InSPIRE

Innovation Summit for Preparedness & Resilience

Navigating Resilience and Climate Data & Building Partnerships for Next-Level Planning and Grant Success

NAPSG Foundation

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Meet the presenters

Benjamin Rance
Federal Emergency Management Agency

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Lowcountry Hazards Center & Santee Cooper GIS Laboratory

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Objective

Participants will learn how NCDOT is utilizing GIS to increase efficiencies for post-incident damage reporting to FEMA, and how communities are leveraging mobile mapping capabilities from HERE to support all phases of a disaster.

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Agenda

- 1:00– 1:05 Introductions and Welcome (5 mins)
- 1:05 – 1:35 NCDOT (30 min)
- 1:35 – 2:05 HERE (30 min)
- 2:05 – 2:15 Questions/Wrap-up/Closing

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Which Data Tool is Right for Me?

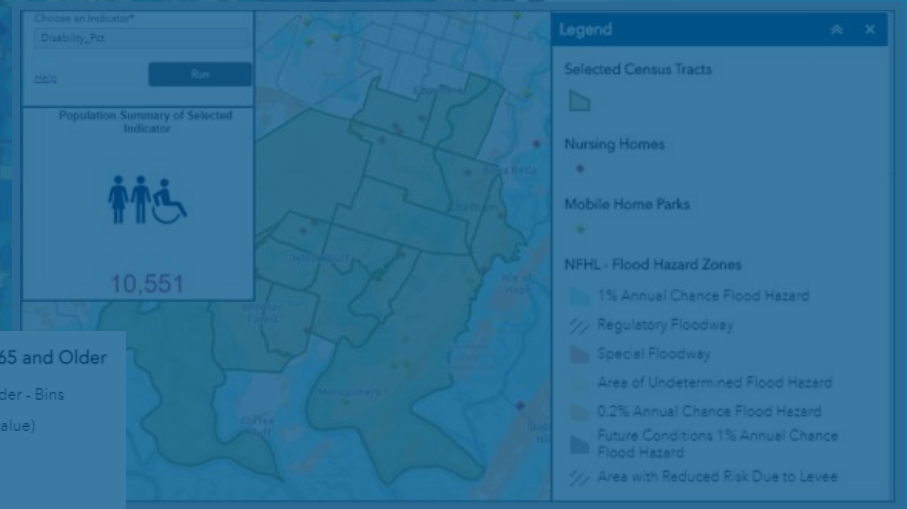
Resilience Analysis and Planning Tool (RAPT)

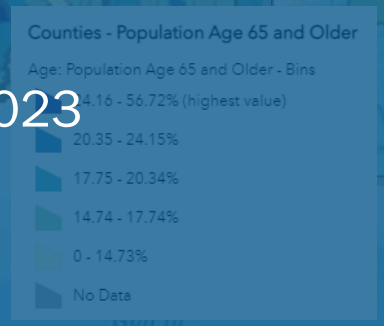
Grant Equity Threshold Tool (GETT)

Climate Risk and Resilience Portal (ClimRR)

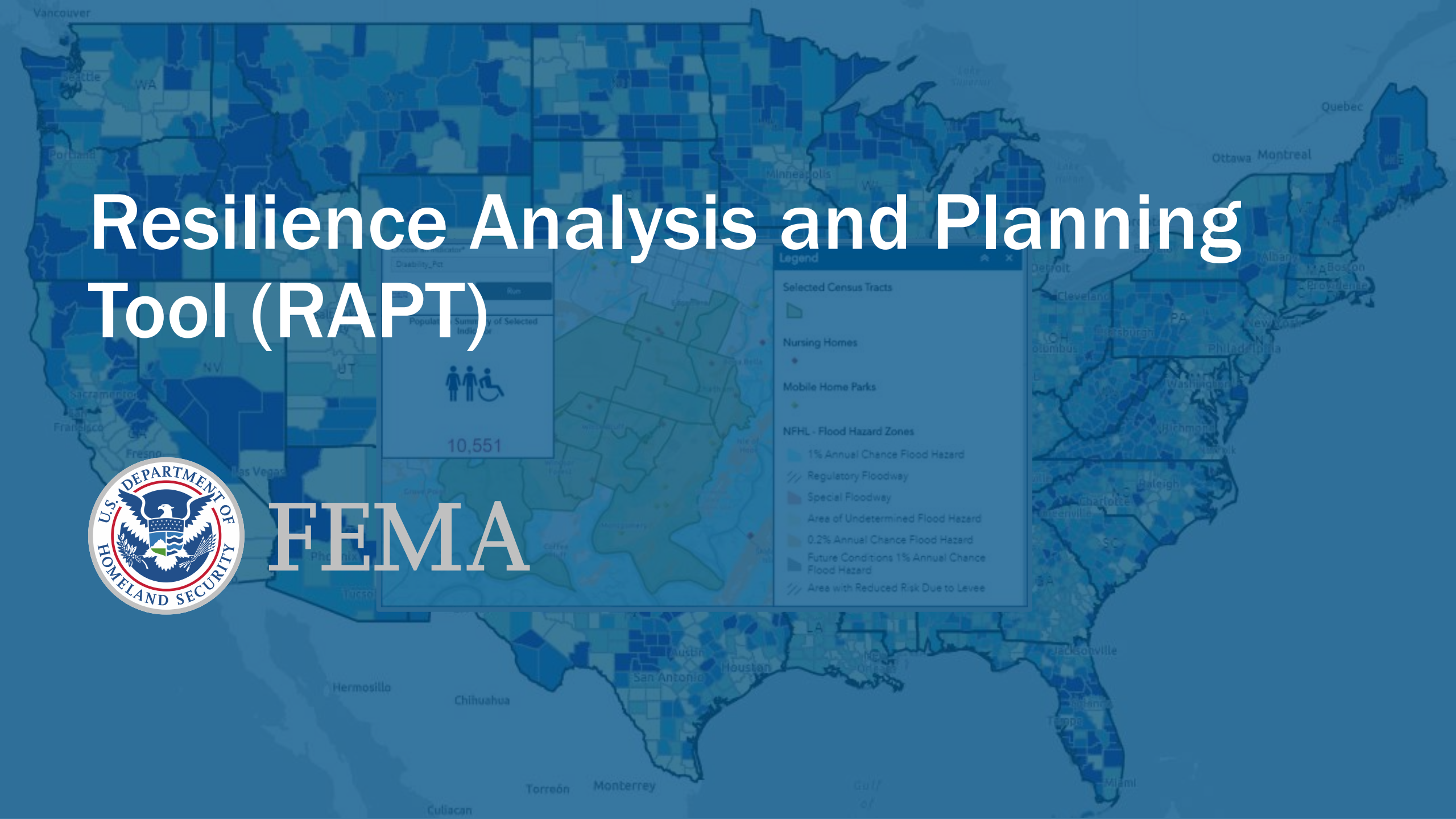
FEMA

Risk Analysis, Planning & Information Directorate | 2023





Resilience Analysis and Planning Tool (RAPT)



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

People and Community

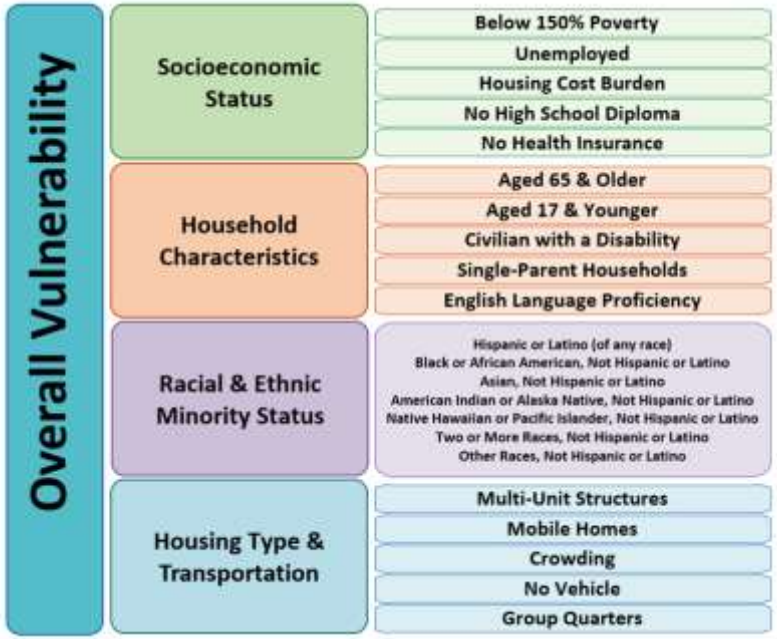
Infrastructure

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.

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

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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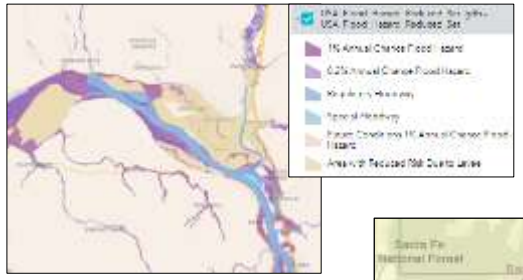
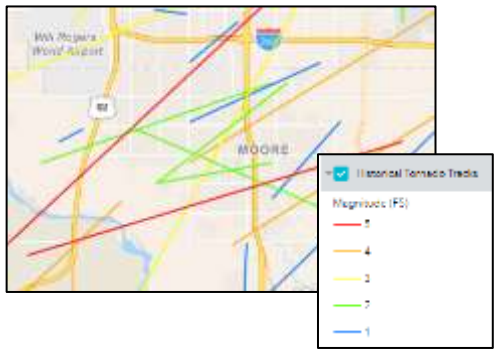
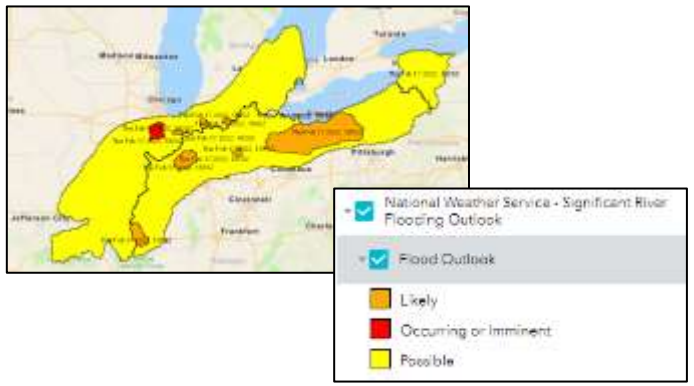
Hazards, Weather, Risk

- 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







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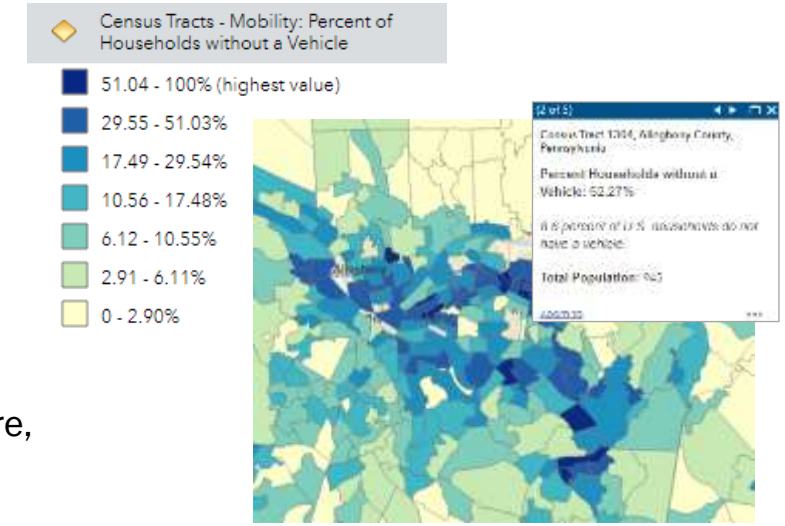
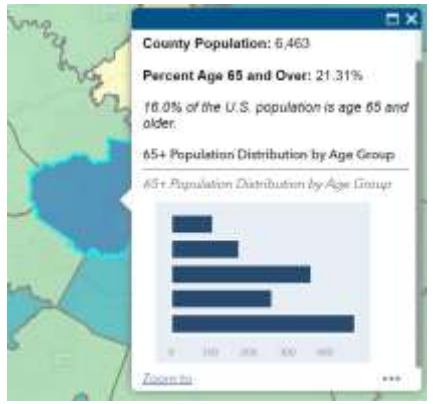
Data Binning, Pop-Up Boxes and Attribute Tables

- **Data Binning:**
  County = 5 bins
  Census Tract = 7 bins
  Tribal = 5 bins

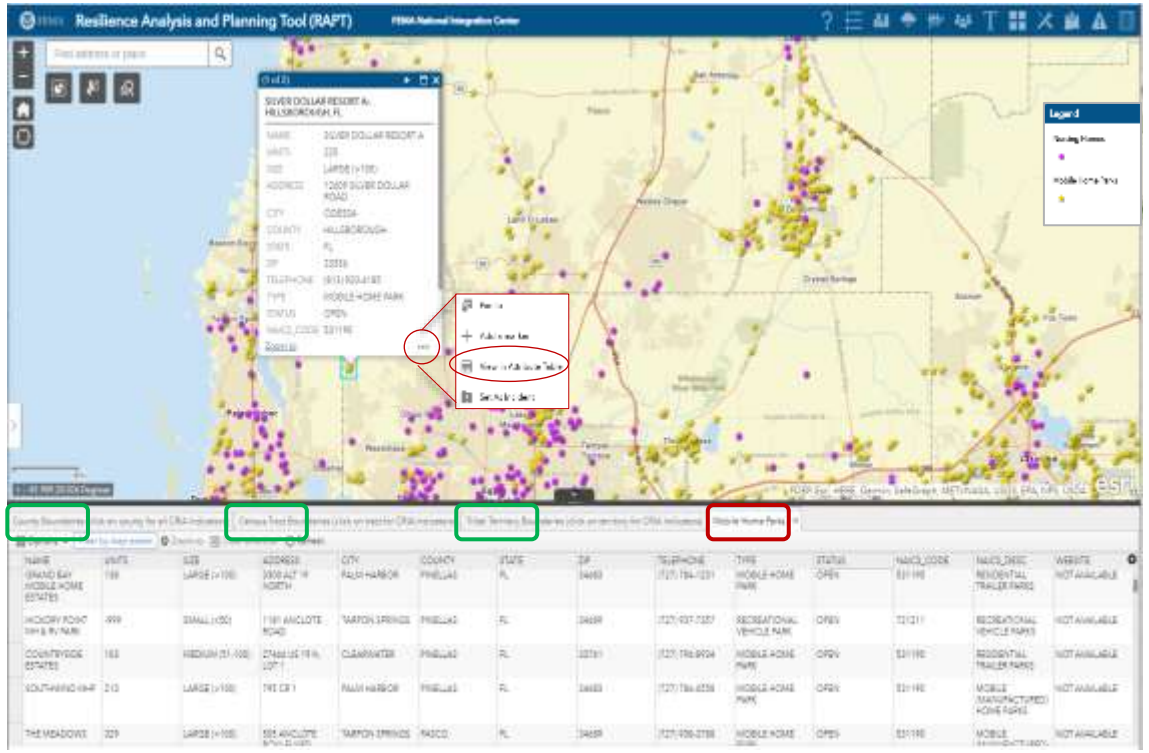
- **Pop-up boxes:**
  Additional information for each data point: population, infrastructure, and hazards

