



Empowering BIG DATA in ONE GIS Platform

Walk Chang
Interactive Digital Technologies Inc.

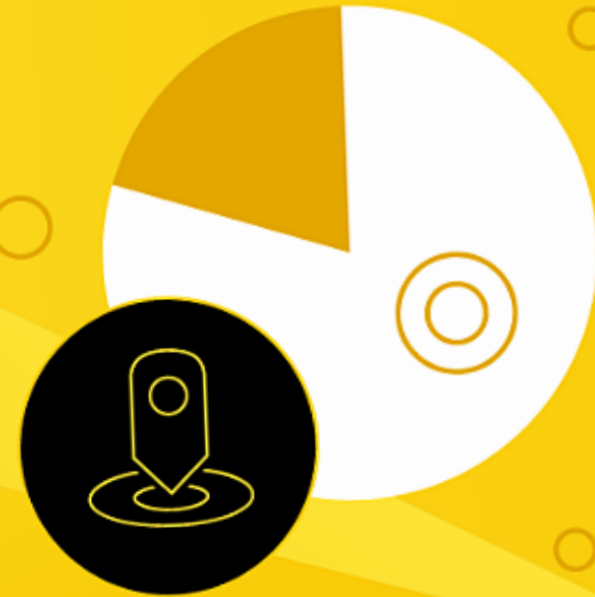
Tobler's first law of geography

Everything is related to everything else...
but near things are more related than distant things.

80% OF ALL DATA COLLECTED INCLUDES A LOCATION COMPONENT

but only 10% of that data is being used to power business decisions. Analyzing location provides insights that improve decision making in everything from marketing to supply chain logistics and operations.

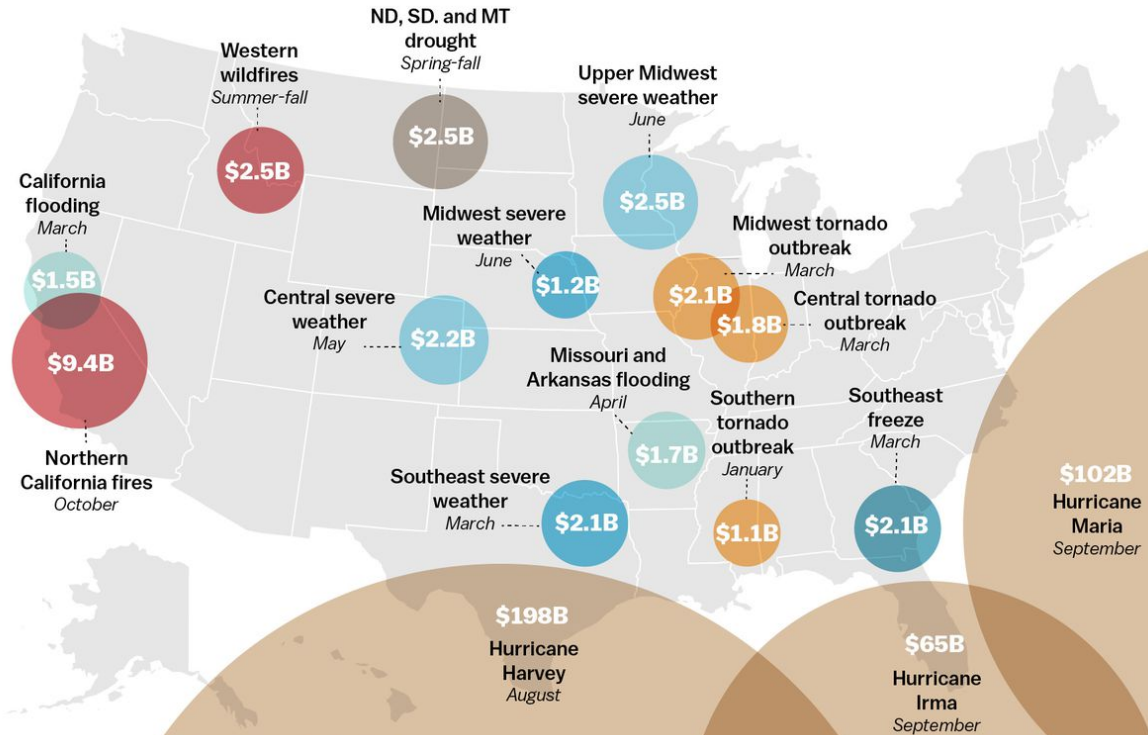
Source: IDC, Gartner



We Face A New Normal

Costs, Size and Frequency of incidents are all increasing

Billion-dollar disasters of 2017 in the US



Sources: NOAA, Ball State University Center for Business and Economic Research (for Harvey), Reuters (for Maria), and CoreLogic (for Irma)

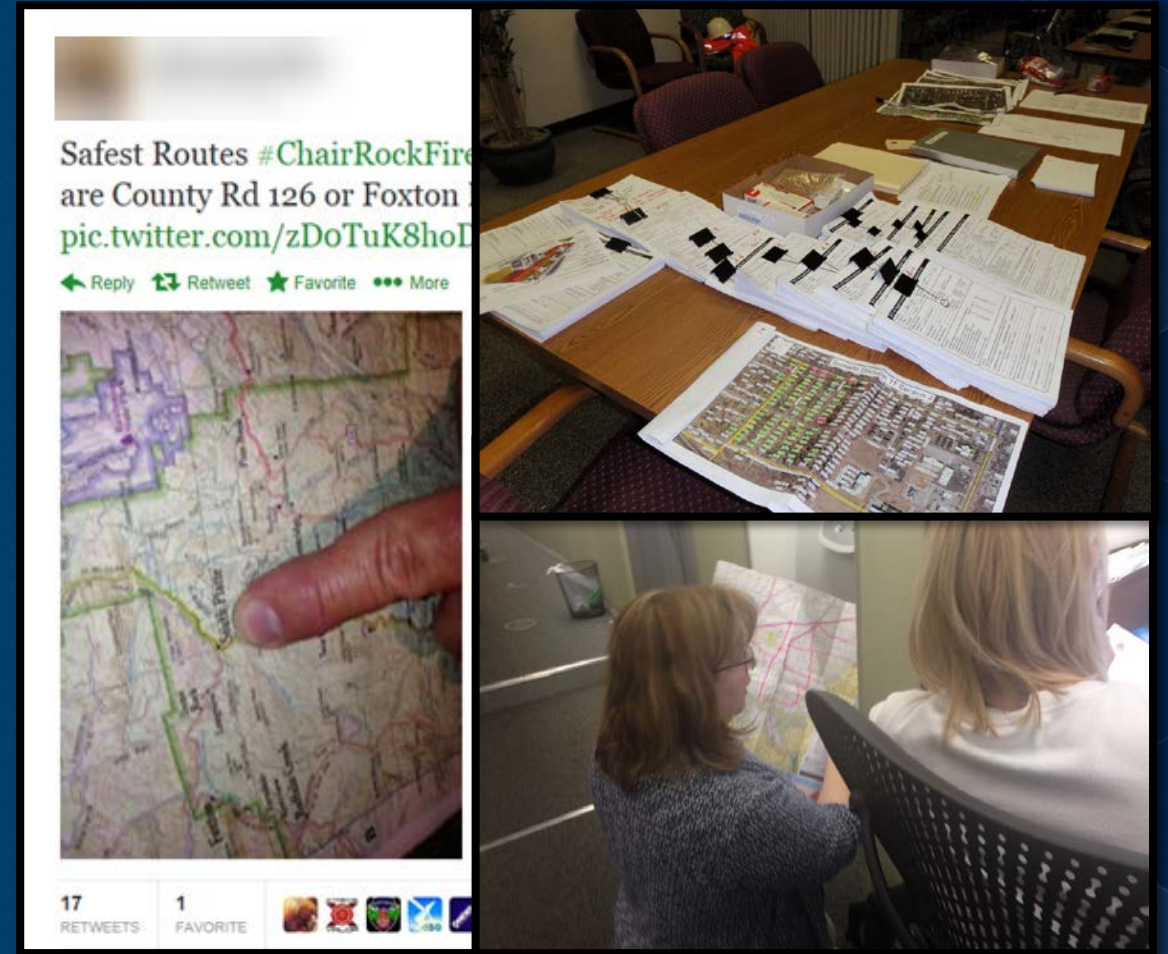
Vox



Internally, Organizations Are Challenged as Well

Legacy issues can be difficult to overcome...

- Paper Processes that Do Not Scale
- Lack of Actionable Information
- Silo Point Solutions
- Limited Staff Resources



...leading to information latency that puts decisions at risk in this new normal.

