

Optimize Field Operations with GIS

Chris McIntosh, Director of Public Safety Industries, Esri





WELCOME

GIS in Emergency Response

Rapid Support Capability in Wildland Fire

- In 2008, the Virginia Department of Forestry recorded 1,322 wildland fires that burned 25,704 acres.
- Virginia saw the worst fire day in memory on Sunday, Feb. 10, 2008.
- High winds across the state whipped up 354 fires that burned more than 16,000 acres.



*Creating Awareness and Need for
Analysis and Map Products*

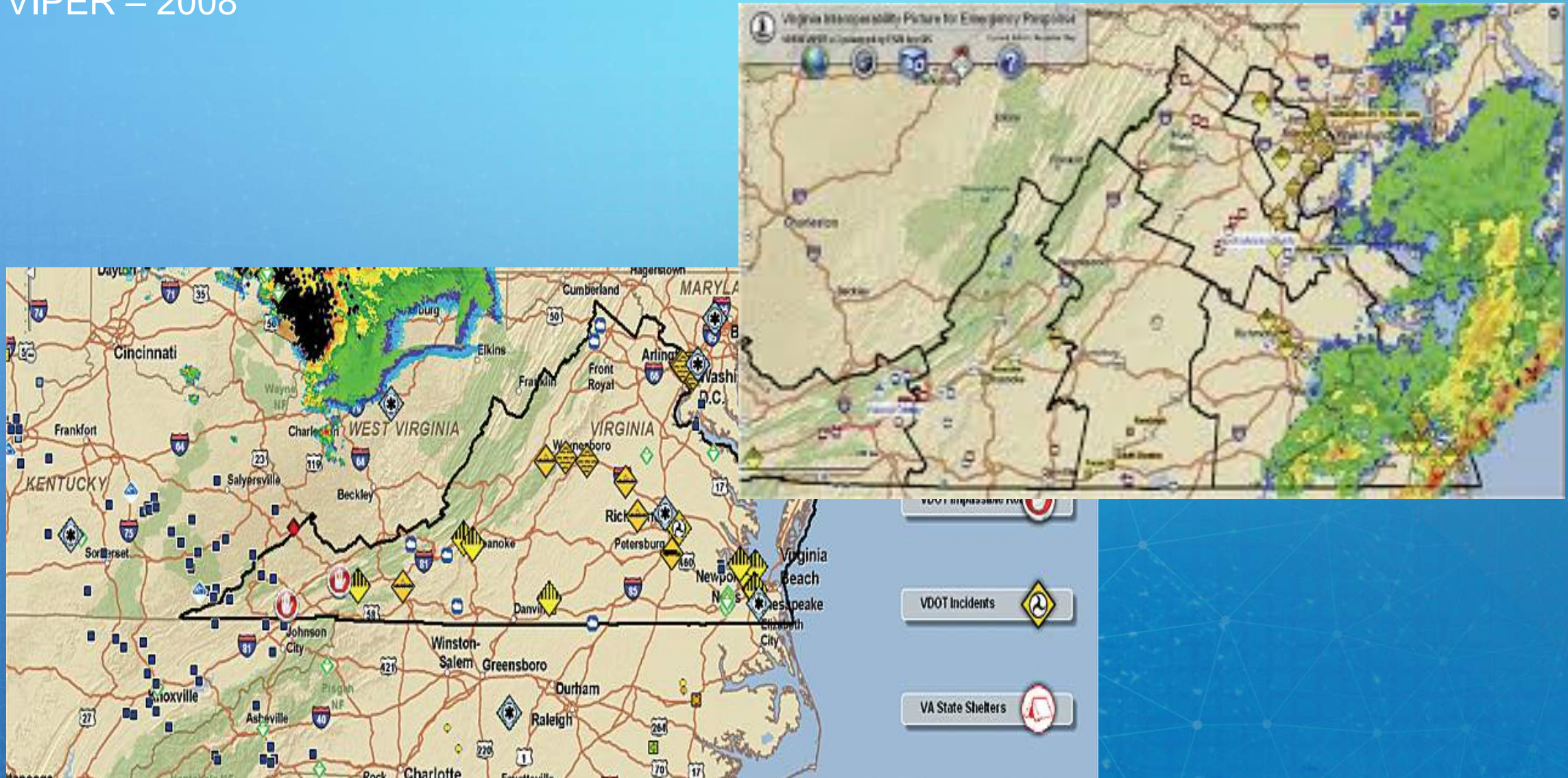
Traditional GIS

Providing Analysis and Map Products



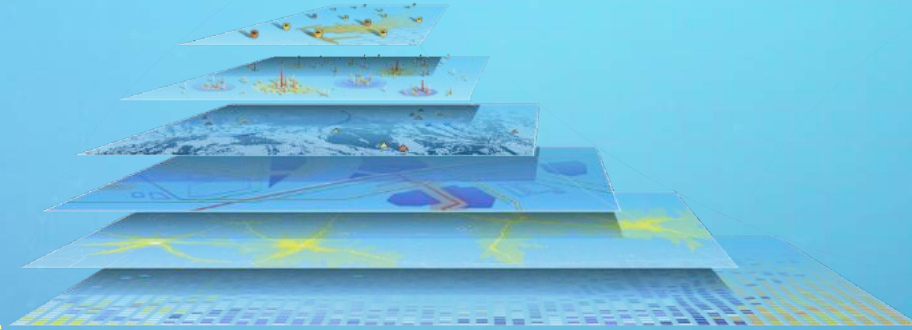
Virginia Interoperability Picture for Emergency Response

VIPER – 2008



Web Maps

Opening, Integrating and Simplifying Everything



Web GIS





Vision

GIS

Enables Efficiencies,
Lowers Costs, and
Promotes Improved
Decision Making
When Used in Field
Operations



Our Nation Is Evolving

Undergoing a Massive
Digital Transformation



Location, Mapping and GIS Are Becoming Essential

A Fundamental Language
for Understanding and
Managing Our World



Providing Content
and Context

About Everything

GIS Provides the Framework and Process

For Enabling a Smarter World



Data Integration
and Management

Visualization
and Mapping

Analysis
and Modeling

Planning and
Design

Decision-
Making

Action

Science

Understanding

Collaborating

Transforming How We Think and Act . . .

GIS Is Becoming Distributed

A New Architecture Is Emerging

Enabling
Collaboration

Systems of Systems



*Enabled by Portals . . .
. . . Abstracting Distributed Data and Analytics*

Field GIS

Taking GIS Beyond the Office



- Collecting Data
- Recording Measurements
- Reporting Observations
- Managing Work

Connecting the Field with the Enterprise

GIS Integrates Real-Time Data

Providing Dynamic Information About Everything



Built Environment

Natural Environment

Sensors

IoT

GIS Connects Everyone

Creating a System of Engagement

Supporting Real-Time
Awareness and
Collaboration

People

Communities

Organizations



*GIS Provides a
Common Language
for Communication*

GIS Integrates Everything

Connecting People, Processes, Things and Data About Them

Improving Efficiency,
Collaboration and
Communication

*System of
Engagement*

Helping Organizations
Understand . . .

*System of
Record*

*System of
Insight*

Supports Multiple
Types of Systems

. . . And Be Aware, Alert,
and Responsive



Apps

Focused ArcGIS Applications

Field

Collector

Navigator

Workforce

Survey123

Drone2Map

Office

ArcGIS Earth

Explorer

Maps for Office

Maps for SharePoint

Operations Dashboard

Maps for Adobe Creative Cloud

Maps for Power BI

CityEngine

GeoPlanner

Business Analyst

Community

Story Maps

Initiatives

Open Data

Photo Survey

Quick Report

Crowdsource Polling



Focused, Powerful, and Ready-to-Use

How Do I get Data into a Web Map?

Your source, any source

Source Materials



ArcGIS
Desktop



Spreadsheet



Database



CSV



Sensor &
Real-Time
Data



WebEOC
Boards

Data from Esri



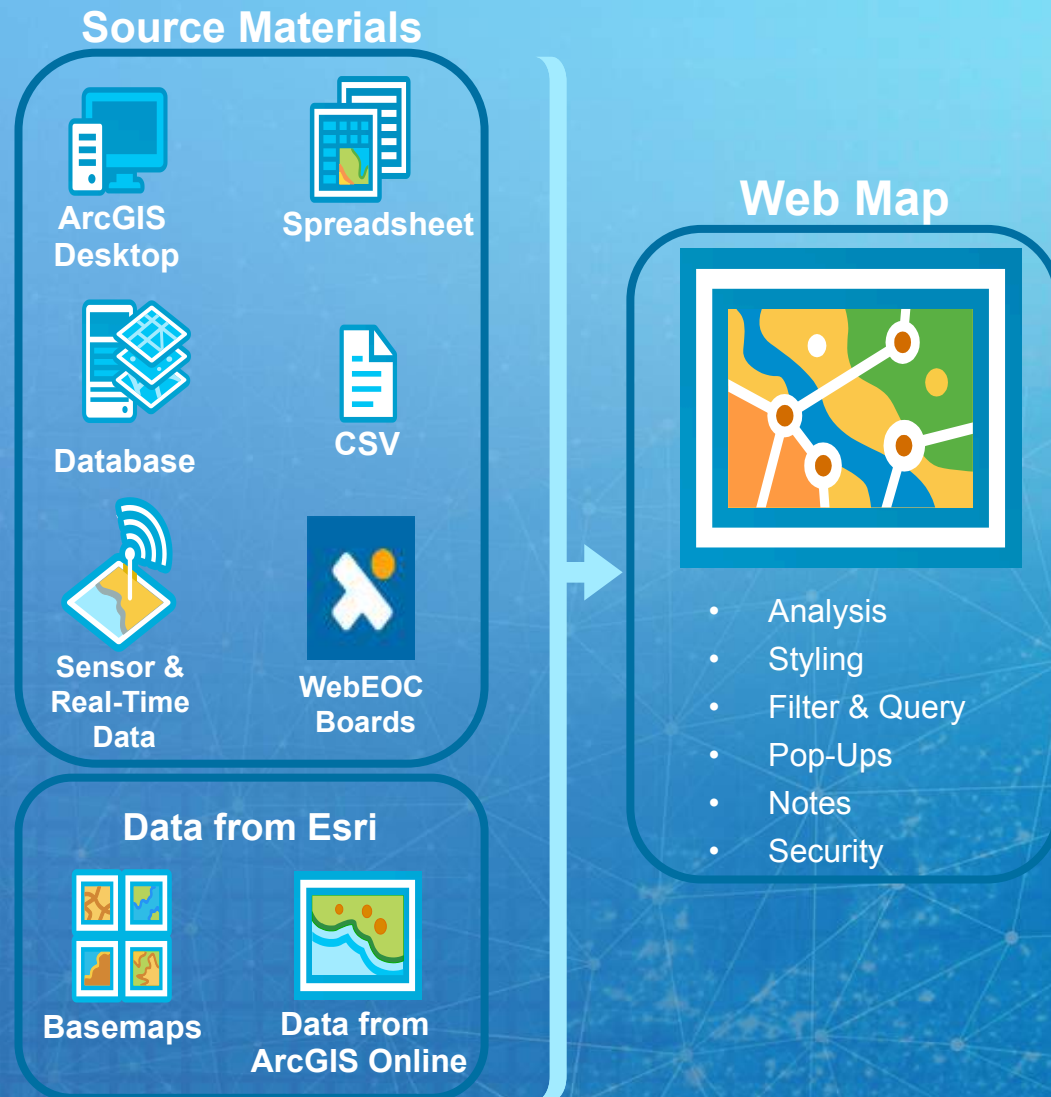
Basemaps



Data from
ArcGIS Online

What Does a Web Map Do?

