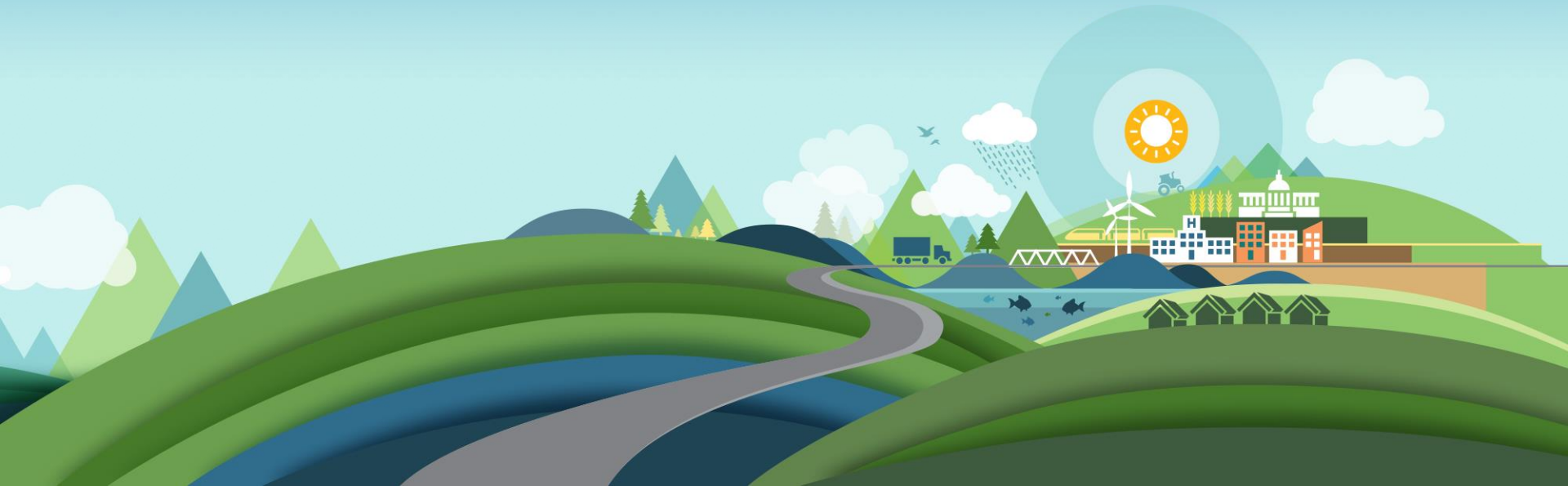


Increasing Community Resilience

Planning, Mitigation & the Role of GIS

Ryan Lanclos
Emergency Management Industry Manager
Esri



Responsible for helping our communities:

Mitigate Risk

Reduce Impact

Recover Quickly



Our Purpose and Mission

Provide...

- Software
- Support
- Data
- Switchboard

Online: www.esri.com/disaster

Email: disaster_help@esri.com



esri

Disaster
Response

...when your **capacity** is exceeded

General Strategy for Esri DRP

- Utilize our **Platform** to support **Common Workflows**
- Step in when a user's **capacity is exceeded**
- **Fill a gap** between GIS and Operators
- **Prototype** on the technical side
- Move prototypes to **core**
- Think **mobile** first, **responsive** design and use **ArcGIS Online**
- Help with external **communication**

Rim Fire: Perspectives Map

1 Critical Points of Interest

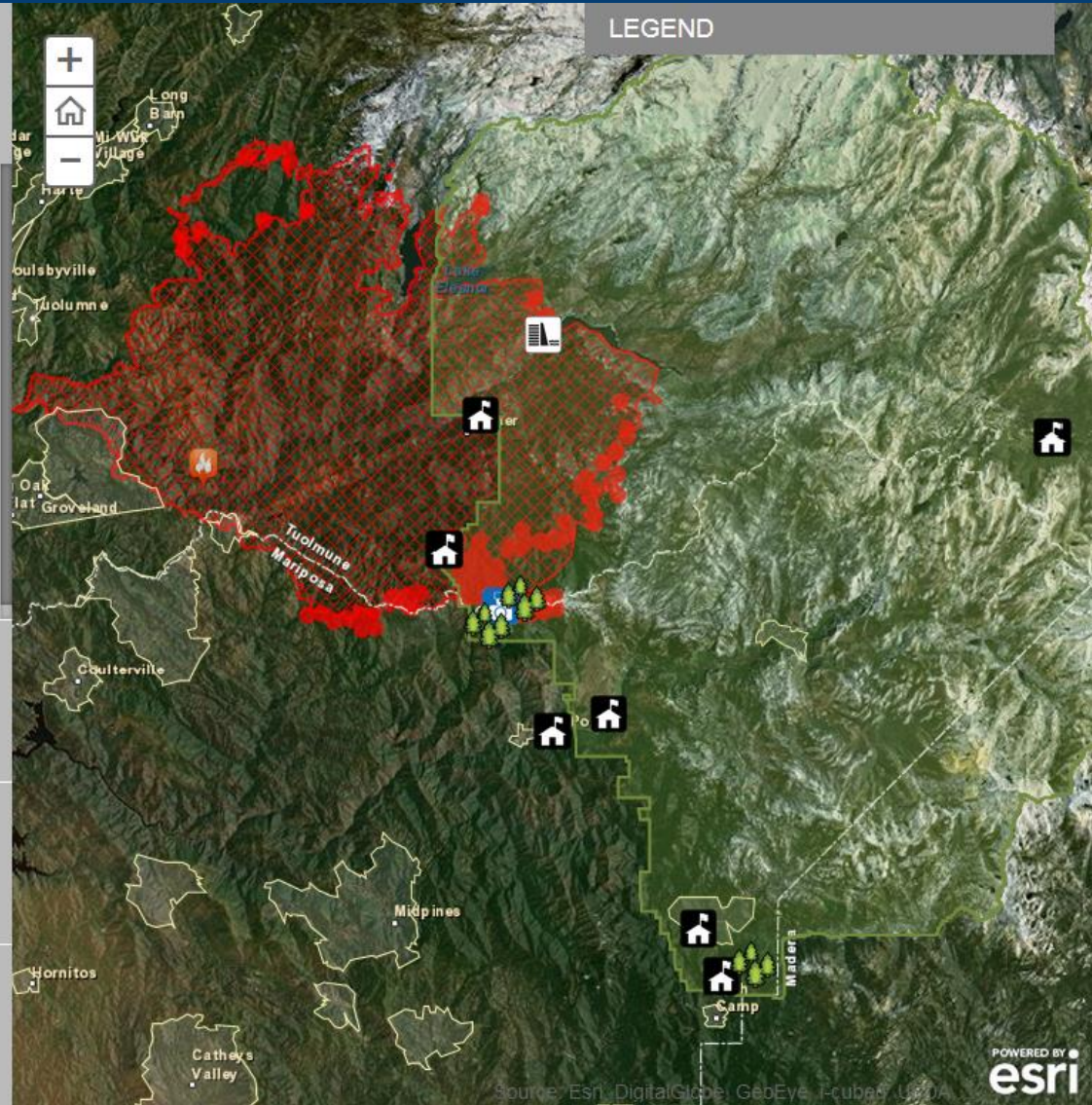
The Rim Fire is currently threatening many communities near Yosemite National Park and poses a potential risk to several ranger stations and sequoia groves. This map also shows the location of the O'Shaughnessy Dam and reservoir, which provides water for the San Francisco Bay Area.

Click any feature on the map to learn more about each point of interest.

2 Fire Progression

3 Yosemite National Park Fire History

4 Power and Water Infrastructure



Colorado Flooding: Map Tour

Longmont, Colorado Flood Tour

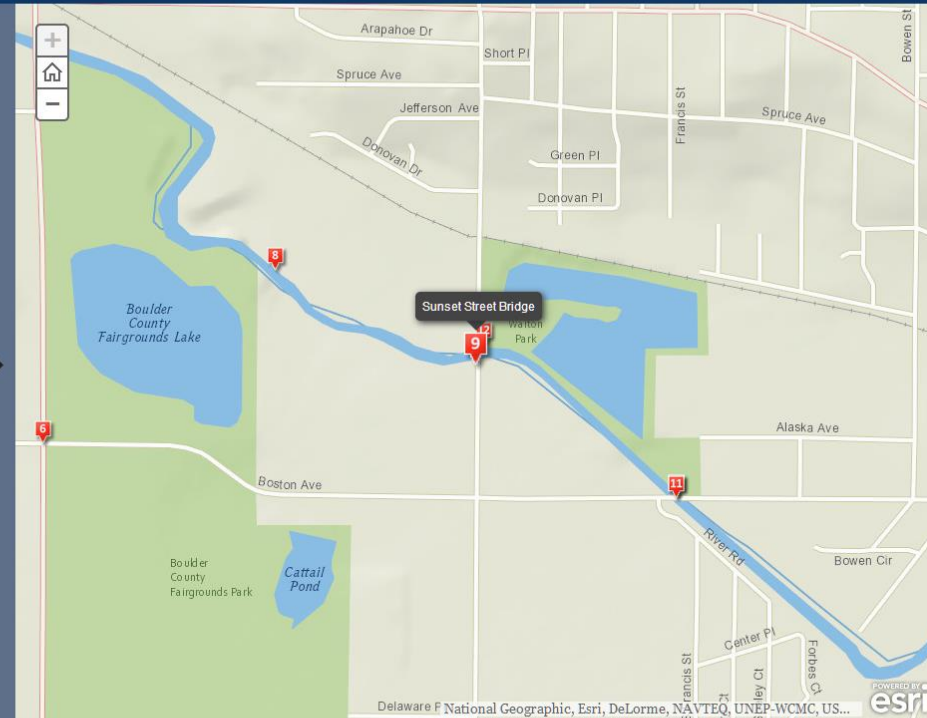
During the week of September 9, 2013, the Front Range was overwhelmed by rain that totaled up to 21 inches in parts of Boulder County. The rain caused massive flooding in many communities. The map tour below shows flooding of the St. Vrain River and Left Hand Creek in Longmont.