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



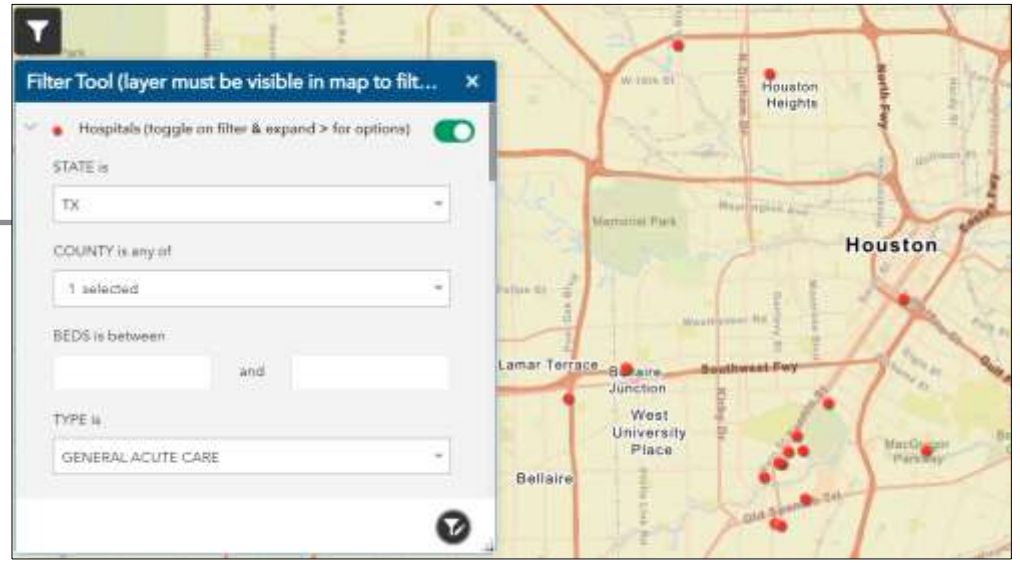


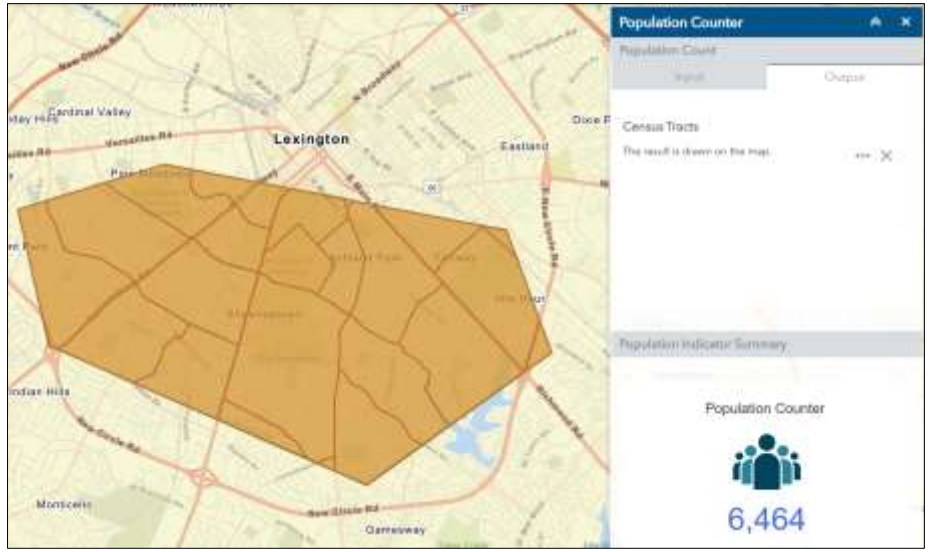
age, disabilities, language, race



Analysis Tools

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





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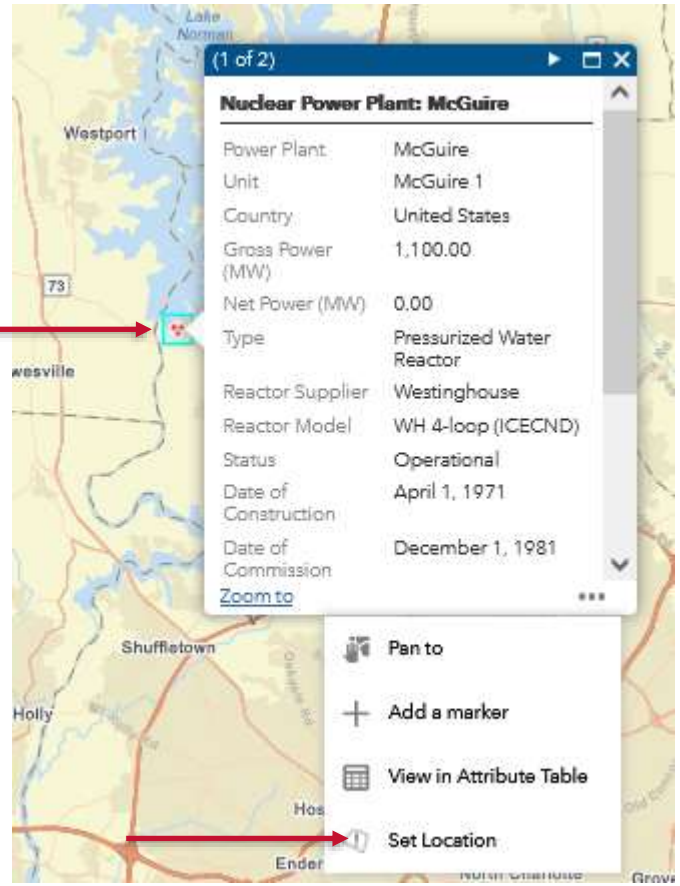
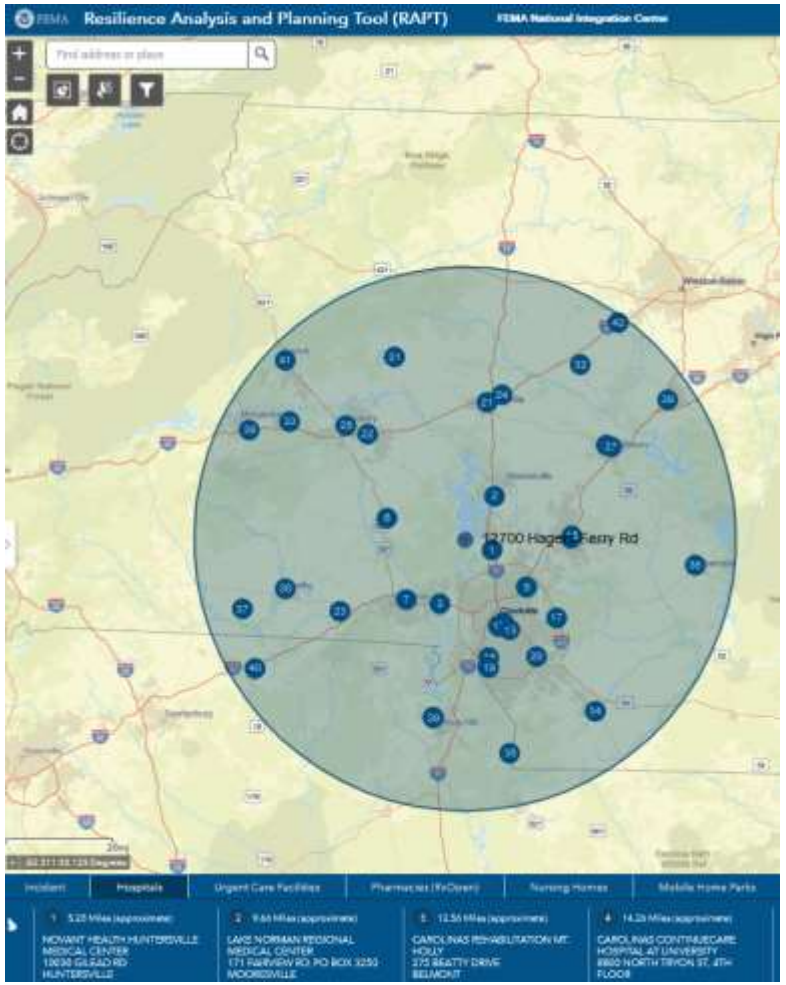
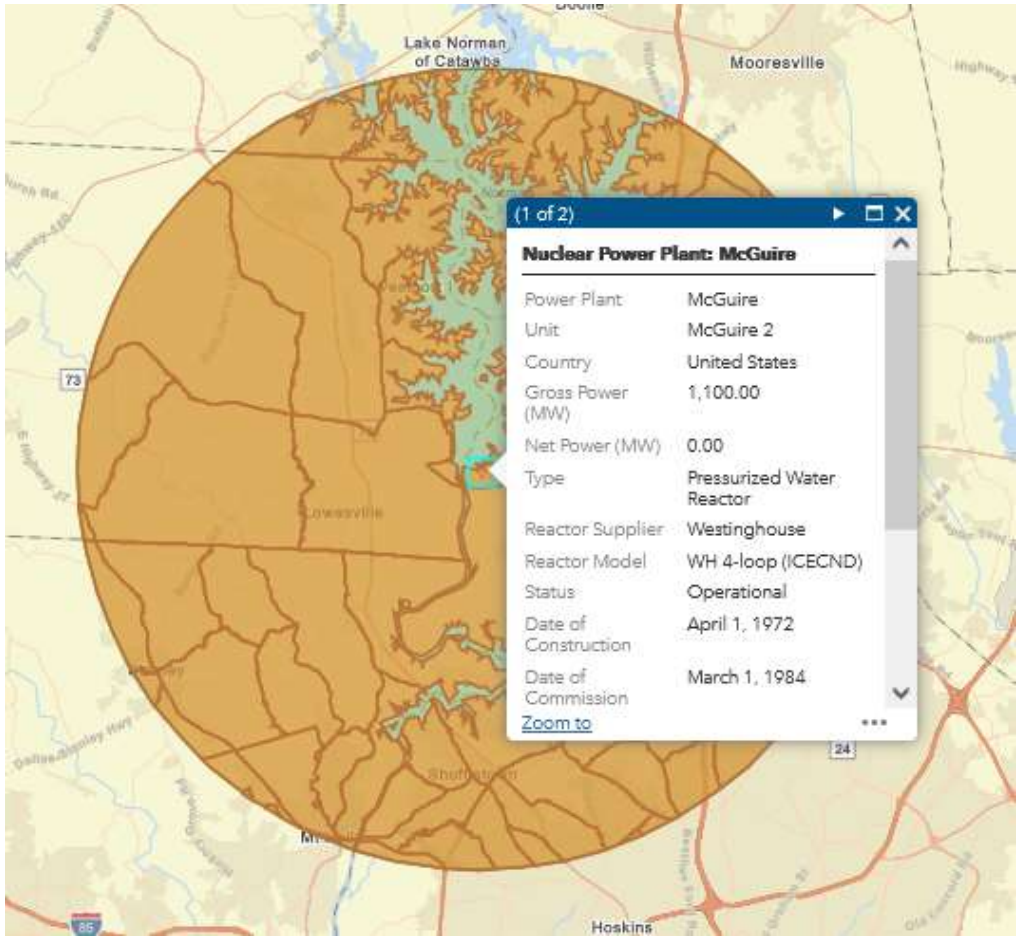
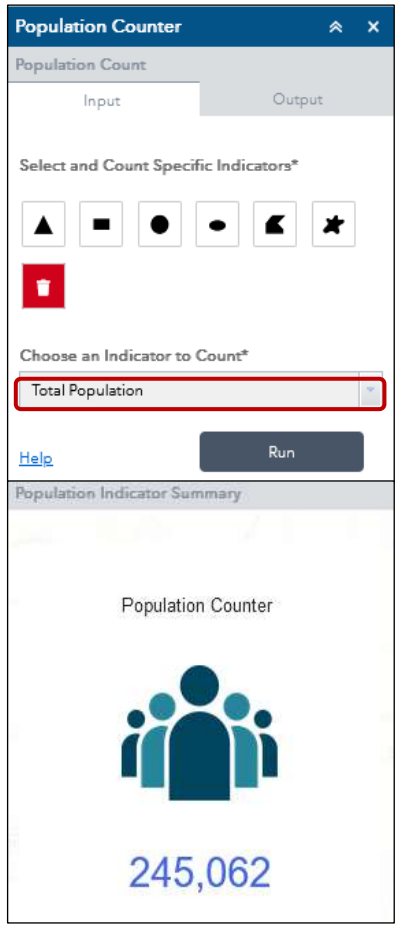
Add Data and Incident Analysis

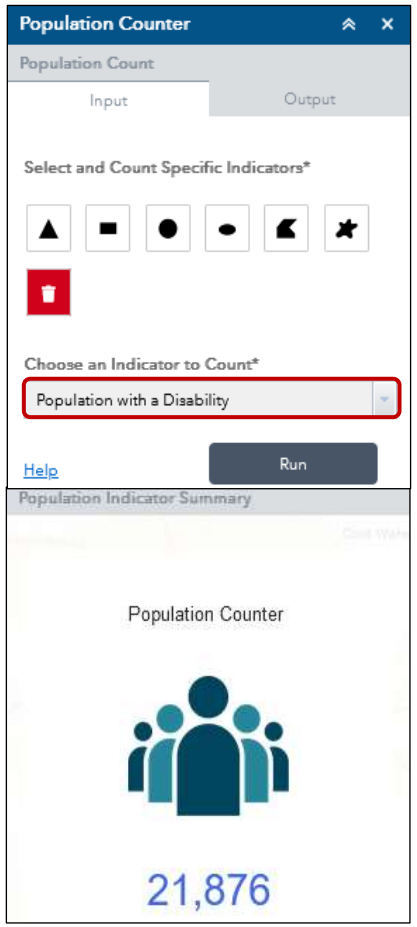




Population Counter







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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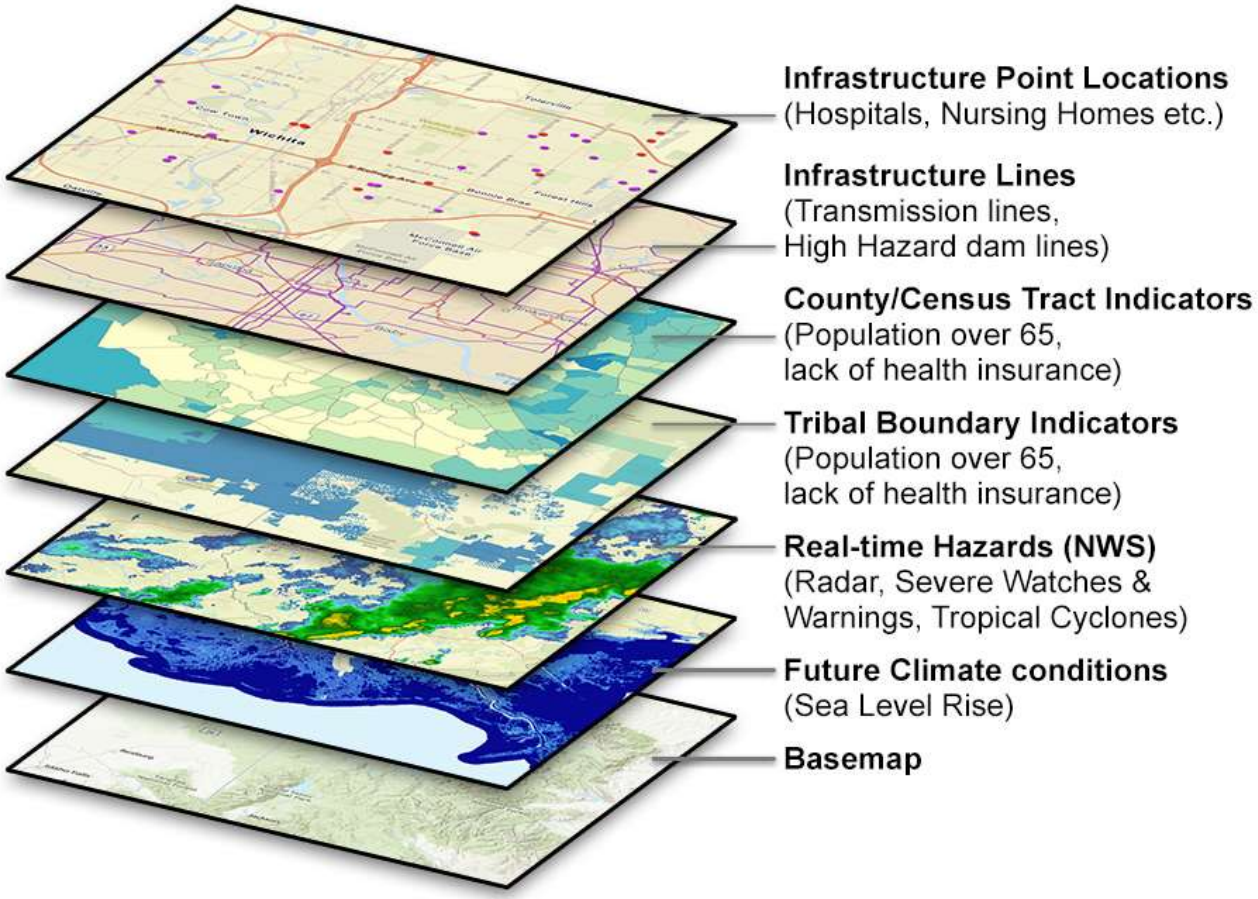
RAPT Analysis through Layer Combinations



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

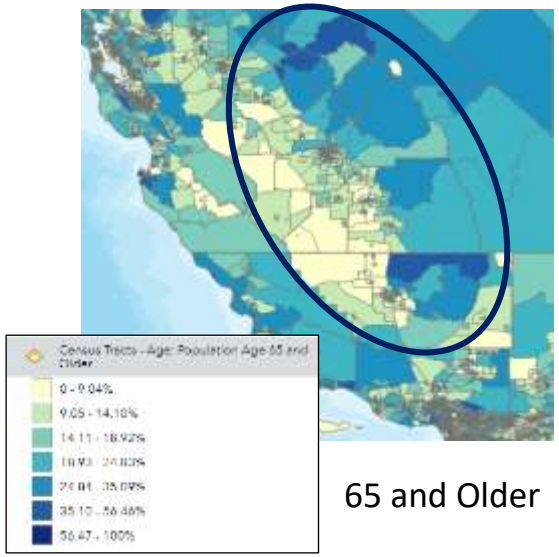
DECISION SUPPORT

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

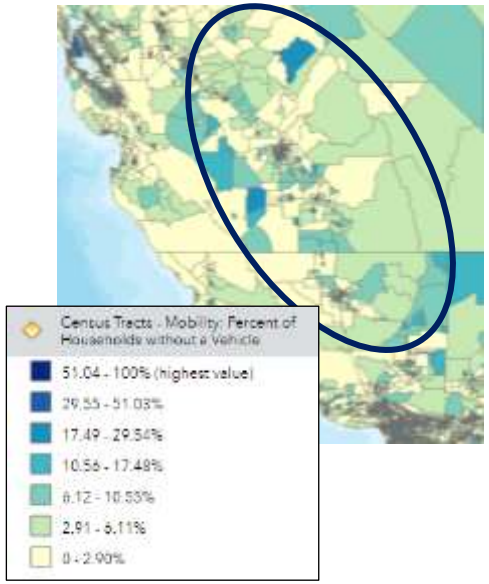
- cooling centers
- transportation
- neighbor-to-neighbor check-ins

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:

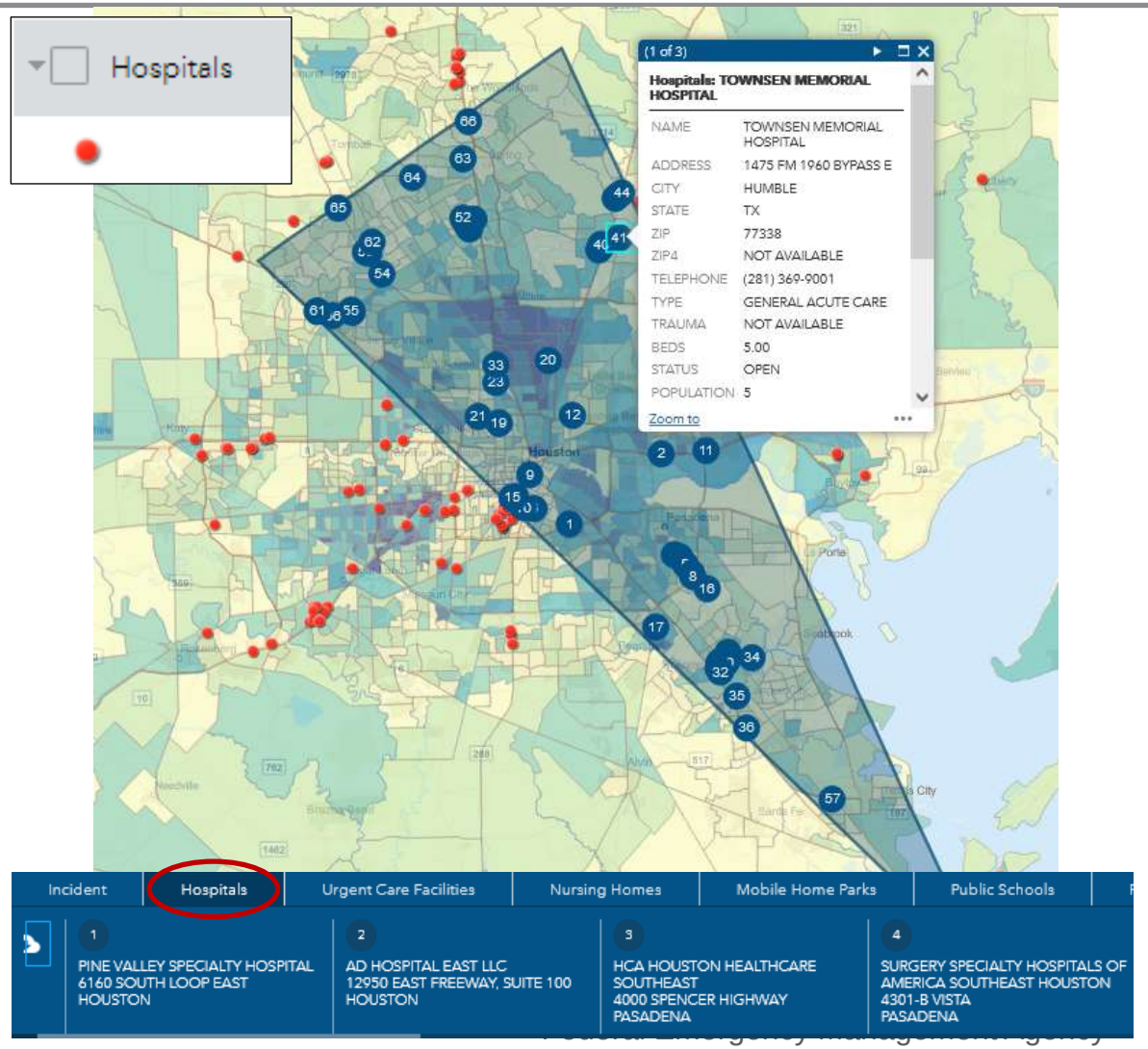
Hospitals in path of storm and outside potentially affected area