Supporting Operations for Emergency Management

Common Challenges

- Understand the potential impact from an incident
- Estimate and deploy limited resources
- Monitor rapidly changing conditions
- Assess and report damage
- Provide real-time operational briefs
- Communicate effectively with the public and media



GIS is helping us be **SMARTER, SAFER, & HEALTHIER**



An Complete and Integrated System

Supporting Emergency Management Operations



**Maintain
Situational
Awareness**



**Conduct
Damage
Assessment**

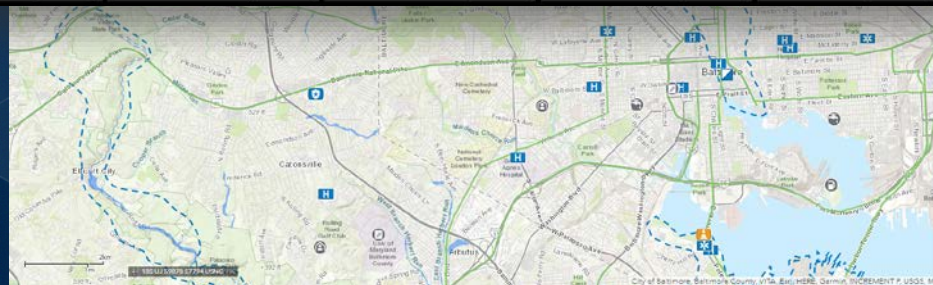
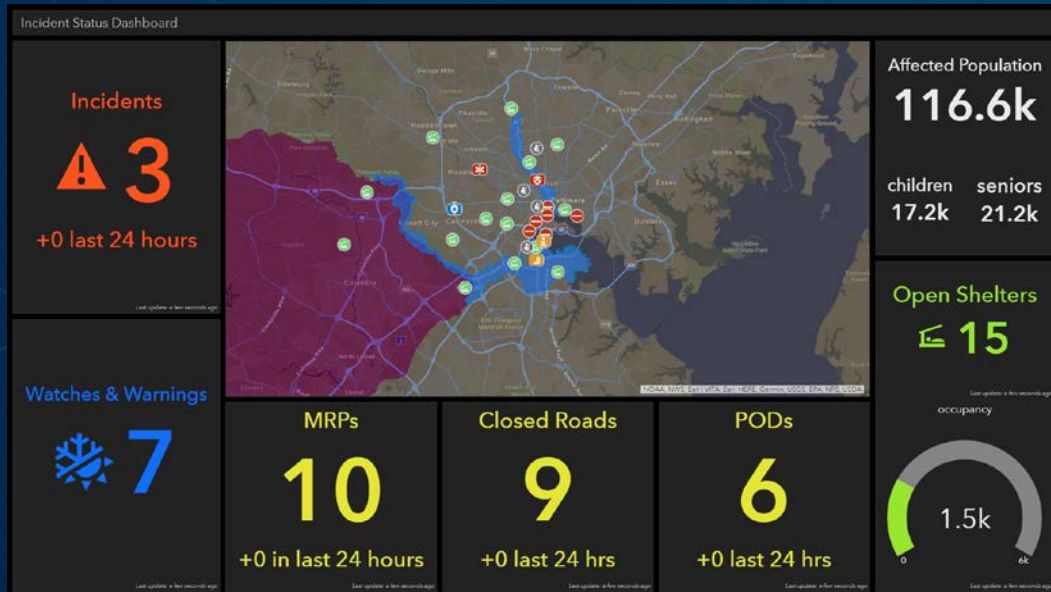


**Manage
Public
Information**

Maintain Situational Awareness

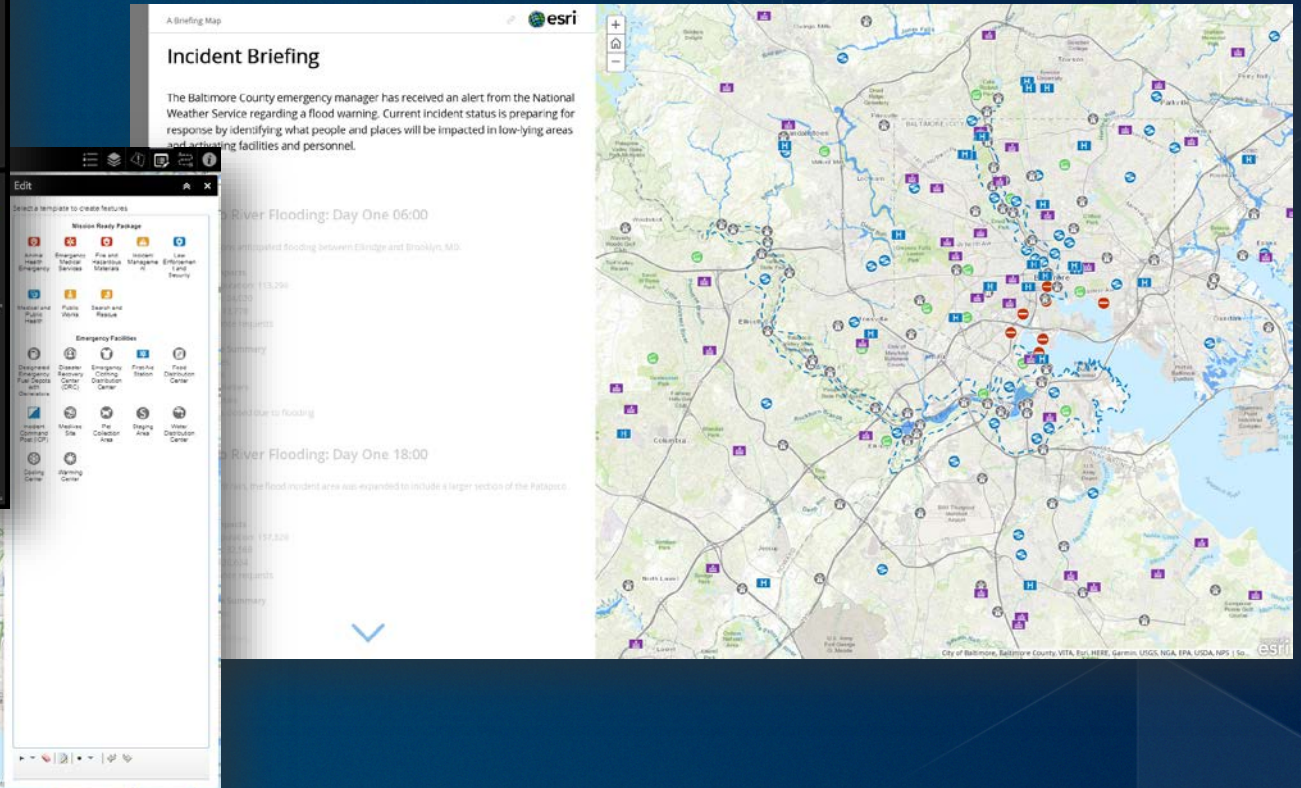
Monitor changing conditions. Put your plan into action. Brief your team in real-time.