A story map



Sunset Street Bridge

Bridge out at Sunset St. North of Boston Ave. next to Izaak Walton Park



Left Hand Creek



Boulder Valley Farms



Boulder Valley Farms



Art in Public Places



Left Hand Creek Bike Trail



Hover Road



St. Vrain Greenway



St. Vrain Greenway



Sunset Street Bridge



Debris Removal



Debris Removal



Park Dr

Typhoon Haiyan/Yolanda: UNOCHA Logistics

Typhoon Haiyan/Yolanda Perspectives Map

Get a complete picture of the impact of Typhoon Haiyan/Yolanda in the Philippines and Southeast Asia. Click through the numbered tabs to see the storm's path and how it impacted communities in Tacloban City, Bohol, and Bantayan Island.

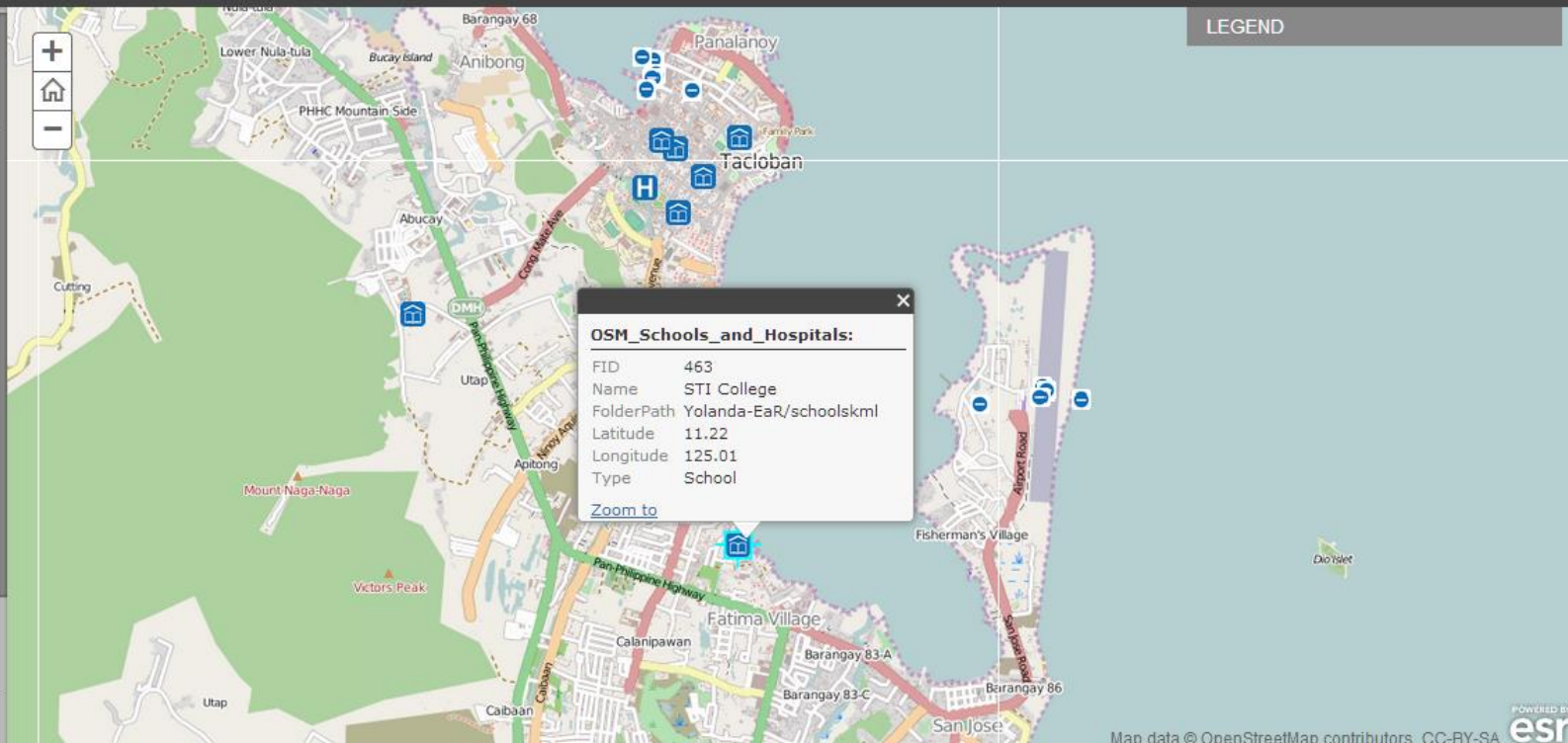
1 Typhoon Haiyan/Yolanda

2 Storm Surge in Tacloban City

The Philippines government and the United Nations have established a forward command post for Region 8 in Tacloban City. The city was hit particularly hard by flood waters, which were observed as high as three meters in some areas. Many parts of the city are without food, water, and electricity.

This map shows schools and hospitals in the area as well as damage reports from social media and UNOSAT.

Recent



Oso, Washington Slide: Imagery Support

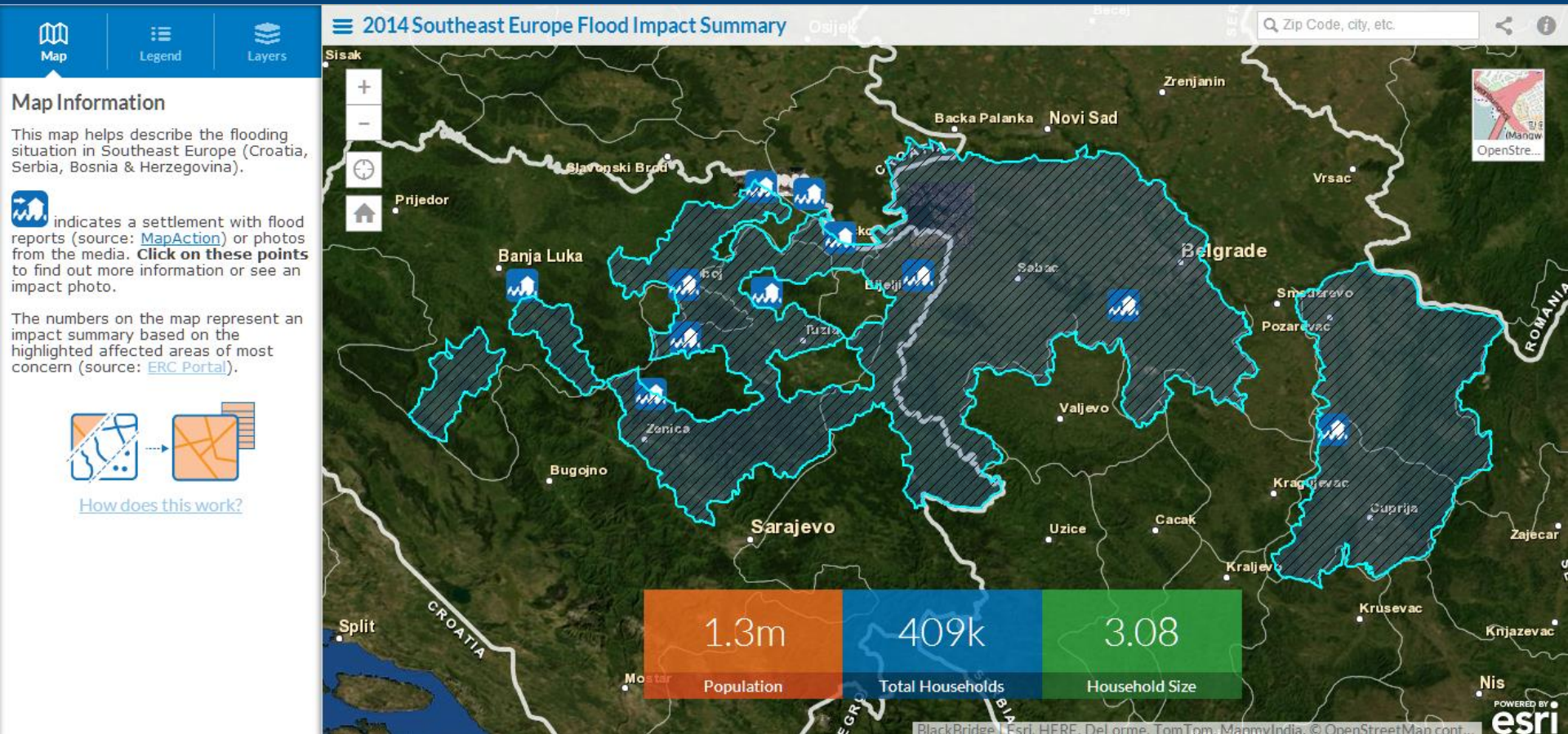
Before and After the Hwy 530 Landslide

A story map [f](#) [t](#) [l](#)

On March 22, 2014, a major landslide occurred near Oso, Washington. This swipe map allows for viewing of the high resolution post-event aerial imagery (right) from Washington State DOT collected on March 24th, 2014. Use the swipe and zoom tools to compare the image with ArcGIS Online World Imagery (left).

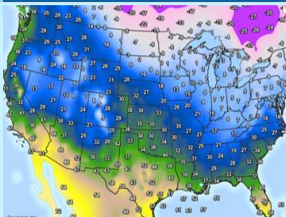


Southeast Europe Flooding: Impact Summary

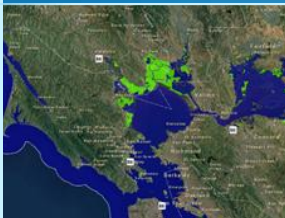


Increasingly **Complex** Disasters

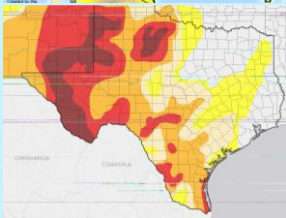
Climate Change



Flooding



Sea-level Rise



Wildfire

Drought



Economic Impacts



Open Data

How do you create actionable information?



