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.

EM GEO FORUM
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Get Tech Ready! Technology-Related Guidance & Tools for Hurricane Readiness

EM GEO FORUM

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June 30, 2020

Future EM Geo Forum Dates

August EM Geo Forum

Details Coming Soon!

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

EM GEO FORUM

Geospatial Tools for Search & Rescue and First Responders

EM GEO FORUM

Flood Modeling Needs & Products

EM GEO FORUM

Tornado Readiness and Resources

EM GEO FORUM

Get Tech Ready!

Technology-Related Guidance & Tools for Hurricane Readiness

Join the FEMA Response Geospatial Office (RGO) and the National Alliance for Public Safety GIS (NAPSG) Foundation for this virtual seminar to learn about preparing for future hurricanes during COVID-19.

Attendees will:

- Learn about FEMA's preliminary damage assessment (PDA) process and discover tools and resources available to aid jurisdictions in preliminary damage assessments.
- Gain insight into the use of high water marks to improve flood models and damage assessments.
- Learn how FEMA Regions work with and support states before, during, and after hurricane landfall.
- Understand how to develop a Geospatial Game Plan to implement across all hazards.

Date: June 30, 2020 from 2:00 PM to 3:00 PM EDT
Registration: http://events.r20.constantcontact.com/register/event?oeidk=a07eh55y6v04c4cc162&llr=nplxpbdab
Audience: First Responders, Emergency Managers, and GIS and technology specialists who support public safety

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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, FEMA GIO

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Tech Ready!

What is the goal of the EM Geo Forum Series?

- Platform for GIS professionals and the EM Community to learn how to access/request geospatial analysis and tools
- Provide an opportunity for the community to learn from each other by highlighting national best practices and lessons learned.

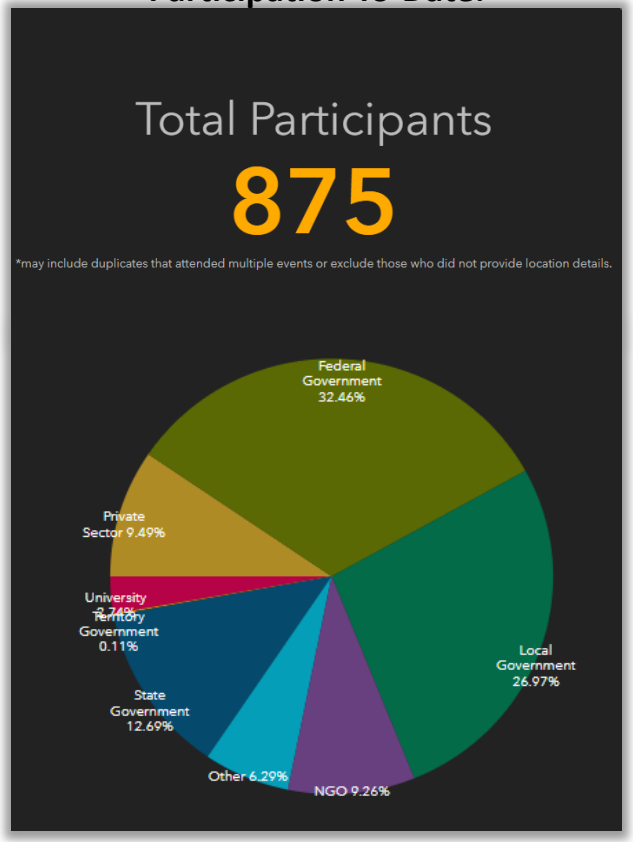
What is the goal of this session?

- Reinforce the concept of readiness via a (Geospatial) Game-Plan
- Share updated guidance for conducting Preliminary Damage Assessments and the latest Geospatial Tools, Analysis, Artificial Intelligence for the PDA process
- FEMA, Regions, States, and Partners coordinate to collect high-water marks and improve data
- Discuss planning consideration for Response and Recovery during a Pandemic

Why your contributions are important?

- Share your great work to help further advance the Emergency Management Community
- Critical Mission Partner through your continued coordination and collaboration to improve the outcomes of survivors

Participation To-Date:



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Today's Agenda

1 **Introduction:** Tari Martin

2 **Hurricane Geospatial Game Plan:** Paul Doherty

3 **Geospatial Tools for PDA:** Jarrett McLane & Katie Picchione

4 **Regional Collaboration with FEMA:** Alan Johnson

5 **Augmenting HWMs:** Adam Barker

6 **Next Steps, Closing, & Questions**

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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

