Navigating Disaster: FEMA Resources for Disaster Response

FEMA R4 Response, Recovery, & Mitigation

September 2025

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Presentation Content

- GIS Coordination during Disaster Response Operations
- Remote Sensing Operations
- Recovery: Damage Assessment Resources
- Mitigation: Common Resources for Damage Assessments

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FEMA R4 Geospatial Resource Center

GIS Coordination during Disaster Response Operations

GIS Resource Centers Mission

Mission Statement:

To provide comprehensive geospatial support and expertise in emergency management, enhancing preparedness, response, recovery, and mitigation efforts across FEMA Region 4.

Services We Provide:

- ❑ GIS Coordination during Disaster Response Operations
- ❑ Data Modeling and Analysis
- ❑ Remote Sensing and Imagery Collection

Key Stakeholders:

- ❑ Regional Response Coordination Center (RRCC)
- ❑ Watch Unit & Threat Analysis Unit
- ❑ Response Operational Planning
- ❑ IMAT and FIT Teams
- ❑ Recovery Disaster Declaration Unit
- ❑ State, County, Local, and Tribal GIS Managers
- ❑ Federal Partner Agencies

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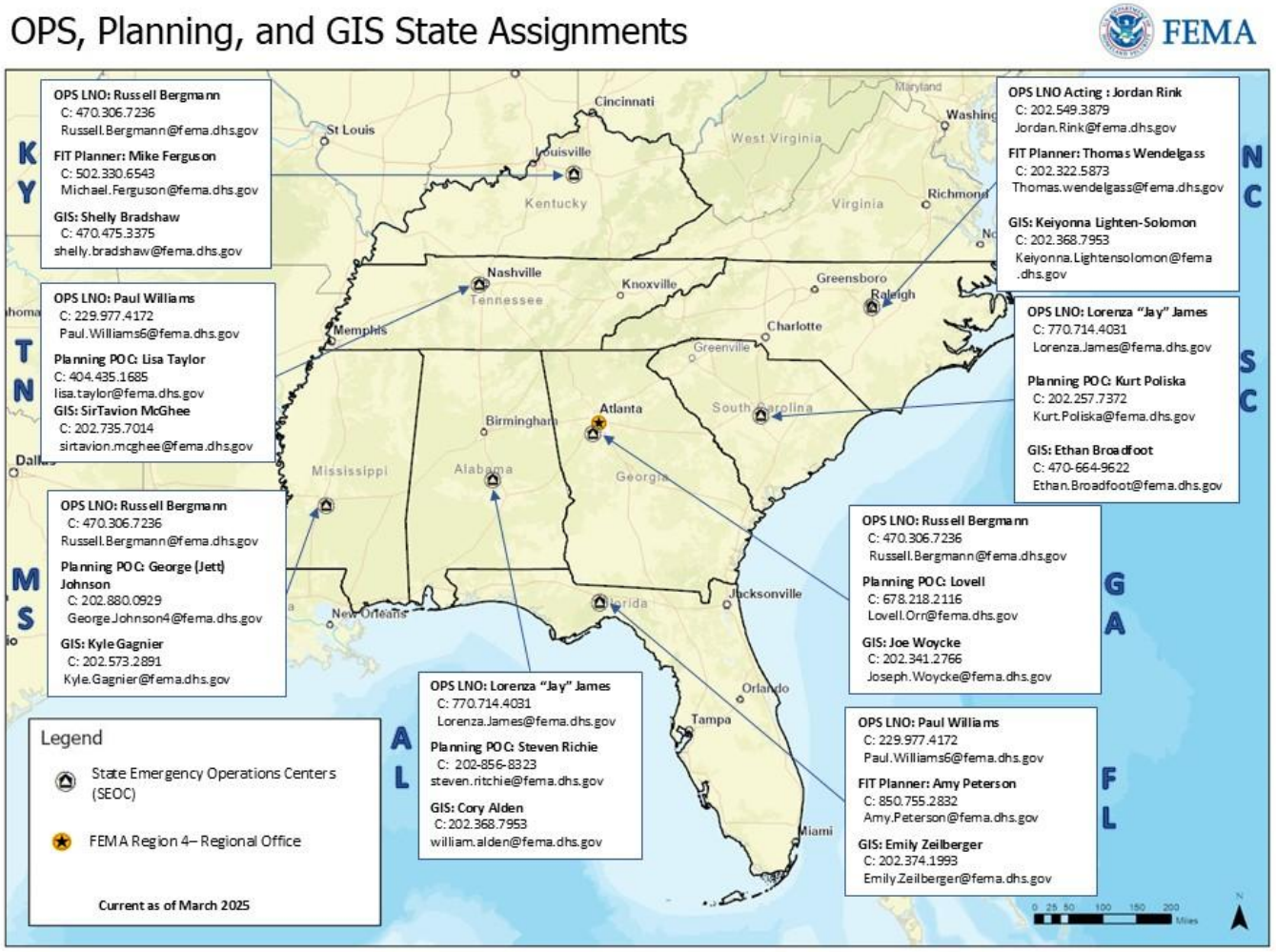
GIS State Assignments



Main point of coordination for FEMA GIS RFIs and GIS assistance.

Always include your state EM GIS point of contact in communications and requests.