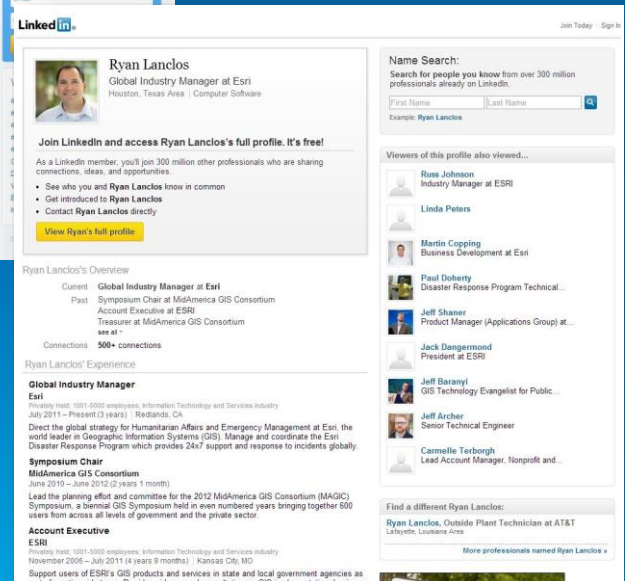
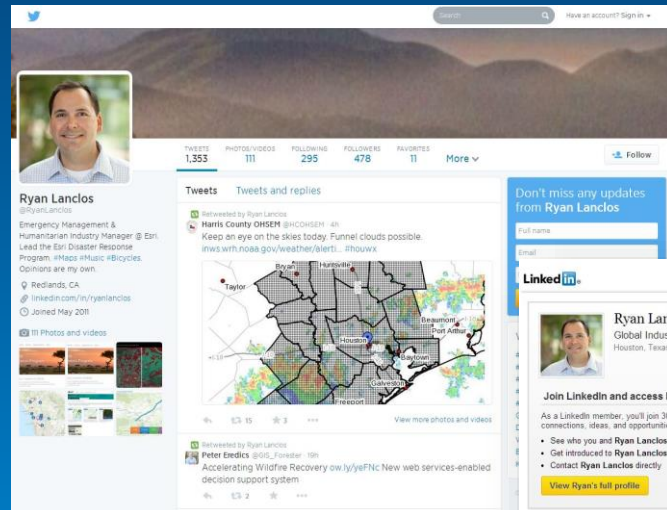
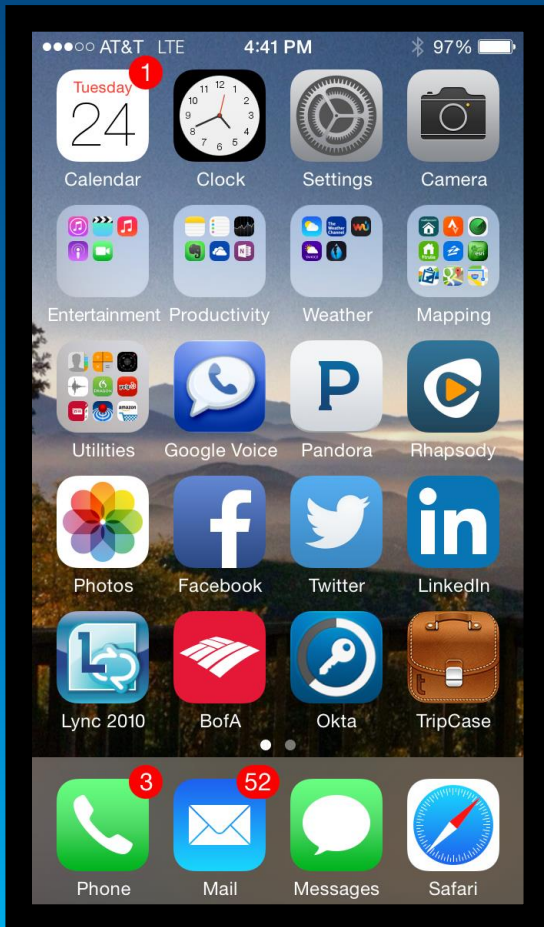
Mobility

How do you reach a mobile society?



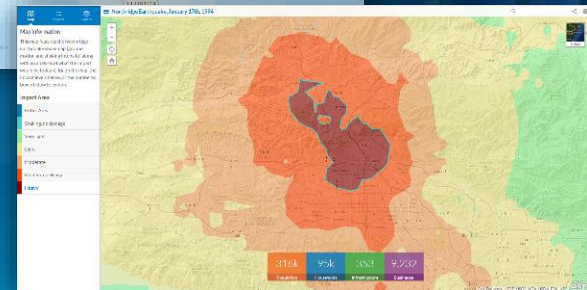
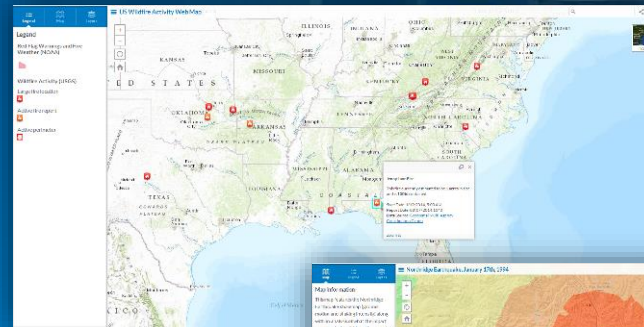
Consumer Engagement

How do you connect with your citizens?



Preparedness

- Open Data
- Free Apps
 - Public Information Maps
 - Impact Summary Maps
 - Time Enabled Maps
- Prototyping
 - GeoForm
- Low Cost & Modern GIS
 - ArcGIS Online
 - NPO Program & Home Use
 - Desktop + ArcGIS Online + Content + Free Apps



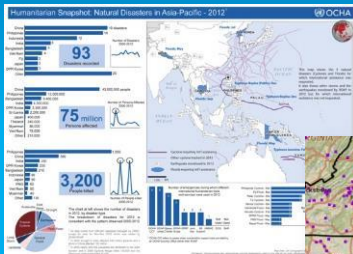
GIS

Building more resilient communities



More than just a map...

