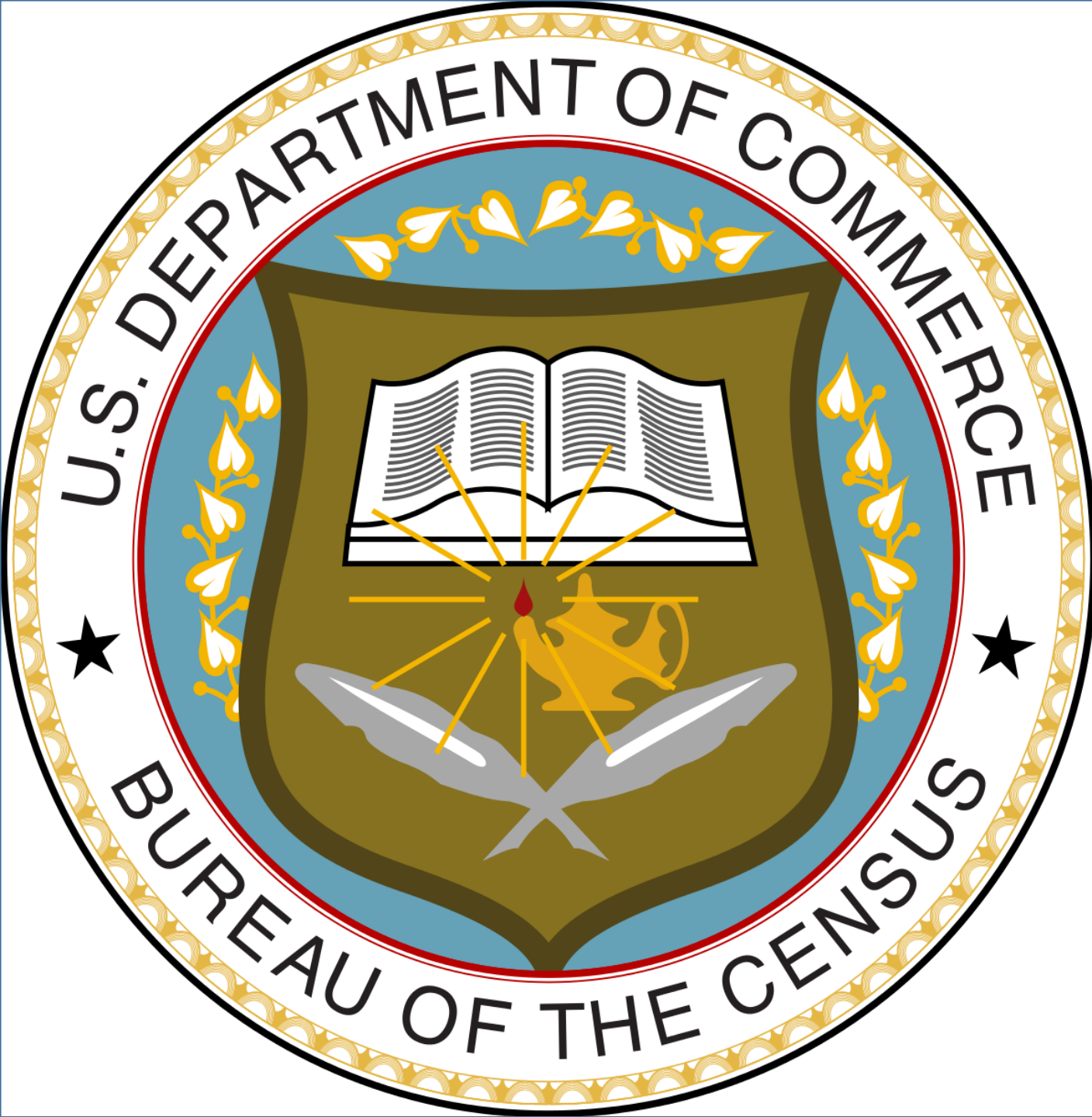


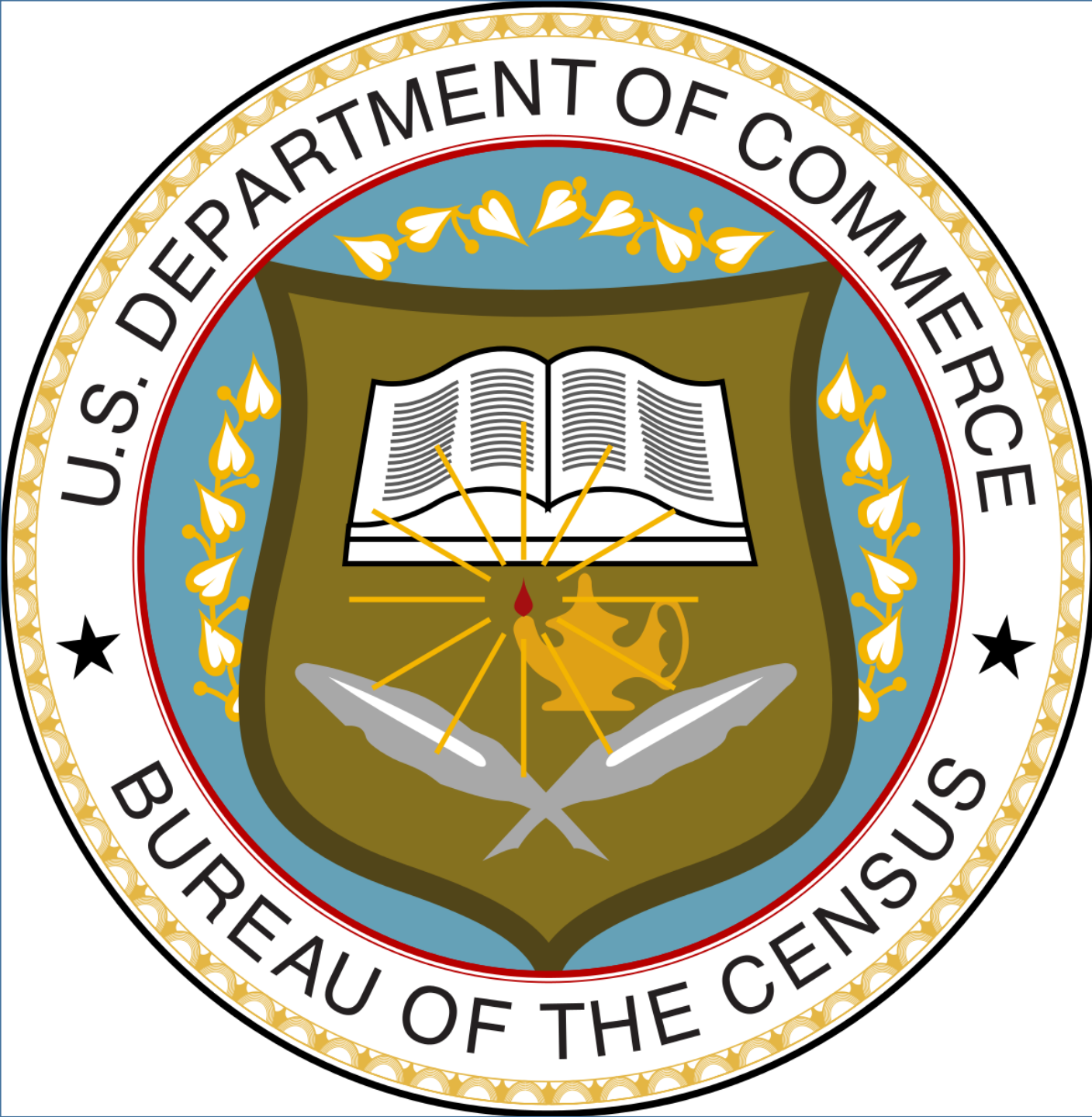
# Statistics for Resiliency

Ron Jarmin  
U.S. Census Bureau

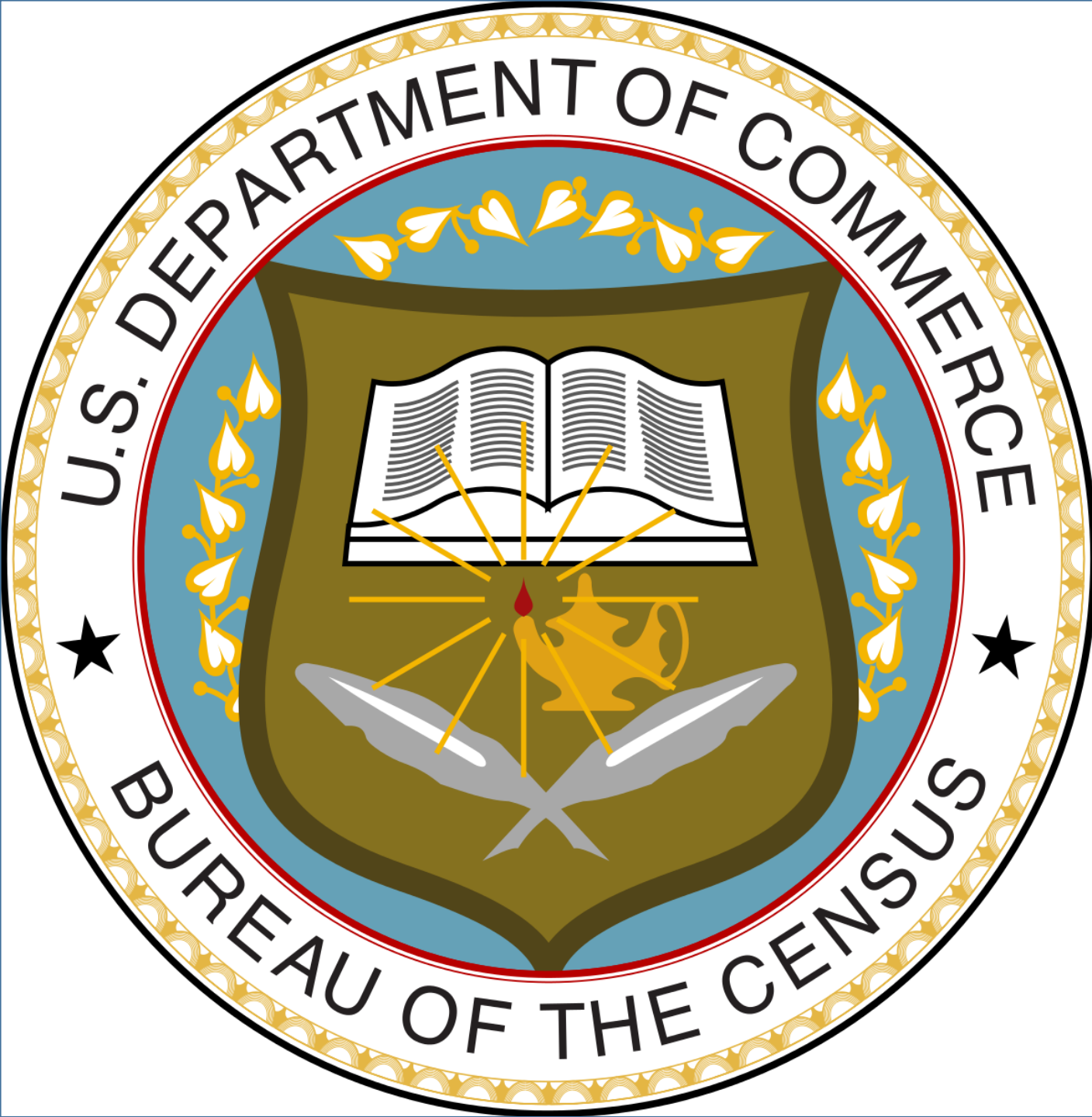
Natural Disasters Expo  
March 2, 2023



The federal  
government's largest  
statistical agency



We conduct more than 100 censuses and surveys each year, including:

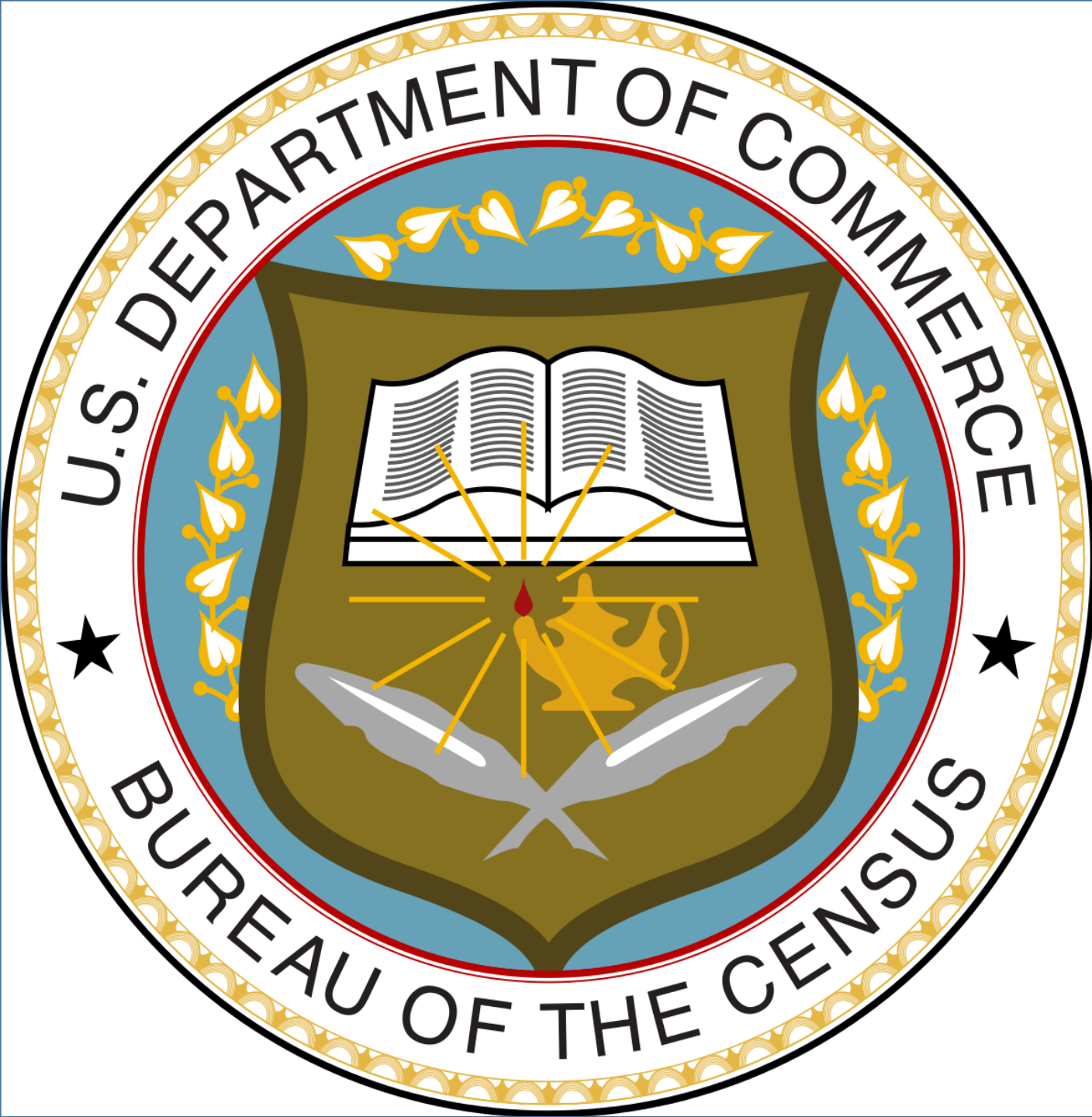


**The Decennial Census** – the once-a-decade population and housing count of all 50 states and U.S. territories

**The Economic Census** – the once-a-five-year measure of American businesses

**The American Community Survey** – the ongoing, annual survey of the social, economic, housing, and demographic characteristics of the nation's population





**Our mission is to  
serve as the  
nation's leading  
provider of  
quality data  
about its people  
and economy**



**Climate**



Disaster



Climate





Disaster



Climate



Resilience



**What is  
Resilience?**

## **What is Resilience?**

Community resilience is a measure of the capacity of individuals and households within a community to absorb, endure and recover from the external stresses of the impacts of a disaster.

