



NORTH CAROLINA STATISTICS SUMMARY (2011 - 2024)								
17	CLIMATE DISASTER DECLARATIONS							
\$4.5 BILLION	FEMA + HUD POST-DISASTER FUNDING							
10.5 MILLION PEOPLE	POPULATION TOTAL							
\$428	PER CAPITA SPENDING ON CLIMATE DISASTERS							
WAKE (8 DISASTERS)	COUNTY WITH THE HIGHEST DISASTER OCCURRENCES							
32	COUNTIES HAVE HAD FIVE OR MORE DISASTERS							
3.6 MILLION PEOPLE	LIVE IN AREAS WITH VERY HIGH SOCIAL VULNERABILITY (SVI > 0.75)							
4.4 HOURS	TOTAL OUTAGE DURATION (HOURS PER CUSTOMER PER YEAR)							
N/A	ASCE INFRASTRUCTURE REPORT CARD GRADE							
47	SUPERFUND SITES							
\$7.0 BILLION	CLIMATE INFRASTRUCTURE SUPPORTED THROUGH SMALL INSURANCE SURCHARGE							

DISASTER OCCURRENCES 2011-2024

FEDERALLY DECLARED CLIMATE DISASTERS BY COUNTY



72% of counties in North Carolina have had 3 or more recent diasters.

post-disaster assistance

FEDERAL ASSISTANCE 2011-2024

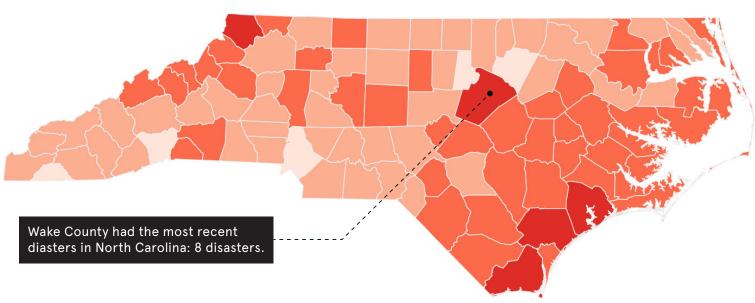
POST-DISASTER PUBLIC ASSISTANCE AND HAZARD MITIGATION FUNDS OBLIGATED BY COUNTY FOR CLIMATE DISASTERS



\$2.4B HUD CDBG-DR Funds

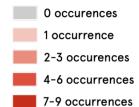
\$4.5B FEMA + HUD assistance

\$428 per capita cost



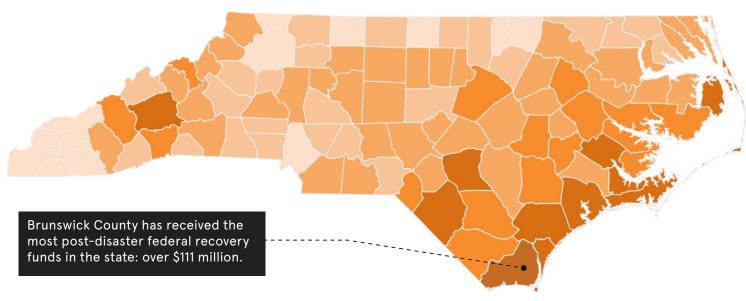
Number of Disaster Events

Major Disaster Declarations (2011-2024)



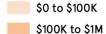
10+ occurrences

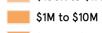
MAP MADE BY REBUILD BY DESIGN FEMA DATA COURTESY OF IPARAMETRICS

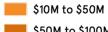


FEMA Public Assistance and Hazard Mitigation

Federal Share Obligated (2011-2024)







