



U.S. Nuclear Regulatory Commission  
**34<sup>th</sup> ANNUAL REGULATORY  
INFORMATION CONFERENCE**

**MARCH 8-10, 2022**

**PREPARING FOR  
TOMORROW**  
[WWW.NRC.GOV](http://WWW.NRC.GOV) #NRCRIC2022

# **How Technology and Data Are Helping FEMA Understand Disaster Impacts**

**Chris Vaughan**

**FEMA, Geospatial Information Officer**



## Our Mission

Support decision makers in understanding the size, scope, and extent of disaster impacts so they can deliver resources to the communities most in need.



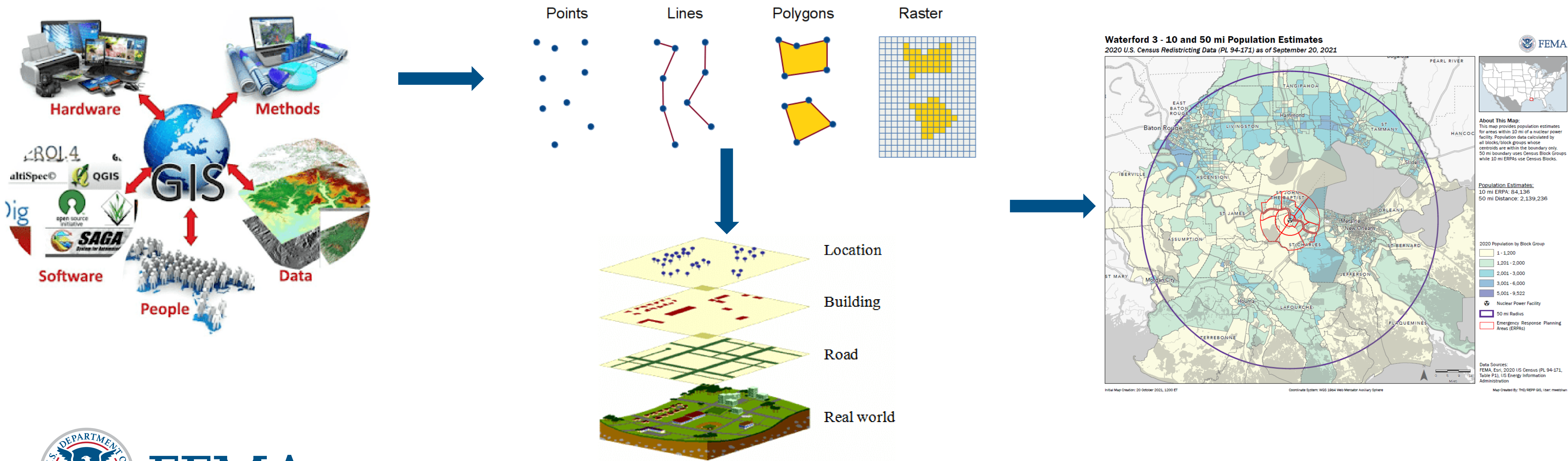
**FEMA**





# What is a Geographic Information System (GIS)?

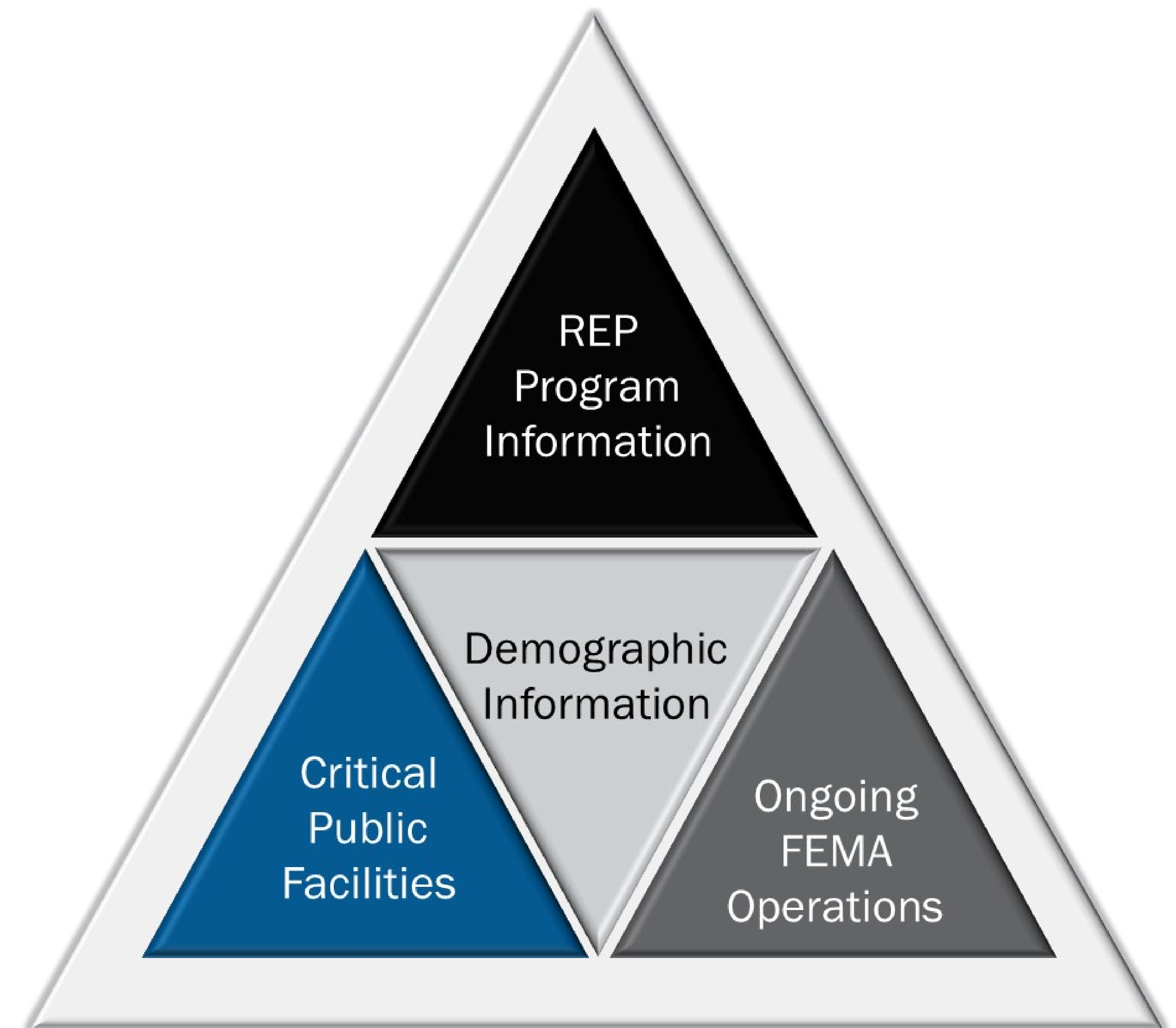
The computer **hardware** and **software** and **methods** that allow **people** to create, store, analyze, output, and display spatial **data** to drive decisions.





