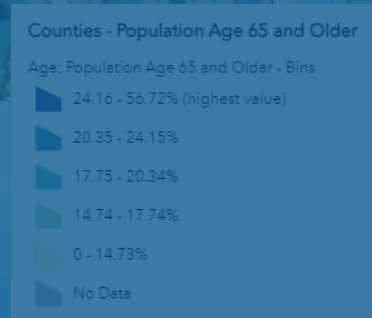


Resilience Analysis and Planning Tool (RAPT)

National Integration Center Technical Assistance | 2023



FEMA



Choose an Indicator*

Disability_Pct

Help Run

Population Summary of Selected Indicator

10,551

Legend

- Selected Census Tracts
- Nursing Homes
- Mobile Home Parks
- NFHL - Flood Hazard Zones
 - 1% Annual Chance Flood Hazard
 - Regulatory Floodway
 - Special Floodway
 - Area of Undetermined Flood Hazard
 - 0.2% Annual Chance Flood Hazard
 - Future Conditions 1% Annual Chance Flood Hazard
 - Area with Reduced Risk Due to Levee

RAPT helps you VISUALIZE and ANALYZE data for all phases of emergency management.



People and Community



Infrastructure



Hazards, Weather, Risk

- RAPT gives everyone a free, no-login required GIS capability.
- Over 100 pre-loaded GIS layers are easy to toggle on and off.
- Easy to use analysis tools: Incident Analysis, Population Counter, Filter.
- Add Data layers from ArcGIS Online, URLs or local files.
- Print or download results to spreadsheets.
- FEMA's Community Resilience Challenges Index and Indicators.

Community Resilience Challenges Index

1. Conduct literature review: Search terms “resilience” and “index, methodology(ies), or indicator(s)” and “community or disaster”
2. Catalogue all distinct methodologies/indices
3. Identify methodologies that meet inclusion criteria:
 - Quantitative
 - Public methodology
 - Public data
 - County-level
 - Generalized hazard risk
 - Pre-disaster conditions
4. Determine indicators used in multiple methodologies
5. Select indicator data source and bin for GIS visual display
6. Complete correlation analysis and create index

Methodologies from 2021 Lit Review

- Australian National Disaster Resilience Index (ANDRI)*
- Baseline Resilience Indicators for Communities (BRIC)
- Community Disaster Resilience Index (CDRI)
- Community Disaster Resilience Index (CDRI2)*
- Composite Community Disaster Resilience Index (CCDRI)
- Community Resilience Index (CRI2)
- Disaster Resilience of Place (DROP)
- Fraser: Social Capital and Social Vulnerability Indices*
- Nursey-Bray: Indicators for Adaptive Capacity*
- Regional Climate Resilience Index (RCRI)*
- Resilient Capacity Index (RCI)
- Social Vulnerability Index (SVI)
- Social Vulnerability Index (SoVI)
- The Composite Resilience Index (TCRI)

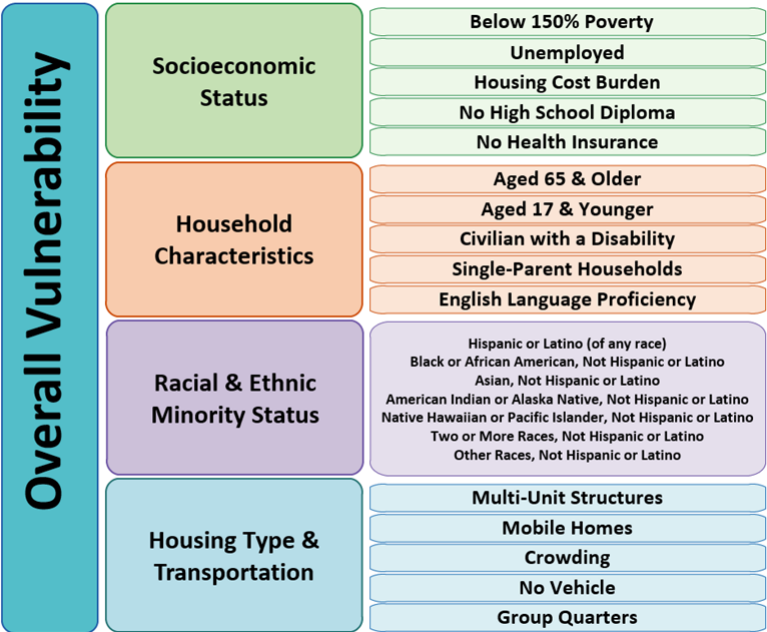
* International



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Comparison with CDC Social Vulnerability Index

2020 SVI: 2016-2020 Census-Tract Data
 Aggregate and 4 Sub-Indices (based on 16 indicators):



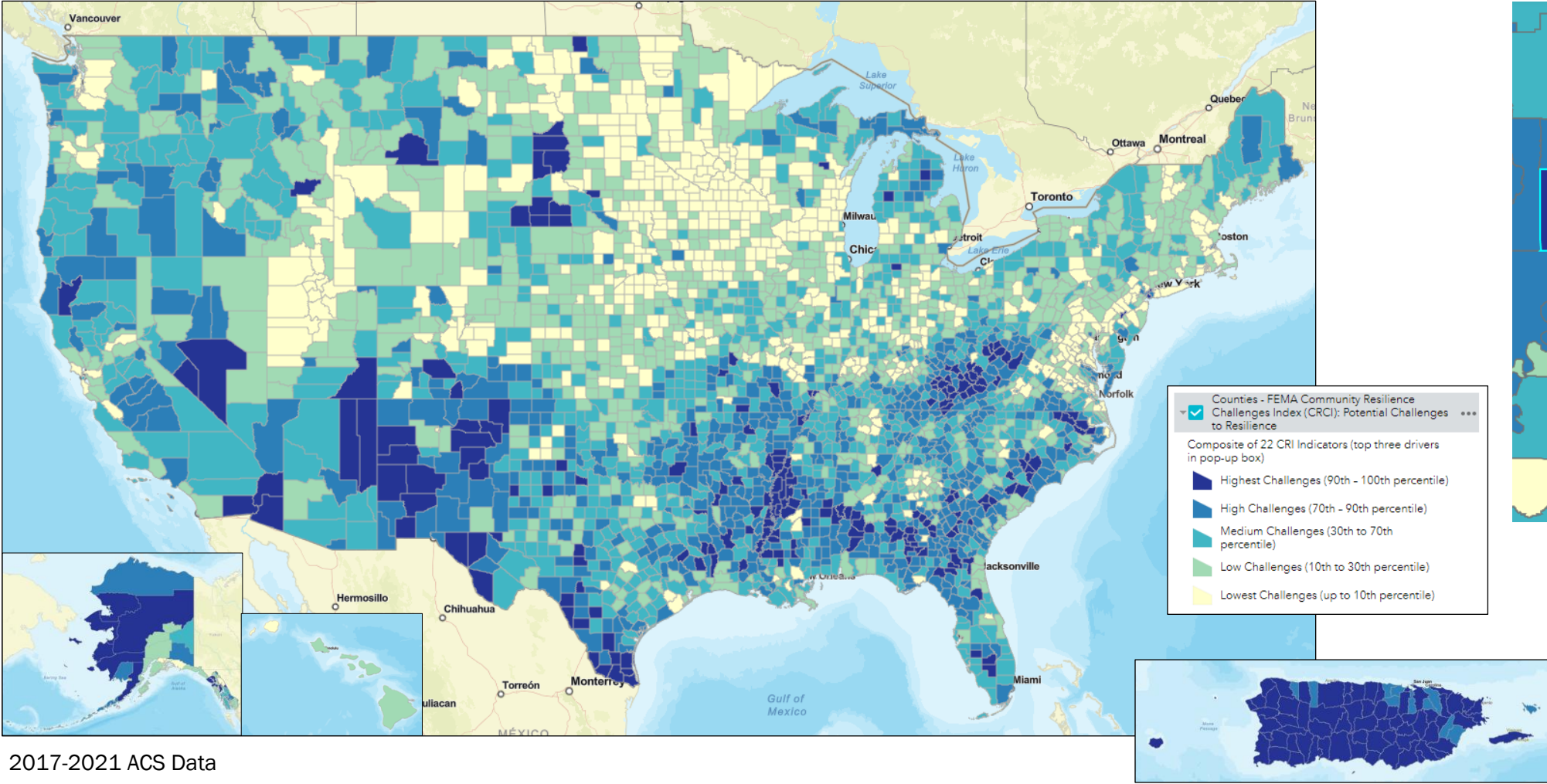
2023 CRCI: 2017-2021 Census-Tract Data
 Aggregate CRCI and individual Indicator values (22):