\$50M to \$100M



MAP MADE BY REBUILD BY DESIGN FEMA DATA COURTESY OF IPARAMETRICS

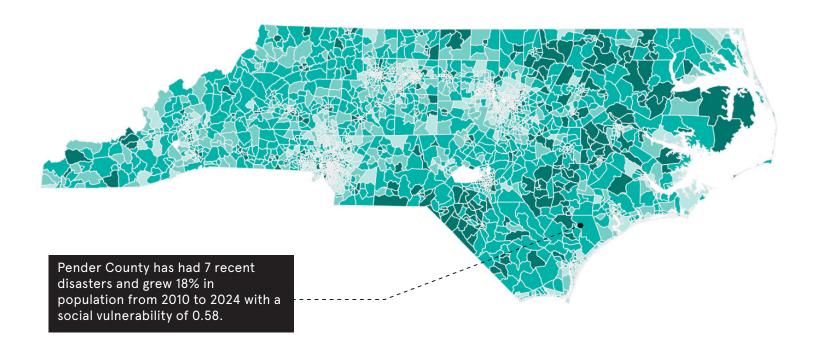
205

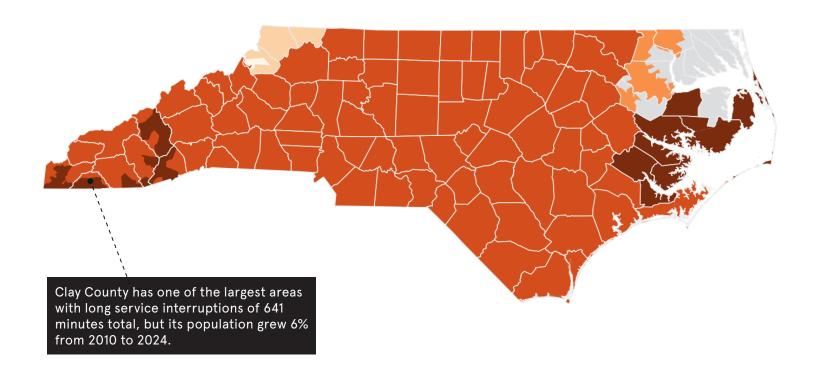
SOCIAL VULNERABILITY INDEX 2022

AREAS OF GREATEST SOCIAL VULNERABILITY

ENERGY RELIABILITY 2023

COUNTIES AT GREATEST RISK OF POWER OUTAGES





Social Vulnerability Index

CDC (2022)