Asia-Pacific Natural Disasters



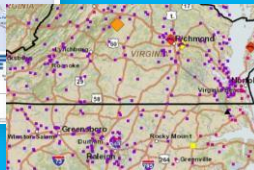
Asia Pacific Region

Interior Geospatial Emergency Management



U.S. Department of the Interior/
USGS

Hazard Map



VDEM

Documenting Storm Damage



U.S. Department of the Interior /Urban
Forestry Administration, Washington, DC

Risks from Sea Level Rise



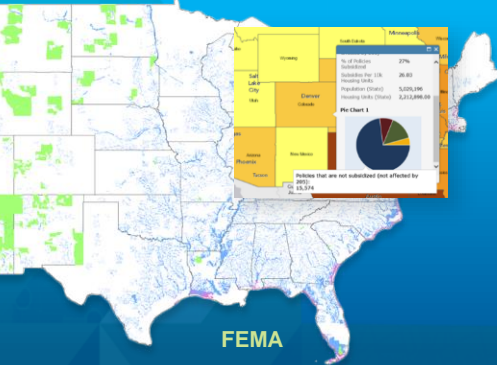
New York City, Jersey City

Storm Threat to Energy Infrastructure



U.S. Energy
Information
Administration

Flood Planning



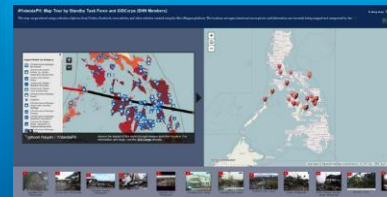
FEMA

Posted Warnings



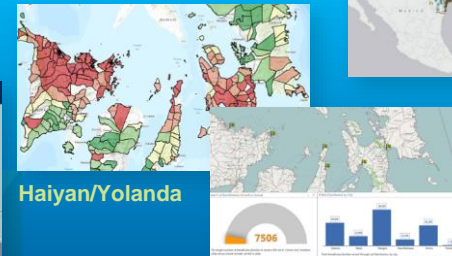
National Weather Service

Typhoon Damage Assessment



Standby Task Force/GIS Corps

Typhoon Response

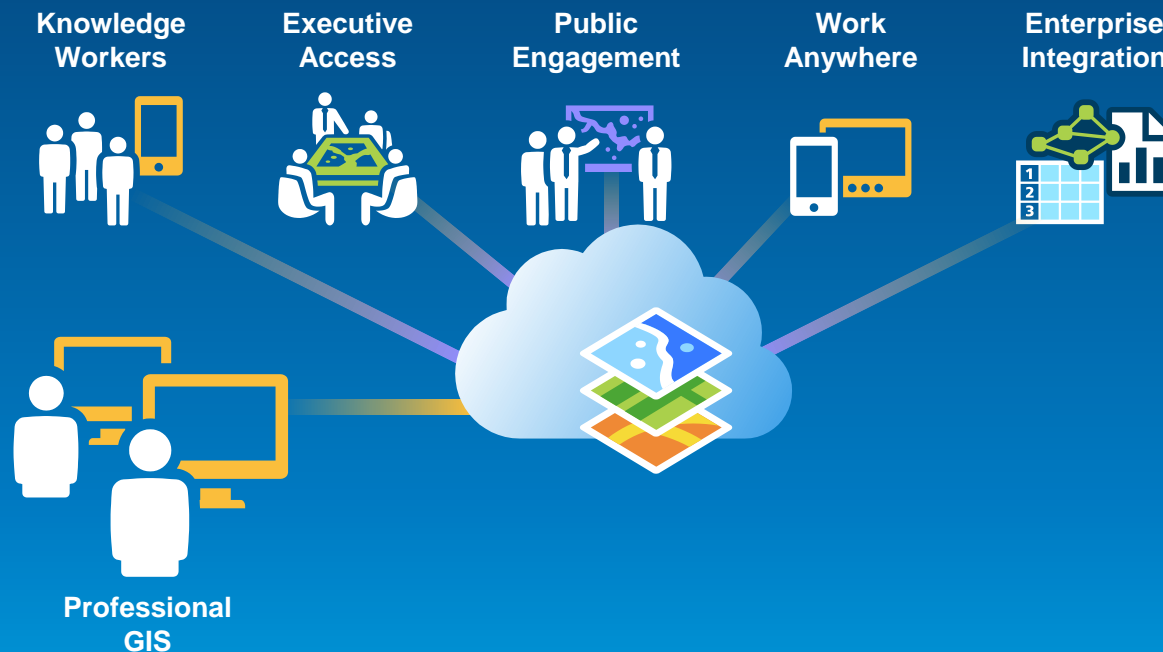


Haiyan/Yolanda

World Vision

Web GIS Supports Everyone

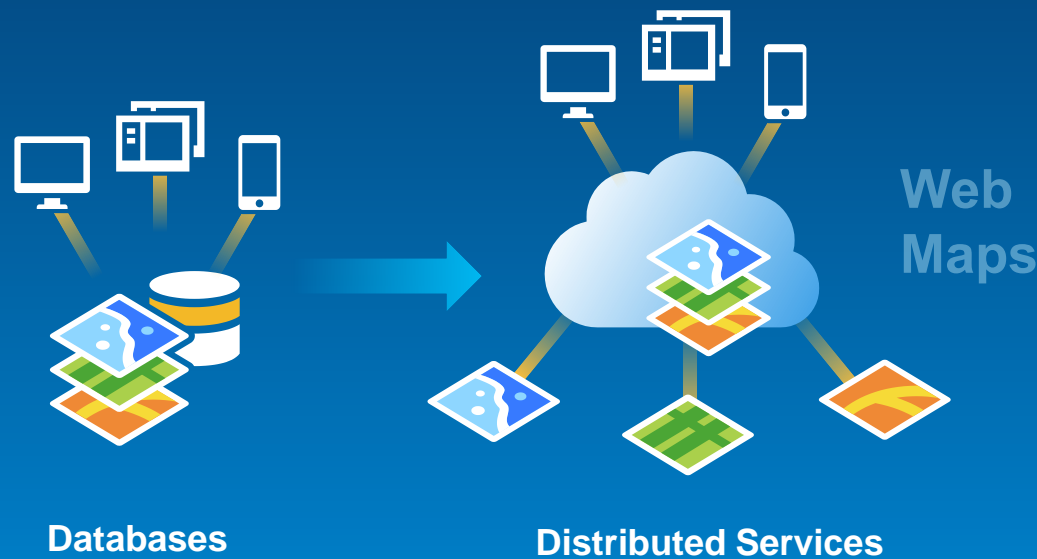
Enabling workflows across the community...



..with modern and configurable apps

Web GIS Provides a New Pattern for Integration

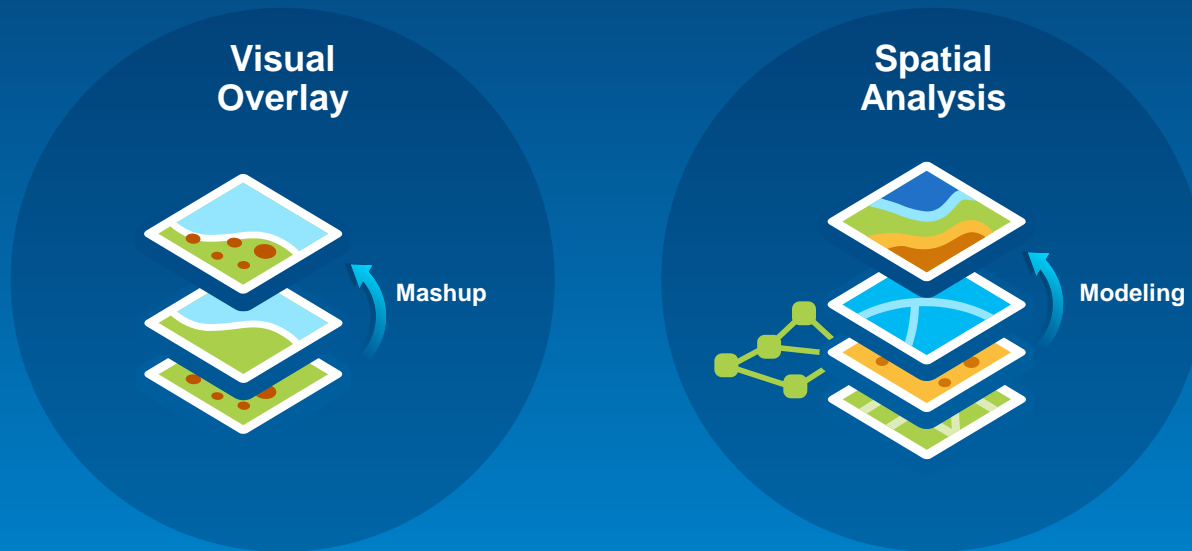
Making Data Sharing and Access Easier



Enabling a Flexible and Agile Approach

Web GIS Dynamically Integrates Information

Combining and Analyzing Information



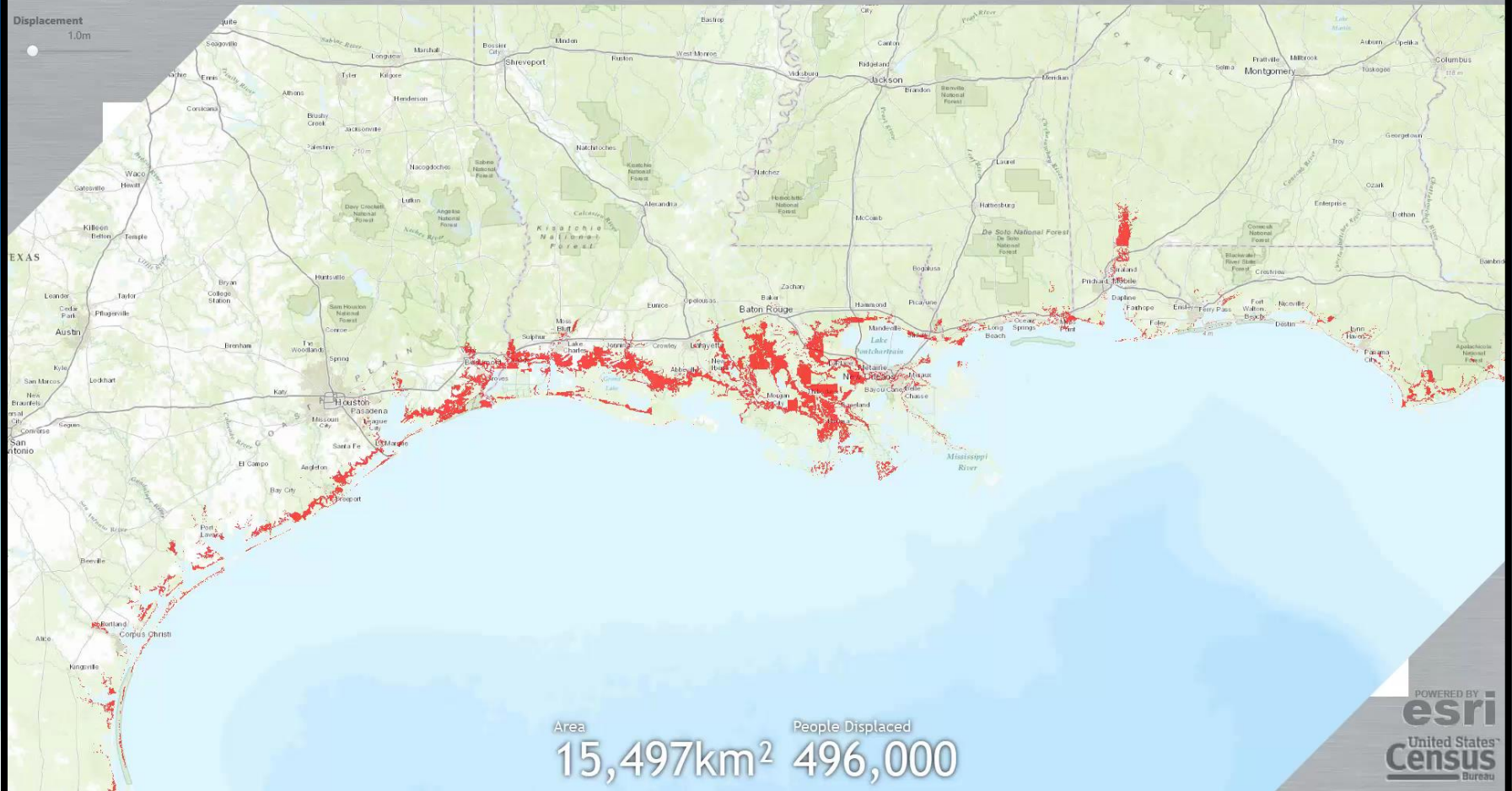
Helping to develop actionable information. . .

census map

developed by the applications prototype lab

Displacement

1.0m



ArcGIS - Risks and Mitigation

MODIFY MAP [Sign In](#)

[Details](#) [Basemap](#)

[Print](#) [Measure](#)