Ottawa, MI
County Population: 293,713
FEMA Community Resilience Challenges Index Percentile: 5 of 100
FEMA CRCI Indicators
Percent without HS Diploma: 6.23%
Percent Age 65 and Older: 15.12%
Percent with a Disability: 10.02%
Percent HH without a Vehicle: 3.99%
Percent HH with Limited English: 1.25%
Percent Single-Parent HH: 14.81%
Percent HH without a Smartphone: 11.91%
Percent Mobile Homes: 5.54%
Percent Owner-Occupied Housing: 74.67%
Number of Hospitals per 10,000 People: 0.10
Number of Medical Practitioners per 1,000 People: 22.43
Percent without Health Insurance: 3.53%
Percent Below Poverty Level: 7.62%
Median HH Income: \$77,288
Percent Unemployed Labor Force: 3.86%
Percent Unemployed Women in Labor Force: 4.21%
Percent Workforce Employed in Predominant Sector: 23.48%
Income Inequality (Gini Index): 0.42
Social/Civic Organizations per 10,000 People: 0.51
Percent without Religious Affiliation: 55.78%
Percent Inactive Voters: 8.05
Population Change: 0.47



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FEMA Community Resilience Challenges Index by County



(2 of 2)

Pemiscot, MO

County Population: 15,949

FEMA Community Resilience Challenges Index - Percentile: 96

CRI aggregates the area's standard deviation values for all 22 CRI indicators and is a relative value of potential challenges to resilience.

*CRI in Puerto Rico does not include the Households with Limited English indicator.

The top 3 drivers of the CRI value for this county are:

- 1) Population Change
- 2) Percentage of households with single parents
- 3) Percentage of the population with a disability

[Zoom to](#)

2017-2021 ACS Data

RAPT Community Demographics Data Layers

* County data only; ** County and Tribal only; ^ County and Census Tract only; + Census Tract only



Population Characteristics

- Population without a High School Diploma
- Population 65 and Older
- Population with a Disability
- Population by Race and Hispanic Origin^

Household Characteristics

- Households without a Vehicle
- Households with Limited English
- Single-Parent Households
- Households without a Smartphone
- Households without Broadband Subscription+



Housing

- Mobile Homes as Percentage of Housing
- Housing Units that are Owner-Occupied
- Housing Costs as a Percentage of Household Income^
- Residential Structures in SHFA with Flood Insurance*

Healthcare

- Number of Hospitals*
- Medical Professional Capacity**
- Population without Health Insurance
- Medicare Recipients with Power-Dependent Devices*

Economic

- Population Below Poverty Level
- Median Household Income
- Unemployed Labor Force
- Unemployed Women in the Labor Force
- Income Inequality
- Workforce in Predominant Sector



Connection to Community

- Presence of Civic and Social Organizations*
- Population without Religious Affiliation*
- Percentage of Inactive Voters*
- Population Change*



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County and Census Tract Community Resilience Challenges Index (CRCI) combining 22 indicators.

Infrastructure Layers: Homeland Infrastructure Foundation-Level Data Open

- Hospitals
- Nursing Homes
- Pharmacies
- Urgent Care Facilities
- Dialysis Centers
- Mobile Home Parks
- Fire Stations
- Local Law Enforcement Locations
- Public Health Departments
- 911 Service Area Boundaries
- SNAP Authorized Retailers
- Places of Worship
- Colleges and Universities
- Private Schools
- Public Schools
- Prison Boundaries
- Power Plants
- Electric Transmission Lines
- Wastewater Treatment Plants
- Solid Waste Landfills
- High-Hazard Dams

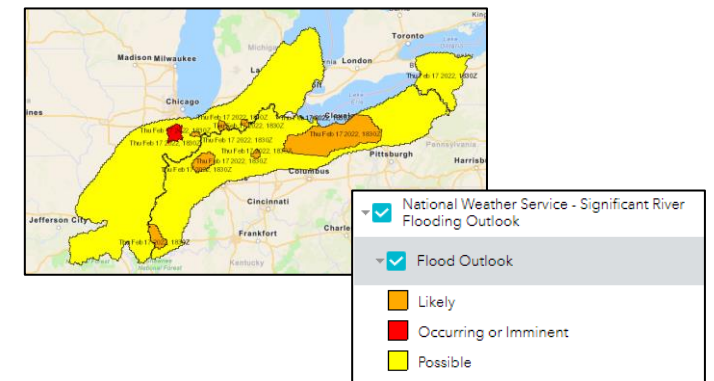
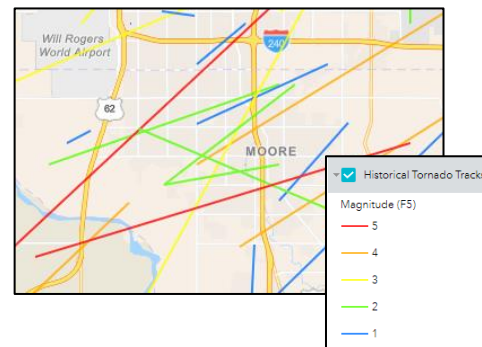
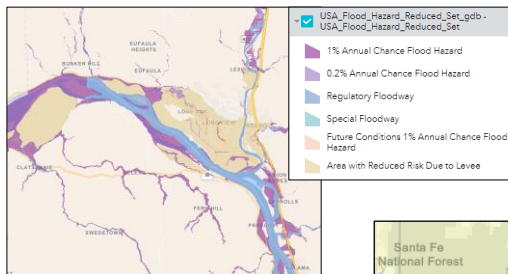


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Hazards, Weather, Risk

- Live Stream Gauges
- Flood Hazard
- Hurricane Tracks (1990+)
- Historical Tornado Tracks
- Wildfires – Current Incidents (Points)
- Wildfires – Current incidents (Perimeters)
- Seismic Hazard
- National Risk Index Expected Annual Loss for 18 natural hazards