0.0 - 0.2

0.2 - 0.4

0.4 - 0.6

0.8 - 1.0

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

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

206 207

TOTAL: 17 DISASTERS		Total	20	11	4103: SEVERE STORMS. 4146	2013	4153: SEVERE STOR	2014 MS.	2016		2018		2019	4543: SEVER		020	2021			2024	4837: POTENTIAL
FEMA PA + HM: \$2.1 B HUD CDBG-DR: \$2.4 B			1969: SEVERE STORMS, TORNADOES, AND FLOODING	4019: HURRICANE IRENE	FLOODING, LANDSLIDES, FLOO	DING, LANDSLIDES,	FLOODING, LANDSLII MUDSLIDES	4167 SEVERE WINTER	4285: HURRICANE MATTHE	4364: TORNADO ANI SEVERE STORMS	4393: HURRICANE FLORENCE	4412: TROPICAL STOR	M 4465: HURRICANE DO		ES, AND	4568: HURRICANE ISAIAS	1588: TOODICAL STOOM ETA	4617: REMNANTS OF ROPICAL STORM FRED	4827: TROPIC HELEI		TROPICAL CYCLONE EIGHT
FEMA + HUD ASSISTANCE: \$4.5 B	3	PA Obligations HM Obligations	PA Obligations HM Obligations	PA Obligations HM Obligations	PA HM PA Obligations	igations HM	PA HI	M PA Obligations Obligations	PA Obligations HM Obligati	PA HM	PA Obligations HM Obligations	PA Obligations Obligation	PA Obligations HM Obli	igations PA Obligations	HM	PA Obligations Obligations	PA Obligations Obligations PA O	Obligations Obligations	PA Obligations	HM	PA HM
37000 37000: Statewide 15	\$851,387,120.90	\$822,653,669.31 \$28,733,451.59		\$16,310,181.86 \$1,334,042.87	\$4,212,154.14 \$0.00 \$5,86	Obligations 8,828.01 \$152,083.0	0 \$3,380,443.74 \$99,3	22.58 \$28,795,058.50 \$675,863.83		Obligations Obligation .50	\$270,367,068.91 \$10,108,128.42	, , , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , ,	1,764.04 \$12,544,606.87	\$209,788.75	Obligations \$6,635,761.12 \$344,436.00	\$28,143,756.48 \$102,176.00 \$19,	205,155.67 \$182,464.0	\$264,390,603.33		J
37001 37001: Alamance County 4 37003 37003: Alexander County 3	\$3,195,146.71 \$138,300.34	\$3,195,146.71 \$0.00 \$138,300.34 \$0.00	\$0.00 \$0.00					\$2,941,184.98 \$0.00	0		\$188,265.37 \$0.00	\$65,696.36 \$0	0.00	\$0.00	\$0.00		\$111,388.44 \$0.00		\$26,911.90	\$0.00)
37005 37005: Alleghany County 4 37007 37007: Anson County 2	\$6,536.57 \$2,112,293.00	\$6,536.57 \$0.00 \$2,112,293.00 \$0.00				\$0.00 \$0.0	0		\$454,890.80 \$.00	\$6,536.57 \$0.00 \$1,657,402.20 \$0.00						\$0.00 \$0.00		\$0.00	\$0.00	
37007 37007: Anson County 2 37009 37009: Ashe County 7	\$1,638,187.17	\$1,638,187.17 \$0.00			\$4	7,559.15 \$0.0	0 \$0.00	\$0.00	\$454,090.00		\$66,807.52 \$0.00			\$4,500.00	\$0.00		\$0.00 \$0.00	\$0.00 \$0.0	\$1,519,320.50	\$0.00	
37011 37011: Avery County 4 37013 37013: Beaufort County 6	\$6,881,473.96 \$19,788,114.98	\$6,881,473.96 \$0.00 \$12,584,494.45 \$7,203,620.53		\$5,548,722.98 \$111,797.00		1,373.96 \$0.0	0 \$0.00	\$0.00	\$757,423.26 \$.00	\$3,932,300.58 \$7,091,823.53		\$1,720,552.61	\$0.00		\$625,495.02 \$0.00	\$0.00 \$0.00	\$0.00 \$0.0	\$6,860,100.00	\$0.00)
37015 37015: Bertie County 5	\$8,275,988.92	\$1,552,109.36 \$6,723,879.56	\$40,324.33 \$0.00	\$156,036.30 \$0.00					\$1,104,868.66 \$4,473,31	.50	\$64,704.45 \$2,250,569.06					\$186,175.62 \$0.00					
37017 37017: Bladen County 5 37019 37019: Brunswick County 7	\$10,378,330.57 \$111,332,119.77	\$7,954,179.96 \$2,424,150.61 \$108,953,392.77 \$2,378,727.00	\$55,450.68 \$0.00	\$0.00 \$33,750.00 \$2,792,564.45 \$0.00					\$1,438,681.14 \$424,020 \$25,228,855.91 \$	0.02	\$6,431,921.25 \$1,966,380.59 \$59,503,396.55 \$2,285,525.25	\$4,081,868.59	\$28,126.89 0.00 \$7,456,260.64 \$93	\$0.00 3,201.75		\$9,890,446.63 \$0.00					\$0.00 \$0.00
