County	5	$1,376,167.54	$1,376,167.54	$0.00														
06095	06095: Solano County	7	$11,154,483.48	$10,836,569.97	$317,913.51									$3,096,552.55	$120,882.00				
06097	06097: Sonoma County	8	$129,224,394.25	$97,381,920.58	$31,842,473.67														
06099	06099: Stanislaus County	4	$14,651,672.45	$14,651,672.45	$0.00														
06101	06101: Sutter County	4	$9,762,340.46	$7,142,960.96	$2,619,379.50														
06103	06103: Tehama County	4	$1,459,447.95	$1,459,447.95	$0.00														
06105	06105: Trinity County	9	$14,131,017.33	$13,127,873.58	$1,003,143.75														
06107	06107: Tulare County	4	$14,638,485.51	$14,076,667.26	$561,818.25	$1,497,218.32	$0.00												
06109	06109: Tuolumne County	8	$13,118,275.22	$12,225,808.22	$892,467.00							$1,156,987.18	$892,467.00						
06111	06111: Ventura County	5	$52,917,596.50	$38,538,302.50	$14,379,294.00														
06113	06113: Yolo County	7	$6,084,126.30	$5,820,698.55	$263,427.75														
06115	06115: Yuba County	5	$22,675,955.33	$22,675,955.33	$0.00														
Total	Total	39	$6,695,775,251.92	$6,278,962,682.10	$416,812,569.82	$80,864,515.33	$6,091,901.51	$37,703,713.52	$2,460,991.97	$444,517.27	$0.00	$24,906,594.21	$3,886,053.68	$29,794,587.77	$2,679,292.00	$924,687.91	$0.00	$221,573,327.30	$8,055,027.37

	2017											
	4301: SEVERE WINTER STORMS, FLOODING, AND MUDSLIDES		4302: SEVERE WINTER STORM		4305: SEVERE WINTER STORMS, FLOODING, AND MUDSLIDES		4308: SEVERE WINTER STORMS, FLOODING, AND MUDSLIDES		4312: FLOODING		4344: WILDFIRES	
COUNTY NAME	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations	PA Obligations	HM Obligations
06000: Statewide	$13,393,506.23	$1,389,287.94	$3,345,510.33	$0.00	$1,360,948.64	$495,692.00	$633,766,224.06	$63,124,334.52	$269,934.77	$0.00	$419,926,416.85	$26,359,076.50
06001: Alameda County	$9,031,996.04	$3,038,281.35			$264,900.54	$0.00	$8,839,206.19	$3,569,062.50				
06003: Alpine County	$241,191.73	$0.00					$204,240.20	$0.00				
06005: Amador County	$928,121.21	$0.00					$1,676,367.77	$0.00				
06007: Butte County	$6,081,097.01	$0.00					$2,823,714.85	$0.00			$106,138.71	$4,694,486.25
06009: Calaveras County	$1,634,279.68	$0.00			$11,144.38	$6,626.00	$1,170,911.43	$0.00				
06011: Colusa County	$272,363.27	$0.00					$1,035,175.36	$0.00				
06013: Contra Costa County	$3,644,745.84	$0.00			$421,879.64	$0.00	$16,086,848.45	$7,844,217.60				
06015: Del Norte County							$1,704,750.74	$0.00				
06017: El Dorado County	$6,688,240.72	$0.00			$1,563,030.74	$0.00	$6,787,589.57	$0.00				
06019: Fresno County												
06021: Glenn County							$304,793.36	$0.00				
06023: Humboldt County	$11,238,158.43	$1,974,171.21					$8,398,350.03	$0.00				
06025: Imperial County					$36,505.19	$0.00						
06027: Inyo County	$11,496.91	$0.00			$0.00	$0.00						
06029: Kern County					$4,007,513.94	$0.00						
06031: Kings County							$0.00	$0.00				
06033: Lake County	$1,278,210.11	$0.00					$3,995,754.90	$99,773.78			$331,912.31	$86,124.54
06035: Lassen County	$459,691.88	$0.00					$1,192,310.96	$0.00				
06037: Los Angeles County	$962,412.75	$0.00			$11,330,272.17	$145,230.00						
06039: Madera County												
06041: Marin County	$3,709,685.96	$908,621.46					$2,943,094.87	$0.00			$31,944.15	$2,767,866.25
06043: Mariposa County							$1,253,327.23	$0.00				