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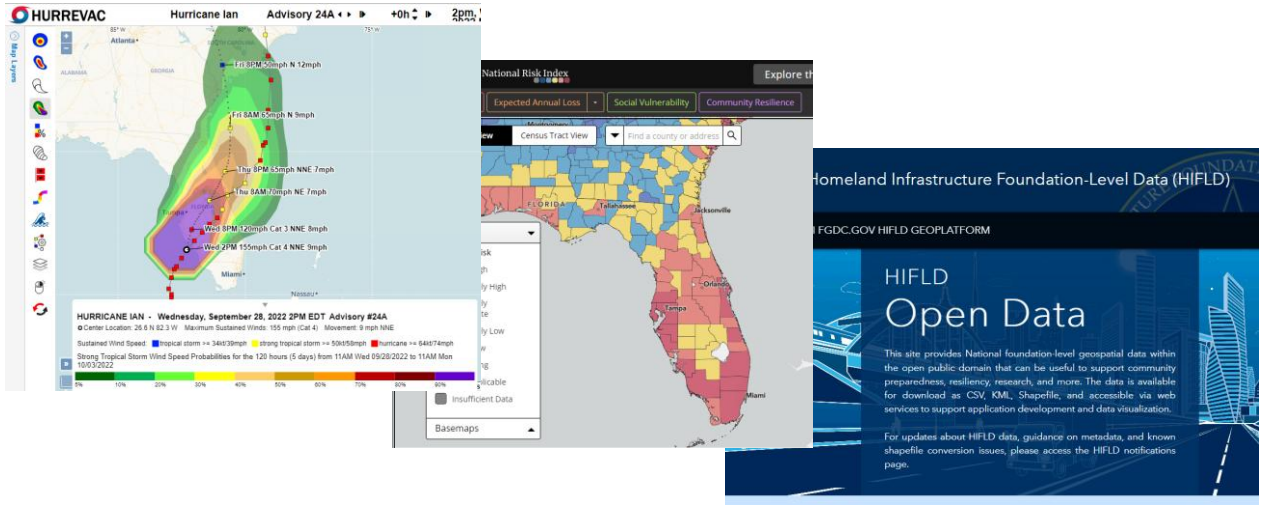
Key Datasets We Utilize ?

Primary Data Sources:

- ❑ American Community Survey (ACS)
- ❑ FEMA Community Resilience Challenges Index
- ❑ Homeland Infrastructure Foundation Level Data (HIFLD) – Click here for HIFLD Availability Update
- ❑ National Risk Index (NRI)
- ❑ USA Structures



Collaboration with Partner Agencies:

- ❑ Sharing insights and datasets to enhance decision-making.

CDC · CDFI FUND · AmeriCorps · Department of Education · Department of the Interior · Department of Energy · EPA · FEMA · HUD · NIH NIEHS · NOAA · US Army Corps of Engineers · USDA · Department of Transportation

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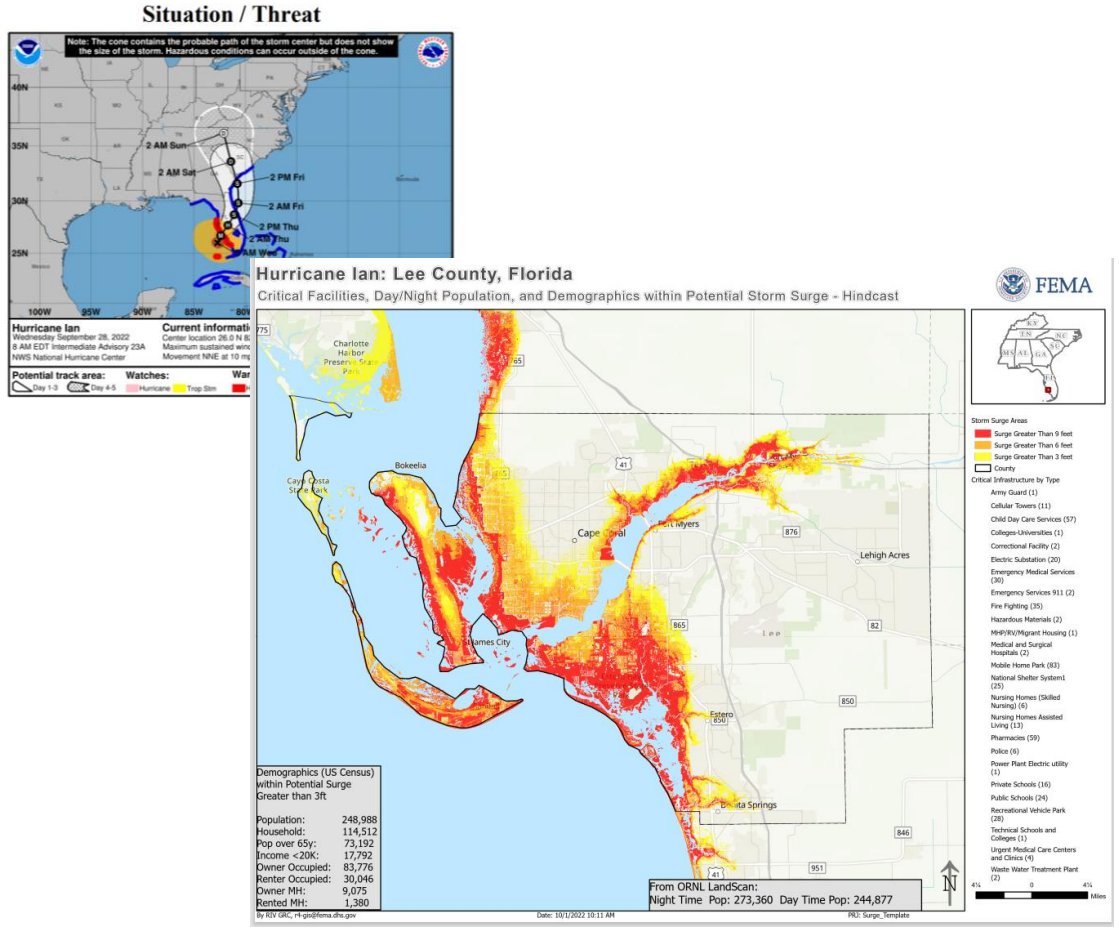
Leveraging the Data

Key Benefits to Emergency Managers:

- ❑ Identify areas where vulnerable populations are most at risk.
- ❑ Source and process authoritative datasets.
- ❑ Assess potential impacts on community lifelines.
- ❑ Prioritize disaster response and recovery operations effectively.