Operations Dashboard



Operations Management

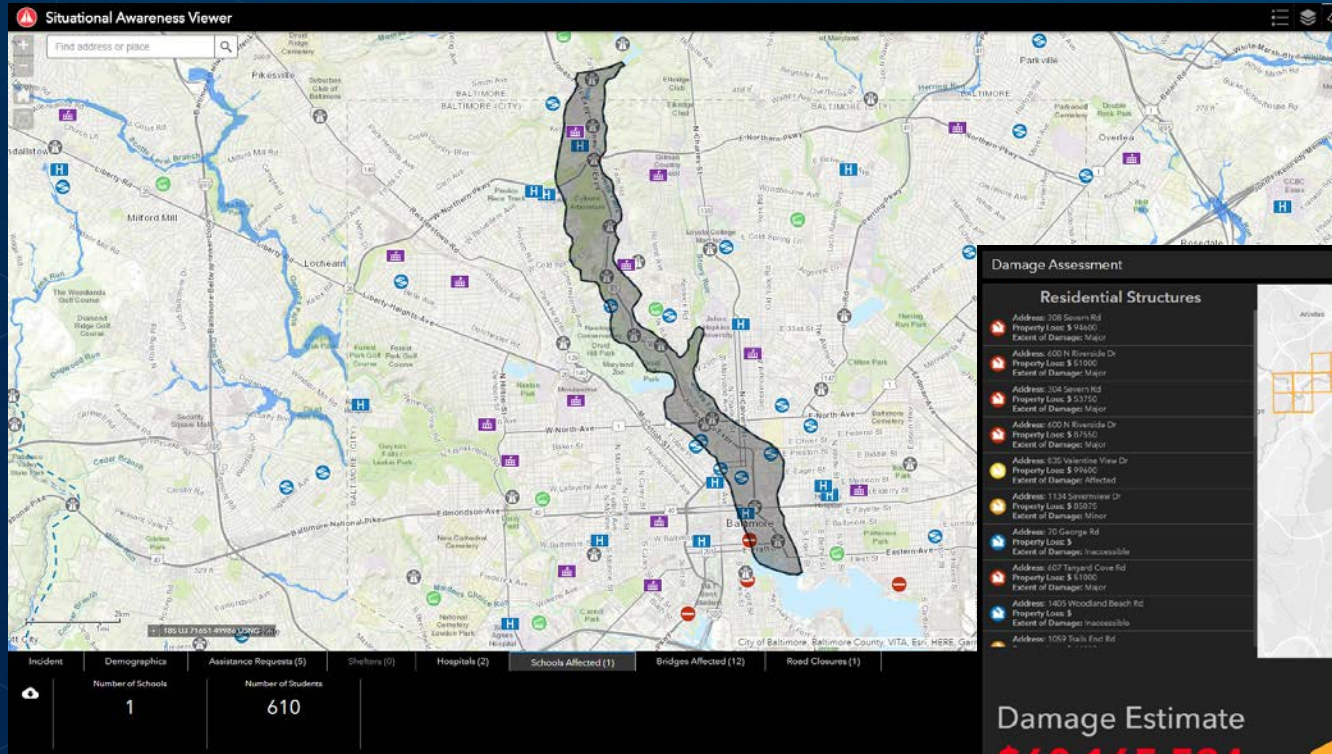
Operational Briefings



Anticipate your next move and make more informed decisions that can save lives and property.

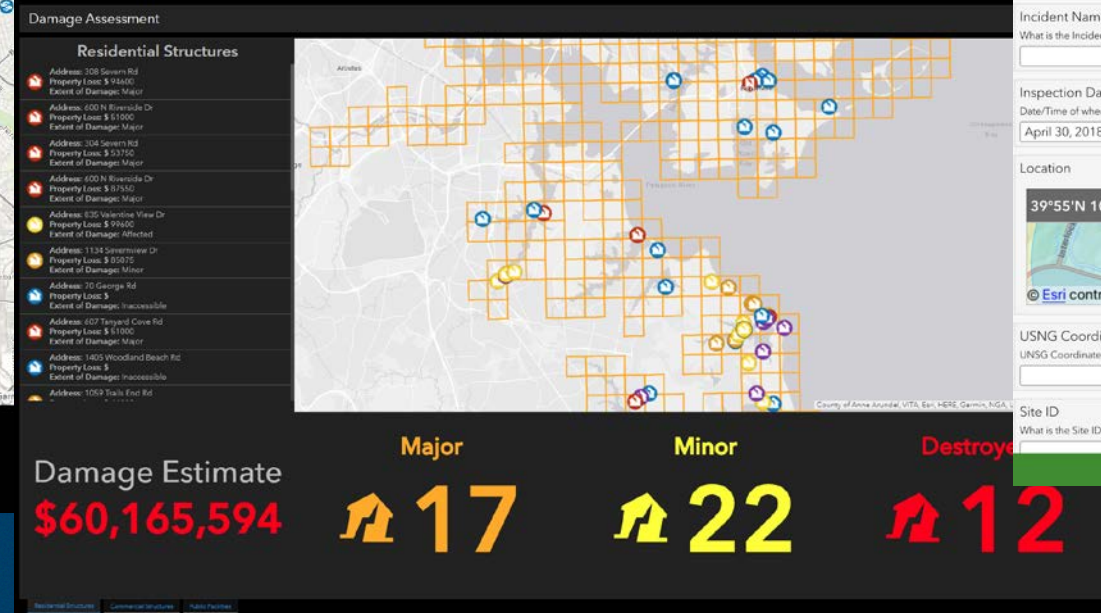
Conduct Damage Assessment

Understand potential impact. Conduct damage assessments. Monitor reporting thresholds for your disaster declaration.



Impact Analysis

Damage Assessment Collection & Reporting



Residential Buildings

Incident Number
What is the Incident Number?

Incident Name
What is the Incident Name?

Inspection Date Time
Date/Time of when the inspection occurred
April 30, 2018 12:29

Location
39°55'N 105°7'W ± 1289.33 m
Esri contributors

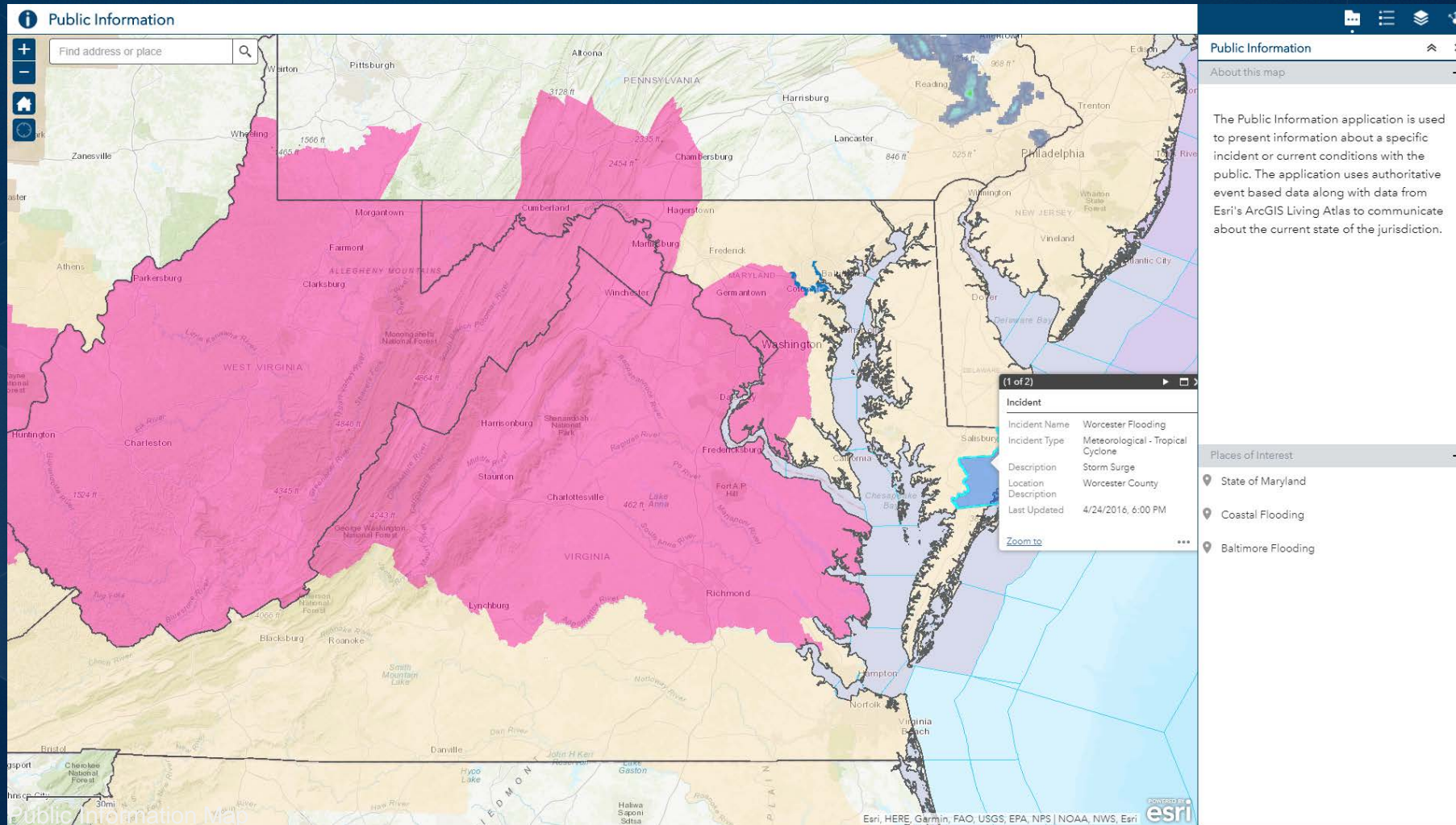
USNG Coordinate
USNG Coordinate

Site ID
What is the Site ID?

With lives at risk and disaster recovery funds on the line, time is critical.