06045: Mendocino County	$4,409,349.64	$0.00			$3,512,643.94	$224,898.12					$5,306,178.07	$2,775,721.75
06047: Merced County	$553,828.74	$0.00					$587,534.38	$0.00				
06049: Modoc County					$10,484.35	$0.00	$86,707.86	$0.00				
06051: Mono County	$64,967.80	$0.00			$28,827.33	$0.00	$297,950.98	$0.00				
06053: Monterey County	$11,520,364.83	$0.00					$9,450,679.65	$0.00				
06055: Napa County	$4,455,614.17	$1,288,815.00			$984,788.47	$0.00	$3,202,827.27	$0.00			$6,423,872.29	$5,115,057.82
06057: Nevada County	$1,709,470.76	$0.00					$834,490.70	$0.00			$136,309.91	$1,250,302.51
06059: Orange County					$4,105,709.00	$30,000.00					$2,689,082.36	$3,555,607.21
06061: Placer County	$4,200,248.48	$0.00			$31,507.42	$0.00						
06063: Plumas County	$853,091.46	$0.00					$998,220.48	$0.00				
06065: Riverside County					$3,171,452.65	$0.00						
06067: Sacramento County	$8,977,670.59	$609,150.39			$6,491,997.90	$0.00	$21,171,297.54	$100,481.86			$962,737.74	$34,891.50
06069: San Benito County	$508,402.09	$0.00					$708,133.80	$0.00				
06071: San Bernardino County												
06073: San Diego County					$5,092,217.78	$0.00						
06075: San Francisco County												
06077: San Joaquin County	$137,356.08	$0.00					$4,010,817.19	$1,154,961.35				
06079: San Luis Obispo County	$2,486,312.95	$0.00			$433,048.07	$0.00	$1,412,163.48	$2,240,334.96				
06081: San Mateo County	$13,497.71	$1,791,237.26			$3,116,638.70	$381,474.00	$5,401,542.49	$1,125,767.00				
06083: Santa Barbara County					$582,288.12	$4,819,674.90	$3,093,847.35	$3,360,791.45				
06085: Santa Clara County	$10,348,538.31	$0.00					$10,372,620.79	$0.00				
06087: Santa Cruz County	$3,723,126.77	$838,388.25			$12,228,505.48	$41,438.00	$33,485,043.39	$0.00				
06089: Shasta County	$4,260,199.43	$0.00					$5,135,865.02	$0.00				
06091: Sierra County	$1,902,324.16	$0.00					$2,949,434.03	$0.00				
06093: Siskiyou County	$185,161.00	$0.00					$165,536.29	$0.00				
06095: Solano County	$2,764,499.29	$0.00					$770,476.79	$0.00			$823,075.47	$197,031.51
06097: Sonoma County	$2,723,997.80	$2,407,017.75					$3,008,554.12	$2,083,898.09			$58,724,400.84	$23,418,839.49
06099: Stanislaus County							$5,221,508.08	$0.00				
06101: Sutter County	$1,649,680.42	$2,619,379.50					$4,943,525.67	$0.00				
06103: Tehama County							$264,382.65	$0.00				
06105: Trinity County	$35,389.54	$0.00			$2,411,357.78	$0.00	$2,522,025.40	$0.00				
06107: Tulare County												
06109: Tuolumne County	$5,735,581.36	$0.00			$741,466.64	$0.00	$1,189,637.11	$0.00				
06111: Ventura County												
06113: Yolo County	$986,106.22	$0.00			$615,998.34	$0.00	$1,038,717.00	$263,427.75				
06115: Yuba County	$11,883,651.60	$0.00					$9,193,629.64	$0.00			$1,110,697.98	$0.00
Total	$145,663,628.97	$16,864,350.11	$3,345,510.33	$0.00	$62,555,127.21	$6,145,033.02	$823,699,829.12	$84,967,050.86	$269,934.77	$0.00	$496,572,766.68	$70,255,005.33

	2018						2019											
	4353: WILDFIRES, FLOODING, MUDFLOWS, AND DEBRIS FLOWS		4382: WILDFIRES AND HIGH WINDS		4407: WILDFIRES		4422: SEVERE STORMS, FLOODING, LANDSLIDES, AND MUDSLIDES		4423: SEVERE STORMS AND FLOODING		4425: SEVERE STORMS AND FLOODING		4431: SEVERE WINTER STORMS, FLOODING, LANDSLIDES, AND MUDSLIDES		4434: SEVERE WINTER STORMS, FLOODING, LANDSLIDES, AND MUDSLIDES		4436: SNOWSTORM AND FLOODING	