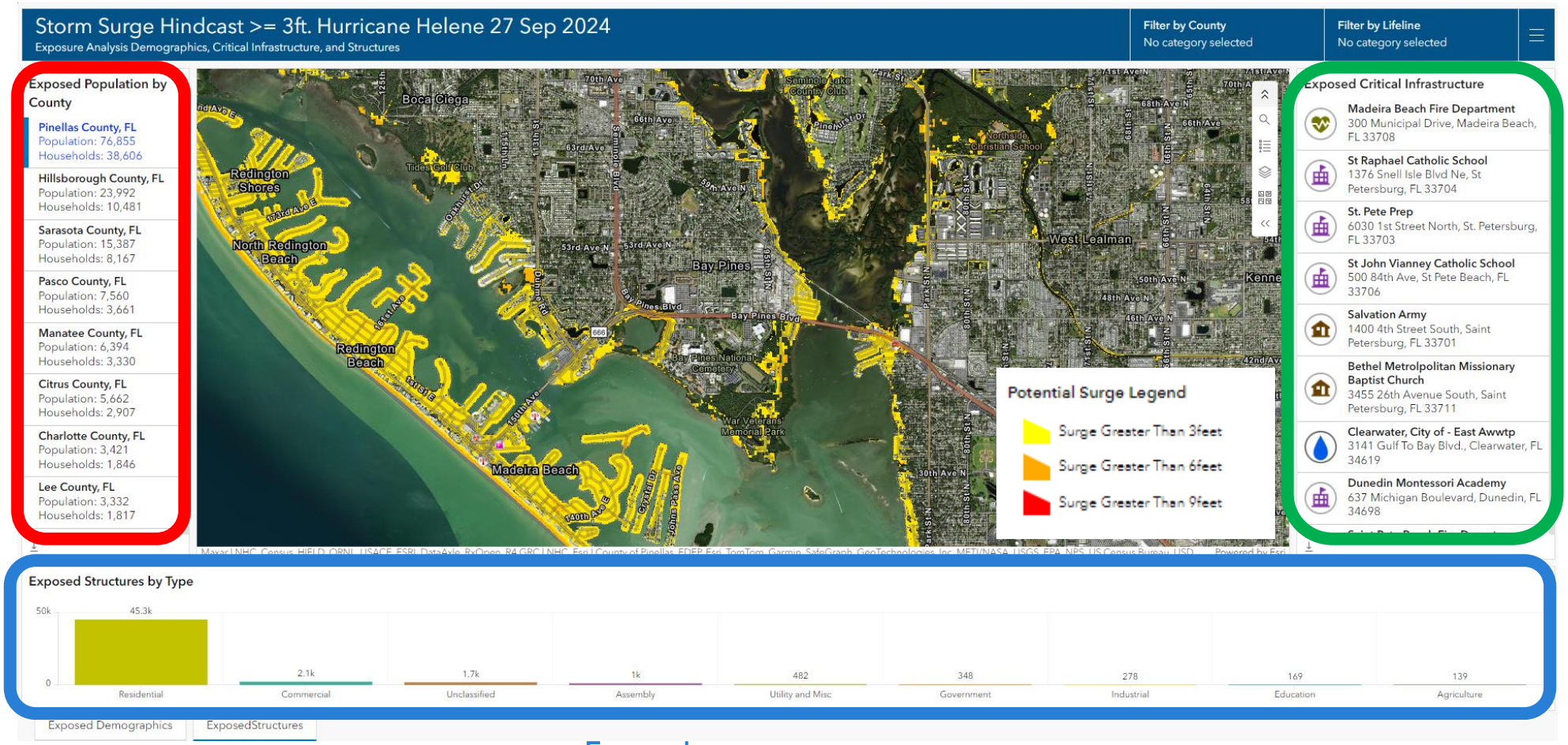
Outcome:

Emergency Managers are equipped to allocate resources promptly and strategically.



Analysis Example: Hurricane Storm Surge Model (NHC)

Exposed Demographic Information



Exposed Critical Infrastructure

Exposed Structures by Type

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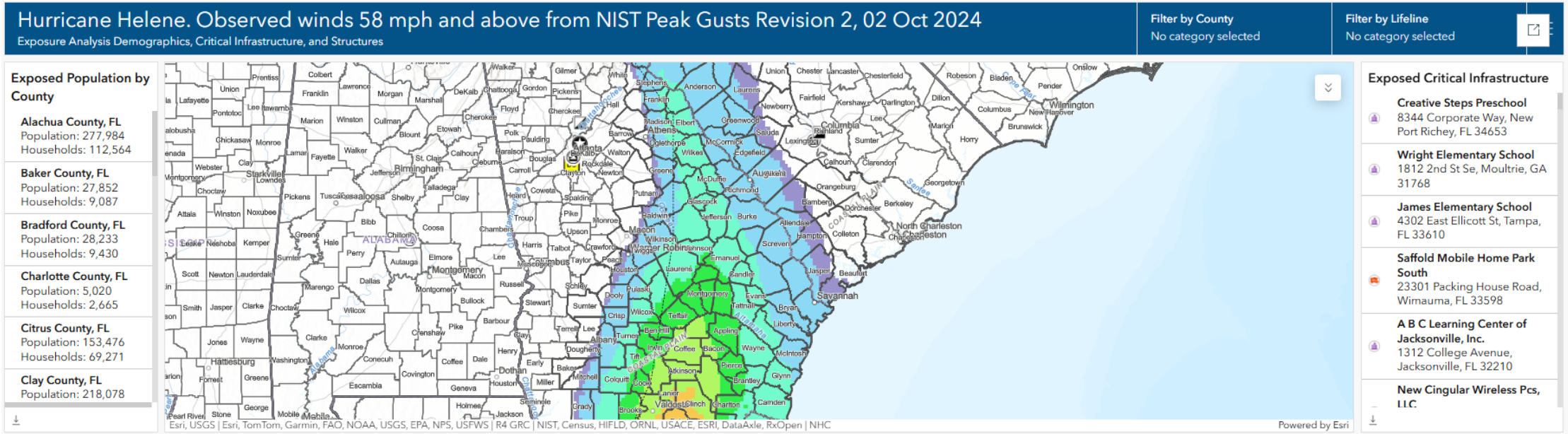
Analysis Example: Wind Exposure (NIST)