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

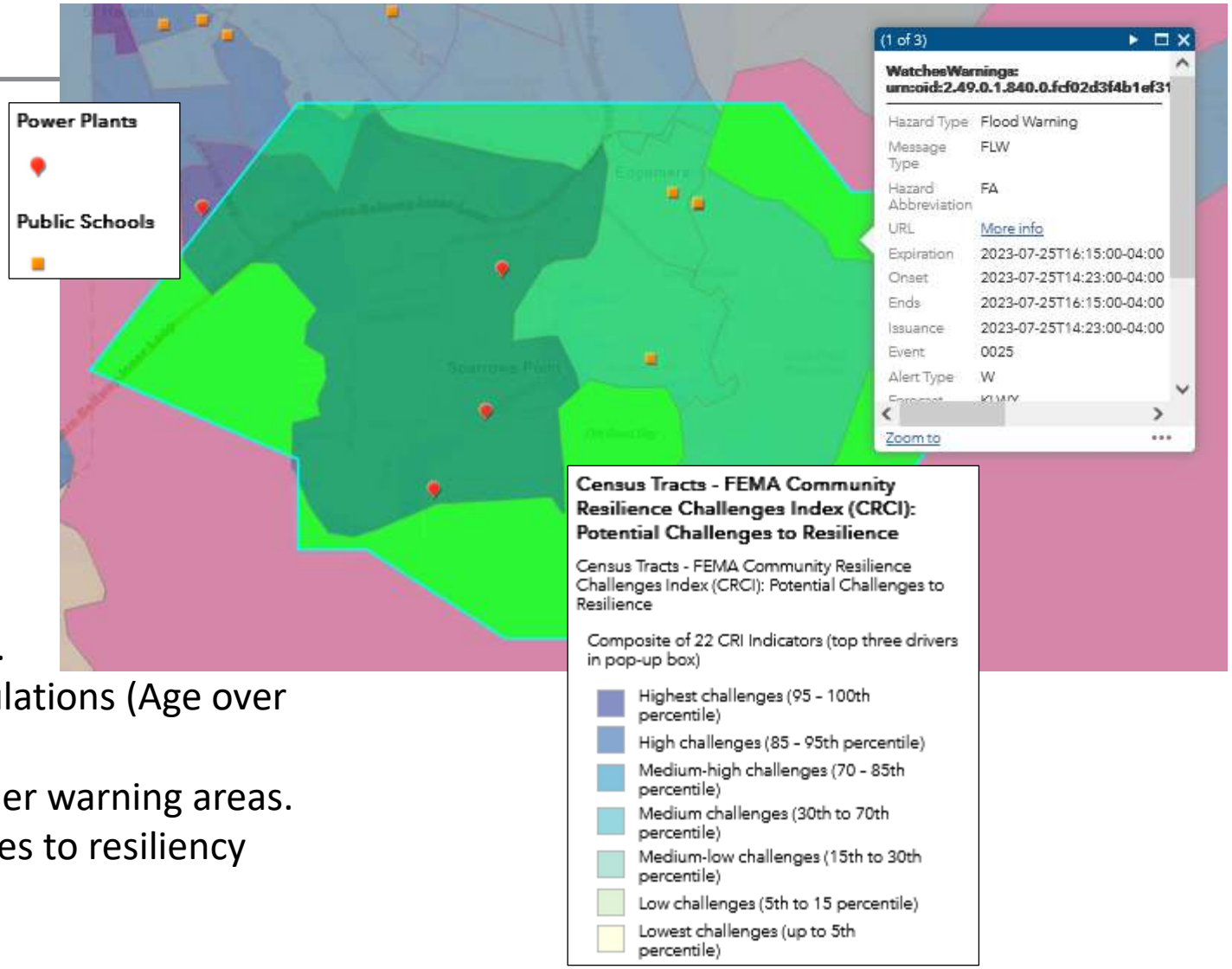
Infrastructure:

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 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!!

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Grant Equity Threshold Tool (GETT)

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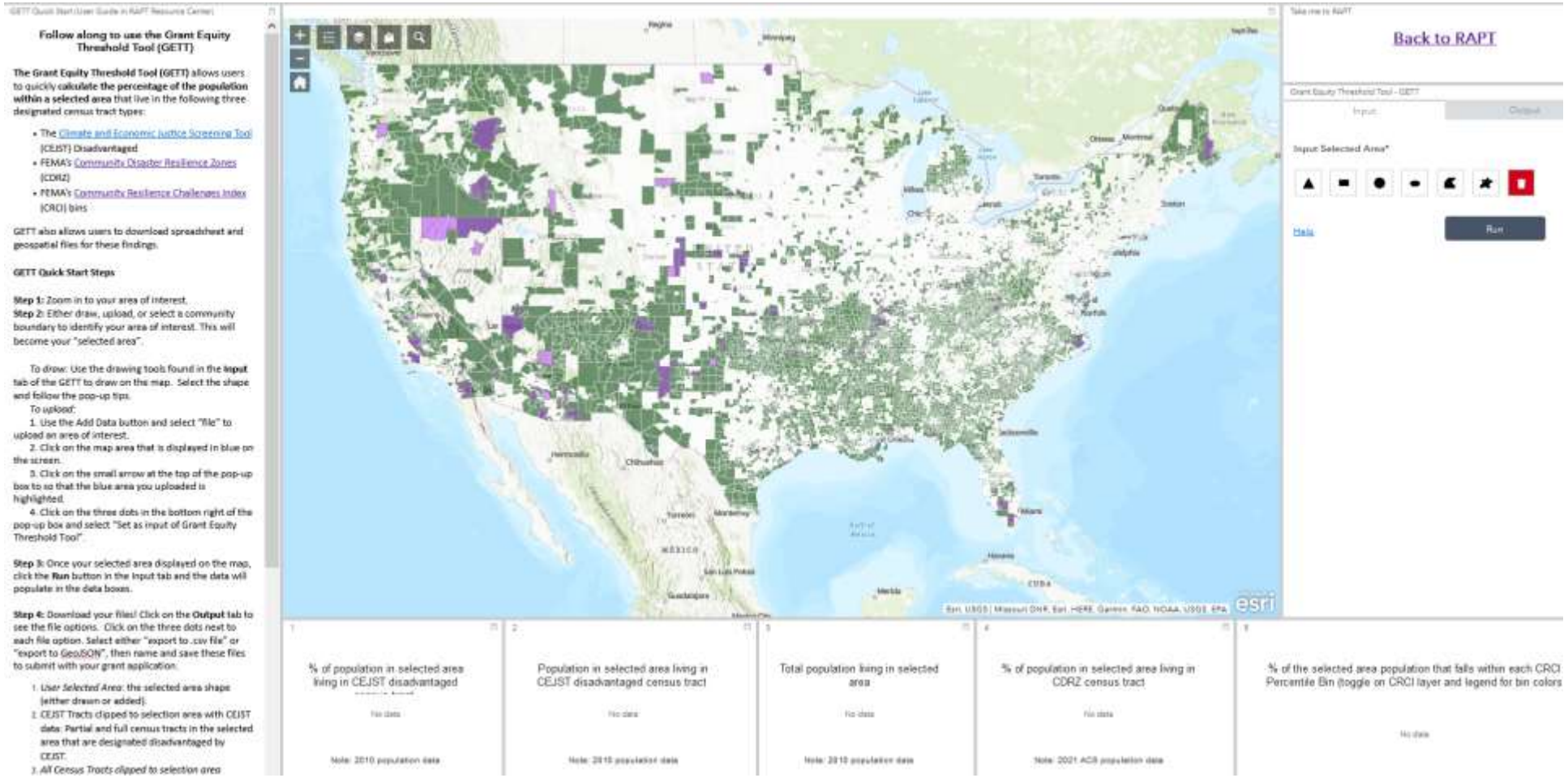
Grant Equity Threshold Tool



Follow along to use the Grant Equity Threshold Tool (GETT)

The Grant Equity Threshold Tool (GETT) allows users to quickly **calculate the percentage of the population within a selected area** that live in the following three designated census tract types:

- The Climate and Economic Justice Screening Tool (CEJST) Disadvantaged
- FEMA's Community Disaster Resilience Zones (CDRZ)
- FEMA's Community Resilience Challenges Index (CRCI) bins

GETT also allows users to download spreadsheet and geospatial files for these findings.

GETT Quick Start Steps

Step 1: Zoom in to your area of interest.
Step 2: Either draw, upload, or select a community boundary to identify your area of interest. This will become your "selected area".

To draw: Use the drawing tools found in the **Input** tab of the GETT to draw on the map. Select the shape and follow the pop-up tips.
To upload:
1. Use the Add Data button and select "file" to upload an area of interest.
2. Click on the map area that is displayed in blue on the screen.
3. Click on the small arrow at the top of the pop-up box to so that the blue area you uploaded is highlighted.
4. Click on the three dots in the bottom right of the pop-up box and select "Set as input of Grant Equity Threshold Tool".

Step 3: Once your selected area displayed on the map, click the **Run** button in the Input tab and the data will populate in the data boxes.

Step 4: Download your files! Click on the **Output** tab to see the file options. Click on the three dots next to each file option. Select either "export to .csv file" or "export to GeoJSON", then name and save these files to submit with your grant application.

1. *User Selected Area*: the selected area shape (either drawn or added).
2. CEJST Tracts clipped to selection area with CEJST data: Partial and full census tracts in the selected area that are designated disadvantaged by CEJST.
3. *All Census Tracts clipped to selection area*

Back to RAPT

Input Selected Area*

Help

Run

% of population in selected area living in CEJST disadvantaged

Population in selected area living in CEJST disadvantaged census tract

Total population living in selected area

% of population in selected area living in CDRZ census tract

% of the selected area population that falls within each CRCI Percentile Bin (toggle on CRCI layer and legend for bin colors

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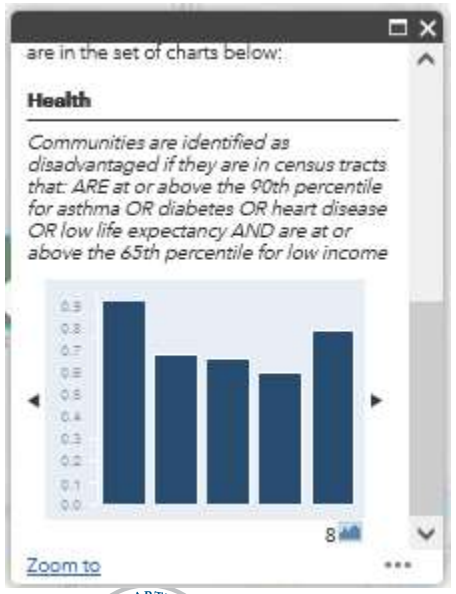
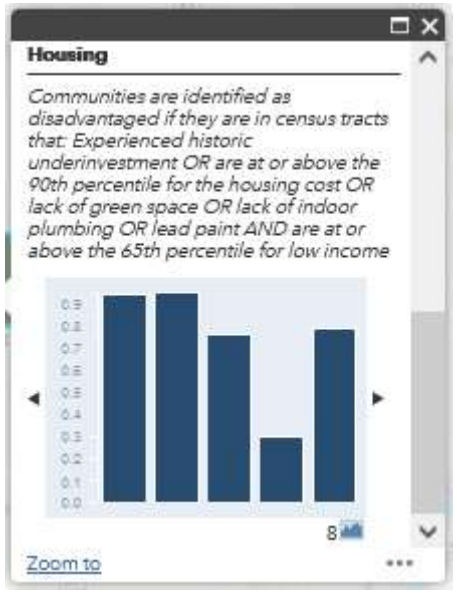
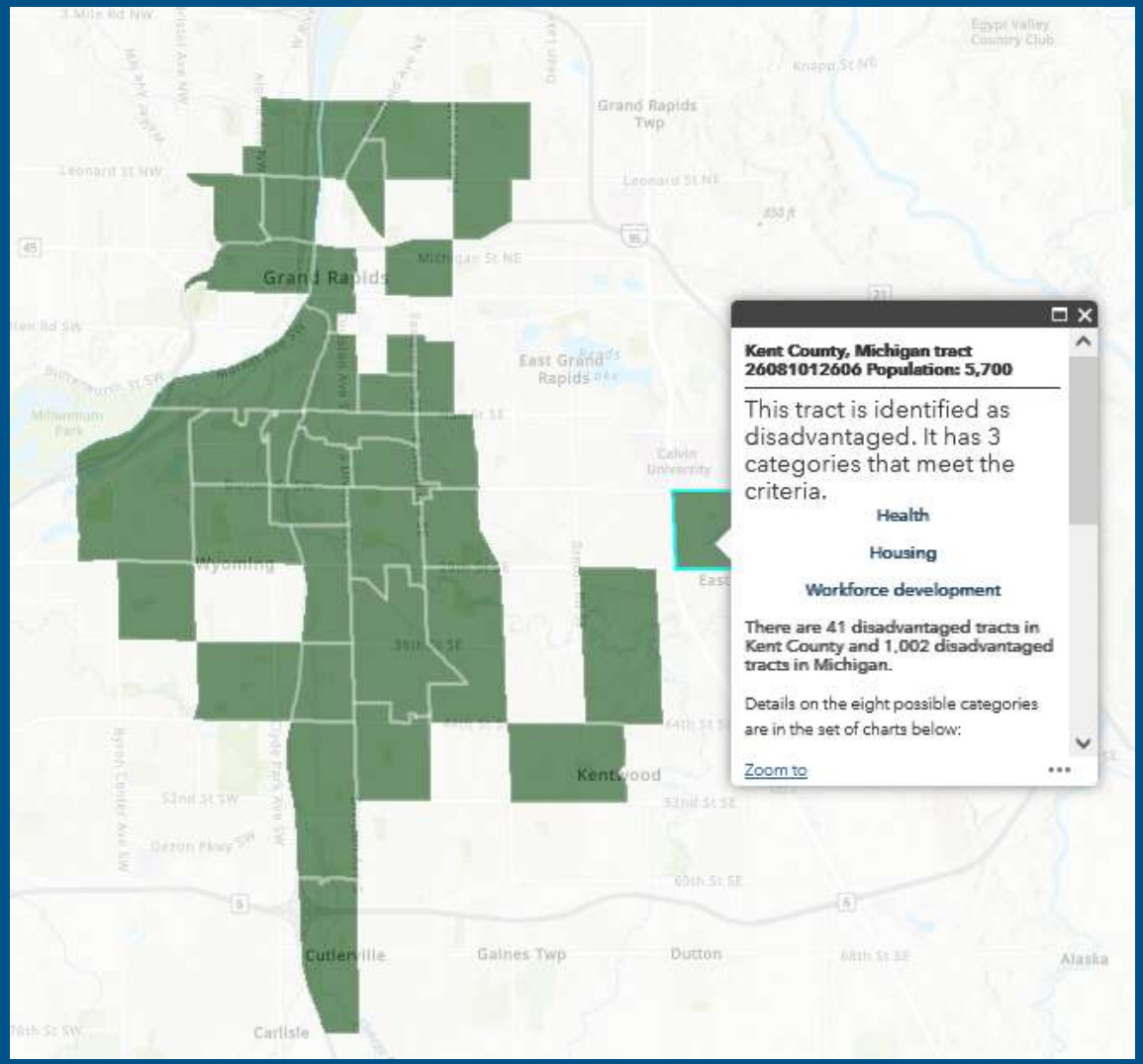
CEJST Information in GETT

- Displays CEJST Disadvantaged tracts
- Pop-up with criteria information
- Total disadvantaged tracts in County and State
- Charts of the 8 disadvantaged categories







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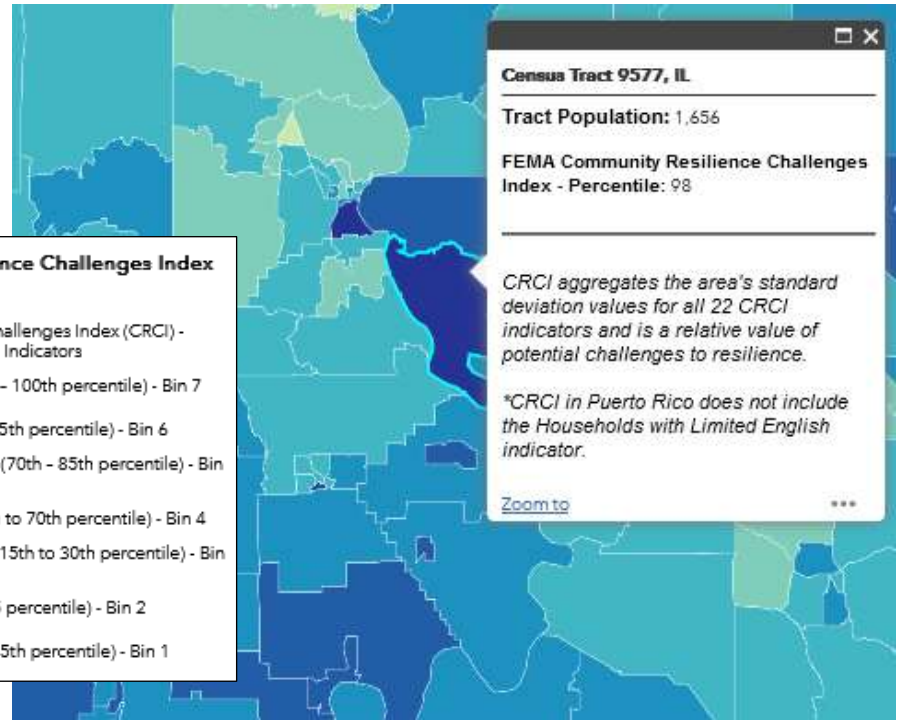
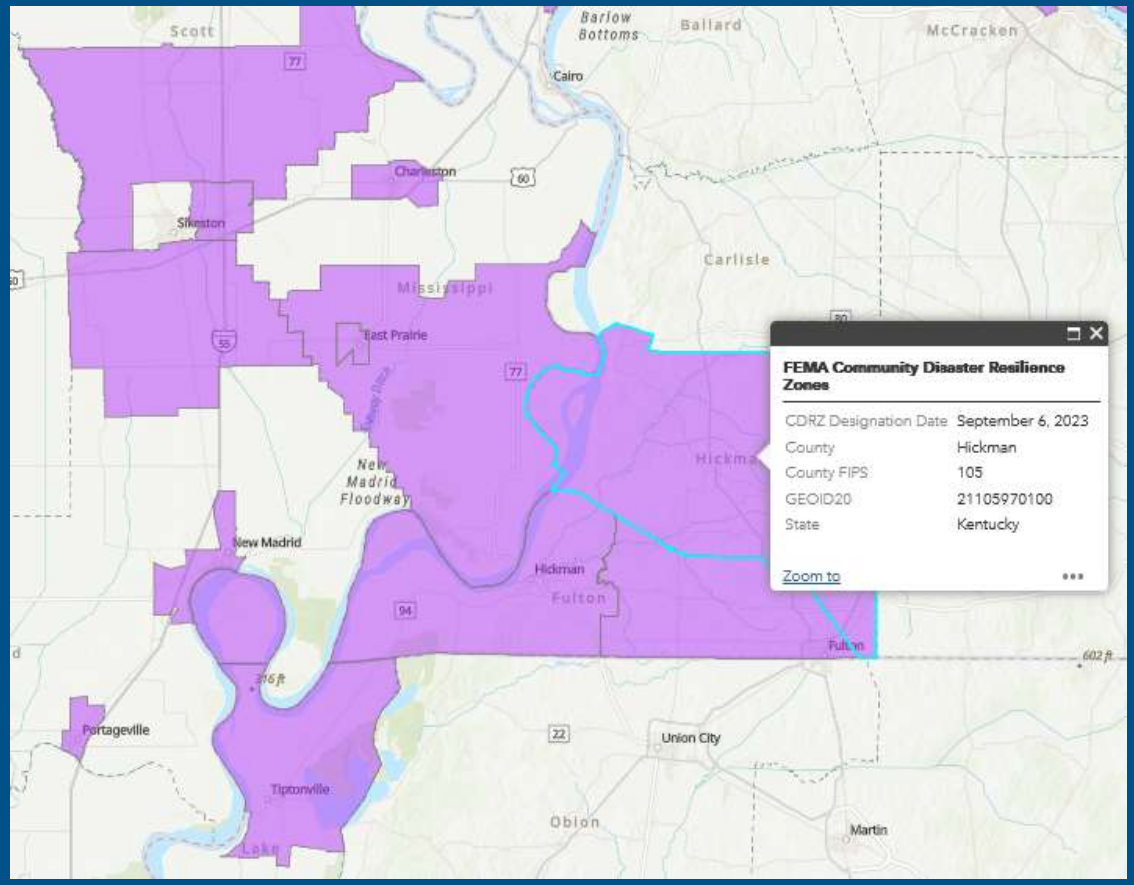
CDRZ and CRCI Information in GETT