37021 37021: Buncombe County 3 37023 37023: Burke County 3	\$56,358,554.73 \$389,789.42	\$56,358,554.73 \$0.00 \$389,789.42 \$0.00				7,725.43 \$0.0 9,642.78 \$0.0											\$1, \$295,989.64 \$0.00	027,810.19 \$0.0	\$52,993,019.11 \$4,157.00	·	
37025 37025: Cabarrus County 2	\$228,749.36	\$228,749.36 \$0.00									\$228,749.36 \$0.00								\$0.00	\$0.00	
37027 37027: Caldwell County 5 37029 37029: Camden County 3	\$408,409.15 \$1,016,300.32	\$408,409.15 \$0.00 \$86,260.32 \$930,040.00		\$14,229.16 \$0.00		5,458.14 \$0.0	0		\$65,680.68 \$930,04	1.00	\$88,566.71 \$0.00		\$6,350.48	\$0.00			\$19,514.91 \$0.00 \$	113,258.73 \$0.0	\$21,610.66	\$0.00)
37031 37031: Carteret County 6	\$90,211,437.00	\$88,809,156.50 \$1,402,280.50		\$7,734,283.76 \$254,938.00				20.00	\$437,876.04	.00	\$79,208,436.93 \$1,147,342.50	040.007.04	\$1,312,951.93	\$0.00		\$115,607.84 \$0.00					\$0.00 \$0.00
37033 37033: Caswell County 2 37035 37035: Catawba County 2	\$84,699.61 \$4,694,464.38	\$43,387.61 \$41,312.00 \$4,694,464.38 \$0.00					\$4,579,000.75	\$0.00 \$41,312.00 \$0.00				\$43,387.61	0.00						\$115,463.63	\$0.00)
37037 37037: Chatham County 3 37039 37039: Cherokee County 2	\$487,140.64 \$0.00	\$487,140.64 \$0.00 \$0.00 \$0.00							\$154,243.88	.00	\$313,942.18 \$0.00	\$18,954.58	0.00	\$0.00	\$0.00				\$0.00	\$0.00	1
37041 37041: Chowan County 4	\$1,302,514.87	\$1,193,818.29 \$108,696.58		\$319,897.37 \$0.00					\$509,834.06 \$108,69	5.58			\$262,530.04	\$0.00	φυ.υυ	\$101,556.82 \$0.00					
37043 37043: Clay County 1 37045 37045: Cleveland County 2	\$0.00 \$929,500.00	\$0.00 \$0.00 \$929,500.00 \$0.00												\$0.00	\$0.00				\$0.00 \$929,500.00		
37047 37047: Columbus County 5	\$14,112,650.74	\$7,324,157.85 \$6,788,492.89	#CF 070 00	\$80,504.93 \$0.00					\$3,130,936.19 \$5,109,69		\$3,789,472.49 \$1,490,531.19			\$0.00		\$0.00 \$188,271.00					
37049 37049: Craven County 6 37051 37051: Cumberland County 3	\$93,931,831.31 \$54,988,381.71	\$83,484,590.03 \$10,447,241.28 \$51,972,958.19 \$3,015,423.52	\$3,019,214.57 \$0.00						\$678,361.03 \$ \$22,820,180.28 \$1,103,500	.78	\$75,586,904.17 \$9,152,650.78 \$26,133,563.34 \$1,911,913.74		\$1,243,415.04 \$518	5,707.50		\$689,659.70 \$0.00					
37053 37053: Currituck County 4 37055 37055: Dare County 6	\$1,510,496.87 \$58,696,725.66	\$1,243,151.87 \$267,345.00 \$46,822,534.03 \$11,874,191.63	\$1,658.29 \$0.00	\$395,017.07 \$267,345.00 \$7,123,041.15 \$1,702,420.50						.00	\$3,450,078.29 \$4,702,456.88	\$429,382.90 \$0	\$676,677.20 0.00 \$20,396,350.41 \$5,469	\$0.00 9,314.25							\$0.00 \$0.00
37057 37057: Davidson County 4	\$2,464,492.63	\$2,464,492.63 \$0.00		ψ1,102,420.00				\$1,415,262.56 \$0.00	0		\$329,713.76 \$0.00	\$719,516.31 \$0	0.00	,			\$0.00 \$0.00				ψυ.υυ
37059 37059: Davie County 3 37061 37061: Duplin County 5	\$7,304,009.04 \$12,572,326.73	\$7,304,009.04 \$0.00 \$7,606,683.08 \$4,965,643.65		\$268,361.89 \$0.00				\$101,439.87 \$0.00	\$1,407,612.75 \$535,79	.10	\$5,777,110.02 \$4,429,844.55	\$91,411.81	0.00 \$153,598.42	\$0.00			\$7,111,157.36 \$0.00 \$0.00 \$0.00				
37063 37063: Durham County 1	\$1,454,468.70	\$0.00 \$1,454,468.70									\$0.00 \$1,454,468.70					\$12.026.00					
37065 37065: Edgecombe County 4 37067 37067: Forsyth County 2	\$29,306,653.22 \$1,769,937.12	\$12,687,778.84 \$16,618,874.38 \$1,769,937.12 \$0.00		\$2,278,734.44 \$0.00					\$10,396,007.52 \$16,618,87			\$1,769,937.12	0.00			\$13,036.88 \$0.00	\$0.00 \$0.00		\$0.00	\$0.00	
