

Deploying Core Operational Information with Web GIS

National Geospatial Preparedness Summit

December 4, 2017

National Alliance for Public Safety GIS (NAPSG) Foundation

napsfoundation.org | [@napsfoundation](https://twitter.com/napsfoundation)

Goals and Objectives

Overview of the standardized framework for Core Operational Information relevant across all hazards.

- Learn about best practices related to Core Information Needs in:
 - Preparedness
 - Readiness
 - Response
 - Recovery
- Explore your own communities.
- Develop / refine your game plan for Core Information Needs in your agency.

Background

- Core Operation Information evolved following work with first responders across the country to develop the [National Flood Preparedness Guideline](#).
- Series of workshops funded through DHS Science & Technology directorate to help the public safety community prepare for, respond to, and recover from flood disasters.
- 2 Regional pilots projects served to validate and refine the Guideline.

Produced with support from the US Department of Homeland Security Science and Technology Directorate, agreement number HSHQDC-16-C-B0016.

National Flood Preparedness Guideline

Version 2.3 | June 2017

Core Operational Information Solution
Contract: HSHQDC-16-C-80016



National Alliance for Public Safety GIS (NAPSG) Foundation
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Flood Preparedness Pilot Outcomes

- Guideline Addressed:
- First Responders: Key challenges often faced by flood-prone communities
 - Improved Alerting and Warning
 - Resource Management and Coordination
 - Common Reference Grid for Operations
 - Faster Information Delivery to Decision Makers
 - Increased Trust and Confidence in Data
 - Information Management and Overload
- GIS / IT Supports Staff: Priority Information Needs from Preparedness to Recovery
 - Key workflows and information needs of first responders
 - Common data needs and sources

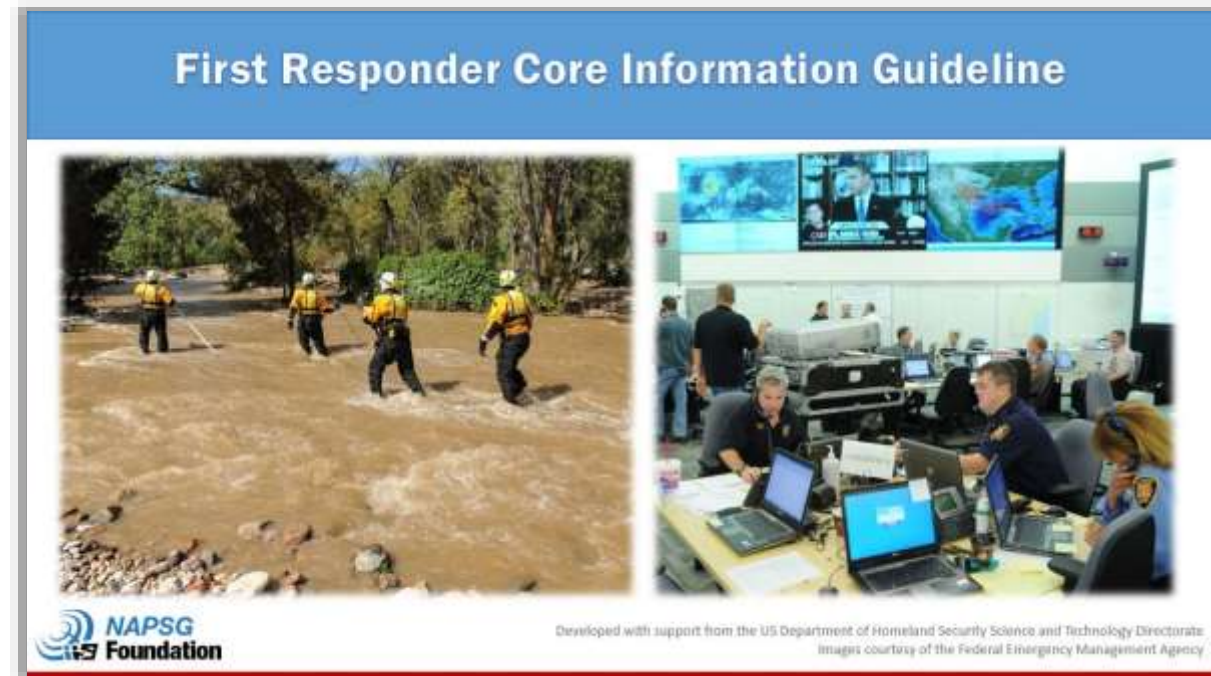
Agenda

- 1000 Introductions & Objectives
- 1010 What are Core Information Needs?
- 1030 Hands-on Exercise #1 – Explore Core Info Needs
- 1050 Case Study: Hurricane Michael
 - Florida SERT Perspective
 - State SAR / EMS Perspective
- 1125 Hands-on Exercise #2 – Explore Your Community
- 1150 Close-out

Flood Preparedness Pilot Outcomes

1. First Responder Core Information Guideline

- Interactive guideline to provide first responders and decision makers with a standardized framework for Core Operational Information, regardless of hazard.
- Aligns the key decision points with essential elements of information and supporting data requirements for supporting effective decision making in disasters.
- By design, this guideline supports flexible, scalable, and practical implementation.



<https://arcg.is/u8Kji>

Flood Preparedness Pilot Outcomes

2. GIS Technical Implementation Guidance

- A companion to the First Responder Critical Information Guideline for Flood Events
- Describes more technical workflows and best practices for supporting operators and decision makers through all phases of a disaster.