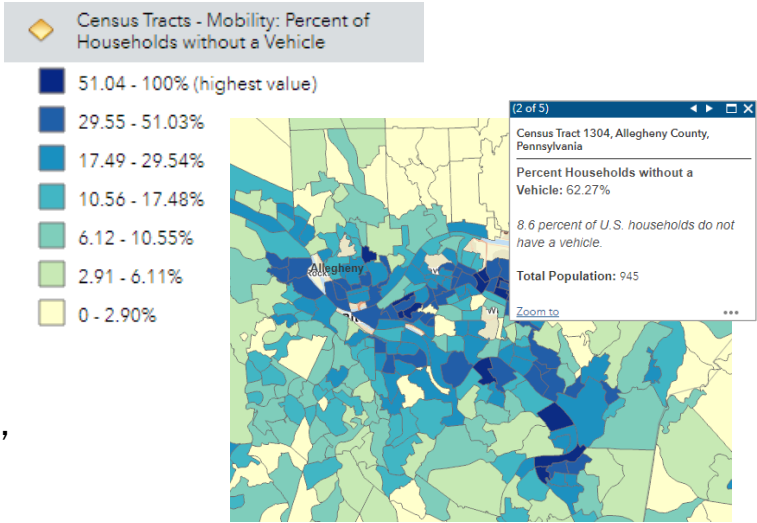
- NOAA Sea Level Rise (4-6 ft.)
- NHC Storm Surge Category 1-5
- NWS Watches and Warnings
- NWS Severe Weather Outlook
- NWS Atlantic/Caribbean Tropical Cyclones
- NWS Eastern Pacific Tropical Cyclones
- NWS Excessive Rainfall Outlook
- NWS Climate Outlooks
- NWS Fire Weather Outlooks
- NEXRAD Real-Time Weather Radar



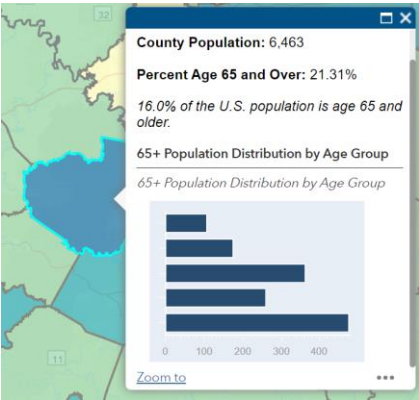
FEMA

Data Binning, Pop-Up Boxes and Attribute Tables

- **Data Binning:**
 County = 5 bins
 Census Tract = 7 bins
 Tribal = 5 bins
- **Pop-up boxes:**
 Additional information for each data point: population, infrastructure, and hazards



- **Attribute tables:**
 - By map extent
 - By FEMA region, state, county, zip code
 - Select rows

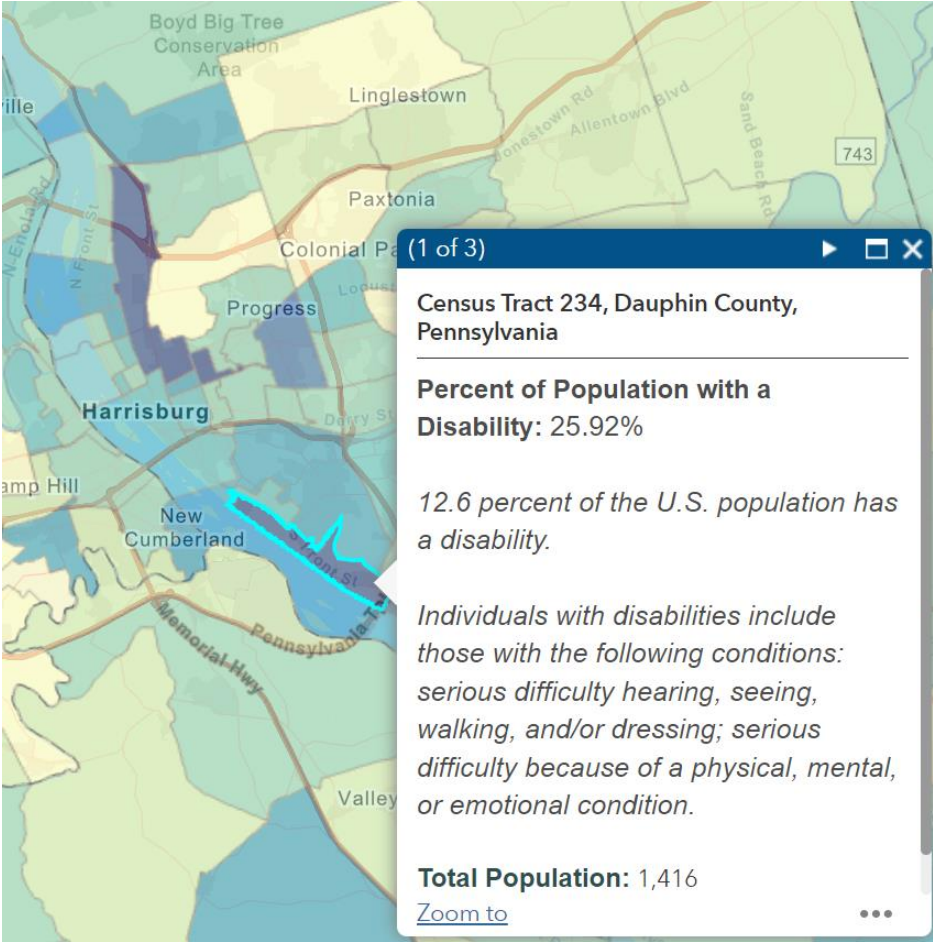
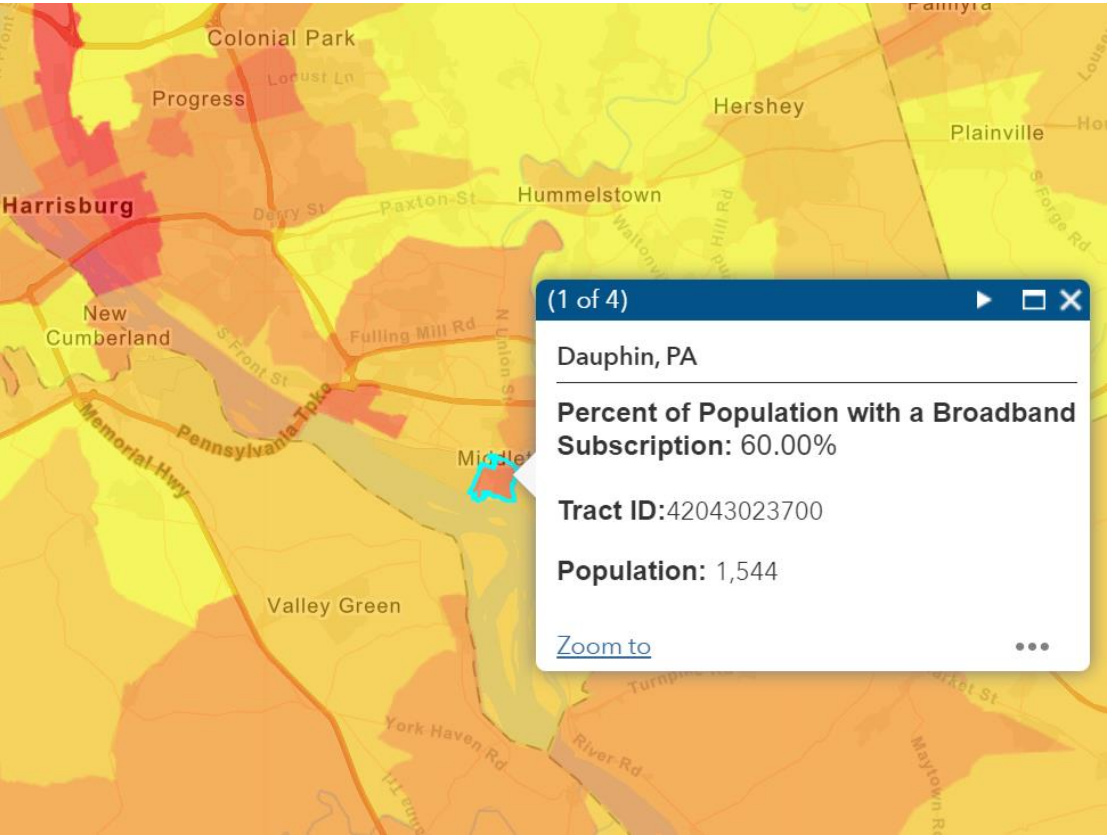