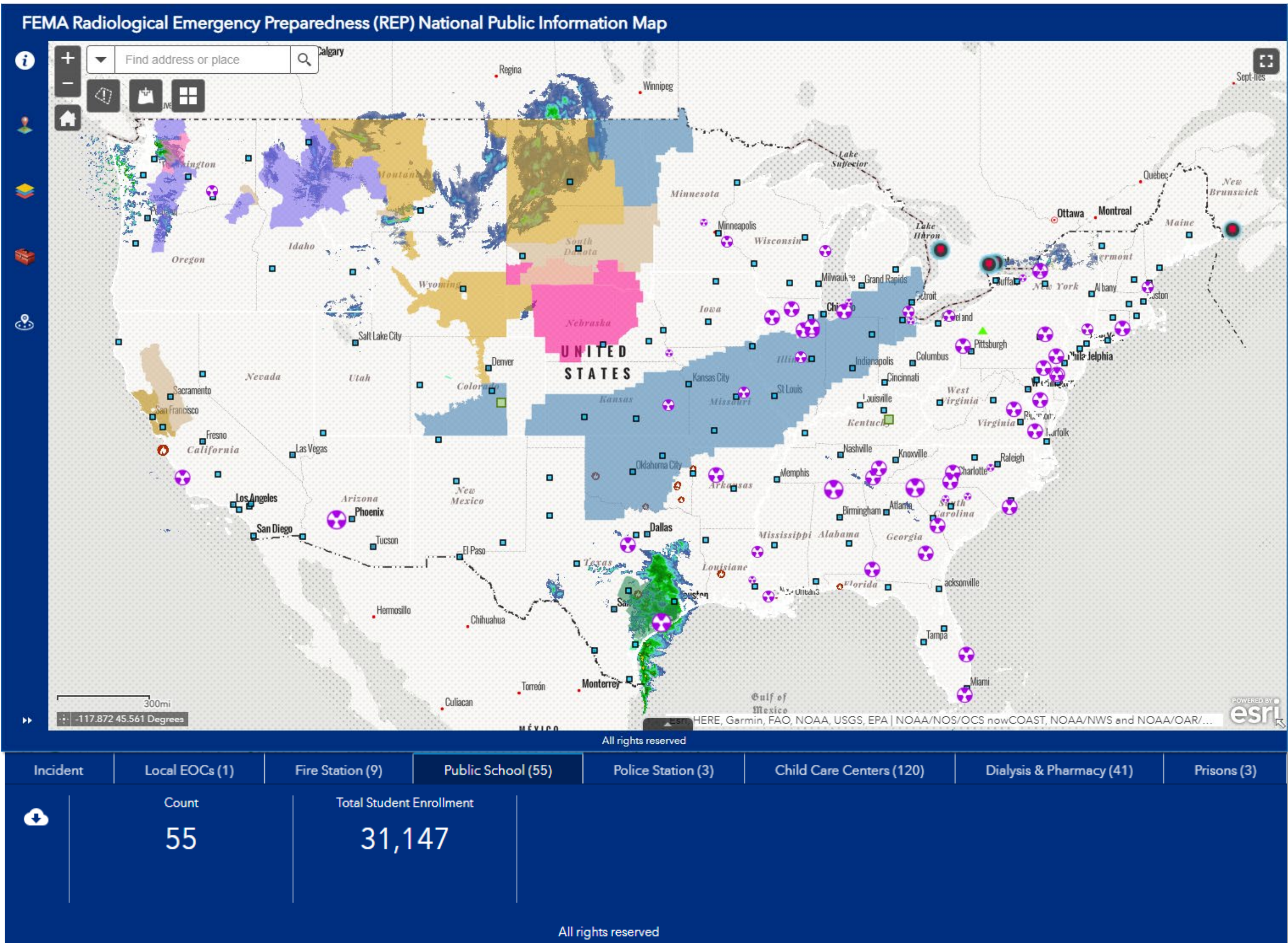
# How does GIS support Radiological Emergency Preparedness (REP)?

- Develop common operating picture for preparedness and pre-incident planning for potential response in communities surrounding commercial nuclear facilities
- Provide access to analytical data, utilizing existing agency expertise and technology to shape and inform future decisions.
- Develop national-level datasets of infrastructure and demographics that support offsite radiological emergency preparedness programs.