Organize. Analyze. Share.



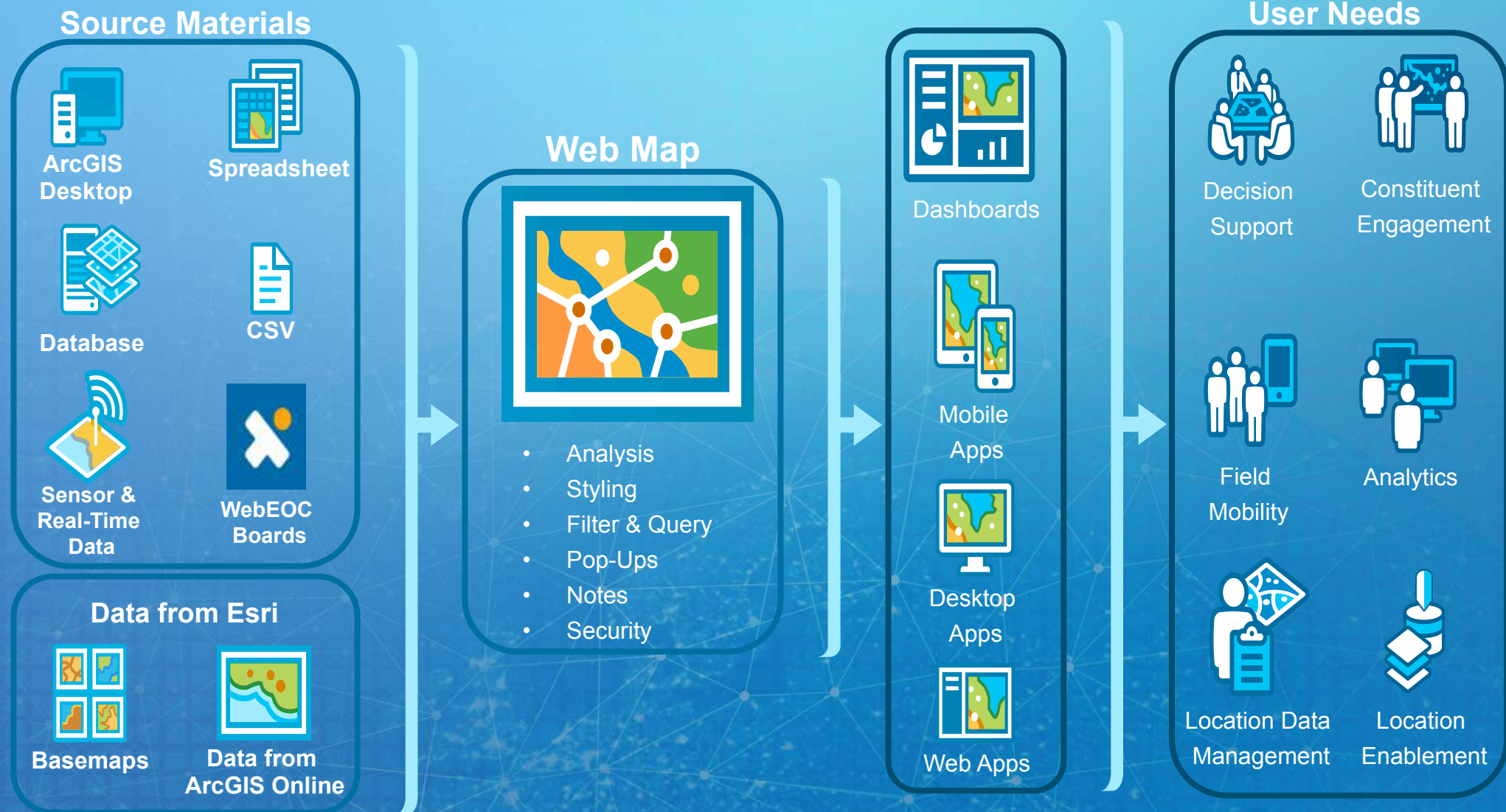
How Do I Use a Web Map?

One map, many uses



Why Do I Need Different Apps?

Different tools for different user needs



Why Do I Need Different Apps?

Different tools for different user needs

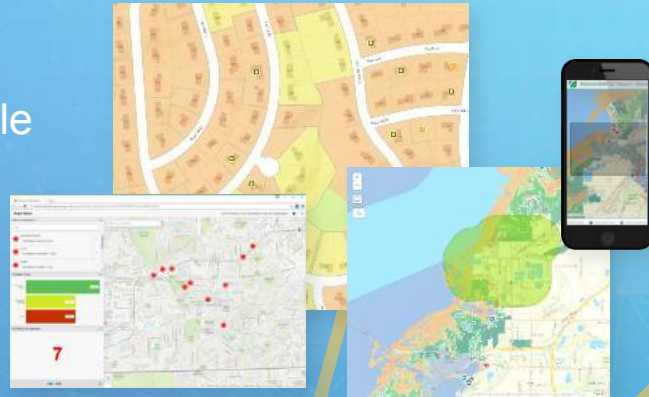


Hundreds of Ready-to-Use Maps & Apps

Open-Source Solutions

- Easily Configurable
- Fully Supported
- No Cost

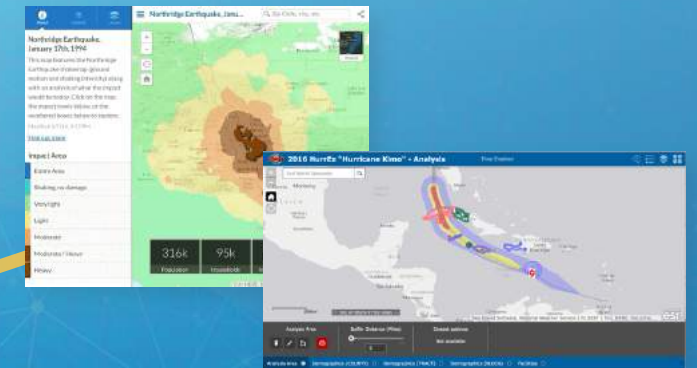
Local & State Government



Utilities & Telecom



Emergency Management & Public Safety



Open-Source Solutions

450+ Solutions
500,000+ Downloads



Military & Security

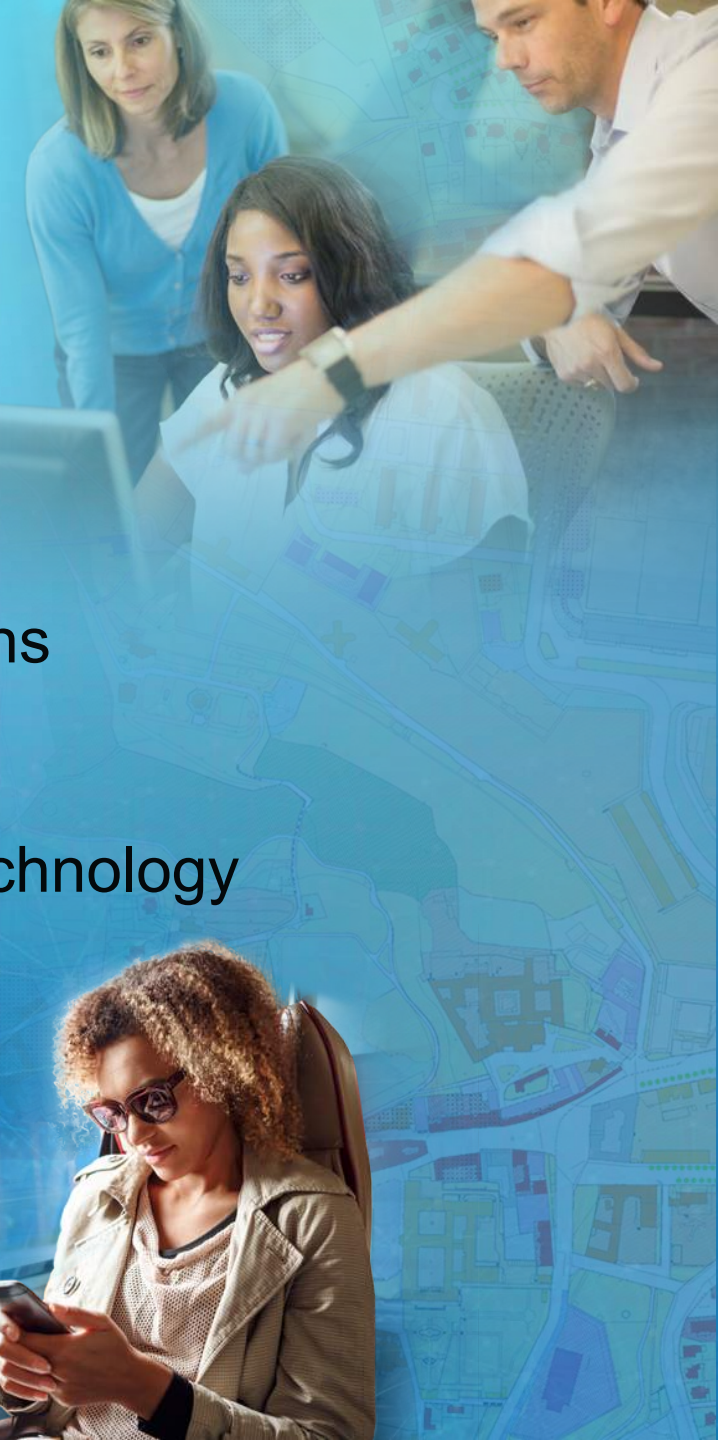


Delivering Innovation & Best Practices

Benefits of Optimizing Field Operations

Now Is The Time to Act

- Streamline workflows to improve data collection efficiency
- Use analytics to drive decisions quickly
- Improve situational awareness while coordinating operations
- Integrate spatial information from stovepipe systems
- Reduce the risk and cost of implementation with proven technology