age, disabilities, language, race

NAME	UNITS	SIZE	ADDRESS	CITY	COUNTY	STATE	ZIP	TELEPHONE	TYPE	STATUS	NAICS_CODE	NAICS_DESC	WEBSITE
GRAND BAY MOBILE HOME ESTATES	138	LARGE (>100)	3300 ALT 19 NORTH	PALM HARBOR	PINELLAS	FL	34683	(727) 784-1231	MOBILE HOME PARK	OPEN	531190	RESIDENTIAL TRAILER PARKS	NOT AVAILABLE
HICKORY POINT MH & RV PARK	~999	SMALL (<50)	1181 ANCLOTE ROAD	TARPON SPRINGS	PINELLAS	FL	34689	(727) 937-7357	RECREATIONAL VEHICLE PARK	OPEN	721211	RECREATIONAL VEHICLE PARKS	NOT AVAILABLE
COUNTRYSIDE ESTATES	103	MEDIUM (51-100)	27466 US 19 N, LOT 1	CLEARWATER	PINELLAS	FL	33761	(727) 796-8934	MOBILE HOME PARK	OPEN	531190	RESIDENTIAL TRAILER PARKS	NOT AVAILABLE
SOUTHWIND MHP	213	LARGE (>100)	795 CR 1	PALM HARBOR	PINELLAS	FL	34683	(727) 786-6558	MOBILE HOME PARK	OPEN	531190	MOBILE (MANUFACTURED) HOME PARKS	NOT AVAILABLE
THE MEADOWS	329	LARGE (>100)	505 ANCLOTE SOUTH BAY	TARPON SPRINGS	PASCO	FL	34689	(727) 938-3788	MOBILE HOME PARK	OPEN	531190	MOBILE (MANUFACTURED) HOME PARKS	NOT AVAILABLE

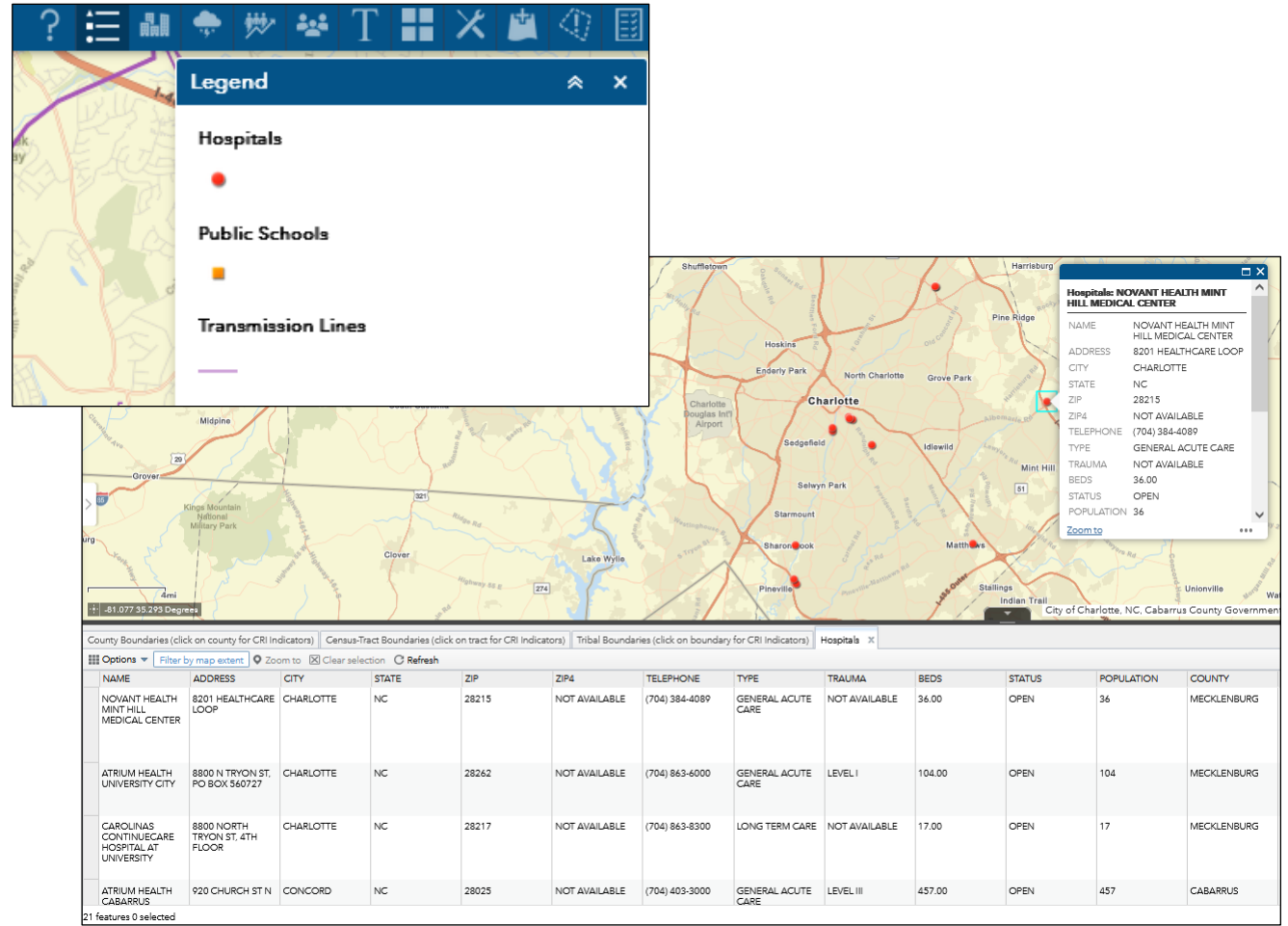
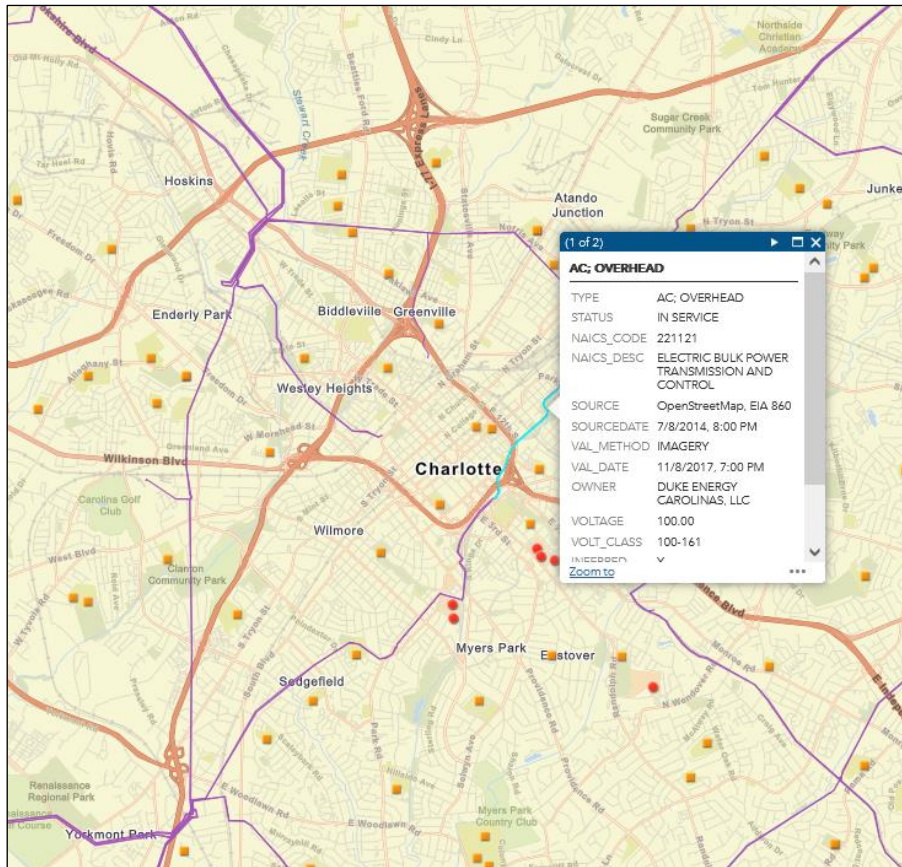