Manage Public Information

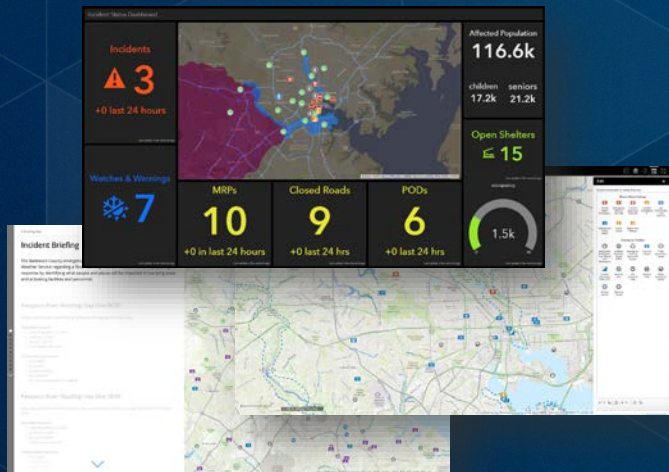
Disseminate critical information that raises awareness and drives action.



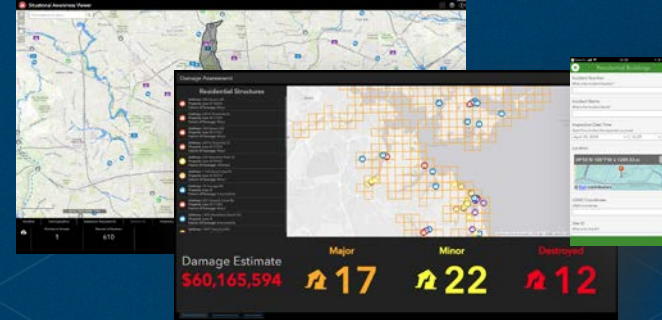
Emergency Management Operations

An complete and integrated system...

Maintain Situational Awareness



Conduct Damage Assessment



Manage Public Information



Geospatial Cloud

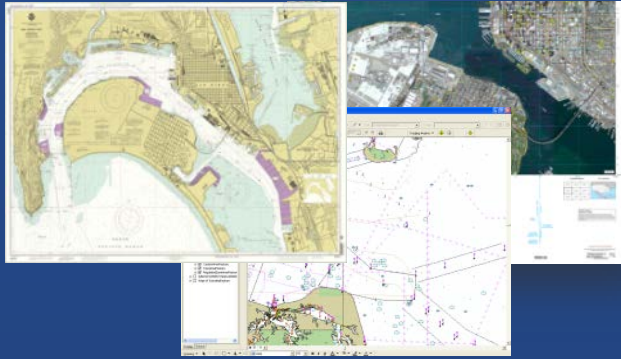


...that enables mission critical decisions that can save lives and property.

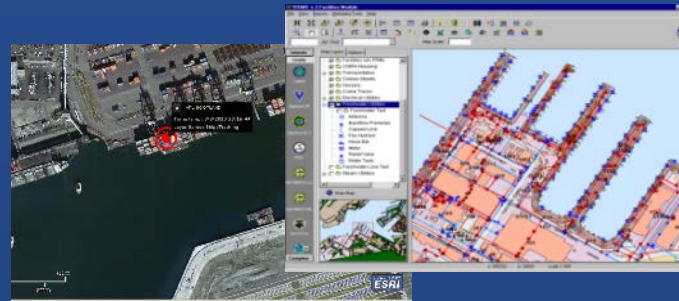
ArcGIS System is Everywhere in Disaster Management