COUNTY NAME	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
06000: Statewide	$263,477,267.81	$2,657,723.61	$304,737,283.36	$2,987,297.85	$1,749,216,505.60	$39,970,583.96	$575,161.50	$0.00	$2,087,710.97	$0.00	$497,676.70	$0.00	$4,563,632.81	$804,780.90	$1,457,847.94	$1,014,089.08	$555,139.68	$0.00
06001: Alameda County																		
06003: Alpine County																		
06005: Amador County															$230,997.74	$0.00		
06007: Butte County					$146,854,291.45	$34,518,099.04									$1,757,153.77	$0.00		
06009: Calaveras County													$718,866.06	$2,490,476.25				
06011: Colusa County													$87,103.28	$0.00	$866,974.59	$0.00		
06013: Contra Costa County																		
06015: Del Norte County															$4,873.78	$0.00		
06017: El Dorado County															$0.00	$441,750.00		
06019: Fresno County																		
06021: Glenn County															$615,694.90	$0.00		
06023: Humboldt County															$5,682,946.74	$111,345.54		
06025: Imperial County																		
06027: Inyo County																		
06029: Kern County																		
06031: Kings County																		
06033: Lake County			$2,440,920.82	$2,007,571.29											$1,784,214.67	$158,468.30		
06035: Lassen County																		
06037: Los Angeles County	$0.00	$588,379.24			$51,266,932.93	$43,442,970.79							$4,099,711.66	$0.00				
06039: Madera County																		
06041: Marin County													$1,935,608.74	$0.00	$323,254.18	$0.00		
06043: Mariposa County													$0.00	$0.00	$0.00	$0.00		
06045: Mendocino County													$0.00	$0.00	$2,692,390.28	$0.00		
06047: Merced County																		
06049: Modoc County																		
06051: Mono County													$135,566.22	$0.00				
06053: Monterey County															$347,453.10	$0.00		
06055: Napa County													$0.00	$0.00	$2,493,915.29	$0.00		
06057: Nevada County																		
06059: Orange County													$249,401.57	$0.00				
06061: Placer County																		
06063: Plumas County																		
06065: Riverside County													$27,088,092.21	$0.00				
06067: Sacramento County																		
06069: San Benito County																		
06071: San Bernardino County																		
06073: San Diego County	$0.00	$0.00																
06075: San Francisco County																		
06077: San Joaquin County																		
06079: San Luis Obispo County																		
06081: San Mateo County																		
06083: Santa Barbara County	$51,962,395.08	$1,969,716.77											$1,388,102.61	$699,883.50				
06085: Santa Clara County																		
06087: Santa Cruz County																		
06089: Shasta County			$17,329,034.11	$3,273,076.66									$4,244,166.50	$0.00				
06091: Sierra County																		
06093: Siskiyou County																		
06095: Solano County																		
06097: Sonoma County															$17,688,425.65	$2,292,305.36		
06099: Stanislaus County																		
06101: Sutter County																		
06103: Tehama County															$483,730.49	$0.00		
06105: Trinity County													$972,889.69	$0.00	$180,108.23	$0.00		
06107: Tulare County																		
06109: Tuolumne County															$542,910.05	$0.00		
06111: Ventura County	$18,596,383.37	$8,942,984.75			$13,696,721.59	$5,286,309.25												