Research shows that resilience can be predicted by individual and household characteristics.

# The Need for the Community Resilience Estimates

COVID-19 pandemic presented the need for timely, accurate, and customizable information about the population.

Many groups reached out to the Census Bureau for data.





# Why Should the Census Bureau Measure Resilience?



# The Census Bureau's Capability

- The Census Bureau serves as the nation's leading provider of quality data about its people and economy.
  - This makes the Bureau well positioned to provide the most accurate and timely measures for an individually focused community resilience indicator.
- We can adapt the estimates as needed to incorporate the latest and most relevant data.
- Invite collaboration with academics and federal agencies.



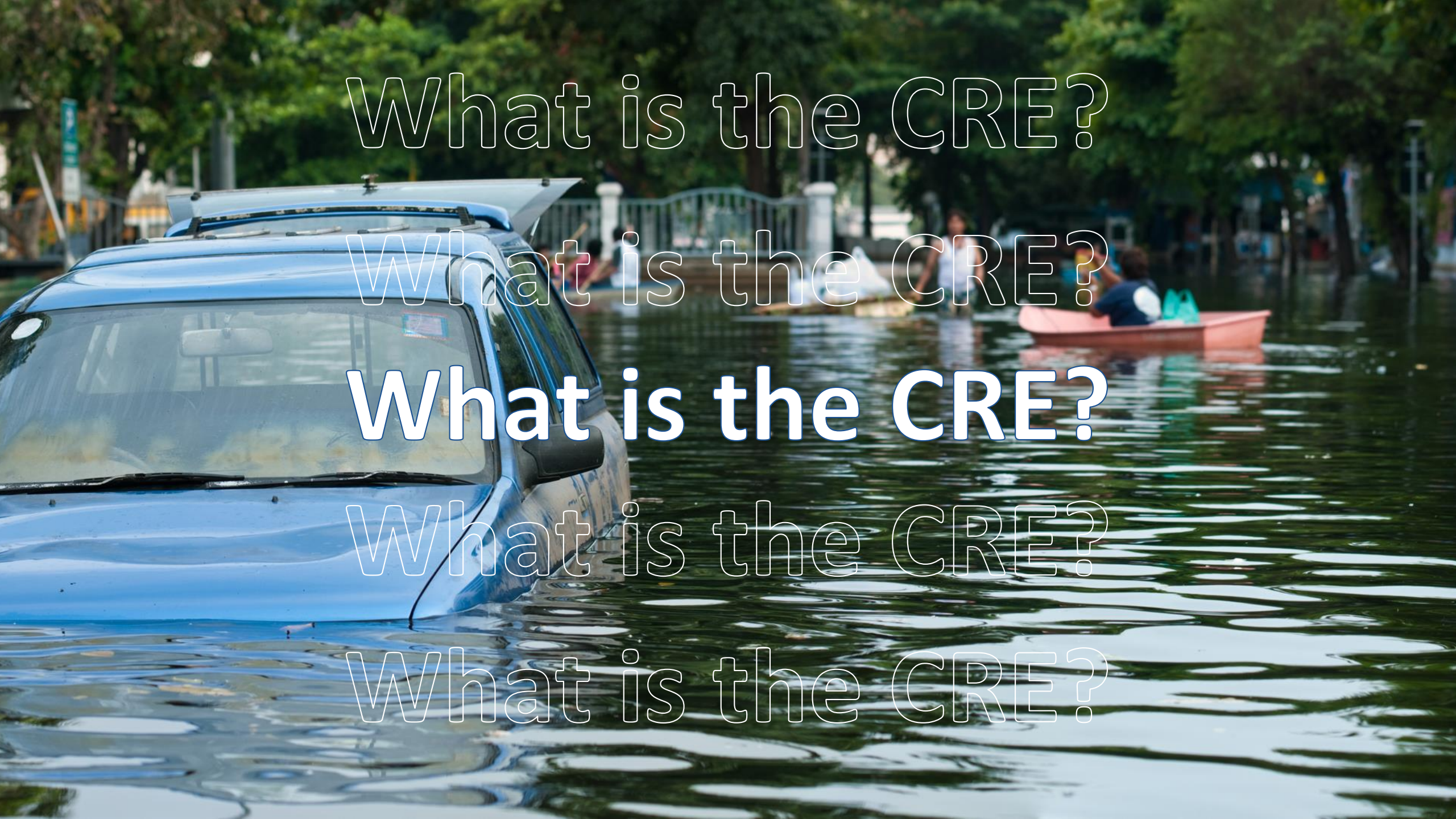
What is the CRE?

What is the CRE?