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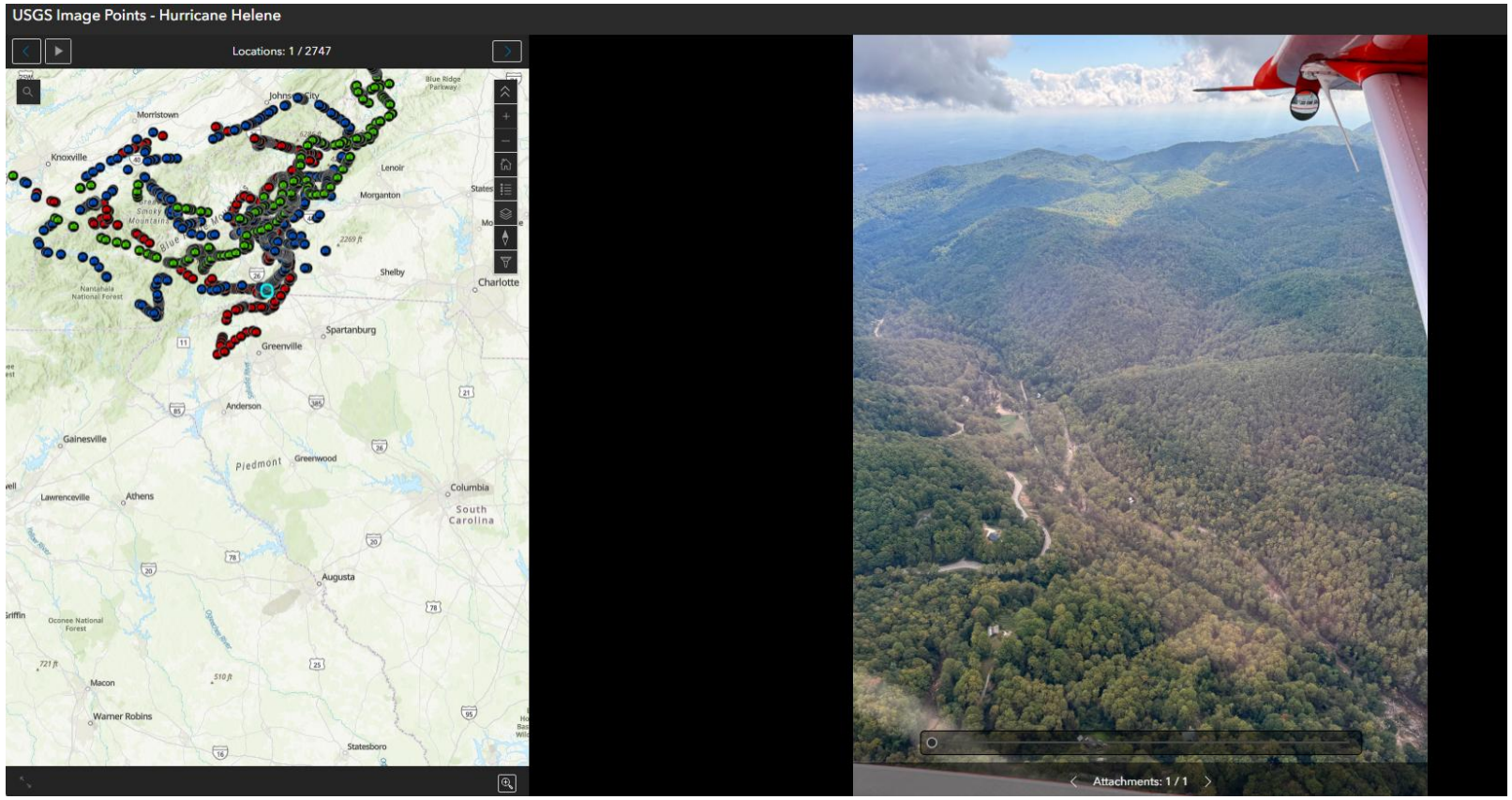
Support Example: NC Landslides (USGS/FEMA)



Support Example: Before and After Imagery (NOAA/ESRI/FEMA)

