

# Leveraging GIS for Multi-agency Response to Significant Incidents

Part 1 of the Esri Public Safety –  
*Engagement and Collaboration Webinar Series*



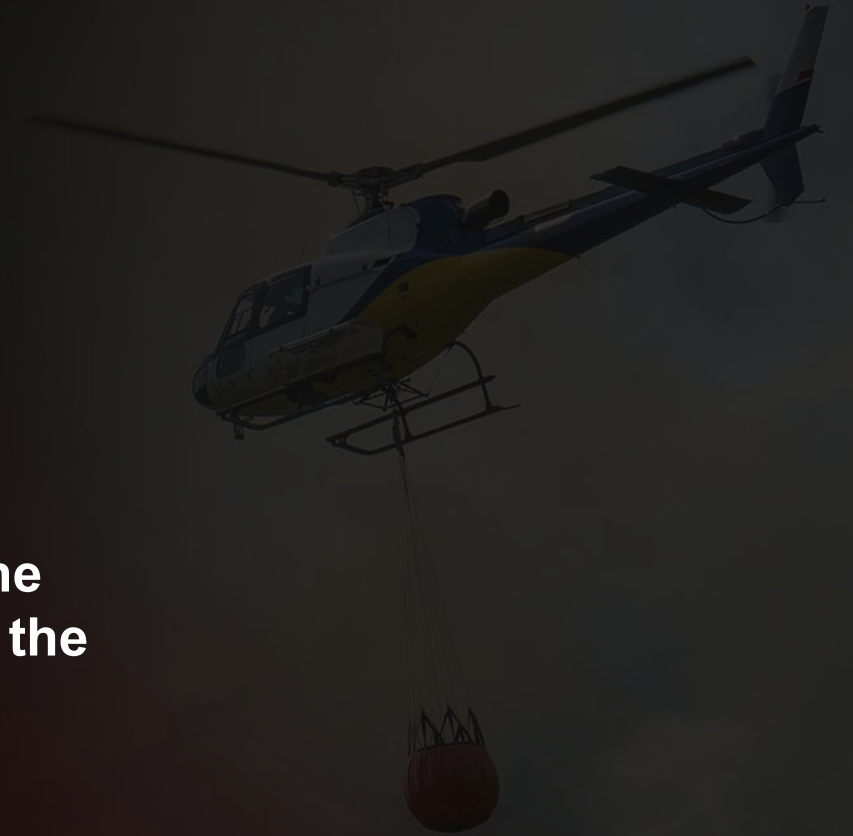
# Carrie Speranza

Esri Director Emergency Management  
[csperanza@esri.com](mailto:csperanza@esri.com)



# Housekeeping

- **Please use the attendee panel to submit your questions.**
- **A recording and resources will be emailed to you after the webinar. You can also download today's resources from the attendee panel.**
- **Please provide us with feedback! Survey available at the end of the webinar.**



# GIS Can Enhance Engagement and Collaboration Efforts

## *Our Webinar Journey*



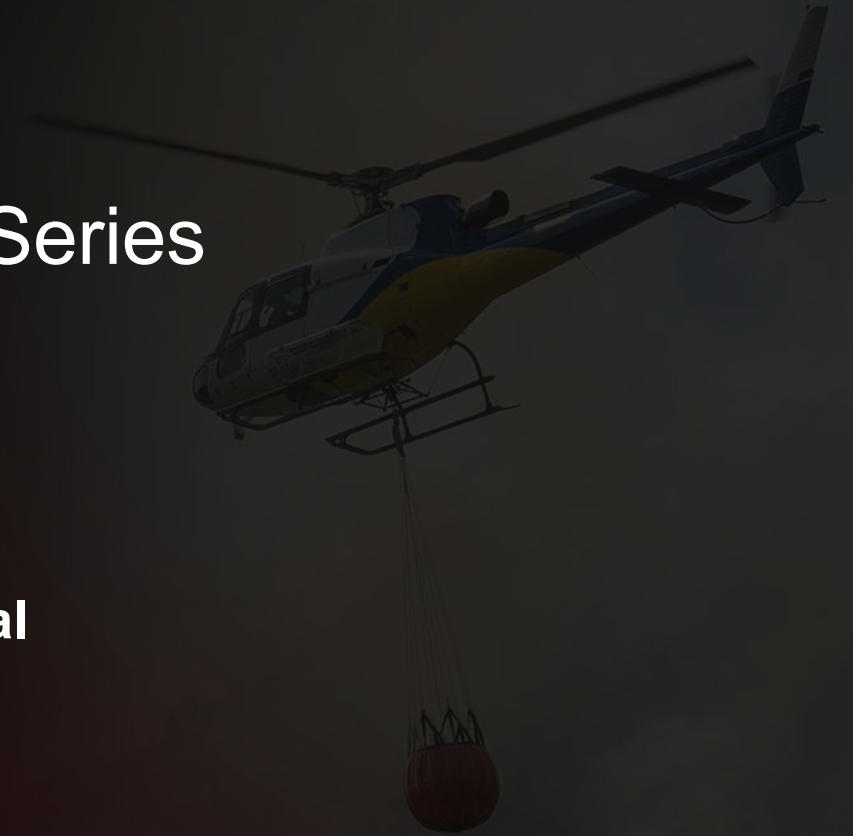
**Webinar 1: Tactical Approach**  
*GIS In Action: Urban Search & Rescue*

**Webinar 2: Operational Approach**  
*GIS In Action: International Humanitarian Efforts*

**Webinar 3: Strategic Approach**  
*The How: Governance & Policy*

# Engagement and Collaboration Webinar Series

- **Part 1: Leveraging GIS for Multi-agency Response to Significant Incidents**
- **Part 2: Improving Response Coordination and Situational Overview with GIS and UAVs**
- **Part 3: Regional and Cross-Jurisdictional Collaboration: Unlocking the Power of Spatial Data Integration**



# Mike Cox

Esri Director of Fire, Rescue, EMS  
[mike\\_cox@esri.com](mailto:mike_cox@esri.com)



# Jared Doke

National Alliance for Public Safety GIS  
(NAPSG) Foundation



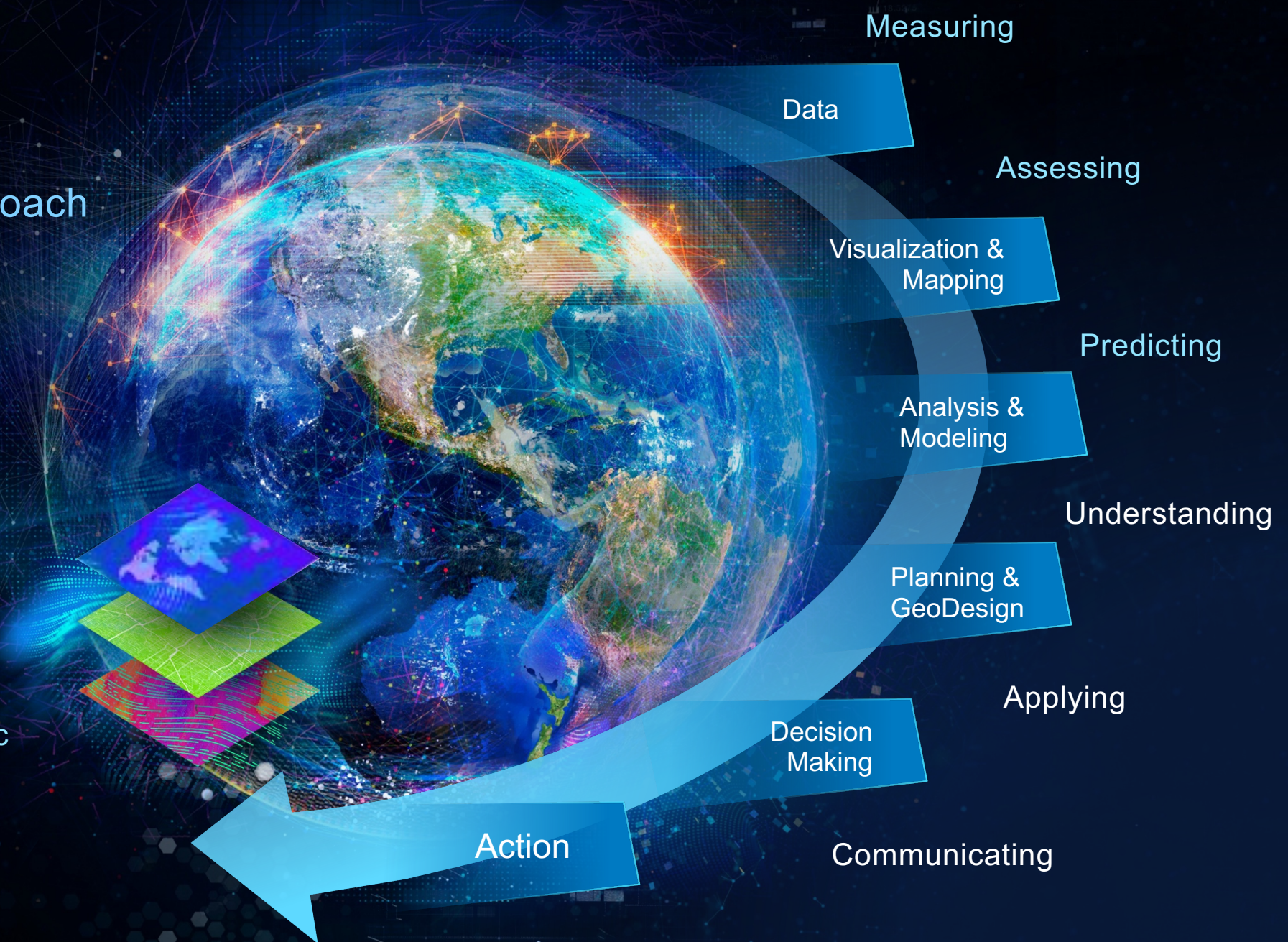
NAPSG Foundation

# GIS

Enables The Geographic Approach

Providing a Process and Framework . . .