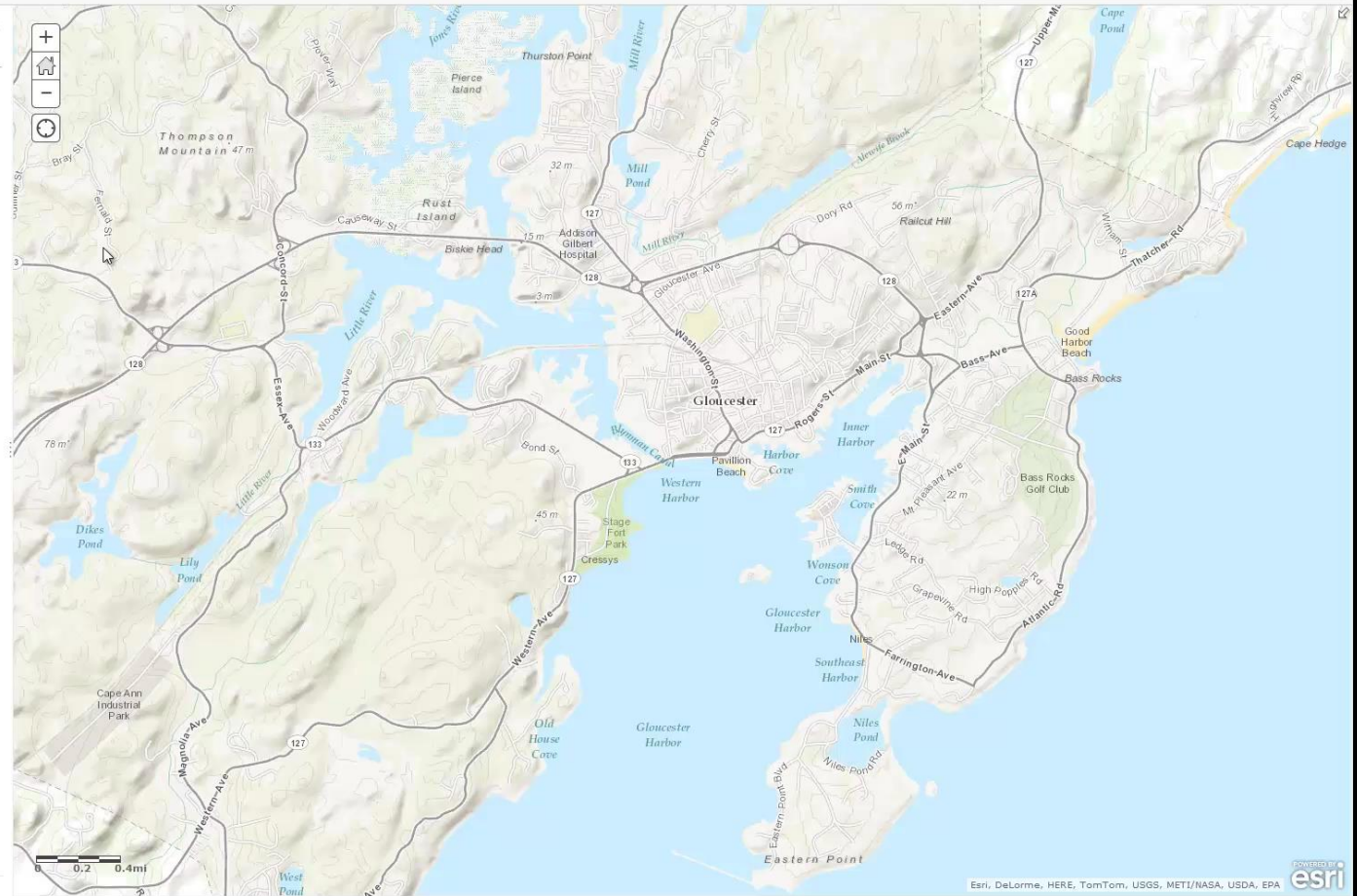
Find address or place



[About](#) [Content](#) [Legend](#)

Contents

- ☐ Mitigation Policies and Infrastructure
- ☐ Areas of Concern
- ☐ Community Centers
- ☐ Schools
- ☐ Flooded Structures
- ☐ Flooded Structures (Hurricane Inundation)
- ☐ Flooded Roads
- ☐ Flooded Roads (Hurricane Inundation)
- ☐ 100 and 500 Year Flood Zones
- ☐ Environmental Justice (Elderly)
- ☐ Hurricane Inundation
- ☐ Environmental Justice Low Income Area
- ☒ Topographic



Building a Resilient Community

Leveraging Your Location Platform

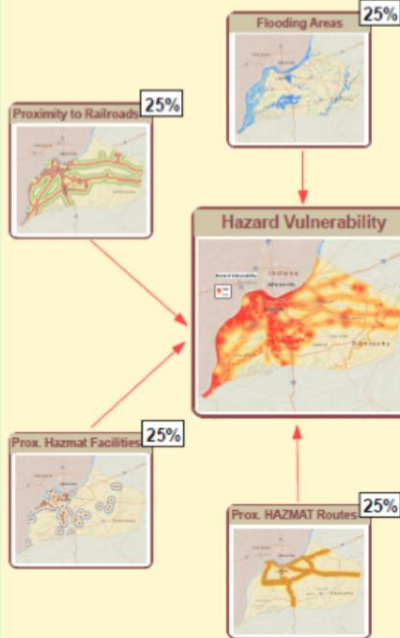
1. **Understand** Your Vulnerabilities
2. **Communicate** Your Efforts
3. **Prepare** Your Systems to Scale

1. Understand Your Vulnerabilities

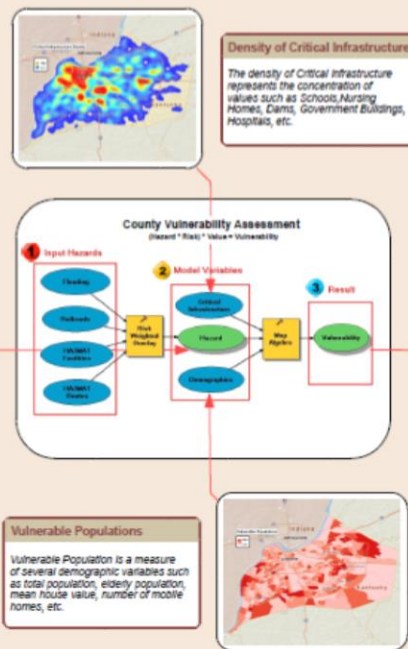
Analyze + Understand + Target

Vulnerability Assessment

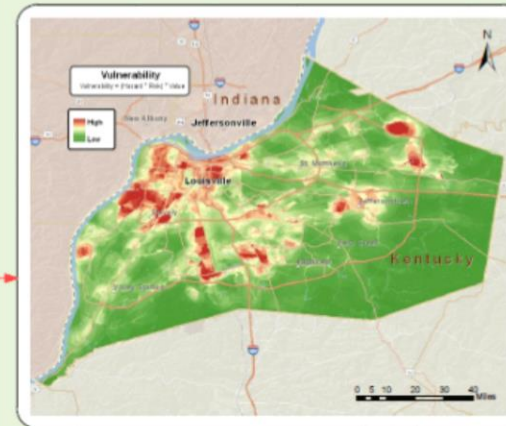
1 Hazards Natural and Technological



2 Values Infrastructure and Population



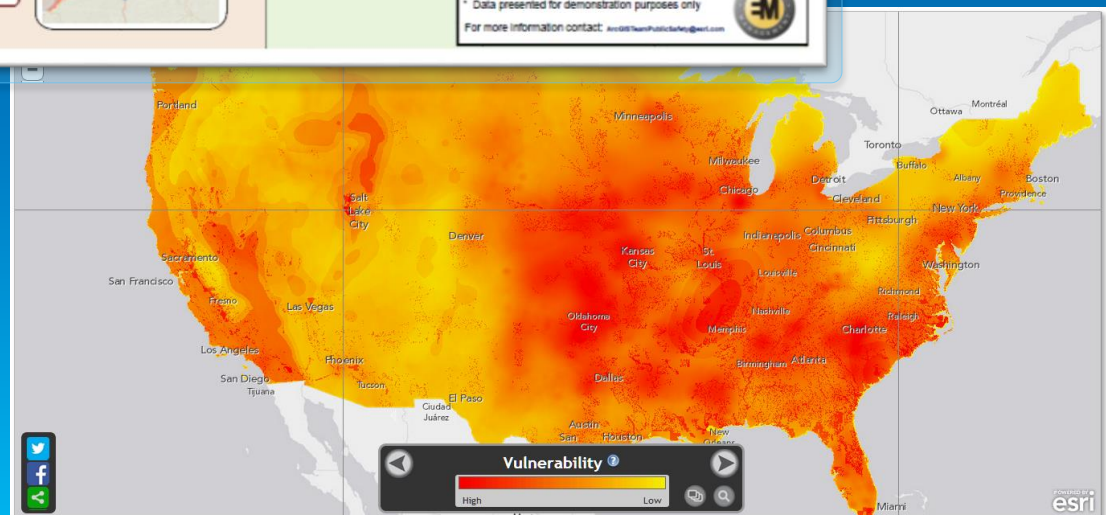
3 Vulnerability (Hazard * Risk) * Value = Vulnerability



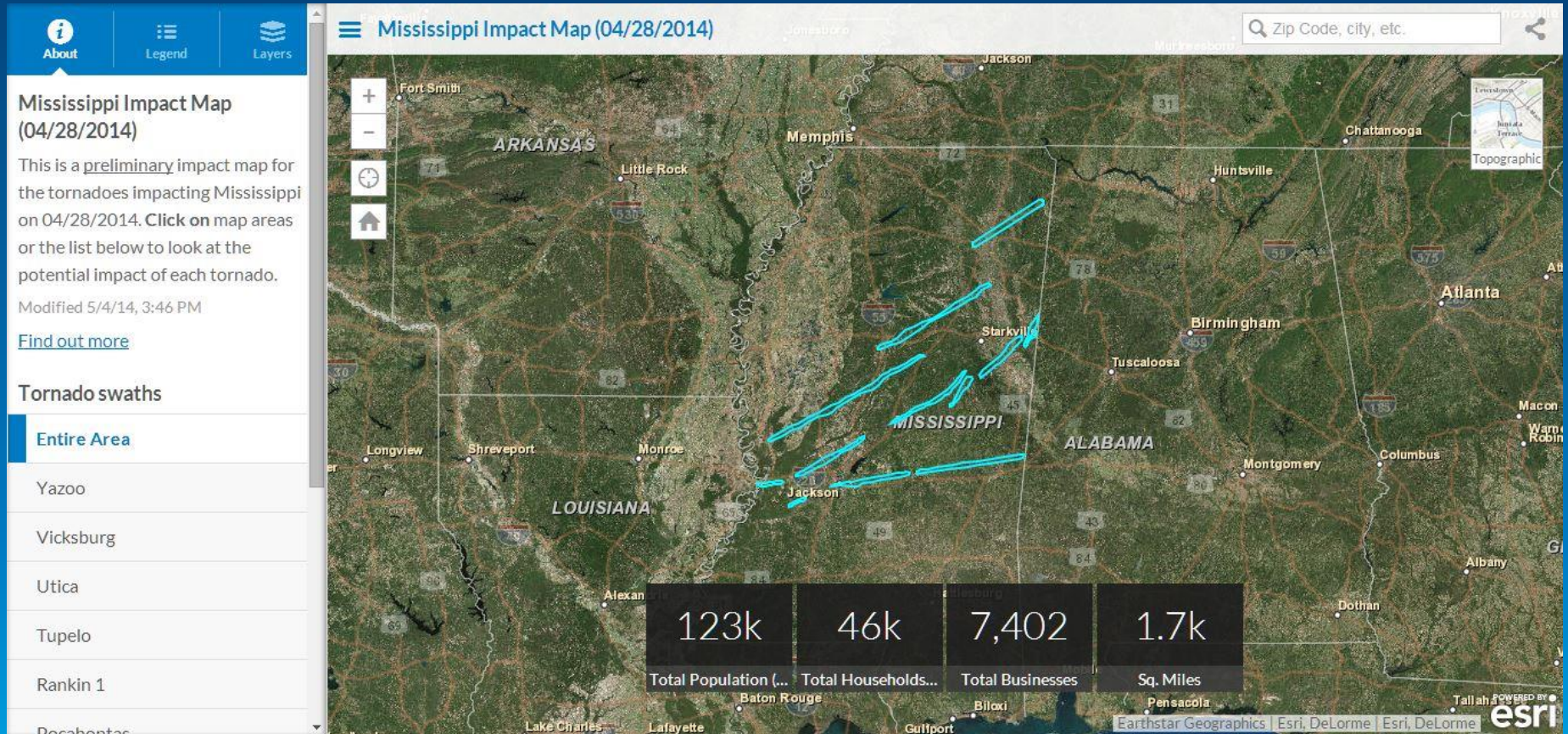
Prepared by the County Planning Officer

* Emergency Management Agency
* Data presented for demonstration purposes only

For more information contact: jeff@jeffersonvilleky.com



Impact Summary Map Application





Map



Legend



Layers

Northridge Earthquake, January 17th, 1994

Q Zip Code, city, etc.