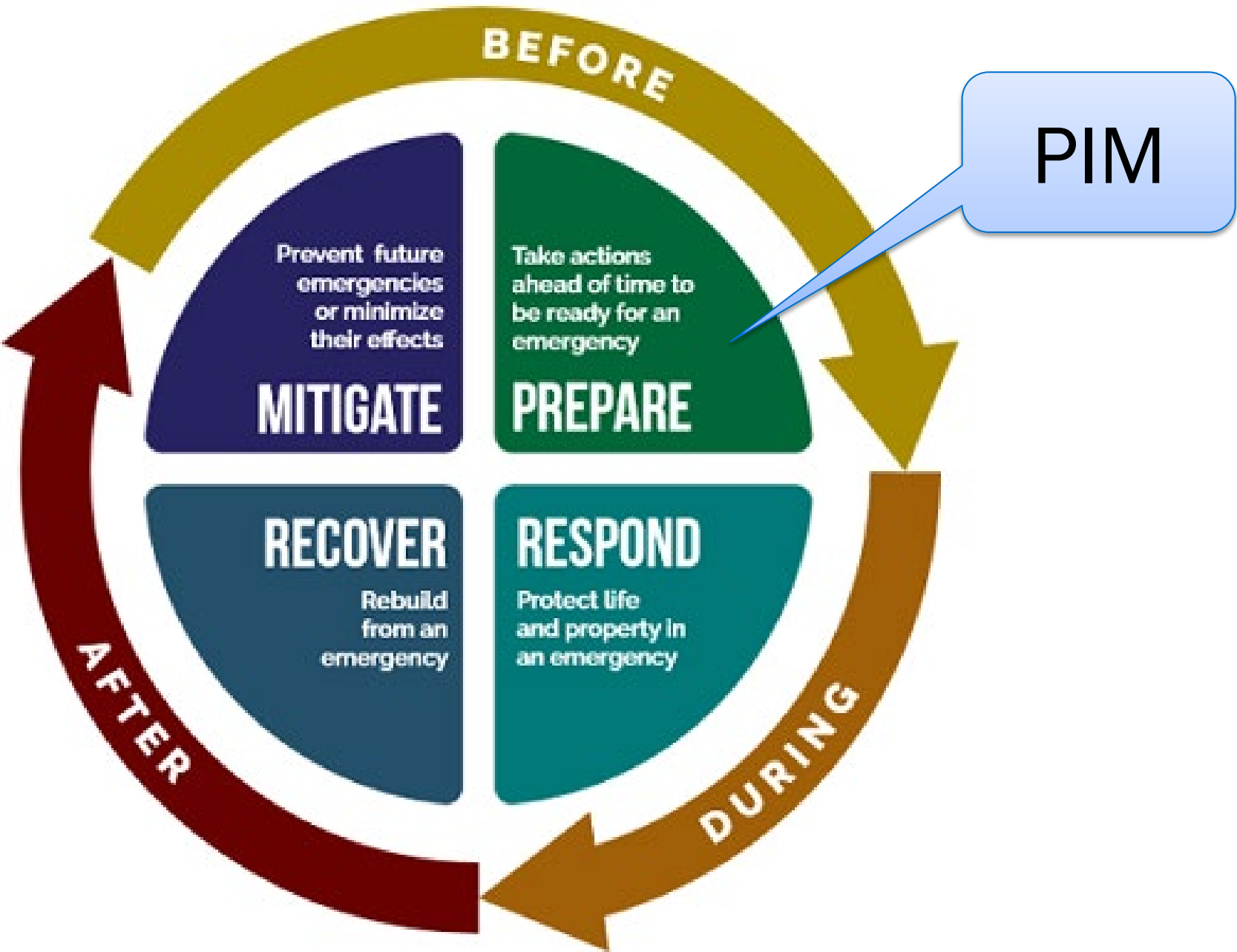
# FEMA REPP Public Information Map (PIM) – Building Resilience by Informing and Preparing the Community



### Application & Use

- Situational Awareness
- Planning Factors/Scenario Building
  - Sheltering
  - Plume Exercises
- Information Sharing/Outreach