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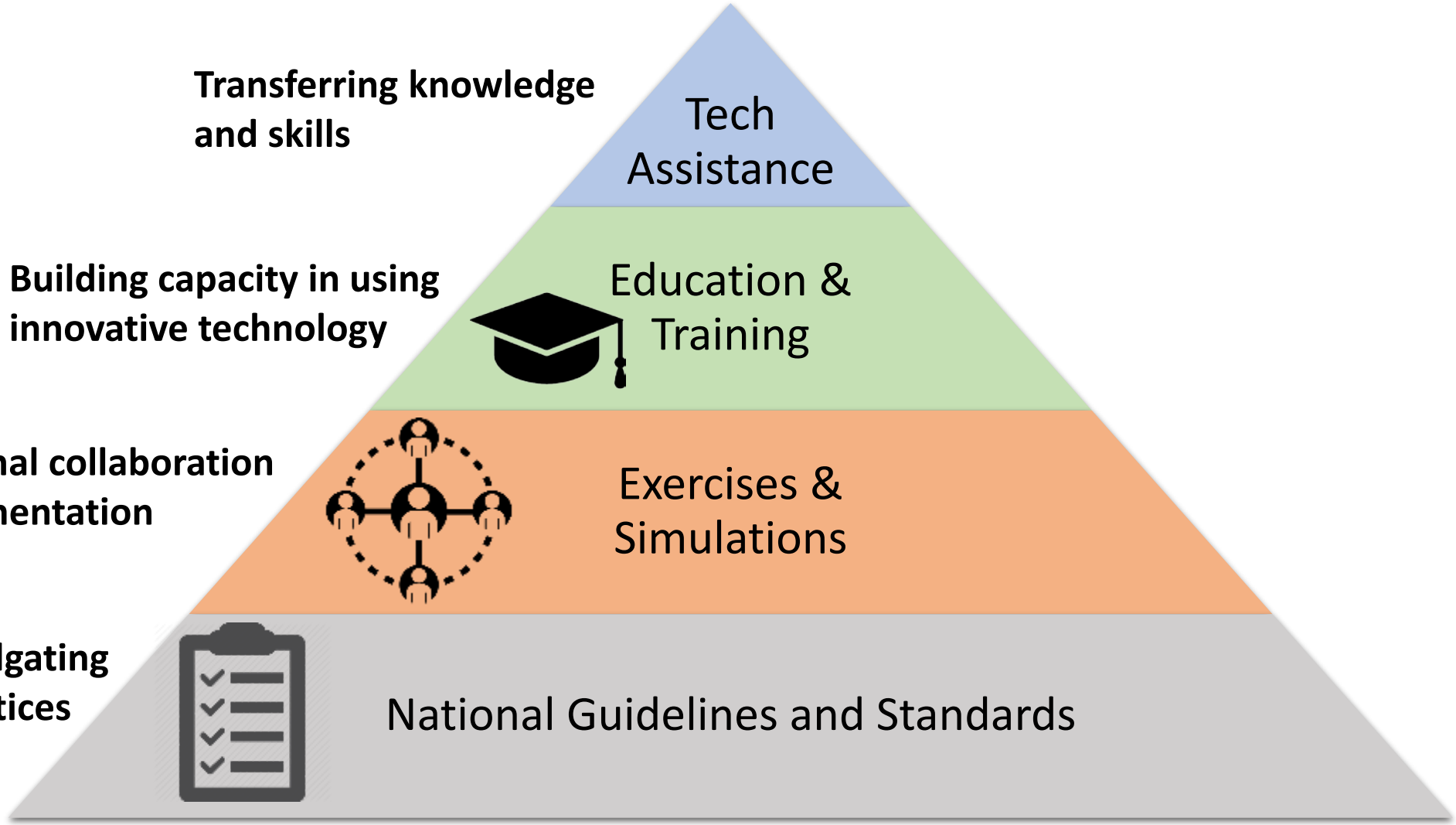
How Do We Do It



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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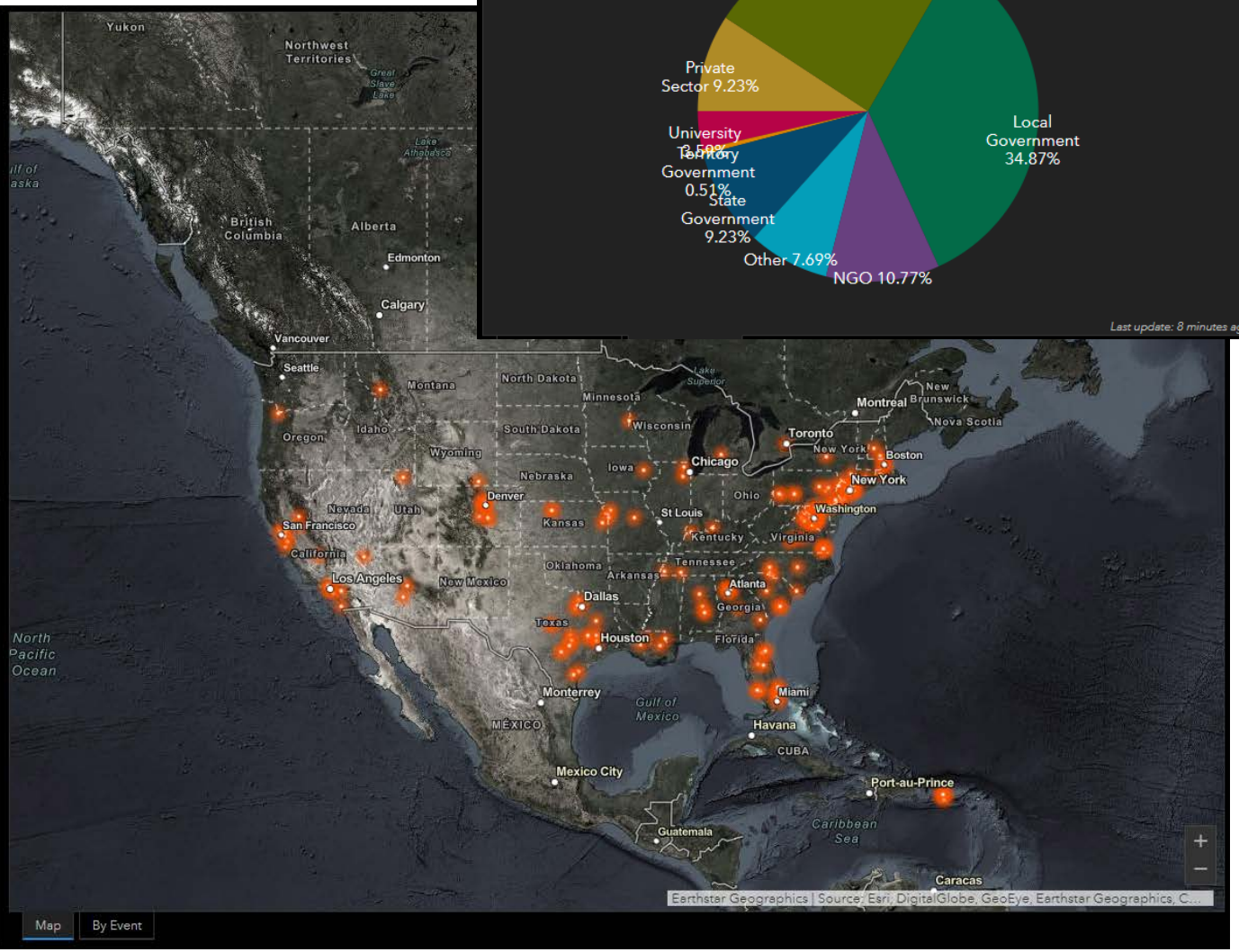
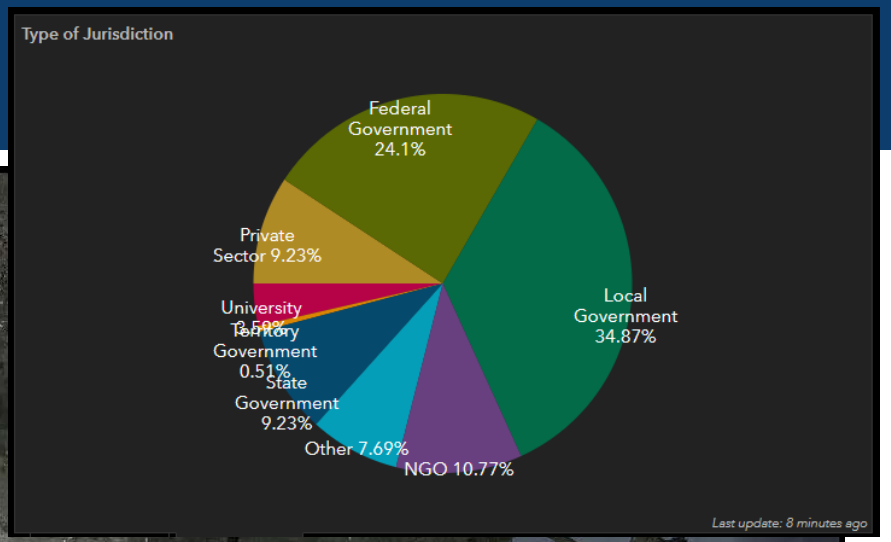
Today’s Attendees