Flood Preparedness Pilot Outcomes

3. Core Operational Information

What are the Core Information Needs of Decision Makers from Readiness – Recovery

- A standardize framework of core operational information
- Supports both planning and operations across hazards and agencies.
- Is flexible and technology agnostic

	Preparedness (0)	Readiness (1)	Response (2)	Recovery (3)
	"Blue Skies"	72-Hour Forecast - Operational Period I	Operational Period I – Life-saving Complete	Damage Assessment – Lifeline / Community Restoration
Core Info Need (Hazard)	Where is flooding potential the greatest?	Where can we expect the most precipitation?	Where did we receive the most precipitation?	Are there any future forecasted events?
Geospatial Information	National Flood Hazard Layer (FEMA)	72-Hour Precipitation Forecast (NOAA NDFD), Weather watches and warnings (NWS)	Stream gauges (USGS, local), Rain Gauges	Short-term and long-term watches and warnings (NWS)
Core Info Need (Impacts)	Where are the most vulnerable communities? Lifelines?	Which rivers and are most likely to be impacted?	Where are the areas of greatest concern for life safety?	Where are the communities and lifelines that need the most support?
Geospatial Information	Social Vulnerability Index (CDC), Lifelines (HIFLD Open Data)	National Water Model (OWP), Short-term and long-term watches and warnings (NWS), Local rain and river gauges.	Geo-enabled 911/311 systems, crowdsourcing, first responders, remote sensing	Information collected in Response Phase + preliminary damage assessment
Core Info Need (Resources)	What are our trigger points or thresholds for action?	Will we have the resources we need?	What resources do we have / need to mobilize for life safety?	What resources do we have / need to mobilize for recovery?
Geospatial Information	Historic events and working with local hydrologists to determine thresholds	Resource Inventory	Mutual aid system(s), National Shelter System	Mutual aid system(s)

Hazard Data Shown is for Flood Example

Technical Implementation Guidance

- 1. Background on Flood Preparedness Guideline
- 2. Overview of Core Operational Information
- 3. Framework Implementation Strategies (Monitoring – Recovery)

Framework

	Preparedness (0)	Readiness (1)	Response (2)	Recovery (3)
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ArcGIS Online Group

Resource: All-Hazards Core Information Needs Group

This is an ArcGIS Online Group with layers that address core information needs related to All-Hazards.

owned by [adrianm/arcgis](#)

Join This Group

Items

Details

Created: June 20, 2018

Viewable by: Everyone (public) (open data)

Contributors: Only group owner

17

100

Owner

adrianm/arcgis

Tags

NAPSG Foundation, DHS Science and Technology, Core Info Needs, HIFLD, Resilience, Incident Data

Description

Purpose: To serve as a starting point for geospatial decision support tools that rely on base data and live data. It is an outcome of the First Responder Core Information Guideline project.

Expiration Date: This is a permanent group that should not be deleted.

Context: This ArcGIS Online Group is a catalog of layers that can be used in geospatial decision support tools that should be built in the Preparedness phase of incidents. To nominate new layers for this Group, send an email to adrianm@resilience.gov and marin@resilience.gov. This Group was developed with support from the US Department of Homeland Security (DHS) Science and Technology Directorate (S&T), agreement number HSHQDC-16-C-80076.

Guidance

First Responder Core Information Guideline - The purpose of this interactive guideline is to provide first responders and decision makers with a standardized framework for Core Operational Information.

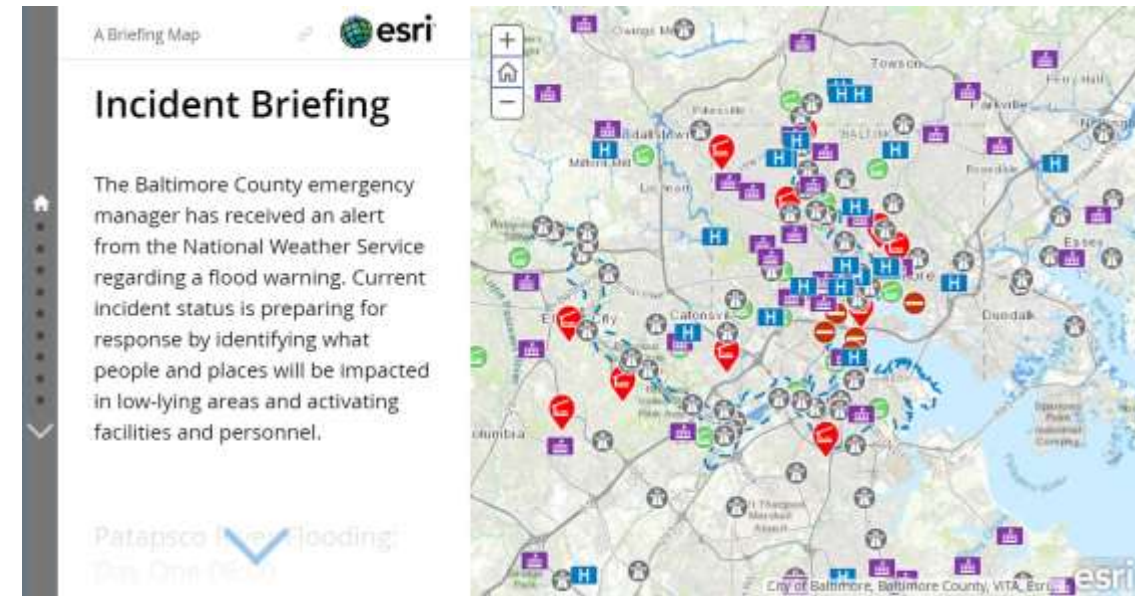
GIS Technical Core Information Guideline - This technical guidance serves as a companion to the First

Monitoring

Daily Status Report

- Typically a PDF sit report or daily email is distributed to command staff in your public safety agency
- Convert into a dynamic format with Live Data where available
- Multiple Formats:
 - [FEMA Story Map Journal](#)
 - [Cascade Story Map Daily Status Report](#)
- As a result of routine operation, users gain an increase trust and confidence in using geo-enabled decision support tools.