Environment

Science & Technology

Infrastructure

Economic Development

Natural Resources

Business

Pollution

Transparent Government

Operational Awareness

Supporting Your Organization's Mission to Address National Challenges

Natural Disasters

Water Resources

Environmental Change

Agriculture

Human Health

Nature Conservation

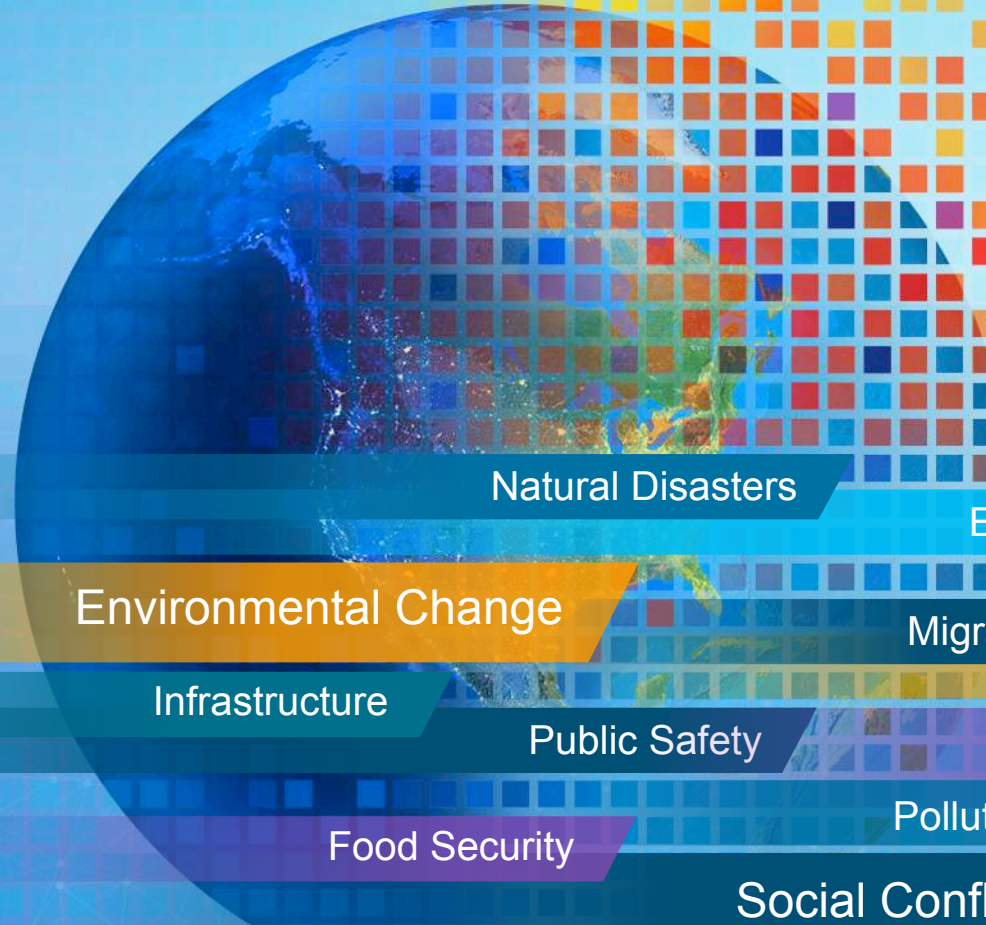
Energy

Social Conflicts

Urbanization & Development

Making a Difference

Our Nation Is Increasingly Challenged



Natural Disasters

Energy

Environmental Change

Migration

Urbanization

Infrastructure

Public Safety

Population

Food Security

Pollution

Social Conflict

Political Polarization

Consumption

The Evidence Is Clear . . .

We Need to Be Smarter

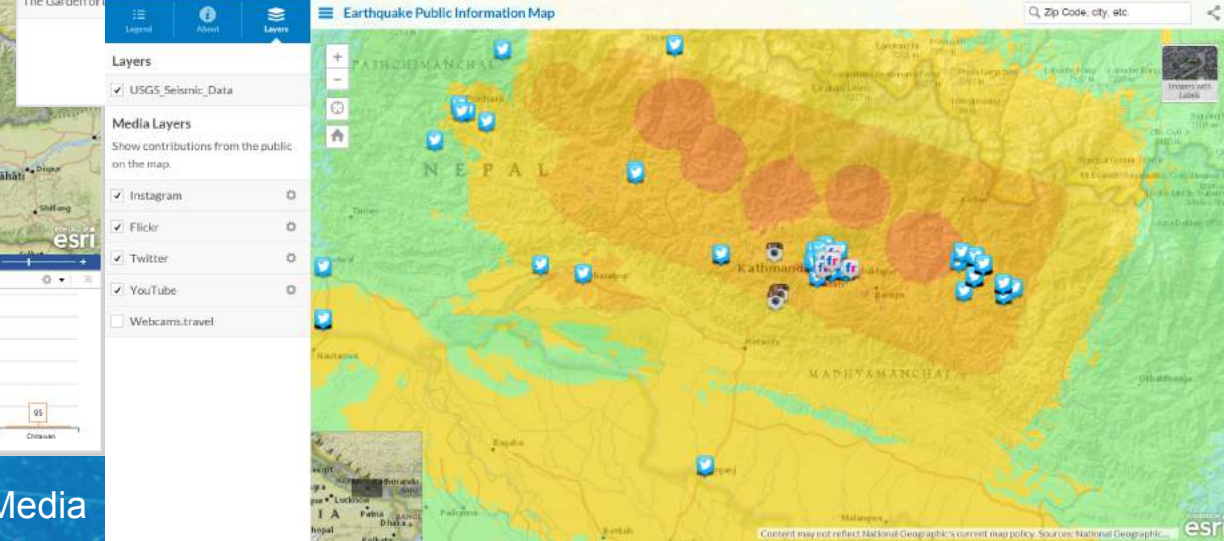
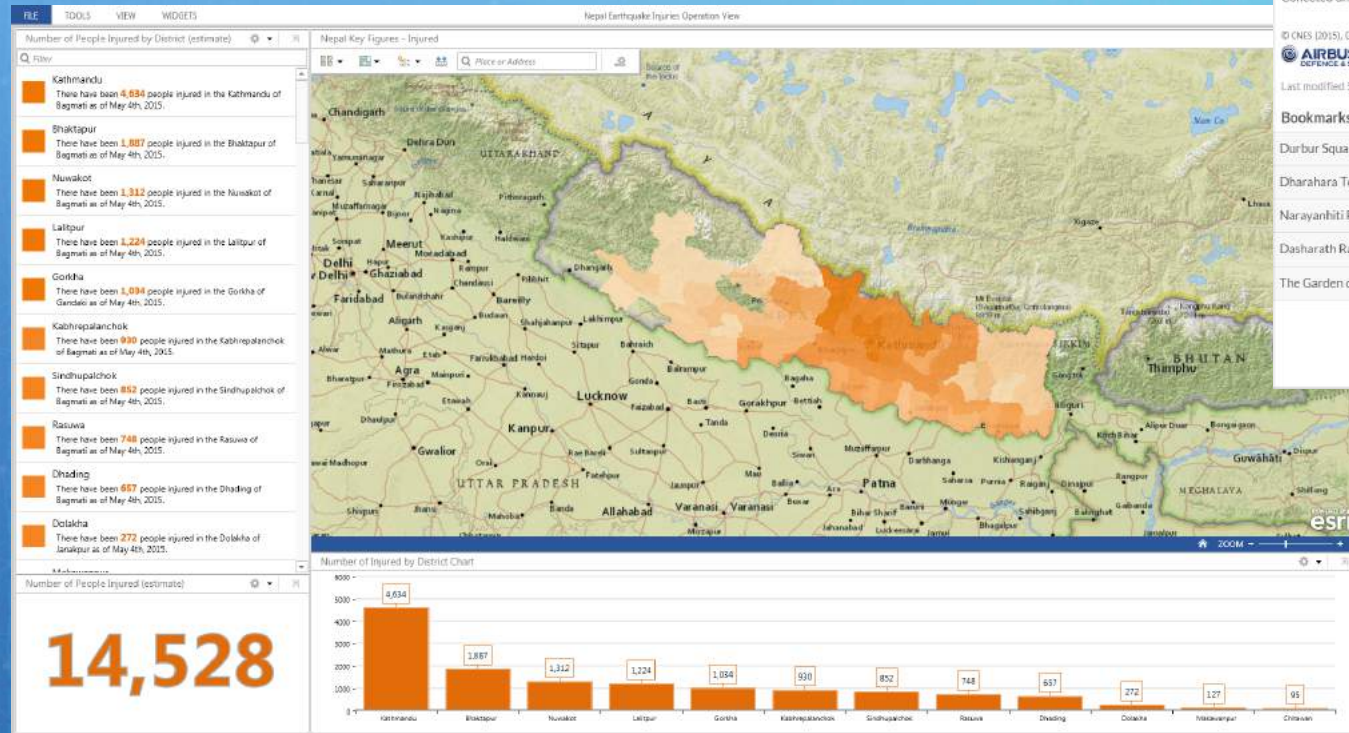
We Need to Understand
. . . And Work Together

Nepal Earthquake

April 2015

Swipe Map

Casualty Dashboard



Social Media

WebEOC

Standard Boards

The screenshot shows the 'Significant Events' board in the WebEOC interface. It features a search bar and a list of events. Each event entry includes a type (e.g., Animal Incident, Birth Threat, Adult Client), a brief description, a record number, a date, a name, a phone number, and a position. The board is titled 'Significant Events' and has a 'Default' view.