PIM Supplements Existing Response Tools



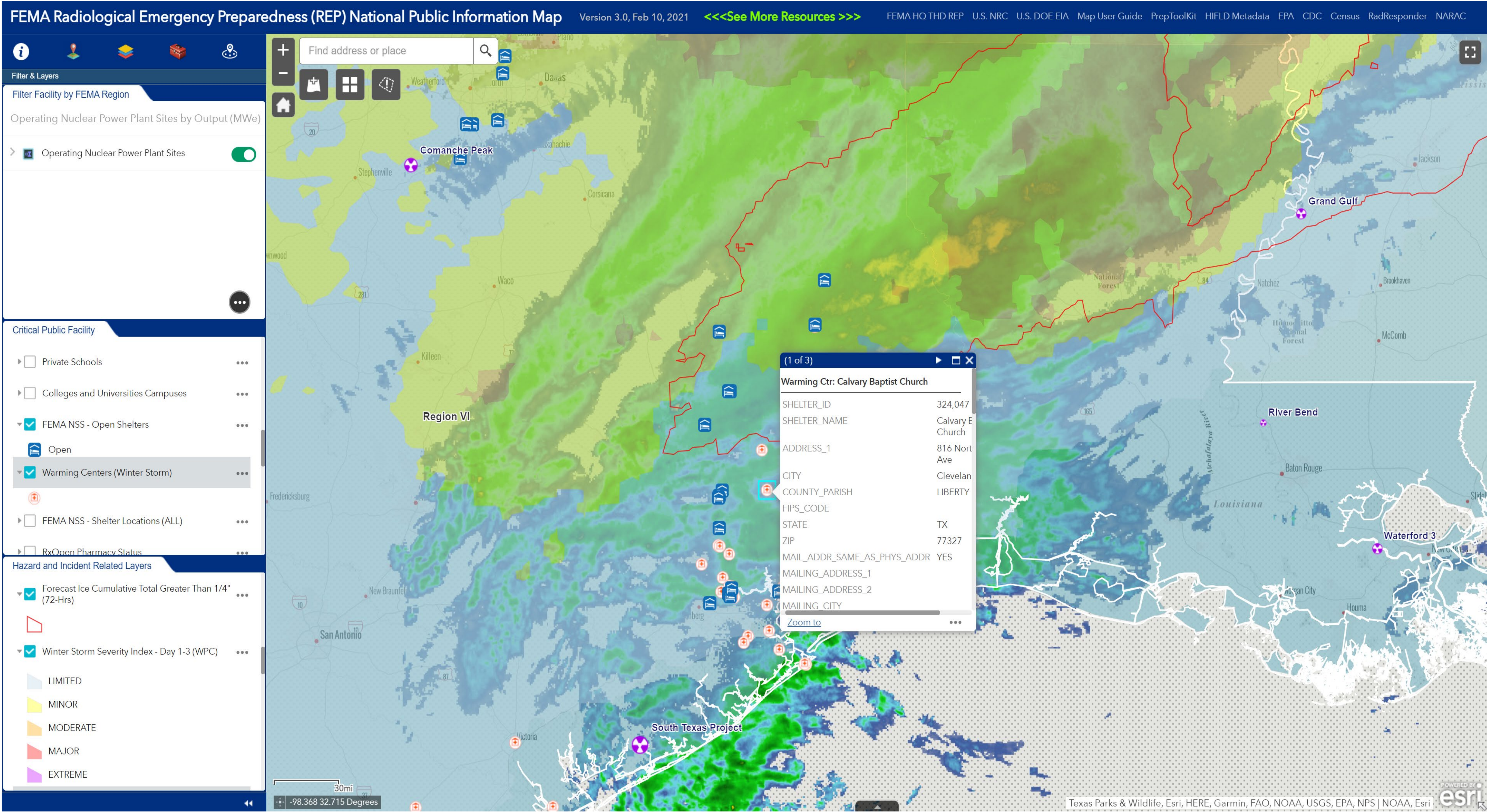
FEMA



# Severe Weather: Ice storm February 17, 2021

## ■ Real-Time Weather

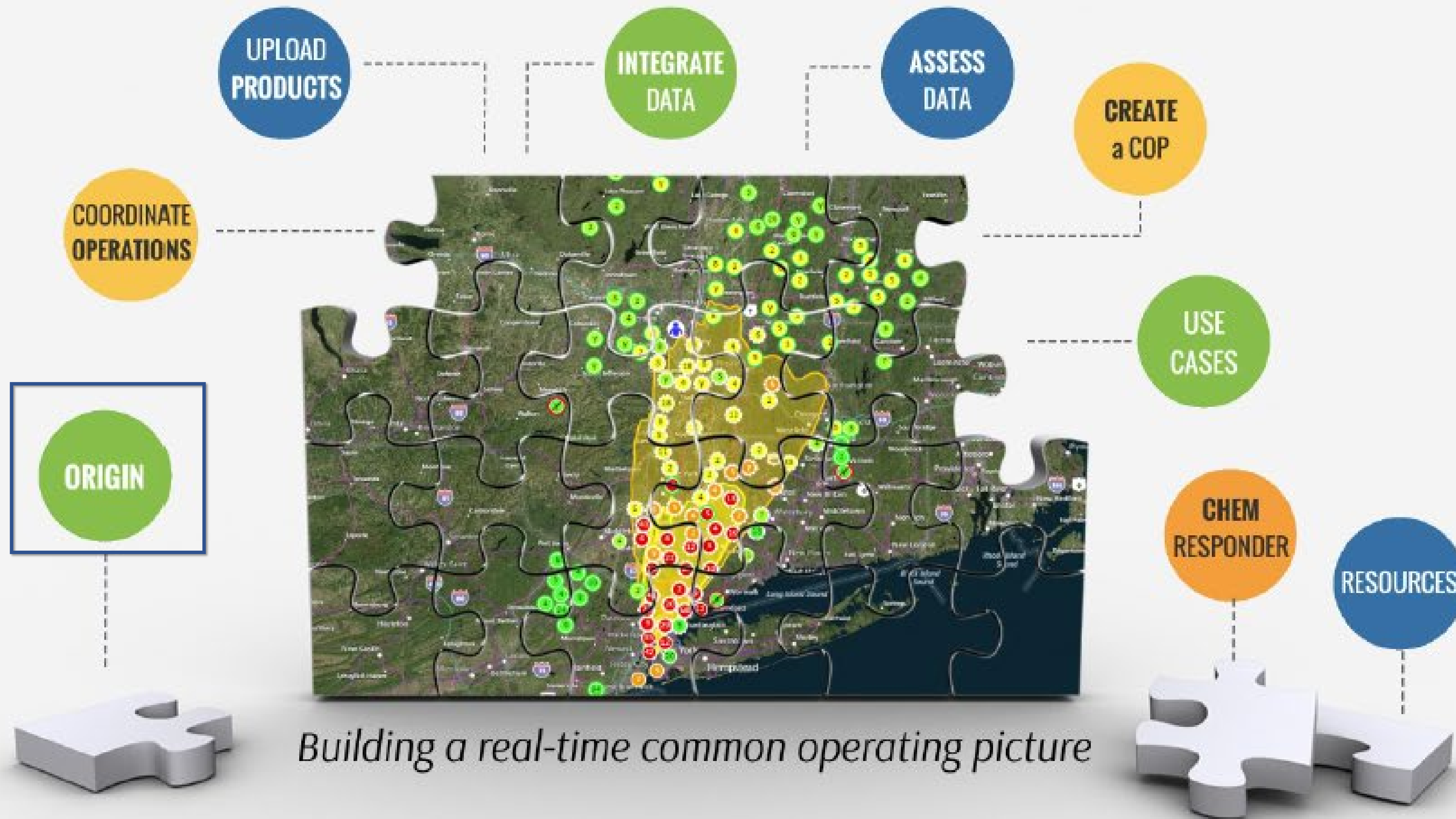
- ❑ Shelters
- ❑ Warming Centers
- ❑ Ice Accumulation Forecast
- ❑ Winter Storm Severity Index