- Displays CDRZ tracts
- Displays CRCI tracts and percentile
- Pop-up with information





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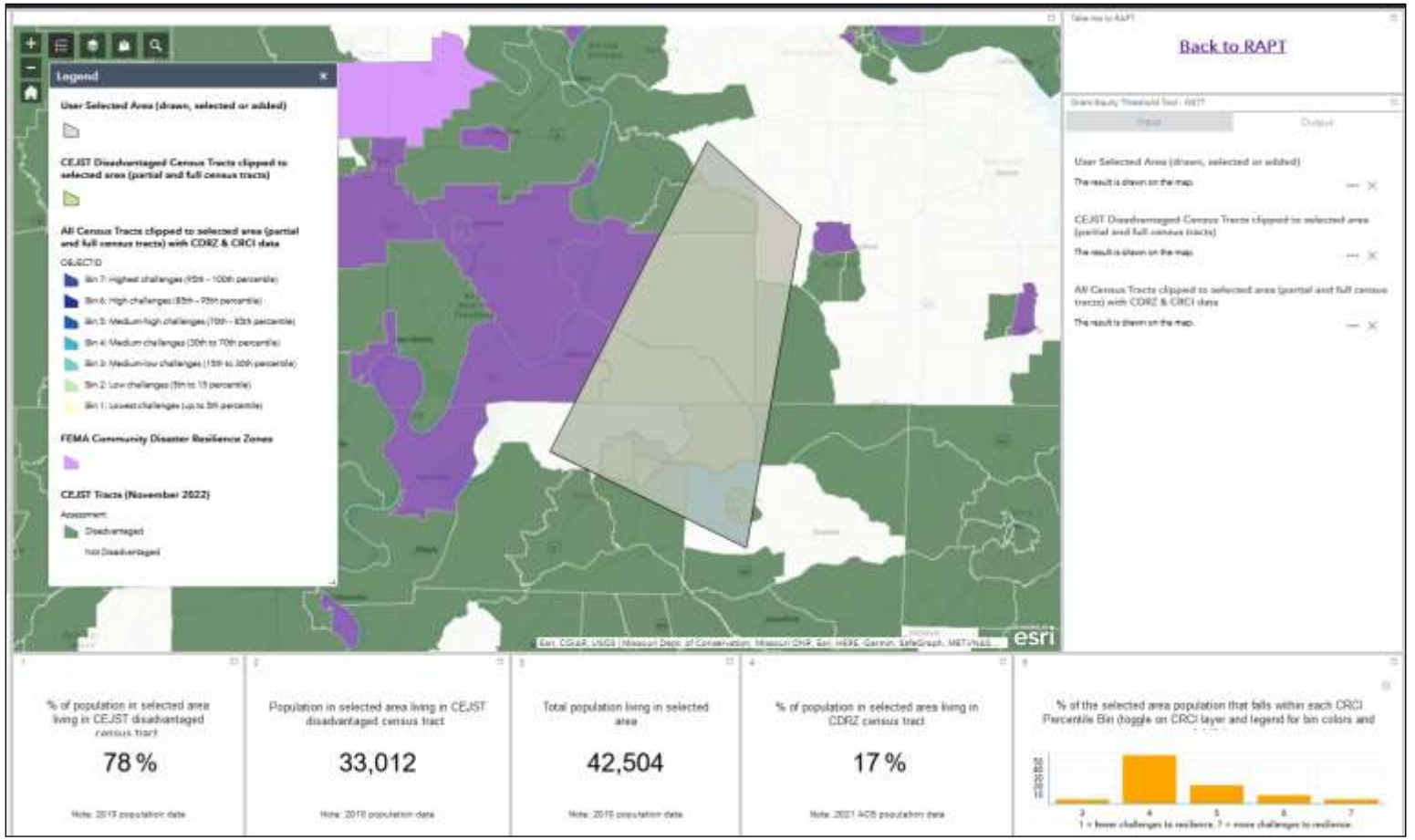
Benefitting Area and CEJST, CDRZ and CRCI Information

The GETT allows users to quickly **calculate the percentage of the population within a benefitting area** that live in the following census tracts:

- The Climate and Economic Justice Screening Tool (CEJST) Disadvantaged
- FEMA's Community Disaster Resilience Zones (CDRZ)
- FEMA's Community Resilience Challenges Index (CRCI) bins

Users create their Benefitting Area:

- Draw unique shape
- Use Community Layer
- Upload shapefile/GeoJSON



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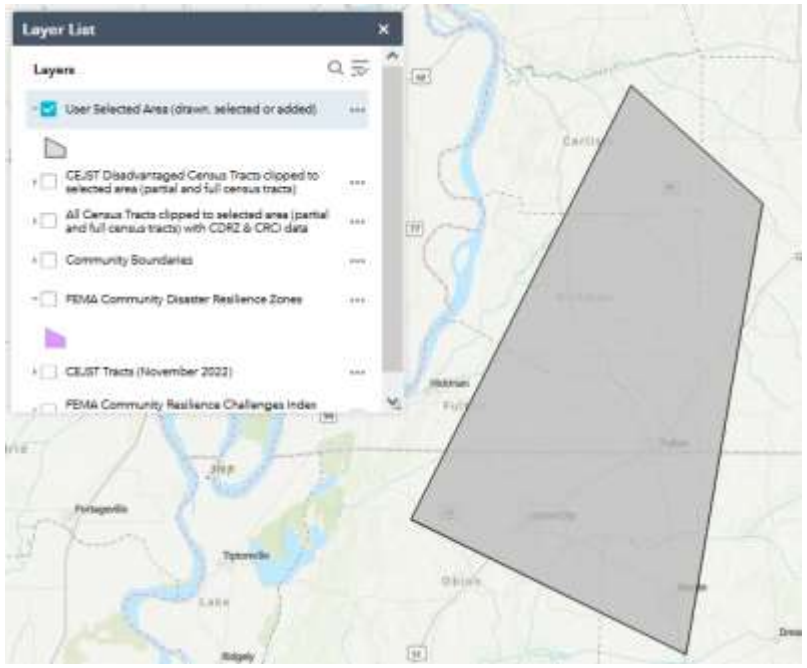
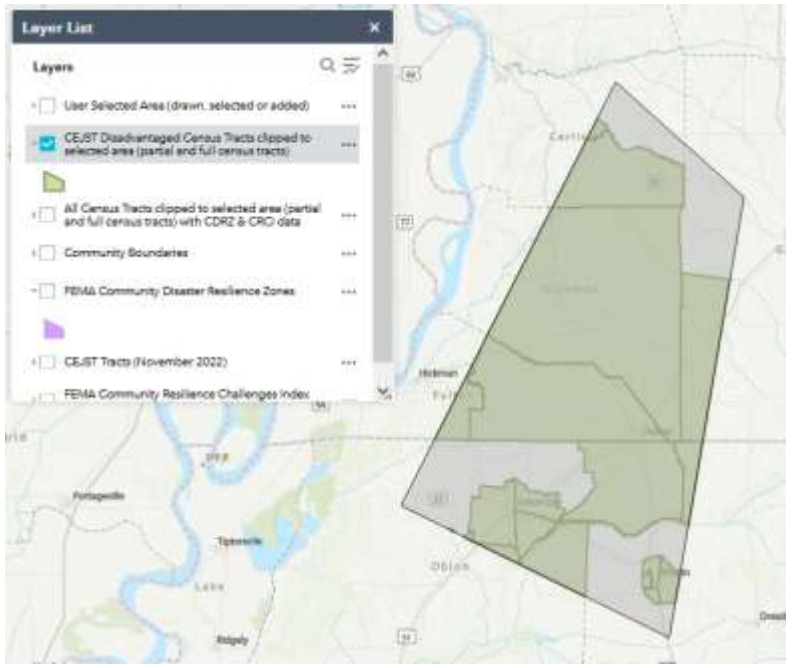
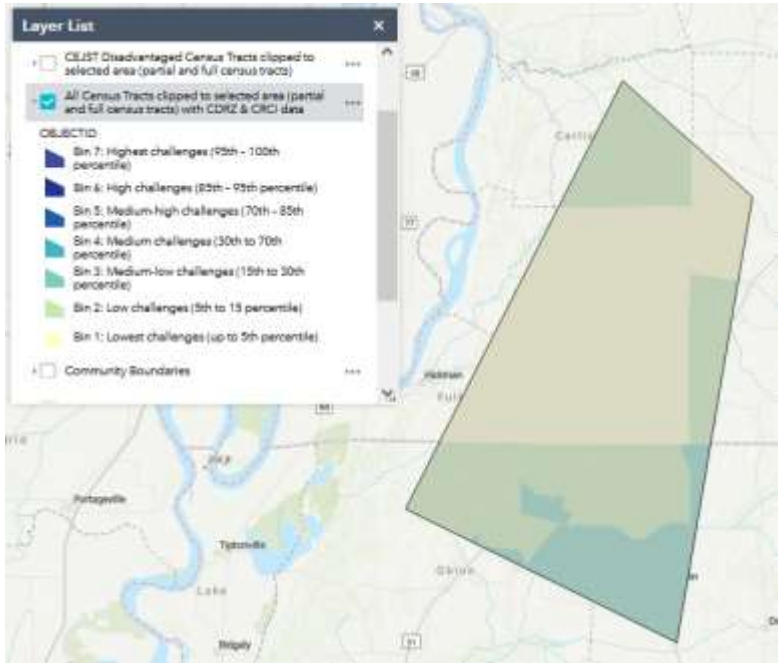
Grant Equity Threshold Tool Outputs

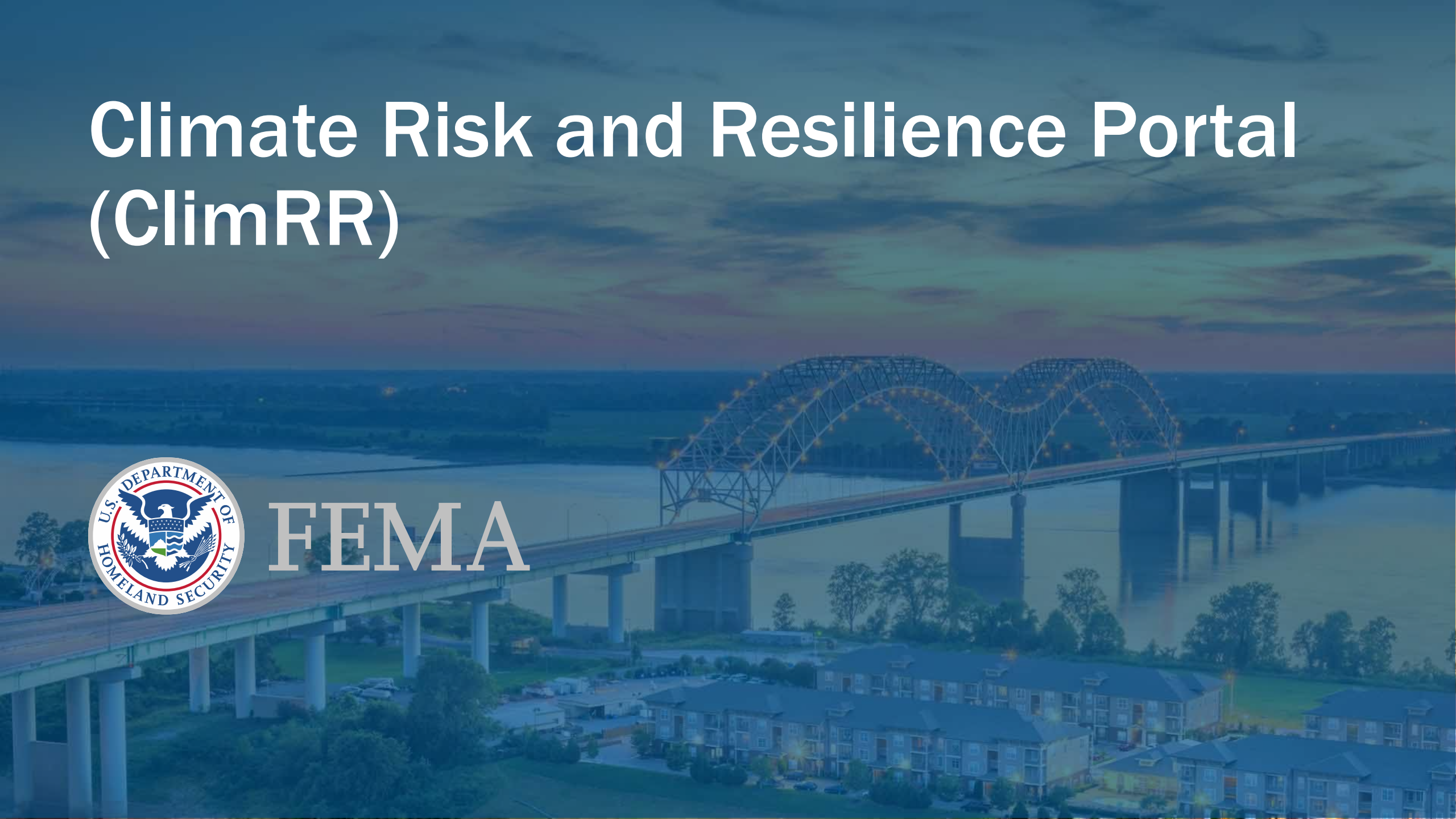
- Shapefiles / GeoJSONs of each layer
- Excel document with all tracts listed







Climate Risk and Resilience Portal (ClimRR)



Climate Risk & Resilience Portal (ClimRR): Goals

- Provide free and equitable access to leading, peer-reviewed climate datasets.
- Empower non-technical individuals, organizations, planners and officials at state, local, tribal, and territorial governments to analyze climate risk to support decision-making and adaptation efforts.
- Contextualize how climate risks factor into equity considerations and barriers to community and infrastructure disaster resilience.
- ClimRR is the outgrowth of a public-private partnership between Argonne National Laboratory, FEMA, and AT&T.