Situational Awareness / Significant Events

The screenshot shows the 'Resource Requests/Task Assignments' board. It includes a search bar and a table with columns for Tracking #, Mission Name, Originator, Assigned To, Priority, Time Due, Status, Last Updated, and Details. The table contains several rows of data, such as 'Swat Team Support Req', 'Need Base Camp', and '200 Sandbags Needed'. The board is titled 'Resource Requests/Task Assignments' and has a 'Default' view.

Resource Management / Missions

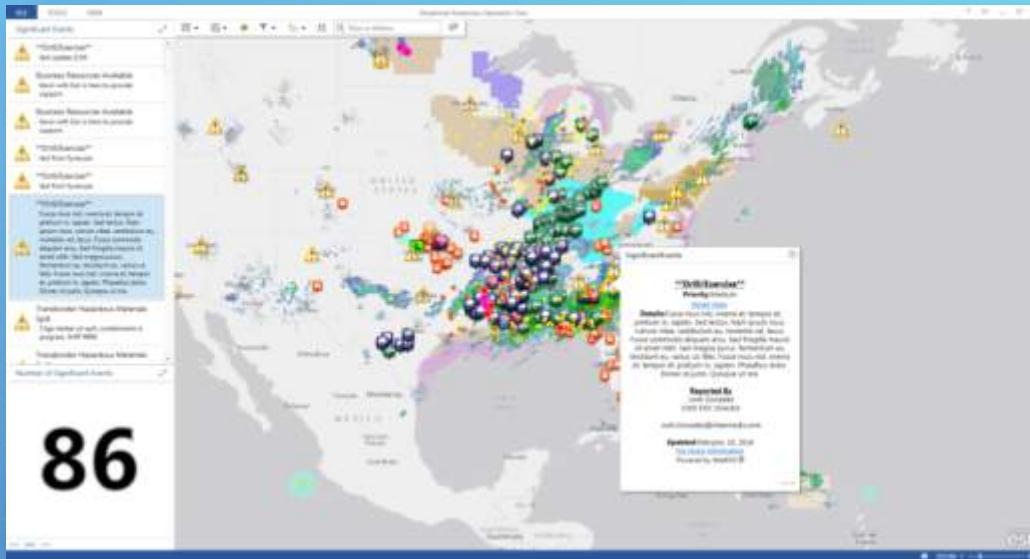
The screenshot shows the 'Shelter Status' board for the period '2015-10-01 October Storms'. It features a search bar and a table with columns for Name, Status, Type, ADA Compliant, Functional Needs, Pet Friendly, Back-up Generator, Capacity, Occupancy, Availability, and Details. The table lists several shelters, including 'Adams Street Recreation Center', 'Arcadia HS (school)', and 'Adams HS & MS'. The board is titled 'Shelter Status' and has a 'Default' view.

Mass Care / Shelters

The screenshot shows the 'Road Closures' board for the period '2015-10-01 October Storms'. It features a search bar and a table with columns for Region, Jurisdiction, Priority, Status, Road Name, From Cross Street, To Cross Street, Last Updated, and Details. The table lists several road closures, such as 'Springfield', 'Spierfield', 'Mayberry', 'W. Blueround Road', 'Balford', and 'Balford'. The board is titled 'Road Closures' and has a 'Default' view.

Transportation / Road Closures

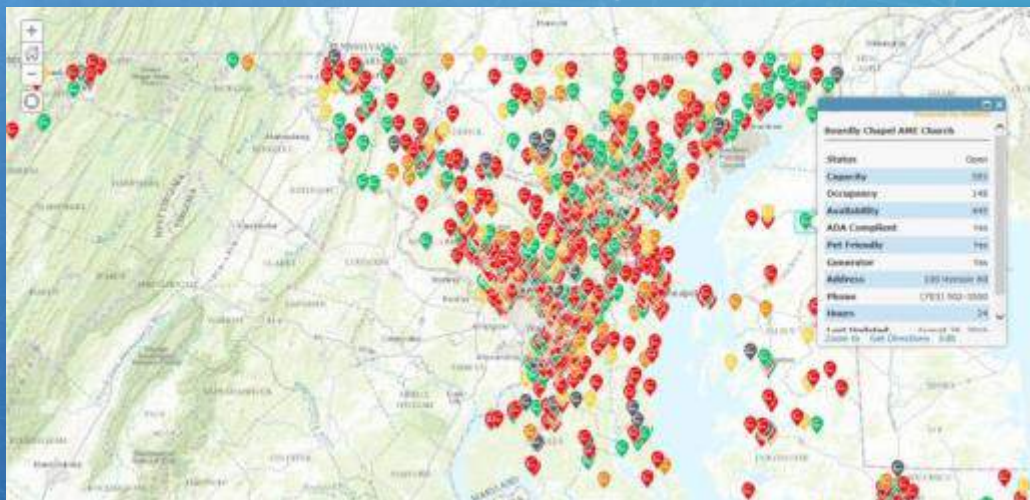
Common Emergency Management Needs



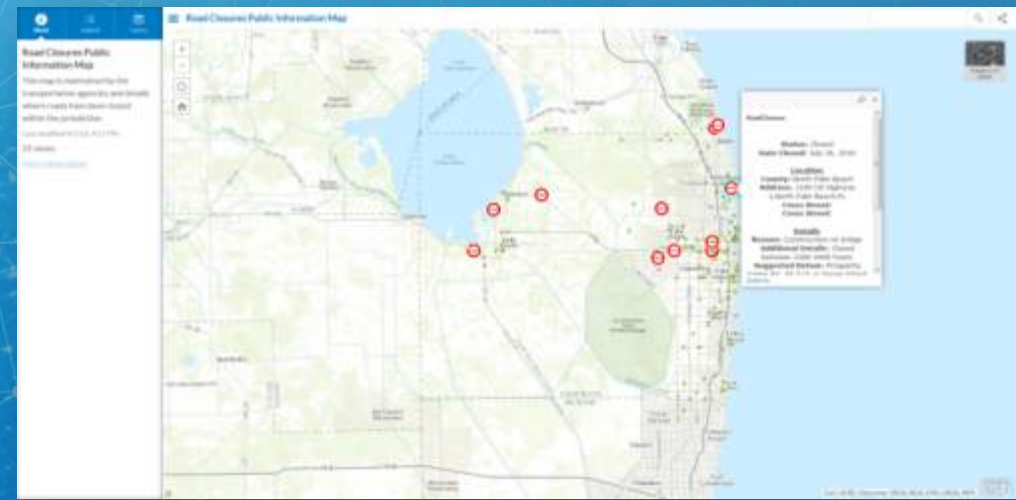
Situational Awareness / Significant Events



Resource Management / Missions



Mass Care / Shelters



Transportation / Road Blocks

MH17

Establishing Rapid Geospatial Support Capability



17 July 2014 at 1014h (UTC), Malaysian Airlines flight MH17, departed Amsterdam with 298 people on board, from 10 countries.



MH17

Establishing Rapid Geospatial Support Capability



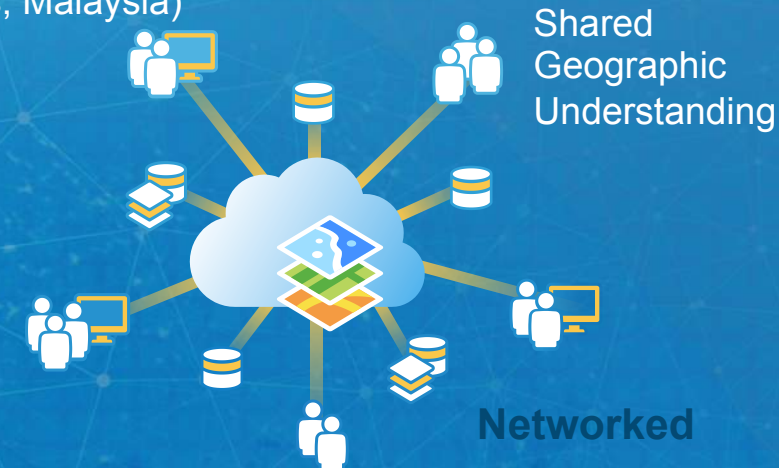
Main Op's - San Diego, USA



In-country Ops – BGSP, Malaysia

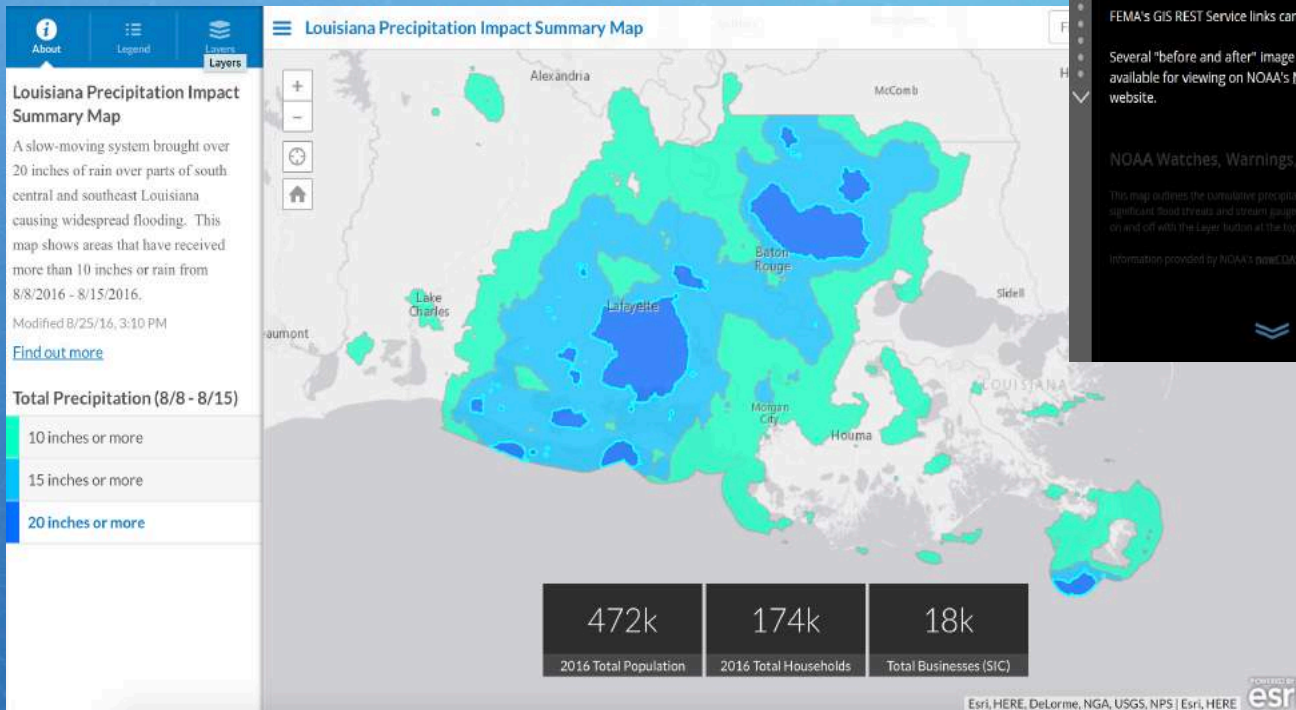


Users (multiple agencies, Malaysia)