. . . For Applying Geographic Knowledge Widely



Measuring

Data

Assessing

Visualization & Mapping

Predicting

Analysis & Modeling

Understanding

Planning & GeoDesign

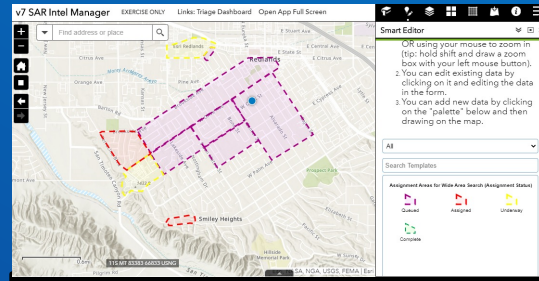
Applying

Decision Making

Communicating

Action

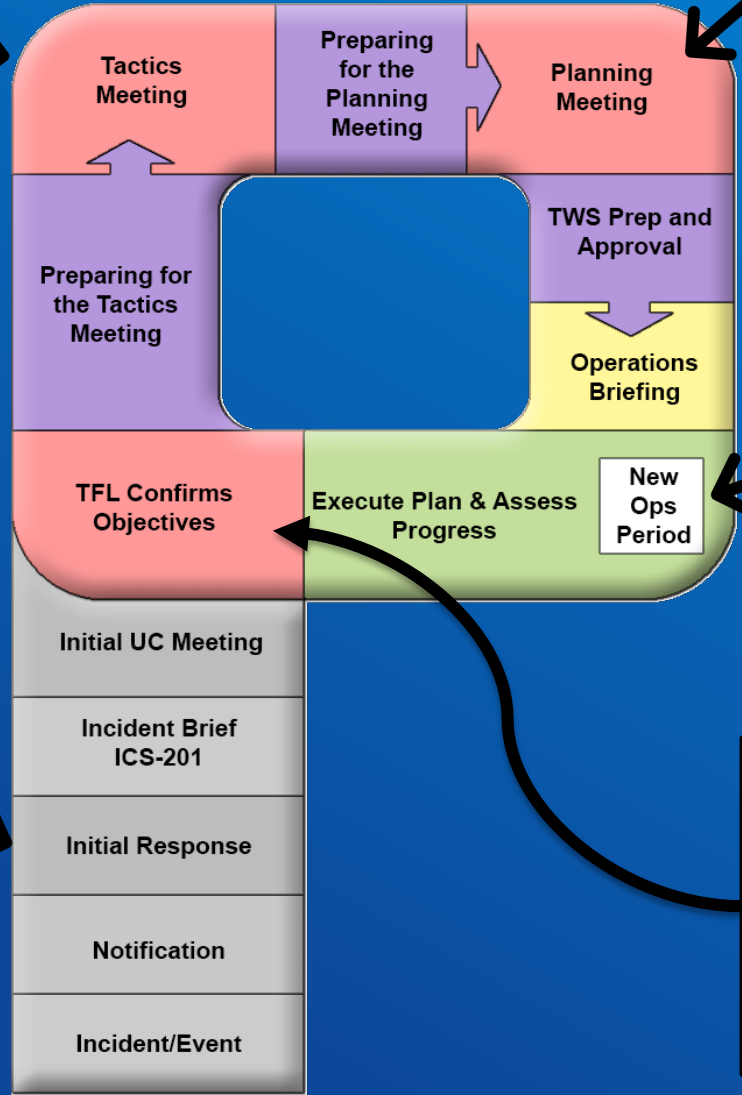
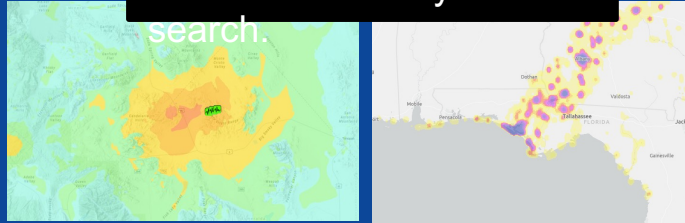
# Geospatial Planning P



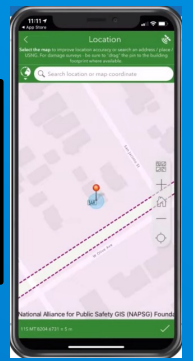
**2 Plans/TIS:** Create assignment areas.

**1 Plans/TIS/IST:** Refine common operating map forecast / early impacts – determine objectives, meet with AHJ, Create Divisions & Branches. etc.

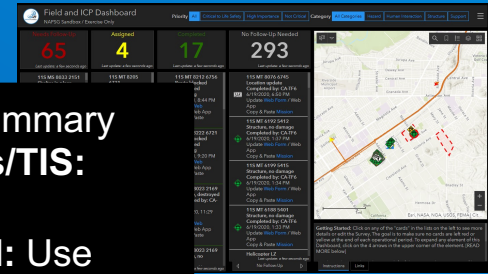
**0 Plans/TIS/IST:** Prepping the common operating map forecast / early impacts  
**Field:** Use QuickCapture to document hasty / recon search.



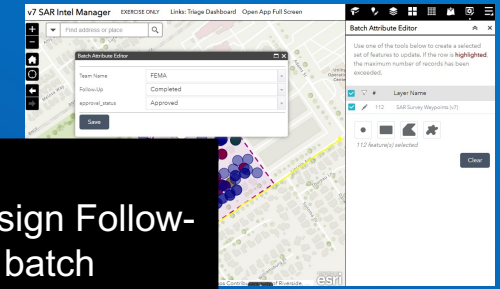
**3 Plans / TIS** Prioritize assignment areas with Ops, develop ics204/209. Prepare devices, train field team.



**4 IST:** Monitor Summary Dashboard  
**Plans/TIS:** Monitor Tactical Dashboard, **Field:** Use Survey123 for waypoints, QuickCapture for tracklog.



**5 Between Op. Period:**  
**Plans/TIS:** Review, Assign Follow-up, Approve Data (see batch attribute editor). Generate reports for SitRep with S123 Results. **IST:** Review Summary Dashboard and overall search progress.

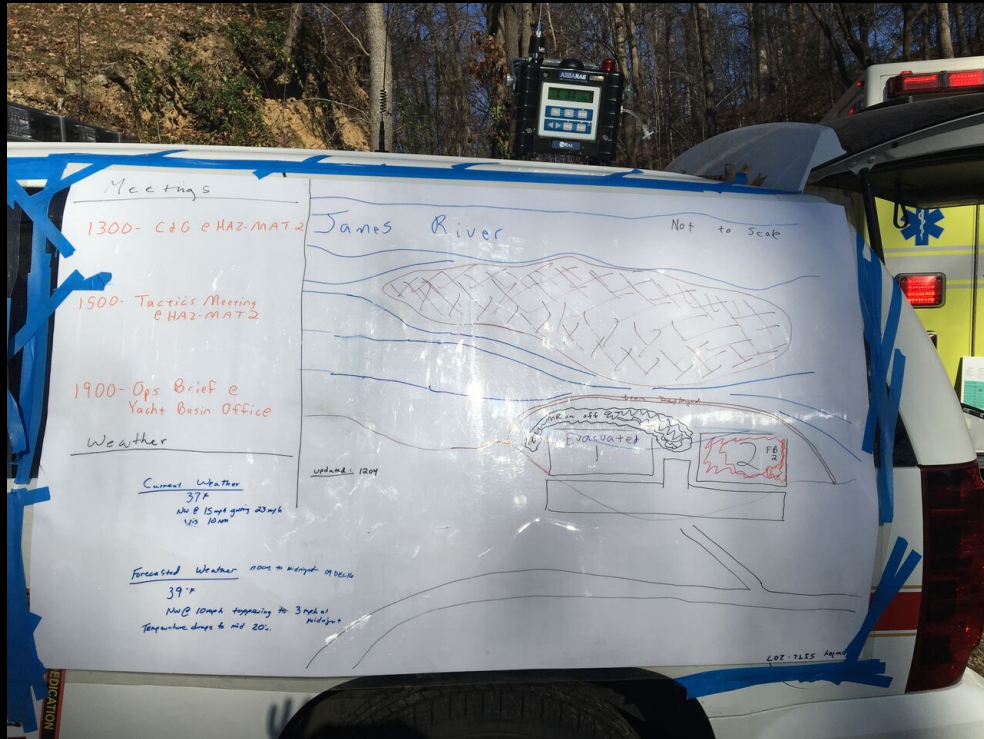


# GIS Abstracts Our World



# Data driven operational decision making...

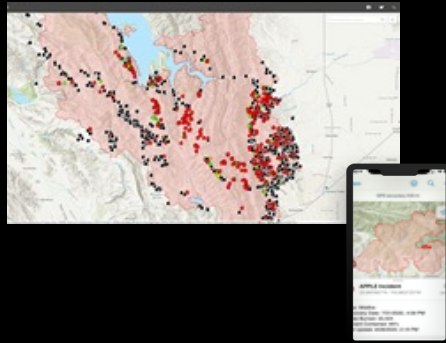
Transitioning from this...



