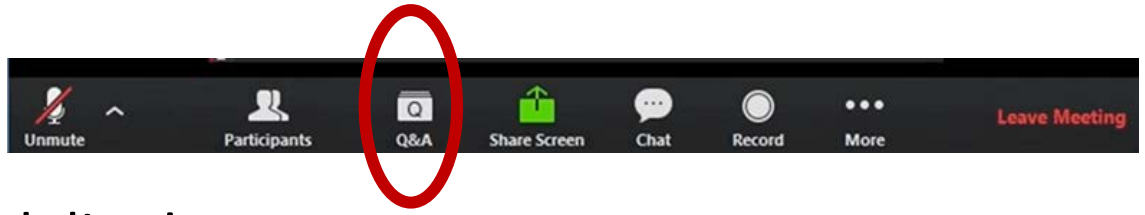
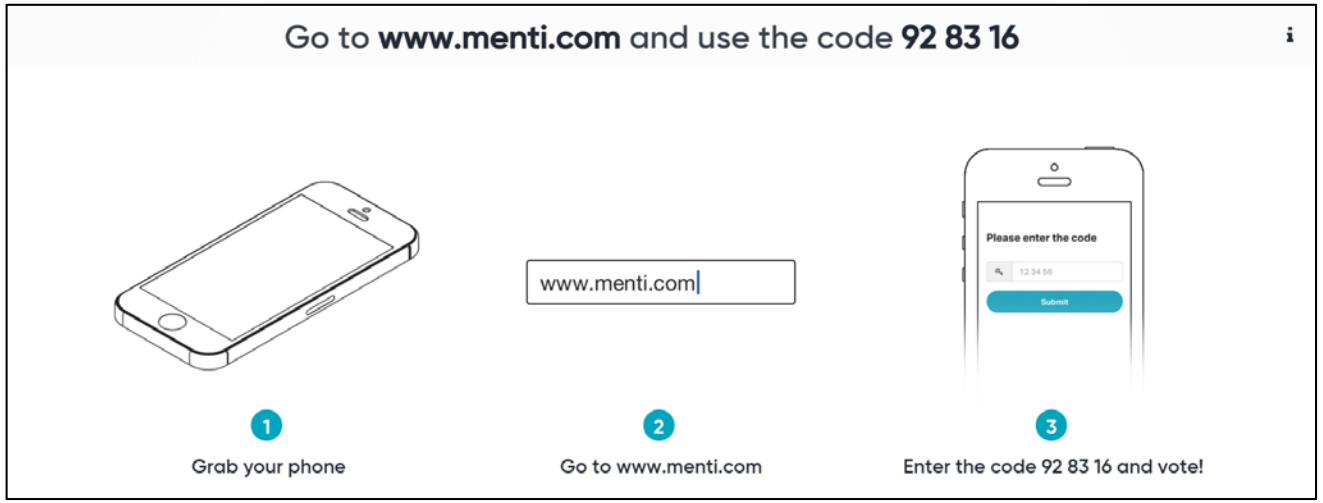
Webinar Prep

- Due to the large attendance, all participants are muted for the duration of the session to prevent background noise.
  - Please use the Q&A functionality within Zoom for questions that are relevant to the whole group.
  - We will address these Q&A at the end of the webinar!
- This webinar will be recorded.



- We want to hear your thoughts on flood modeling!
  - Participate using the instructions below



OR

use this QR code!

EM GEO FORUM

Flood Modeling
Needs & Products

March 26, 2020

Menti.com,
code 92 83 16

Future EM Geo Forum Dates

May EM Geo Forum

Details Coming Soon!

https://www.napsgfoundation.org/events/

Menti.com,
code 92 83 16

EM GEO FORUM

Flood Modeling Needs & Products

Join the FEMA Response Geospatial Office (RGO) and the National Alliance for Public Safety GIS (NAPSG) Foundation for this virtual seminar to learn about the needs and uses for flood models in incident management.

Attendees will:

- Learn about flood modeling needs in various stages of a flood event.
- Gain an understanding of available flood modeling products and their corresponding uses and limitations.
- Learn about the uses of modeled versus observation-derived depth-grid products.
- Gain insight into FEMA's approach to flood modeling.

Date: Thursday, March 26, 2020 from 2:00 PM to 3:00 PM EST
Registration: http://events.r20.constantcontact.com/register/event?oeidk=a07egy4rtk079746629&llr=nplxpbdab
Audience: First Responders, Emergency Managers, and GIS & Technology Specialists

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Modeling and Data Working Group (MDWG)

Meeting the 3rd Wednesday of the month
from 2:00-3:30 PM ET

Adobe Connect: https://fema.connectsolutions.com/mdwg-monthly-meeting/
Conference Bridge: 800-320-4330, Passcode: 399137#

Email: fema-mdwg@fema.dhs.gov

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FEMA

Welcome

Chris Vaughan, GIO, FEMA

EM GEO FORUM

Today's Presenters

Katherine Picchione – Crowdsourcing Specialist, FEMA

Casey Zuzak – NHRAP Senior Risk Analyst, FEMA

Adam Barker –Geospatial Analyst, FEMA

Matt Welshans – Geospatial Information Unit Lead, FEMA

Phillip Ulbrich – Emergency Management Specialist, FEMA

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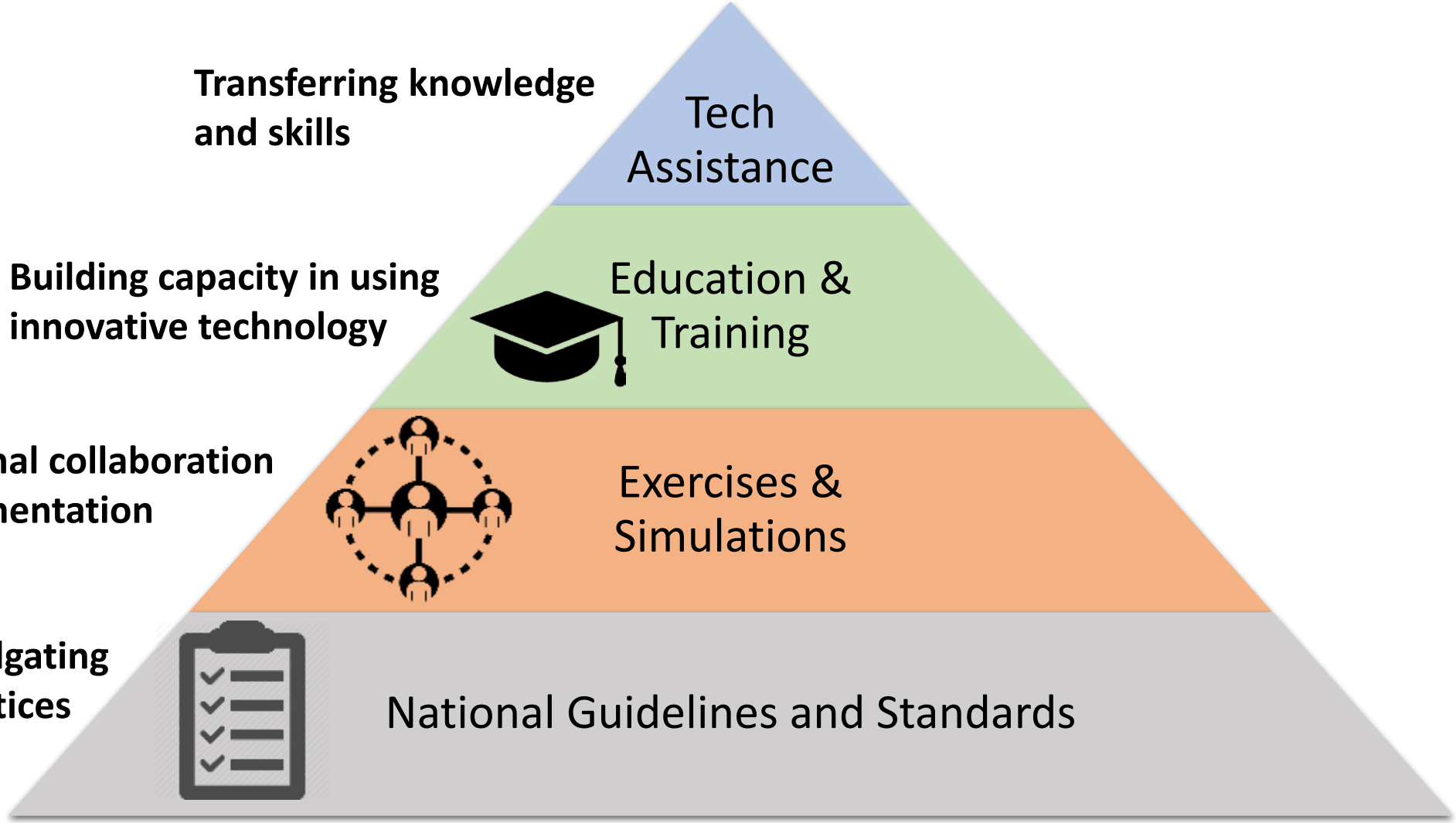
About NAPSG Foundation