Resilience Indicators - Census Tract



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Infrastructure

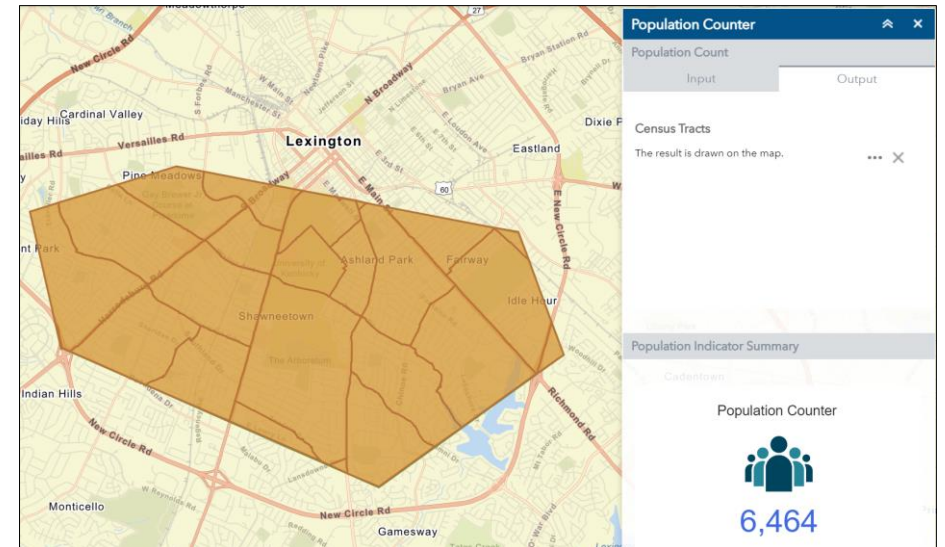
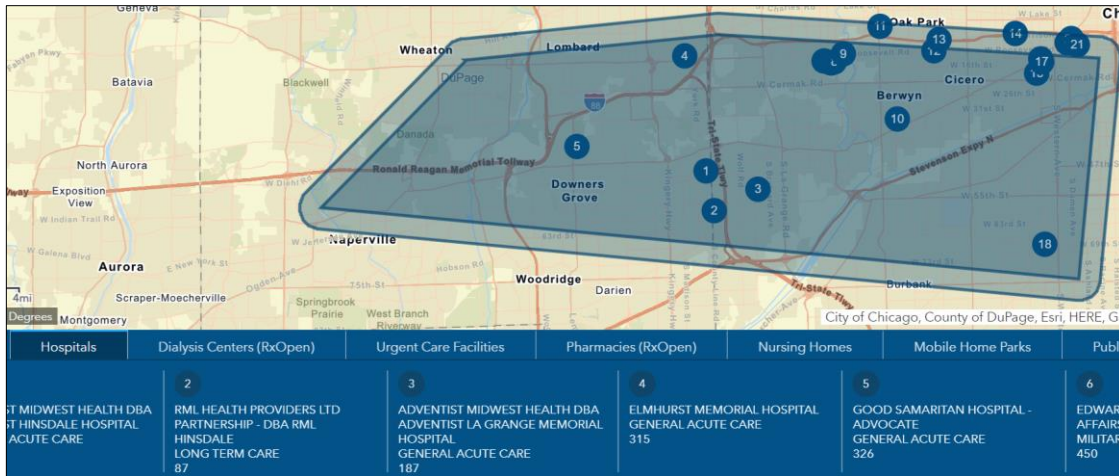
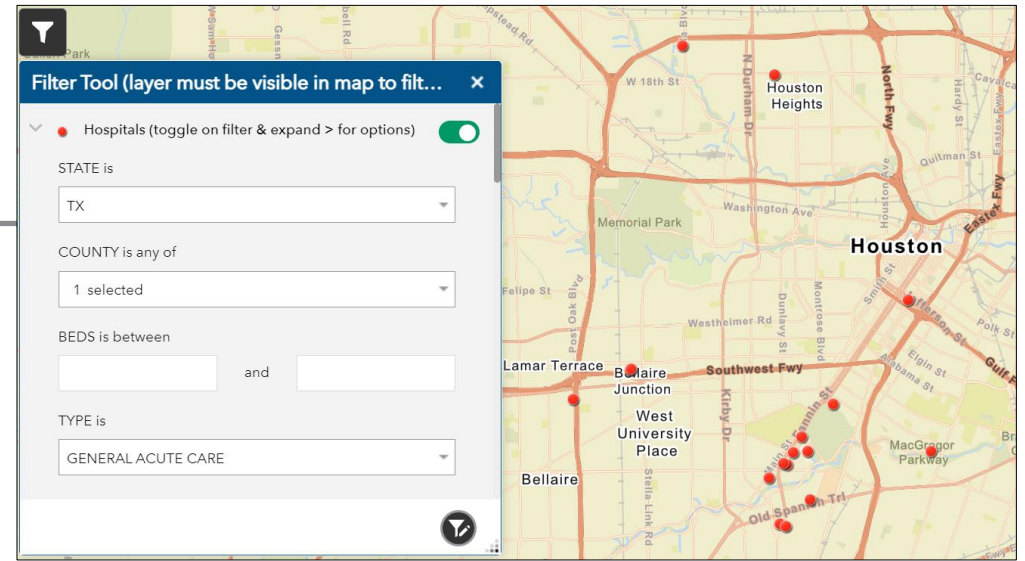
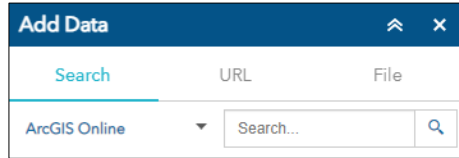