Esri Solution: Incident Briefing

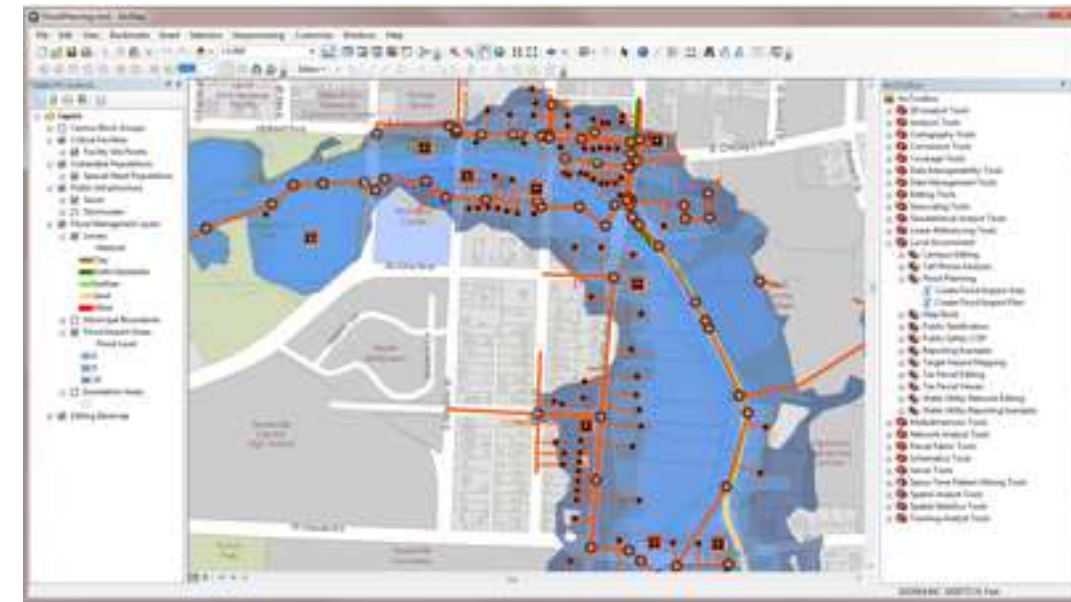


<https://solutions.arcgis.com/emergency-management/help/incident-briefing/>

Preparedness – Identify Risk

- Hazards Exposure
 - View core information needs, data sources and models related to the Flood Hazard.
 - Explore other hazards – Prep Toolkit [Hazard Explorer](#)
 - Follow links to Models
- People
 - Demographics such as Vulnerable Populations
 - CDC Social Vulnerability Index
- Infrastructure
 - Public & Critical infrastructure
 - Homeland Infrastructure Foundation-Level Data (HIFLD)

Esri Solution: Flood Planning



<https://solutions.arcgis.com/emergency-management/help/flood-planning/>

*****Local knowledge of region and historic events*****

Preparedness -> Readiness – Establish Trigger Points

For notice events, prediction and early warning can trigger courses of action

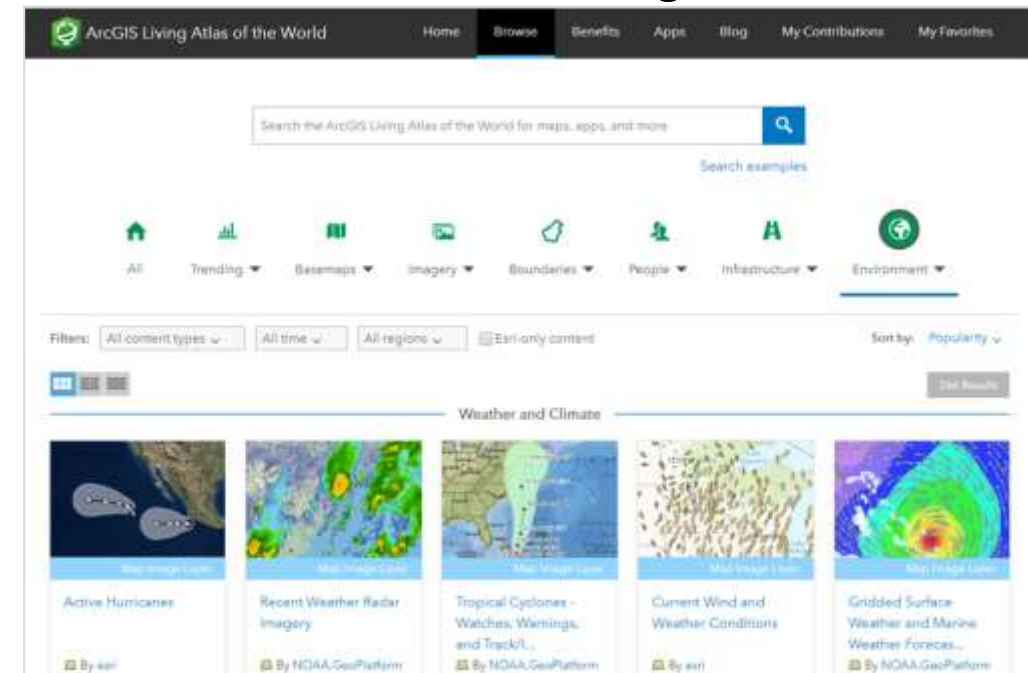
- Severe Weather Trigger Points
 - Day to Day Monitoring - Live Weather Feeds
 - Flood Example – identify stream gauge levels that require an alert and build actions, Example Actions:
 1. Automated email to command staff,
 2. Conduct preliminary impact analysis to people and infrastructure,
 3. Pre-position / request resources