37069 37069: Franklin County 1 37071 37071: Gaston County 2	\$125,855.13 \$343,314.01	\$125,855.13 \$0.00 \$343,314.01 \$0.00							\$125,855.13	.00				\$289,324.69	\$0.00)			\$53,989.32	\$0.00)
37073 37073: Gates County 2	\$166,912.05	\$166,912.05 \$0.00		\$31,933.62 \$0.00					\$134,978.43	.00								00.00			
37075 37075: Graham County 3 37077 37077: Granville County 3	\$0.00 \$509,035.14	\$0.00 \$0.00 \$509,035.14 \$0.00						\$87,287.83 \$0.00	0		\$330,537.96 \$0.00	\$91,209.35 \$0	0.00	\$0.00	\$0.00			\$0.00 \$0.0	\$0.00	\$0.00	
37079 37079: Greene County 5 37081 37081: Guilford County 3	\$2,090,723.71 \$7,803,109.65	\$1,399,229.19 \$691,494.52 \$7,285,982.65 \$517,127.00	\$170,859.33 \$29,201.00	\$306,417.81 \$0.00				\$5,568,707.92 \$47,561.00	\$652,320.18 \$662,29		\$239,802.21 \$0.00 0.00 \$1,717,274.73 \$469,566.00		\$29,829.66	\$0.00							
37083 37083: Halifax County 3	\$2,264,544.96	\$2,144,070.46 \$120,474.50		\$1,835,732.99 \$119,837.00				ψ3,300,707.92 ψ47,301.00	\$217,989.15 \$63	.50											
37085 37085: Harnett County 5 37087 37087: Haywood County 2	\$8,211,457.27 \$14,678,421.70	\$8,211,457.27 \$0.00 \$12,857,959.75 \$1,820,461.95	\$727,709.51 \$0.00	\$64,101.07 \$0.00					\$2,194,647.57	1.00	\$4,492,309.55 \$0.00		\$732,689.57	\$0.00			\$12,	857,959.75 \$1,820,461.9	95 \$0.00	\$0.00	
37089 37089: Henderson County 1	\$15,407,805.84	\$15,407,805.84 \$0.00	00.054.00 00.00	#000 400 05 #0 00					0005 700 04	20						\$000.044.47			\$15,407,805.84		
37091 37091: Hertford County 5 37093 37093: Hoke County 4	\$756,717.66 \$1,433,590.82	\$756,717.66 \$0.00 \$1,339,915.82 \$93,675.00	\$8,854.30 \$0.00 \$5,950.84 \$0.00	\$239,466.85 \$0.00						.00	\$399,347.80 \$93,675.00		\$10,333.38	\$0.00		\$222,614.17 \$0.00	\$0.00 \$0.00				
37095 37095: Hyde County 6 37097 37097: Iredell County 4	\$22,457,526.61 \$3,607,905.03	\$12,767,013.22 \$9,690,513.39 \$3,607,905.03 \$0.00		\$2,013,010.61 \$576,318.22					\$4,569,570.56	.00	\$179,873.21 \$7,311,681.00 \$129,682.05 \$0.00		0.00 \$6,004,558.84 \$1,590 0.00	0,130.37		\$0.00 \$212,383.80	\$1,603,331.90 \$0.00		\$0.00	\$0.00)
37099 37099: Jackson County 3	\$1,288,565.73	\$1,288,565.73 \$0.00				8,565.73 \$0.0	0					V 1,011,0011.00	5.00				V 1,000,001.00	\$0.00 \$0.0			
37101 37101: Johnston County 4 37103 37103: Jones County 5	\$8,055,774.32 \$9,485,609.89	\$6,833,633.72 \$1,222,140.60 \$3,776,571.14 \$5,709,038.75	\$251,340.31 \$0.00	\$84,789.34 \$0.00 \$107,327.35 \$53,502.00					\$5,375,282.96 \$1,222,14 \$80,095.62 \$564,50		\$1,122,221.11 \$0.00 \$3,481,984.63 \$5,091,027.75		\$72,929.76	\$0.00		\$34,233.78 \$0.00					
37105 37105: Lee County 4 37107 37107: Lenoir County 5	\$7,834,540.72 \$18,894,595.60	\$7,834,540.72 \$0.00 \$14,124,845.12 \$4,769,750.48	\$1,716,221.63 \$0.00	\$3,470,653.90 \$0.00					\$1,497,785.17 \$1 \$4,579,428.93 \$4,374,90	.00	\$4,620,533.92 \$0.00 \$5,508,515.39 \$333,760.43		\$256,461.46 \$61	1,085.25		\$309,785.44 \$0.00			\$0.00	\$0.00)
37107 37107: Lenoir County 3	\$354,007.29	\$354,007.29 \$0.00		\$3,470,653.90 \$0.00			\$344,537.36	\$0.00	\$4,579,426.93 \$4,374,90	00	\$5,506,515.39 \$555,760.43		\$230,401.40 \$01	1,065.25		\$509,765.44 \$0.00			\$9,469.93	\$0.00	
37111 37111: McDowell County 3 37113 37113: Macon County 2	\$1,786,240.91 \$0.00	\$1,609,690.91 \$176,550.00 \$0.00 \$0.00				\$0.00 \$0.0	0				\$829,695.26 \$176,550.00	\$55,260.47 \$0	0.00						\$724,735.18 \$0.00		