Our Vision

A Nation of emergency responders and leaders equipped with the knowledge and skills in applying technology and data to change the outcome for survivors.

- 501(c)(3) Non-profit organization established in 2005
- +20,000 member network: Public Safety leaders, first responders, and GIS practitioners
- Board of Directors comprised of public safety & emergency management industry leaders

How Do We Do It



Transferring knowledge and skills

Building capacity in using innovative technology

Fostering regional collaboration through implementation

Defining and promulgating consistent best practices

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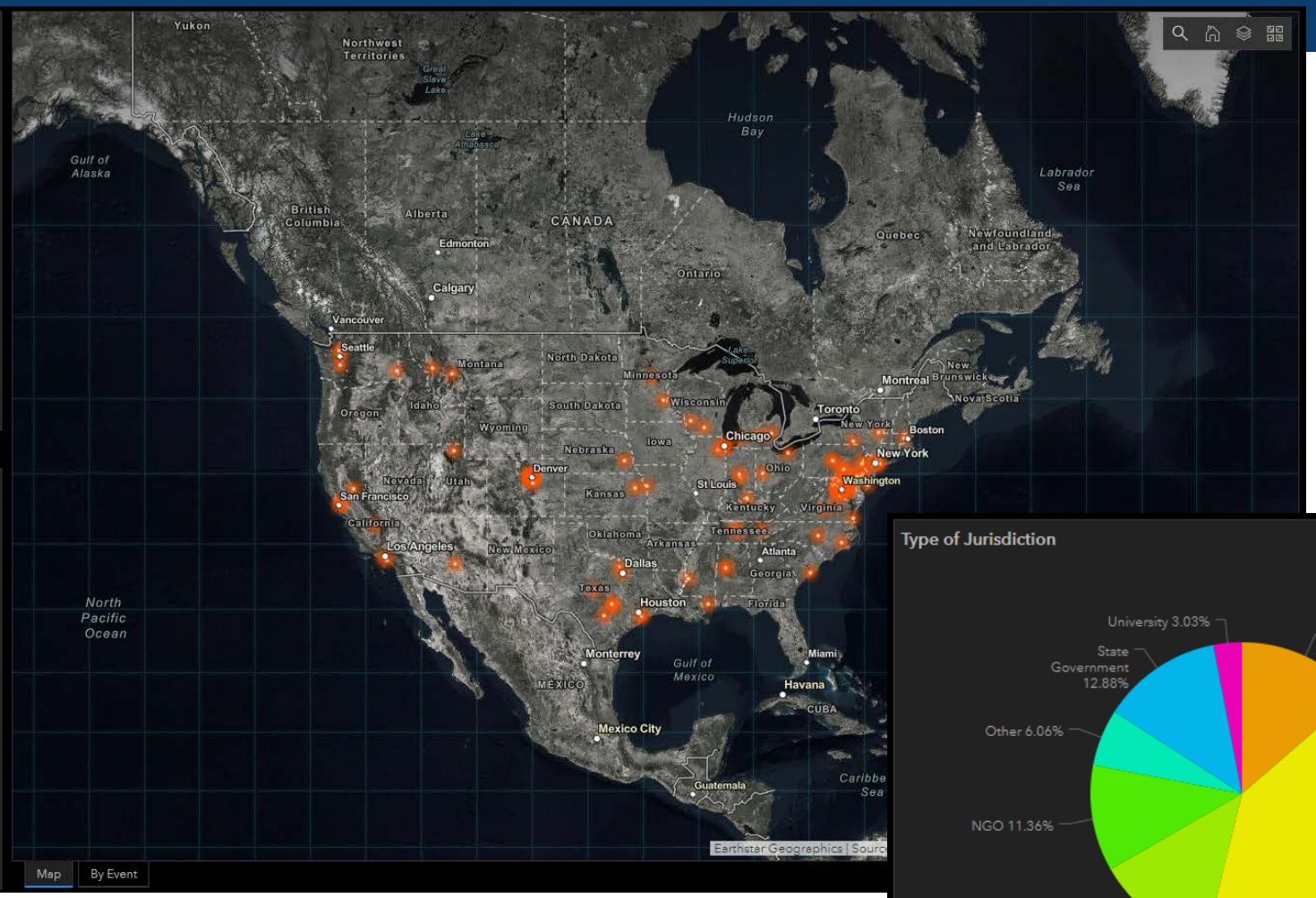
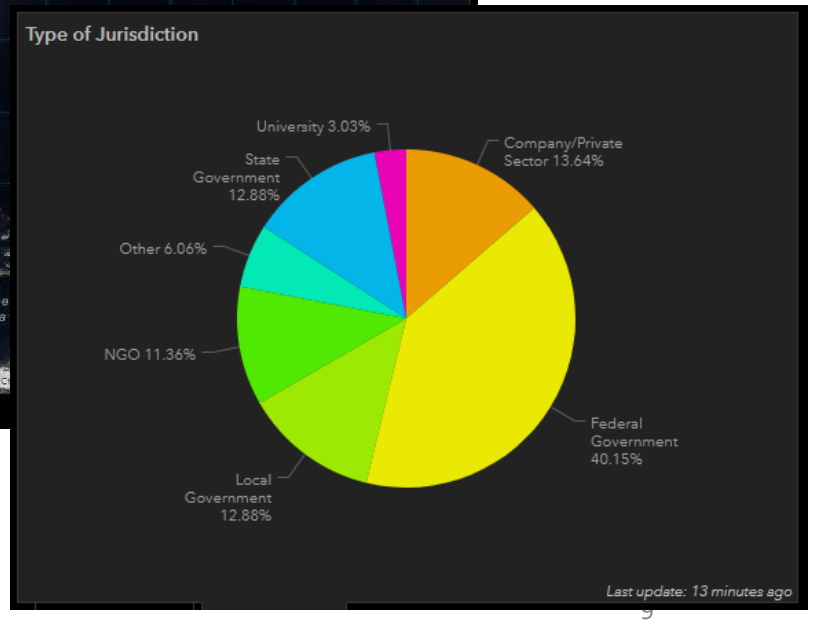
Today's Attendees





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Objectives

1. Learn about flood modeling needs in various stages of a flood event.
2. Gain an understanding of available flood modeling products and their corresponding uses and limitations.
3. Learn about the uses of modeled versus observation-derived depth-grid products.
4. Gain insight into FEMA's approach to flood modeling.