Map Information

This map features the Northridge Earthquake shakemap (ground motion and shaking intensity) along with an analysis of what the impact would be today. Click on the map, the impact levels below, or the numbered boxes below to explore.

Impact Area

Entire Area

Shaking, no damage

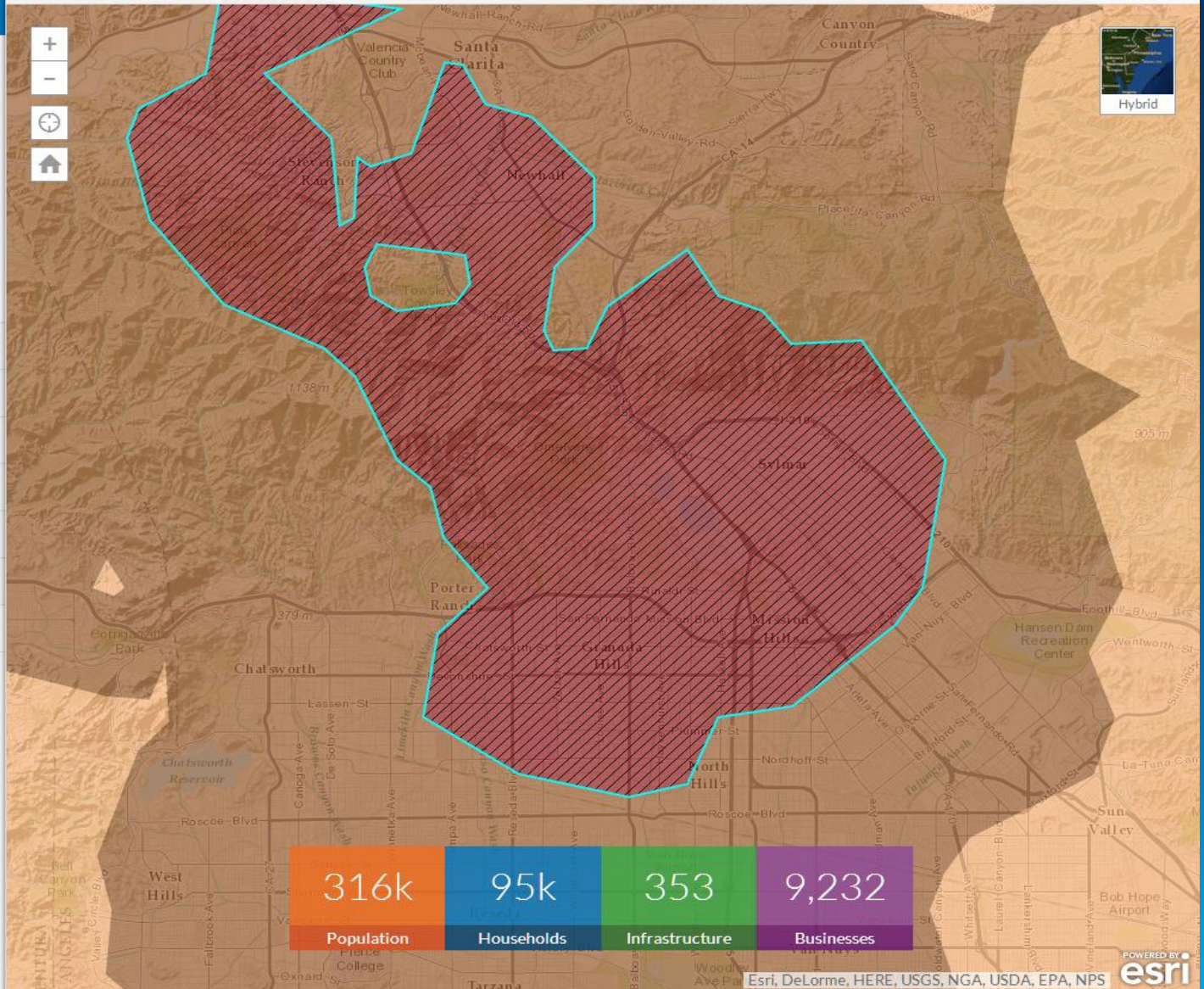
Very light

Light

Moderate

Moderate / Heavy

Heavy



Esri, DeLorme, HERE, USGS, NGA, USDA, EPA, NPS

POWERED BY
esri



Community Services

Find government facilities & services near you

Enter Address, Intersection or Landmark

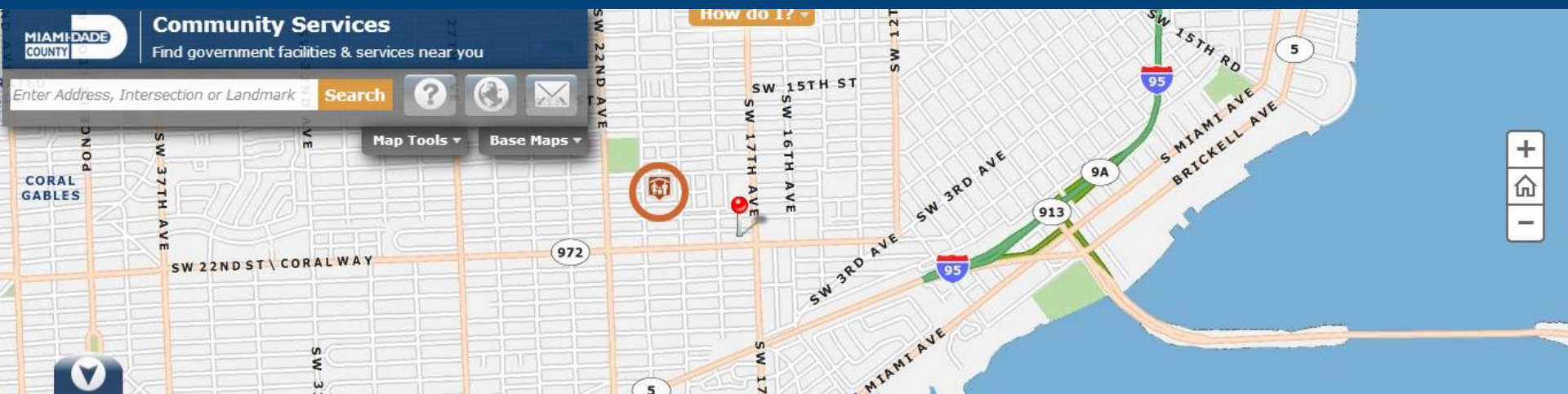
Search



Map Tools

Base Maps

How do I?



Government Emergency Management Garbage & Recycling Education Libraries Parks & Culture Public Safety Water & Sewer Demographics Show All

Storm Surge Planning Zones | Potential Nuclear Radiation Hazard | Evacuation Centers | Evacuation Bus Pick-Up Sites

Storm Surge Planning Zones



Zone: E
Color: Blue
Grid: P16

Mobile home residents and people on electrically dependent life sustaining medical equipment should evacuate when any hurricane evacuation order is issued, regardless of their storm surge planning zone.

Potential Nuclear Radiation Hazard



The location entered is not within a Potential Nuclear Radiation Hazard boundary.

Sector: N/A Direction: N/A

Radius: 25 miles

Evacuation Centers



See News for details on Evacuation Center openings.

[SHENANDOAH MIDDLE \(0.3 miles\)](#)

1950 SW 19TH ST

[CITRUS GROVE MIDDLE SCHOOL \(1.9 miles\)](#)

2153 NW 3RD ST

[BOOKER T. WASHINGTON SR. HIGH \(2.7 miles\)](#)

1200 NW 6TH AVENUE

[KYNOLCH PARK MIDDLE \(2.3 miles\)](#)



Go to:



[Business Incentives](#)



[Environmental Considerations](#)



[Know Where to Vote](#)



[Flood Zones](#)