37115 37115: Madison County 5	\$561,987.95	\$226,446.76 \$335,541.19				4,752.64 \$0.0					\$14,269.61 \$335,541.19			\$0.00	\$0.00			\$87,424.51 \$0.0			
37117 37117: Martin County 2 37119 37119: Mecklenburg County 1	\$1,522,666.62 \$0.00	\$1,522,666.62 \$0.00 \$0.00 \$0.00		\$1,304,605.53 \$0.00					\$218,061.09	1.00									\$0.00	\$0.00)
37121 37121: Mitchell County 4 37123 37123: Montgomery County 3	\$10,502,285.71 \$2,228,544.11	\$10,502,285.71 \$0.00 \$2,228,544.11 \$0.00			\$5	6,289.41 \$0.0	0		\$393,694.86 \$.00	\$1,834,849.25 \$0.00	\$0.00 \$0	0.00	\$0.00	\$0.00			\$0.00 \$0.0	\$10,445,996.30	\$0.00	
37125 37125: Moore County 2	\$7,446,513.75	\$4,558,624.53 \$2,887,889.22							\$830,837.96 \$559,61		\$3,727,786.57 \$2,328,275.09	φυ.υυ φι	0.00								
37127 37127: Nash County 3 37129 37129: New Hanover County 6	\$5,920,129.11 \$81,051,810.85	\$5,479,945.11 \$440,184.00 \$77,606,425.11 \$3,445,385.74		\$4,383,707.90 \$52,500.00 \$1,613,558.51 \$0.00					\$1,096,237.21 \$387,68 \$3,752,068.44 \$.00	\$62,421,332.92 \$2,578,079.74		\$1,891,111.26 \$867	7,306.00		\$7,928,353.98 \$0.00			\$0.00	\$0.00	\$0.00 \$0.00
37131 37131: Northampton County 2	\$261,643.13	\$261,643.13 \$0.00	¢204 540 07	\$211,755.62 \$0.00					\$49,887.51	.00											
37133 37133: Onslow County 7 37135 37135: Orange County 3	\$68,078,905.64 \$3,793,114.48	\$66,173,453.04 \$1,905,452.60 \$2,313,742.80 \$1,479,371.68	\$384,542.07 \$0.00	\$3,119,259.92 \$0.00				\$966,574.35 \$905,407.83		.00	\$50,801,678.02 \$1,905,452.60 \$1,219,152.36 \$573,963.85	\$128,016.09 \$0	\$3,976,320.47 0.00	\$0.00		\$1,404,258.49 \$0.00					\$0.00 \$0.00
37137 37137: Pamlico County 5 37139 37139: Pasquotank County 3	\$32,814,371.51 \$1,868,621.08	\$16,402,098.25 \$16,412,273.26 \$1,133,802.58 \$734,818.50		\$2,284,590.03 \$6,320,748.66 \$482,677.75 \$0.00					\$70,870.79 \$ \$343,446.96 \$734,81	.50	\$13,834,148.31 \$8,272,441.35		\$178,638.39 \$1,819 \$307,677.87	9,083.25		\$33,850.73 \$0.00					
37141 37141: Pender County 7	\$90,042,151.60	\$72,463,674.87 \$17,578,476.73	\$43,507.52 \$0.00	\$5,922,546.65 \$0.00					\$9,511,717.80 \$3,112,20	.74	\$52,428,015.41 \$13,772,519.40		\$2,734,626.12 \$693	3,751.59 \$0.00		\$1,823,261.37 \$0.00					
37143 37143: Perquimans County 5 37145 37145: Person County 3	\$578,698.15 \$103,284.77	\$578,698.15 \$0.00 \$103,284.77 \$0.00		\$314,000.38 \$0.00				\$43,724.92 \$0.00		.00	\$0.00 \$0.00	\$59,559.85	\$134,718.68 0.00	\$0.00 \$0.00	\$0.00	\$15,132.98 \$0.00					
37147 37147: Pitt County 6 37149 37149: Polk County 4	\$15,549,522.05 \$134,606.59	\$11,652,182.46 \$3,897,339.59 \$134,606.59 \$0.00	\$144,864.25 \$58,125.00	\$6,064,447.63 \$383,509.43		2,291.35 \$0.0	0		\$2,806,244.31 \$481,65	.16	\$1,619,885.59 \$2,974,050.00 \$0.00 \$0.00		\$396,523.62	\$0.00	\$0.00	\$620,217.06 \$0.00			\$112,315.24	\$0.00	
37151 37151: Randolph County 5	\$3,935,705.96	\$3,700,404.50 \$235,301.46			\$2	_,_01.00 φυ.0		\$941,688.71 \$0.00		0.00	\$1,587,245.23 \$235,301.46	\$1,006,320.54	0.00	\$51,987.82					Ψ112,013.24	ψ0.00	
37153 37153: Richmond County 2 37155 37155: Robeson County 5	\$571,199.05 \$60,923,902.55	\$571,199.05 \$0.00 \$38,806,072.40 \$22,117,830.15	\$379,041.48 \$0.00						\$125,896.23 \$ \$26,078,836.82 \$14,292,95	.63	\$445,302.82 \$0.00 \$12,209,830.06 \$7,824,870.52		\$138,364.04	\$0.00			\$0.00 \$0.00				
37157 37157: Rockingham County 2	\$322,718.52	\$322,718.52 \$0.00								\$0.00 \$0	0.00	\$322,718.52	0.00						00.00	00.00	