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Planning for a Flood Event in the Wake of a Pandemic

Katherine Picchione
Crowdsourcing Specialist
Response Geospatial Office | Planning and Exercise Division

Carrying Out Public Programs in a pandemic environment

- Many programs rely on field staff. COVID-19 presents an unprecedented threat to individuals and communities, making field visits extremely risky.
- You can enable remote work with geospatial tools!

Data Sources	Production	Applications	Policy
Online forms Cell Phones Aerial imagery Internet of Things Model outputs	2D/3D imagery analysis Livestream Hazard exposure Predictive analytics	Virtual inspections Triage projects Decision support tools Cost models	Alternate Procedures Privacy Risk reduction Pre-position contracts

e.g. Use photos and flood extents to streamline individual assistance for applicants with a high likelihood of damage.

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Design solutions like an engineer

1. Identify specific problems and needs
2. Understand “quick wins”
3. Brainstorm technology options
4. Brainstorm policy/program options
5. Work with policy makers and technologists to develop the best solution
6. Implement and iterate

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Natural Hazards Risk Assessment Program Disaster Response Work

Casey Zuzak, GISP
NHRAP Senior Risk Analyst
Risk Management Directorate | Resilience

Natural Hazards Risk Assessment Program

The NHRAP will provide a common understanding of hazard and consequence data to reduce disaster suffering

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Goals of the NHRAP

Institutionalize an innovative and integrated risk assessment process to link risk with policy and program implementation

Leverage partnerships with hazard identification experts and other FEMA program areas to promote use of credible risk assessment data and practices

Empower states, local governments, tribes, and territories to reduce disaster suffering and to contribute to a more resilient nation

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Disaster Support – National Flood Insurance Program

- NHRAP served as Hazus wind modeling SME to support Hurricane Florence response
  - Improves confidence by conducting QA/QC of model results
  - Ensures HQ and Regions are using the same planning factors

- NHRAP provides NFIP Analytics Team Estimates
  - Coordination with RGO, IWRSS, and PNNL on best available flood hazard information
  - Working with FEMA Coastal Engineers for surge
  - Intersect with FEMA NFIP data to understand the impact of the disaster

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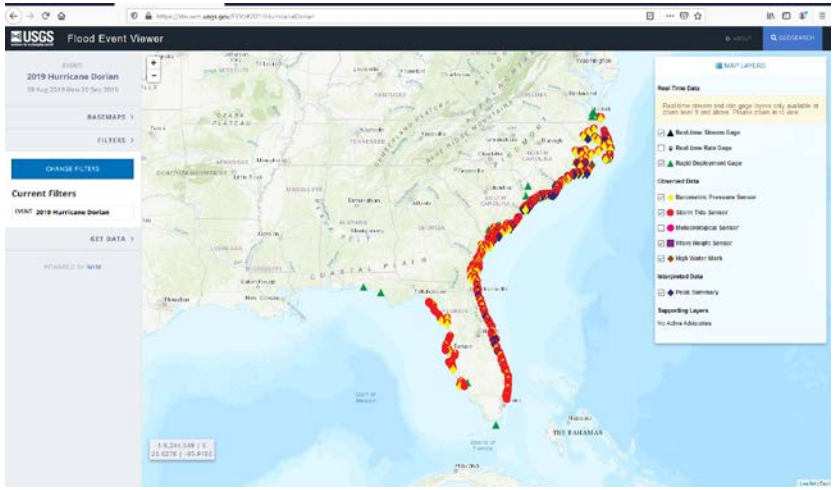
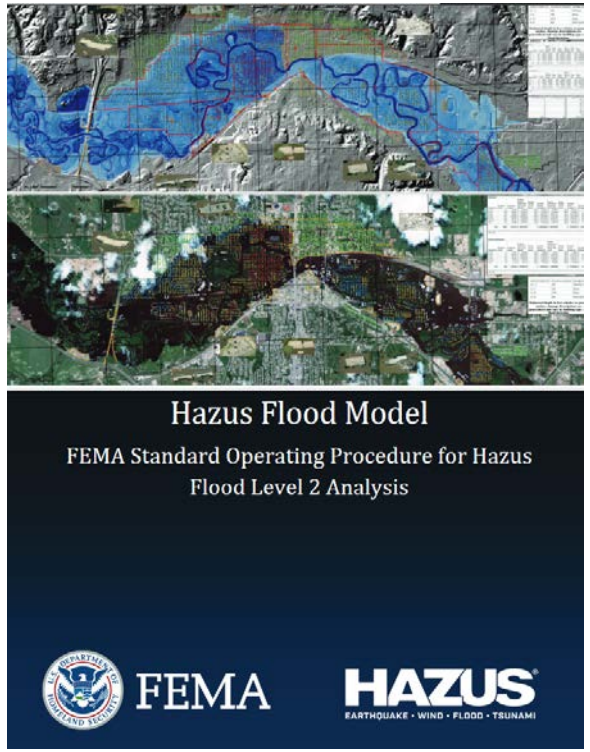
Development of Post Event Flood Depth Grids

- NHRAP Create post-event depth grids from USGS collected High Water Mark data
  - Publish data to disaster geoplatform FTP

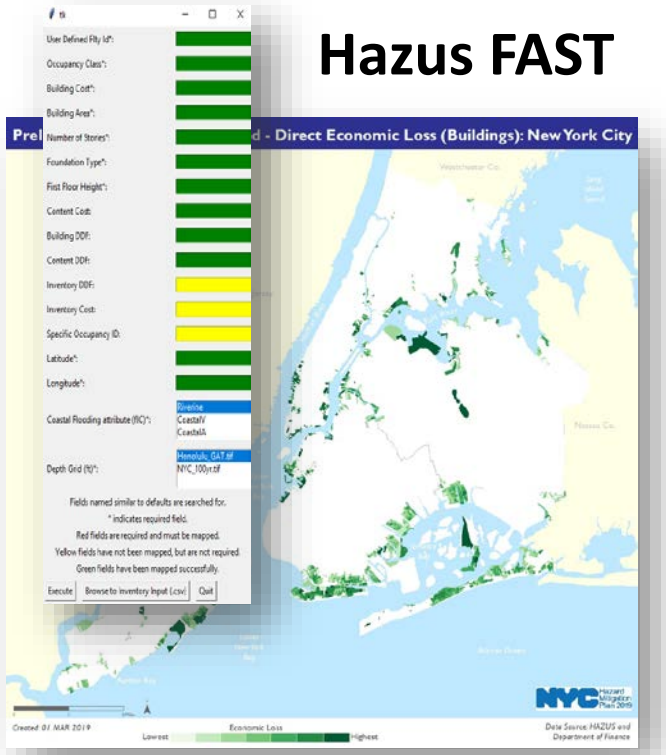
USGS Flood Event Viewer





https://www.fema.gov/media-library-data/1561466386519-b15dc59f1acf1738944b43f42a8b01d7/Hazus_Flood_Model_SOP_level2analysis.pdf