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Objectives

- Learn about FEMA's preliminary damage assessment (PDA) process, and discover tools and resources available to aid jurisdictions in preliminary damage assessments.
- Gain insight into the use of high water marks to improve flood models and damage assessments.
- Learn how FEMA Regions work with and support states before, during, and after hurricane landfall.
- Understand how to develop a Geospatial Game-Plan to implement across all hazards.

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Hurricane Geospatial Game Plan

Paul Doherty, PhD
Director, Technology Innovation
pdoherty@publicsafetygis.org

Geospatial Tools for Preliminary Damage Assessments (PDAs)

Jarrett McLane, FEMA Recovery Front Office
Jarrett.McLane@fema.dhs.gov

Katie Picchione, FEMA Response Geospatial Office
Katherine.Picchione@fema.dhs.gov

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Agenda

- Doctrine and Guidance
  - Preliminary Damage Assessment (PDA) process
  - Updates to PDA Manual
  - Guidance for Virtual PDAs Due to COVID-19
- Geospatial Tools and Resources for Damage Assessments
  - FEMA Geospatial Hub and Incident Journals
  - Survey123
  - Aerial Imagery

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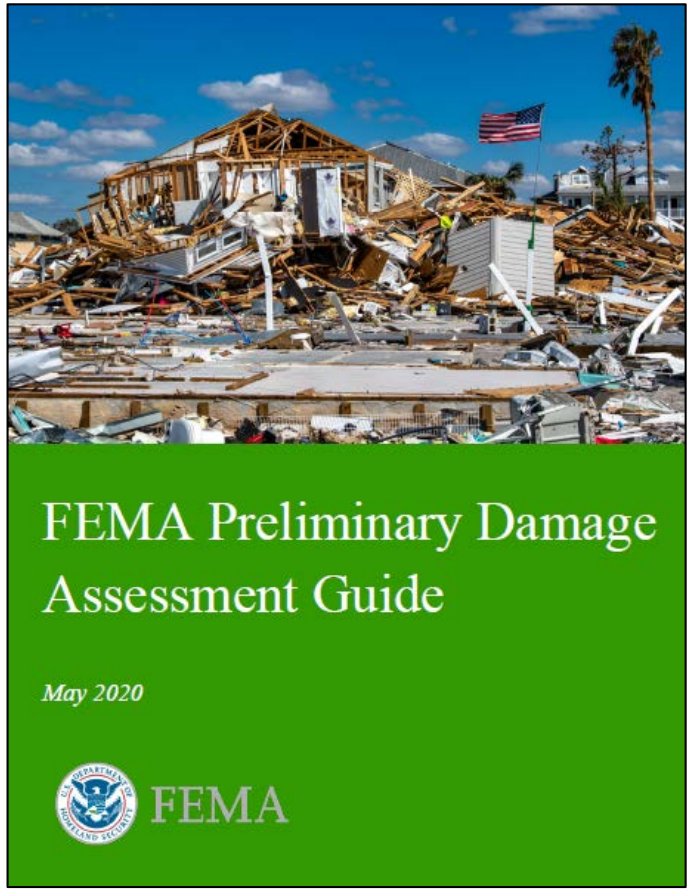
2020 PDA Manual Update

- Emphasis on the importance of initial damage assessments
- PDA Pocket Guide for use in the field
- Tribal Specific Appendix
- Individual Assistance
  - Adjustments to how certain damages impact damage ratings
- Public Assistance
  - Eliminated soft costs
  - Greater emphasis on Desktop Assessments



https://www.fema.gov/media-library/assets/documents/109040

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Virtual PDAs in A Pandemic Environment

- Integrating remote assessment methods into PDAs due to COVID-19
- Guidance for Regions released June 11th
  - Desktop data assessment (IDA data, photos, damages submitted by public)
  - Aerial imagery
  - Predictive modeling
  - Analysis of GIS datasets (building footprints, etc)
- Staff can still go into field to validate damages if necessary

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How can geospatial tools support PDAs?