View Live Examples:

City of Boulder interactive [Flood Emergency Map](#) - monitoring river gauges and action levels

City of Austin [ATX Flood Map](#) - monitors lower-water crossings that triggers actions when activated

Esri Solution: Living Atlas



Response – Obtain Situational Awareness

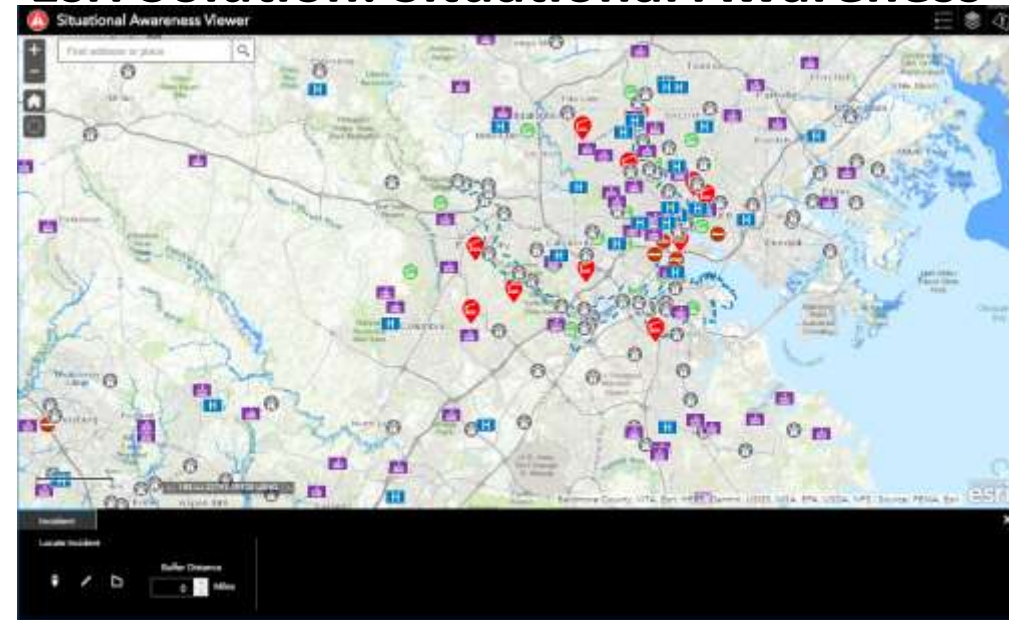
Command View for Situational Awareness

- Monitoring of Hazards (Current/Forecasted); Lifelines; Operations

Mission Focused Applications

- Mass Care / Sheltering
 - Shelter Locator Solution – Recommend a regional view
 - [National Shelter System](#) – Partial solution
- Resource Management
 - [NAPSG RM Dashboard Guidance](#)
 - Inventory and Typing - [IRIS / RTLT](#)
 - RM/Mutual Aid - [National Mutual Aid System](#)
- Transportation
 - Road Closure Editor
 - Waze Connected Citizen

Esri Solution: Situational Awareness



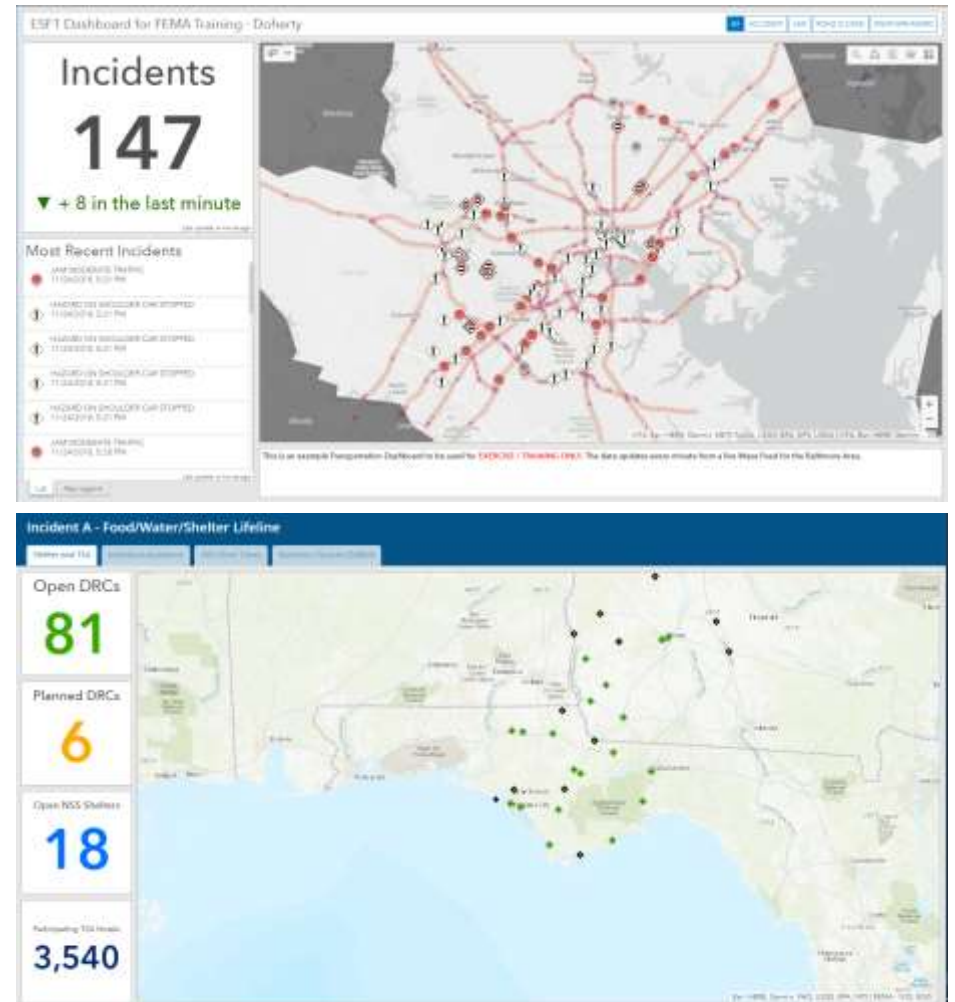
<http://solutions.arcgis.com/emergency-management/help/incident-analysis-viewer/>