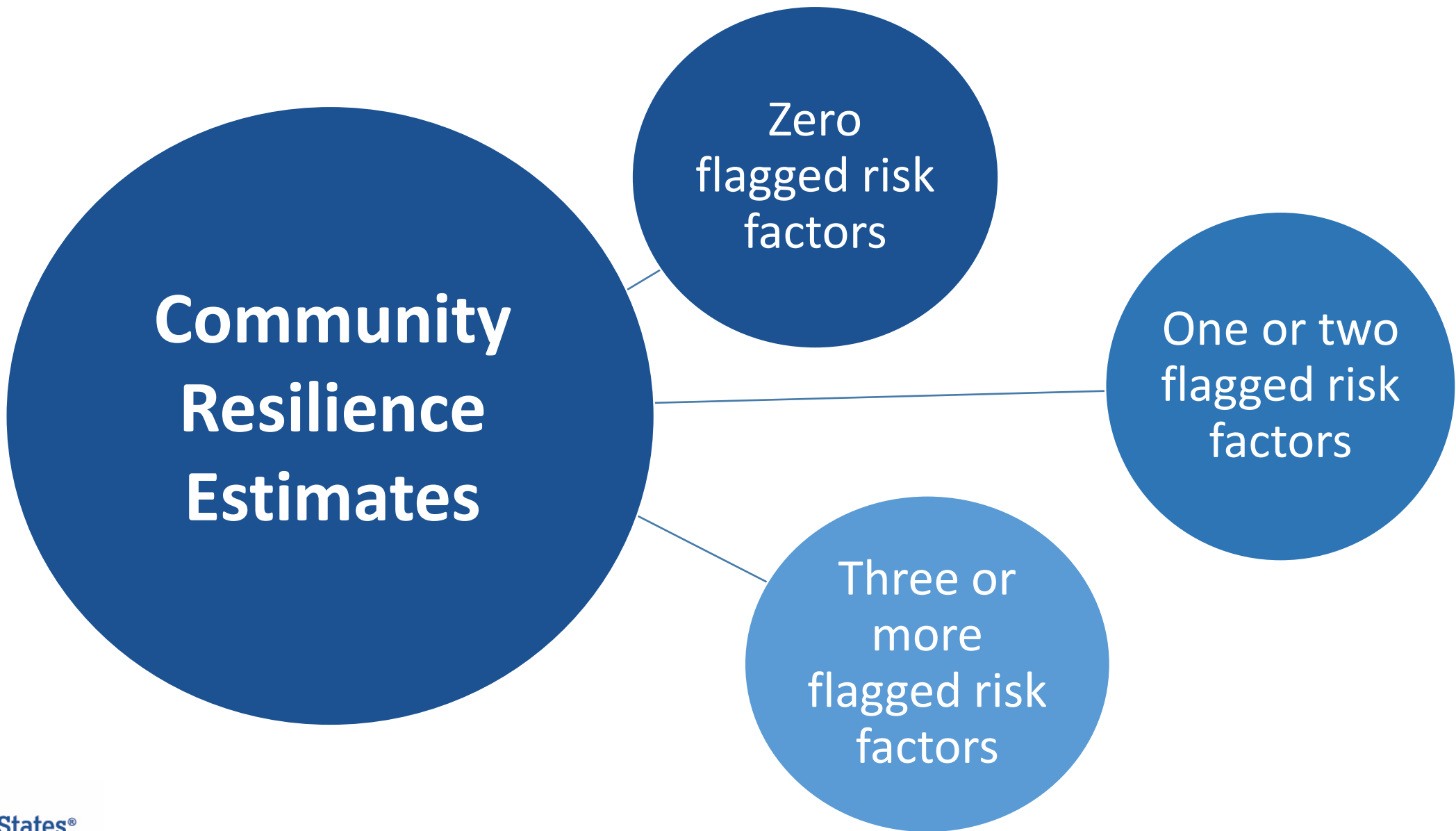
**What is the CRE?**

What is the CRE?

What is the CRE?









# Individual Risk Flags





Community resilience is the capacity of individuals and households to absorb, endure, and recover from the health, social, and economic impacts of a disaster such as a hurricane or pandemic.

When disasters occur, recovery depends on the community's ability to withstand the effects of the event. In order to facilitate disaster preparedness, the Census Bureau has developed new small area estimates, identifying communities where resources and information may effectively mitigate the impact of disasters.

Variation in individual and household characteristics are determining factors in the differential impact of a disaster. Some groups are less likely to have the capacity and resources to overcome the obstacles presented during a hazardous event. Resilience estimates can aid stakeholders and public health officials in modeling these differential impacts and developing plans to reduce a disaster's potential effects.

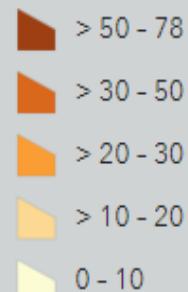
Individual and household characteristics from the 2018 American Community Survey (ACS) were modeled, in combination with publicly-available data from the 2018 National Health Interview Survey (NHIS), to provide tract and county level estimates.

More information on Census Bureau

### Thematic Risk Factor (RF) based on the risk factor selected above

Thematic Risk Factor (Counties)

Percentage of Residents



Esri, FAO, NOAA

Thematic Risk map

Predominant Risk map

Thematic Risk w/Pop map

COVID-19 Impact Report

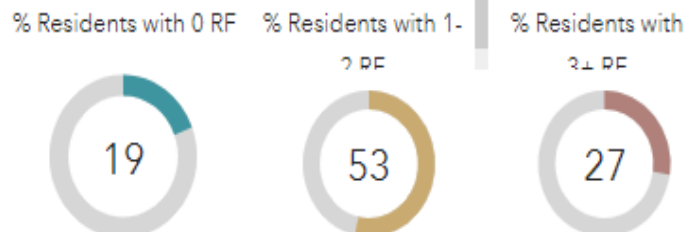
#### State Profile (based on county average)



Percentage of Residents

Number of Residents

#### County Profile (based on tract average)



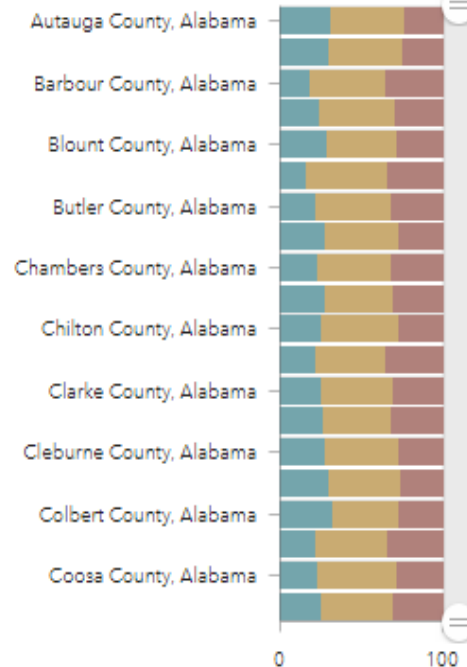
Percentage of Residents

Number of Residents

### County Comparison

Top 20 sorted by percentage of residents with 3+

\*click on a bar to see the location on the map, click again to turn off the selection



County Comparison

Tract Comparison



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
oid	state	county	tract	stname	stabrev	ctname	geo_level	popuni	prednum_	prednum_	predrt_0	predrt_0_	prednum_	prednum_	predrt_12	predrt_12	prednum_	prednum_	predrt_3	predrt_3_moe
1	1			Alabama	AL		State	4807130	1328762	65290.87	27.64	1.36	2192123	75799.27	45.6	1.58	1286245	66020.89	26.76	1.37
1001	1	1		Alabama	AL	Autauga C	County	55420	17545	4022.9	31.66	7.26	24796	4320.5	44.74	7.8	13079	3606.6	23.6	6.51
1E+09	1	1	20100	Alabama	AL	Autauga C	Tract	1921	495	170.7	25.77	8.89	902	188.6	46.95	9.82	524	163	27.28	8.49
1E+09	1	1	20200	Alabama	AL	Autauga C	Tract	2130	779	213.4	36.57	10.02	899	231.8	42.21	10.88	452	195.2	21.22	9.16
1E+09	1	1	20300	Alabama	AL	Autauga C	Tract	3467	1237	328.9	35.68	9.49	1454	343.8	41.94	9.92	776	280.4	22.38	8.09
1E+09	1	1	20400	Alabama	AL	Autauga C	Tract	4522	1632	407.8	36.09	9.02	1642	428.9	36.31	9.48	1248	374.9	27.6	8.29
1E+09	1	1	20500	Alabama	AL	Autauga C	Tract	10844	4023	1021	37.1	9.42	4722	1053	43.54	9.71	2099	822.1	19.36	7.58
1E+09	1	1	20600	Alabama	AL	Autauga C	Tract	3763	1061	334.2	28.2	8.88	1647	375.6	43.77	9.98	1055	329.7	28.04	8.76
1E+09	1	1	20700	Alabama	AL	Autauga C	Tract	2953	702	281.2	23.77	9.52	1442	293	48.83	9.92	809	235.3	27.4	7.97
1E+09	1	1	20801	Alabama	AL	Autauga C	Tract	3083	887	305.5	28.77	9.91	1318	335.3	42.75	10.88	878	288.3	28.48	9.35
1E+09	1	1	20802	Alabama	AL	Autauga C	Tract	10461	3335	953.9	31.88	9.12	5044	1047	48.22	10.01	2082	892.6	19.9	8.53
1E+09	1	1	20900	Alabama	AL	Autauga C	Tract	5697	1688	501.4	29.63	8.8	2871	550.9	50.39	9.67	1138	473.9	19.98	8.32
1E+09	1	1	21000	Alabama	AL	Autauga C	Tract	2960	787	269.3	26.59	9.1	1386	301.2	46.82	10.18	787	265.5	26.59	8.97
1E+09	1	1	21100	Alabama	AL	Autauga C	Tract	3619	919	295.1	25.39	8.15	1469	355	40.59	9.81	1231	332.1	34.01	9.18
1003	1	3		Alabama	AL	Baldwin C	County	216666	64652	12923.3	29.84	5.96	98449	14098.3	45.44	6.51	53565	12300.2	24.72	5.68
1E+09	1	3	10100	Alabama	AL	Baldwin C	Tract	4479	1146	398.8	25.59	8.9	2042	451.3	45.59	10.08	1291	409.2	28.82	9.14
1E+09	1	3	10200	Alabama	AL	Baldwin C	Tract	3433	1214	335.1	35.36	9.76	1424	369.4	41.48	10.76	795	321.1	23.16	9.35
1E+09	1	3	10300	Alabama	AL	Baldwin C	Tract	8772	3041	736.2	34.67	8.39	4046	822	46.12	9.37	1685	734.7	19.21	8.38
1E+09	1	3	10400	Alabama	AL	Baldwin C	Tract	5593	1577	490.2	28.2	8.76	2899	535.8	51.83	9.58	1117	461.3	19.97	8.25
1E+09	1	3	10500	Alabama	AL	Baldwin C	Tract	5205	1226	441.7	23.55	8.49	2566	500.4	49.3	9.61	1413	460.7	27.15	8.85
1E+09	1	3	10600	Alabama	AL	Baldwin C	Tract	3836	801	339.1	20.88	8.84	2027	397.5	52.84	10.36	1008	354.8	26.28	9.25
1E+09	1	3	10701	Alabama	AL	Baldwin C	Tract	9446	3117	791.5	33	8.38	4601	820	48.71	8.68	1728	677.7	18.29	7.17
1E+09	1	3	10703	Alabama	AL	Baldwin C	Tract	15518	5678	1275	36.59	8.22	7735	1300	49.85	8.38	2105	973.5	13.56	6.27
1E+09	1	3	10704	Alabama	AL	Baldwin C	Tract	6022	2137	568.1	35.49	9.43	2879	584.8	47.81	9.71	1006	460.6	16.71	7.65
1E+09										839	39.76	8.46	3782	868	38.13	8.75	2193	692.1	22.11	6.98
1E+09										711.8	31.53	8.73	3929	756.9	48.16	9.28	1657	663.4	20.31	8.13
1E+09										427.4	28.64	7.78	2626	472	47.79	8.59	1295	408.6	23.57	7.44
1E+09										702	27.01	8.66	3782	770.2	46.67	9.51	2132	671.3	26.31	8.28
1E+09										783.1	36.1	8.29	3938	861.4	41.66	9.11	2102	741.5	22.24	7.84
1E+09										412.1	30.08	8.13	2157	456.3	42.54	9	1388	406.1	27.38	8.01
1E+09										410.7	23.21	7.98	2373	461.4	46.13	8.97	1577	415	30.66	8.07
1E+09										830.2	30.92	8.2	3763	870.9	37.18	8.61	3228	751.1	31.9	7.42
1E+09										370.9	35.77	8.43	2025	407.4	46.02	9.26	801	353.9	18.2	8.04
1E+09	1	3	11201	Alabama	AL	Baldwin C	Tract	5191	1684	451.8	32.44	8.7	2030	521.9	39.11	10.05	1477	500	28.45	9.63
1E+09	1	3	11202	Alabama	AL	Baldwin C	Tract	6230	1708	540.3	27.42	8.67	2506	632.5	40.22	10.15	2016	600.6	32.36	9.64