06113: Yolo County															$1,062,111.03	$0.00		
06115: Yuba County																		
Total	$334,036,046.26	$14,158,804.37	$324,507,238.29	$8,267,945.80	$1,961,034,451.57	$123,217,963.04	$575,161.50	$0.00	$2,087,710.97	$0.00	$497,676.70	$0.00	$45,483,141.35	$3,995,140.65	$38,215,002.43	$4,017,958.28	$555,139.68	$0.00

	2020				2021				2023					
	4558: WILDFIRES		4569: WILDFIRES		4610: WILDFIRES		4619: WILDFIRES		4683: SEVERE WINTER STORMS, FLOODING, LANDSLIDES, AND MUDSLIDES		4692: EARTHQUAKE		4699: SEVERE WINTER STORMS, STRAIGHT-LINE WINDS, FLOODING, LANDSLIDES, AND MUDSLIDES	
COUNTY NAME	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
06000: Statewide	$403,841,546.58	$6,005,920.97	$170,656,193.10	$2,717,847.04	$505,876,981.19	$1,243,010.55	$167,988,681.93	$972,258.97	$17,544,129.67	$4,494,175.19	$230,833.64	$8,410.33	$8,946,634.38	$1,464,363.88
06001: Alameda County									$6,669,023.12	$294,415.50			$958,047.36	$0.00
06003: Alpine County									$659,571.94	$0.00			$25,100.66	$0.00
06005: Amador County									$844,082.72	$0.00			$89,763.71	$0.00
06007: Butte County	$10,015,308.47	$738,975.00							$408,934.15	$0.00			$754,526.03	$0.00
06009: Calaveras County									$1,170,514.93	$0.00			$887,628.52	$0.00
06011: Colusa County									$1,204,342.85	$0.00				
06013: Contra Costa County									$10,911,562.96	$0.00				
06015: Del Norte County			$107,251.04	$0.00					$62,820.81	$300,000.00			$59,639.23	$0.00
06017: El Dorado County							$15,586,134.52	$750,280.04	$3,468,438.60	$0.00			$522,910.99	$0.00
06019: Fresno County			$6,455,526.60	$0.00					$2,158,401.99	$240,435.00			$1,088,537.79	$0.00
06021: Glenn County									$2,010,456.43	$0.00			$310,865.97	$0.00
06023: Humboldt County	$255,271.96	$1,670,269.45							$1,681,505.17	$435,375.00			$1,022,703.40	$0.00
06025: Imperial County													$3,854,058.53	$0.00
06027: Inyo County									$390,541.15	$0.00			$299,555.99	$0.00
06029: Kern County													$6,200,466.11	$0.00
06031: Kings County													$2,377,035.39	$0.00
06033: Lake County	$631,574.65	$1,231,712.44					$233,698.64	$83,231.40					$173,358.85	$0.00
06035: Lassen County	$263,221.25	$0.00			$1,174,651.68	$0.00								
06037: Los Angeles County			$7,781,006.32	$2,197,062.08					$6,557,036.10	$2,111,931.02			$2,171,004.04	$1,114,594.50
06039: Madera County			$1,362,991.56	$0.00					$726,299.67	$0.00			$365,231.15	$0.00
06041: Marin County									$1,582,379.12	$0.00			$567,122.60	$1,275,000.00
06043: Mariposa County									$120,402.95	$150,000.00			$71,166.20	$0.00
06045: Mendocino County	$98,026.91	$200,262.40	$83,857.02	$0.00					$1,291,919.50	$246,615.90			$0.00	$0.00
06047: Merced County									$4,226,256.36	$0.00			$1,285,410.71	$0.00
06049: Modoc County													$433,227.42	$0.00
06051: Mono County													$2,954,576.88	$0.00
06053: Monterey County	$2,087,809.22	$0.00							$6,986,944.96	$0.00			$3,960,242.26	$0.00
06055: Napa County	$3,593,646.67	$650,048.92	$5,974,451.91	$1,361,326.00					$315,557.15	$0.00			$0.00	$0.00
06057: Nevada County	$165,735.26	$112,500.00			$324,252.16	$0.00			$927,049.65	$952,554.75			$421,469.88	$0.00
06059: Orange County														
06061: Placer County					$217,479.31	$0.00			$1,985,396.11	$0.00			$73,498.41	$0.00