CENTER FOR CLIMATE RESILIENCE AND DECISION SCIENCE
Argonne National Laboratory

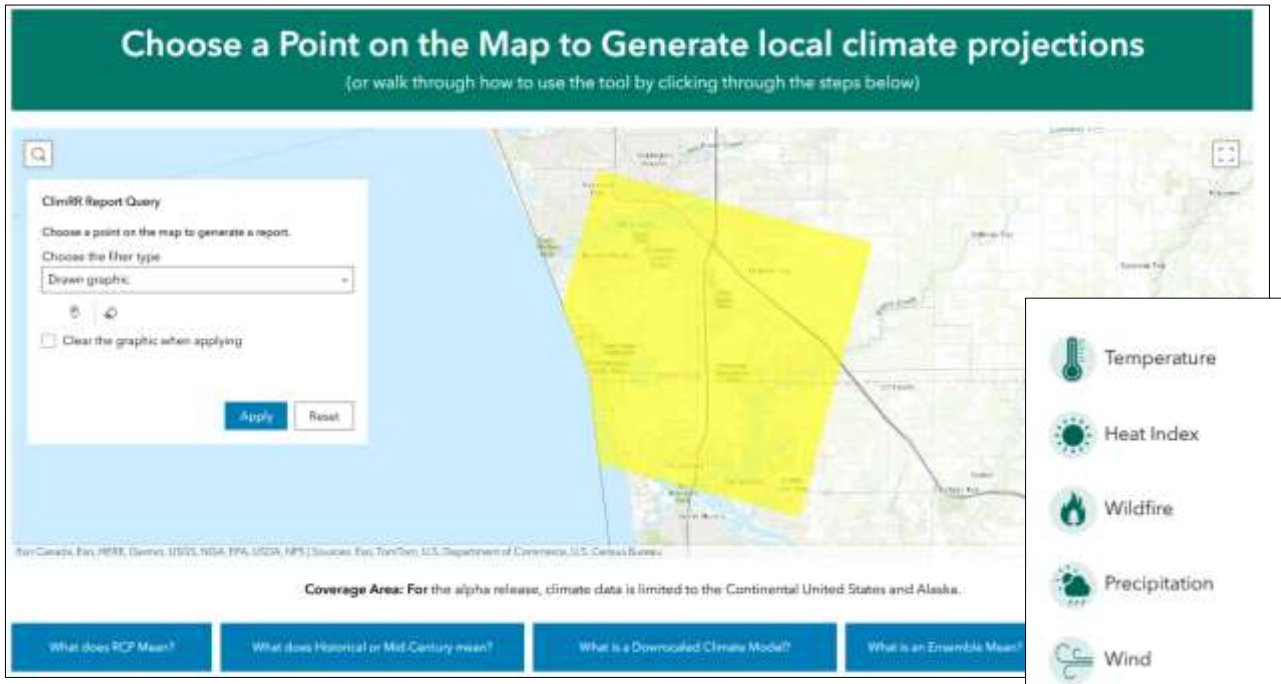
FEMA

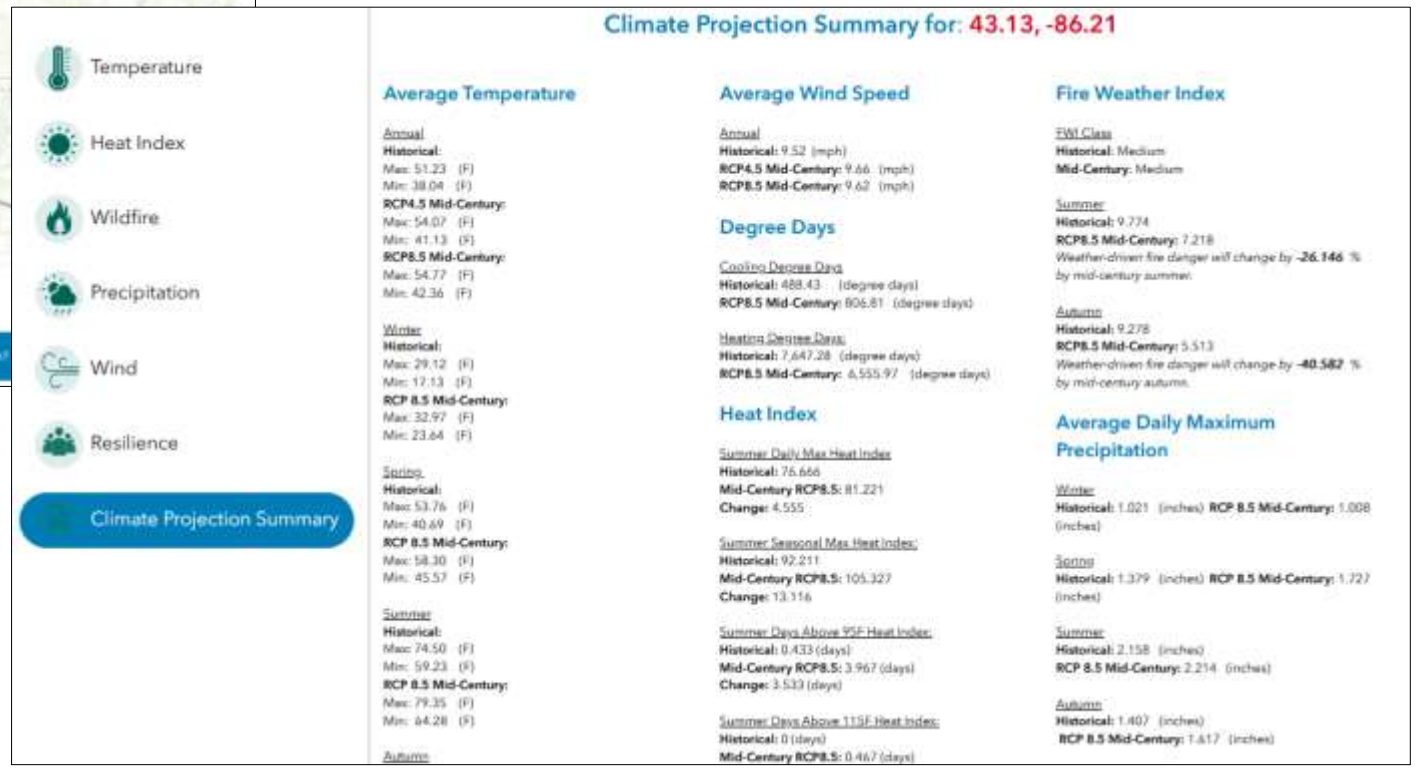
AT&T

Dynamical Downscaling

- From coarse resolution (100-200km) to high resolution, community-level data (12km)
- Downscaled data are an *ensemble mean* of three different global climate models
- Physics-based models that address non-stationarity
- Two scenarios: RCP8.5 (high emissions) + RCP4.5 (~Paris accords)
  - Useful for infrastructure protection and disaster planning
- Scientific transparency: widely published and peer reviewed modeling and outcomes
- Future release will be 9 times more precise (4km)

Location Summary





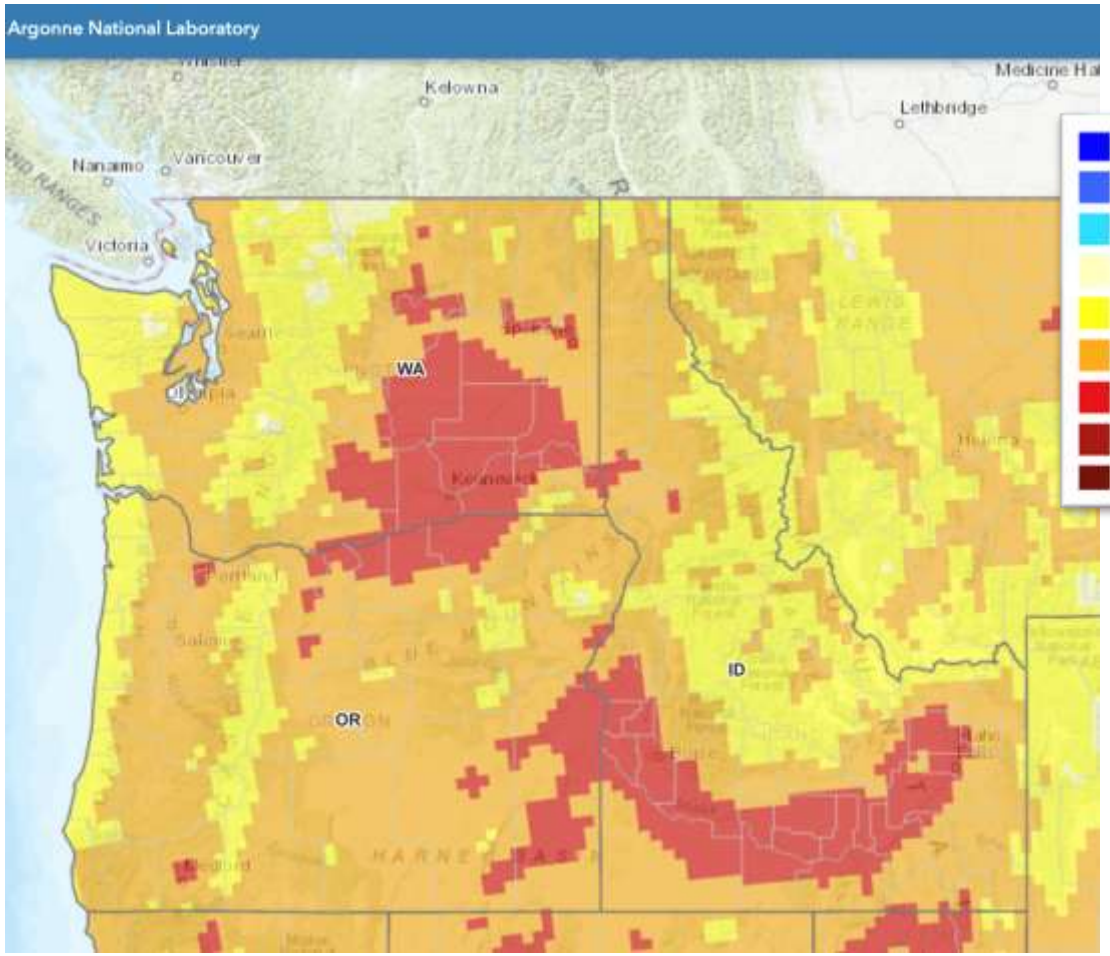
Map Explorers

- Max Temps
- Min Temps
- Precipitation
- Wind Speed
- Degree Days (high and low)
- Fire Weather
- Heat

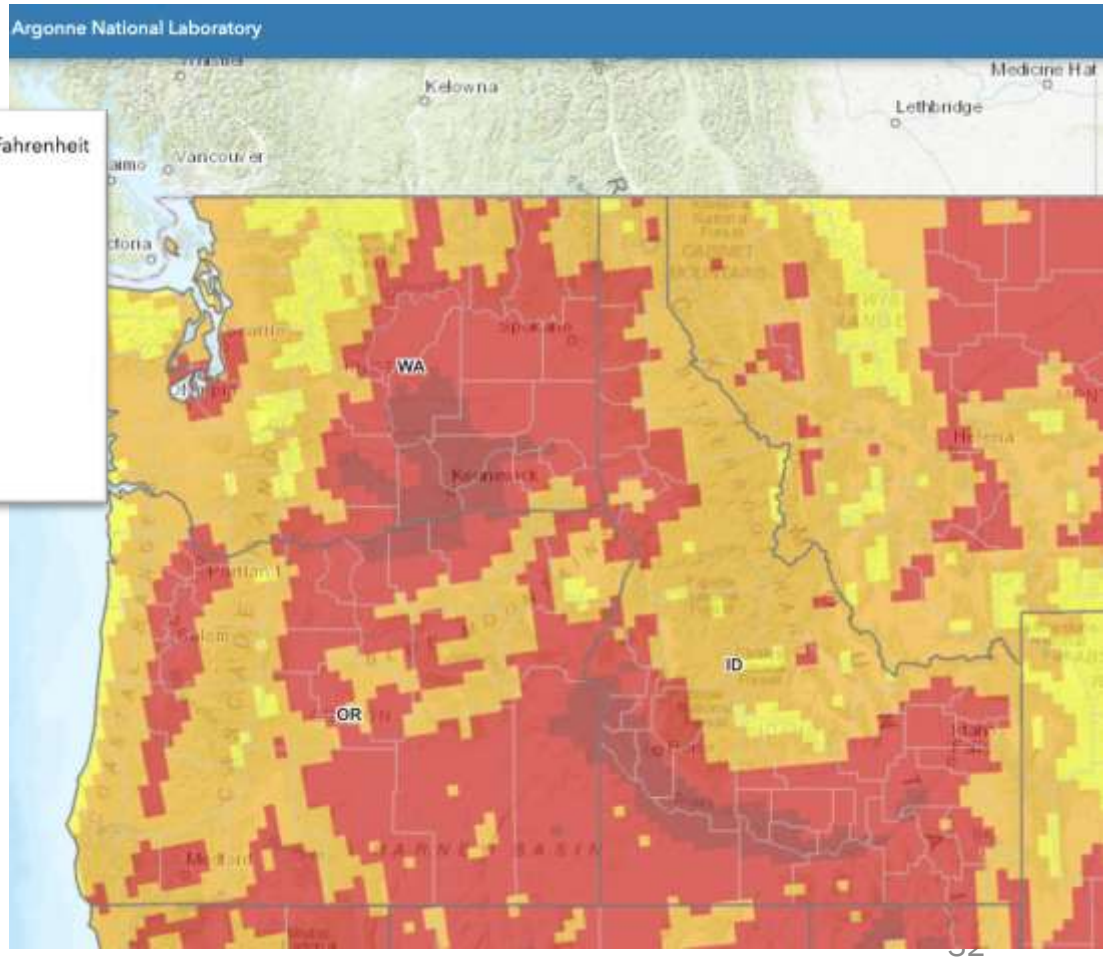
FEMA

Map Explorers

Historical Summer Temps



Mid-Century RCP8.5



Questions & Discussion

benjamin.rance@fema.dhs.gov

FEMA-TARequest@fema.dhs.gov

Creating community resilience partnerships to enhance grant application success.

***Norman Levine**, Director: Lowcountry Hazards Center & Santee Cooper GIS Laboratory*

COLLEGE of CHARLESTON
SANTEE COOPER GIS LABORATORY

InSPIRE
Innovation Summit for Preparedness & Resilience

COLLEGE of CHARLESTON
LOWCOUNTRY HAZARDS CENTER

Who am I:
Leveraging Interdisplinary Collaboration

- Norman Levine Professor of Geology & Environmental Geosciences at the University of Charleston, SC (the College of Charleston)
- Director of the Lowcountry Hazards Center, and the College's the Santee Cooper GIS and Remote Sensing Laboratory and the State's South Carolina Earthquake Education and Preparedness Program
- Steering Committee of the Charleston Resilience Network and URISA's Community Resilience Committee
- Past 10 years Dr Levine has received over 36 grants and contracts as the lead or Co-PI

Overview

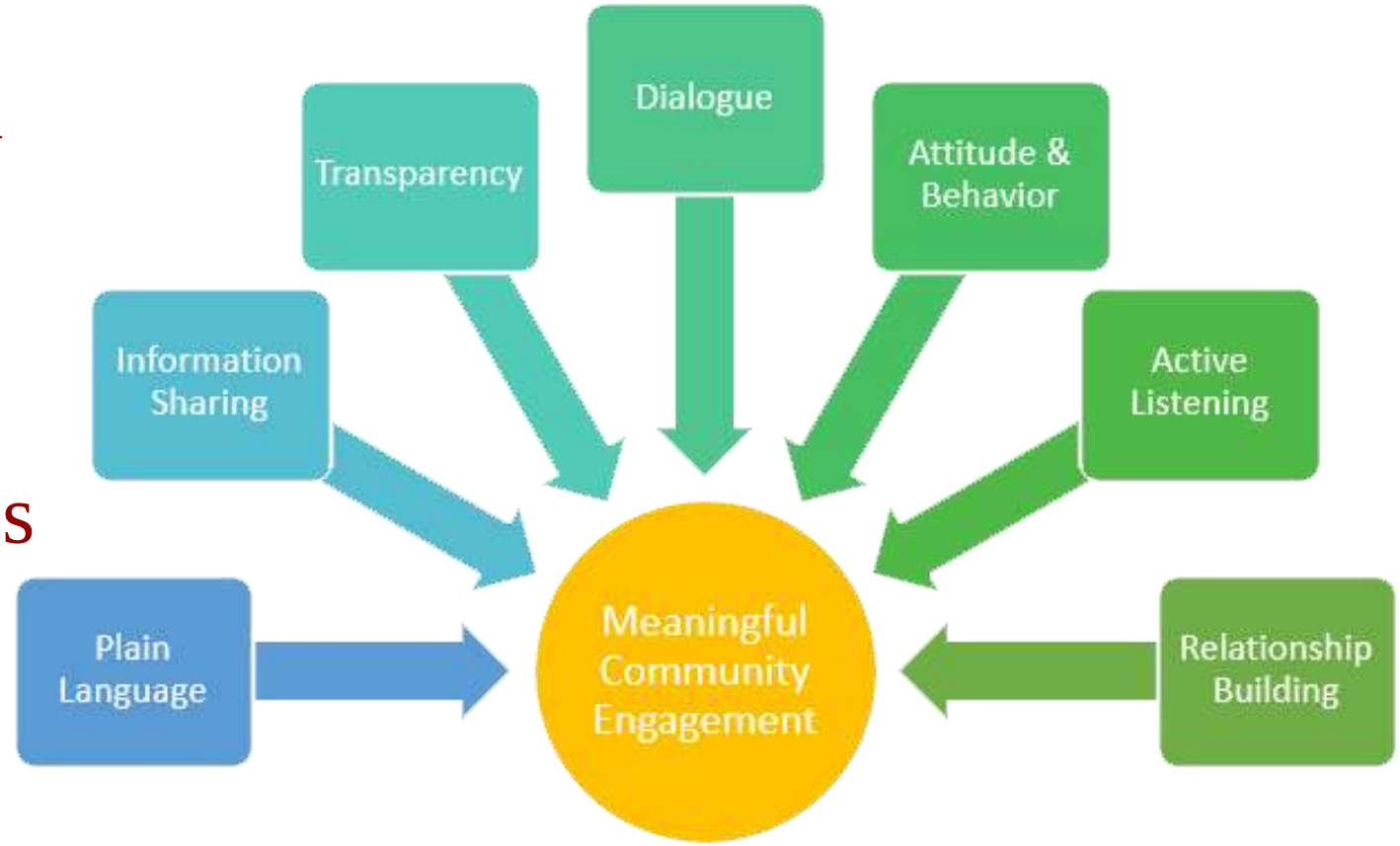
- Resilience
- Importance of community engagement in resilience-based projects
- Connection between Resilience, Inclusivity, and Project Success
- Federal Grant Programs and Resilience
- Strategies for Inclusive Community Engagement
- Capacity Building
- Case Studies – Success stories from South Carolina
- Recommendations

Resilience Projects are About Communities

- Resilience in the context of community development refers to a community's ability to withstand, adapt to, and recover from various shocks and stressors.
- Resilience goes beyond mere survival; it involves the capacity of a community to bounce back, learn, and thrive in the face of adversity.
- The inclusion of community engagement in resilience-based projects ensures the creation of enduring solution.

The importance of community engagement in resilience-based projects

Community engagement is a critical component in resilience-based projects, playing a pivotal role in ensuring the success, sustainability, and effectiveness of initiatives aimed at building resilience within communities.