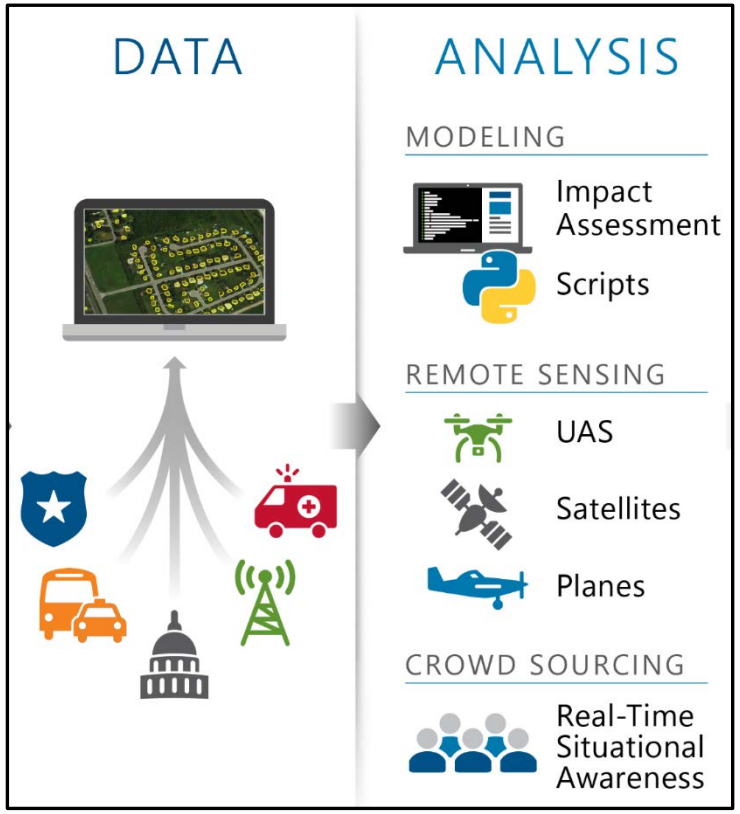
Hazus FAST



Flood Mapping Use Cases: FEMA Response

Adam Barker, PhD
Geospatial Analyst
Response Geospatial Office

HQ Team: Response Geospatial Office



How many people will be affected by an event and what is the extent of the damage?

And Beyond:

- Which roads are damaged?
- Which CIKR are likely damaged?
- Which communities are isolated?
- How many structures are destroyed?
- What is the extent of debris?

Provide Better Support for the Disaster Survivor

- Reduce Complexity
- Save Time
- Enhance Situational Awareness

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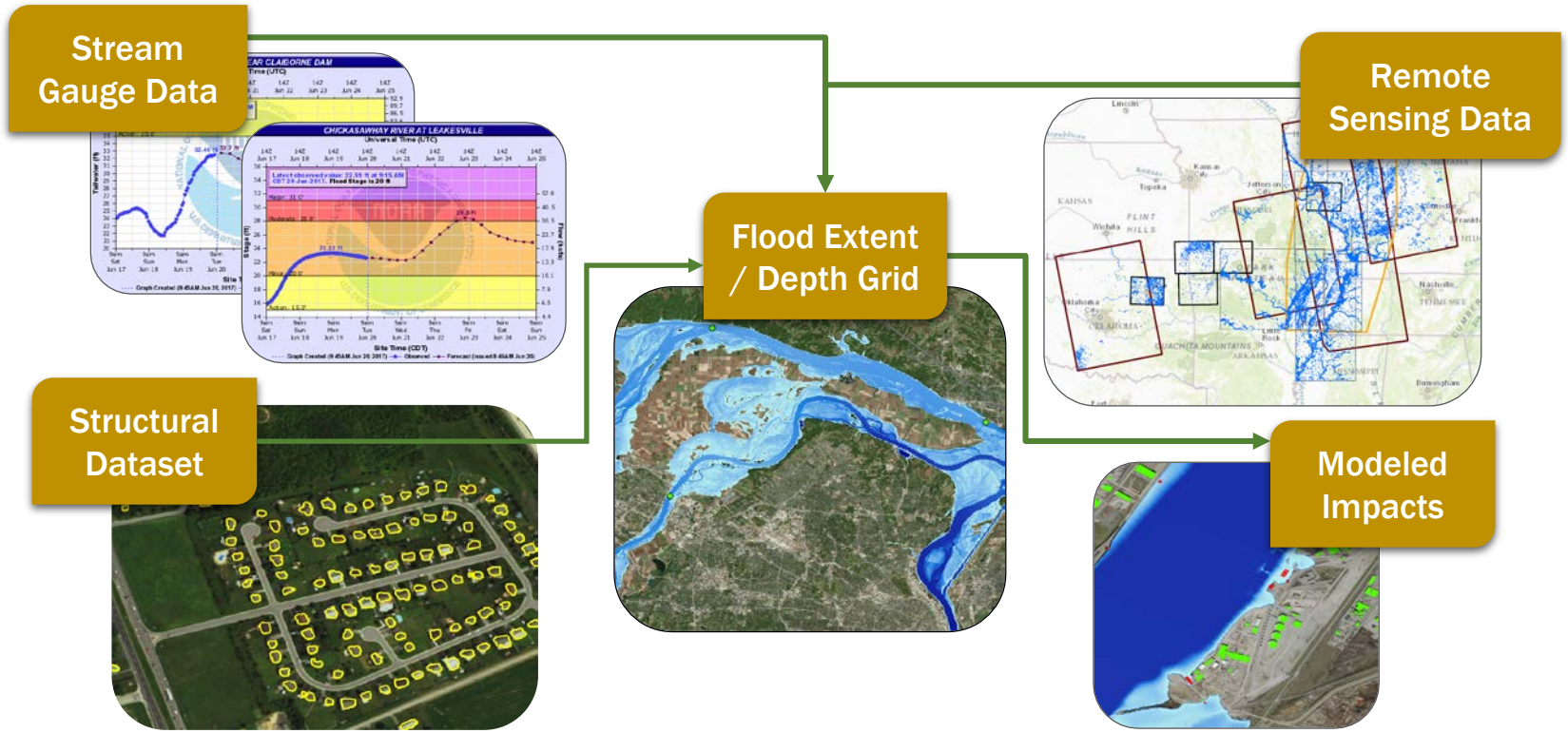
How do we assess the impact and identify damage?

In-house approach:



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So what exactly are the needs of Response

Pre-event: Where will the water be and how much?

- The need: Rapid-response predictive flood models to assess the impact
- Time: Ideally 72 to 48 hours before an event (if possible)
- We will absolutely compromise on accuracy and precision in favor of a timely product
- Goal: Provide situational awareness to guide leadership decision making and assess resource requirements

Post-event: Where and how deep is the water and for how long?