Recovery – Synthesize Information

Damage Assessment / Lifeline and Community Restoration

- 7 Lifelines Construct
 - Energy (Power / Fuel)
 - Communications
 - Transportation
 - Food, Water & Sheltering
 - Safety & Security
 - Health & Medical
 - Hazardous Waste
- Damage Assessments
 - Incorporate information from earlier phases, e.g., Phase 1 - Crowdsourced Information and Phase 2 - SAR/First Responder Data Collection
- Resource Management to support recovery

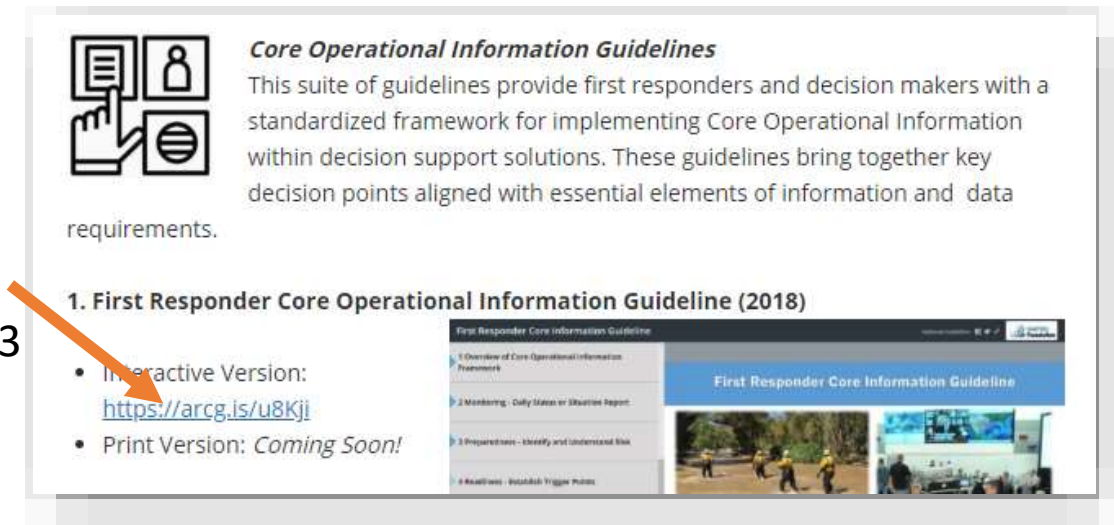
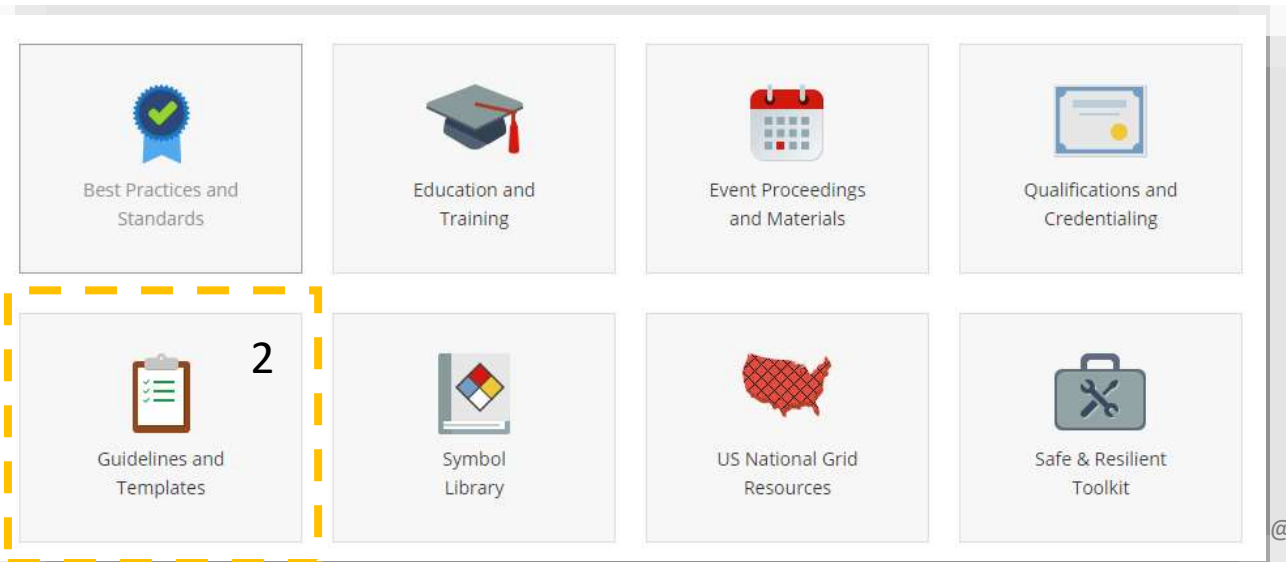
Esri Solution: Operations Dashboard



Exercise 1A

With your neighbors, explore the Core Info Needs Story Map <https://arcg.is/u8Kji> and indicate which of the examples you would like to work on in your own jurisdictions (if any).