CSV File Download

# Benefits of Using the CRE

To identify most at-risk populations for equitable distribution of the resources, use the CRE.

**Timeliest, most statistically accurate, and granular measure of vulnerability**

**Small area methodologies are proven**

**The CRE advances the years of work on the SVI and SoVI**



# Other Census Bureau Data Products





Step 1: Select State  
Florida

Step 2: Select County  
Lee County, Florida

**To set the Community Context (right panel):**  
"Select a State" in Step 1 or Draw a Region in the Map Using the select tool  
The right panel will update to reflect your chosen state or region.

**To generate County Profile (tabs):**

**Responsive Legend**  
Census Datasets (states, counties, census tracts)

**Predominant Risk Factor -Tracts (CRE 2019)**

Predominant category

- Estimated population with 3+ risk factors
- Estimated population with 1-2 risk factors

**Reference Layer Legend**  
(Overlays from other data sources)

Active Hurricanes, Cyclones and Typhoons (Source: NOAA)

Forecast Position

Classify by Wind Speed

Category 5

**Interactive Map: Explore Census Bureau and Emergency Response Reference Datasets**

Select Thematic & Reference Layers to view by clicking Layers icon in map then turning layers on & off | Expand the map by clicking in the upper right corner

Zoom to Pan 1 of 2

**CRE 2019 - Census Tract 19.15, Lee County, Florida**

Census Tract 19.15, Lee County, Florida  
Total Population: 4,297

- % of Residents with 3+ RF : 54.76% (+/- 17.66%)
- # of Residents with 3+ RF : 2,353 (+/- 759)
- Estimated population within risk factor is **Higher** than the national estimate
- % of Residents with 1-2 RF : 42.36% (+/- 17.58%)
- # of Residents with 1-2 RF : 1,820 (+/- 759)

10 km 10 mi

University of South Florida, County of Lee, FL, FDEP, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS | NHC, JTWC, Esri

American Community Survey 2015-2019, Community Resilience Estimates Equity Supplement 2019, County Business Patterns 2020, & Nonemployer Statistics 2019

Community Context  
**Florida**

**Households 7.7M** **Population 20.9M**

**Community Resilience Estimates 2019**

**23.8%**  
est. Population with 3+ Risk Factors  
[Explore CRE Equity Supplement](#)

**ACS 2015-2019 5-Year Estimates Household Characteristics**

**Below Poverty: 1.0M** or 13.3% of Households  
**1+ Disability: 2M** or 25.9% of Households

**Without Vehicle: 489.2k** or 6.3% of Households  
**With Broadband: 1.3M** or 83.0% of Households

[View Florida DP02, DP04, B22010, B17017 data at data.census.gov for MoE & more](#) | [MOE Methodology](#)