06063: Plumas County	$108,039.27	$0.00			$19,534,107.98	$0.00							$335,607.89	$0.00
06065: Riverside County													$51,656.25	$0.00
06067: Sacramento County	$929,842.41	$4,917,772.50	$174,390.88	$0.00			$385,197.35	$174,565.37	$6,047,151.57	$150,000.00			$844,866.98	$375,000.00
06069: San Benito County									$840,974.99	$0.00			$1,160,650.97	$0.00
06071: San Bernardino County			$3,086,987.61	$1,125,000.00									$2,640,770.96	$164,325.00
06073: San Diego County			$483,896.15	$30,063.00					$3,948,827.09	$300,000.00				
06075: San Francisco County	$3,995,520.63	$189,558.00							$1,949,103.97	$0.00			$1,909,966.46	$0.00
06077: San Joaquin County									$4,856,519.53	$0.00			$305,926.26	$0.00
06079: San Luis Obispo County									$4,269,845.48	$2,675,070.00			$970,073.68	$0.00
06081: San Mateo County	$2,394,838.76	$2,101,327.75							$7,700,087.60	$404,775.00			$465,831.97	$674,852.39
06083: Santa Barbara County									$14,025,312.24	$150,000.00			$680,640.88	$0.00
06085: Santa Clara County	$2,627,502.90	$0.00							$4,658,977.85	$2,550,000.00			$842,027.87	$0.00
06087: Santa Cruz County	$42,699,057.05	$989,762.00							$8,795,286.65	$548,230.50			$381,234.02	$0.00
06089: Shasta County			$647,898.03	$6,976,601.24									$318,878.58	$0.00
06091: Sierra County	$569,382.77	$0.00											$631,002.19	$0.00
06093: Siskiyou County			$958,380.78	$0.00					$7,500.00	$0.00				
06095: Solano County	$2,875,451.88	$0.00							$455,559.85	$0.00			$50,954.14	$0.00
06097: Sonoma County	$6,090,864.73	$967,101.23	$4,756,773.38	$290,190.75					$3,088,269.63	$383,121.00			$1,300,634.43	$0.00
06099: Stanislaus County	$1,258,484.88	$0.00							$4,687,763.60	$0.00			$3,483,915.89	$0.00
06101: Sutter County									$519,409.12	$0.00				
06103: Tehama County					$47,254.87	$0.00			$664,079.94	$0.00				
06105: Trinity County	$2,387,040.15	$1,003,143.75			$1,079,240.37	$0.00			$420,360.41	$0.00			$3,119,462.01	$0.00
06107: Tulare County	$1,820,066.06	$75,000.00							$592,057.37	$486,818.25			$10,167,325.51	$0.00
06109: Tuolumne County	$306,211.36	$0.00							$1,071,576.78	$0.00			$1,481,437.74	$0.00
06111: Ventura County									$5,337,841.83	$150,000.00			$820,460.62	$0.00
06113: Yolo County	$9,430.33	$0.00							$2,074,210.63	$0.00			$34,125.00	$0.00
06115: Yuba County	$470,602.51	$0.00	$17,373.60	$0.00										
Total	$489,494,476.66	$20,853,354.41	$202,546,977.98	$14,698,090.11	$528,253,967.56	$1,243,010.55	$184,193,712.44	$1,980,335.78	$149,914,284.19	$17,023,517.11	$230,833.64	$8,410.33	$71,871,232.76	$5,068,135.77

	2023												2024							
	4707: SEVERE WINTER STORMS AND MUDSLIDES		4713: SEVERE WINTER STORM AND FLOODING		4714: SEVERE STORM AND FLOODING		4743: TROPICAL STORM HILARY		4746: TROPICAL STORM HILARY		4750: TROPICAL STORM HILARY		4758: SEVERE STORM AND FLOODING		4769: SEVERE WINTER STORMS, TORNADOES, FLOODING, LANDSLIDES, AND MUDSLIDES		4772: SEVERE STORMS AND FLOODING		4773: SEVERE WINTER STORM	
COUNTY NAME	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
06000: Statewide	$0.00	$0.00	$213,251.94	$0.00	$435,992.13	$0.00	$0.00	$0.00	$543,053.87	$0.00	$5,994,981.37	$653,463.25			$5,231,743.51	$221,734.52	$0.00	$0.00	$0.00	$0.00
06001: Alameda County																				
06003: Alpine County																				
06005: Amador County																				