- The need: Observation-validated flood inundation map
- Time: The RGO is required to provide initial damage assessments **within 72 hours** of the event
- Goal: Assess the damage scope to expedite the declaration process (if need be), refine resource needs, and gather data that will be used by other functional areas at different times

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Flood Modeling in Field Disaster Response

Matt Welshans

GIS Unit Leader

FEMA National IMAT Blue

GIS in the Field: Response GIS Teams

- Integration with state and other federal GIS teams in larger-scale responses
- Remote support from Region GIS teams in smaller-scale recovery only operations.
- Provide basic information for:
  - Situational Awareness
  - Decision Making (Crisis Action Planning)
  - Future Planning (Modeling/Forecasting)
- Updated information is always a need!

Life-Saving

Life-Sustaining

Property Protection

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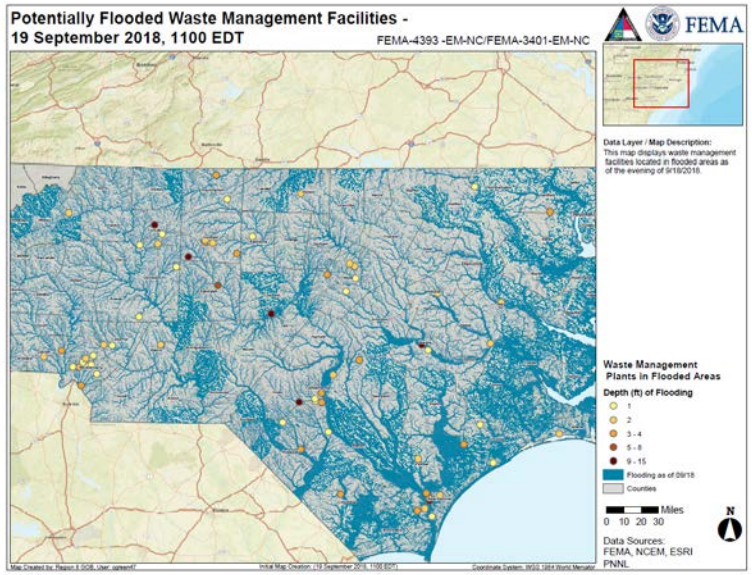
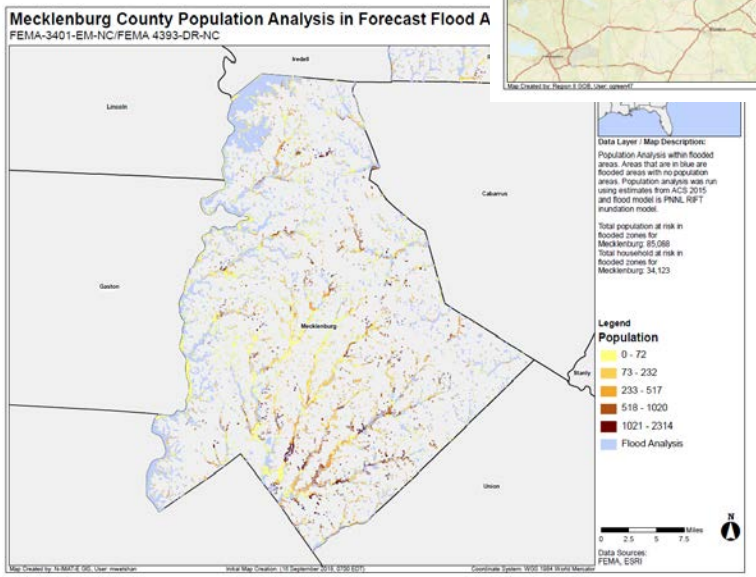
Flood Modeling: How We Use It in Response Operations

- Stand-in for inundation layer
  - Scope of population affected
  - Potential damage to infrastructure
- More fidelity than FEMA Flood Zones
- Used for scenario building, planning factors, areas of concern.
  - Needed within tight deadlines for high level decisions on assets and forces needed.
  - Reliable, rapid timeframes needed to set expectations while incident is occurring.
  - Perfection not needed, but confidence should be indicated.





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Current Flood Modeling Suite

HAZUS Flood Damage Model

RIFT – Rapid Infrastructure Flood Tool

SLOSH – Sea, Lake, Overland Surges from Hurricanes

High Water Marks (once available)

Next Steps: A Wish List

- First Floor Elevations
  - Mitigating Factor
  - Prevents overestimation of flood damage
- Vector data
  - Allows quick analysis in online environment
  - Bucketed values for quick analysis
- Timely Scenarios/Confidence for Planning
  - Best-case
  - Worst-case
  - Most likely case

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Interagency Coordination Division
-
Community Planning Capacity Building (CPCB)

Phillip Ulbrich

Interagency Coordination Division | Recovery Directorate

Louisiana Resilient – 2016 Flooding

- The Resilient Recovery Pilot is a coordination effort among FEMA, various federal and State agencies, and non-governmental partners in the State of Louisiana.

- The Pilot will support jurisdictions at the watershed level to integrate recovery, resilience, and hazard mitigation through a robust team of subject matter experts (SMEs).

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Louisiana Resilient – Principal Innovations

- **Watershed-based Regionalism**
- **Integrate Resilience and Recovery Support**
- **Transition to a Fully State-Resourced Process**

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Louisiana Resilient – Pilot Goals

- **Reduce future disaster cost**
- **Build State and Local Capacity**
- **Leverage Findings to Improve Federal Action**