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Analysis Tools

Analysis Tools

- Add Data
- Filter Tool
- Population Counter
- Incident Analysis Tool



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Add Data and Incident Analysis

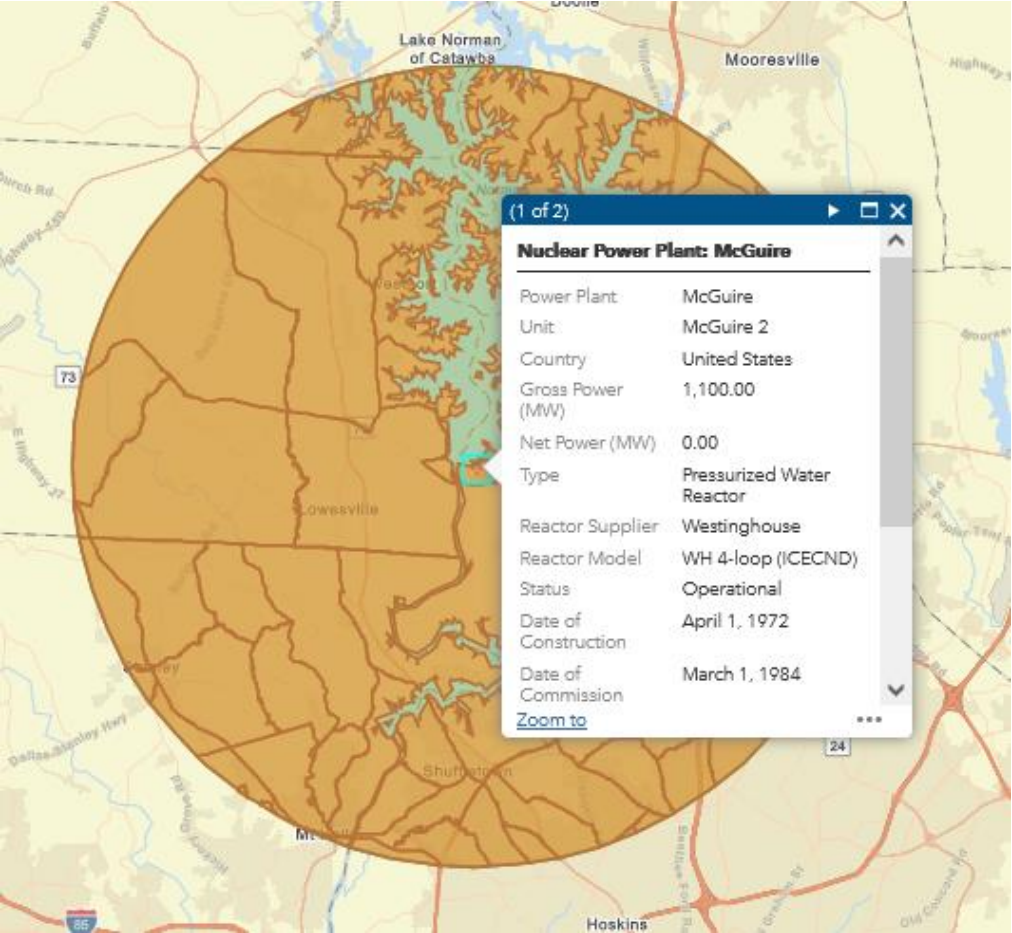
Nuclear Power Plant: McGuire	
Power Plant	McGuire
Unit	McGuire 1
Country	United States
Gross Power (MW)	1,100.00
Net Power (MW)	0.00
Type	Pressurized Water Reactor
Reactor Supplier	Westinghouse
Reactor Model	WH 4-loop (ICECND)
Status	Operational
Date of Construction	April 1, 1971
Date of Commission	December 1, 1981

Incident	Hospitals	Urgent Care Facilities	Pharmacies (Rx/Open)	Nursing Homes	Mobile Home Parks
1	5.28 Miles (approximate)	2	9.66 Miles (approximate)	3	12.56 Miles (approximate)
NOKANT HEALTH HUNTERSVILLE MEDICAL CENTER 10530 GLEASD RD HUNTERSVILLE	LAKE NORMAN REGIONAL MEDICAL CENTER 171 FAIRVIEW RD, PO BOX 3250 MOORESVILLE	CAROLINAS REHABILITATION MT. HOLLY 275 BEATTY DRIVE BELMONT	CAROLINAS CONTINUECARE HOSPITAL AT UNIVERSITY 6300 NORTH TRYON ST, 4TH FLOOR		