Baton Rouge, Louisiana Flooding

August 2016



FEMA's GeoPlatform

DR 4277 and Baton Rouge Area Flooding

An overview of current operations related to DR-4277 and Baton Rouge area flooding. You can pan and zoom, as well as select JFO's, DRC's, and Declared Counties to view more information as needed. Flood extents shown are approximate and being worked on around the clock. To view flood extents from the Governor's Office of Homeland Security and Emergency Preparedness (GOHSEP), please use the Layer List button to toggle them on or off.

[FEMA's Baton Rouge Area Flooding Open Data site.](#)

FEMA's GIS REST Service links can be viewed [here](#).

Several "before and after" image comparisons are available for viewing on NOAA's National Geodetic Survey website.

NOAA Watches, Warnings, and Precipitation

This map displays the cumulative precipitation over the last 72 hours, with significant road threat and stream gauge flood stage. You may turn layers on and off with the Layer button at the top right.

Information provided by NOAA's realDART Mapping Portal.

Italy Earthquake

August 2016

The image is a screenshot of a web application titled "Earthquake Public Information Map". The main map shows Italy and surrounding regions, with a red pin indicating an earthquake location in central Italy. A video player window is overlaid on the map, displaying a video titled "EARTHQUAKE 6.2 AUGUST 24, 2016. ITALY CENTER: SADNESS AND SILENCE". The video player shows a scene of a road with debris and people. The video description reads: "LAST NEWS ABOUT THE VIOLENT EARTHQUAKE IN THE CENTER OF ITALY. 6.2 RICHTER. THE WRATH OF NATURE. THE SIGNS OF NIBIRU , COMING ...". The video is by "CapitalsDJs" and was posted on "6:20pm · Aug 25, 2016". The map interface includes a search bar at the top right, navigation controls on the left, and a small inset map in the bottom left corner. The Esri logo is visible in the bottom right corner of the map area.

Earthquake Public Information Map

Find address or place

YouTube (1 of 11)

EARTHQUAKE 6.2 AUGUST 24, 2016.
ITALY CENTER: SADNESS AND SILENCE

04:54

LAST NEWS ABOUT THE VIOLENT EARTHQUAKE IN THE CENTER OF ITALY. 6.2 RICHTER. THE WRATH OF NATURE. THE SIGNS OF NIBIRU , COMING ...

CapitalsDJs

6:20pm · Aug 25, 2016

Zoom to

Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLor... esri

European Migrant Crisis

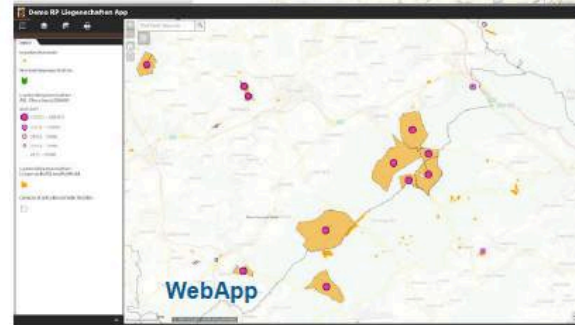
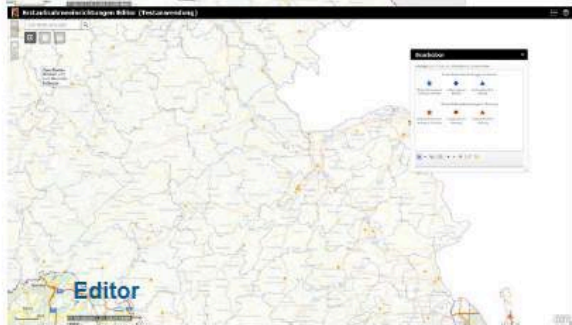
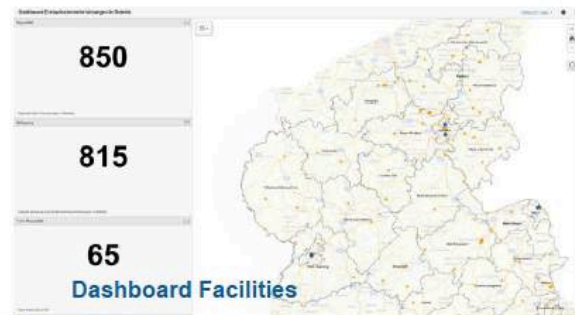
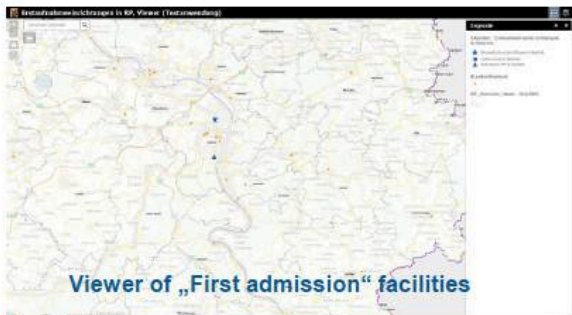
Governments of affected countries are rapidly changing their policies in response to the migrant influx, resulting in a shifting array of barriers to migrants' progress.

Orange arrows are migration routes; **red lines** represent barriers.

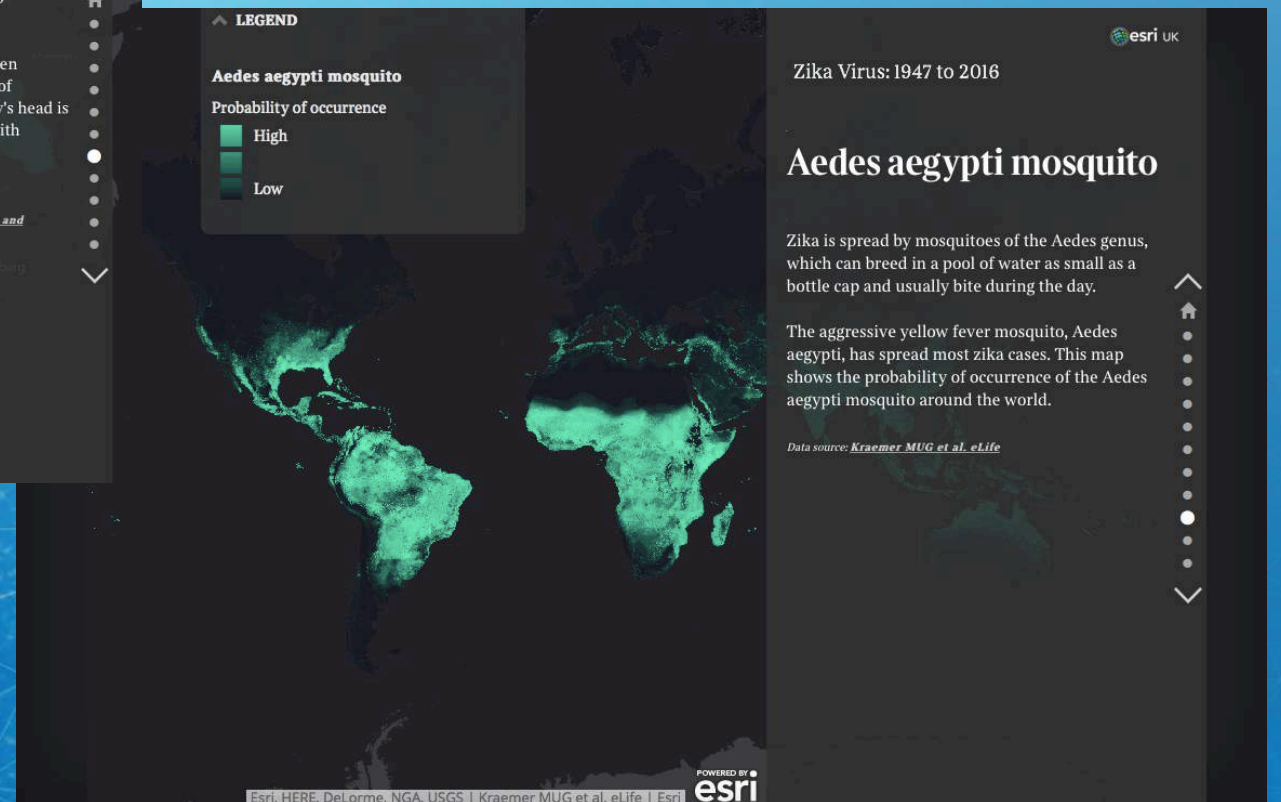
Click on map features for information.