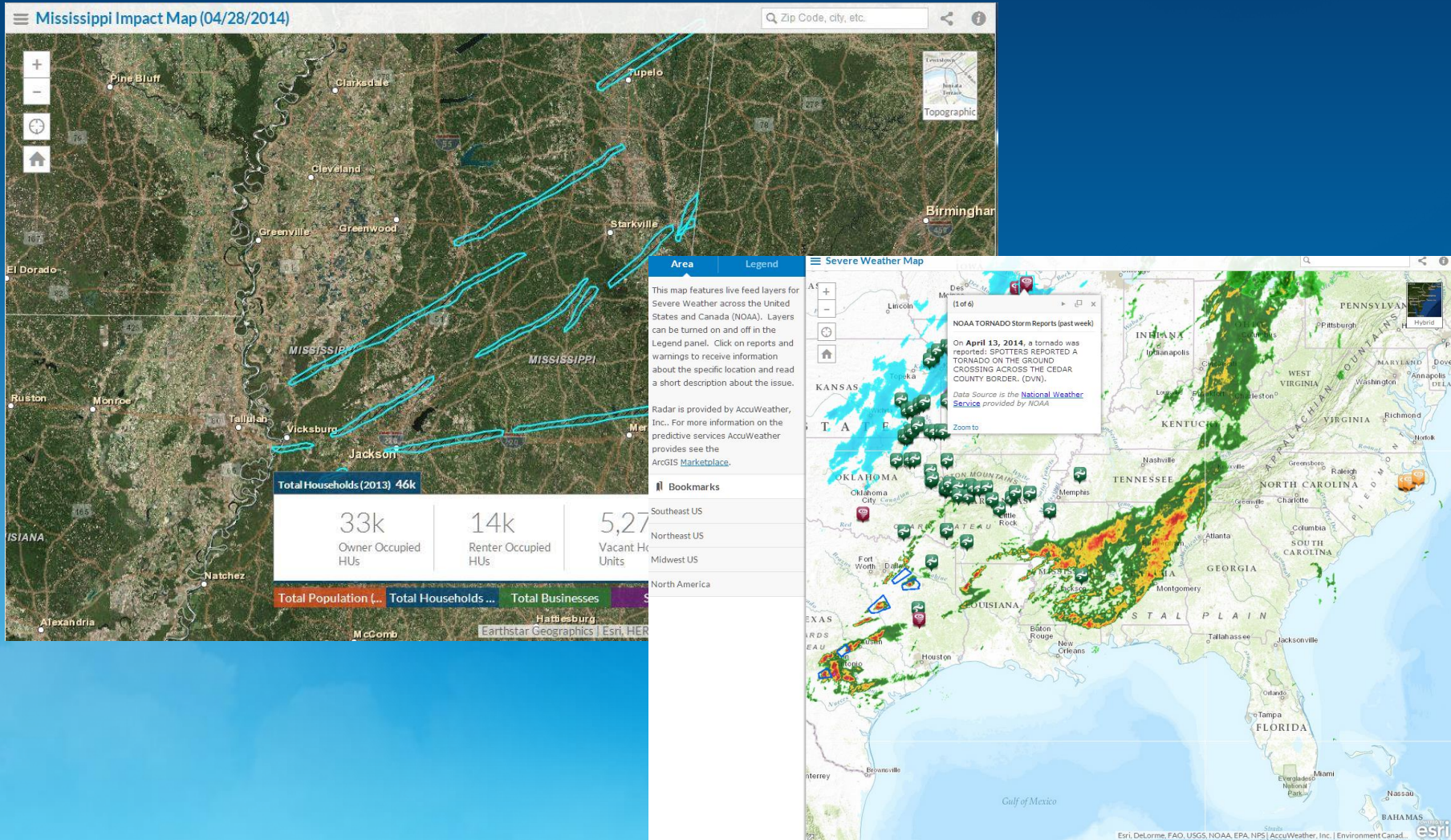
Created by Miami-Dade County GIS 2014

2. Communicate Your Efforts

Dynamic + Consumer + Re-Use

Data Never Stops

There's an app for that!



Consumer Focused

Available on any device



Think mobile first and use existing templates

Reusable

Build Once. Use Everywhere.

Emergency Mobile

ReadySanDiego SDCountyEmergency SDCountyRecovery

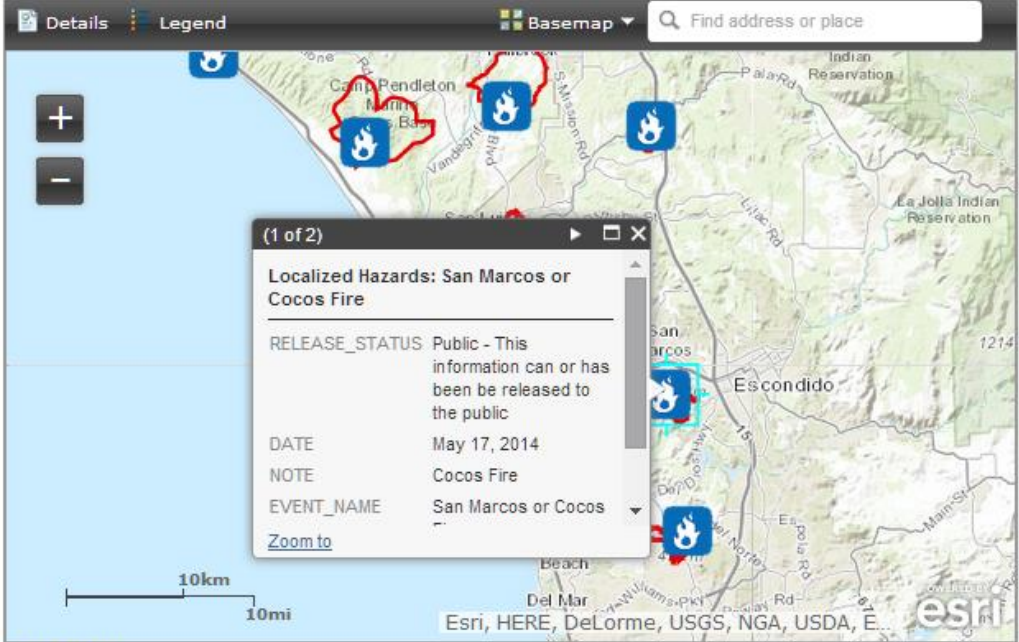
San Diego County Emergency Site

Home | Updates | Maps | Shelters | LACs | Other Agencies

Home > Maps

Emergency Map

Details Legend Basemap Find address or place



(1 of 2)

Localized Hazards: San Marcos or Cocos Fire


RELEASE_STATUS	Public - This information can or has been be released to the public
DATE	May 17, 2014
NOTE	Cocos Fire
EVENT_NAME	San Marcos or Cocos

[Zoom to](#)

10km 10mi

Esri, HERE, DeLorme, USGS, NGA, USDA, E...

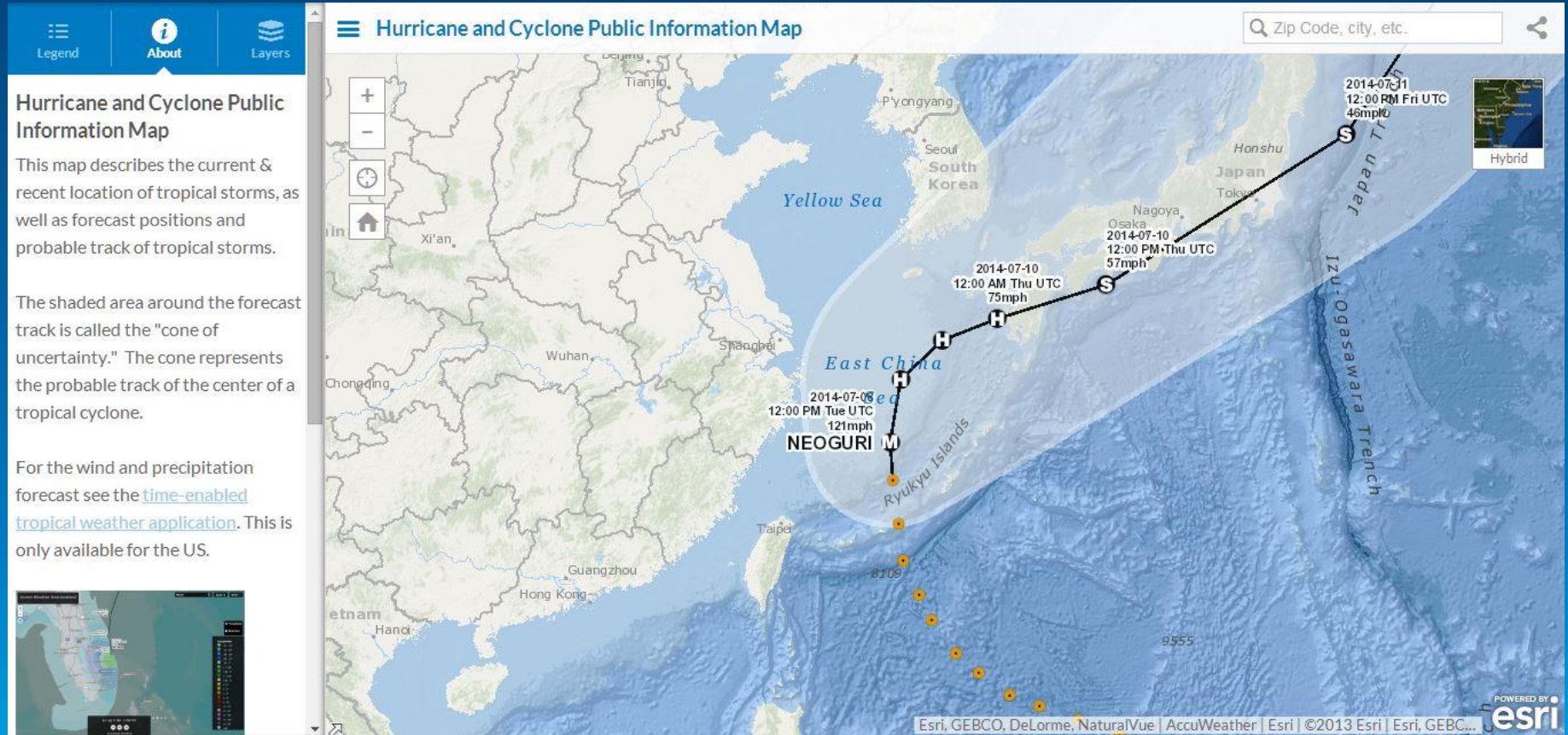
Search: GO

 AlertSanDiego

[View Larger Map](#)

Please note that fire, evacuation, and other hazard boundaries are approximate and can change rapidly. This map is based on

Public Information Map Application



GeoForm Application

1. Enter Information

Report Date Time

mm/dd/yyyy

Contact Name

Full Address

Cell Phone

Email

Habitable

- ☐ Yes
☐ No

Does it appear safe to stay here? If you need shelter call xxx-xxx-xxxx.

Number of Occupants

Enter a number

How many people typically live here?

Extent of Damage

Affected

Primary Cause of Damage

Earthquake

Description of Damage

This template is currently in the ArcGIS Online [Early Adopter Program](#) - to provide feedback please [submit an issue](#).

[Choose File](#) No file chosen

3. Complete Form

Add this information to the map.

[Submit new entry](#)

2. Select Location

Select a location for your submission using one of the following options or by clicking/tapping the map.