Community Engagement Provides

- Community engagement provides you with information and perspectives, which can help you make decisions that consider the bigger picture and impact on all your stakeholders
- Local Knowledge and Expertise
  - valuable local knowledge about their vulnerabilities, strengths, and unique needs
- Building Trust and Social Capital
  - Establishing trust is crucial for effective collaboration, information-sharing, and the successful implementation of resilience measures

Community Engagement Provides

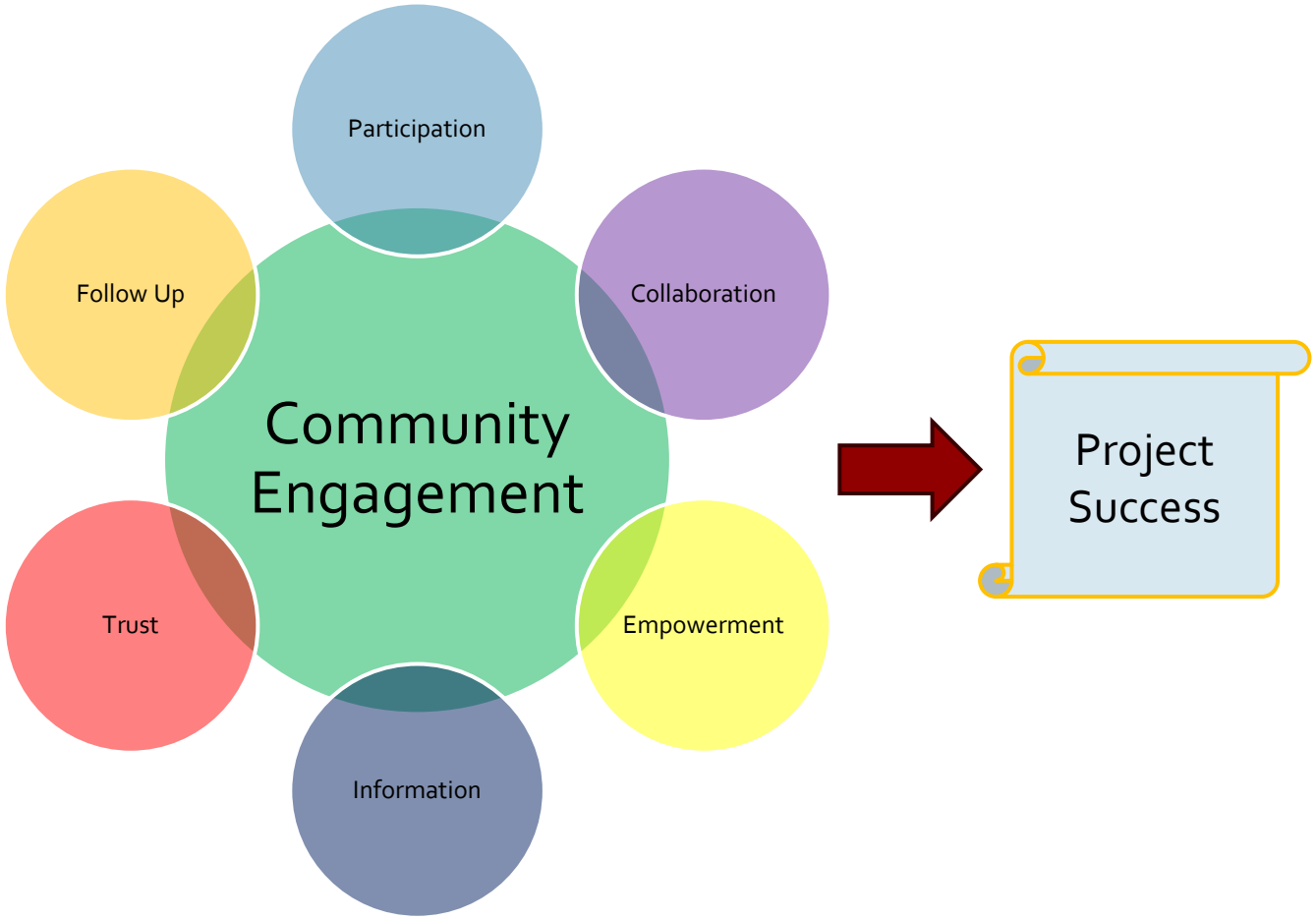
- Empowerment and Ownership
  - Engagement empowers active participation resulting in higher likelihood success
- Providing Tailored solutions
  - Tailored solutions are more likely to be sustained and supported over time

Pros of Community Engagement

- In times of crisis, a community that has been engaged in the resilience-building process is more likely to respond rapidly and effectively.
- The community's active involvement allows for quicker adaptation to changing circumstances.
- Engaged communities are more likely to sustain resilience efforts beyond the project's initial phases.
- Community ownership and ongoing involvement contribute to the longevity and success of resilience initiatives.

Community Engagement = Project Success

- Community engagement is not merely a step in the planning process; it is a foundational element that ensures the relevance, effectiveness, and sustainability of resilience-based projects, ultimately fostering stronger, more adaptable, and resilient communities.



So How Do We Build Resilient Communities With

Federal Grant Funding Programs

Federal Resilience Grant Programs

- Identify Appropriate Programs
- Identifying Community Needs
- Understanding Community Structure
- Building a Team
- Connecting with Program Directors
- Developing Strategies for Specific Programs

The Four Types of Federal Grant Funding

- Competitive Grants
  - Based on the Merit of Your Proposed Project
  - write up a proposal to apply and submit it to the funder. These grants are also known as “discretionary” funding.
- Pass-Through Grants
  - Under this funding structure, states have the option to distribute these funds as competitive or non-competitive based on terms and authorizing legislation of the primary award.
- Formula Grants
  - Awardees are Predetermined
  - Legislation and regulations set the formula for this type of funding, so funders must adhere to that formula when awarding grants
- Continuation Grants
  - Renewal of an Existing Grant

Federal Grant Programs and Resilience

Agency	Program Name	Grant Description
DOT	Infrastructure for Rebuilding America (INFRA) Grant Program	Primarily focused on transportation infrastructure, INFRA grants may support projects that enhance overall community resilience.
HUD	National Disaster Resilience Competition (NDRC)	A competitive grant program that provides funding to communities to help them recover from disasters and build resilience against future events.
HUD	Community Development Block Grant (CDBG) Program	Provides funding to states and local governments for various community development activities, including disaster recovery and resilience.
FEMA	Pre-Disaster Mitigation (PDM) Grant Program	Supports hazard mitigation planning and projects aimed at reducing the risk and impact of future disasters.
FEMA	Building Resilient Infrastructure and Communities (BRIC) Program	Part of the Disaster Recovery Reform Act, BRIC provides funding for projects that enhance community resilience and reduce the risk of future disasters.
FEMA	Hazard Mitigation Assistance (HMA) Grant Program	HMA grants, including the Flood Mitigation Assistance (FMA) and Pre-Disaster Mitigation (PDM) programs, support projects that reduce or eliminate the long-term risk of flood damage.
FEMA	Emergency Management Performance Grant (EMPG) Program	Provides funding to assist state and local governments in enhancing and sustaining all-hazards emergency management capabilities.
NFWF	Resilient Communities Program	Supports projects that enhance natural resources and ecosystems to help communities better withstand environmental challenges.
NFWF	National Coastal Resilience Fund (NCRF)	Supports projects that strengthen natural infrastructure and enhance the resilience of coastal communities to withstand the impacts of storms and sea-level rise.
USDA	USDA Community Facilities Direct Loan & Grant Program	Provides funding to develop essential community facilities in rural areas, including those that enhance community resilience.

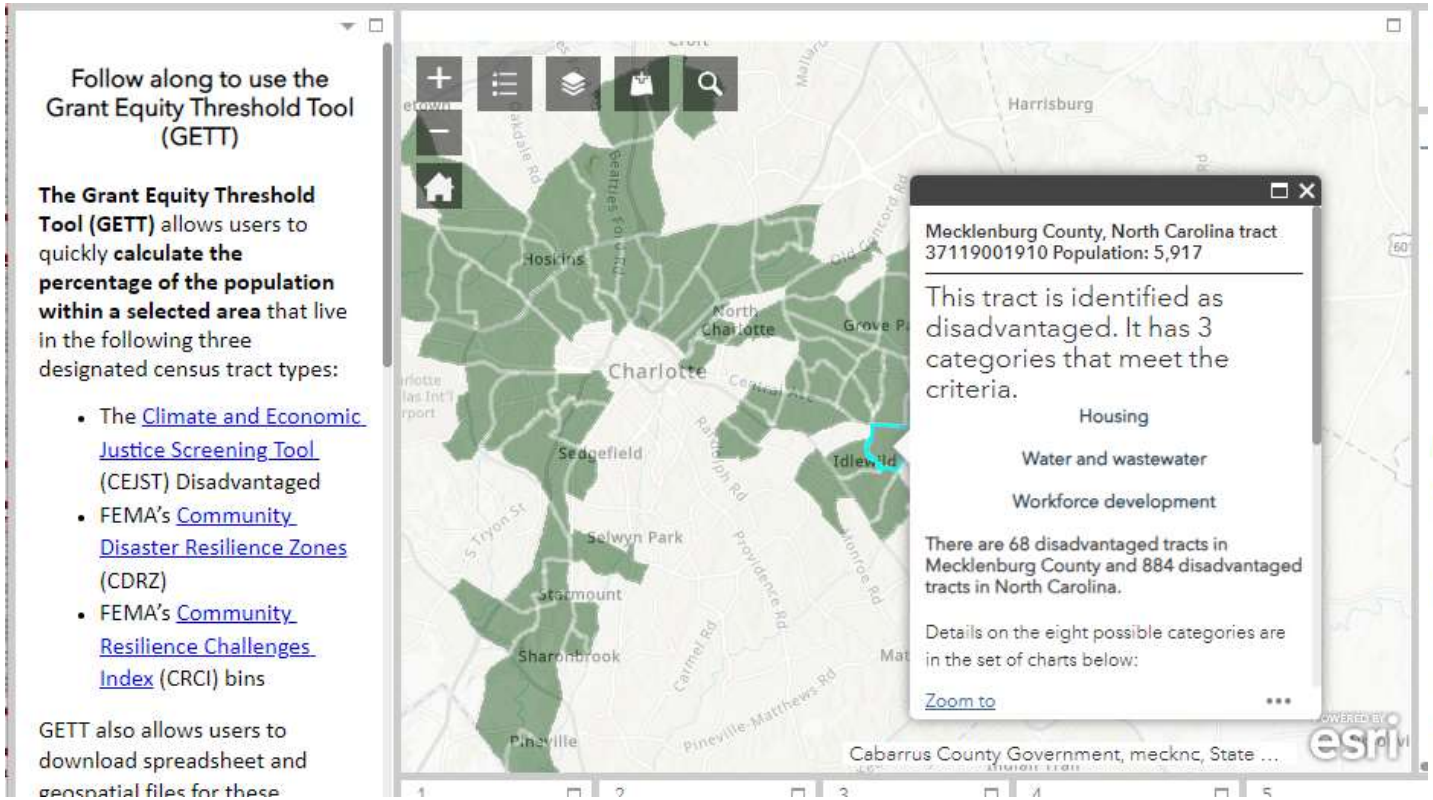
Agency	Program Name	Grant Description
NOAA	Regional Coastal Resilience Grants	Supports projects that enhance the resilience of coastal communities and ecosystems to the adverse impacts of extreme weather events, climate hazards, and changing ocean conditions.
NOAA	Coastal Ecosystem Resiliency Grants	Focuses on projects that improve the resilience of coastal ecosystems to the impacts of extreme weather events and climate-related stressors.
NOAA	Living Shorelines Grants	Supports the implementation of living shoreline projects that use natural infrastructure to increase coastal resilience and protect against erosion.
NOAA	Habitat Blueprint	Focuses on collaborative habitat restoration projects that contribute to the resilience of coastal and marine ecosystems.
NOAA	Community-based Restoration Program Coastal and Marine Habitat Restoration Grants	Supports community-driven habitat restoration projects that enhance the resilience of coastal and marine ecosystems.
NOAA	NOAA RESTORE Science Program	Funds research that informs the management and restoration of Gulf of Mexico ecosystems following the Deepwater Horizon oil spill, contributing to long-term resilience.
NOAA	Sea Grant Resilience Funding	Various Sea Grant programs, often in collaboration with NOAA, provide funding for projects that enhance the resilience of coastal communities to environmental hazards and climate change.
NOAA	Coral Reef Conservation Program Grant Opportunities	Supports projects focused on the conservation and restoration of coral reefs, contributing to the resilience of these critical ecosystems.
NOAA	National Estuarine Research Reserve System (NERRS) Collaborative Science Program	Provides funding for collaborative research projects within the NERRS that contribute to the understanding and management of estuarine ecosystems and their resilience.
NOAA	Competitive Research Program	This program funds scientific research that contributes to understanding and addressing key challenges in areas such as climate variability, ecosystem health, and coastal resilience.

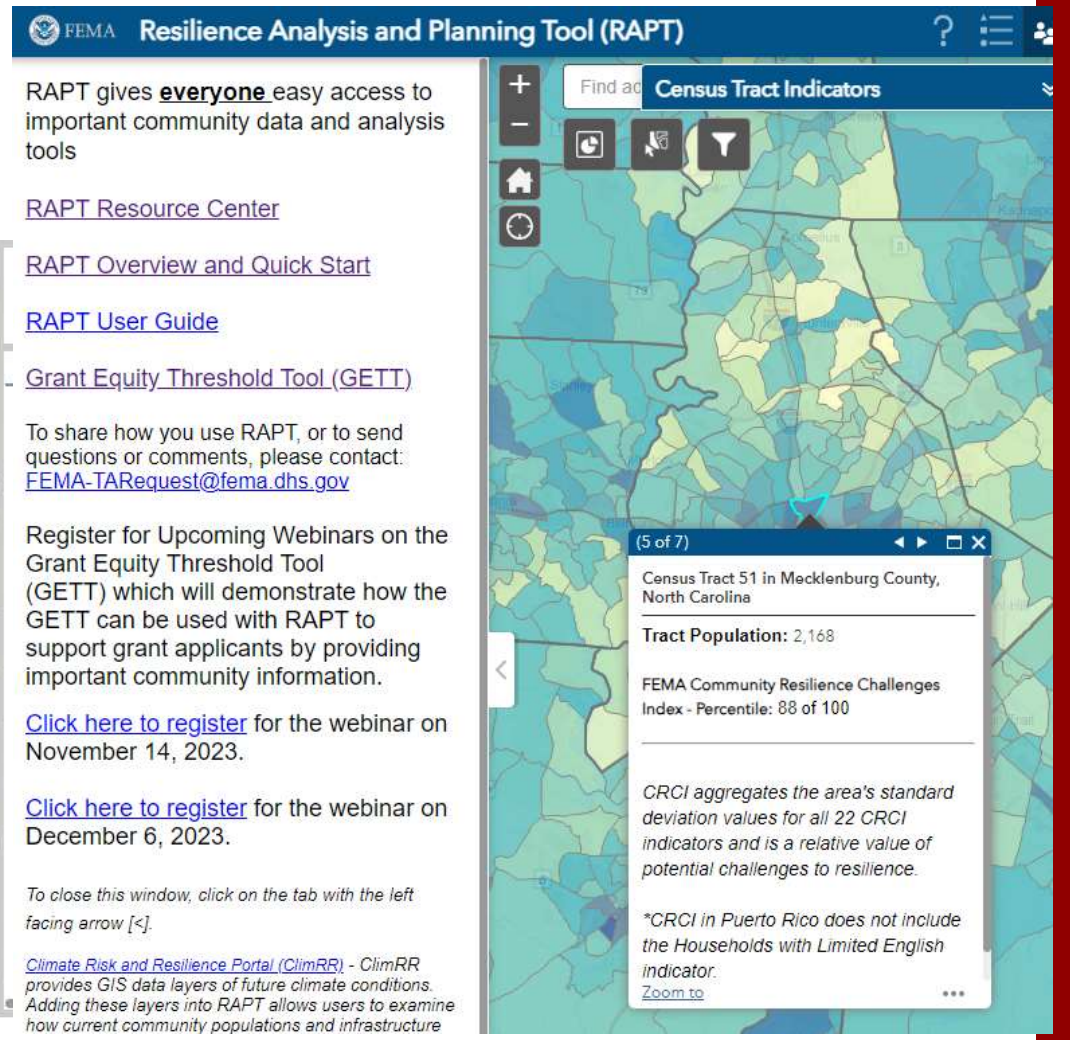
Agency	Program Name	Grant Description
EPA	Smart Growth Program	Promotes development that is sustainable, economically viable, and resilient. Encourages communities to consider the long-term impacts of development on the environment and community well-being.
EPA	Climate Ready Water Utilities	Assists water utilities in adapting to climate change impacts, including extreme weather events, to ensure the resilience of water infrastructure and services.
EPA	Environmental Justice Small Grants Program	Provides funding for projects that address environmental and public health issues in communities disproportionately affected by environmental burdens.
EPA	Brownfields Program	Helps communities assess, clean up, and redevelop contaminated properties, promoting sustainable land use and revitalizing communities.
EPA	Community Air Toxics Monitoring Program	Supports community-based air quality monitoring initiatives, empowering communities to collect data on air pollutants and address environmental health concerns.
EPA	Clean Water State Revolving Fund (CWSRF)	While primarily focused on water quality improvement projects, the CWSRF can support infrastructure projects that contribute to community resilience, such as green infrastructure for stormwater management.
EPA	Environmental Justice Collaborative Problem-Solving Cooperative Agreement Program	Provides funding for community-based organizations to collaborate with stakeholders to address environmental and public health issues, with a focus on vulnerable and overburdened communities.
EPA	National Environmental Information Exchange Network Grant Program	Supports the development of information exchange networks to enhance the sharing of environmental data, which can contribute to more informed decision-making for community resilience.
EPA	State Environmental Justice Cooperative Agreement Program	Provides funding to states to develop and implement environmental justice initiatives, working to address environmental and public health disparities in vulnerable communities.

Choosing the Correct Grant Program

Identifying Community Needs

- Identify and map disadvantaged demographic groups
- Justifying Choices





Strategies for Inclusive Community Engagement

- Identifying Partners
  - Tailoring Communication
    - multiple channels for outreach
  - Identify Communities that will be impacted
    - Create a team with Boots on the Ground
      - Start With County / Municipal Contacts
      - Regional / State Extension Agencies (Land Grant / Sea Grant)
      - Local Advocacy Groups/ NGO’s
      - Private Industry working in the region

Building Capacity and Capabilities

- It is never too early to start building capacity
- Develop your regional network though meetings and events
  - discuss needs of the groups and regions around you
  - limits redundancy in projects
  - increases chances of creating working groups that will have higher grant success rates
  - Consider providing funds to participants in your grants (Stipends – time is valuable)
- Empowering local leaders and stakeholders
  - Working groups
  - Outreach events
- Ensuring the transfer of skills, techniques, and solutions
  - These teams help to ensure that projects when finished will reach broader audiences

Case Studies – Success stories from South Carolina

- The Charleston Resilience Network
- Beaufort South Carolina Resilience and Adaptation Support Program
- South Carolina Water Quality Portal

Charleston Resilience Network

- Challenge Getting buy-in and fostering interagency cooperation
- Capacity Building

1. Establish the participation structure, topical area(s) and geographic scope for the Charleston Resilience Network

2. Promote consistent, coordinated, and comprehensive approach to support resilience planning and action across sectors in the Charleston region

3. Identify and engage stakeholders to incorporate resilience into planning, design, construction and mitigation efforts

Charleston Resilience Network

Grew out of a 2014 DHS sponsored Resilience Exercise at the College of Charleston

The **Charleston Resilience Network** works to foster a unified strategy and provide a forum to share science-based information, educate stakeholders and enhance long-term planning decisions that result in resilience.

Steering Committee

The City of Charleston • S.C. Dept. of Health and Environmental Control • S.C. Sea Grant Consortium • College of Charleston • SCANA Corporation • Berkeley-Charleston-Dorchester Council of Governments • Charleston Water System • Charleston County

Advisory: U.S. Department of Homeland Security, Office of Infrastructure Protection, National Oceanic and Atmospheric Administration

By 2019, 214 groups had participated in CRN activities. Participants came from all sectors.