WebApps & Dashboard from Rhineland-Palatinate

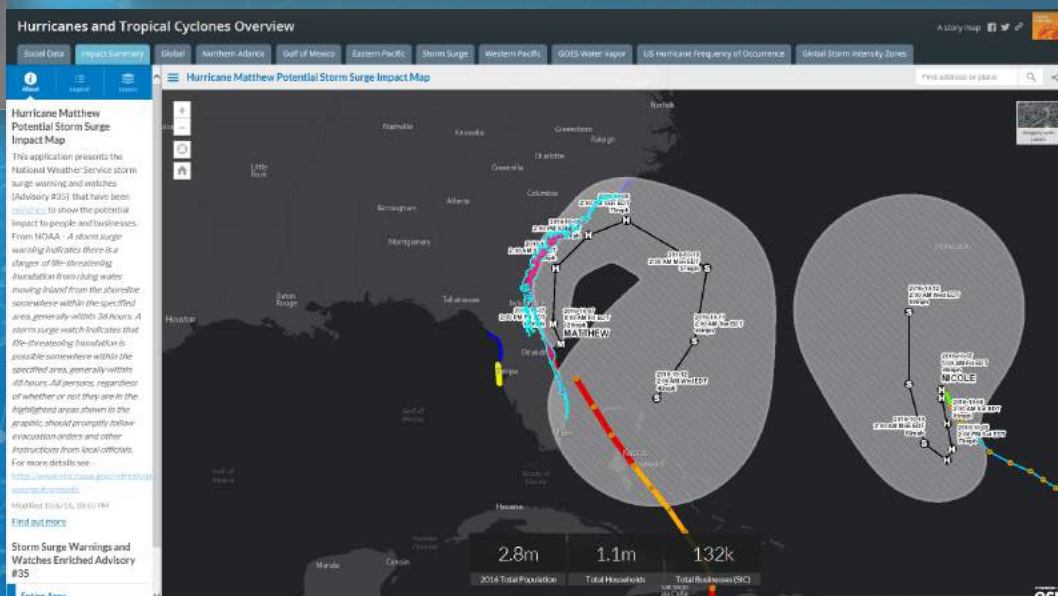
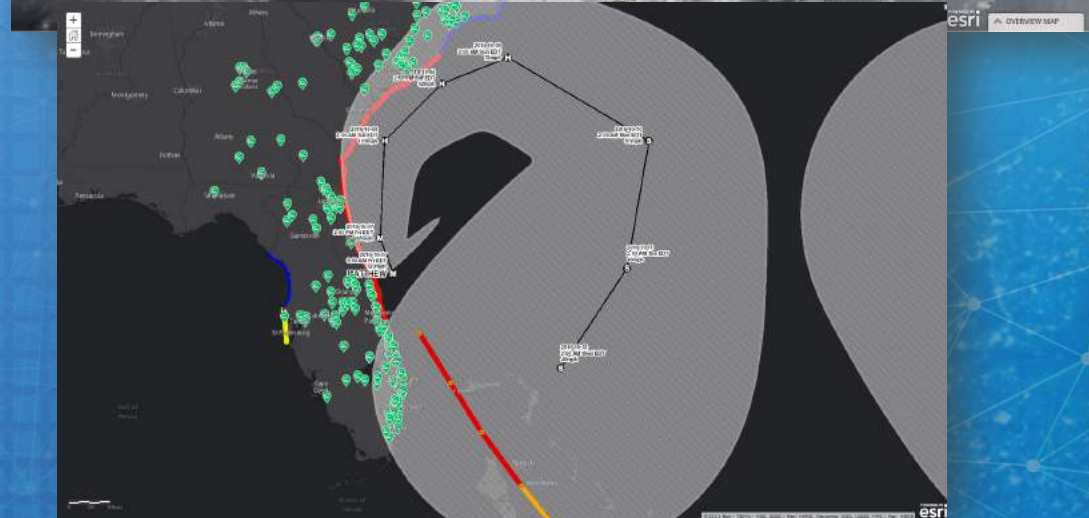
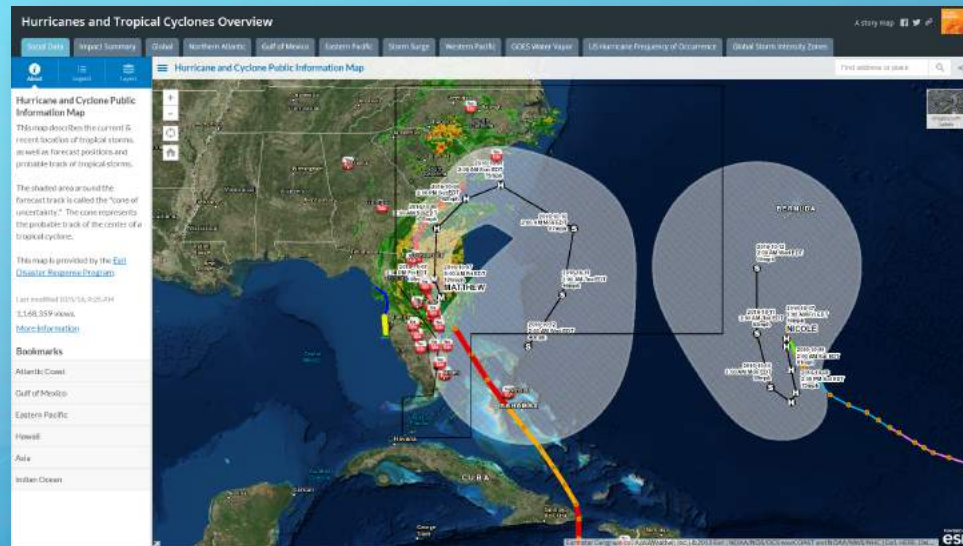
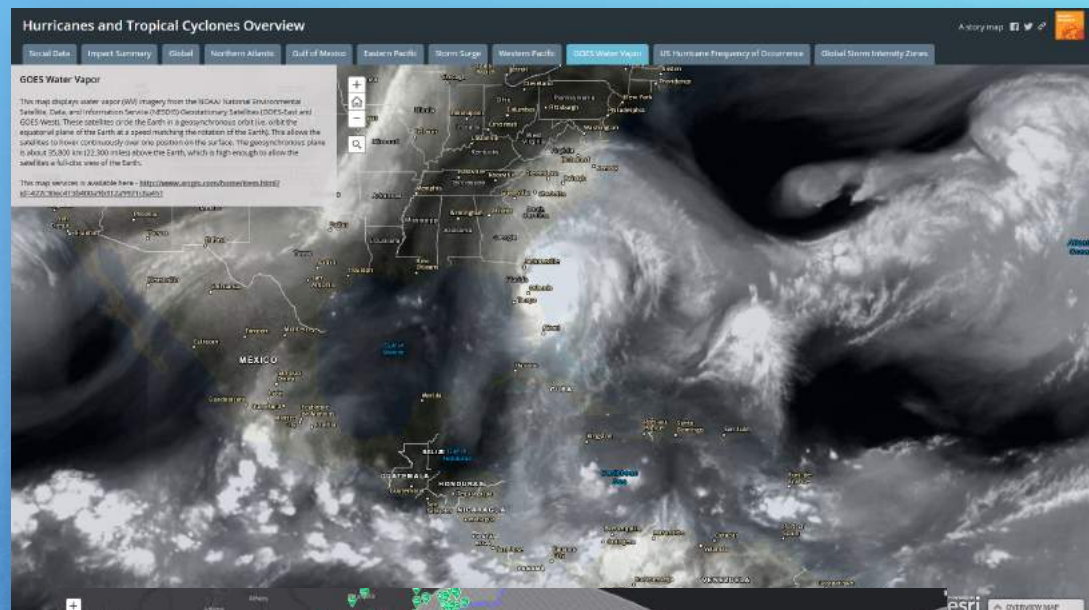


Zika Virus



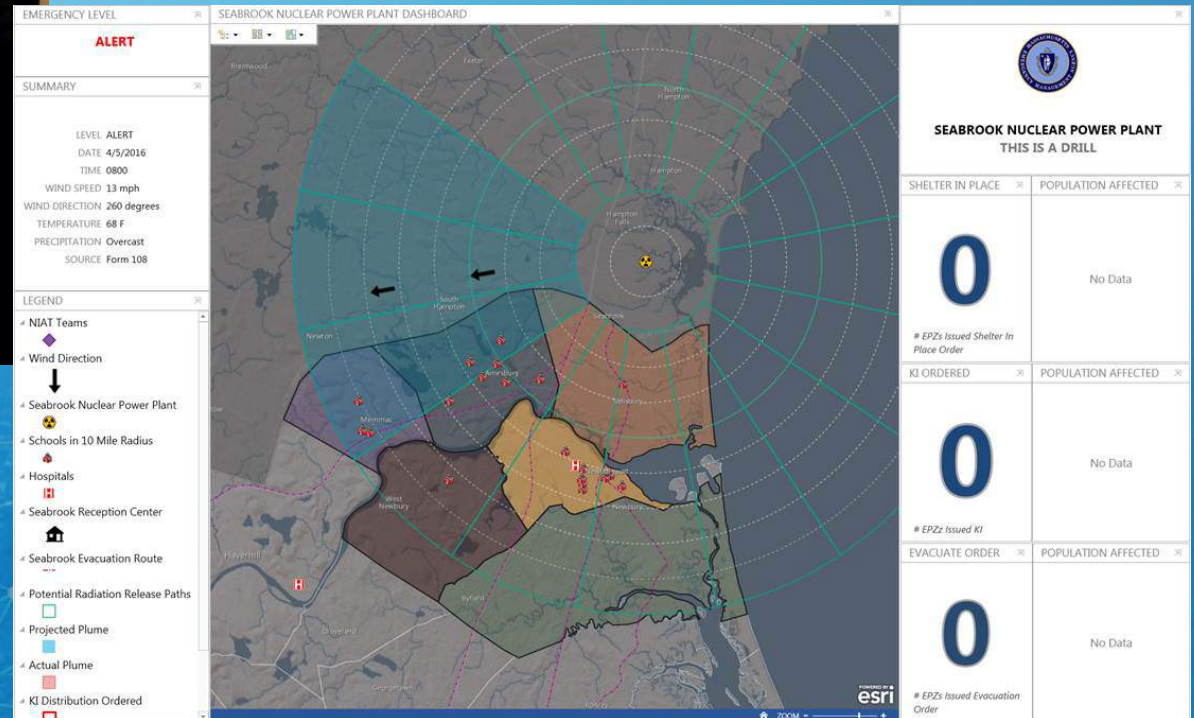
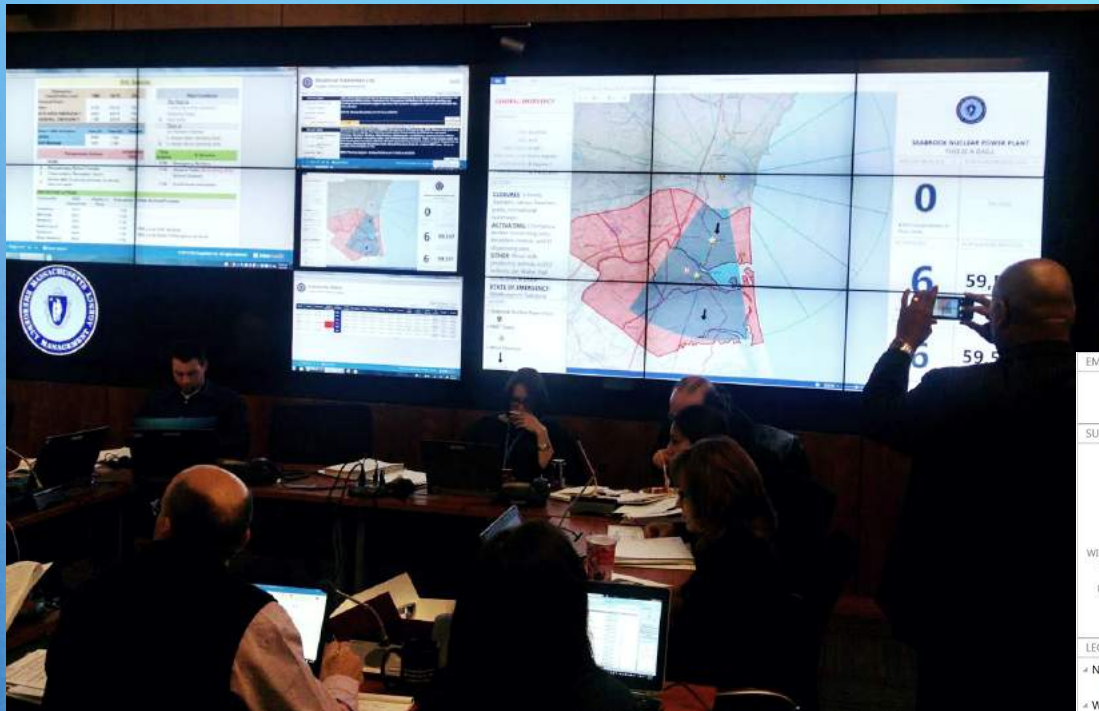
Hurricane Matthew