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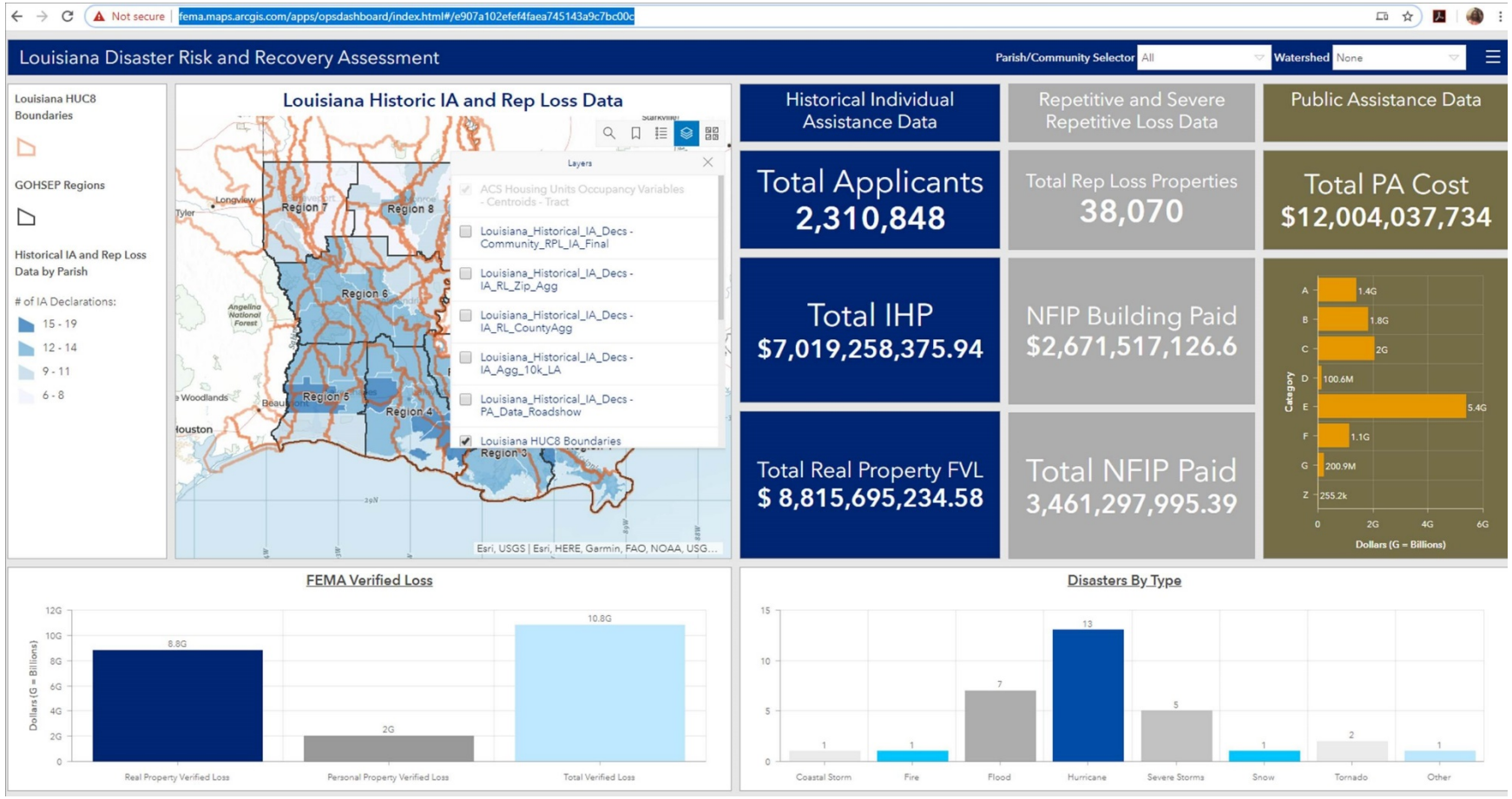
Not secure
fema.maps.arcgis.com/apps/opsdashboard/index.html#/e907a102efef4faea745143a9c7bc00c
Louisiana Disaster Risk and Recovery Assessment
Parish/Community Selector All
Watershed None
Louisiana HUC8 Boundaries
GOHSEP Regions
Historical IA and Rep Loss Data by Parish
# of IA Declarations:
15 - 19
12 - 14
9 - 11
6 - 8
Louisiana Historic IA and Rep Loss Data
Layers
ACS Housing Units Occupancy Variables - Centroids - Tract
Louisiana_Historical_IA_Decs - Community_RPL_IA_Final
Louisiana_Historical_IA_Decs - IA_RL_Zip_Agg
Louisiana_Historical_IA_Decs - IA_RL_CountyAgg
Louisiana_Historical_IA_Decs - IA_Agg_10k_LA
Louisiana_Historical_IA_Decs - PA_Data_Roadshow
Louisiana HUC8 Boundaries
Region 7
Region 8
Region 6
Region 5
Region 4
Region 3
Esri, USGS | Esri, HERE, Garmin, FAO, NOAA, USG...
Historical Individual Assistance Data
Total Applicants
2,310,848
Total IHP
$7,019,258,375.94
Total Real Property FVL
$ 8,815,695,234.58
Repetitive and Severe Repetitive Loss Data
Total Rep Loss Properties
38,070
NFIP Building Paid
$2,671,517,126.6
Total NFIP Paid
3,461,297,995.39
Public Assistance Data
Total PA Cost
$12,004,037,734
Category
A 1.4G
B 1.8G
C 2G
D 100.6M
E 5.4G
F 1.1G
G 200.9M
Z 255.2k
0 2G 4G 6G
Dollars (G = Billions)
FEMA Verified Loss
Dollars (G = Billions)
8.8G
2G
10.8G
Real Property Verified Loss
Personal Property Verified Loss
Total Verified Loss
Disasters By Type
1
1
7
13
5
1
2
1
Coastal Storm
Fire
Flood
Hurricane
Severe Storms
Snow
Tornado
Other