Plan Field Operations (Situational Awareness)

Collect Data

Virtually Assess and Validate Damages

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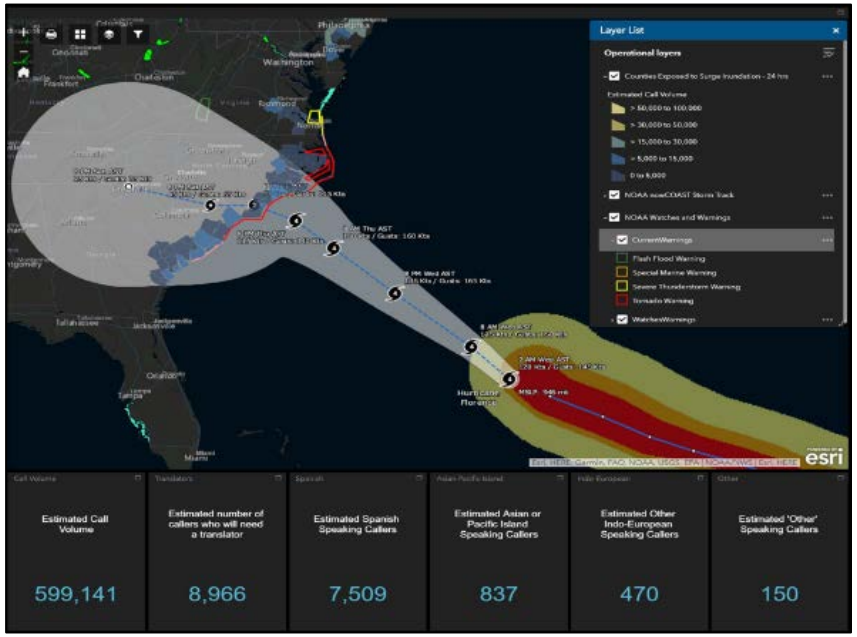
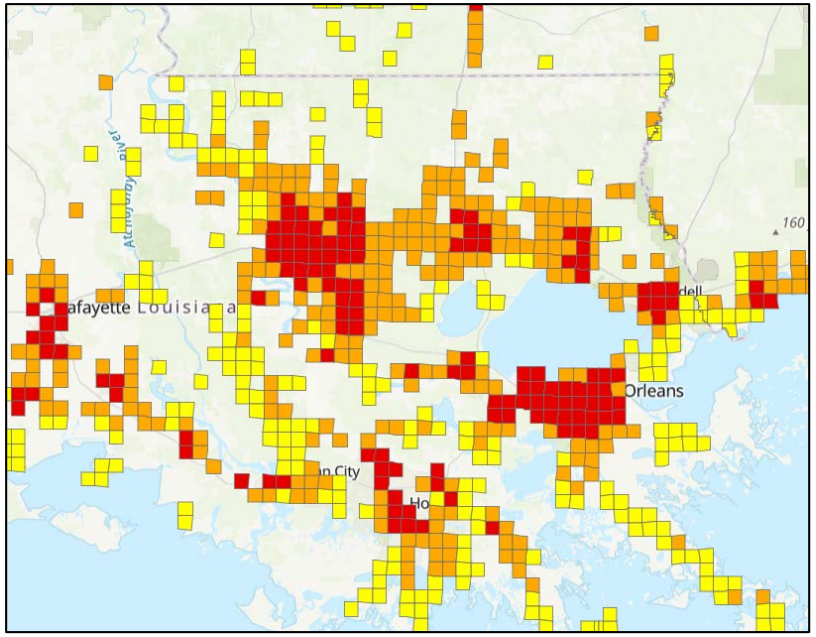
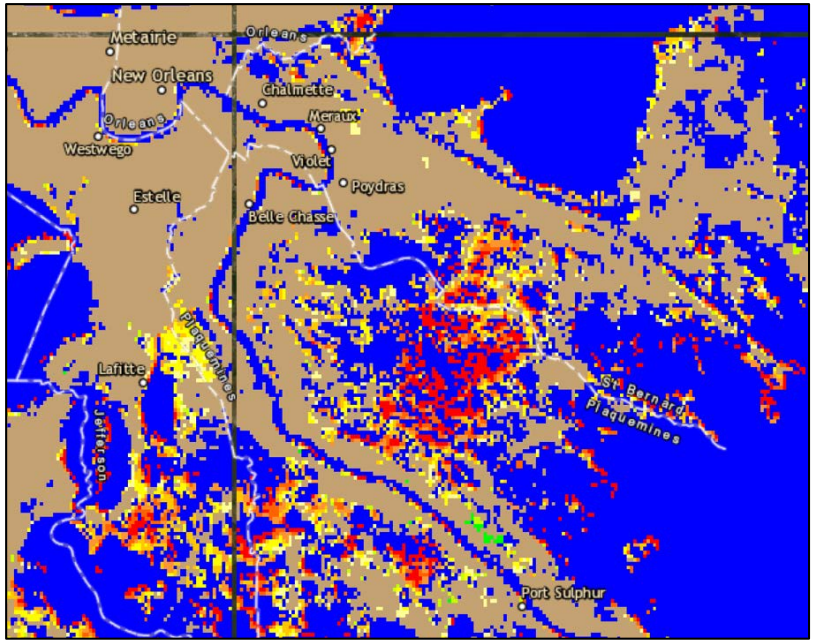
Use FEMA's public dashboards, data layers, and analysis tools when planning field operations