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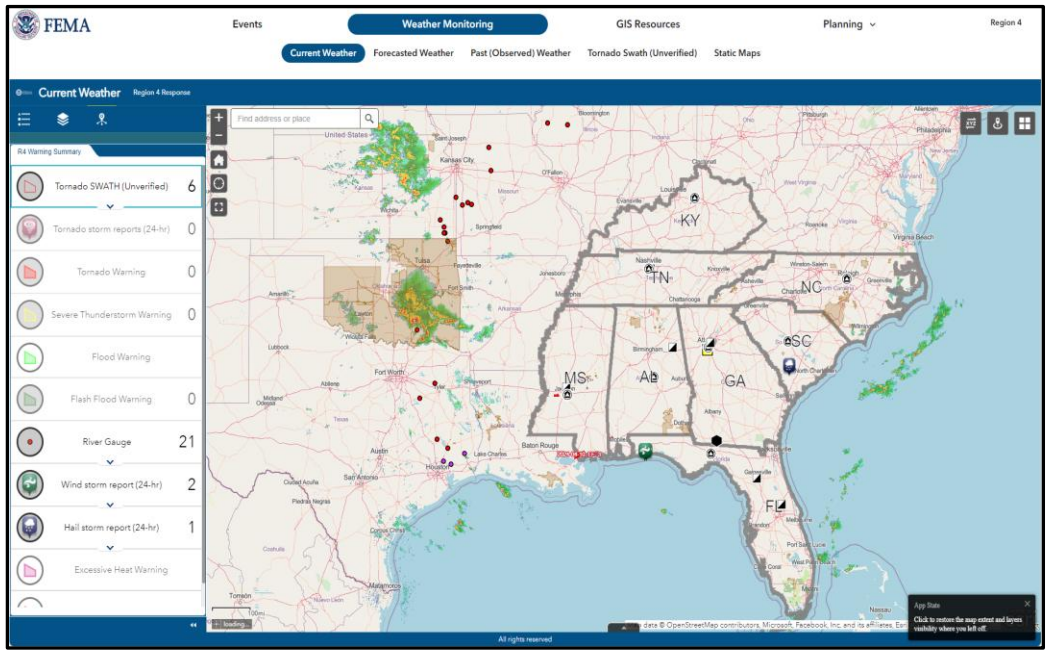
How We Share Information

Communication and Tools:

- WebEOC (Official Database of Record)
  - Static GIS can be found in geospatial library
- GIS Coordination Calls – SLTT partners
  - Hosted daily, during RRCC activation
- State GIS Liaisons and FIT Planners
- ArcGIS Online Web Application: Region 4 Situational Awareness Journal

JUVARE | WebEOC



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Situational Awareness Journal

Incident Data (Updated during Activation)

- Storm Surge, Inundation, Wind models based on major advisories
- US&R
- Damage assessment data (multi-agency)
- Remote Sensing
- Recovery (PDAs)
- Data from FSLTT partners
- Static products (Force Laydown, Dec Map)

Steady State

- ❑ RAPT Tool
- ❑ Planning Tools
- ❑ NWS Watches/Warnings
- ❑ Radar

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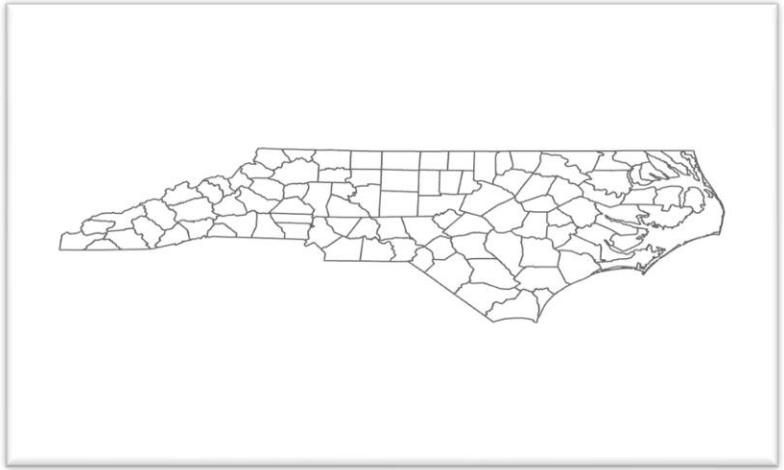
Wrap-Up

- Contact us for geospatial coordination
- Assistance with sourcing, processing, and leveraging data
- Quarterly Calls – coordinate through state GIS point of contact
- Ad Hoc/Urgent requests – include state GIS contact in all communications



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How to Reach Us

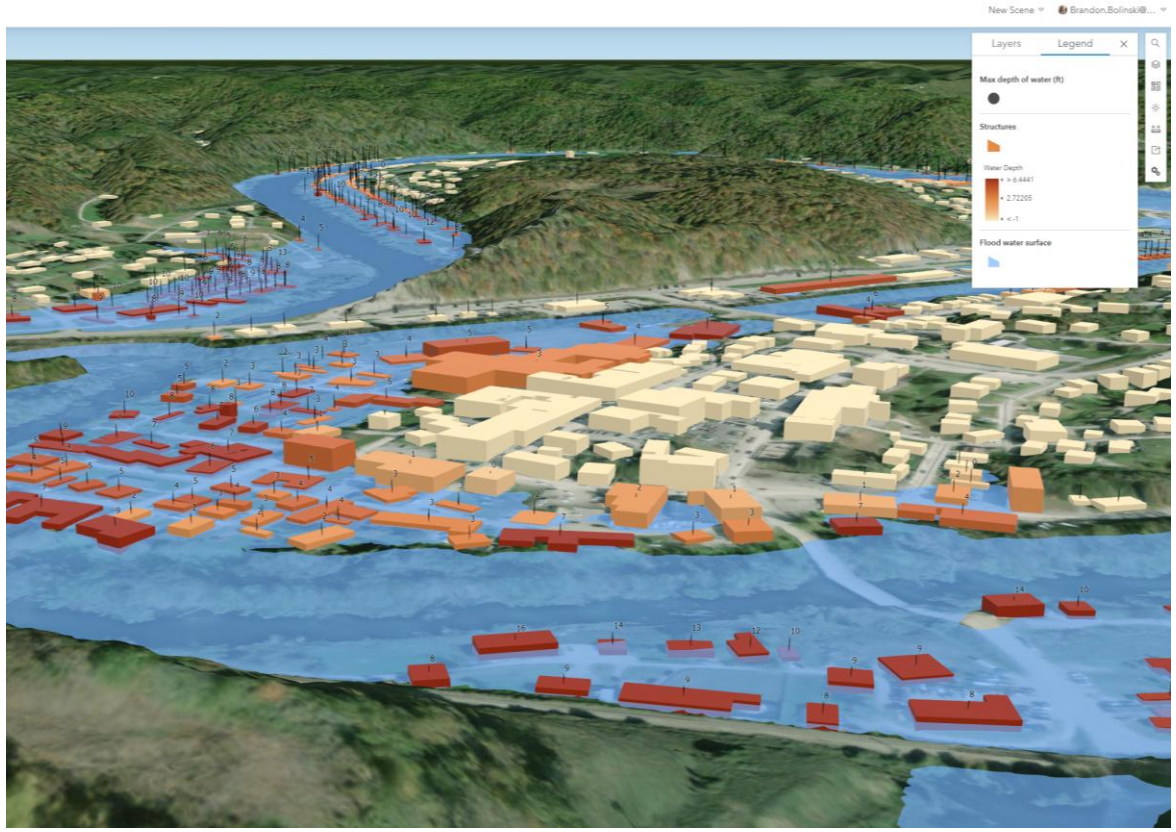
Contact Information:

- **Email:** r4-gis@fema.dhs.gov

Collaborating on ArcGIS Online:

- Join Our Partnered Collaboration Group: FEMA R4 State Partners – Overview

1. Contact us using your official organization email. Include your AGOL username.
2. Work through your State Emergency Management GIS office for coordination.



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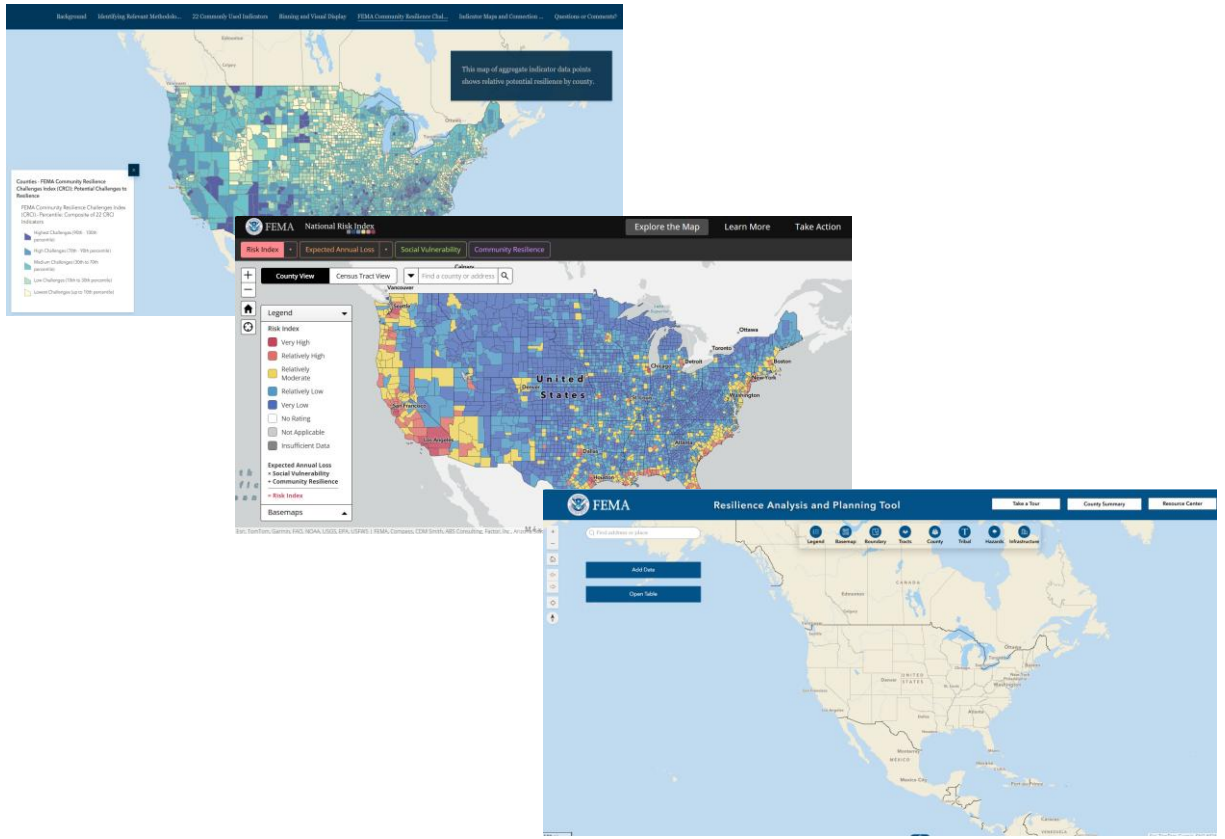
Additional FEMA Resources (Public)

- Community Resilience Challenges Index
  - Documentation: CRIA Methodology_2022
  - Data: FEMA Community Resilience Challenges Index (CRCI) Counties – Overview ; FEMA Community Resilience Challenges Index (CRCI) Census Tracts – Overview;
- National Risk Index
  - Documentation: National Risk Index Technical Documentation
  - Data: National Risk Index | FEMA.gov
- Resilience Analysis Planning Tool
  - Documentation: RAPT
  - Data: Future Resilience Analysis and Planning Tool (RAPT) - PRODUCTION