... Providing an Enterprise Platform for Information Sharing

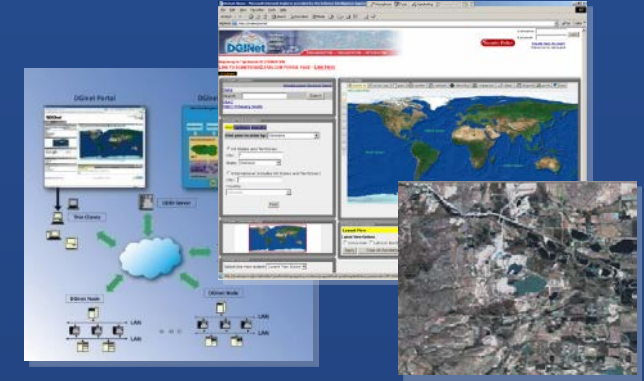
Foundation Data Management



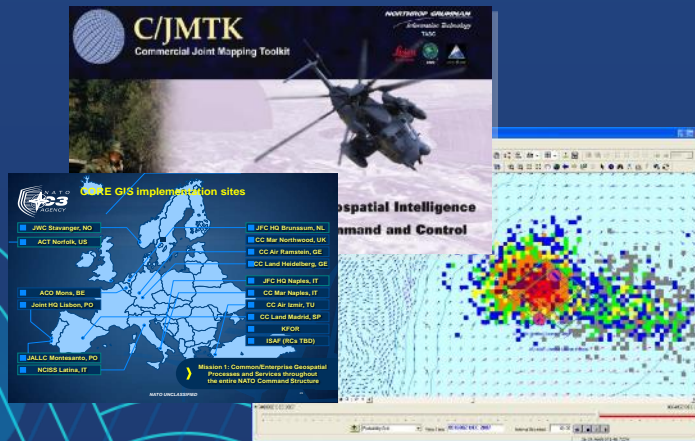
Installation Management



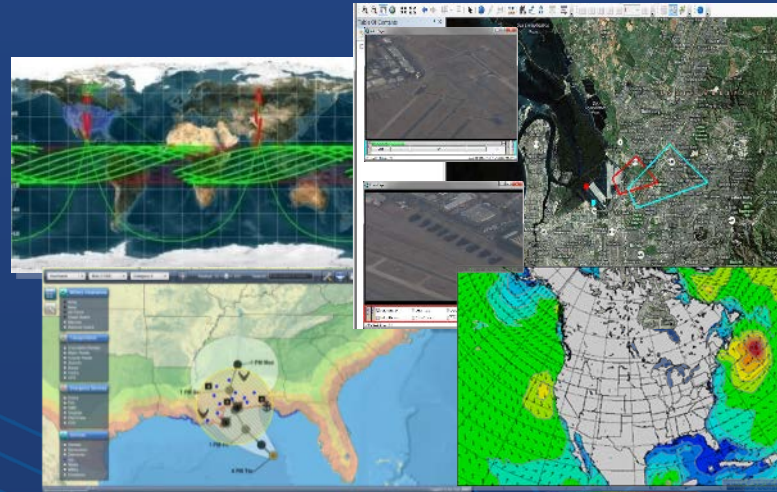
Intelligence Analysis and Dissemination



Command and Control



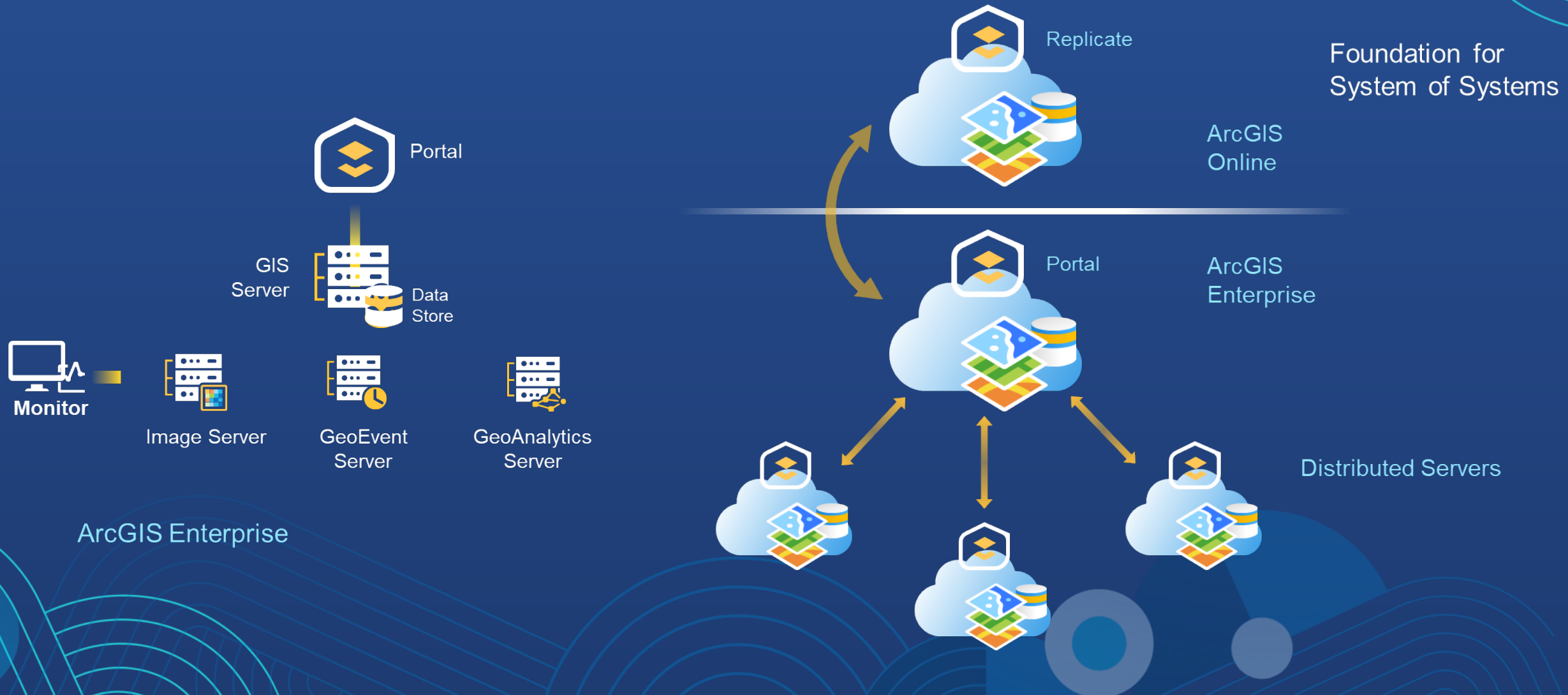
Sensor and Meteorological Integration



Shared Situational Awareness

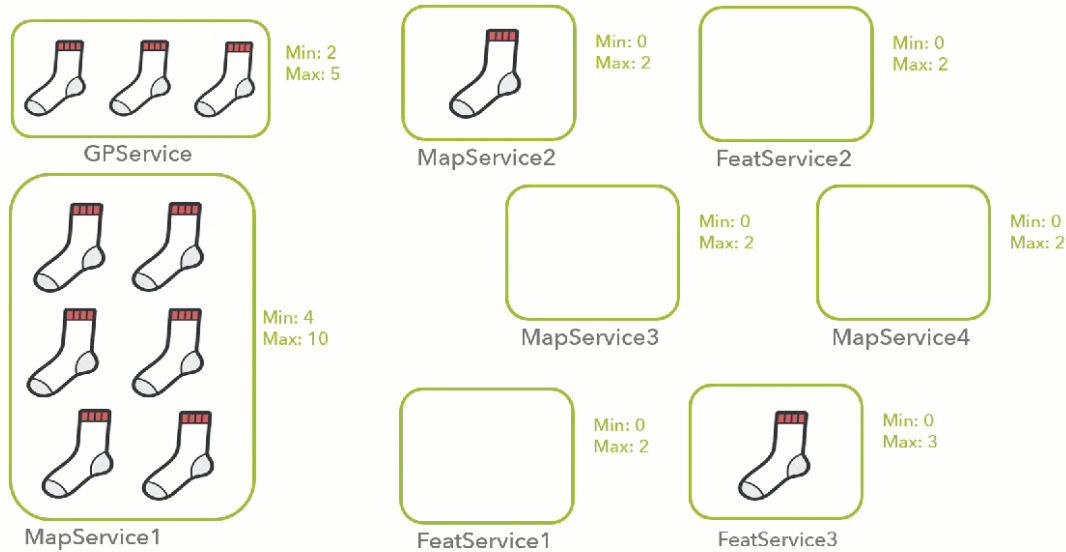


One geospatial cloud

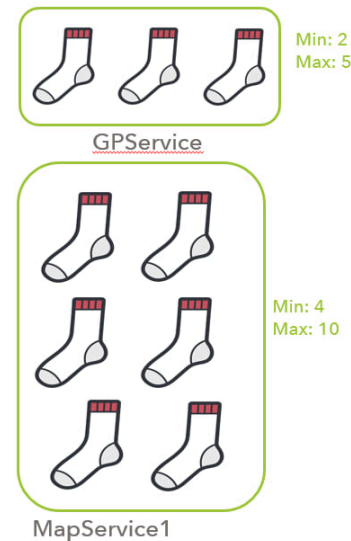


Shared Instance

To balance the resources of your server farm...



ARCGIS SERVER SITE



ARCGIS SERVER SITE

Shared instance pool
New at 10.7



4 ArcSOCs

Participants:
MapService2
MapService3
MapService4
FeatService1
FeatService2
FeatService3

One geospatial cloud benefits all

Analysts



Planners



Executives



Commanders



Dispatchers



Field Personnel



Briefers



Elected Officials



Community



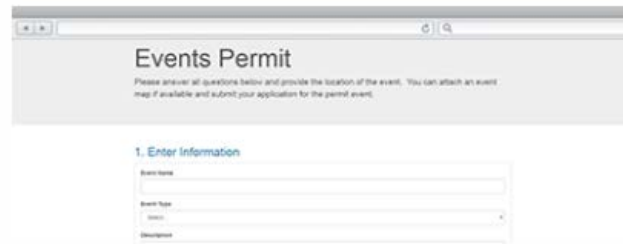
Disaster
Management
Professional



Esri Solutions Templates – get you started

Manage Community Events

A collection of maps and apps used by government agencies and other stakeholders to permit, coordinate, plan, and promote community or special events.

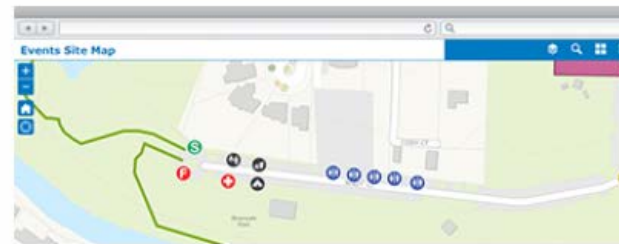


Apply for an Event Permit

Events Permit can be used by organizers and sponsors to submit a community event permit application.

[> View Application](#)

[? Learn more](#)



Create Event Maps

Events Site Map can be used by organizers and coordinators to create site maps that accompany event permit applications.

[> View Application](#)

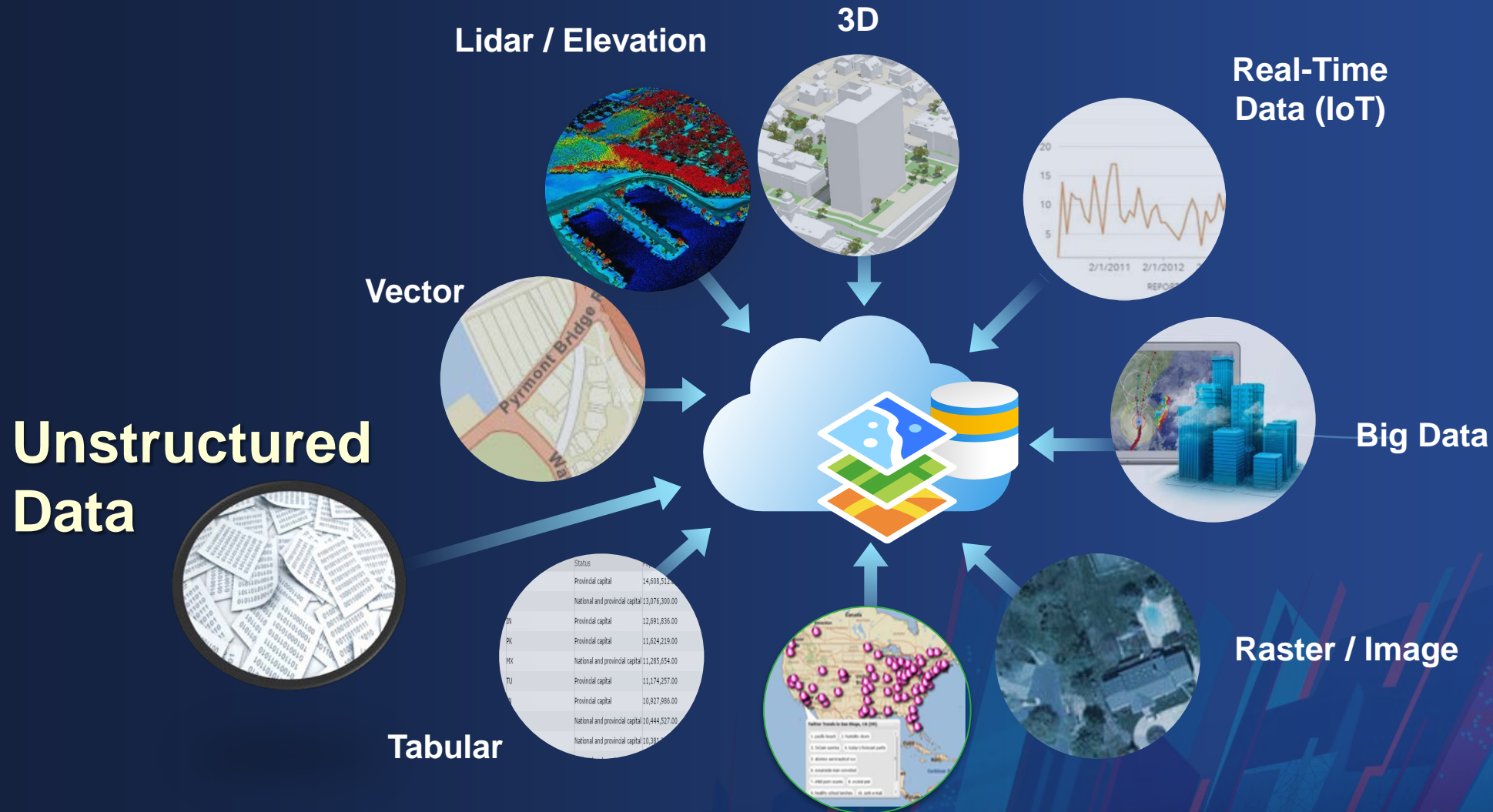
[? Learn more](#)