FEMA Hurricane Journal
Hurricane Florence – September, 2018



Prioritizing Operations Support Tool
Tropical Storm Cristobal – June, 2020



VIIRS Floodwater Fraction Map Products
New Orleans – Current

Geospatial Hub: https://gis-fema.hub.arcgis.com
GeoPlatform Community: http://disasters.geoplatform.gov/

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Survey123 PDA Tool Initiative Goals

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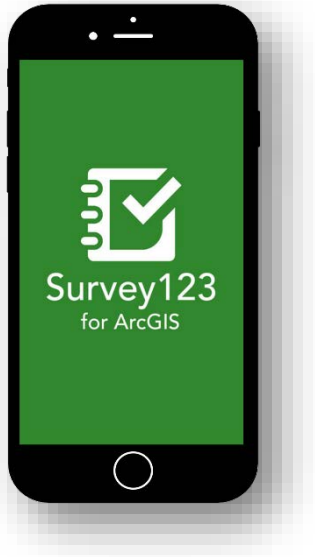
Field Assessment and Collection Tools (FACT)

Survey123 Form



Points Viewer/Dashboard

Reporting Application

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PDA Tool Survey Templates

- FEMA makes the templates publicly available to state, territorial, tribal, and local governments interested in using Survey123 for Damage Assessments.
- Templates are available at this address:
  - https://www.fema.gov/preliminary-damage-assessments
  - Look under the Section titled “PDA Templates”

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Use aerial imagery to assess damage and validate damage reports

Aerial photography
Midland, MI, May 2020 – Civil Air Patrol

Sharing data and imagery among local, state, and federal partners facilitates damage assessments and recovery

Civil Air Patrol
Commercial Manned-Aircraft Imagery
University Partners
Small Unmanned Aerial Systems

3D imagery product and
automated damage assessments
Jonesboro, AR, March 2020
Civil Air Patrol

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Please contact us with questions or for assistance using these resources!

Jarrett McLane, FEMA Recovery Front Office
Jarrett.McLane@fema.dhs.gov

Katie Picchione, FEMA Response Geospatial Office
Katherine.Picchione@fema.dhs.gov

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RiskMAP
Increasing Resilience Together

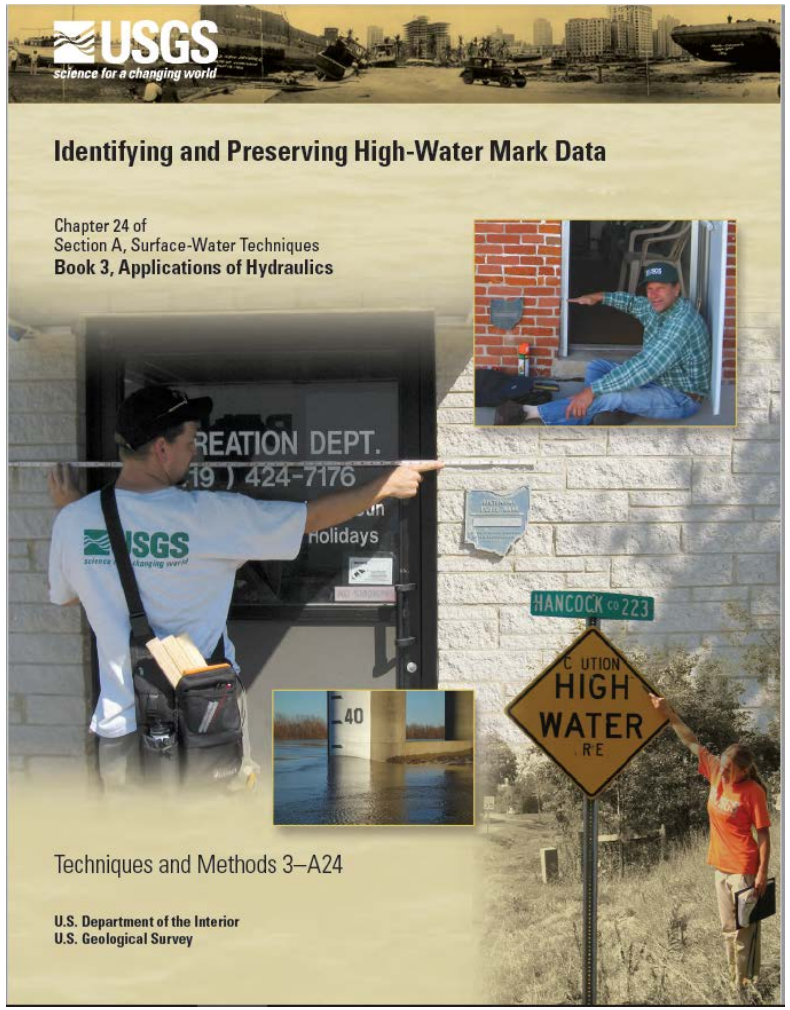
HIGH WATER MARKS COLLECTION FROM HURRICANE in a Social Distancing Environment

EM Geo Forum "Get Tech Ready! Technology-Related Guidance and Tools for Hurricane Readiness."
June 30, 2020

FEMA

HIGH WATER MARK MANUAL

- Free available resource here:
- https://pubs.er.usgs.gov/publication/tm3A24
- Covers how to
  - identify different types of HWM,
  - Collect, and document
  - Tools and Safety during collection
  - Create understanding of the highly perishable nature of the data



FEMA

RiskMAP
Increasing Resilience Together

DISASTER STANDARD OPERATION PROCEDURE FOR HWM COLLECTION

- Steps

1. RRCC opens, Risk Analyst coordinates with USGS lead about need, funding.
2. FEMA writes the Mission Assignment for the initial collection.
3. USGS mobilizes resources, mainly personnel, to ground collect
4. After marking sites, survey team collects elevation data in NGVD88.
5. HWM report posted to USGS FEV site
6. Follow up report on gage f/Q, inundation mapping issued