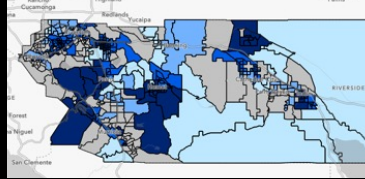
To this...



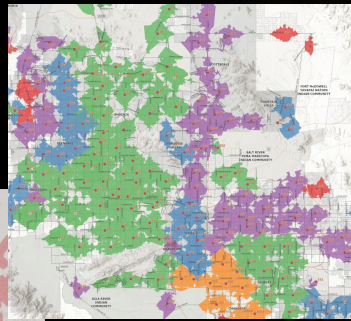
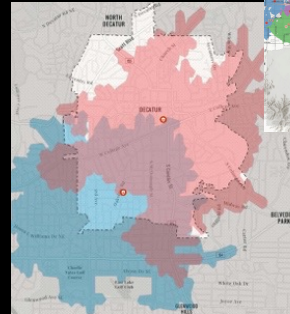
# Damage Assessment



# Opioid Overdoses

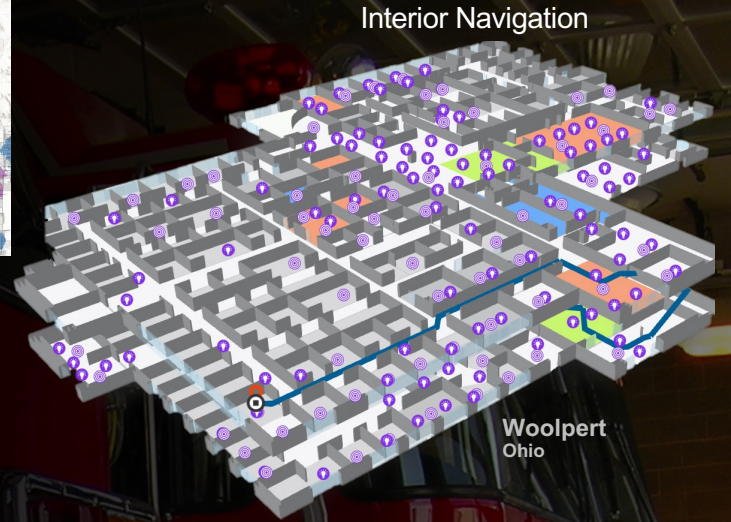


# Drive Time Analysis



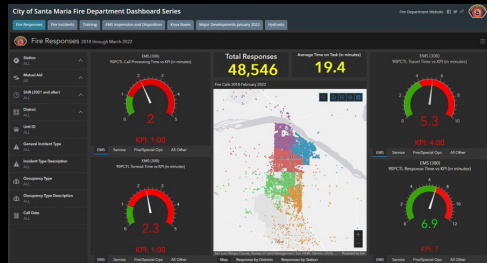
City of Scottsdale  
Arizona

InterDev  
Georgia



Interior Navigation

Woolpert  
Ohio

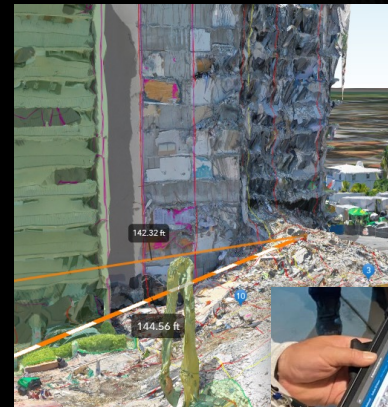


# Response Analytics

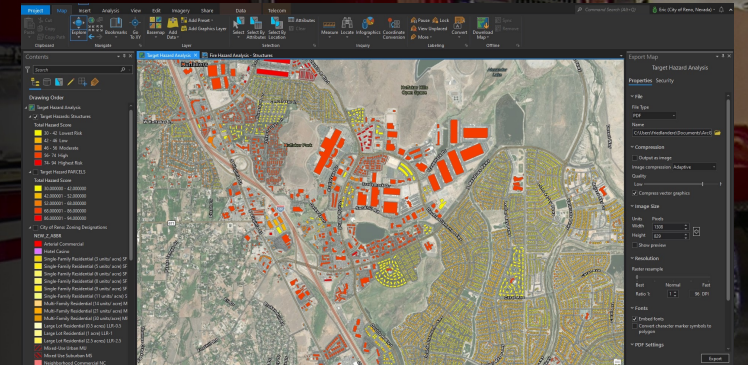
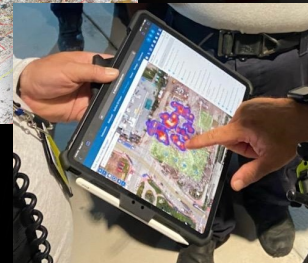


City of Carlsbad

# Structure Collapse



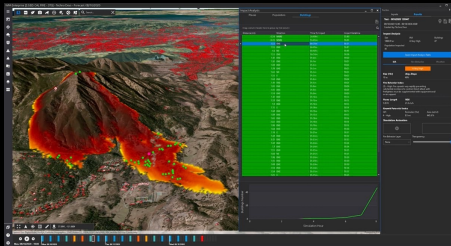
FEMA  
Surfside, Florida



City of Reno  
Nevada

Target Hazard Analysis

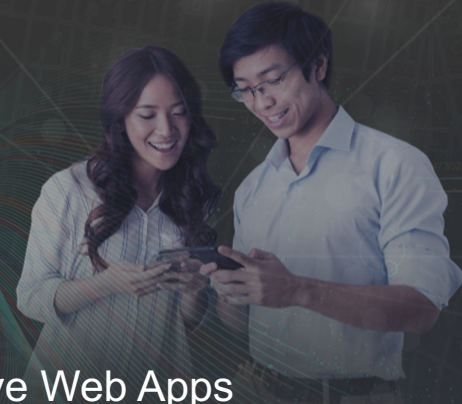
# Fire Behavior Modeling



Technosylva

# ArcGIS

Provides Apps To Support Workflows and Engagements



## Powerful Desktop Apps

ModelBuilder Pro

Screenshots of ArcGIS ModelBuilder and Pro desktop interfaces, showing workflow design and map creation capabilities.

Operational Awareness

A control room dashboard with various metrics and maps, illustrating operational awareness and data visualization.

## Massive Mobile Deployments

Field Operations Data Collection Tracking

Work Management Quick Data Capture

Form-Centric

A collection of mobile devices displaying various ArcGIS field applications, including field operations, data collection, and tracking.

## Pervasive Web Apps

Dashboards Mapping

Infographics StoryMaps

A collection of web-based ArcGIS applications including dashboards, maps, and story maps, demonstrating pervasive web app capabilities.