What do you need to do?

Integrate & Exploit Existing Investments in data & Infrastructure



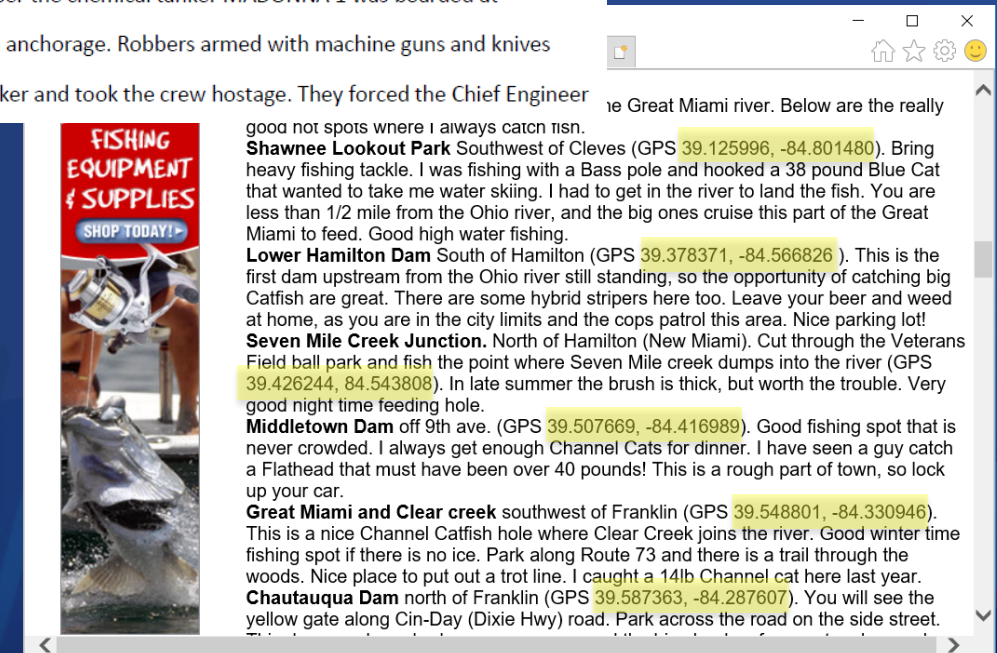
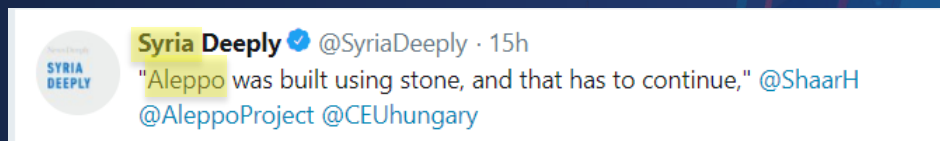
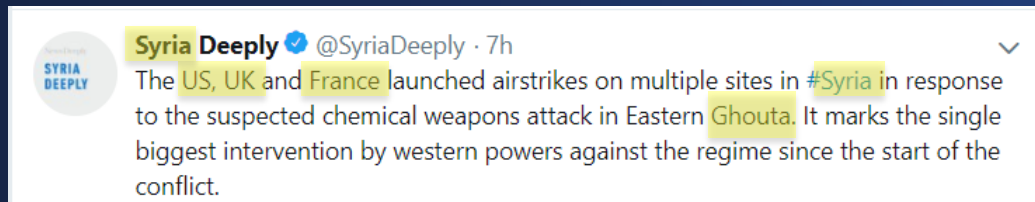
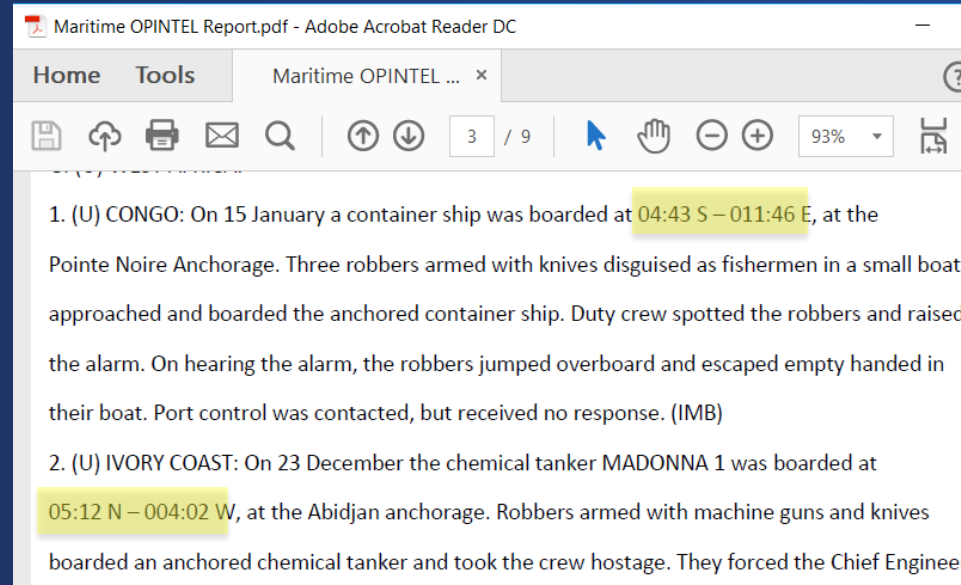
ArcGIS can access & integrate many data types...



Unstructured Data has unique challenges

- Not in a traditional spatial format
- Difficult to machine capture and visualize
- Often in narrative or report format
- Locational data can be found in:

- | | |
|----------------|----------|
| • Reports | DOC, PDF |
| • Web sites | HTML |
| • Social Media | TXT |
| • Presentation | PPT |



Unstructured Data Problem

- Even tabular or semi-structured data is often difficult to work with (Excel, CSV)
 - Varying coordinate formats
 - Several steps to ingest/visualize
- Business problem
 - Excessive manual work (read/copy/paste)
 - Data not captured to enterprise
- Analysts spend 80% of time doing extract-transform-load (ETL) operations and 20% doing actual analysis
- Every past, present, and potential GIS user has this unstructured data problem

KN Anti-Aircraft Equipment_coords [Compatibility Mode] - Excel

File Home Insert Page Layout Formulas Data Review View Tell me what you want to do Share