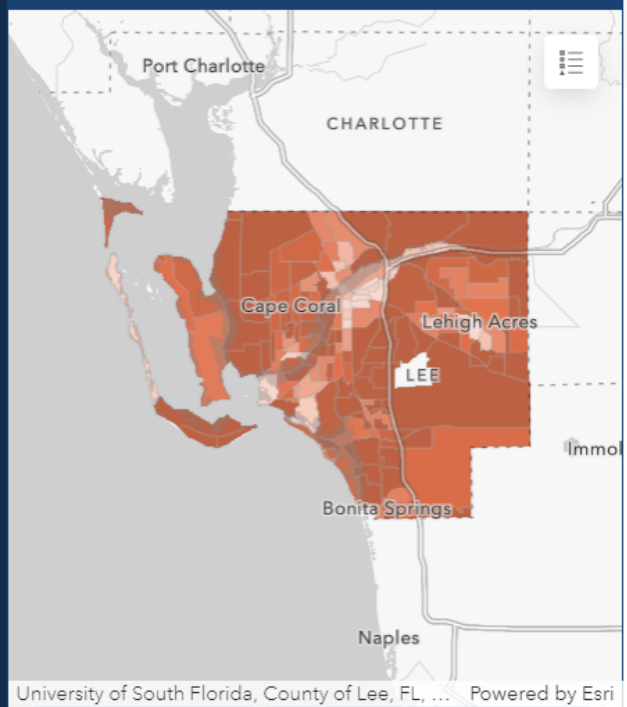
Step 1: Select State  
Florida

Step 2: Select County  
Lee County, Florida

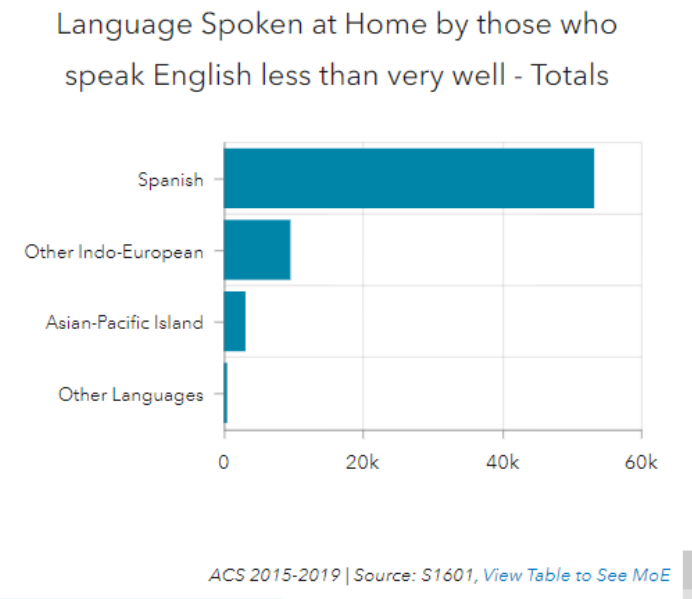
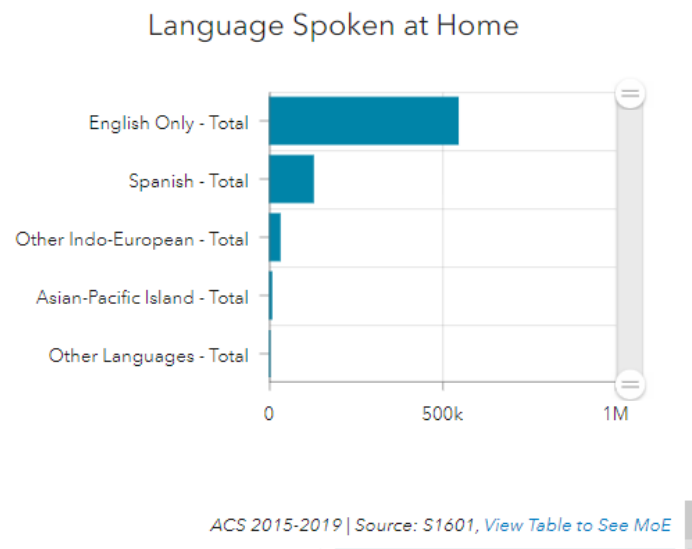
Social Characteristics Data: Lee, Florida

This page is to indicate the social characteristics data of the selected county. Please start with "Step 1: Select State" and "Step 2: Select County" at the top-right corner, and then explore the county data and census tract information in

Broadband Internet Subscription %, 2015-2019 ACS Census Tract



Households with 1+ Disability <b>70,198</b> or 25.4% of Households (+/- 0.5%) <small>(+/- 1,590) Households ACS 2015-2019</small>	Households with 65+ Living Alone <b>42,397</b> or 15.4% of Households (+/- 0.5%) <small>(+/- 1,310) Households ACS 2015-2019</small>	Households Without a Vehicle: <b>13,211</b> or 4.8% of Households (+/- 0.3%) <small>(+/- 945) Households ACS 2015-2019</small>	Households with Broadband <b>235,165</b> or 85.2% of Households (+/- 0.5%) <small>(+/- 2,518) Households ACS 2015-2019</small>
--------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------



Community Context: Florida

Households **7.7M** Population **20.9M**

Community Resilience Estimates 2019  
**23.8%**  
est. Population with 3+ Risk Factors  
[Explore CRE Equity Supplement](#)

ACS 2015-2019 5-Year Estimates Household Characteristics

Below Poverty: <b>1.0M</b> or 13.3% of Households	1+ Disability: <b>2M</b> or 25.9% of Households
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[View Florida DP02, DP04, B22010, B17017 data at data.census.gov for MoE & more](#) | [MOE Methodology](#)

**Search:**  Filter ▾

**Update (September 15, 2021):** [Click here to read about application changes related to the COVID-19 Pandemic](#)

## Events as of 02/27/2023

### Wildfires

Southwick Wma-G10,11,12,18,19\_Dfg-Rx Fire

Zip 01077

Affected Population: 188

Rocky Branch Fire

Zip 65542

Affected Population: 9

Bratton Fire

Zip 74126

Affected Population: 0

Dumb Betty Branch Fire

No data

Affected Population: 0

Southwick Wma-G1-5-E1-5-Dfg-Rx Fire

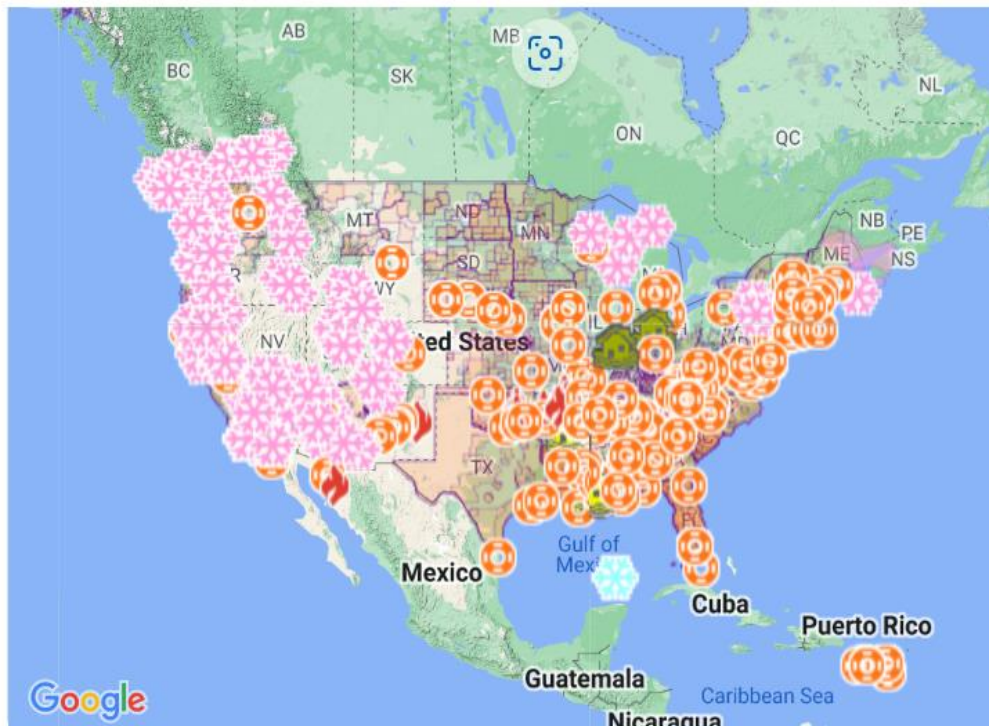
No data

Affected Population: 0

Rockin T Fire

No data

Affected Population: 0



- Tropical Storms
  -  Current Wind Radii
  -  Wind History (Cumulative Swath)
  -  Forecast Area (Cone of Uncertainty)
- Wildfires
  -  Perimeter
- Floods
  -  Likely
  -  Occurring or Imminent
- Winter Weather
  -  Forecasted Snowfall
  -  Forecasted Freezing Rain
- Disaster Declaration Areas
  -  Emergency or Disaster Declaration
  - COVID-19 Pandemic
  -  Emergency or Disaster Declaration