FEMA

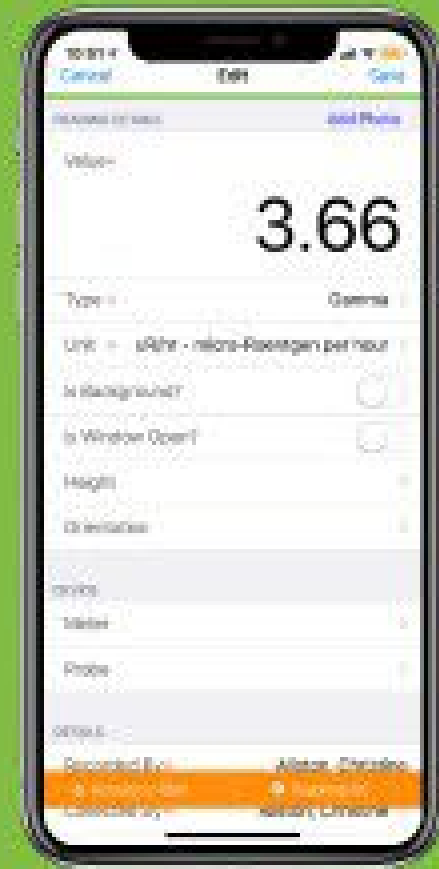


# RadResponder Network





# Integrate Raw Data

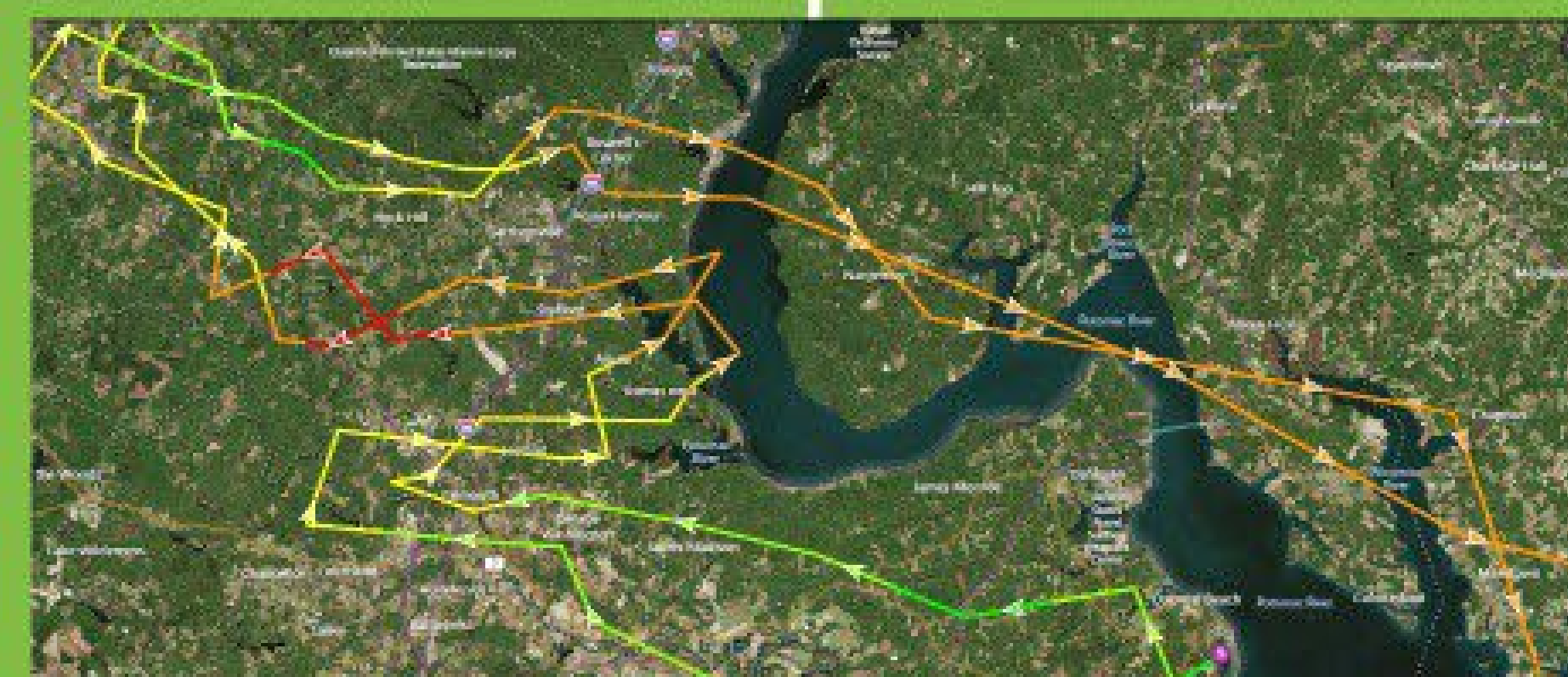
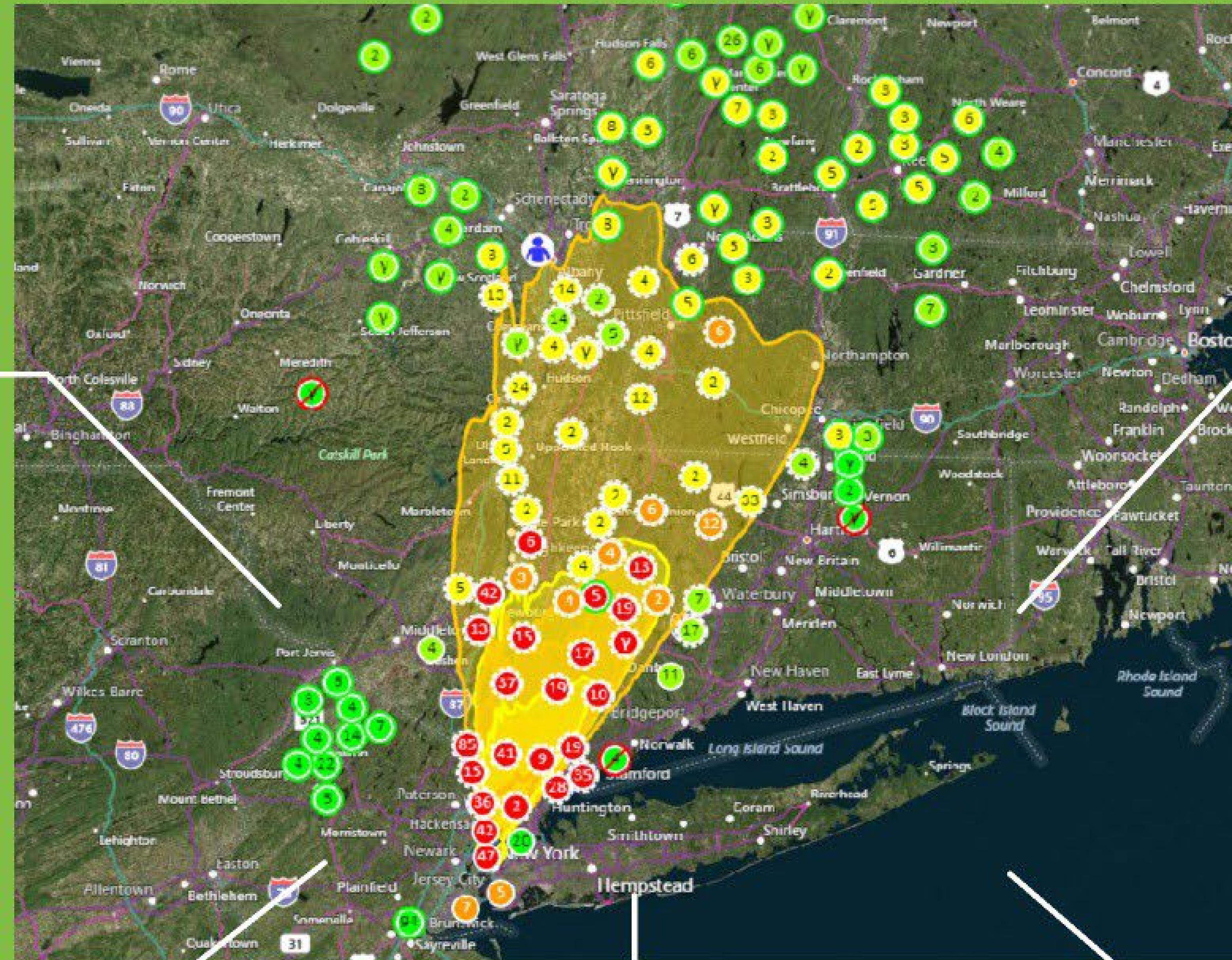


- Field Surveys
- Field Samples
- Observations
- Spectra
- Dose Readings
- Data Sets