- USGS can provide the following in direct support of response and recovery operations:
  - Field measurements of flood water heights in impacted communities;
  - Deploy supplemental water-level measuring instruments.
  - Measure streamflow and discharge of flooded channels, directly or indirectly.
  - Flagging of High-Water Marks and collect evidence of flooding for impacted developed areas and communities.
  - Locate and record the horizontal position and vertical elevation of the High Water Marks (HWM).
  - Documentation of HWMs with field notes, digital photographs and depth measurements to the ground at the HWM location at the time of inspection.
  - Data measurements will be provided in GIS-ready format via the USGS National Water Information System or Short-Term Network system for display and download.
- Areas of Interest: General focus of the study will be for inland flooding in or near communities and populated areas from Texas-Louisiana border to Lafayette area. Primary watersheds include Sabine, Calcasieu, Mermentau, and Vermilion. Primary data collection sites to be near canals, rivers, streams and reaches in affected watersheds. Specific focus areas for data collection will be supplemented as the impactful event unfolds and guidance is provided by FEMA, NOAA, and USGS review.

HWM EXAMPLES –MUD LINE

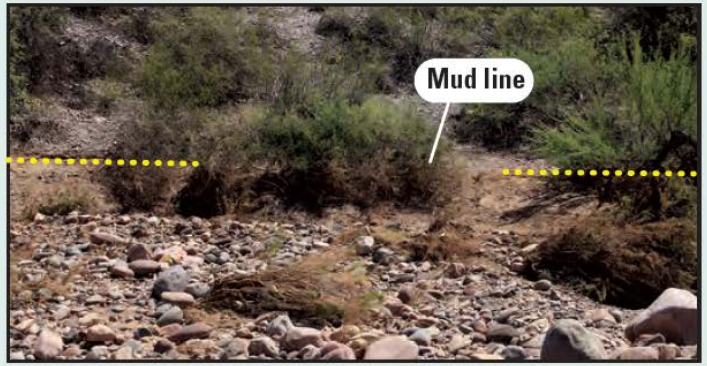


Figure 1. A mud line visible from a distance on desert shrubs. Sediment from the floodwaters has deposited onto the shrubs, turning them brown.

Figure 3. A well-defined mud line left on the interior side of a glass wall.

HWM EXAMPLES –SEED LINE

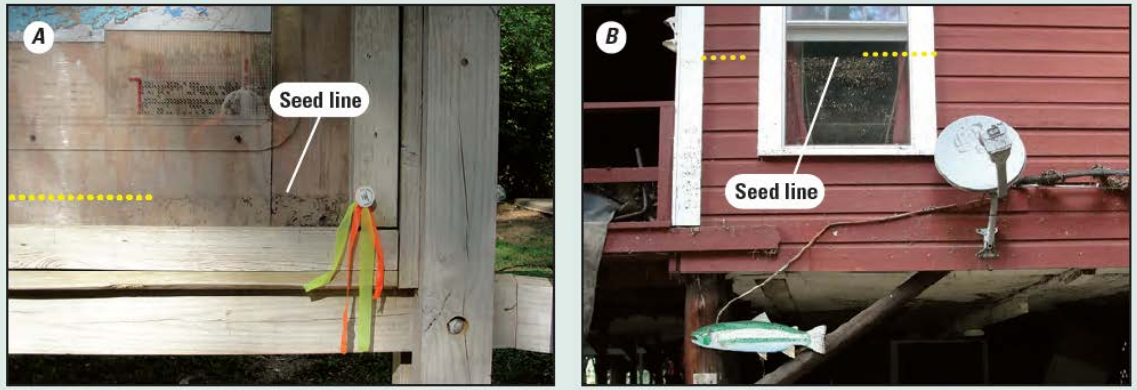


Figure 7. Seed lines on the surfaces of *A*, a recreational sign and *B*, a home exterior. Photographs by Walter Killion.

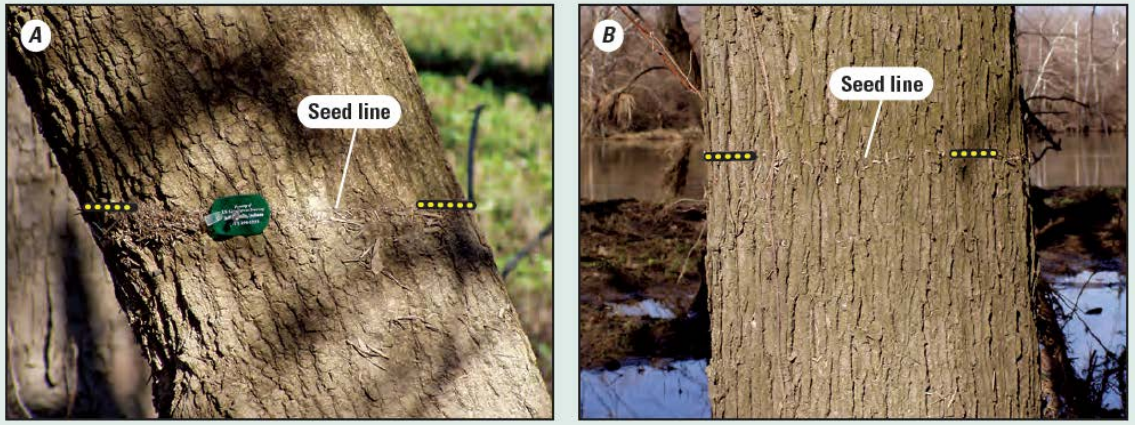


Figure 8. Well-defined seed lines on large tree trunks (*A*, *B*, and *C*). Photographs *A* and *B* by Bret Robinson; photograph *C* by