**Basemap:** Terrain ▾

Custom Industries  
All Sectors

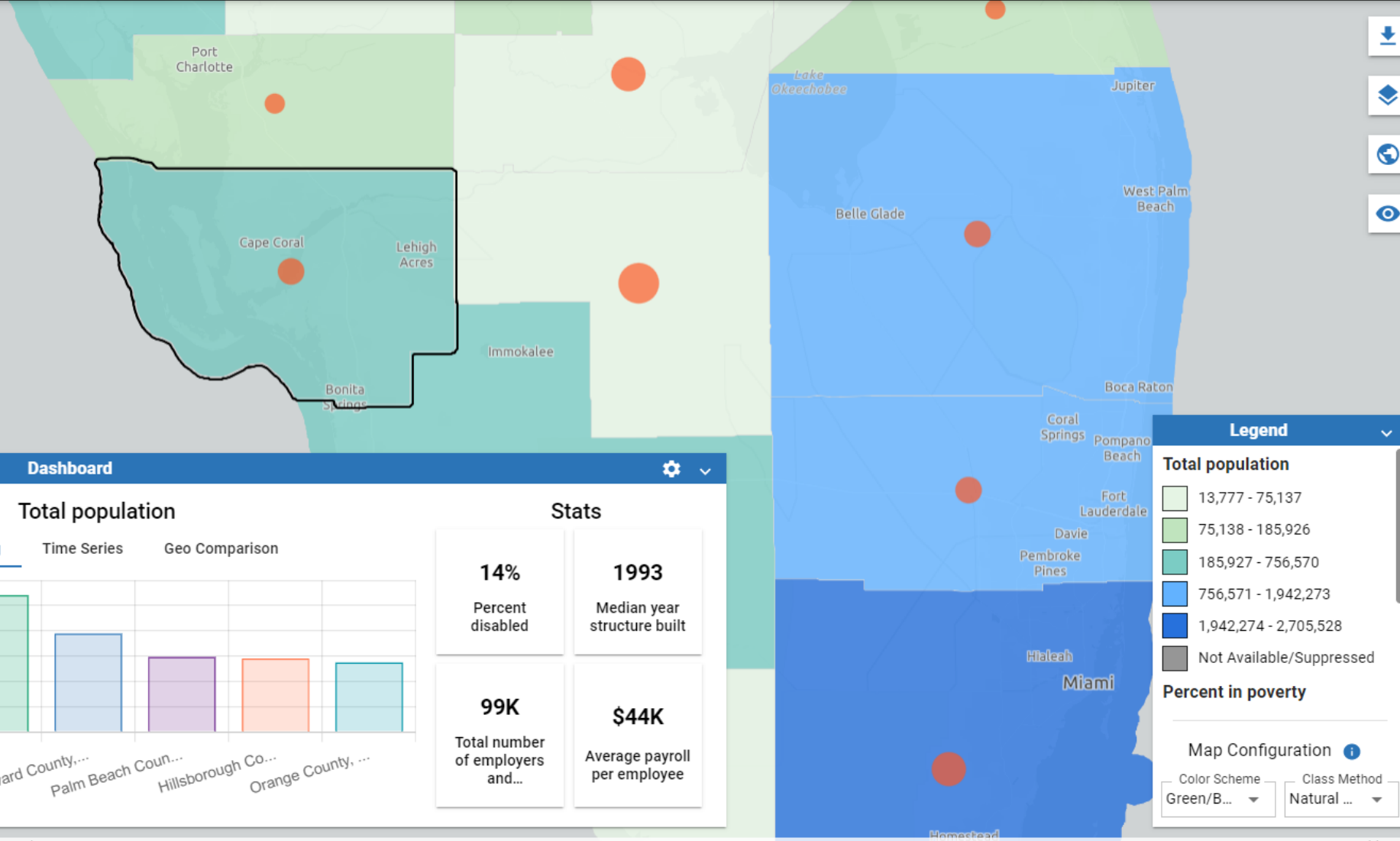
1 Total population

2 Percent in poverty

0 filters

Location Search  
Lee County, Florida

State Metro **County** City/Town ZIP Code Tract



Region View

### Dashboard

#### Lee County, Florida

**756,570** ± n/a  
Total population

**11.8%** ± 0.7%  
Percent in poverty

[CREATE REPORT](#)

#### Total population

Geo Ranking | Time Series | Geo Comparison

County	Total Population
Lee County, Florida	756,570
Miami-Dade County	~2.7M
Broward County	~1.9M
Palm Beach County	~1.4M
Hillsborough County	~1.3M
Orange County	~1.2M

#### Stats

**14%**  
Percent disabled

**1993**  
Median year structure built

**99K**  
Total number of employers and...

**\$44K**  
Average payroll per employee

#### Legend

##### Total population

- 13,777 - 75,137
- 75,138 - 185,926
- 185,927 - 756,570
- 756,571 - 1,942,273
- 1,942,274 - 2,705,528
- Not Available/Suppressed

##### Percent in poverty

Map Configuration

Color Scheme: Green/B...  
Class Method: Natural ...

University of South Florida, County of Collier, EDER, Esri, HERE, Garmin, SafeGraph, Esri, METI/NASA, USGS, EPA, NPS

Powered by Esri



### Sections

Contents

Consumers/Residents

Demographic Characteristics

**Socioeconomic Characteristics**

Housing Characteristics

Business Summary

Employer Businesses

Business Revenue

Nonemployer Businesses

Workforce

Quarterly Businesses

Building Permits

Business Comparison

Businesses Totals

Key Ratios

Employer Business Ownership

These data are subject to sampling and non-sampling errors. See [Methodology](#) on the ACS Home Page for more information.

## Socioeconomic Characteristics

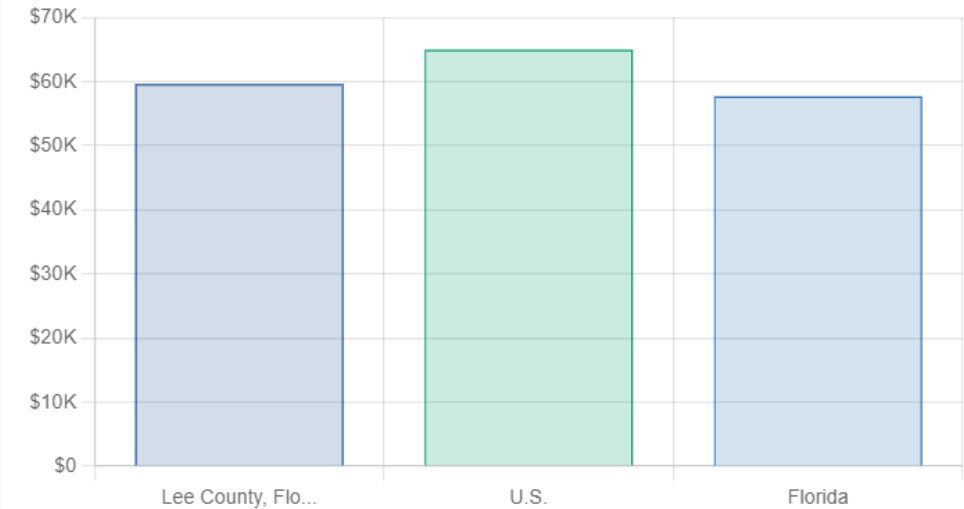
Includes information on social and economic characteristics from the 2011-2015 and the 2016-2020 American Community Survey 5-Year Estimates

Variable	Estimate	
Median household income	\$59,608	
Average income	\$84,303	
Percent high school degree or higher	89.3%	
Percent Bachelor's degree or higher	28.5%	
Average household size	2.58	
Percent in poverty	11.8%	
Percent population 16 years and over in labor force	53.3%	
Percent employed	50.6%	
Percent disabled	13.8%	
Percent with health coverage	86.6%	
Percent of all workers 16 and over who commute to work	92.5%	
Percent who work from home	7.5%	
Average travel time to work (mins)	27.6	
Percent with no vehicles available	5.0%	