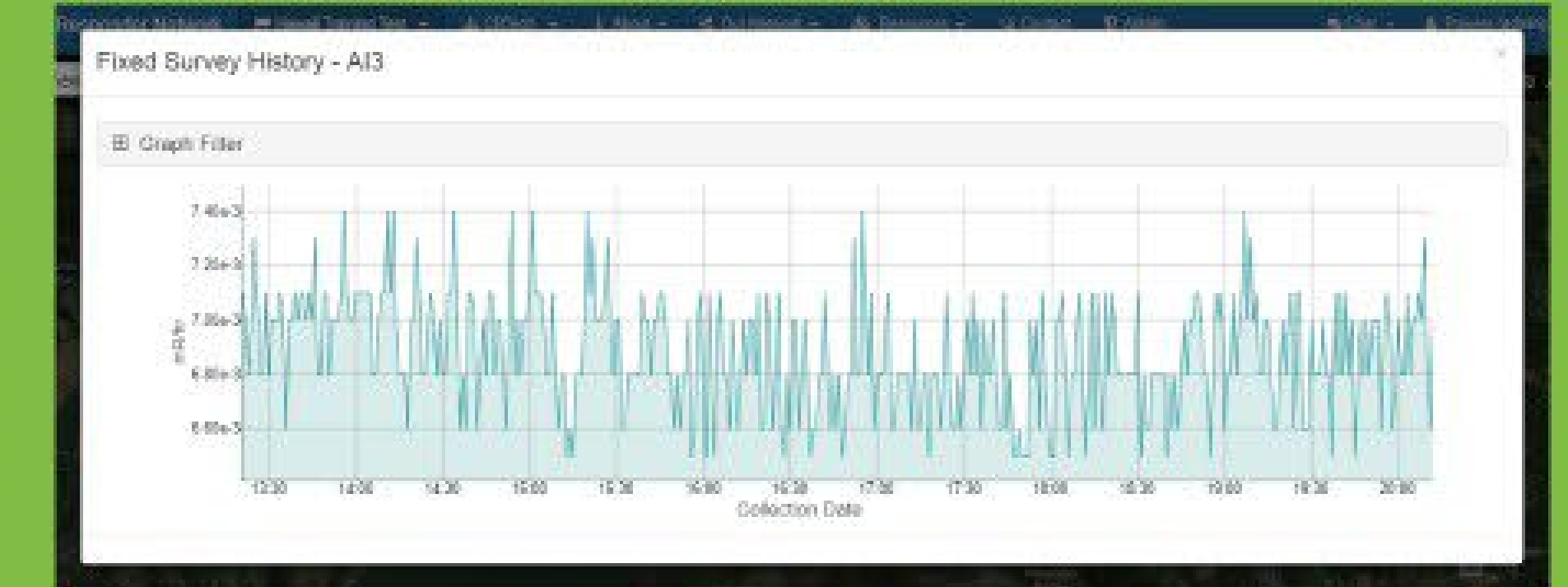
Mobile application uploads data in real-time, saves data locally when no connection is detected

Collected	Type	Severity	Value (Raw)	Units (Raw)	Team	Collected By	Comment	Location
9/25/2018 16:43	Gamma	Background	2.74000	uf/hr		Alleton, Christine		38.9152 -77.2301
9/10/2018 14:30	Gamma	Background	3.00000	uf/hr	Strike Team 1	Taylor, Jodi		38.9555 -82.7591

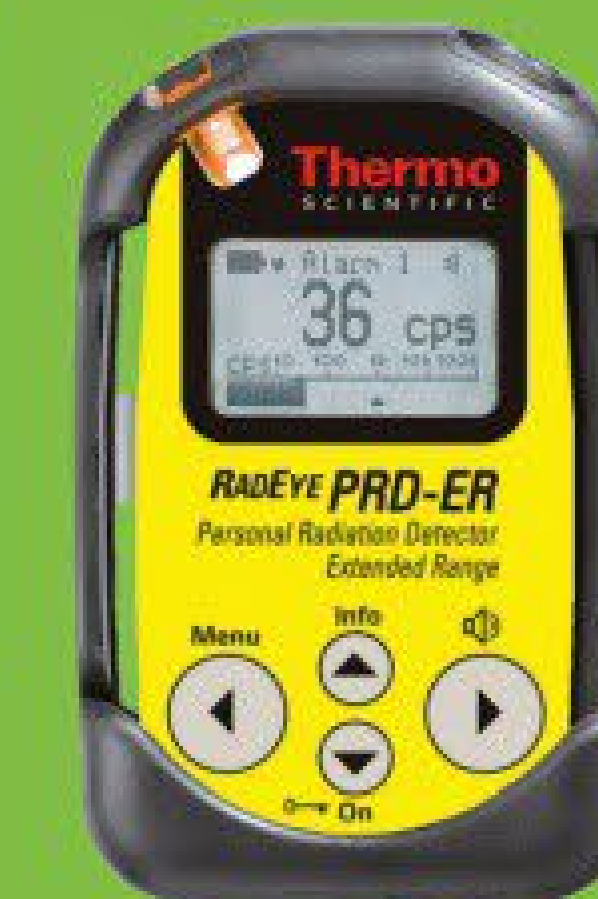
Enter individual records or bulk upload data via the **website**