Portal



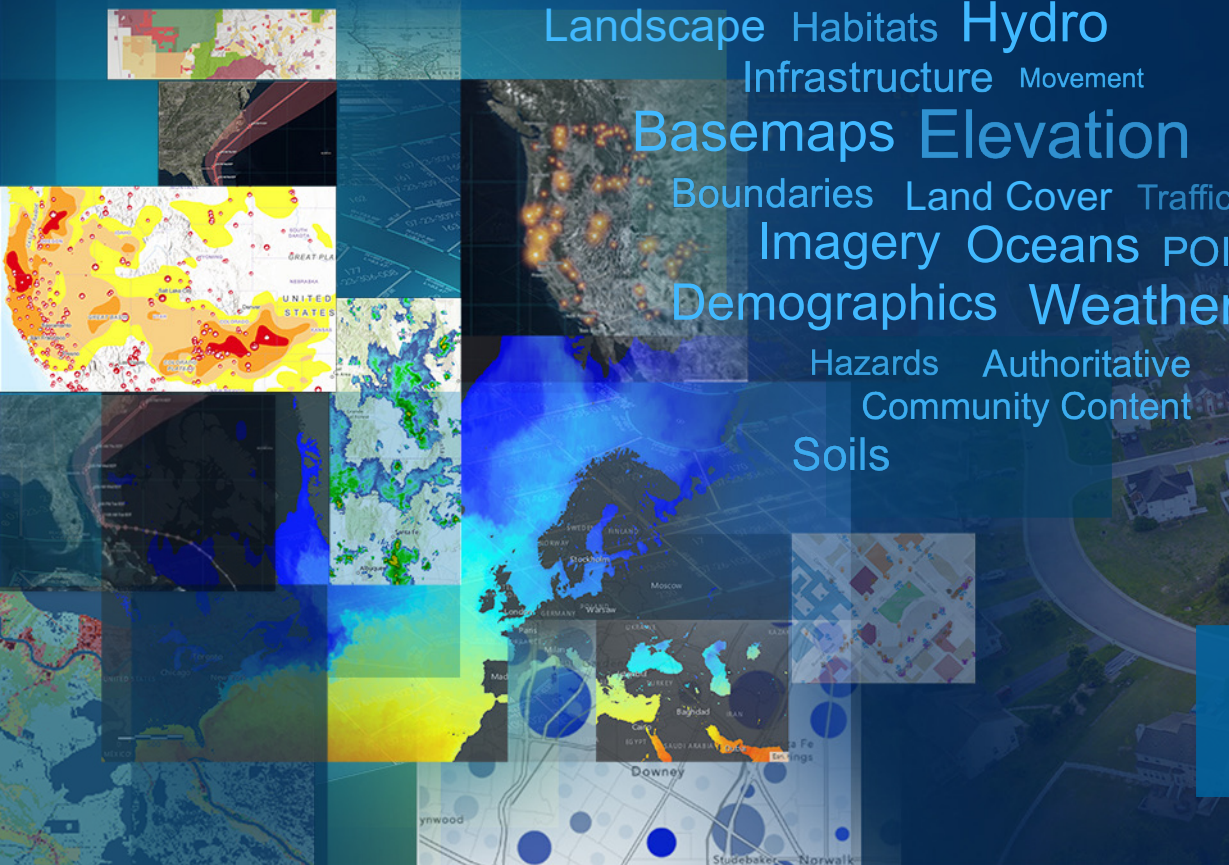
Geospatial Infrastructure

Empowering Everyone . . .  
. . . In Your Organization and Beyond

# ArcGIS Includes Massive Ready-to-Use Content

Basemaps, Imagery and a Living Atlas of the World

## Living Atlas



Transportation Environment Business

Landscape Habitats Hydro

Infrastructure Movement

Basemaps Elevation

Boundaries Land Cover Traffic

Imagery Oceans POI

Demographics Weather

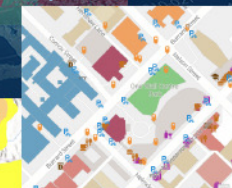
Hazards Authoritative  
Community Content

Soils

Updated Land Cover (NLCD)



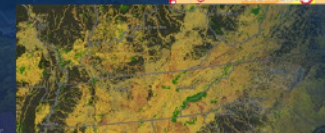
OpenStreetMap  
Layers



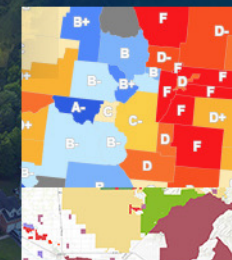
Real-Time  
Observations



NatureServe  
Imperiled Species



Policy Maps



Protected Areas



## New & Improved

- Expanded POIs
- Better OSM Integration
- Global Demographics
- Enhanced Imagery
- New Content
  - Landcover Forecast
  - Biodiversity
  - Air Quality
  - Global River Flow
  - . . .

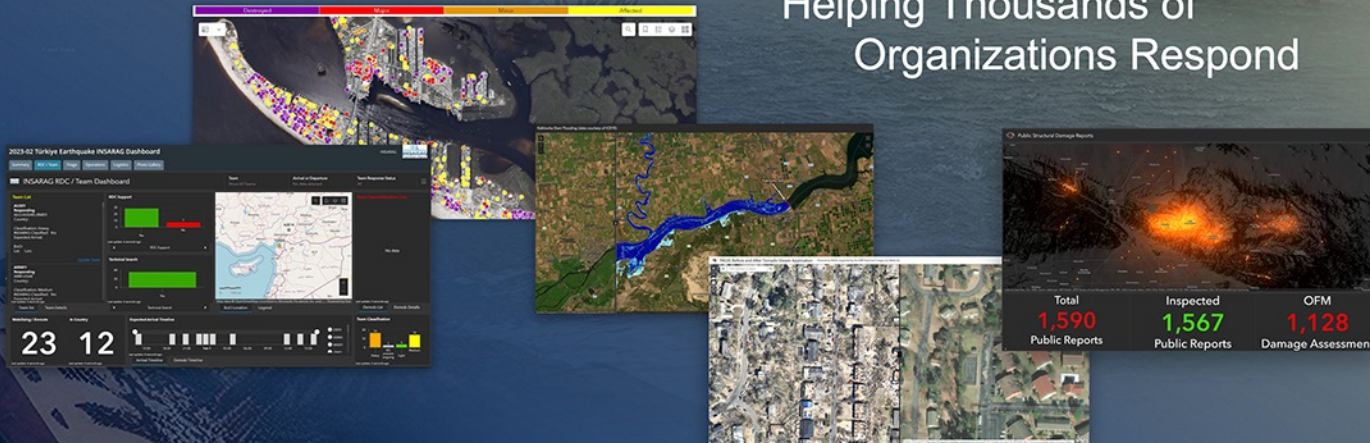
- Millions of Maps, Layers and Datasets
- Billions of Requests Daily

*Global Geographic Data . . .  
About Everything*

# DISASTER RESPONSE

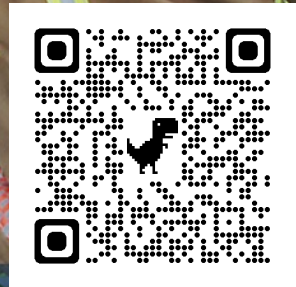
Supporting Users Globally in Times of Crisis

Helping Thousands of Organizations Respond



Partnered with

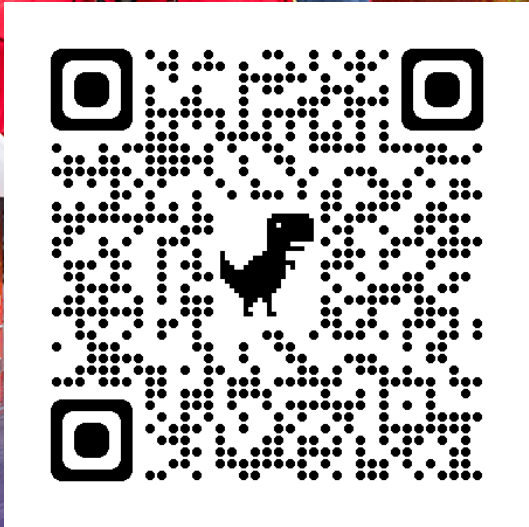
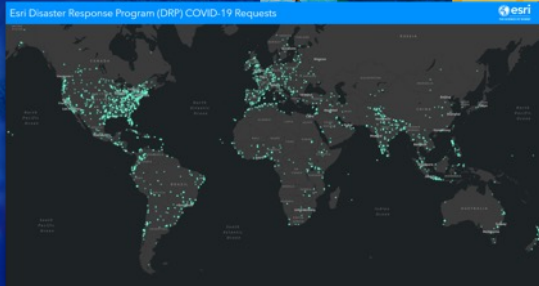
- Users
- HOT
- Esri Partners
- GISCorps
- MapAction
- American Red Cross
- FEMA



Mobilizing & Coordinating Resources Across Esri

# DISASTER RESPONSE

Supporting Users Globally in Times of Crisis



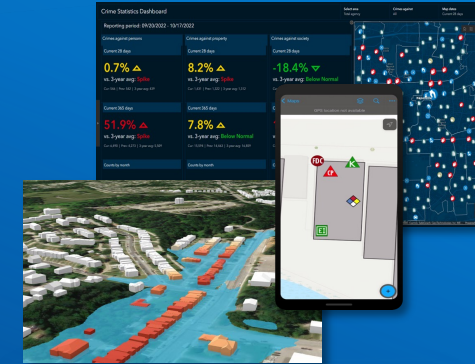
# ArcGIS Solutions Ready-to-Use ArcGIS Configurations

## Preconfigured

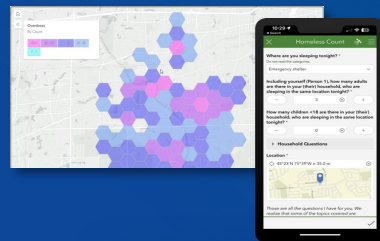
Tools  
Data Models  
Apps  
Workflows  
Maps  
Add-Ins  
Initiatives  
Dashboards



Local & State Governments



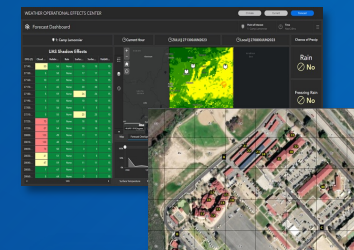
Emergency Management & Public Safety



Health & Human Services



Utilities & Telecoms



Defense & Security

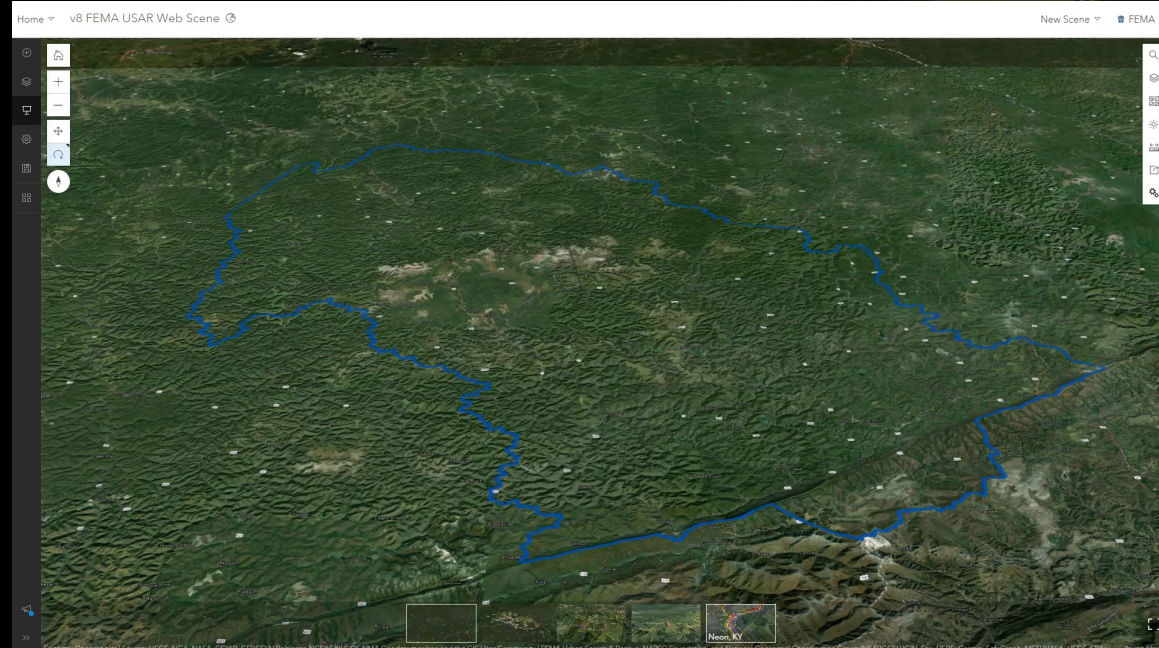
## Industries

- Land Records
- Public Works
- Emergency Management
- Utilities / Network Management
- Planning and Development
- Natural Resources
- Transportation
- Defense
- Public Safety
- Telecommunications
- Conservation
- Elections
- Health / Human Services