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Population Counter



Population Counter

Population Count

Input Output

Select and Count Specific Indicators*

Choose an Indicator to Count*

Total Population

Run

Population Indicator Summary

Population Counter

245,062

Population Counter

Population Count

Input Output

Select and Count Specific Indicators*

Choose an Indicator to Count*

Population with a Disability

Run

Population Indicator Summary

Population Counter

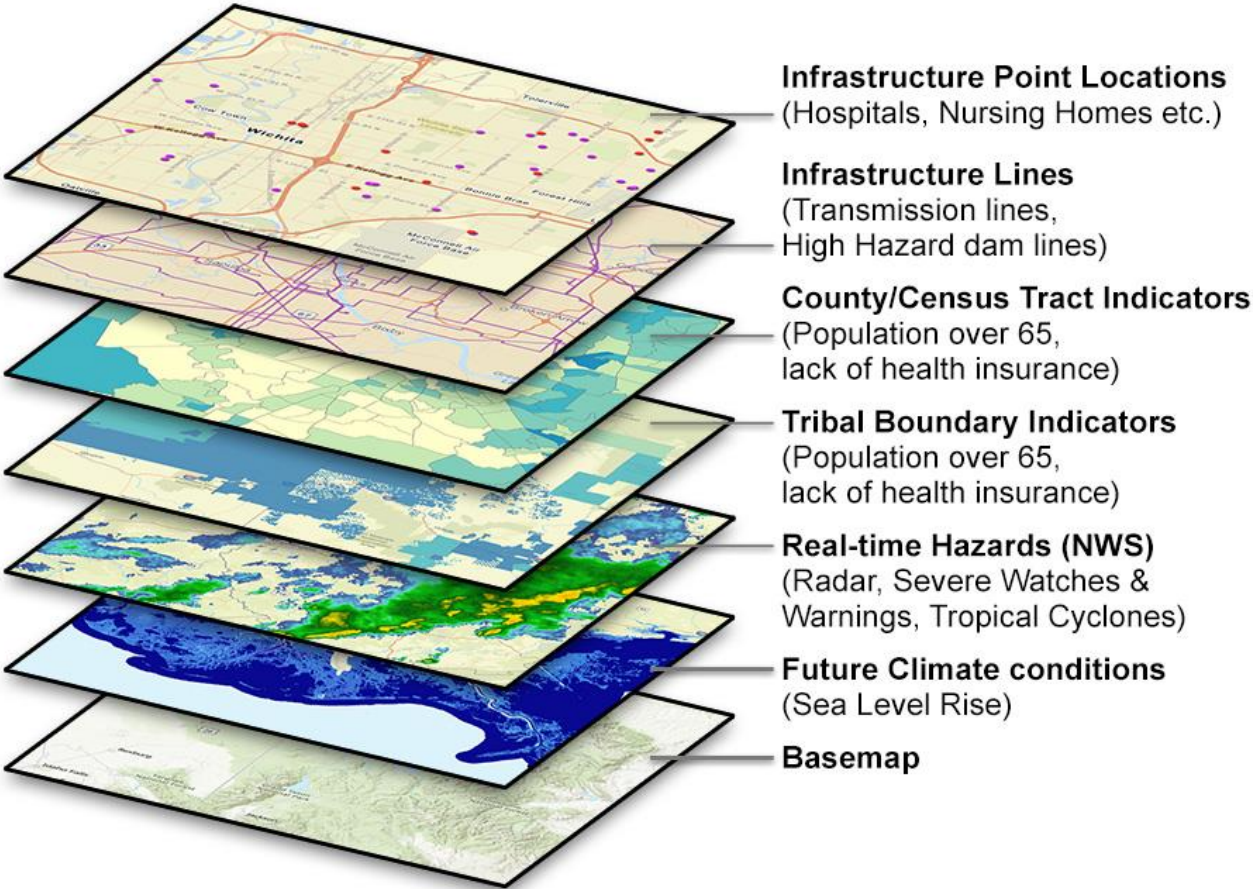
21,876

- Total Population
- Population without HS Diploma
- Population Unemployed
- Population with a Disability
- HH with Limited English
- HH without a Vehicle
- Population Age 65 and Over
- Population without Health Insurance
- Single Parent HH
- HH without Smartphone
- Population Living Below Poverty Level
- Population Living in Mobile Homes



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RAPT Analysis through Layer Combinations



RAPT combines multiple data sets and analysis tools to support situational awareness for all phases of emergency management.



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Heat Risk

LAYER COMBINATION

Hazard/Risk:

NWS Watches and Warnings

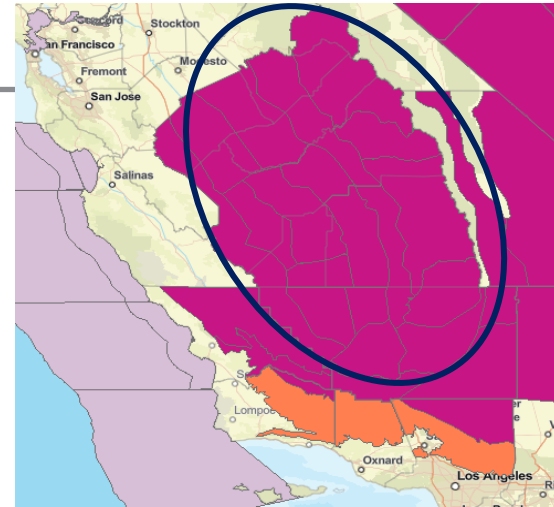
Census Tract:

% of population age 65 and older
% of households without a vehicle

DECISION SUPPORT

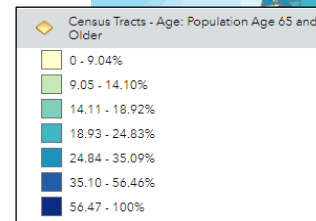
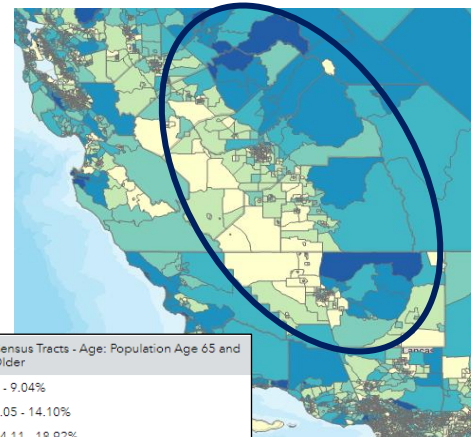
In counties with Excessive Heat Warning, prioritize outreach and operations support:

- cooling centers
- transportation
- neighbor-to-neighbor check-ins

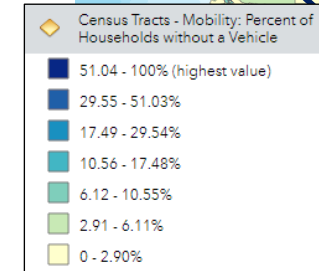
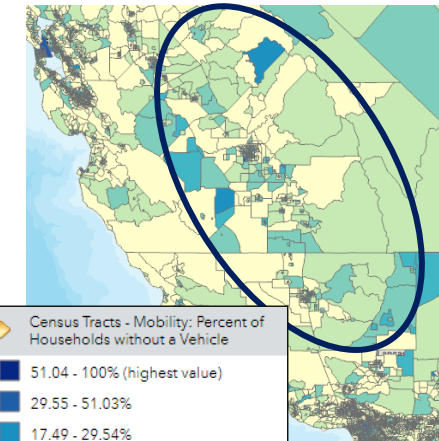


Excessive Heat Warning

Without a Vehicle



65 and Older



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Hurricane Evacuation

LAYER COMBINATION

Hazard/Risk:

Incident Analysis Tool to draw projected storm path

Infrastructure:

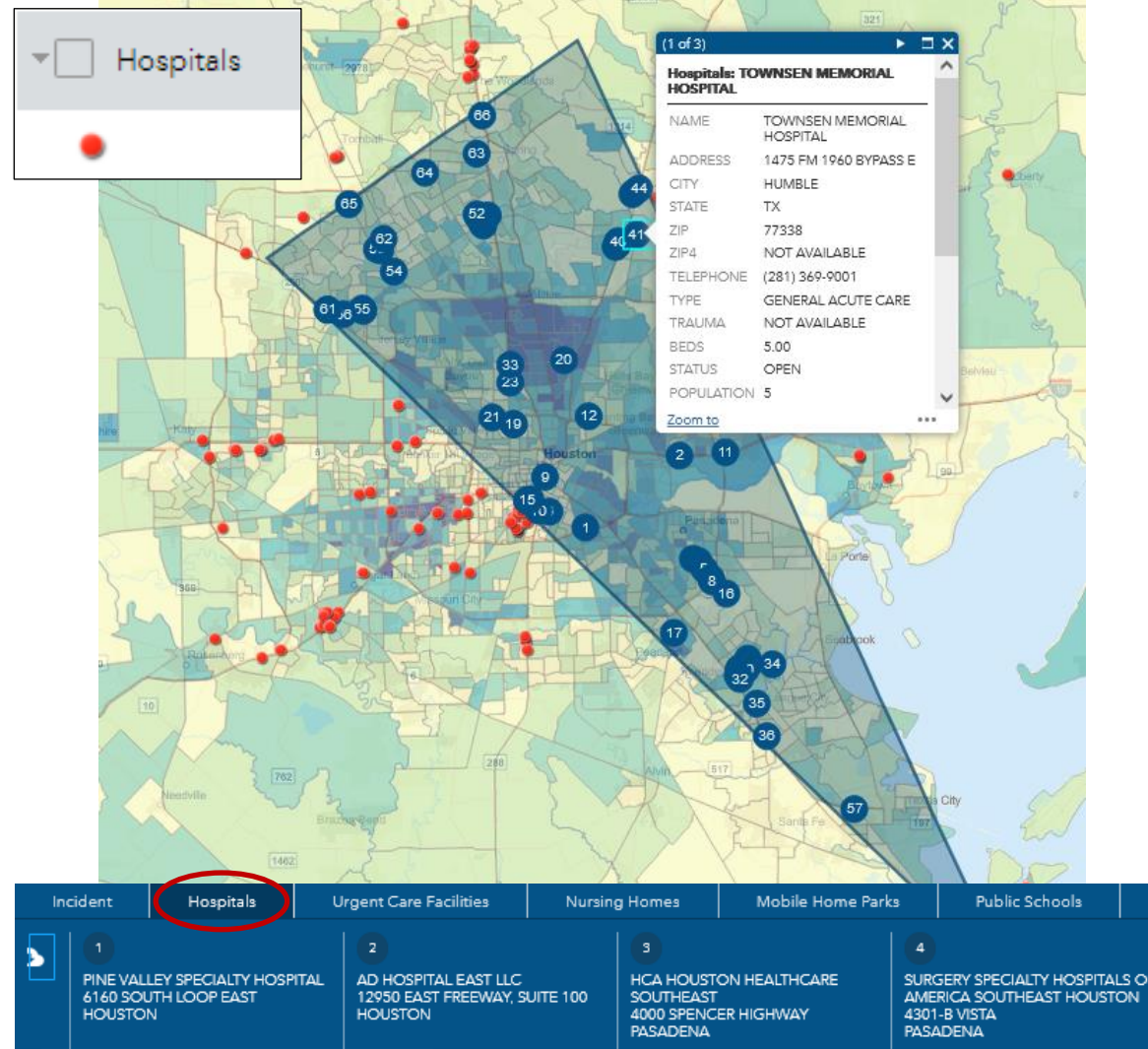
Hospitals in path of storm and outside potentially affected area