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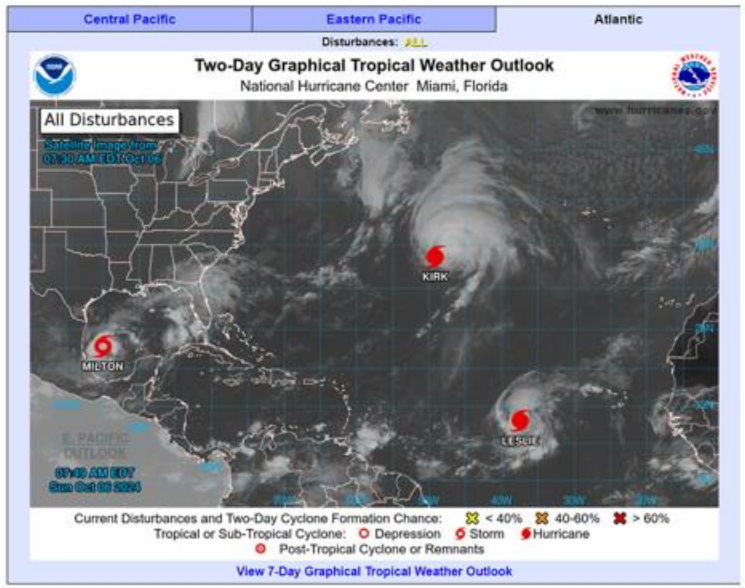
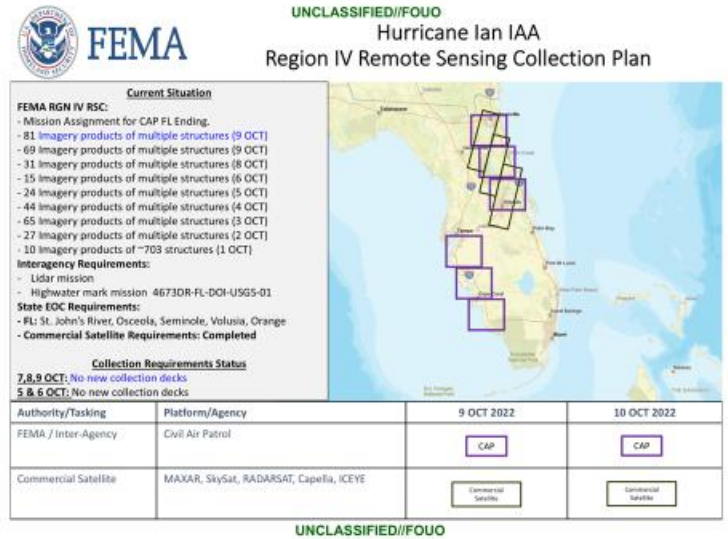
FEMA R4 Remote Sensing

Remote Sensing



Daily Remote Sensing Coordination Call



Collaborative Collection Plan

NASA

NOAA

US Army Corps of Engineers®

MISSISSIPPI STATE UNIVERSITY
RASPET FLIGHT RESEARCH LABORATORY

CIVIL AIR PATROL
U.S. AIR FORCE AUXILIARY

Imagery Collection Partners

How to Reach Us

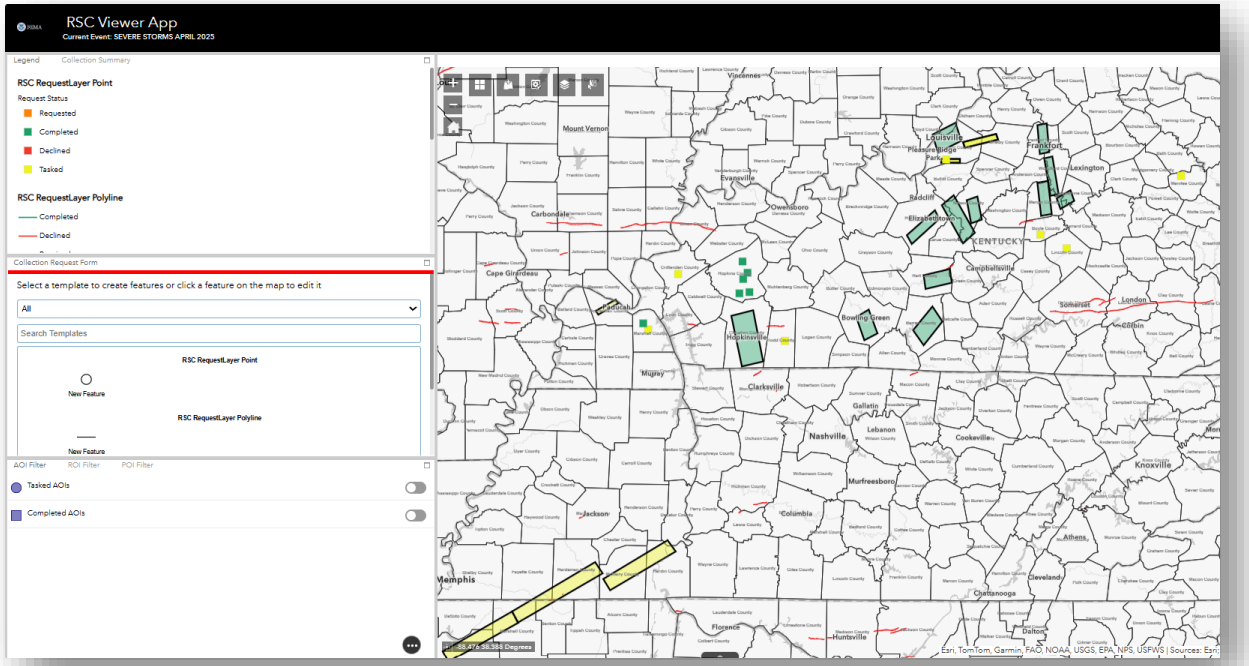
Contact Information:

- **Email:** travis.potter@fema.dhs.gov

Collaborating on ArcGIS Online:

- Join Our Partnered Collaboration Group: FEMA R4 Remote Sensing Collaboration

1. Contact us using your official organization email.
2. Include your AGOL username in e-mail.



FEMA R4 RSC Viewer

Interactive mapping tool for AOI development, imagery sharing, and deconfliction of imagery collection

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Recovery: Damage Assessment Resources

Current Damage Assessment Resources

Resource Links:

- FEMA Preliminary Damage Assessment Resources
- FEMA Preliminary Damage Assessments Guide
- How to Share Initial Damage Assessment Geospatial Datasets with FEMA

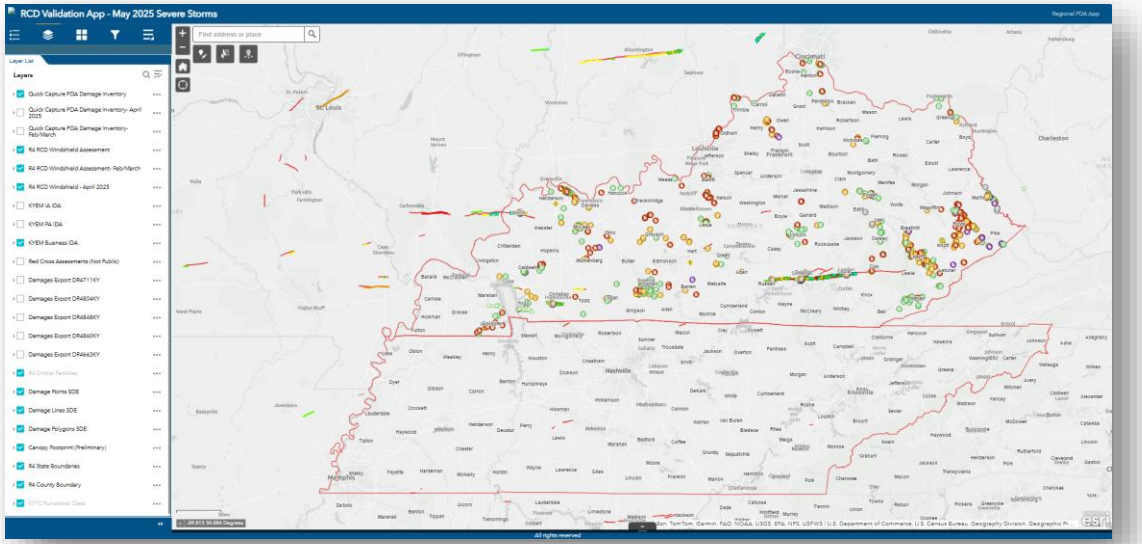
Resource Videos:

- Preliminary Damage Assessments Overview
- Conducting Joint Preliminary Damage Assessments
- Using Data to Support Disaster Declaration Requests
- Public Assistance Preliminary Damage Assessment
- Individual Assistance Preliminary Damage Assessment

How to Reach Us

- **Contact Information:**
- **Email:** lee.edge@fema.dhs.gov

- **Collaborating on ArcGIS Online:**
- All products available on Situational Awareness Journal



FEMA R4 RCD Validation Apps
Interactive mapping tool for damage validation, PDA field collection, and SLTT damage information exchange

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Mitigation: Common Resources for Damage Assessments

Resources and Tools for Floodplain Management

Pre-Disaster Preparation (Preparedness Phase)

Goal: Prepare datasets, templates, and tools for rapid deployment post-disaster.

- **Key GIS Tasks:**
- Collect and maintain:
  - **Parcel data** with ownership and assessed values.
  - **Building footprints** (e.g., from local government or USA structures).
  - **Floodplain data** (e.g., FEMA NFHL).
  - **Elevation and LIDAR data** (for flood depth analysis).
- Set up:
  - **GIS field collection templates:** preloaded with fields like structure type, damage level, flood depth, photos, etc.
  - **Substantial Damage Estimator (SDE) tool** templates for use in conjunction with field data.

Common Tools and Resources for Damage Assessments

Data Resources

1. FEMA Substantial Damage Estimator (SDE) Tool

- A standalone FEMA tool (not strictly GIS but integrates with GIS workflows).
- Collects and analyzes structural damage data to determine if a building is substantially damaged.
- Compatible with ArcGIS and can import/export shapefiles.

2. Local GIS/Parcel Data

- Parcel data from city/county assessors helps identify structure values and pre-damage information.
- Building footprints, zoning layers, and floodplain maps are critical for SDA decisions.

3. Remote Sensing / Aerial Imagery

- **NOAA Aerial Imagery** (post-disaster flights)
- **USGS Earth Explorer** or **Sentinel Hub** – Satellite imagery before and after the event.
- Drones (UAS) can provide hyper-local imagery for high-resolution damage mapping.

Initial Response & Field Deployment

Goal: Rapidly gather structural damage data after the disaster.

- **Key GIS Tasks:**
- Deploy mobile apps for field inspectors:
  - Record location via GPS
  - Add photos of damage
  - Estimate % of damage
  - Input water line or flood depth
- Enable **offline data collection** for areas with no connectivity.
- Sync data to a central GIS server.

Analysis & Decision Support

Goal: Analyze whether structures are "substantially damaged" (≥50%).

- **Key GIS Tasks:**
- Use formulas or SDE Tool to calculate % damage vs pre-damage value.
- Map damage categories:
  - Minor (<10%)
  - Major (10–50%)
  - Substantial (≥50%)
- Overlay flood zones to identify NFIP compliance issues.
- Identify target areas for follow-up inspections.

Use online dashboards synced to field data to show summaries by neighborhood, flood zone, etc

GIS Workflow for Substantial Damage Assessment

Reporting & Communication

- **Goal:** Share findings with FEMA, the public, and local officials.
- **Key GIS Tasks:**
- Generate:
  - **SDA reports by structure or parcel**
  - **Damage summary maps**
  - **Flood-influenced damage zones**
- Publish:
  - **Public-facing dashboards**
  - Maps showing where re-building will require NFIP compliance
- Archive all data for long-term mitigation planning.

Use online data hubs to coordinate recovery stakeholders and share non-sensitive data.

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