- Extensive (150+)
- Easy to Deploy
- Fully Supported
- Included with ArcGIS

... Helping Organizations Quickly Realize Value

# THE SCIENCE OF WHERE



### SAR Field Data Collection

38.977°N 76.487°W

USNG: 18S UJ 7119 1532

Waypoint \*

- Victims
- Hazards
- Damage
- Other

Victim Type: Evacuated

Victim Count: 5

Patient Identification

### SAR Field Data Collection

38.977°N 76.487°W

USNG: 18S UJ 7119 1532

Waypoint \*

- Victims
- Hazards
- Damage
- Other

Select Hazard Present

Flood/Water Level

Flood Level

Please specify ft, in, etc.

Hazard Comments

### Dashboard

48-4663-KY Urban Search and Rescue Data is archived and made available via this Geospatial Incident Briefing.

Waypoints Filtered View - 175886

The data on this dashboard are filtered for external emergency management stakeholders. Human interactions are redacted. If you need full access please contact the ESF9 Desk or ESF9 Liaison.

Definitions for waypoints and tracks can be found here: [Data Dictionary](#).

About Legend Incident List

Waypoints	Damage Observations	Lifeline Reports
<b>75,655</b> +2,551 Today	<b>73,810</b> +2,507 Today	<b>14</b> +0 Today

This is a tally all observations in the field (with human interactions filtered out).

These are witness reports by first responders and are not "official" preliminary damage assessment values. They may be used by the SLT and FEMA Region as part of the 2024 damage assessment process. [Data source](#)

These are simple "spot reports" from the field based on the Community Lifeline construct.



### 2023-02 Türkiye Earthquake INSARAG Dashboard

INSARAG Operations Dashboard

UCC / SCC: All | Team: All Teams | Sector: All Sectors | Reporting Period: No data selected

**Workites Assigned by UCC:** 253

**Workites In Progress:** 39

**Reports waiting for Team QA:** 0 (3 hours+)

**Total waiting:** 0

**Total Victim Extractions:** 926

**Victim forms waiting for Team QA:** 0 (3 hours+)

**Total waiting:** 0

**List of assigned Workites**

**Worksite A1** [Completed]

Assigned Team: POL01  
Assignment Date: 2/9/2023, 2:03 AM  
Reporting frequency: ...

**Worksite A2** [Completed]

Assigned Team: AUS02  
Assignment Date: 2/14/2023, 6:34 AM  
Reporting frequency: ...

**Worksite A3** [Completed]

Assigned Team: BUL01  
Assignment Date: 2/9/2023, 7:04 AM  
Reporting frequency: ...

**Workites Completed vs Total Tasked**

Total number of Rescues

Category	Count
Deceased	680
Live	219

**Totals:** 266

**Victim Extractions**

**Worksite : A1**  
Team: QAT01  
Date of Extrication: 2/8/2023, 6:15 AM  
Victim Number: 1

Victim Info: Female  
Floor level: 3  
Position in Structure: living room  
ASR3  
Condition: Deceased , Injuries:

Handed over to: Ambulance

**Worksite : A1**  
Team: POL10  
Date of Extrication: 2/10/2023, 9:00 AM  
Victim Number: 1

Victim Info: female child 10 yo  
Floor level: 3  
Position in Structure: laying on back  
ASR4  
Condition: Deceased , Injuries: Critical

Handed over to: Mortuary

**Worksite : A1**  
Team: POL10  
Date of Extrication: 2/10/2023, 10:00 AM  
Victim Number: 2



U.N. INSARAG USAR

Lee Newman, London Fire Brigade ISAR

# Search and Rescue Common Operating Platform

**Jared Doke**

National Alliance for Public Safety GIS (NAPSG)  
Foundation



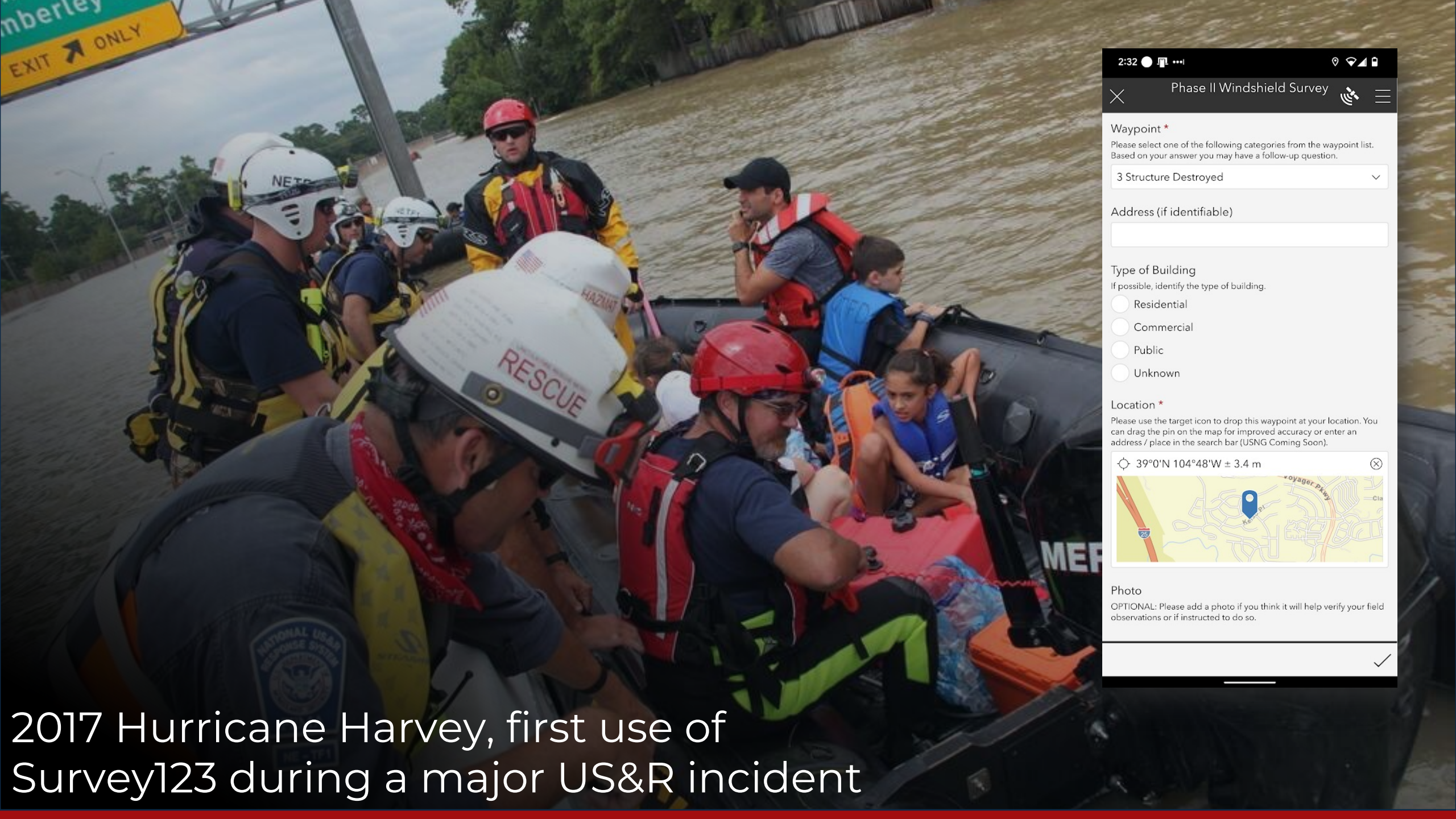
NAPSG Foundation



Search and Rescue is  
an inherently spatial problem



2013 GPS Use and File Conversion Protocol (Iron Sights)



2:32 [status icons]

Phase II Windshield Survey [icons]

Waypoint \*

Please select one of the following categories from the waypoint list. Based on your answer you may have a follow-up question.

3 Structure Destroyed [dropdown arrow]

Address (if identifiable)

Type of Building

If possible, identify the type of building.

Residential

Commercial

Public

Unknown

Location \*

Please use the target icon to drop this waypoint at your location. You can drag the pin on the map for improved accuracy or enter an address / place in the search bar (USNG Coming Soon).