Census Tract:

% of households with limited English

DECISION SUPPORT

- Priority hospitals for evacuation support.
- Hospital locations outside of impact zone to re-direct patients.
- Planning and operations support to help evacuate people with limited English



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Severe Weather

LAYER COMBINATION

Hazard/Risk:

NWS real-time Severe Weather Watches and Warnings

Infrastructure:

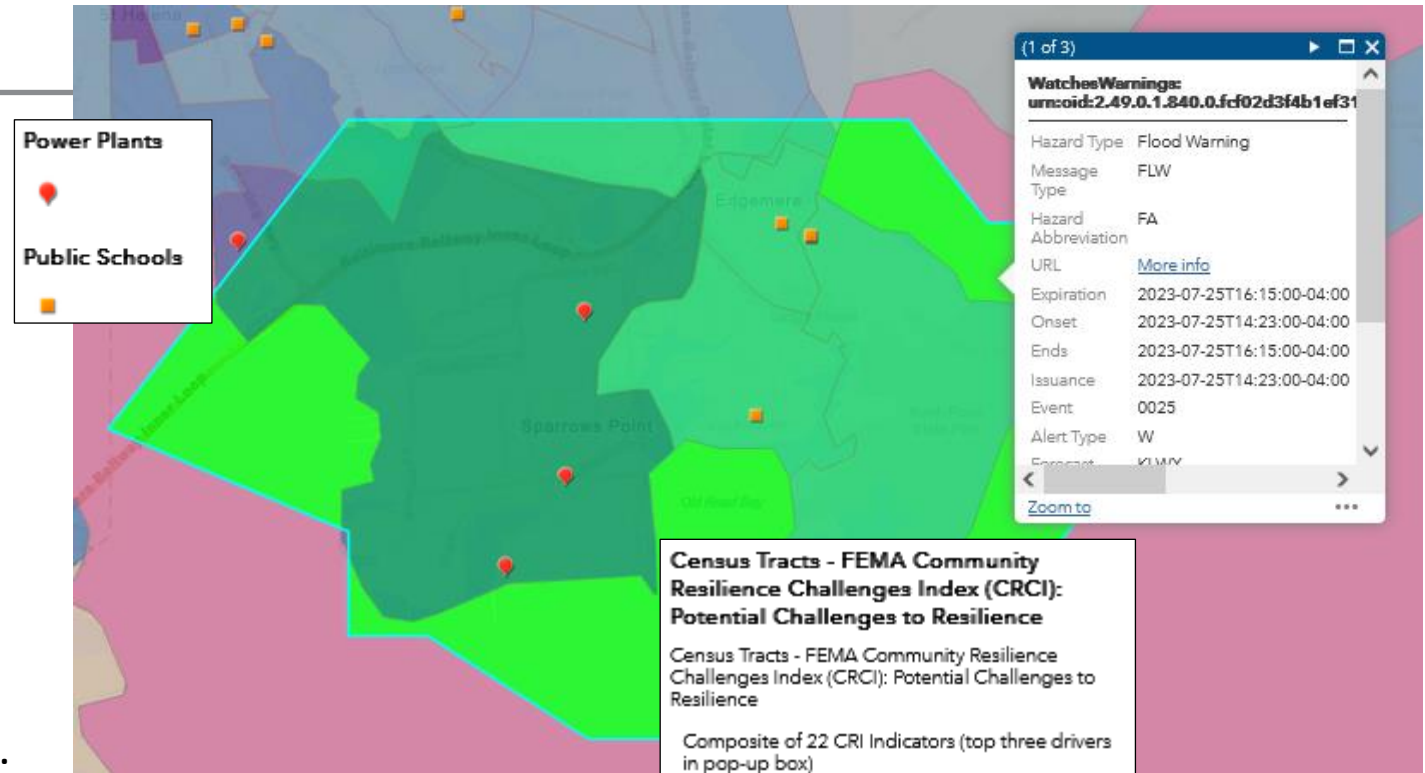
Power Plants
Public Schools

Census Tract:

FEMA CRCI Percentile

DECISION SUPPORT

- Estimate total population within incident area.
- Estimate population estimates for at-risk populations (Age over 65, Disability, No Vehicle etc.)
- Identify infrastructure located in severe weather warning areas.
- Determine census tracts with greater challenges to resiliency using CRCI.



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RAPT and Preparedness Considerations

- **Identify local, specific risks**
 - Hazard layers
 - Real-time severe weather
- **Identify communities impacted by risks**
 - Equity/disadvantaged
 - FEMA's Community Resilience Challenges Index
 - Demographics (language, disability)
 - (#) people with access and functional needs (affected)
 - (#) people with limited English proficiency (affected)
- **Capability gaps**
 - #of hospital beds, medical service locations (dialysis)
 - Electricity-dependent Medicare population



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RAPT Resource Center

- RAPT overview
- Use Cases
- Indicator Analysis
- Data Sources
- User Guide and FAQs
- Instructional video
- Contact us email: FEMA-TARequest@fema.dhs.gov

Send Us Your Use Cases!!



A screenshot of the RAPT Resource Center website. The page has a dark blue header with navigation links: FEMA, RAPT Overview, Use Cases, Indicator Analysis, Data Sources, User Guides & FAQs, Connect & Share, and About. A search icon and "Sign In" link are in the top right. The main content area is light gray and features the title "Resilience Analysis & Planning Tool (RAPT)" with a sub-headline "RAPT gives everyone easy access to important community data and analysis tools" and a "Take Me to RAPT!" link. The FEMA logo is in the top right. Below the title is a "Welcome to the RAPT Resource Center" section. The text describes the center's purpose and lists various data layers and analysis tools. A diagram on the right shows a stack of map layers with labels: Infrastructure Point Locations, Infrastructure Lines, County/Census Tract Indicators, Tribal Boundary Indicators, Real-time Hazards (NWS), Future Climate conditions, and Basemap. The FEMA logo is at the bottom right of the diagram.

Questions & Discussion

benjamin.rance@fema.dhs.gov

FEMA-TARequest@fema.dhs.gov

fema.gov/rapt