37159 37159: Rowan County 3 37161 37161: Rutherford County 4	\$923,754.67 \$1,127,460.11	\$923,754.67 \$0.00 \$1,127,460.11 \$0.00			\$3	3,994.99 \$0.0	0 \$2,350.41	\$0.00			\$923,754.67 \$0.00			\$551,180.86	\$0.00		\$0.00 \$0.00		\$0.00 \$539,933.85		
37163 37163: Sampson County 6 37165 37165: Scotland County 2	\$7,616,802.81 \$11,659,855.43	\$5,998,787.62 \$1,618,015.19 \$11,659,855.43 \$0.00	\$53,162.88 \$0.00	\$108,191.78 \$0.00					\$1,635,686.50 \$112,28 \$1,022,111.57 \$.00	\$4,086,466.39 \$1,505,734.50 \$10,637,743.86 \$0.00		\$115,280.07	\$0.00			\$0.00 \$0.00				
37167 37167: Stanly County 3	\$773,885.62	\$773,885.62 \$0.00							,,,,,		\$552,697.48 \$0.00			\$221,188.14					\$0.00	\$0.00	
37169 37169: Stokes County 4 37171 37171: Surry County 3	\$56,697.75 \$492,828.31	\$56,697.75 \$0.00 \$492,828.31 \$0.00											0.00	\$0.00 \$270,617.18			\$0.00 \$0.00		\$0.00	\$0.00	\$0.00 \$0.00
37173 37173: Swain County 2	\$88,388.52	\$88,388.52 \$0.00												\$88,388.52				762 264 06	\$0.00	\$0.00	
37175 37175: Transylvania County 2 37177 37177: Tyrrell County 5	\$912,952.81 \$1,772,580.62	\$912,952.81 \$0.00 \$1,698,564.12 \$74,016.50	\$0.00 \$0.00	\$746,638.34 \$59,969.00					\$139,466.97 \$14,04	.50	\$19,889.91 \$0.00		\$792,568.90	\$0.00			\$	763,364.96 \$0.0	\$149,587.85	\$0.00	
37179 37179: Union County 2 37181 37181: Vance County 2	\$1,277,269.60 \$90,570.96	\$1,277,269.60 \$0.00 \$90,570.96 \$0.00		\$31,038.63 \$0.00							\$1,277,269.60 \$0.00		0.00						\$0.00	\$0.00	
37183 37183: Wake County 8	\$27,093,754.79	\$26,224,788.79 \$868,966.00	\$5,984,099.04 \$868,966.00	\$1,491,934.03 \$0.00						0.00	\$9,405,950.01 \$0.00		0.00 \$550,800.13	\$0.00		\$283,201.52 \$0.00		\$48,481.03 \$0.0	00		
37185 37185: Warren County 2 37187 37187: Washington County 3	\$11,082.72 \$1,150,562.94	\$11,082.72 \$0.00 \$601,704.73 \$548,858.21		\$11,082.72 \$0.00 \$340,901.51 \$70,896.71						.00			\$112,557.09 \$477	7,961.50							
37189 37189: Watauga County 4	\$7,122,437.36	\$6,937,850.36 \$184,587.00			\$37	9,743.84 \$0.0	0 \$0.00 \$184,5	87.00			AF 470 470 0						\$	104,263.34 \$0.0	\$6,453,843.18	\$0.00	
37191 37191: Wayne County 5 37193 37193: Wilkes County 3	\$20,577,251.31 \$22,230.00	\$13,413,777.41 \$7,163,473.90 \$22,230.00 \$0.00		\$1,083,474.98 \$0.00			\$22,230.00	\$0.00	\$6,995,684.68 \$6,624,18	00	\$5,170,170.36 \$539,289.40		\$164,447.39	\$0.00 \$0.00	\$0.00		\$0.00 \$0.00		\$0.00	\$0.00	
37195 37195: Wilson County 5	\$5,740,924.50	\$5,147,979.50 \$592,945.00	\$442,838.47 \$0.00	\$1,634,718.85 \$0.00					\$2,507,940.62 \$592,94	.00	\$553,706.56 \$0.00	\$4,004,40	0.00	A7.050.00	00.00		\$8,775.00 \$0.00				
37197 37197: Yadkin County 4 37199 37199: Yancey County 5	\$603,677.29 \$4,898,852.07	\$603,677.29 \$0.00 \$4,898,852.07 \$0.00			\$1	4,367.61 \$0.0	0				\$710,554.37 \$0.00	\$4,004.49	0.00	\$7,650.00 \$0.00			\$592,022.80 \$0.00 \$1,	010,298.84 \$0.0	\$0.00 \$3,163,631.25		
Fotal Total 17	\$2,059,139,603.51	\$1,846,429,811.98 \$212,709,791.53	\$19,065,881.07 \$1,249,699.20	\$87,544,413.46 \$12,057,457.39	\$4,212,154.14 \$0.00 \$10,45	0,593.04 \$152,083.0	0 \$8,328,562.26 \$283,9	09.58 \$40,860,929.64 \$1,670,144.66	6 \$315,691,112.58 \$69,408,46	.83 \$0.00 \$0	0.00 \$795,658,417.83 \$104,313,414.47	\$18,878,059.88 \$330,675	5.28 \$63,751,647.23 \$12,912	2,305.50 \$14,029,444.08	\$209,788.75	\$30,932,649.15 \$745,090.80	\$37,885,936.53 \$102,176.00 \$35,	218,017.02 \$2,002,925.9	95 \$363,921,994.07	\$7,271,659.12	\$0.00 \$0.00