October 2016



Radiological Preparedness Drill

Massachusetts Emergency Management Agency (MEMA)



Boston Marathon

April 2015



Boston Marathon

April 2015

Boston Emergency Medical Services

The image displays a collection of software dashboards used for emergency management during the Boston Marathon. Key components include:

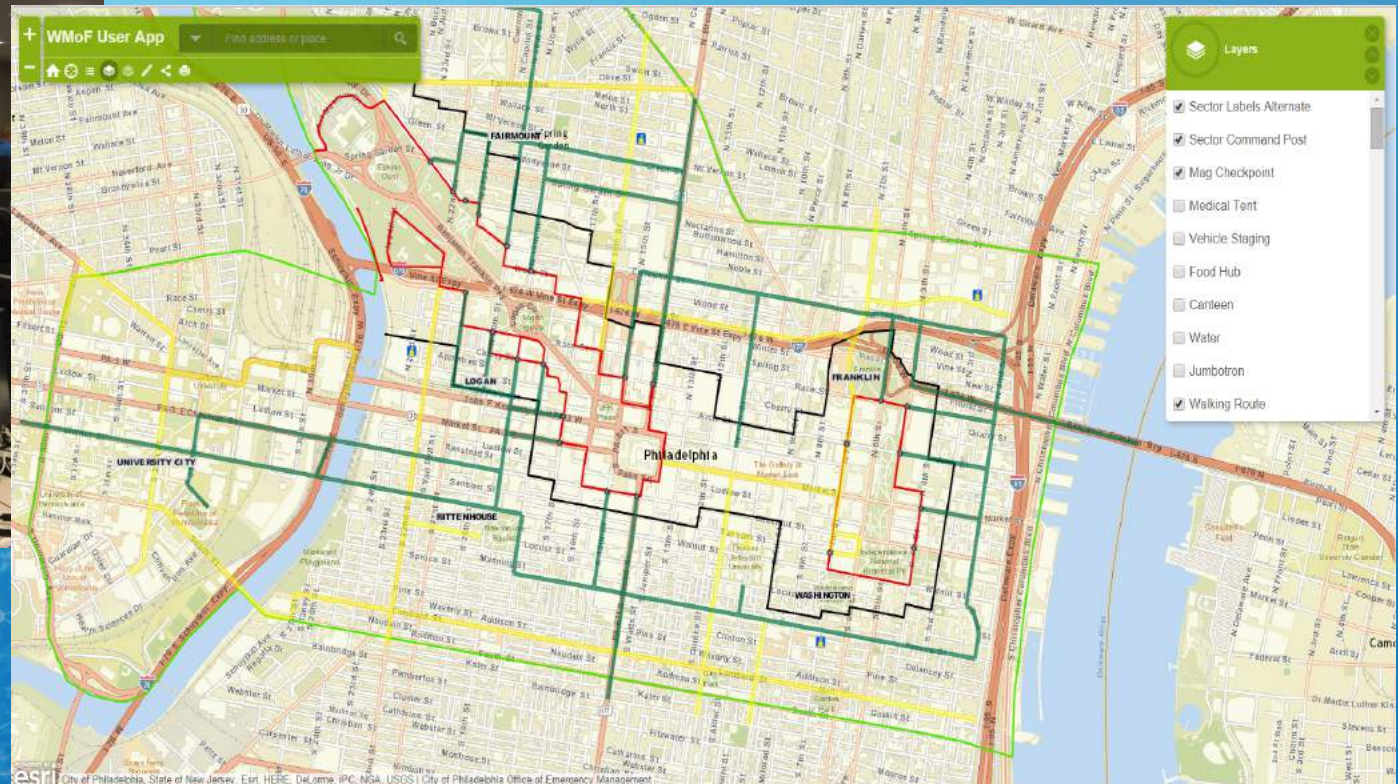
- Priority Events Dashboard:** Shows '1 Priority Events' with a distribution pie chart and '0 Runners' / '0 Active Calls' / '0 Total Calls'.
- Medical Tents Dashboard:** Displays '0 Runners' and '0 Active Calls'.
- Runner Progress Dashboard:** Shows '3 OPEN BRC', '0 WABOC', and '45 CAD Calls'.
- Incident Tracking Dashboard:** Lists incidents such as 'Other | 1 STANHOPE ST | CAD', 'Suspicious Property | Stuart & Tremont St | CAD', and 'Suspicious Person | Ring Rd / Boylston | Radio'.
- Map Dashboards:** Multiple maps showing the marathon route and various incident locations across Boston.
- EMS Operations Dashboard:** Shows 'EMS Trending Calls' and 'EMS Field Assets - Total' (7).
- Summary Statistics:** Large numbers '10' and '3' are prominently displayed on the right side.
- Other Elements:** A 'No Features' label is present on the bottom right, and a 'Powered by esri' logo is visible at the bottom.

City of Boston Emergency Management

Boston Regional Intelligence Center

Pope Visit

City of Philadelphia, September 2015



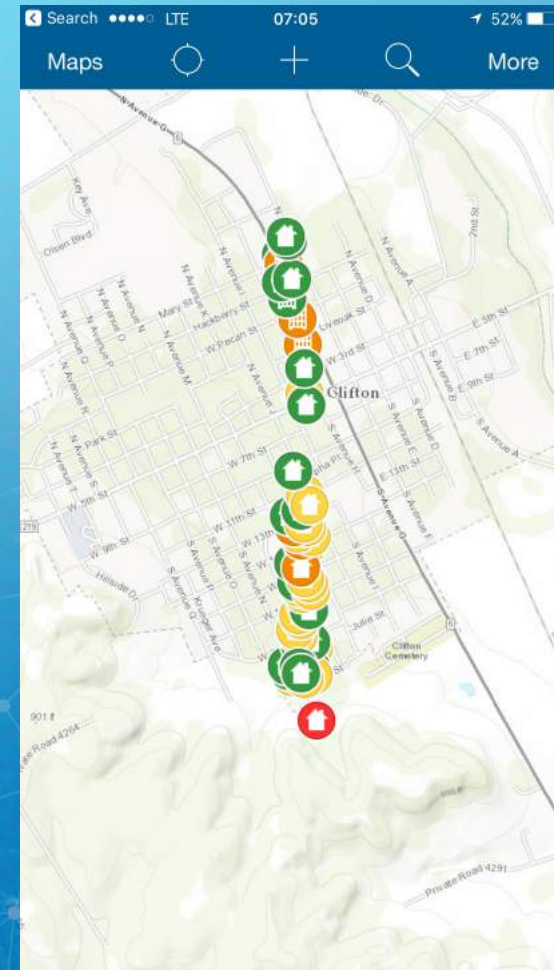
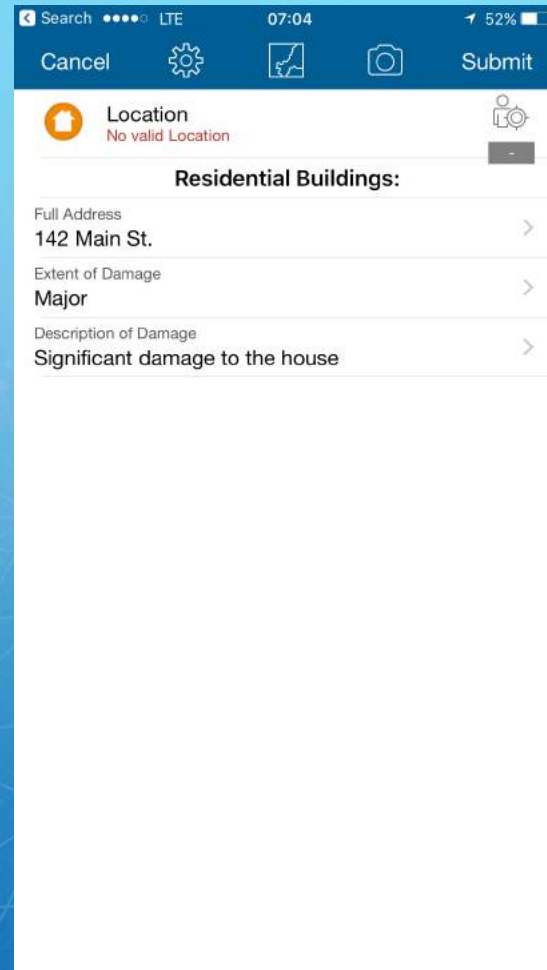
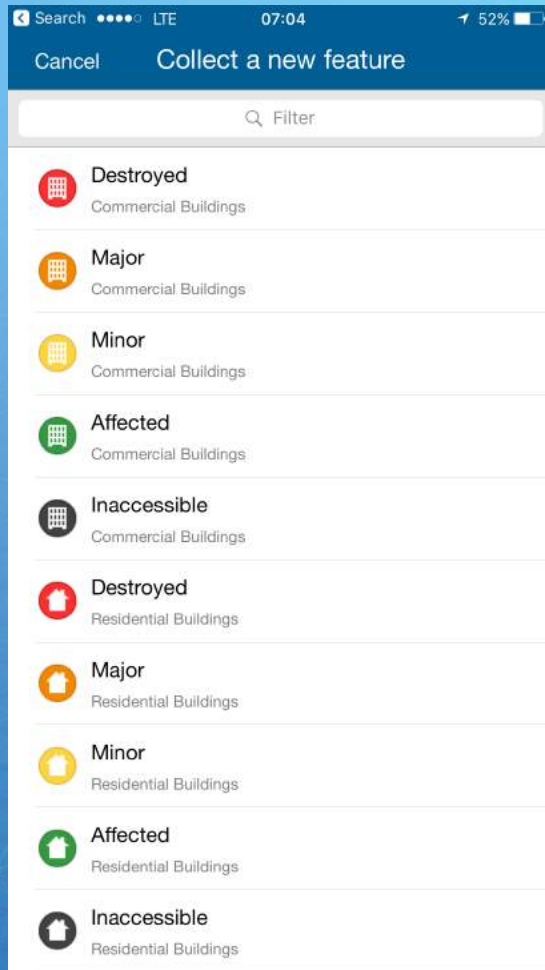
Packaged Applications for Comprehensive Situational Awareness