**Mobile Surveys:**  
Track paths from vehicles, flights, & backpacks



Integrate **fixed monitoring sensors** to stream minute-by-minute data



**Thermo**  
SCIENTIFIC

**LUDLUM**  
MEASUREMENTS, INC.

**POLIMASTER**

**BNC**

Visit our website to see a full list of integrated equipment

Integrated **API equipment** can telemeter data directly to RadResponder



# Briefing Take Aways

- 936 Buildings Destroyed
- 96 Buildings Damaged

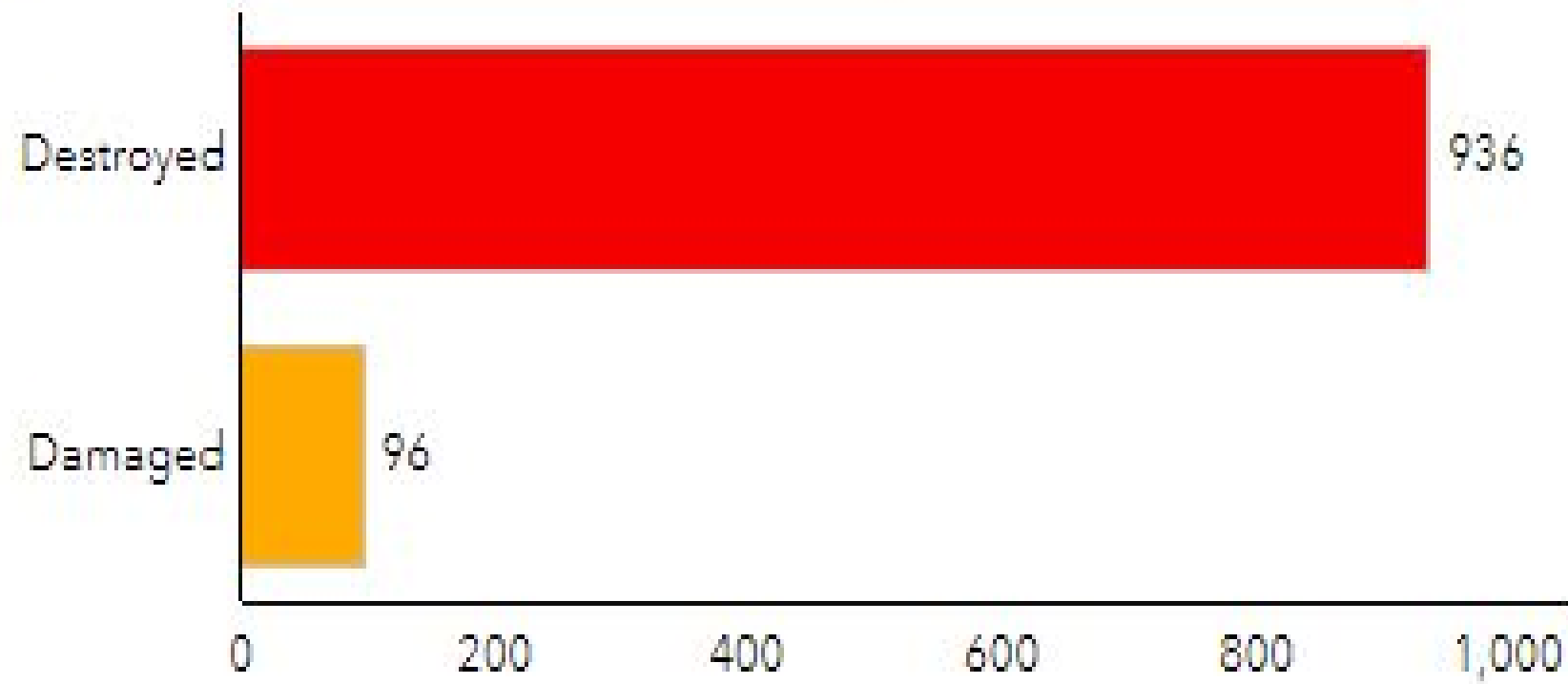


## FEMA Incident Impact Assessment



Current perimeter of the Marshall Wildfire Incident as of 03 January 2022

Count of Assessed Buildings Inside the Perimeter



### KEY FACTS

5,719	2,030	785	5%	2%	0%	11%	41.3
Total Population	Total Housing Units	Population 65+	Unemployed 16+ (%)	Mobile Homes (%)	HHs on Food Stamps (%)	HHs with 1+ Disability (%)	Median Age
\$152,351	\$712,326	0%	0.10	1,979	2.87	33	
Median Household Income	Median Home Value	Pop 65+ Speak Spanish & Ltd. English (%)	SVI	Households	Avg Size Household	Households Without Vehicle	

### CLOSEST HEALTH FACILITY



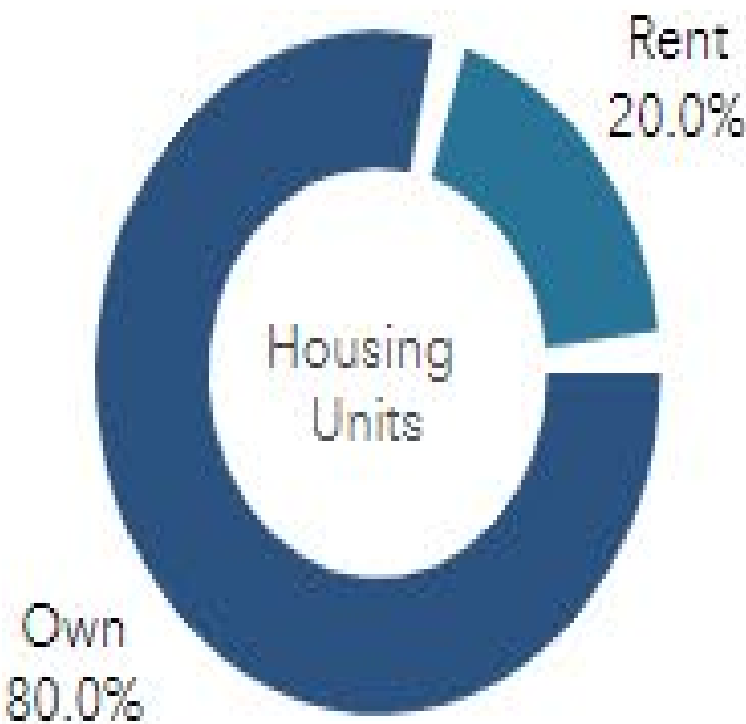
BCH URGENT CARE CTR-SUPERIOR

### HOMEOWNERS INSURANCE

70%	5%	60%	10%
Have Any Homeowners or Personal Property Insurance (%)	Have Home Insurance Coverage For Earthquake or Flood (%)	Homeowner Carries Insurance On Home/Personal Property (%)	Renter Carries Insurance On Home/Personal Property (%)

Race	Population	Percent
Asian	458	8.0%
Black	48	0.8%
Native American	23	0.4%
Pacific Islander	1	0.0%
White	4,926	86.1%
Other Race	65	1.1%
Multiple Races	197	3.4%

No Health Insurance Coverage	(ACS) %	Total
Population <19	0.1%	5
Population Age 19-34	2.5%	139
Population Age 35-64	0.8%	44
Population Age 65+	0.0%	2



This infographic contains data provided by American Community Survey (ACS), Esri, Esri and Bureau of Labor Statistics. The vintage of the data is 2015-2019, 2021, 2026. © 2021 Esri



# Geospatial Resource Center

FEMA's [Geospatial Resource Center](#) allows users to share and access *1000s* of disaster response data, maps and applications.

During an incident, we conduct coordination calls with the impacted state and community geospatial personnel.

- To join the email distribution list, self-register on the site on the [Geospatial Coordination Call page](#).
- Email [FEMA-GIO@fema.dhs.gov](mailto:FEMA-GIO@fema.dhs.gov) should you need other assistance.



The screenshot displays the FEMA Geospatial Resource Center website. At the top, the FEMA logo and navigation links (Pages, Data Catalog, Disaster Journals, Lifeline Dashboards) are visible. The main heading is "Hurricanes", followed by a description: "FEMA GIS supports the emergency management community with world-class geospatial information, services, and technologies to prepare for, protect against, respond to, recover from and mitigate against all hazards." Below this is a breadcrumb trail "Home / Hurricanes" and a "Jump to:" section with links to Advisories, Applications, Data & Imagery, State & Local Resources, Historic Resources, Data Catalog, and Coordination Calls. The "Hazard Overview" section features a map of the United States with a red outline of the Gulf of Mexico. Below the map is a "State & Local Resources" section with four cards: "Web App" (Severe Weather & Emergency Preparedness Information), "Incident 20-027 Combined Tropical Weather" (GOHSEP Incident 20-027 tabbed viewer), "Alabama Flooding & Hazard Dashboard" (The Flood SAF(ER) Viewer application is a one-stop river flooding viewer for the NWS and Emergency Management to...), and "Louisiana River Gauges" (The Louisiana River Gauges dashboard displays the flood stage and status of rivers across the state. Data here is...). Each card has an "Explore" button. At the bottom, there are two more cards: "Wraparound Services Status Map" and "LADOTD Hurricane Laura Debris Removal Status Dashboard". A "Legend" panel on the right side of the map shows "NOAA NOS Tides - Waterlevels Active Stations" and "Coastal Counties".