06007: Butte County															$29,068.48	$0.00				
06009: Calaveras County																				
06011: Colusa County																				
06013: Contra Costa County																				
06015: Del Norte County																				
06017: El Dorado County																				
06019: Fresno County																				
06021: Glenn County																				
06023: Humboldt County															$88,262.06	$0.00				
06025: Imperial County											$234,317.58	$0.00								
06027: Inyo County											$0.00	$0.00								
06029: Kern County											$149,922.46	$0.00								
06031: Kings County																				
06033: Lake County																				
06035: Lassen County																				
06037: Los Angeles County															$382,583.35	$0.00				
06039: Madera County																				
06041: Marin County																				
06043: Mariposa County																				
06045: Mendocino County																				
06047: Merced County																				
06049: Modoc County																				
06051: Mono County																				
06053: Monterey County															$0.00	$0.00				
06055: Napa County																				
06057: Nevada County																				
06059: Orange County																				
06061: Placer County																				
06063: Plumas County																				
06065: Riverside County											$3,614,607.94	$0.00								
06067: Sacramento County																				
06069: San Benito County																				
06071: San Bernardino County																				
06073: San Diego County													$0.00	$0.00						
06075: San Francisco County																				
06077: San Joaquin County																				
06079: San Luis Obispo County															$52,272.73	$0.00				
06081: San Mateo County																				
06083: Santa Barbara County															$0.00	$0.00				
06085: Santa Clara County																				
06087: Santa Cruz County															$0.00	$0.00				
06089: Shasta County																				
06091: Sierra County																				
06093: Siskiyou County											$59,589.47	$0.00								
06095: Solano County																				
06097: Sonoma County																				
06099: Stanislaus County																				
06101: Sutter County															$30,345.75	$0.00				
06103: Tehama County																				
06105: Trinity County																				
06107: Tulare County																				
06109: Tuolumne County																				
06111: Ventura County															$86,895.09	$0.00				
06113: Yolo County																				
06115: Yuba County																				
Total	$0.00	$0.00	$213,251.94	$0.00	$435,992.13	$0.00	$0.00	$0.00	$543,053.87	$0.00	$10,053,418.82	$653,463.25	$0.00	$0.00	$5,901,170.97	$221,734.52	$0.00	$0.00	$0.00	$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.

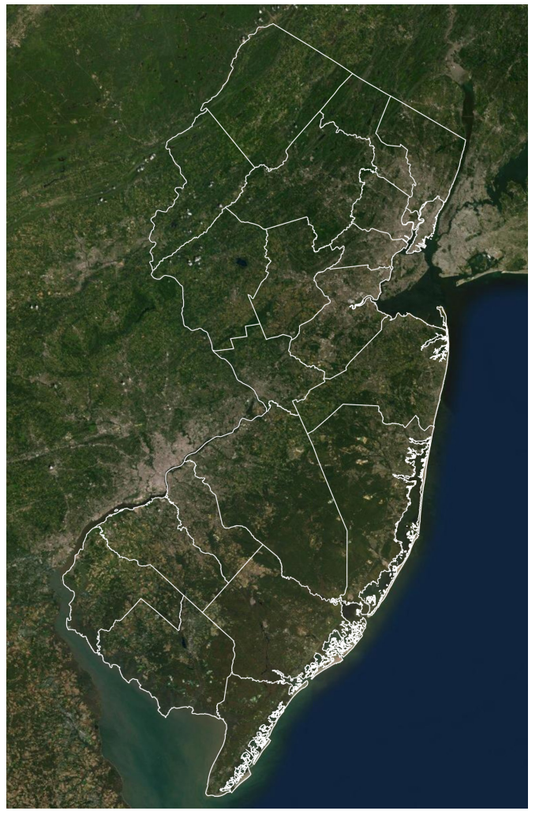
The U.S. needs to change the way it is making funding decisions. Where we make priority investments is equally important to what we invest in. Returns on investments (ROI) in the form of social benefits to communities needs to be part of grant evaluations. The U.S. need to utilize new decision-making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

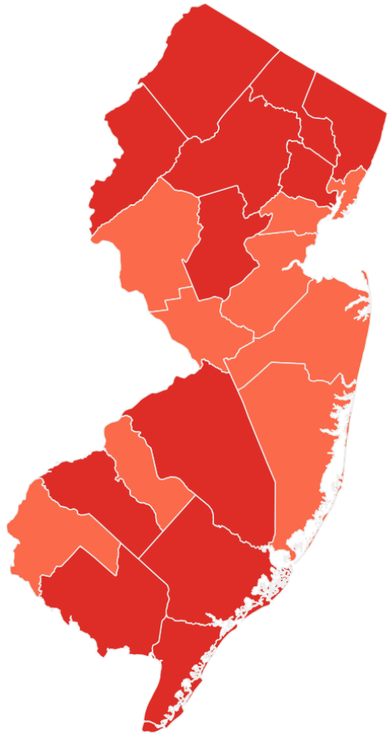


GEOGRAPHIC MAP. SOURCE: ESRI
WORLD IMAGERY BASEMAP

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."