This website can be accessed by going to www.napsgfoundation.org



Case Study: Hurricane Michael 2018

#1 Florida State – State Emergency Response Team (SERT)

- Richard Butgereit
- Jason Ray

#2 Florida State – Search and Rescue

- TJ Lyons
- Paul Doherty

Exercise 2

First Responder Core Information Guideline

4 Readiness - Establish Trigger Points

5 Response - Obtain Situational Awareness

Situational awareness of current road conditions, ongoing operations, and current weather alerts is critical to response efforts. A dashboard or viewer of the situation should be mission focused and support decision-making regarding where and when to direct resources to save lives.

Purpose

The applications on the right are examples of how you can organize geospatial tools to meet core information needs during the response phase.

What Can I Do Next?

Based on key findings from the flood preparedness project, here are key steps you can take to increase response capability. **Click on the bold underlined text below to view an example of each application.**

- Situational Awareness Viewer (**open in new browser**) - A tool like the Situation Awareness widget can be used to assist with understanding

6 Recovery - Synthesize Information

NCR Situational Awareness Viewer (NAPSG)

National Guideline

EXERCISE MODE

Find address or place

Tools at the top of the map are available for performing analysis, viewing attributes of map layers, and adding additional map content.

The first tool you should explore is the [Situational Awareness](#) Widget - run a quick analysis based on a point, line, or area based on your area of interest.

[Watch video](#) or read instructions below. See [additional tutorial](#) for step by step instructions.

Situation Awareness Tool

Identify infrastructure and the number of people that could be impacted in a given area.

Two methods to perform this analysis:

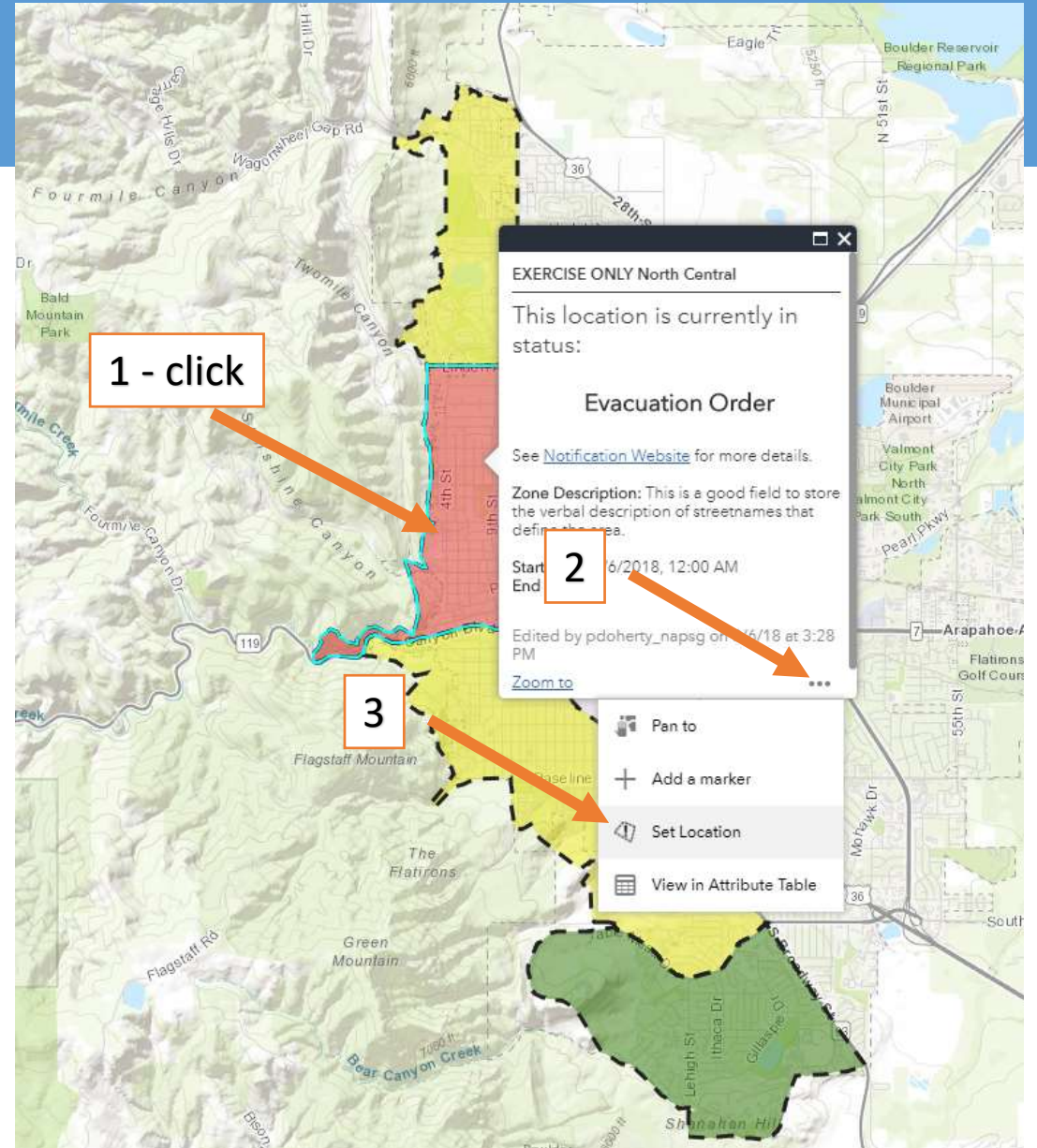
- Draw a point, line or polygon and buffer by a custom distance.