Median household income

*Time Series data not available*

Median household income



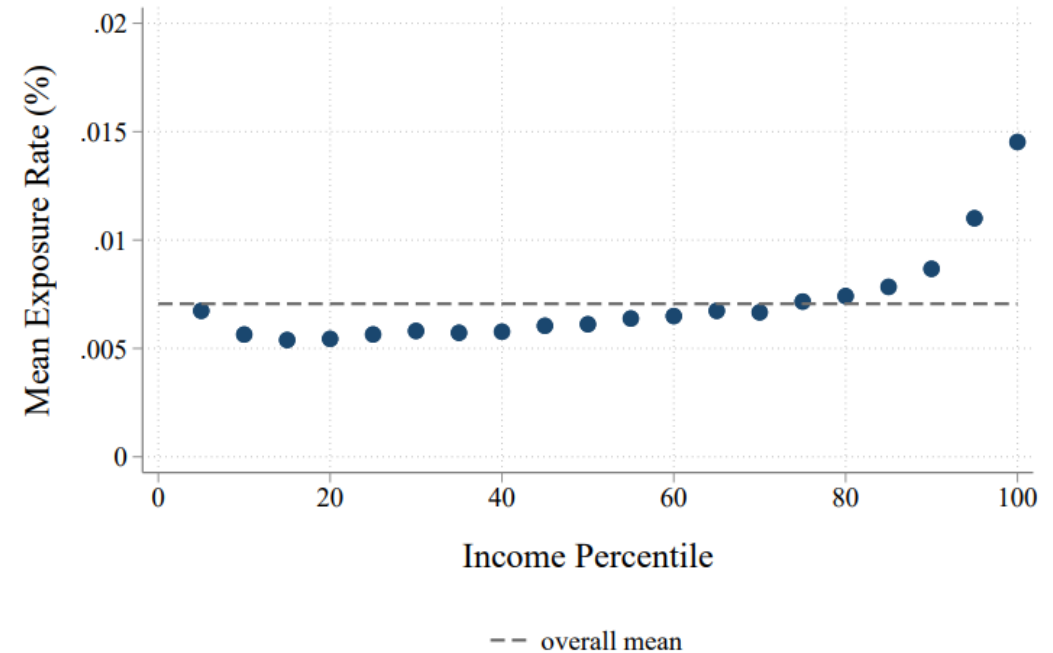
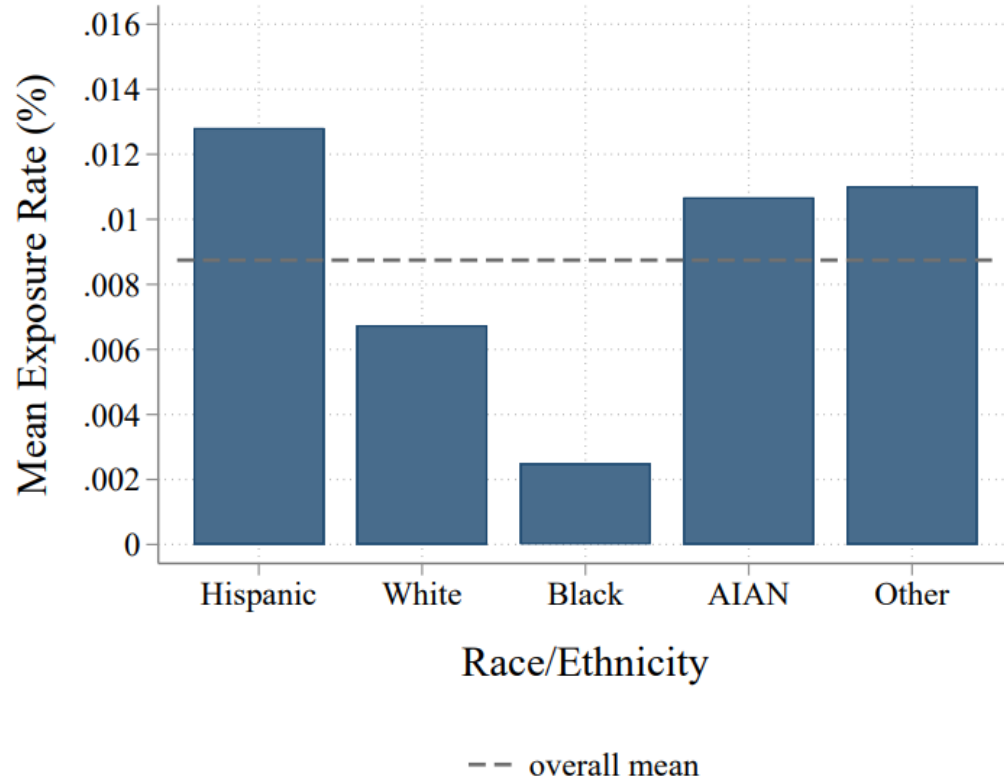
These data are subject to sampling and non-sampling errors. See [Methodology](#) on the ACS Home Page for more information.

# Research: Wildfires and Wildfire Smoke

## Wildfires and Wildfire Smoke

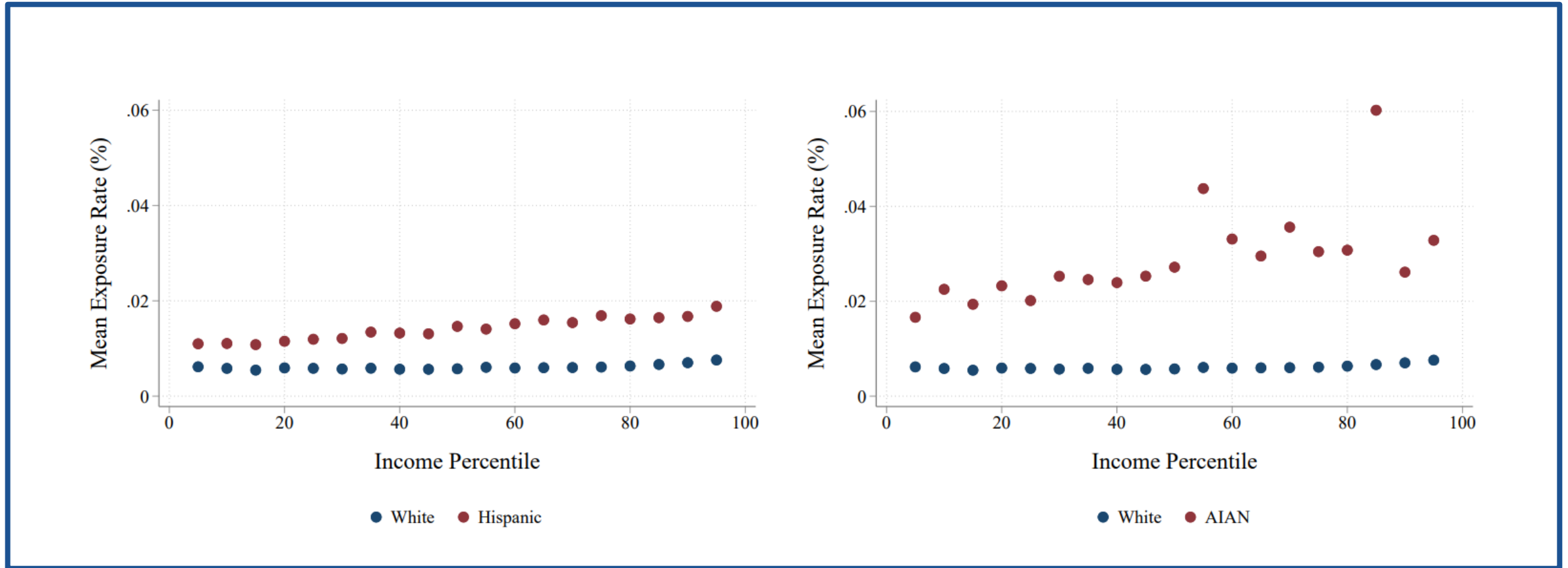


# Exposure to Wildfires by Race and Income





# Hispanic and AIAN Households are Disproportionately Exposed at all Incomes





A satellite image of a tropical cyclone over the Indian Ocean. The cyclone is a large, circular cloud system with a distinct eye in the center. The surrounding clouds are dense and spiral outwards. The landmasses of the Indian subcontinent and Southeast Asia are visible in the background. Overlaid on the image is the text "Research: Real Time Effects of Disasters" in a blue, outlined font, repeated twice.

# Research: Real Time Effects of Disasters

## Real Time Effects of Disasters



Thank You!