HWM EXAMPLES –DEBRIS LINE

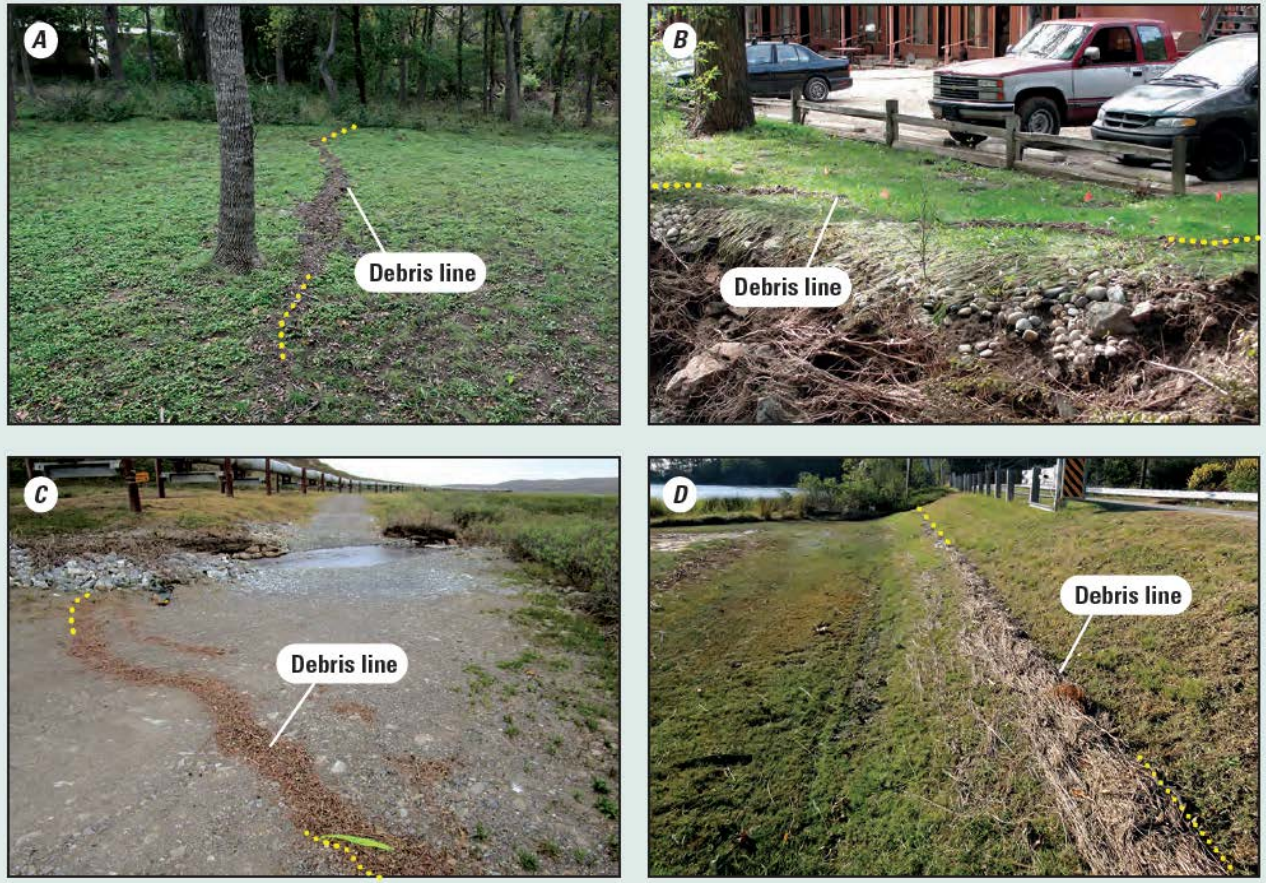


Figure 10. Debris lines formed on *A* and *B*, grassy overbanks; *C*, a roadway; and *D*, a grassy highway embankment. Photograph *C* by Michelle Kang; photograph *D* by R. Russell Lotspeich.