Buffer Distance: 0 Miles

- Select a map layer. Select the three dots to expand the options. Select 'Set Location'.

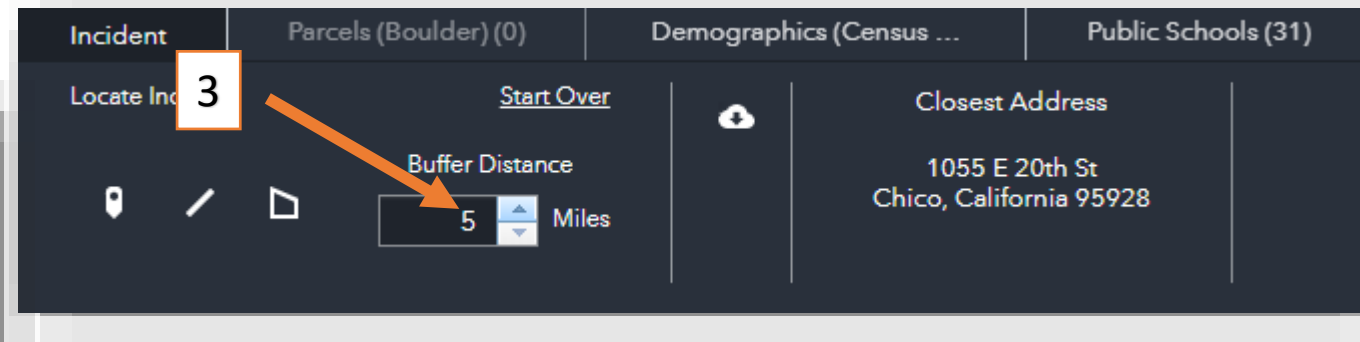
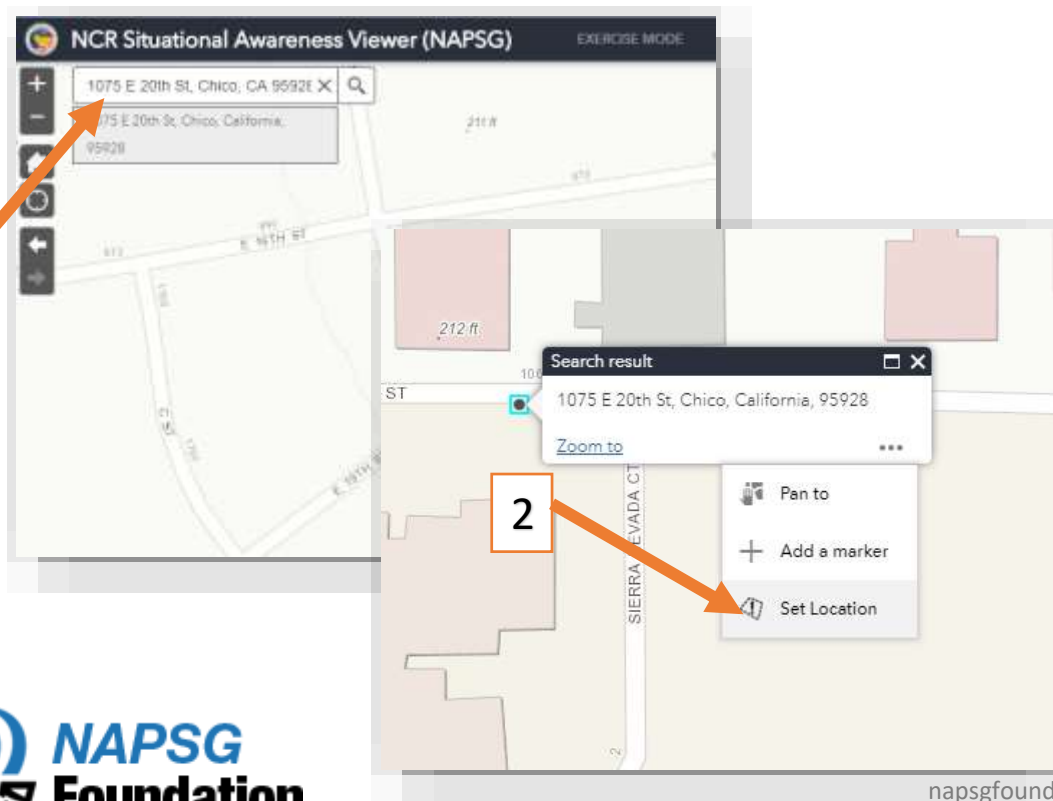
Exercise 2