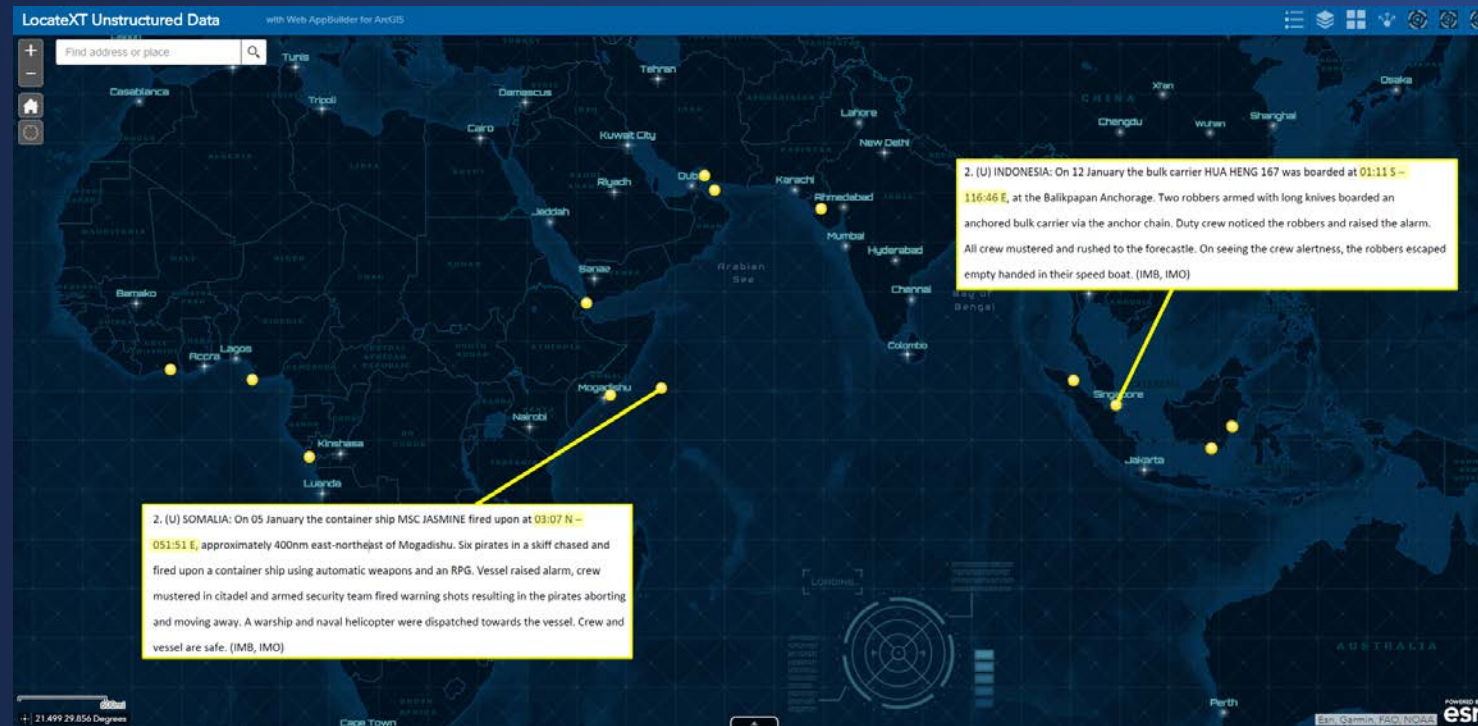
E5

A	B	D	E	F	G
Facility Name	Geocoord	Range_meters	Rate of Fire_rpm	Fire Control	Ammunition
Chun-ma	40.448906 124.941303	3,000	800	Radar	HEI-T (30x21
Hagap	40.079501N 126.180911E	3,000	2,400	Radar	HEI-T (30x21
Hamhung	N39.911890 E127.540802	1,400	550	Radar	API, API-T, H
Hungnam	39.831866N127.618571E	6,000	105	Optical Mechanical Computing Sight	HE-T (57x34
Hwanghae	N38.316676E125.633253	2,500	150	Optical Mechanical Computing Sight	HEI-T (37x25
Kanggye	40 58'16.92"N 126 35'53.00"E	3,000	800	Radar	HEI-T (30x21
Kilju	405747.79N 1291939.45E	3,000	2,400	Radar	HEI-T (30x21
Kumchangni	41 32'19.15"N 127 05'46.55"E	1,400	550	Radar	API, API-T, H
Kumho	400629.43N 1282009.41E	4,000	150	Optical Mechanical Computing Sight	HEI-T (57x34
Kusong	39 58'56.51"N 125 15'13.04"E	6,000	105	Optical Mechanical Computing Sight	HE-T (57x34
Kwanmo-bong	41 40.2005"N 129 12.0569"E	3,000	800	Radar	HEI-T (30x21
Myohyang	4002.2694N 12610.6652E	3,000	2,400	Radar	HEI-T (30x21
Nanam	41 42.7399"N 129 41.0935"E	4,000	150	Optical Mechanical Computing Sight	HEI-T (57x34
Pakch'on	3856.9942N 12514.9831E	6,000	105	Optical Mechanical Computing Sight	HE-T (57x34
Pyongsan	3820.2984N 12623.9172E	2,500	150	Optical Mechanical Computing Sight	HEI-T (37x25
Pyongsong	3915.1019N 12551.3647E	3,000	2,400	Radar	HEI-T (30x21
Pyongyang	51S YD 3847122553	1,400	550	Radar	API, API-T, H
P'unggye-yok	52TEL1364653422	6,000	105	Optical Mechanical Computing Sight	HE-T (57x34
Sinpo	52 T EL 1745848513	3,000	800	Radar	HEI-T (30x21
Sunchon	51SYD 2591366002	1,400	550	Radar	API, API-T, H
Taechon	51S YE 1223322454	1,400	550	Radar	API, API-T, H
Unggi	52T FM 1495588812	6,000	105	Optical Mechanical Computing Sight	HE-T (57x34
Wonsan	52SCJ6547834942	3,000	800	Radar	HEI-T (30x21
Yongbyon	51SYE4010111106	1,400	550	Radar	API, API-T, H