APPENDIX

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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 decisionmaking 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.

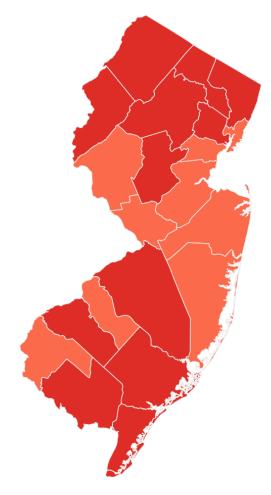


GEOGRAPHIC MAP. SOURCE: ESRI WORLD IMAGERY BASEMAP

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,



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

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."

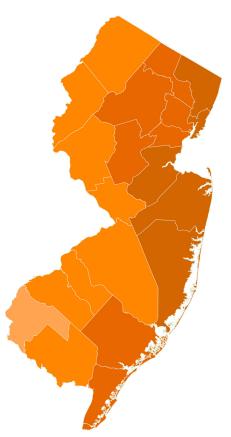
Importantly, extreme heat waves do not fit the criteria for federal disaster declarations despite being the leading cause of deaths among climate hazards. Likewise, sea level rise is not included in this definition despite the threat it poses to numerous communities, including damage to property, loss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

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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 15 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:

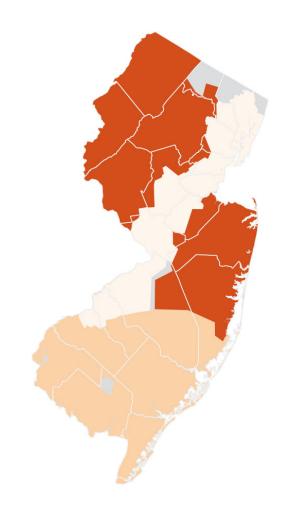
- Socioeconomic Status (below poverty, unemployed, income, no high school diploma);
- Household Composition & Disability (aged 65 or older, aged 17 or younger, older than age 5 with a disability, single-parent households);
- Minority Status & Language (minority, speak English "less than well"); and
-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

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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):

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

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.

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