A. Explore Core Info Needs against Boulder Fire Evacuation Zones

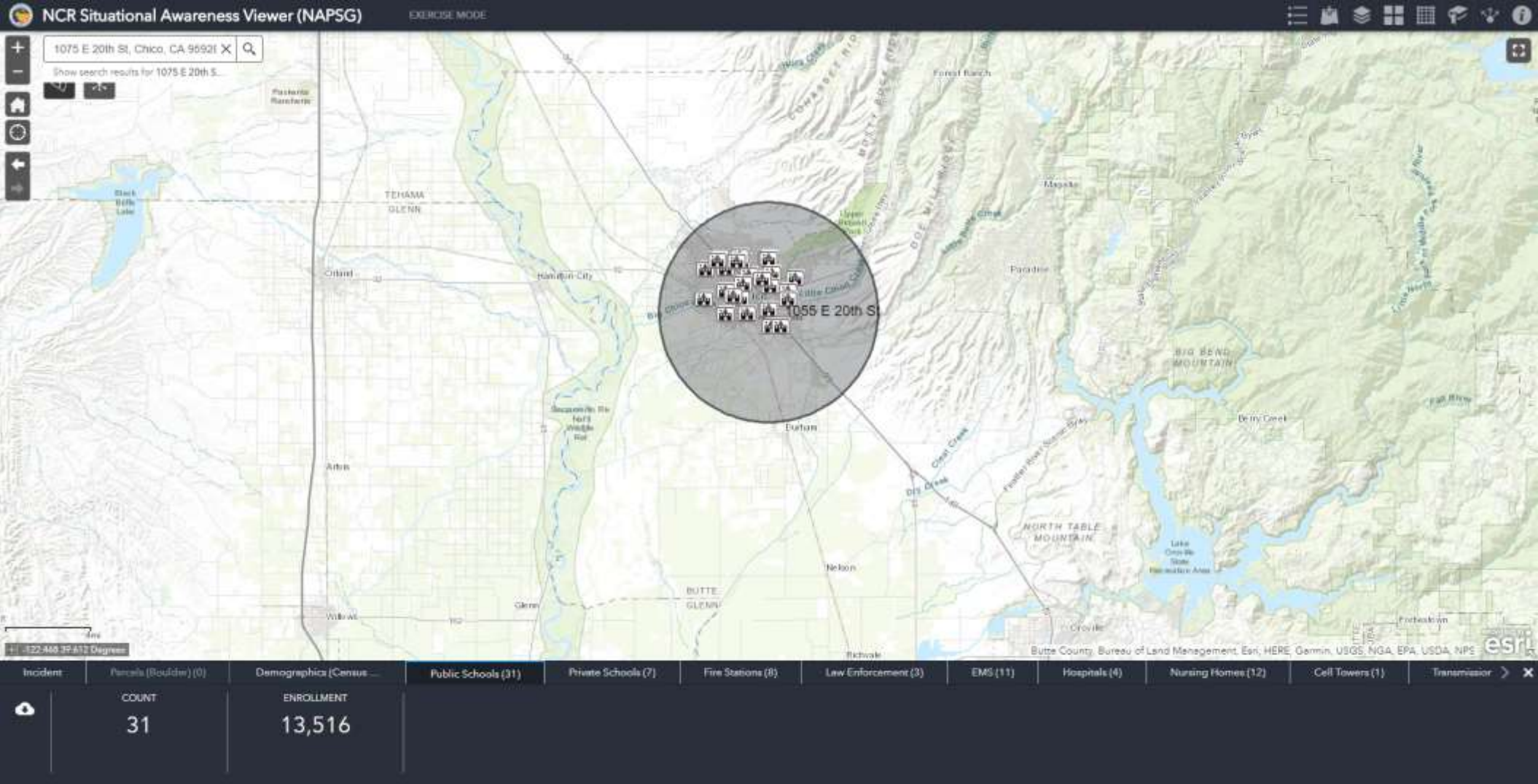


Exercise 2

- A. Explore Core Info Needs against Boulder Fire Evacuation Zones
- B. Explore a 5 mile radius from your office



Exercise 2



Exercise 2B

Identify the biggest gaps in your jurisdiction

	Preparedness	Readiness (1)	Response (2)	Recovery (3)
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Geospatial Information		napsgfoundation.org @napsgfoundation		21

What's Next?

1. Situational Awareness Solution

- Learning “how-to” in the GIS Training right now!

2. Identify Core Information Needs

- Start with 4 – 7
- If you have many more, consider thematic viewers!

3. Train and Use it Everyday

- Refine the process
- Build into workflows

Situational Awareness Viewer

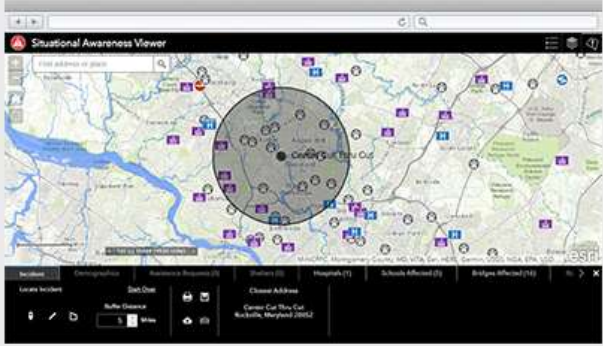
[Home](#)[Get Started](#)[Workflows](#)

Overview

Situational Awareness Viewer is a configuration of Web AppBuilder for ArcGIS that can be used by emergency management personnel to understand the impact of an incident on public infrastructure and human populations.

Situational Awareness Viewer can include incident and operation response information as part of a suite of applications to maintain situation awareness and provide a common operational picture.

[REQUIREMENTS](#)[WHAT YOU GET](#)[WHAT'S NEW](#)[VIEW APPLICATION](#)



Find address or place



Emergency Response Guide

Based on the Emergency Response Guidebook 2...

Spill Location (DD)

Material

Spill Size Show Fire Isolation Zone ☐

Wind Direction (blowing to) Time of Spill

Wind Speed Transport Container

(1 of 2)

type Downwind Zone

[Zoom to](#)

- Pan to
- Add a marker
- Set Location
- View in Attribute Table

Goals and Objectives

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- Learn about best practices related to Core Information Needs in:
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Key Takeaways?

- Preparedness
- Readiness
- Response
- Recovery