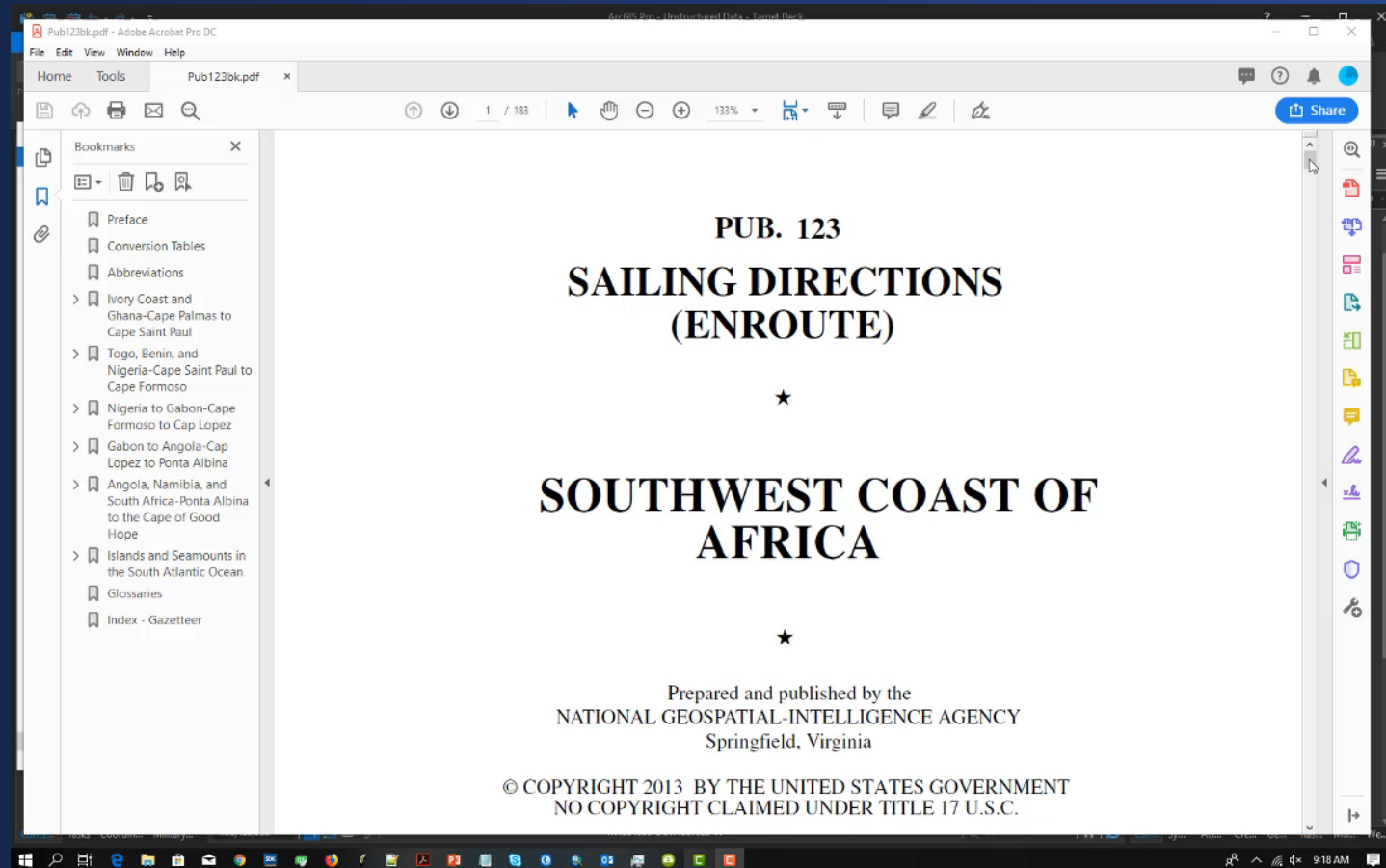
Sheet1 Sheet2 Sheet3

ArcGIS LocateXT is a new Extension

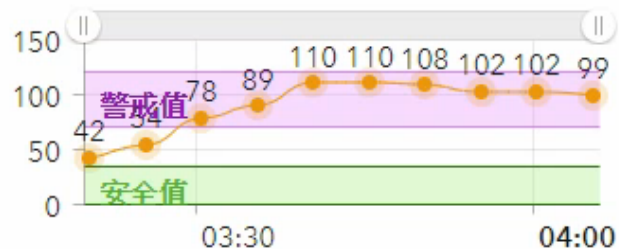
- Technology acquired from ClearTerra
- Uses **Regular Expressions** to search for and extract coordinates in a variety of formats
- Uses a **Custom Location List** for non-coordinate workflows
- Allows users to define custom keywords and start/stop words for tagging and document scraping



ArcGIS LocateXT



感測器(上風處) - 監測數值



位處警戒區人員

1

已派出3組人員

警戒感測器數量

20

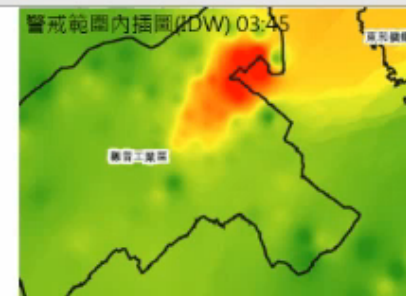
共83個感測器

感測器類別



超標比例

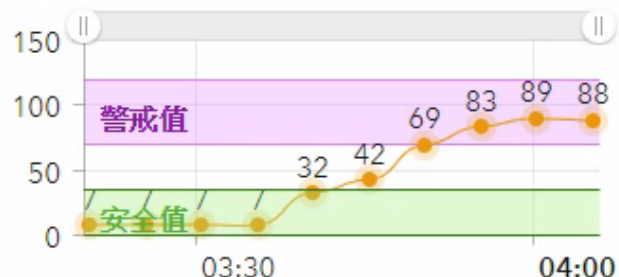
感測器類別



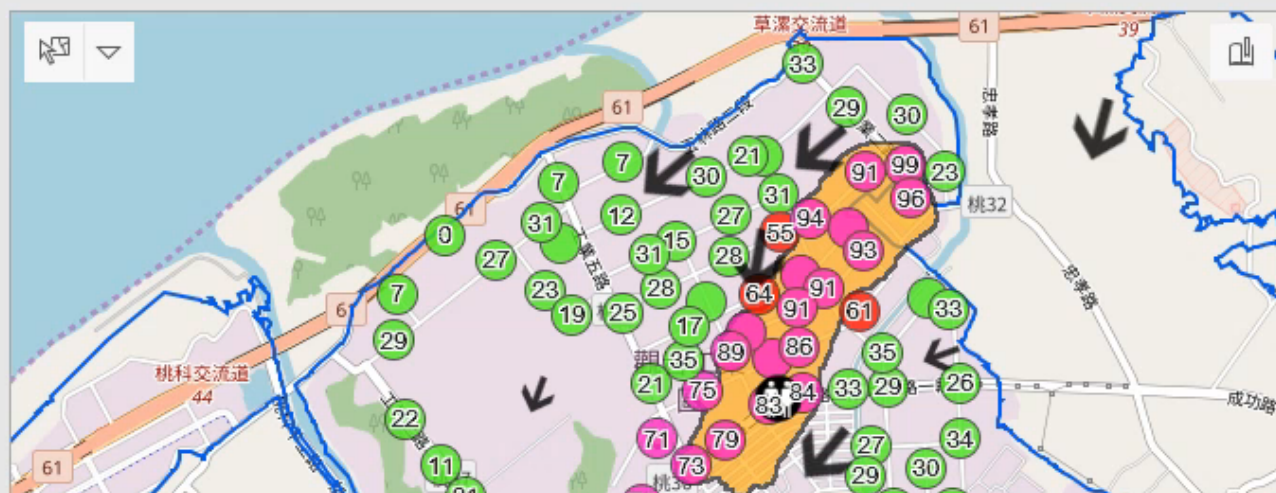
距離警戒區距離: 0m

記錄時間: 4/16/2018 4:05 上午

感測器(中間) - 監測數值



感測器(下風處) - 監測數值



警戒感測器清單

- PM2.5 數值: 99
感測時間: 4/16/2018 4:05 上午
- PM2.5 數值: 96
感測時間: 4/16/2018 4:05 上午
- PM2.5 數值: 94
感測時間: 4/16/2018 4:05 上午
- PM2.5 數值: 94
感測時間: 4/16/2018 4:05 上午

Sensor, real time analytic,
decision making

Daily life

Traffic and air quality

即時空品監測儀表版

即時PM2.5 - 空品監測地圖



PM2.5超標區域-即時資訊與熱區圖





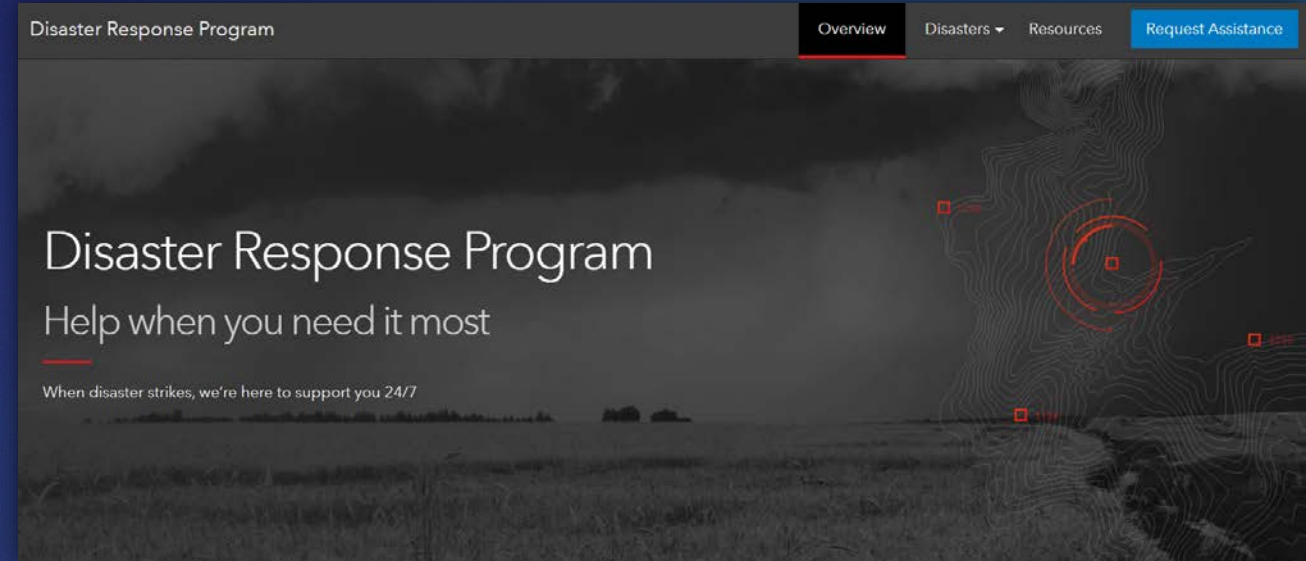
Esri Disaster Response Program (DRP)

Help when you need it most

We can help when your capacity is exceeded

The DRP is available 24x7...

- ArcGIS Software
- Workflow Implementation
- Geospatial Data
- Technical Support



Request Assistance and Explore Resources:

www.esri.com/disaster

Request Assistance via Email:

disaster_help@esri.com

...to support your organization's **response** efforts



Thank you

...for holding out until the last minute