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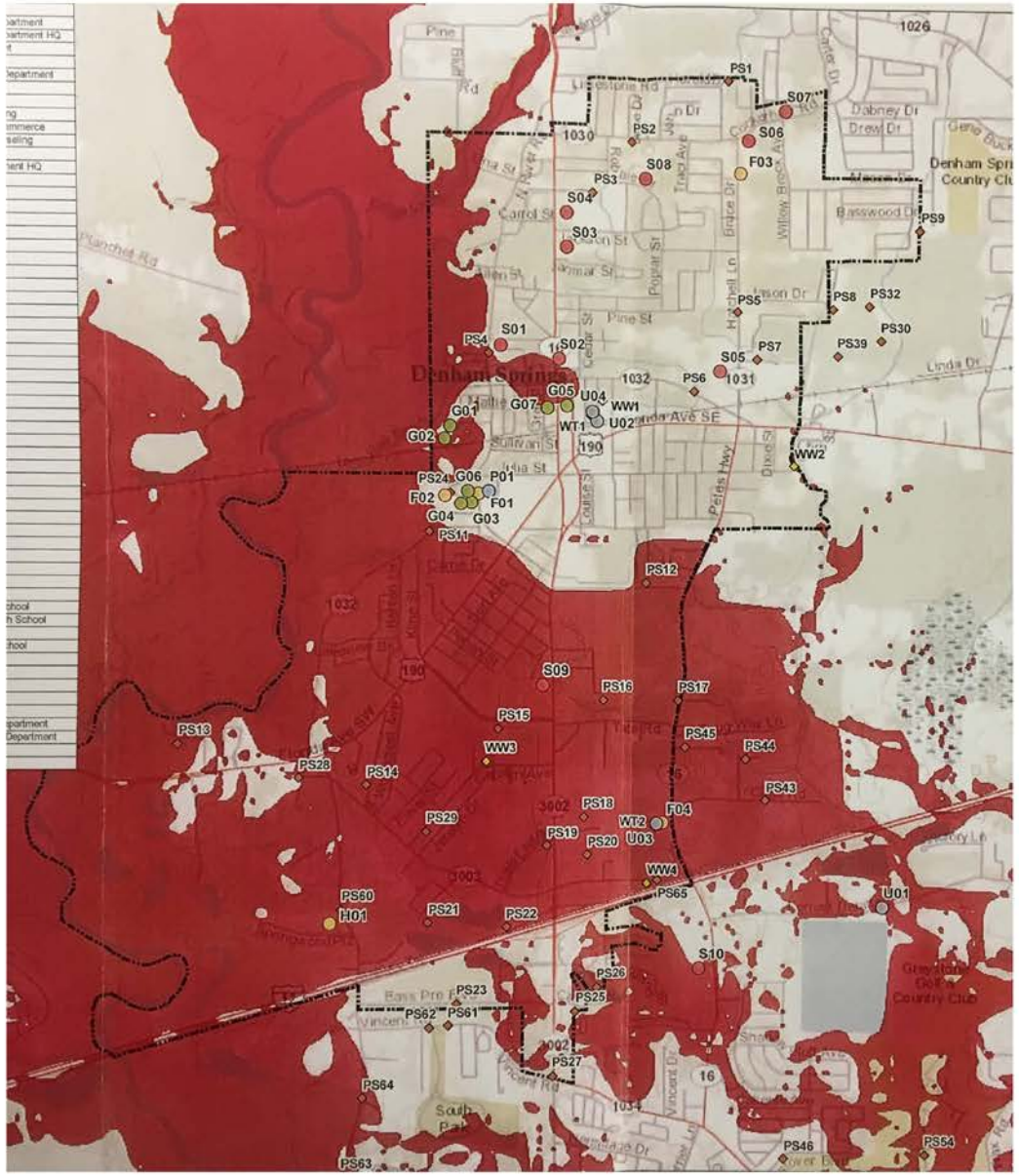
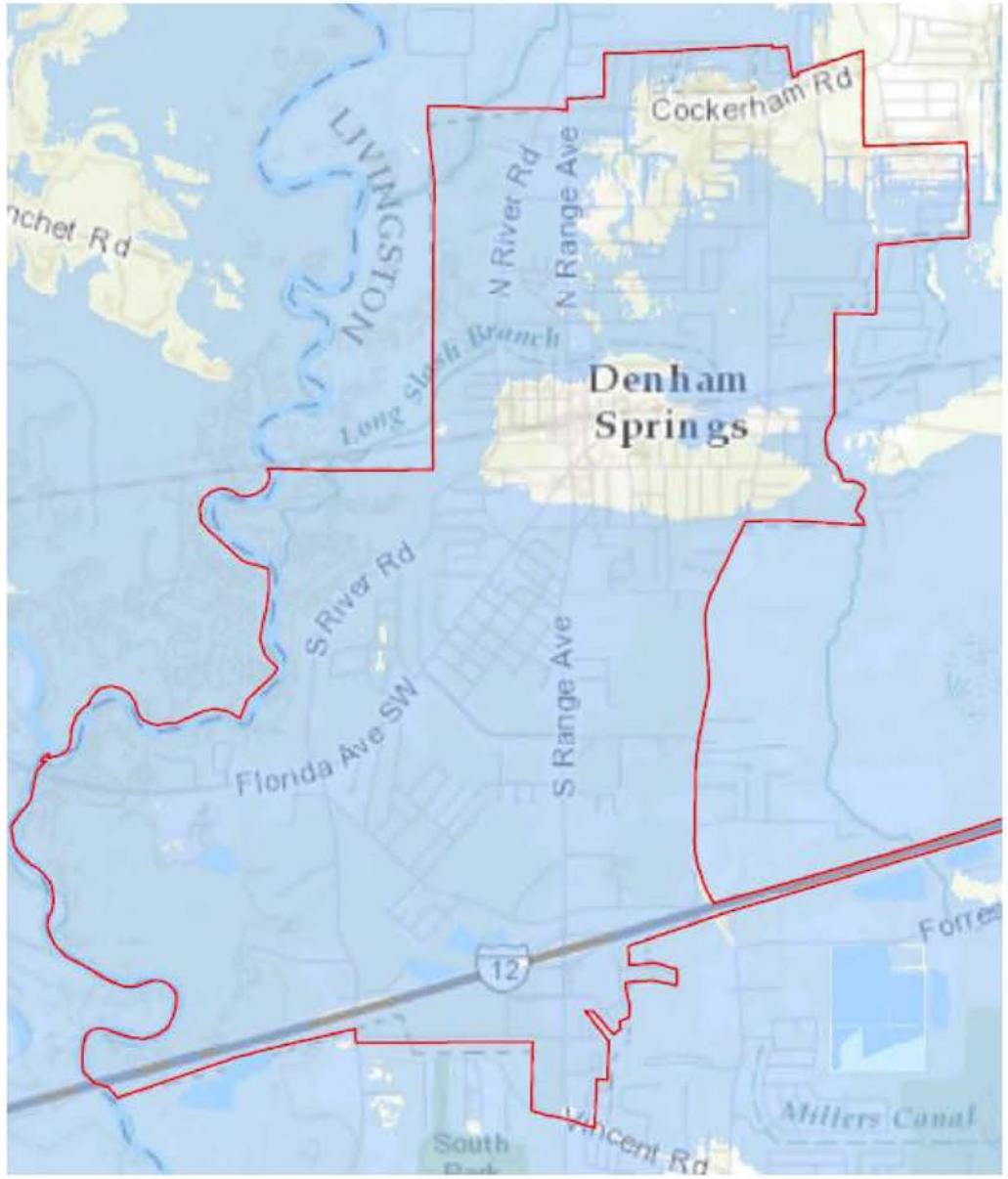


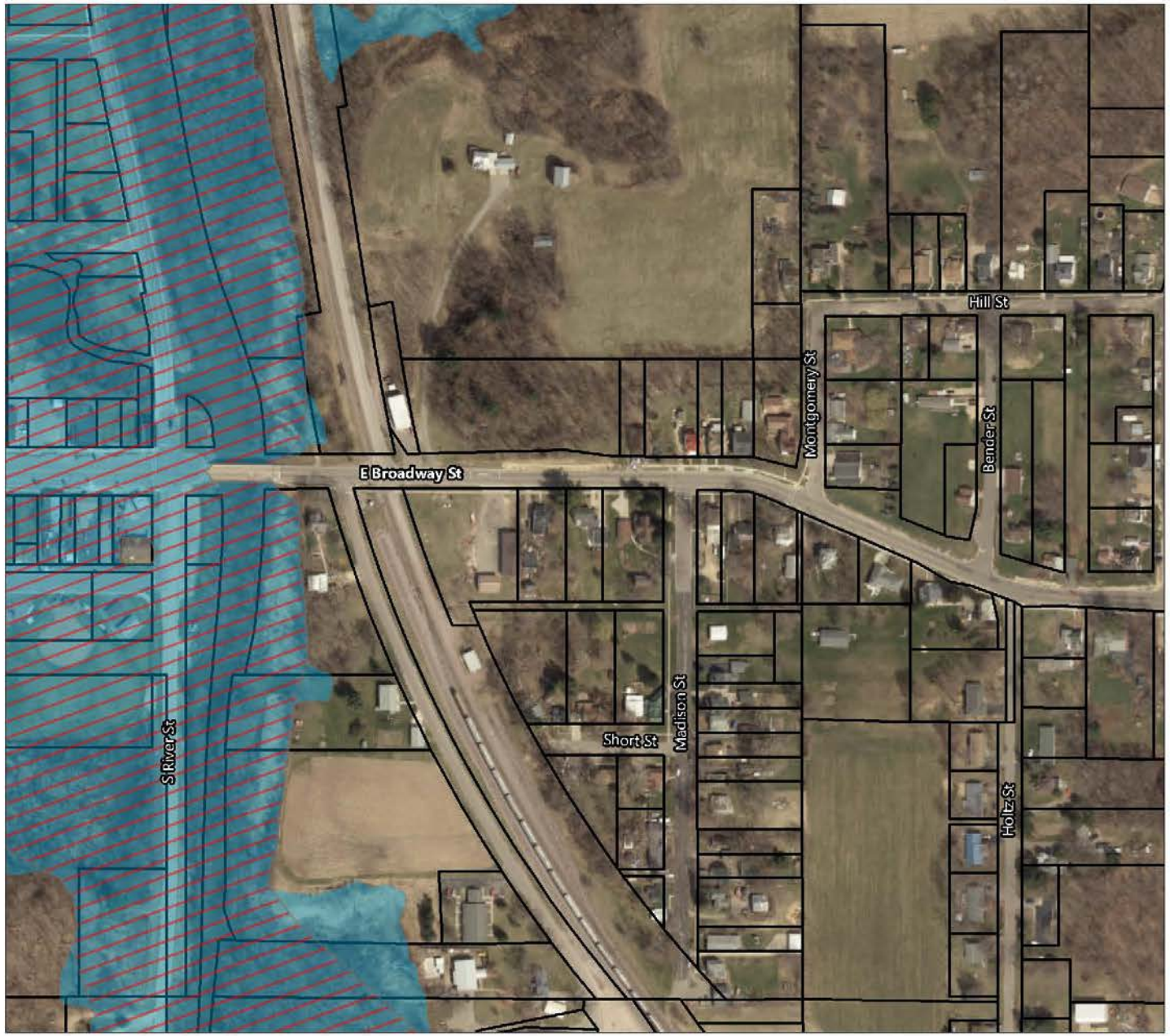
1983 Flood Inundation Map (City of Denham Springs Hazard Mitigation Plan)



2016 Flood Inundation Map (City of Denham Springs)

FEMA-4402-DR-WI - Severe Storms, Tornadoes, Straight-line Winds, Flooding, and Landslides

National Flood Hazard Layer - Village of Rock Springs, WI



Data Layer / Map Description:
This product illustrates the parcels in a section of the Village of Rock Springs, WI. The National Flood Hazard Layer is also displayed.