39°0'N 104°48'W ± 3.4 m [close icon]

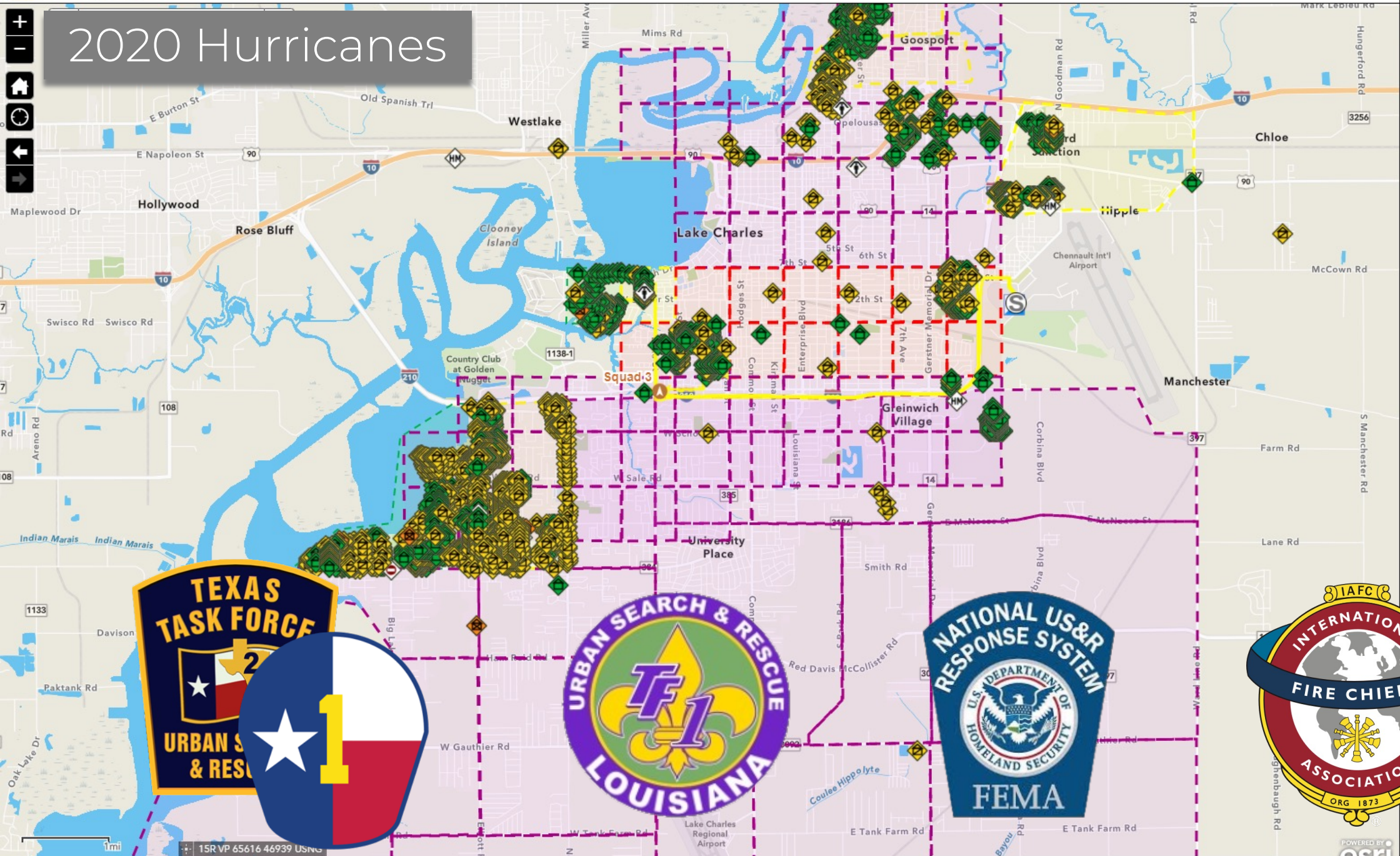
Photo

OPTIONAL: Please add a photo if you think it will help verify your field observations or if instructed to do so.

[checkmark icon]

2017 Hurricane Harvey, first use of Survey123 during a major US&R incident

# 2020 Hurricanes

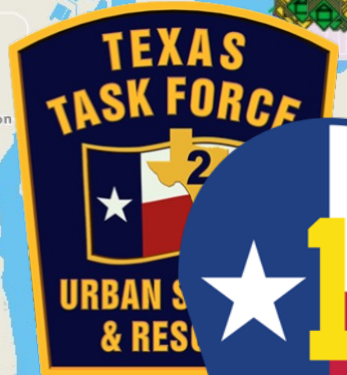


## Instructions

### About

### Legend

- TXTF Last Known Points**
- LATF Last Known Point**
- IAFC Last Known Point**
- IAFC Surveys**
  - Structure, no damage
  - Structure, damaged
  - Structure, failed
  - Structure, destroyed
  - Assisted
  - Evacuated
  - Rescued
  - Victim, detected
  - Victim, confirmed
  - Human remains
  - Human remains, removed
  - Shelter in place
  - Follow-up form
  - Fire incident
  - HAZMAT Incident
  - Flood/water level
  - Gate blocked
  - Gas Hazard
  - Animal issue
  - Targeted search
  - Location update
  - Incident command post
  - Staging
  - Safety zone
  - Helicopter LZ
  - Casualty Collection Point
  - Firehouse (originally marked)





**People**



**Process**



**Technology**

# The NSARGC Mission

National Search & Rescue Geospatial Coordination Group

- Provides national leadership for the integration of geospatial information, technology, and systems into all phases of search and rescue.
  - Geospatial standards and tools
  - Trusted data to support SAR operations
  - Training
  - The development of geospatial capability in the field



## Who is the NSARGC?

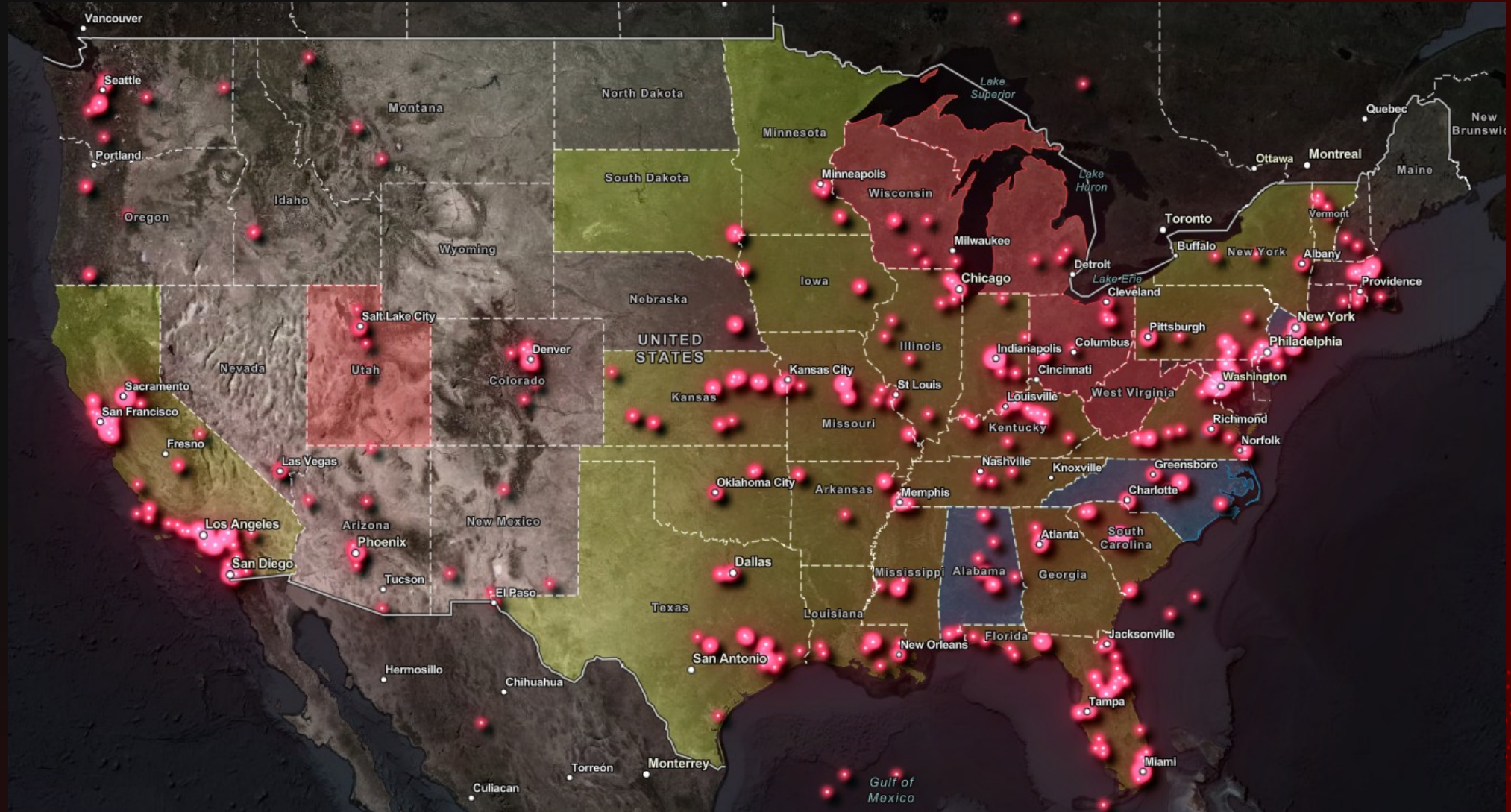
- **NSARGC Community**  
All NSARGC stakeholders
- **NSARGC Cadre** Doers/trusted Advisors
- **NSARGC Committee** NSARGC Leadership