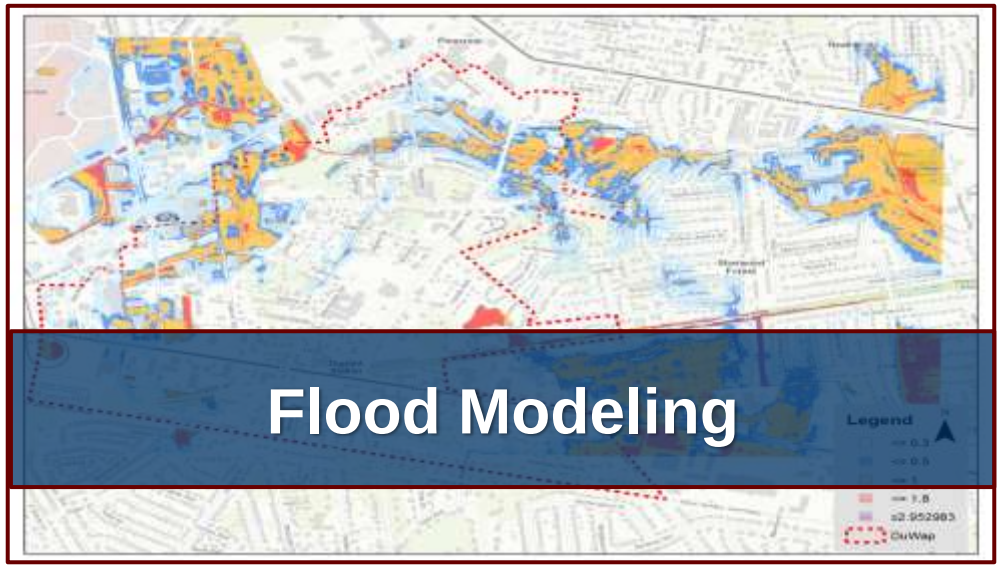
CRN Continued to function a lever for larger regional Federally Funded Projects

- Regional Flood Mapping
- Resilience toolkits
- Outreach / Community Fairs
- National Academy of Science Studies
- Regional Facilitator for Flooding Dialogs
  - Dutch Dialogs

Objectives – DHS / NOAA Funded Grants initiated 2015-2016 >$1.4M

1. Localized Place-based Modeling and Mapping
2. Community Awareness and Engagement
3. Integrative and Collaborative

Building Community Resilience to Water-Related Hazards in the Charleston, S.C. Region: A Charleston Resilience Network Initiative

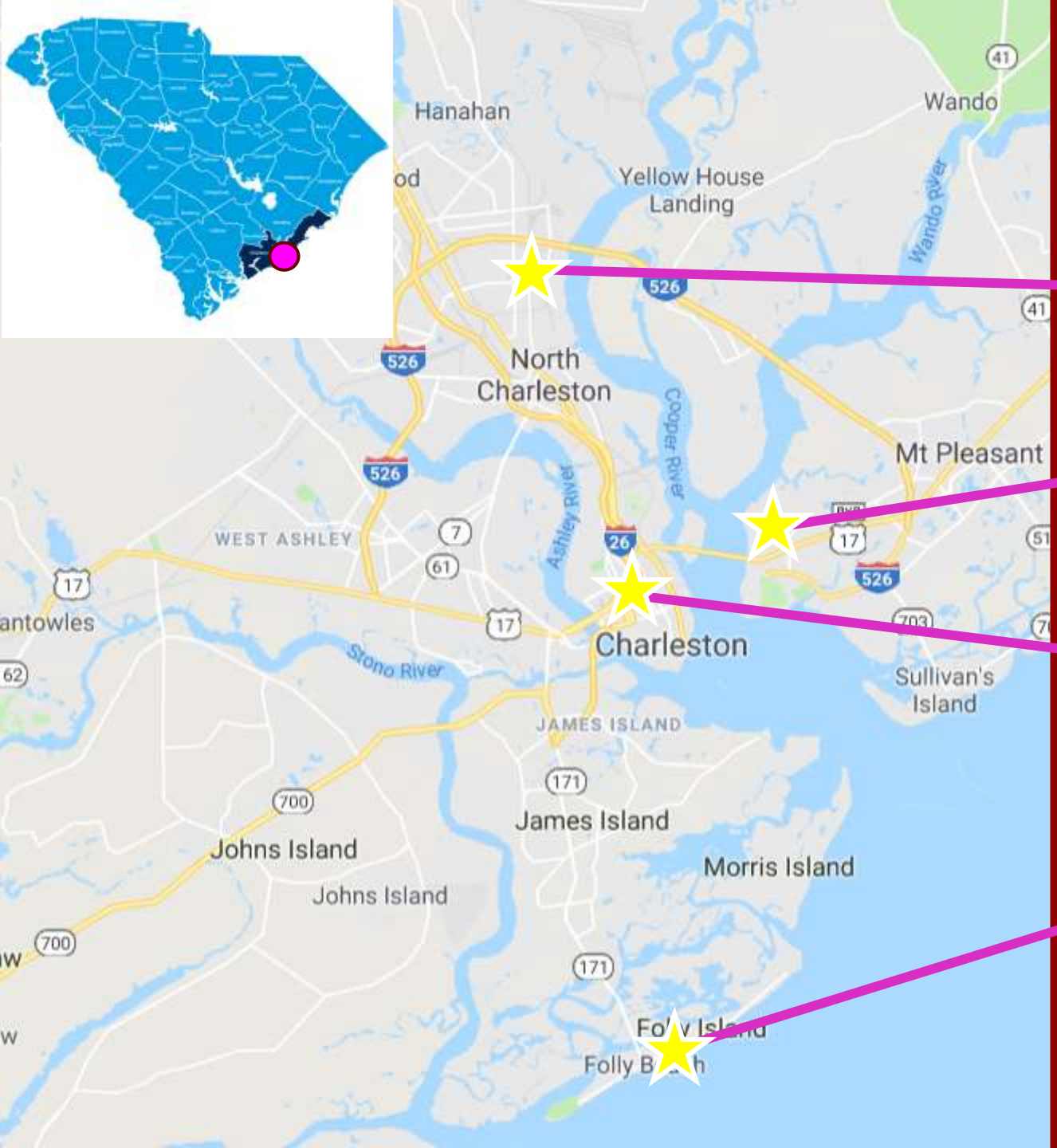


NOAA Sea Grant S.C. Sea Grant Consortium | Charleston Resilience Network | College of Charleston Lowcountry Hazards Center | The Citadel | CISA Carolinas Integrated Sciences and Assessments | NOAA RISA Regional Integrated Sciences and Assessments

Developing a plan

Engagement – Science – Engagement- Actionable Results

- Started with Challenge regional Flooding – No Good models of flooding existed for the region
- Gathered Players
  - Municipalities across region each with their own specific types of flooding issues
- Gathered Science Team
  - Multiple universities for work and State/ Federal agencies for oversite
- Community Engagement
  - Listened to Concerns and perceptions about the problems and causes
- Developed plans to address issues
  - Mapping and identification of mitigation strategies useful
- Re-engage the communities – Integrate results into regional Plans



Selected Neighborhoods

- City of North Charleston
- Town of Mt. Pleasant
- Lower Peninsula, Charleston
- City of Folly Beach

Results

1. Examine and determine on a parcel-level scale the capacity of critical infrastructure in the Charleston region to effectively absorb impacts of flooding events

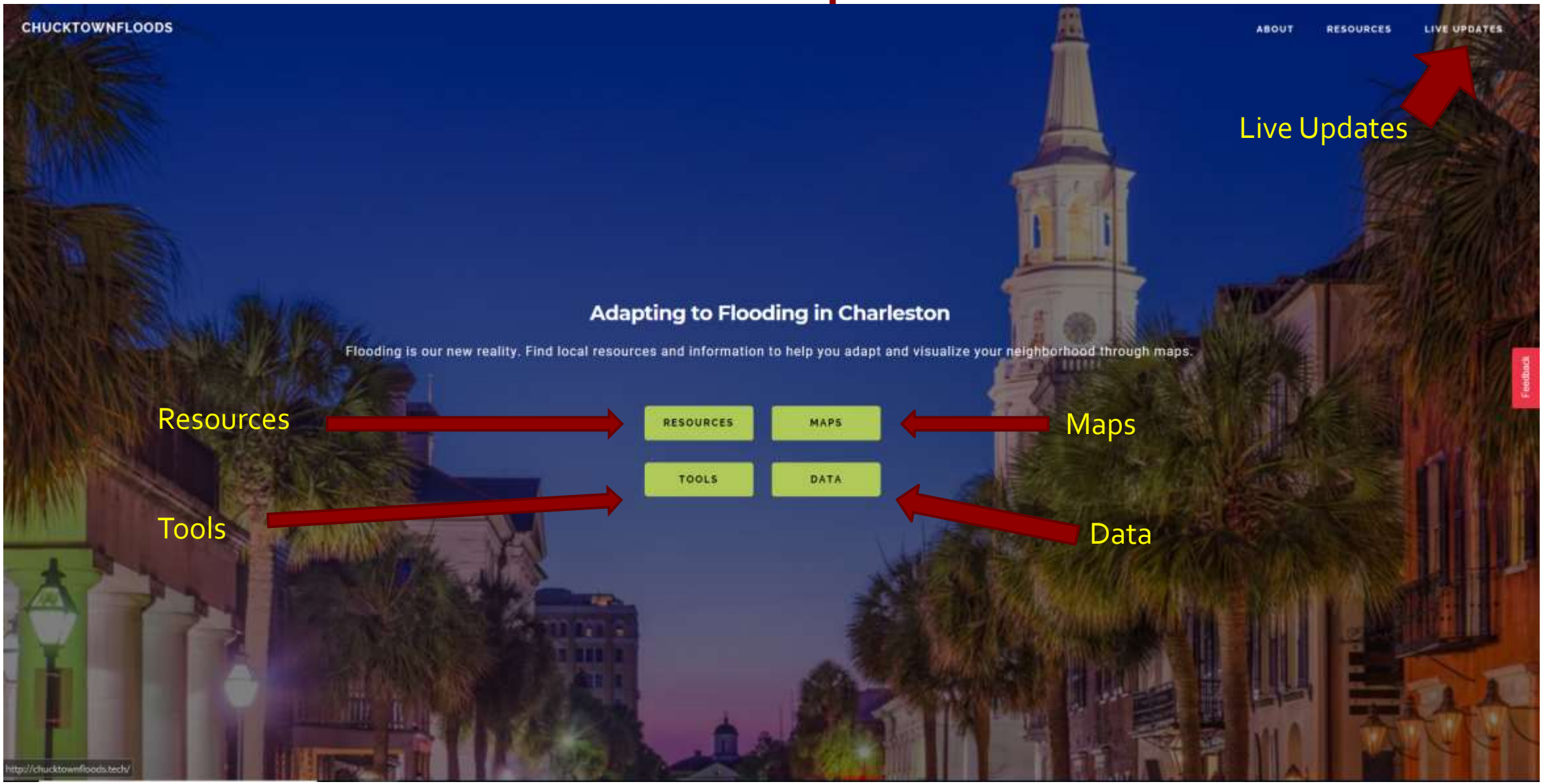
2. Produce detailed information and analyses that will assist multiple stakeholders and organizations as they move from resiliency planning to implementation

3. Foster a unified strategy and provide a forum to share science-based information, educate stakeholders and enhance long-term planning decisions that result in resilience.

Resilience Support Project - The Challenge

- The Charleston, S.C. coastal region is subject to the risks posed by a variety of chronic (e.g., tidal flooding) and episodic (e.g., hurricanes) hazards. We need tools for flooding resilience.
- The development and dissemination of flooding resiliency information and tools are ubiquitous.
  - We identified hundreds of such tools nationwide.
- How applicable are these to the Charleston, SC region?
- How can we develop coastal flooding resiliency and adaptation tools for use in maintaining and enhancing the resiliency of critical infrastructure sectors?

Solution Platform Independent Toolkit

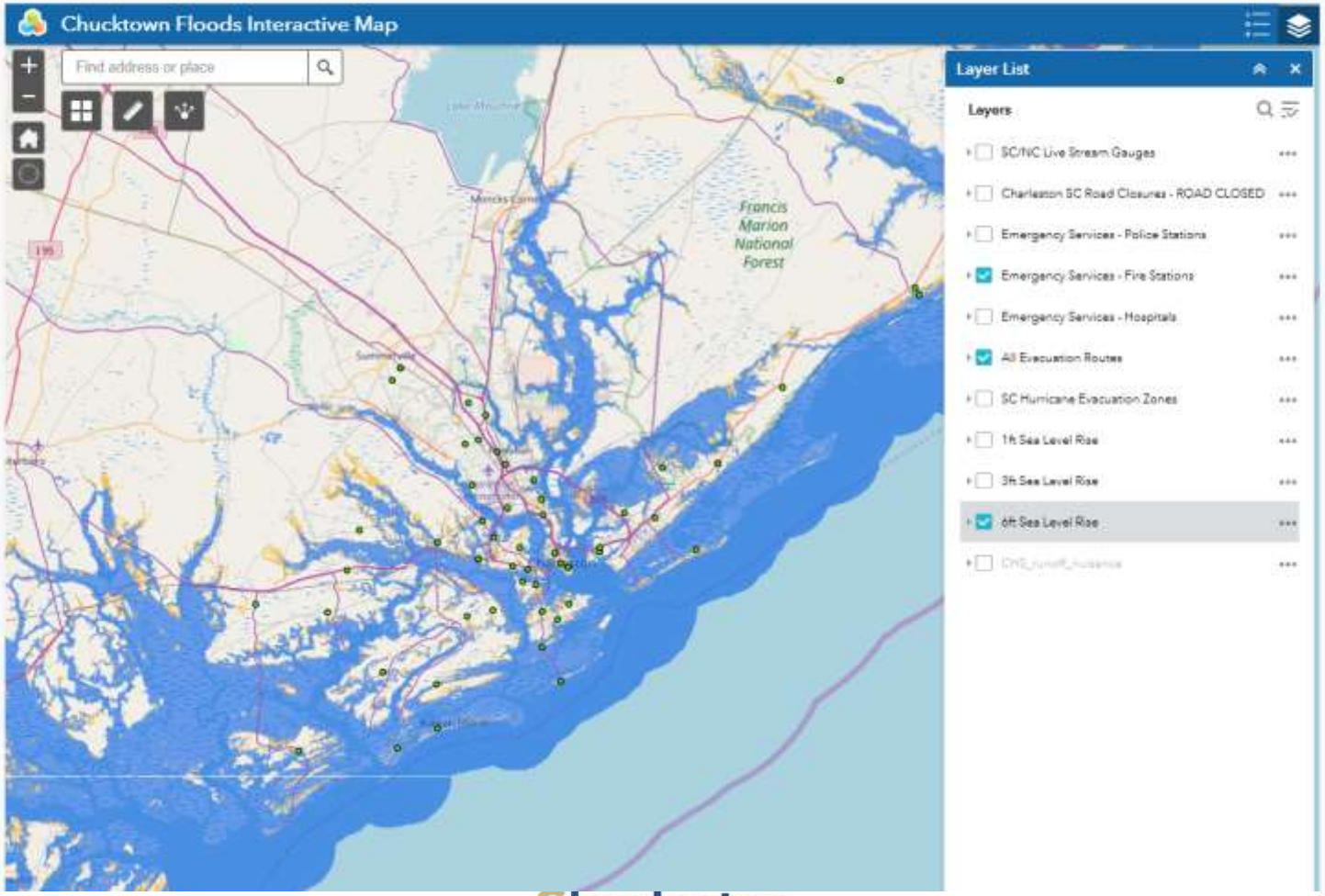


CHUCKTOWNFLOODS

ABOUT RESOURCES LIVE UPDATES

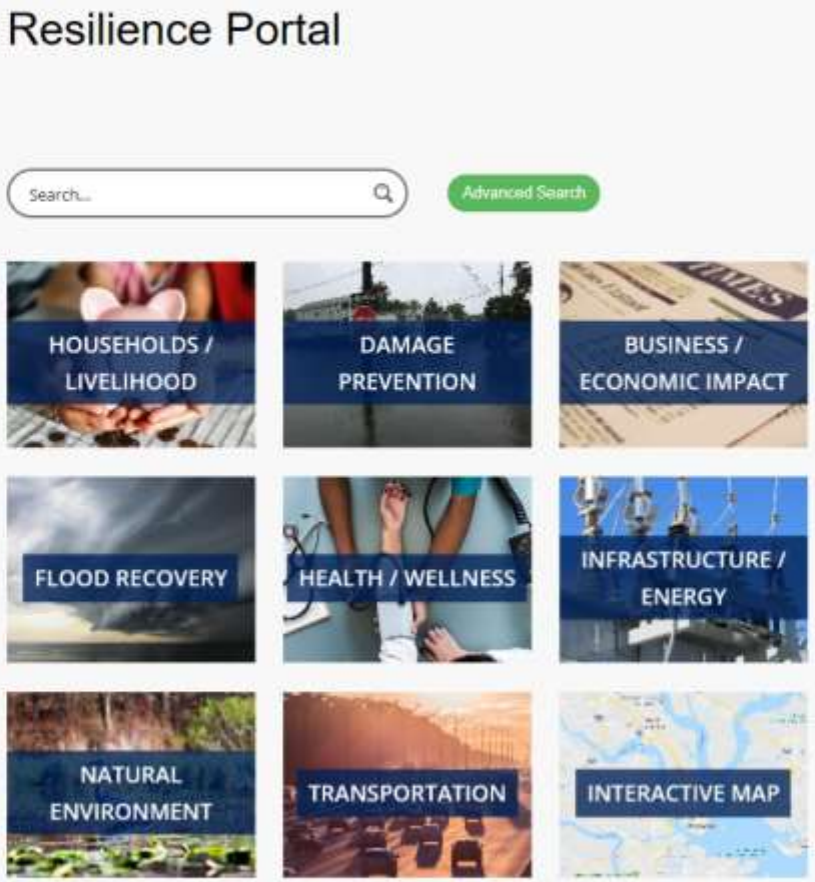
Interactive Map

GIS Driven interactive map of the region

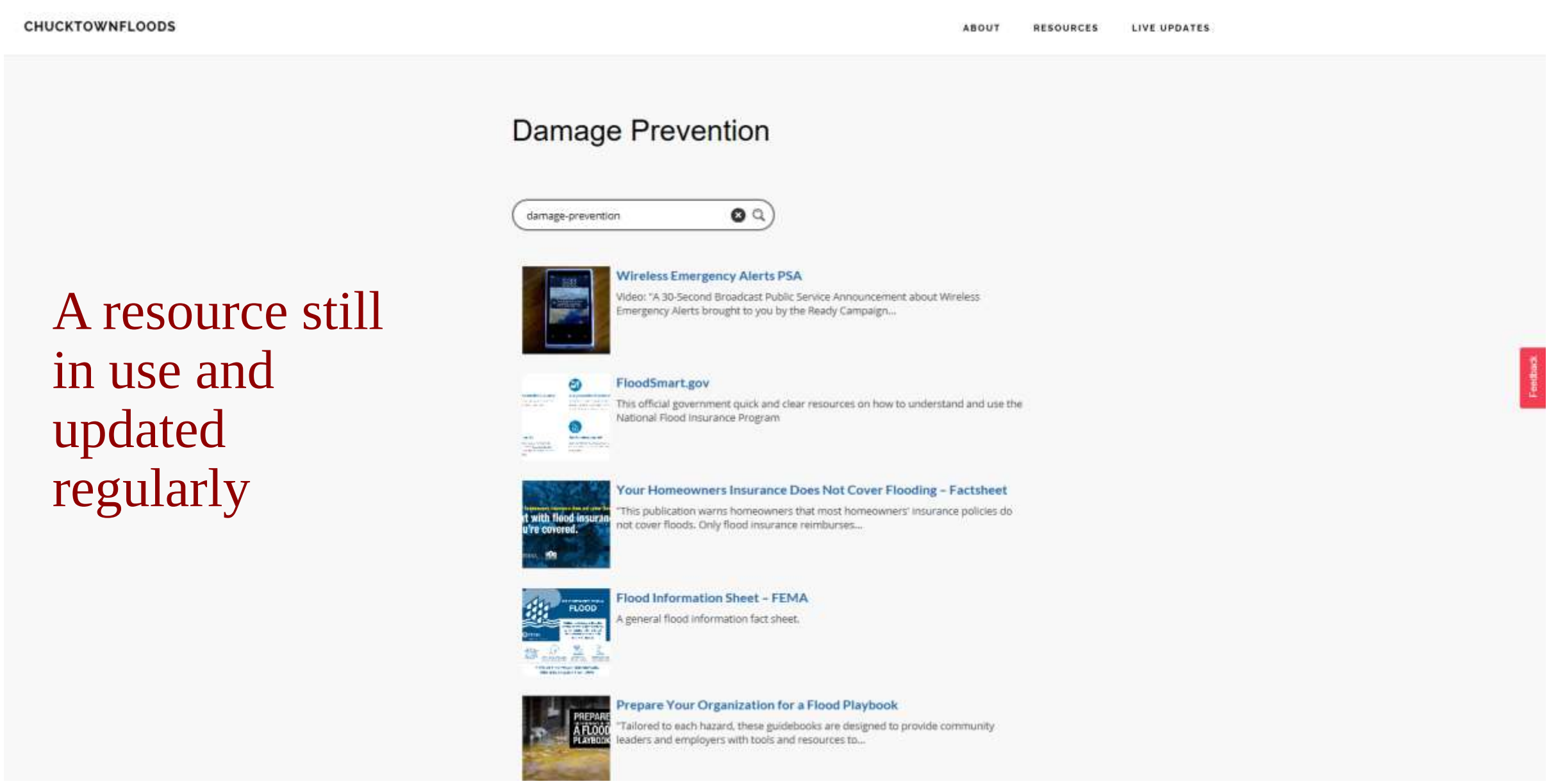


NOAA | Sea Grant | S.C. SEA GRANT CONSORTIUM *Coastal Science Serving South Carolina* | Charleston Resilience Network | BoomTown! | College of Charleston 1770