The screenshot displays a web application interface for "California Drought Demographics". The interface is divided into several sections:

- Executive Briefing:** Contains the title "Drought 2016 Executive Briefing" and a "Table of Contents" with a list of links such as "Reservoir Conditions", "Dry Wells per County", and "Proclamations and Task Forces".
- California Drought Demographics:** A central panel with a legend for drought severity levels: Entire Area (blue), Abnormally Dry (yellow), Moderate Drought (orange), Severe Drought (red), Extreme Drought (dark red), and Exceptional Drought (darkest red).
- Map:** A map of California showing drought severity by county. Major cities like San Francisco, San Diego, Los Angeles, and Fresno are labeled. A search bar at the top right allows for finding addresses or places.
- Summary Statistics:** A table at the bottom right of the map area provides key statistics:

4.5m	180k	1.6m	184k
2015 Total Popula...	Total Businesses (S...	2015 Total Househ...	2009-2013 ACS H...
- Footer:** Includes the Esri logo and text: "Esri, HERE, DeLorme, NGA, USGS | Esri, HERE".

Initial Damage Assessment



Initial Damage Assessment



Sevier County Structure Status

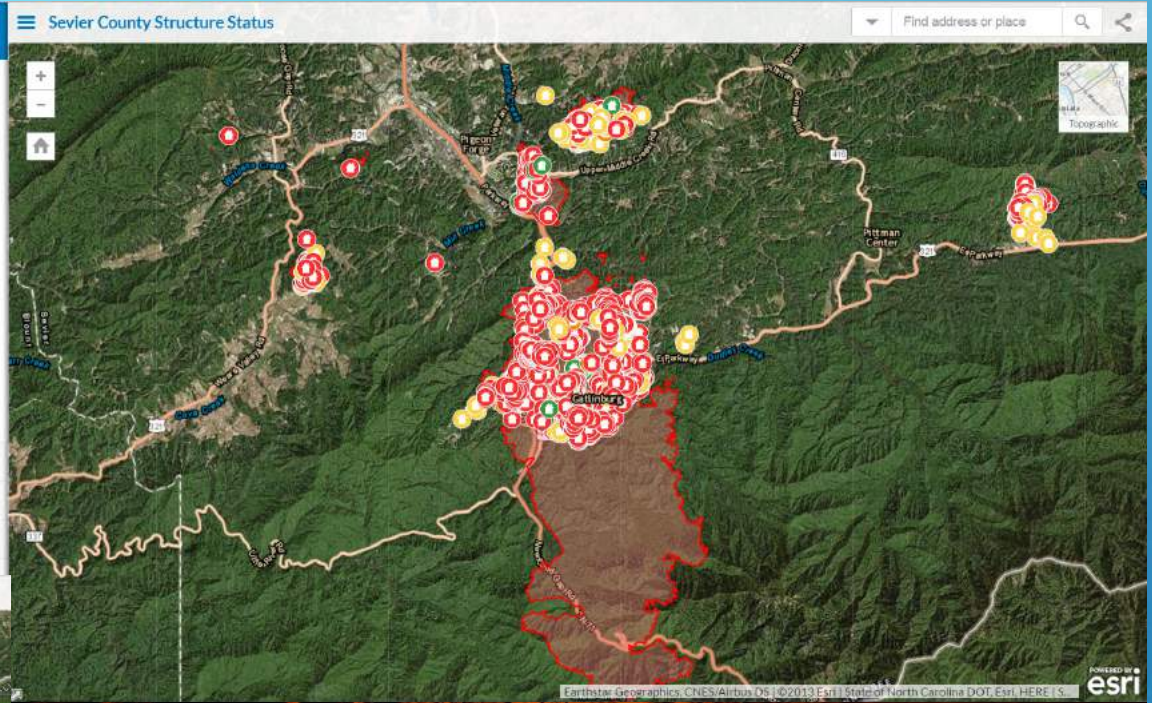
This interactive map provides the status of individual structures. More information will be added as data is processed.

Click or tap on the links below to zoom to specific communities and on the map for more specific information.



Bookmarks

- Gatlinburg
- Cobbly Nob
- Pigeon Forge



Sevier County Structure Status

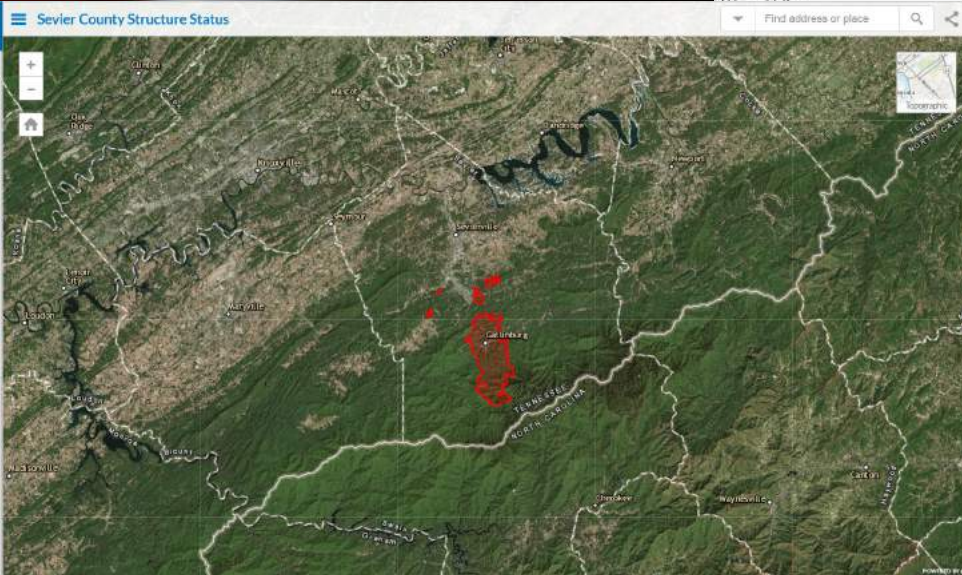
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Bookmarks

- Gatlinburg
- Cobbly Nob
- Pigeon Forge
- Wears Valley
- Shell Mountain
- Sevier County



THE
SCIENCE
OF
WHERE

Getting Started

Optimize Your Field Operations

ArcGIS

Cloud
Quality

Big Data

Open Data

Spatial Analysis

Enterprise Integration

Real-Time

Content

Mapping

Administration

Standards

Geodesign

Performance

Imagery

Interoperability

Editing

Solutions

Usability

Developers

Identity

3D

Data Management

Apps

Security



Support for Federal Users

Simplified Government Contracting (FITARA)

Improved Security (FISMA, FedRAMP)

Providing Additional Resources:

- Managed Cloud Services
- Specialized Training
- Jump Start Packages

... An Easier Way To Implement Successful Systems



Esri is More Than Software

Professional Development

Helping You and Your Organization

Online Courses

Home Use Licensing

DevSummit

Training

ArcUser

Certification Program

ArcNews

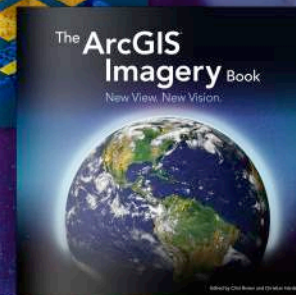
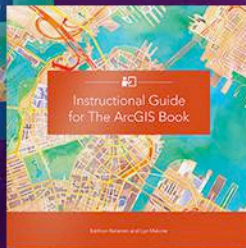
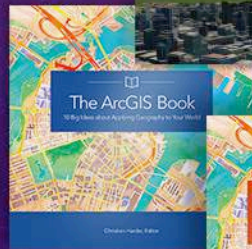
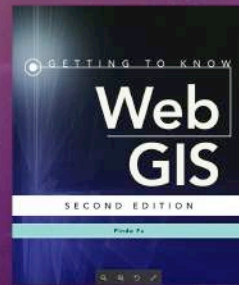
GeoNet Community

Esri Press MOOCs

Young Professionals Network

User Conference

Self-Paced e-Learning





You Are Invited

Optimizing Field Operations Webinar Series

Enhance Efficiencies in the Field

Managing the Field Workforce

Field Data Collection and Inspection

Monitoring Field Operations

Managing and Analyzing Field Data

Sharing Data and Analysis to Support Your Mission





esri

THE
SCIENCE
OF
WHERE