# NSARGC Committee Members



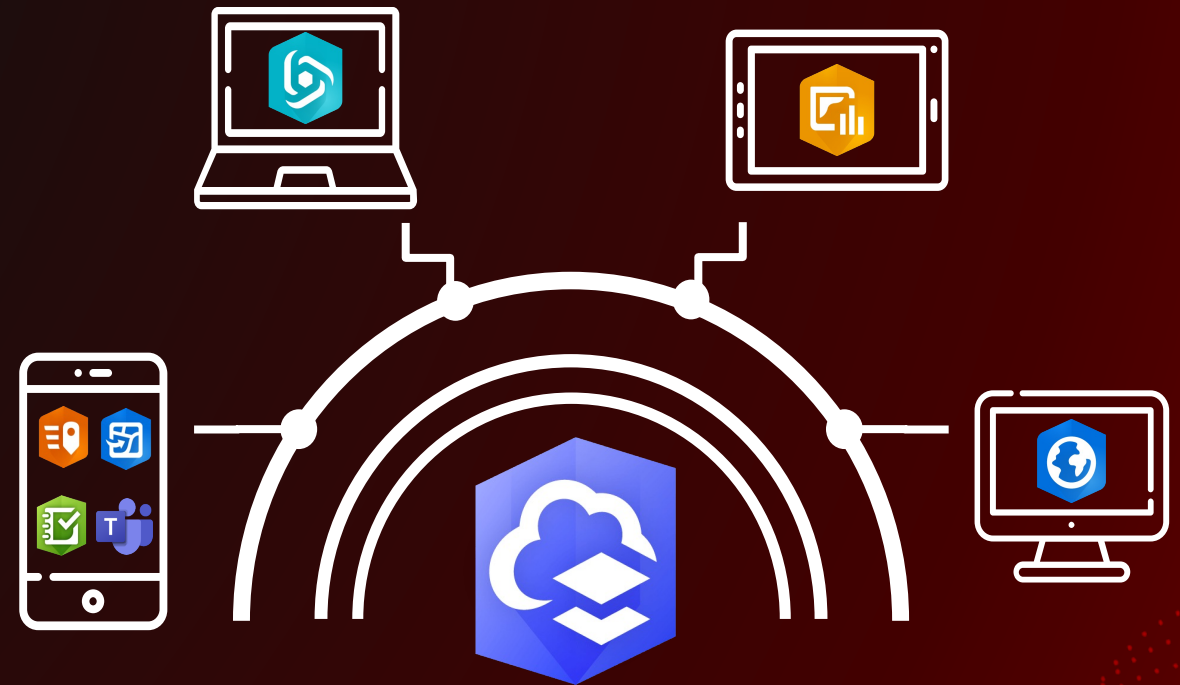
# NSARGC / SARCOP Collaboration (Geospatial Gameplan)



# What is SARCOP?

## Search and Rescue Common Operating Platform

- Multiagency platform
- Designed to assist agencies plan and conduct effective search and rescue (SAR) operations.
- SARCOP aggregates access to easy-to-use mobile applications, web-based applications, and advanced geospatial analytics into a single platform.



Search and Rescue Common Operating Platform

## Purpose of SARCOP

- Collect and share field observations:
  - Search/Human Interactions
  - Damage Observations
  - Hazards
  - Other/Incident Support
- Tracklogs denoting Mission Type
- Provides shared situational awareness for both response and recovery.



## SARCOP is not...

- SARCOP is not a Preliminary Damage Assessment (PDA) tool.
- A system to store Personally Identifiable Information (PII).



## Why Use SARCOP?

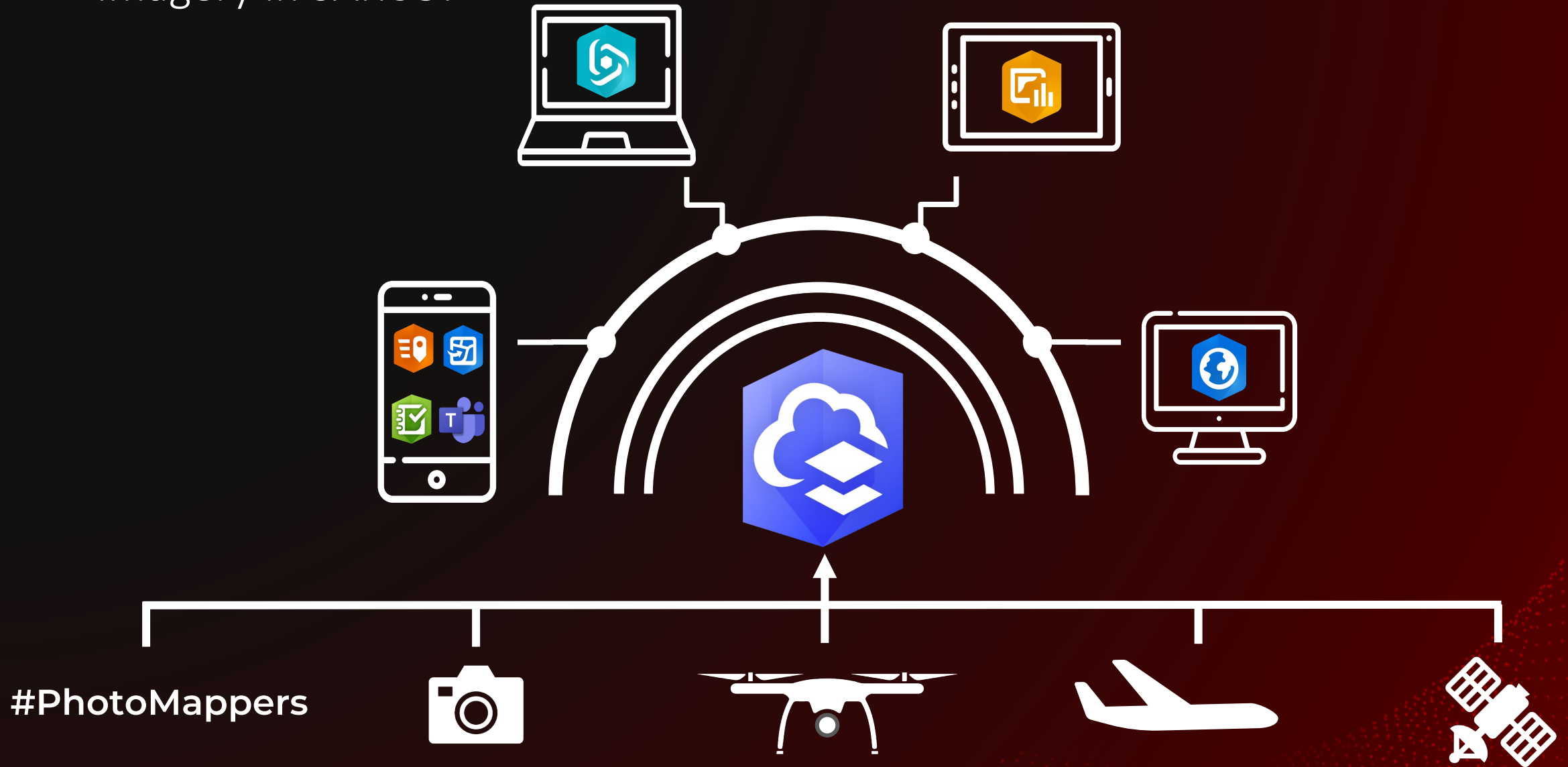
- First, and foremost, SARCOP improves outcomes for survivors.
- Supports better decision making through mapping of forecast and observed impacts.
- Shares information including proposed search areas, known hazards, and areas searched.
- Reduces duplication of effort.
- Identifies (and closes) data and intelligence gaps.