Parcel Boundary

National Flood Hazard Layer

Flood Zone A

Flood Zone AE

Floodway

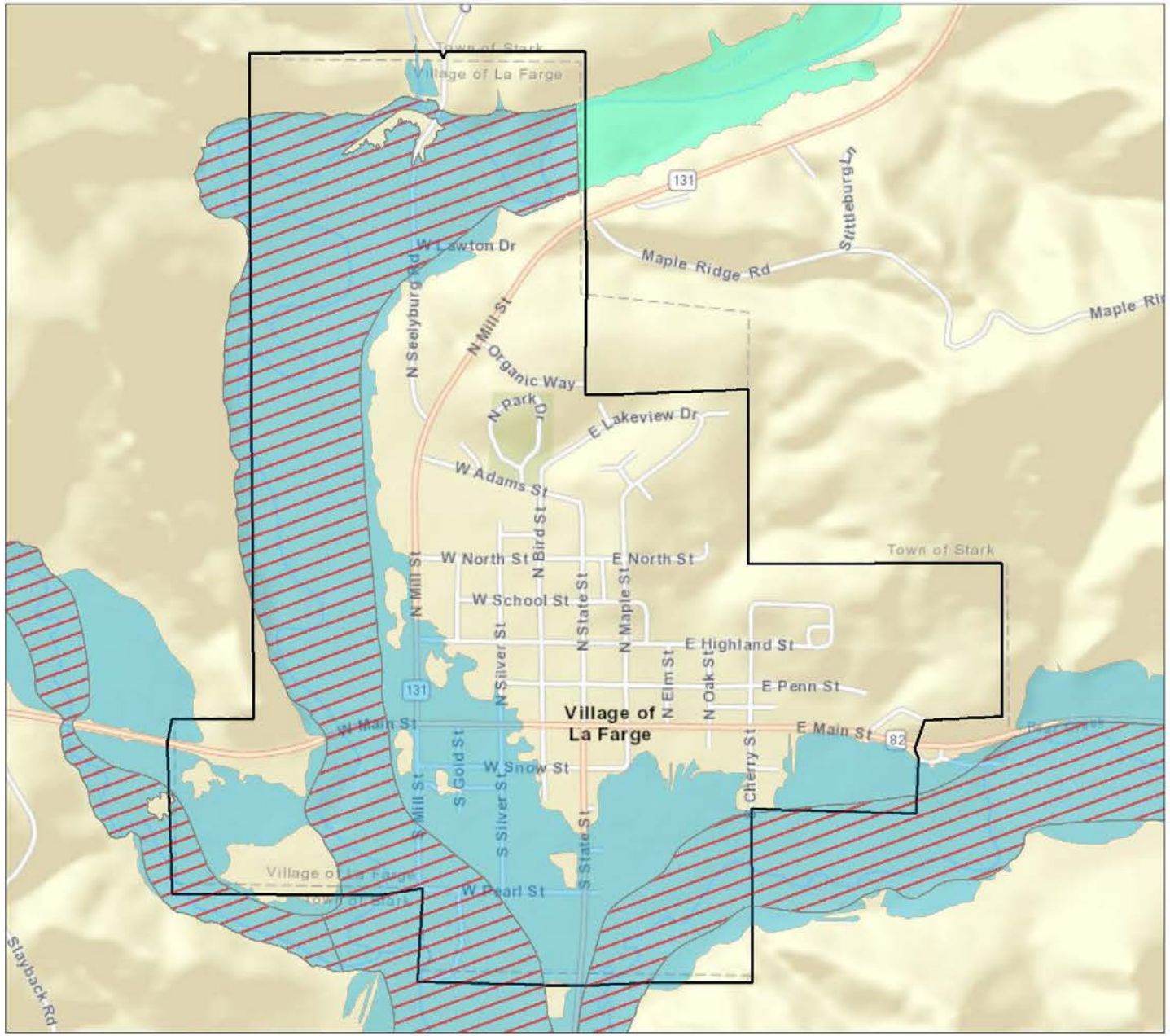
0 0.045 0.09 Miles

0 0.06 0.12 Kilometers

Created: Friday, January 18, 2019 | Source: FEMA Geospatial Resource Center | FEMA Region 5

FEMA-4402-DR-WI - Severe Storms, Tornadoes, Straight-line Winds, Flooding, and Landslides

Village of La Farge, Wisconsin



Data Layer / Map Description:
This product is centered on Village of La Farge, WI and includes the national flood hazard layer. This layer includes the floodway, and flood zones A and AE.

Community Boundary

National Flood Hazard Layer

Flood Zone A

Flood Zone AE

Floodway

0 0.15 0.3 Miles

0 0.2 0.4 Kilometers

Created: Monday, December 10, 2018 | Source: FEMA Geospatial Resource Center | FEMA Region 5

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Call to Action

- Geospatial Game-Plan for a Flood Event (Template)
  - What is yours?
- Core Information Needs
  - Who needs to know what and when?
- Review your Agency's Flood Response Plan
  - Critical considerations during COVID-19

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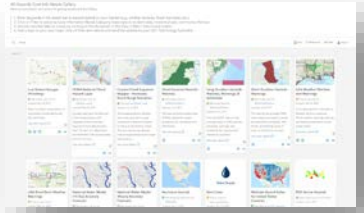
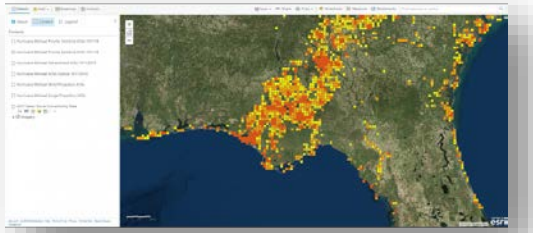
What’s Next?

Resources

- Louisiana Disaster Risk and Recover Assessment Dashboard (Requires FEMA Login)
- Denham Springs Recovery Plan , Louisiana Resilient Recovery Pilot ConOps, and LaWRS Main Section YB712
- National Flood Preparedness Guideline Rehttps://www.napsgfoundation.org/wp-content/uploads/2015/10/National_Flood_Preparedness_Guideline_2017.pdfport
- Core Information Needs - GIS Resources (filter for flood)
- Pin2Flood - Living Atlas
- Prioritizing Operations Support Tool (POST) Dashboard
- Natural Hazards Risk Assessment Program (NHRAP) Website





Thank you!

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cabel@publicsafetygis.org

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