GPS

Search

Coordinates

[Find my location](#)



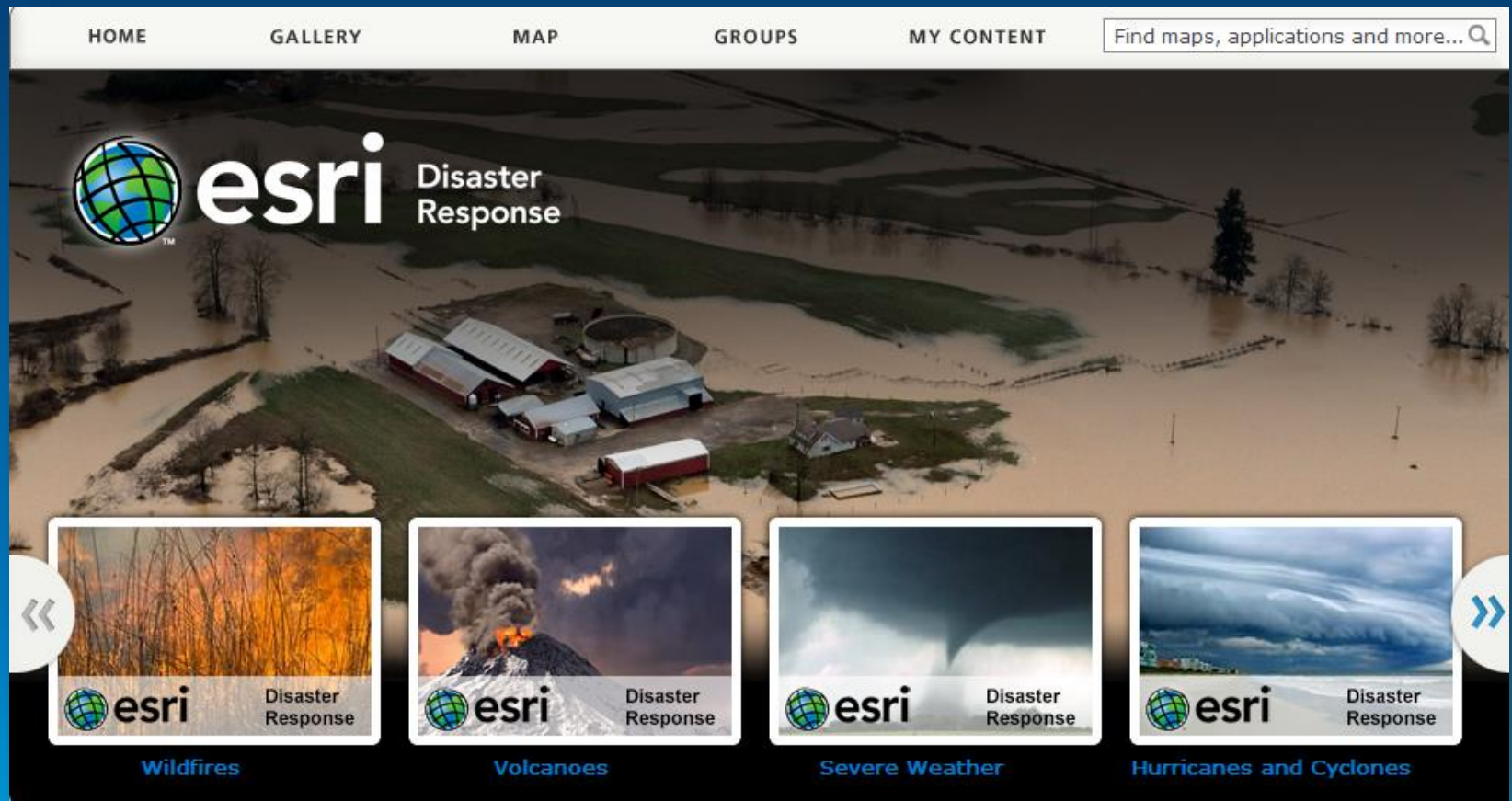
Latitude: 40.03506, Longitude: -74.04960

3. Prepare to Scale

Infrastructure + Workflows + Templates


Scale Your Infrastructure


Can you handle the load?




Hardware. Network. Software. Data.

Esri DRP Open Data

 Esri Disaster Response Program: Open Data



SEARCH SHARE



North America NORTH ATLANTIC OCEAN Europe Asia SOUTH PACIFIC OCEAN Africa South America

MAP | SATELLITE

©2014 Esri & Stamen, Data from OSM and Natural Earth

This is the Esri Disaster Response Program Open Data website. This is where we will make Live Feeds, Base Data, and Incident Data related to disaster response available.

When disaster strikes, Esri's Disaster Response Program (DRP) is there to support you around the clock, 24 x 7. [Request Assistance now from the Esri experts](#), augment software, explore content, and monitor events online as part of our corporate citizenship. We're there when you need us most.

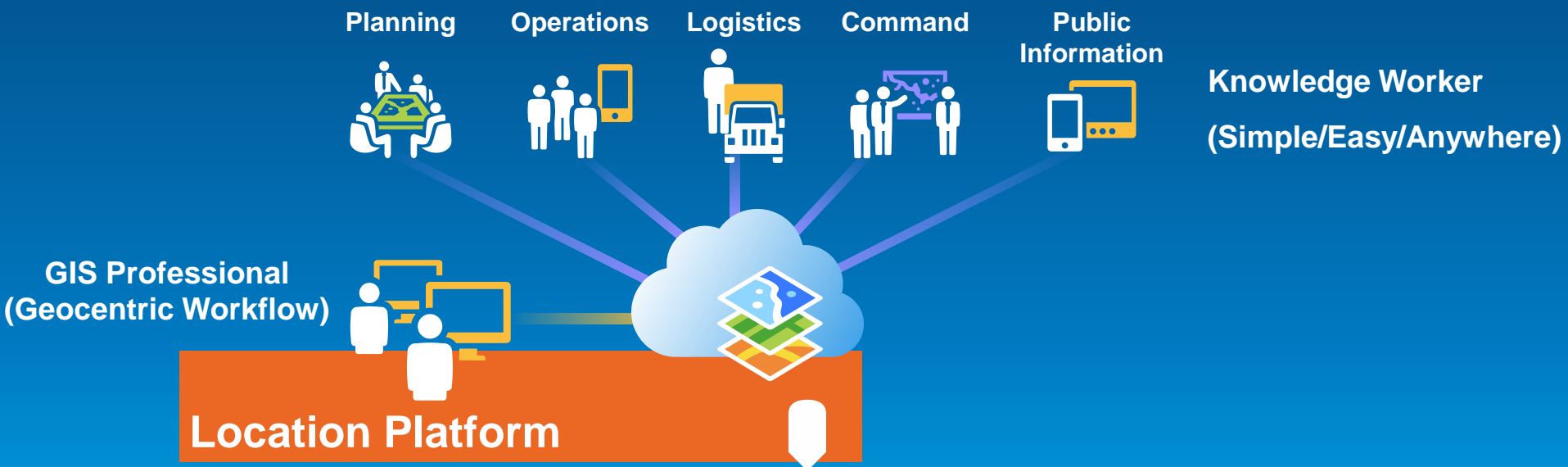
Esri News Feed:

Urban Observatory Maps Comparisons Between Cities

A new version of Urban Observatory will be unveiled at the 2014 Esri User Conference....

Scale Your Workflows

Decision Points Along the Way...



...are opportunities to prepare.

Build off Foundation Apps

Solving Common Workflows

- Collection / Editing
- Viewing
- Mapping
- Analysis
- Awareness
- Communication

* Offline Editing / Use



Don't Reinvent the Wheel

Templates, Apps and Workflows

Planning

- Special Events Plan Template
- Flood Response Template
- ArcGIS Online Organization Model
- Collector for ArcGIS
- Atlas Template (Hazard Maps)

Logistics

- Operations Dashboard
 - Find Nearest Resource Tool
- Esri Maps for Office (Excel)
- Collector for ArcGIS

Operations

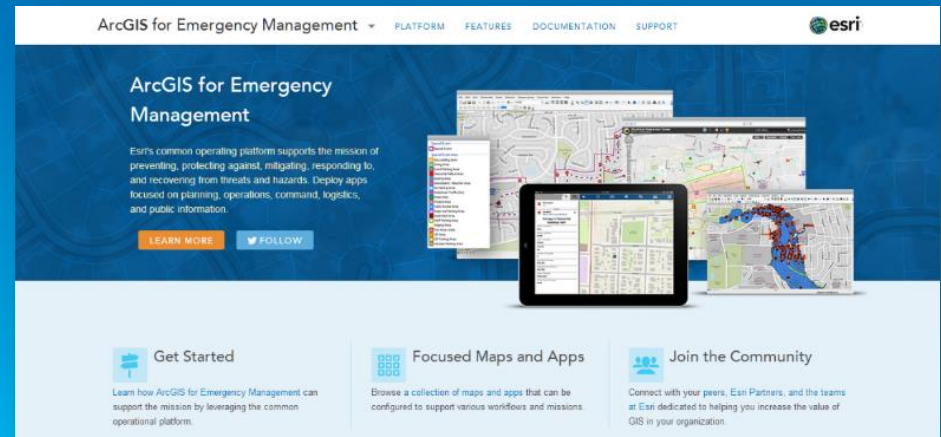
- Operations Dashboard for ArcGIS
- Collector for ArcGIS
 - Damage Assessment Template
 - SAR Template
- Atlas Template (Indicator Maps)
- ESF Web maps with Editing
- Local Impact Map

Command

- Briefing Book Template
- Operations Dashboard for ArcGIS
- Esri Maps for Office (PowerPoint)

Public Information

- Public Information Map Template
- My Hazard Info Template
- Crowdsourcing Template
- Story Map Templates
- Simple Web Maps (evac, shelter, etc).



Esri Disaster Response Program

Helping build resiliency



esri

Disaster
Response

- User Workshops
- Partners & Startups
- Training Guides
 - Blogs
 - SOPs

Tomorrow!

- Confident Communications With Maps
- ½ Day Hands-On Workshop

CO Flooding After Action



Ushahidi



GISCorps & Standby Task Force

esri.com/disaster



Ryan Lanclos | Industry Manager
Emergency Management & Humanitarian
rlanclos@esri.com | @RyanLanclos



Understanding our world.