OH-TF1 Conducting Wide Area Search Operations

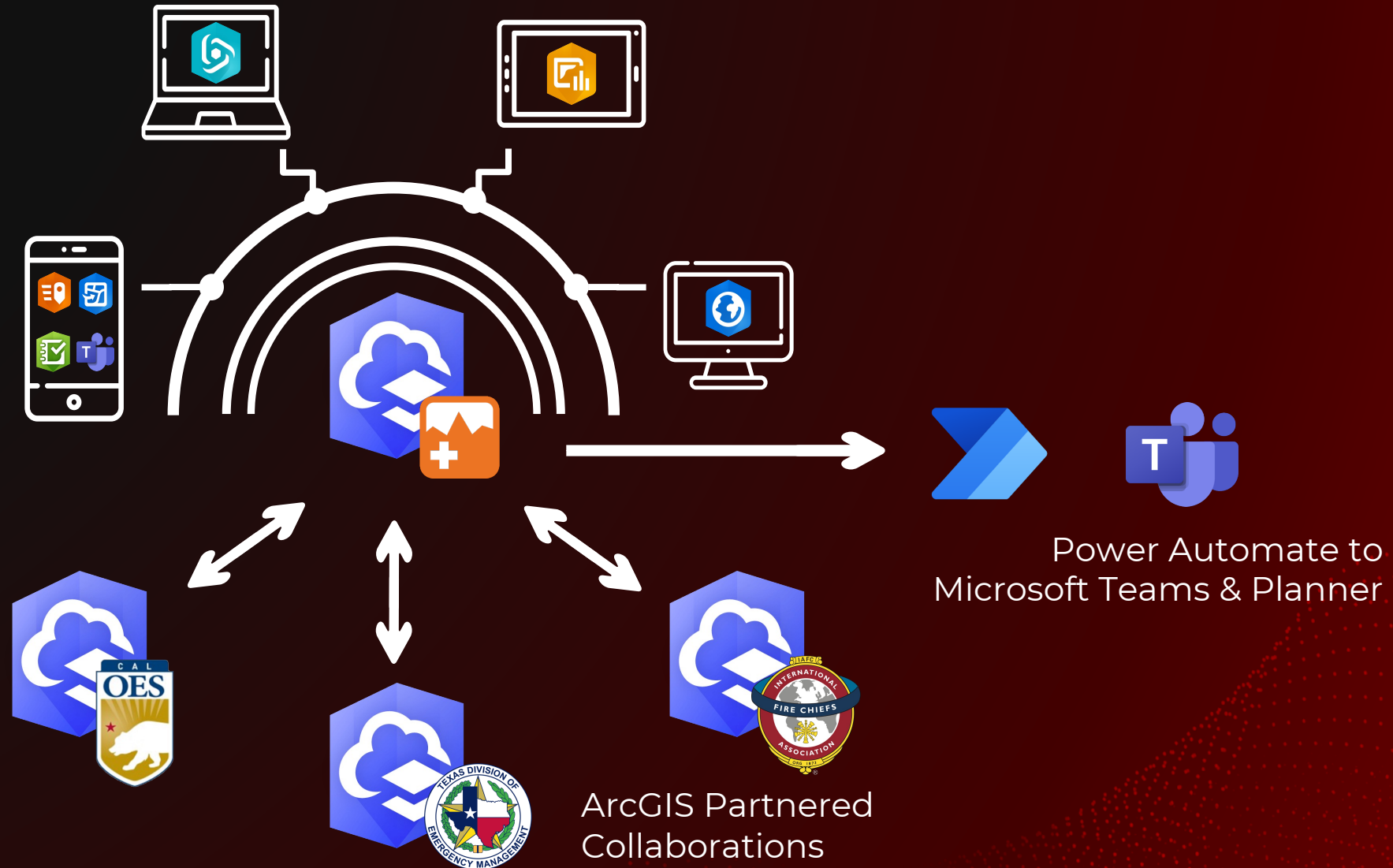


# Imagery in SARCOP



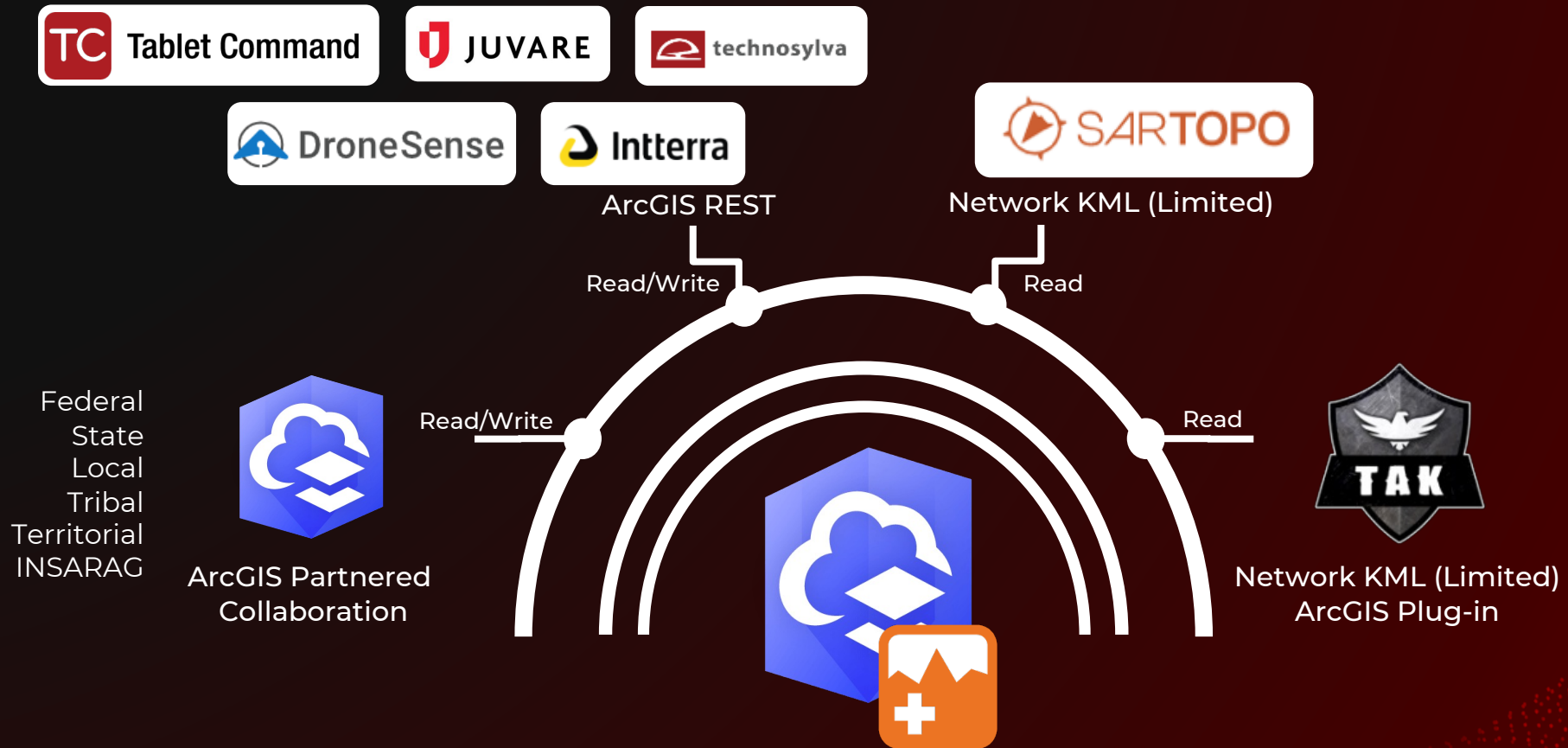
# SARCOP Interoperability

- Utilize secure group sharing to provision
- Filtered views are shared various stakeholders
- Power Automate provides notifications and automation



# SARCOP Interoperability Continued

SARCOP can be connected to other spatial and non-spatial platforms, including, but not limited to:



# Join the NSARGC!

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[jdoke@publicsafetygis.org](mailto:jdoke@publicsafetygis.org)

[nsargc.napsgfoundation.org](http://nsargc.napsgfoundation.org)

[napsgfoundation.org](http://napsgfoundation.org)

[@napsgfoundation](#)



NSARGC Interest List

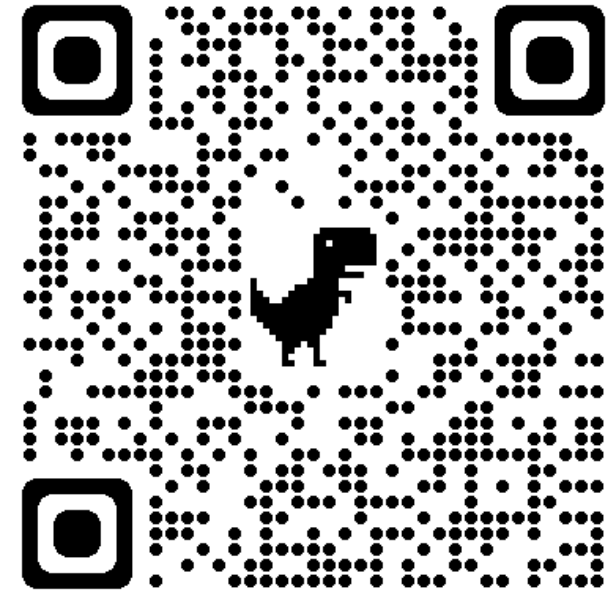


# Search and Rescue Common Operating Platform Local

Deploy the Search and Rescue Common Operating Platform (SARCOP) for local disaster incidents from a template.

NAPSG Foundation

June 12, 2023



# Q&A

**Jared Doke**

National Alliance for Public Safety GIS  
(NAPSG) Foundation



NAPSG Foundation

# Resources

Reminder: please use the attendee panel to submit your questions!



Thank you!



Carrie Speranza, Esri



Mike Cox, Esri



Jared Doke, NAPSG

**Up Next!**

# Improving Response Coordination and Situational Overview with GIS and UAVs

Part 2 of the Esri Public Safety –  
*Engagement and Collaboration Webinar Series*

Register: [go.esri.com/collaboration-series-1](https://go.esri.com/collaboration-series-1)



# Regional and Cross-Jurisdictional Collaboration: Unlocking the Power of Spatial Data Integration

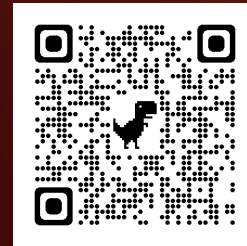
Part 3 of the Esri Public Safety –  
*Engagement and Collaboration Webinar Series*

Register: [go.esri.com/collaboration-series-1](https://go.esri.com/collaboration-series-1)



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<https://www.linkedin.com/groups/7049336/>





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**THE  
SCIENCE  
OF  
WHERE**<sup>®</sup>