MARKING AND DOCUMENTING HWM

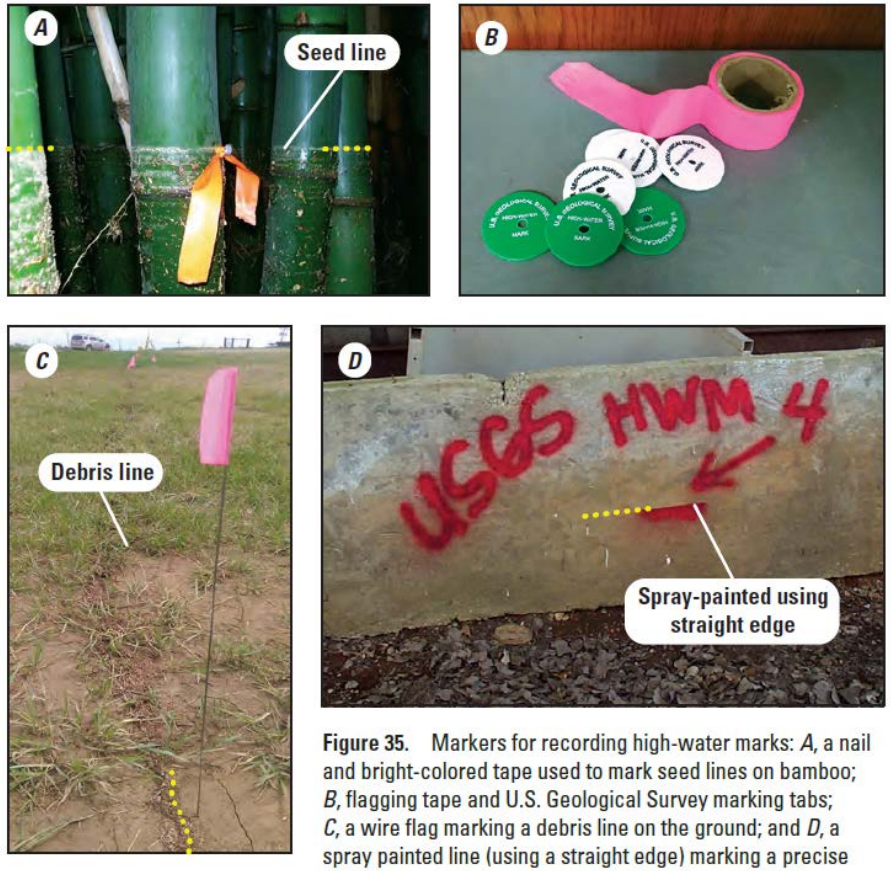


Figure 35. Markers for recording high-water marks: *A*, a nail and bright-colored tape used to mark seed lines on bamboo; *B*, flagging tape and U.S. Geological Survey marking tabs; *C*, a wire flag marking a debris line on the ground; and *D*, a spray painted line (using a straight edge) marking a precise high-water mark on a concrete divider. Photograph *B* by Walter Killion.

USE A CAMERA APP WITH GEO-LOCATION

- There a multitude of apps available for camera phones which allow the user to capture:
- Lat/long
- Direction of phone
- Height of phone
- GPS point

- All these features speed the capture and transmission of data points to a date set.

FEMA

RiskMAP
Increasing Resilience Together

Storm Surge vs Flood Inundation

- Storm Surge is measured by deployed pressure transducers at the coastline.
- Transducers record surge depth and timing with high accuracy.
- Not required if not a storm surge hurricane (ala Harvey)
- Great for Hurricanes like Michael, Ike (2008), Katrina and Rita

- Flooding more due to rainfall. Interior drainage issues and riverine gages for USGS selection criteria.
- Use the techniques in HWM manual
- Examples – Hurricane Harvey, Isaac (LA 2012)

USGS Data Sets and Maps

HARVEY DATA SETS AND MAPS

https://webapps.usgs.gov/harvey/

Various other flood event records, sorted by State and event

http://water.usgs.gov/floods/FEV/

SUMMARY

HIGH WATER MARKS – MEASUREMENTS OF FLOOD IMPACT OF EVENT

- URGENT NEED TO OBTAIN BEFORE EVIDENCE DISAPPEARS
- HURRICANES PROVIDE GREAT OPPORTUNITY TO MOBILIZE/DEPLOY TEAMS BEFORE COLLECTION IS REQUIRED
- CELLPHONES OR NOTEPADS WITH GPS APPS AND CAMERAS, CAN READILY CAPTURE BASIC ABOVE GROUND LOCATIONS OF HWM.

Questions/Feedback/Reactions?

FEMA

Enabling citizen scientists to augment HWM collection

- FEMA is interested in expanding our coverage capabilities using crowd-sourced collection
  - Importantly, this is in addition to USGS or in times when USGS cannot deploy teams (*think force multiplier*…)
- An initial test used Civil Air Patrol to collect measurements in pre-determined locations following Imelda in Texas
- While significant challenges remain, we would like to team up with experts like the USGS to build this capability

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Call to Action

In your agency and the agencies you collaborate with:

1. Identify your team
2. Identify the core information needs
3. Develop a game plan

Template: https://napsg.maps.arcgis.com/home/item.html?id=2e6d28baecc5479096bfc499b2171f5c

Operational Game Plan

Lifeline	Core Information Need	Public	First Responders	Emergency Managers	Operational Game Plan
	Evacuation Status	Am I safe here?	What areas need to be evacuated?	What areas have been evacuated? Where do people need assistance?	Sherriff's Office hand-draws evacuation zones and GIS Specialist updates the layer using pre-designated zones. Alerts are shared via WEA and social media with link to Public Information Map.
	Shelter Status	Where can I go to be safe?	Where do I take evacuees?	Where are the evacuees? What are their needs?	Mass Care lead changes the status of shelters and edits attribute information (e.g., number of people, capacity, etc.) as needed.
	Road Status	How can I get there?	How do I get to those in need?	What is the status of transportation systems?	Public Works provides internal feed of road status, GIS Specialist updates the layer.

Technical Game Plan

Lifeline	Core Information Need	Hosted	Edit Access	View Access	Technical Notes	Technical Game Plan
	Evacuation Status	ArcGIS Online Feature Layer for editing Feature Layer View for viewing	First Responders, Emergency Management	+Public, once approved by PIO		Web AppBuilder App for internal editing. Web AppBuilder for public information map.
	Shelter Status	ArcGIS Online Feature Layer for editing Feature Layer View for viewing	Mass Care Leads	+Public, once approved by PIO		Web AppBuilder App for internal editing. Web AppBuilder for public information map.
	Road Status	ArcGIS Enterprise Feature Layer as live feed Feature Layer View for viewing	Public Works	+Public	Requires FME or GeoEvents	Web AppBuilder App for internal editing. Web AppBuilder for public information map.

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What's Next?

- Daily Geospatial Coordination Calls (during disasters) and Weekly Newsletter https://public.govdelivery.com/accounts/USDHSFEMA/subscriber/new?topic_id=USDHSFEMA_1351
- FEMA Geospatial Resource Center: https://gis-fema.hub.arcgis.com/
- Hurricane Geospatial Game Plan: https://arcg.is/0jOODm
- Subscribe for MDWG updates / Request Slides: fema-mdwg@fema.dhs.gov

COVID-19 Resources

- COVID-19 Pandemic Operational Guidance for the 2020 Hurricane Season https://www.fema.gov/media-library/assets/documents/188203
- COVID-19 Hot-Wash Questionnaire: https://arcg.is/ODeue
- Hot-Wash Recording and Materials: https://www.napsgfoundation.org/resources/covid-19-hot-wash-part-1/

COVID-19 Hot-Wash Questionnaire

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Thank you!

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