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# Questions?

[FEMA-GIO@fema.dhs.gov](mailto:FEMA-GIO@fema.dhs.gov)



# HAZARD

# DATA

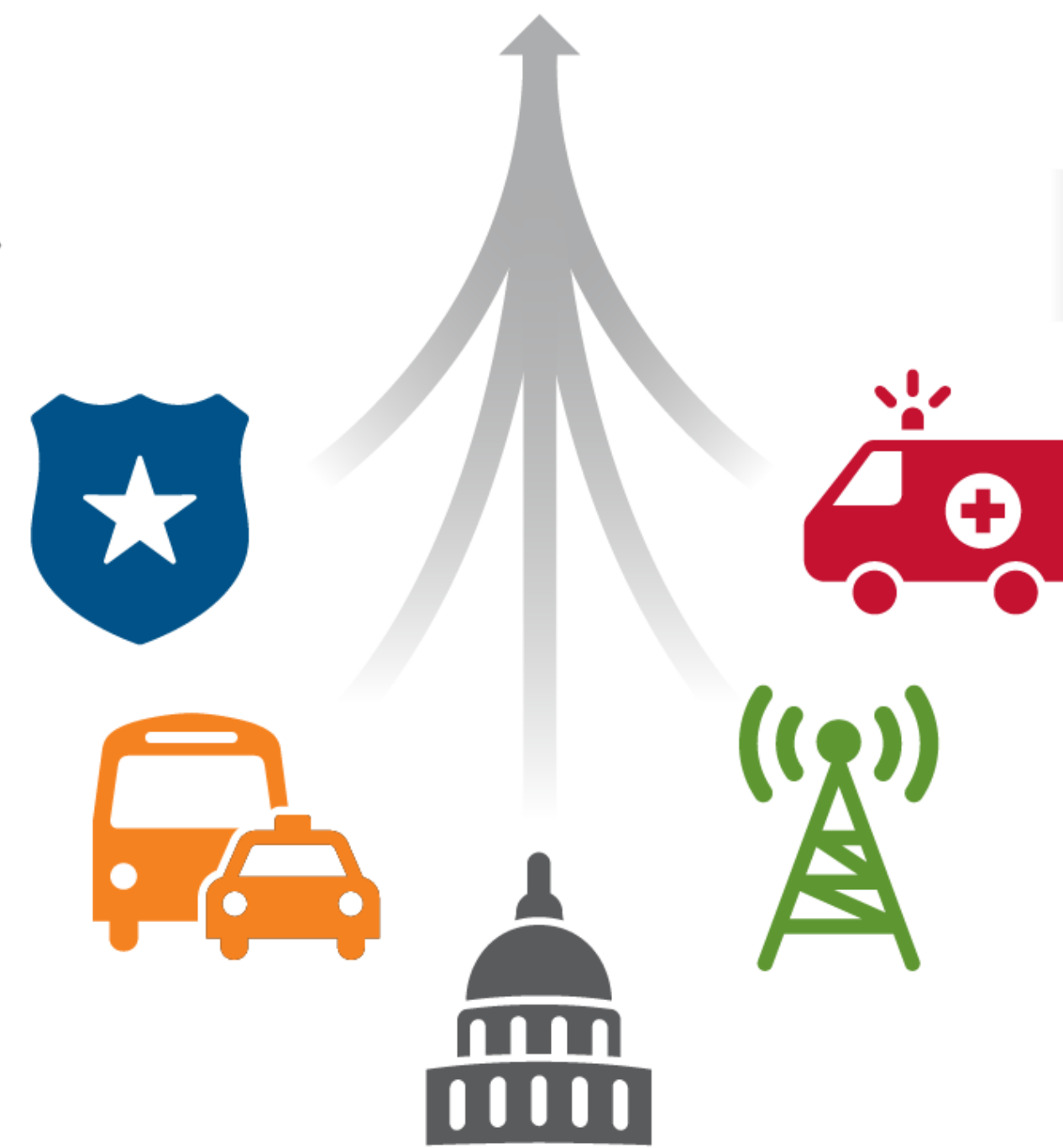
# ANALYSIS

# DISSEMINATION

# GOAL



- Flood
- Tornado
- Hurricane
- Earthquake
- Man-made



## MODELING



- Impact Assessment
- Scripts



## REMOTE SENSING



UAS



Satellites

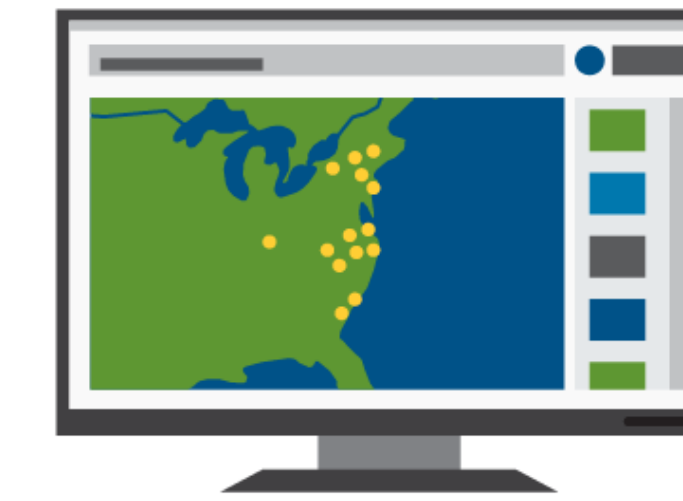


Planes

## CROWD SOURCING



Real-Time Situational Awareness



Dashboards



Reports/  
Infographics



Mobile

Provide Better Support for the Disaster Survivor

- ▶ Reduce Complexity
- ▶ Save Time
- ▶ Enhance Situational Awareness

STEADY STATE

ACTIVATION



- Geo Coord Calls
- Interagency Participation
- Data Sharing

**NEED:**

- **PROGRAM REQUIREMENTS**  
(US&R, IA, PA)
- **SCHEMA STANDARDIZATION**
- **RISK TOLERANCE**