Resources are grouped into simple preset searches or more advanced user driven searches

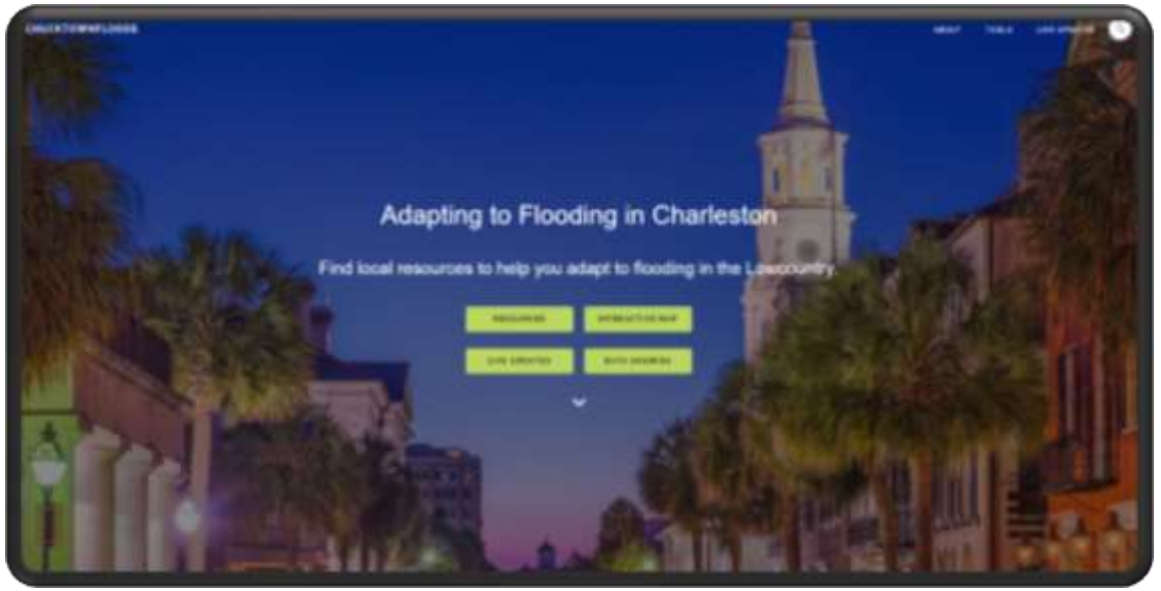


A resource still in use and updated regularly



The Answer: ChucktownFloods

Centralized Resilience Resource for Charleston, SC



http://chucktownfloods.cofc.edu

S.C. SEA GRANT CONSORTIUM
Coastal Science Serving South Carolina

Charleston Resilience Network

BoomTown!

COLLEGE of CHARLESTON

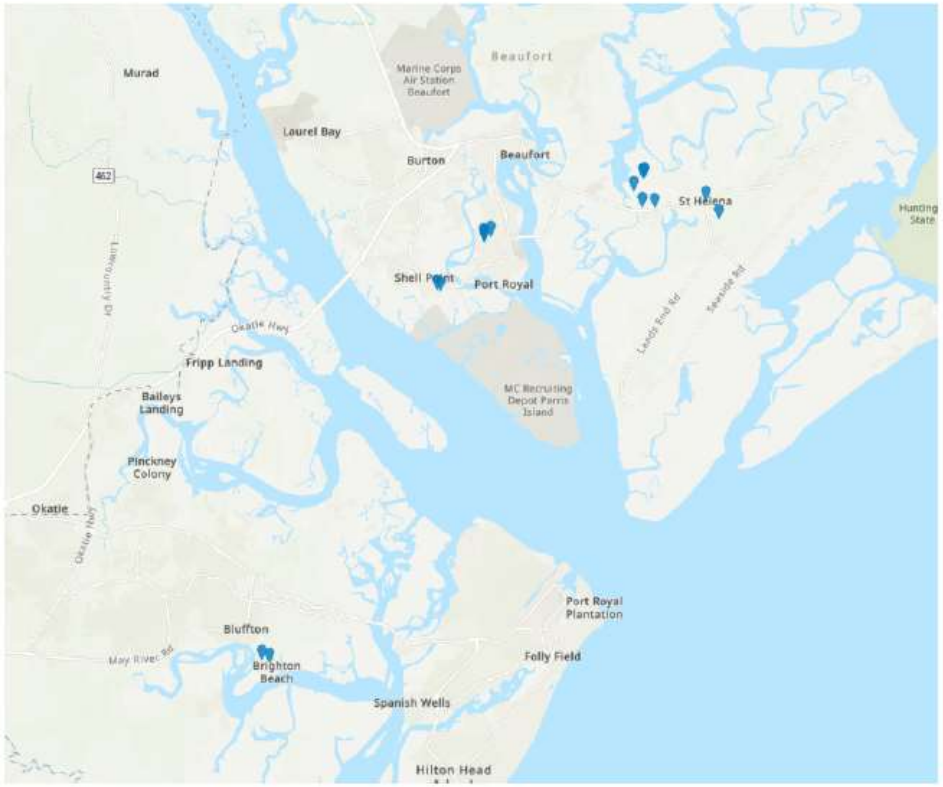
Beaufort County Adapts

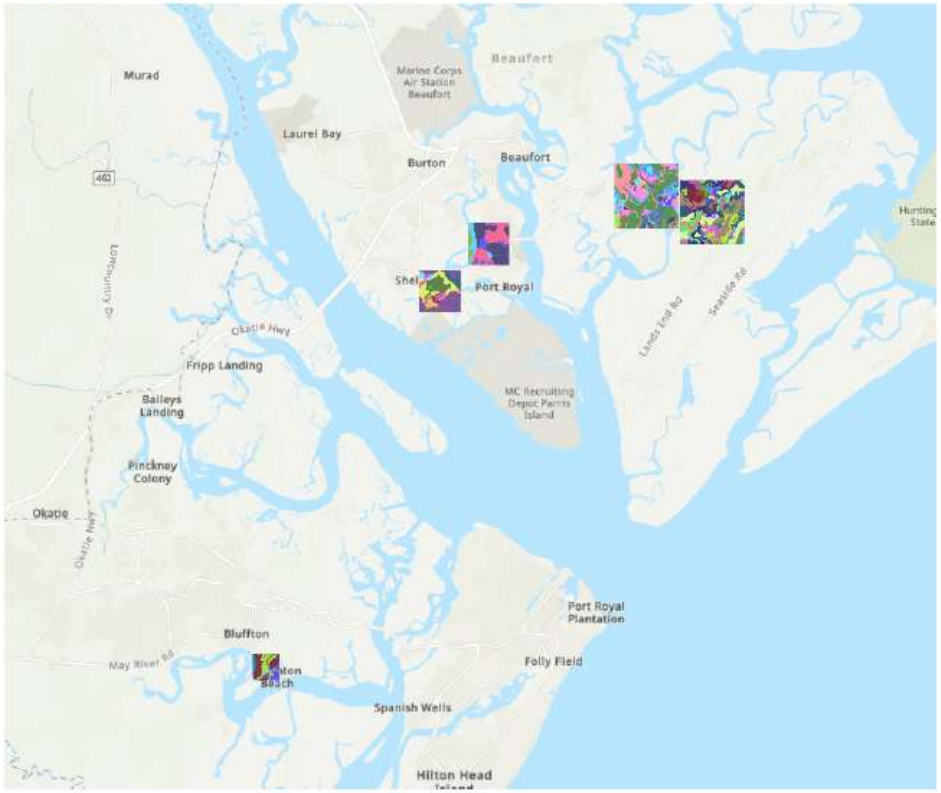
Sea Level Impacts Beneath our Feet

Successes in Charleston led to other regions requesting mapping and aid as well.

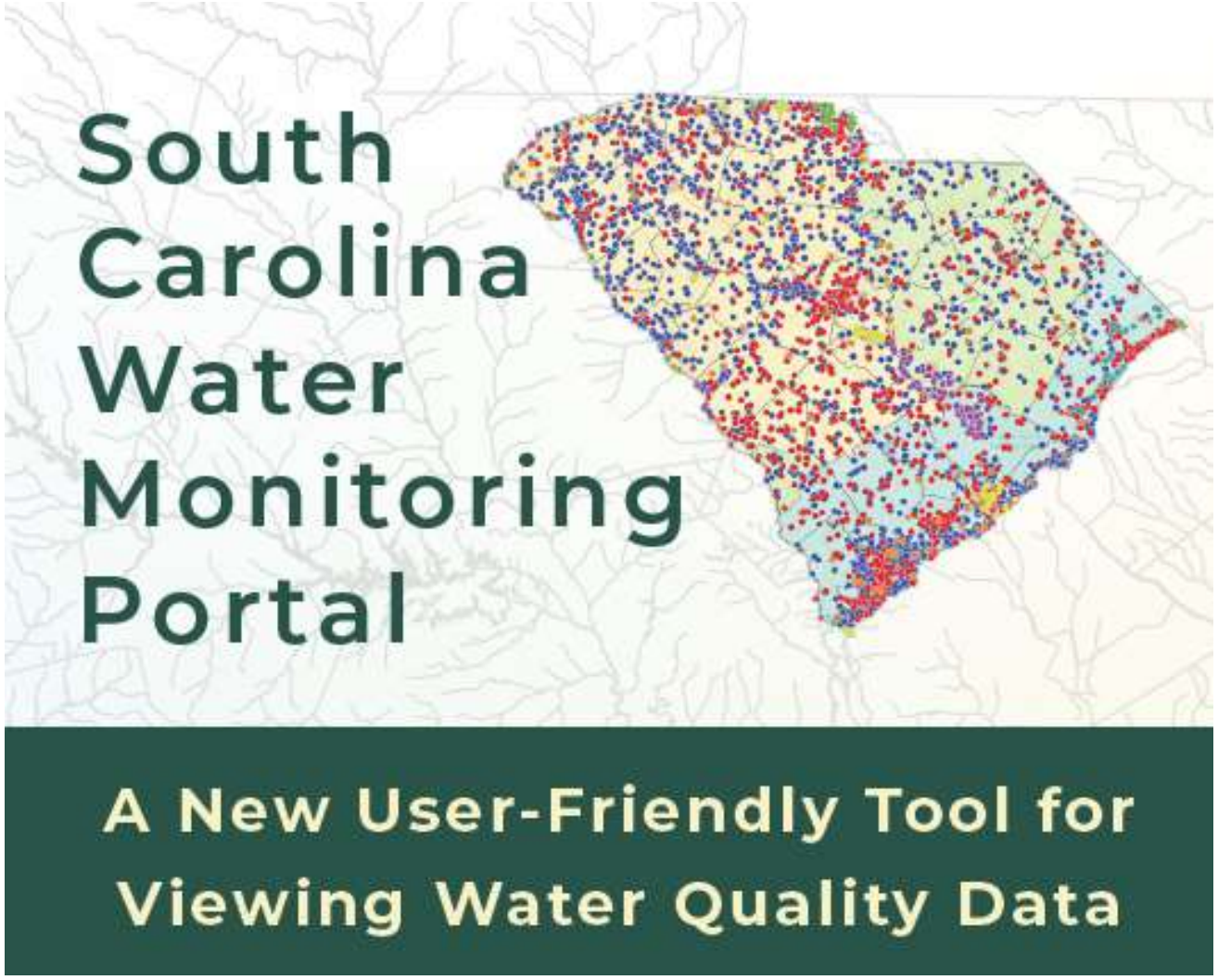
Working in Beaufort SC

- Beaufort County has expressed concern over the integrity of agriculture and sanitation infrastructure (septic Systems) as groundwater rises due to sea level rise. The College of Charleston and USC teamed up with the Municipalities, NGO's and Communities to explore how rising groundwater will affect four economically-challenged communities in Beaufort County. 15 ground water wells have been placed across the effected communities and surface, tidal and groundwater mapping has been completed and reengagement will begin in February.





South Carolina Water Monitoring Portal



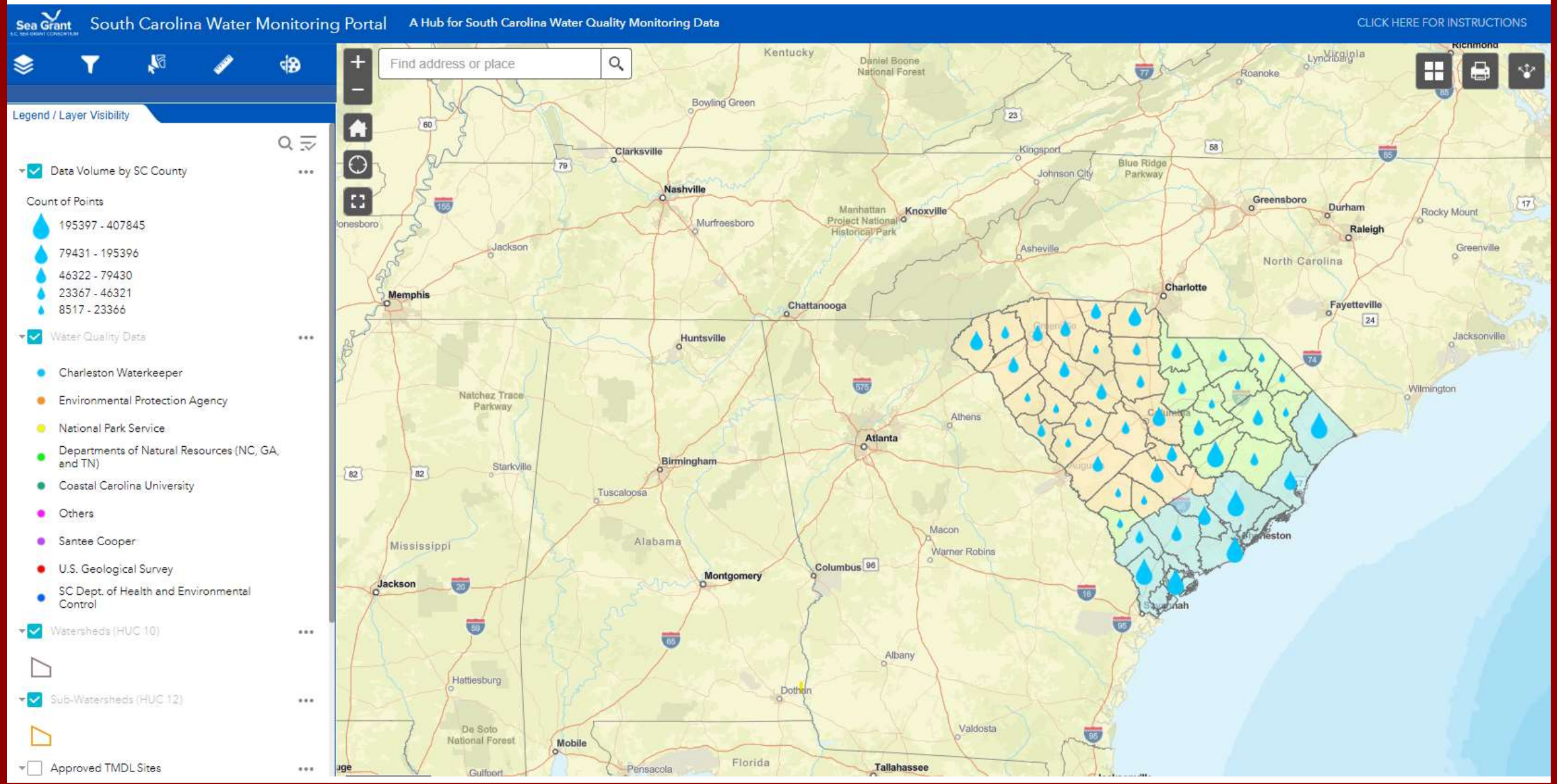
Designed for:
Researchers, Technical Managers, and Extension Professionals:

- This ArcGIS-based, geospatial application displays statewide water quality data on an interactive map.

Sea Grant
S.C. SEA GRANT CONSORTIUM

COLLEGE of CHARLESTON

Partnering with Universities Provides Help in Disseminating Projects



Recommendations

- Build capacity
  - Do not work in a silo - Multi Agency / Multi Disciplinary approaches are favored
- Look to build teams that are efficient and cost effective
  - Local and Regional Universities have experts and Students – Matching
  - Local and Regional Universities can help with project Dissemination and long-term support
  - Extension agencies are tasked with helping and will often provide services –Matching
  - Local NGO's and Advocacy groups will help ensure community buy in
- Develop your challenges list and Goals prior to looking for grant funding
  - Contact Program managers to see if your topic is appropriate
  - Don't Get Discouraged -
    - LoI's from one project may bet used for other programs with minor changes
    - Proposals from one agency can often be reconfigured for other agencies
- Projects need to be maintained
  - Figure into your plans for the maintenance and updates / upkeep of your project
- Keep Engaged

THANK YOU

Questions

COLLEGE of CHARLESTON
SANTEE COOPER GIS LABORATORY

COLLEGE of CHARLESTON
LOWCOUNTRY HAZARDS CENTER

THANKS!

Do you have any questions?
email@publicsafetygis.org
napsgfoundation.org/

@napsgfoundation

NAPSG Foundation

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