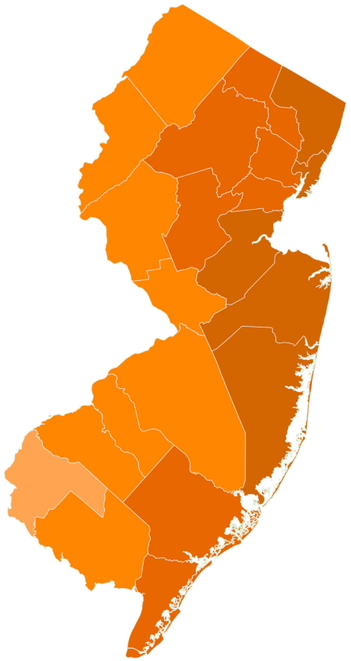
DISASTER OCCURRENCES
SOURCE: FEMA 2011-2024
MAP MADE BY REBUILD BY DESIGN

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

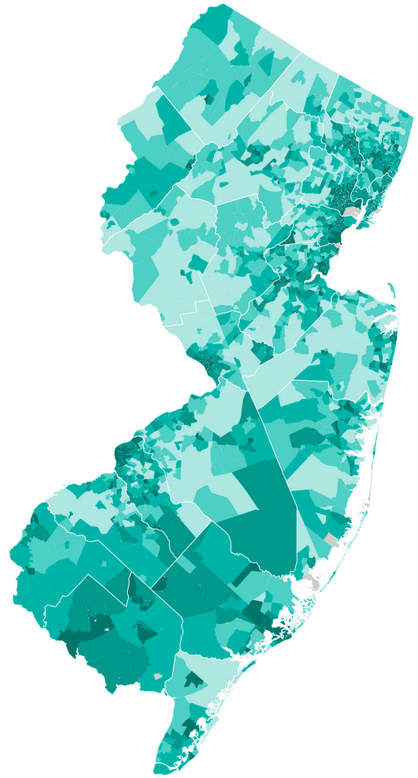
The Disaster Declaration tables provided at the end of each chapter show all federal Disaster Declarations declared between 2011-2024 and the corresponding FEMA obligations associated with those events. **However, in some instances, FEMA continues to obligate funds for years following a declaration.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

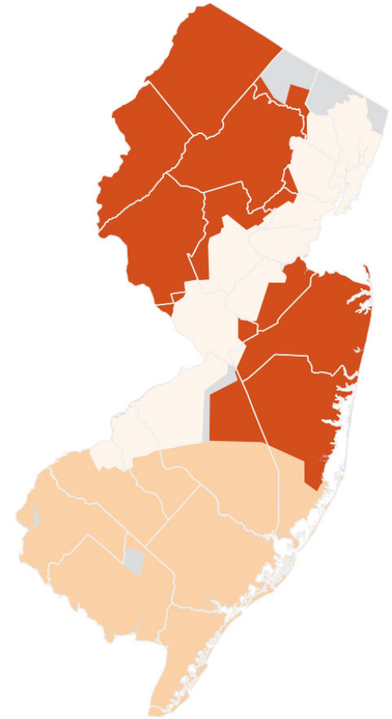
- **Socioeconomic Status** (below poverty, unemployed, income, no high school diploma);
- **Household Composition & Disability** (aged 65 or older, aged 17 or younger, older than age 5 with a disability, single-parent households);
- **Minority Status & Language** (minority, speak English "less than well");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