Post-disaster building health science response for portfolio property owners and managers

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2021 Atlantic Hurricane and Tropical Storm Names | The Weather Channel - Articles from The Weather Channel | weather.com

2021 U.S. billion-dollar weather and climate disasters in historical context

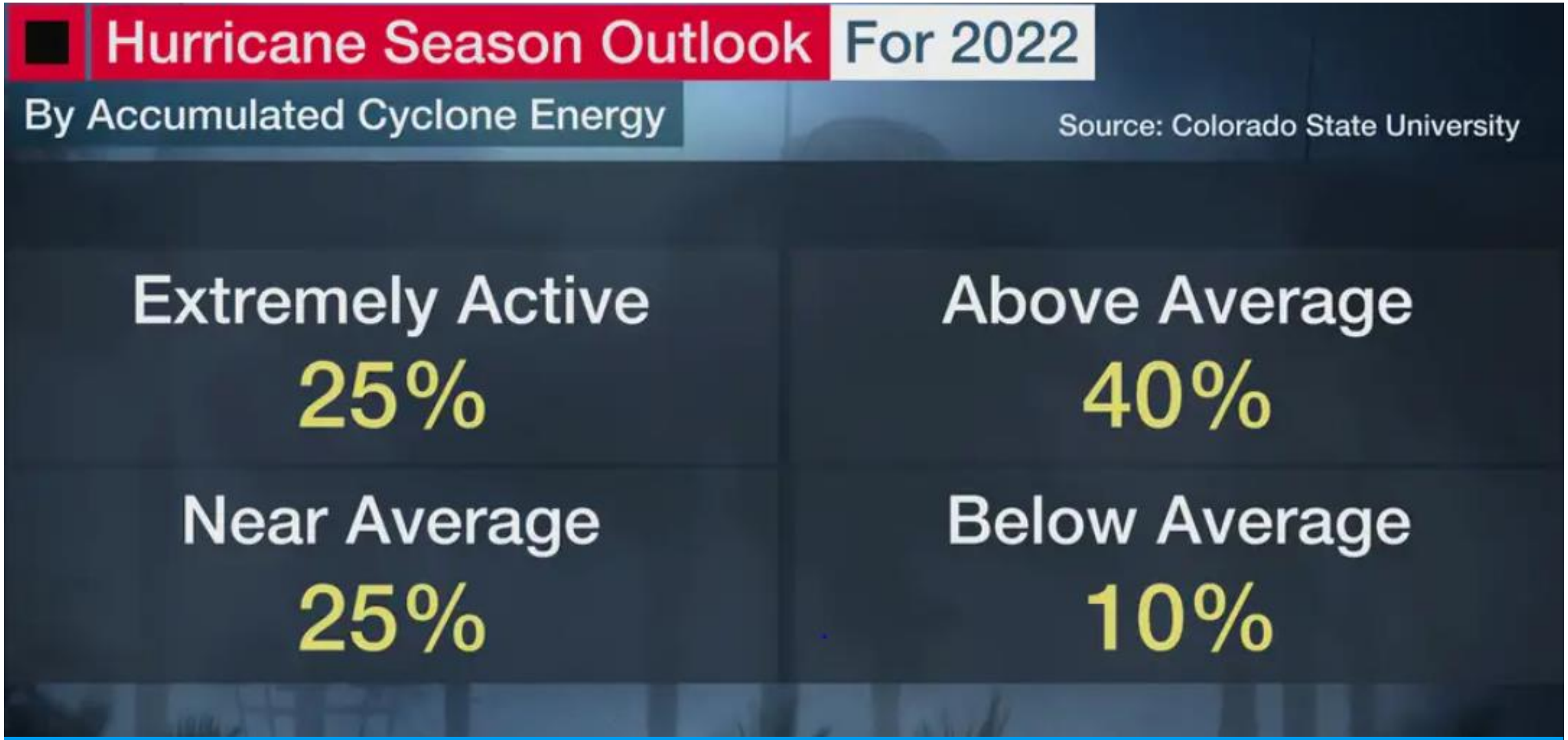
BY ADAM B. SMITH

PUBLISHED JANUARY 24, 2022 | UPDATED MARCH 17, 2022

COMMENTS

Last week, our team at NOAA National Centers for Environmental Information (NCEI) released the final update to its 2021 Billion-dollar disaster report (**www.ncdc.noaa.gov/billions**), confirming what much of the nation experienced throughout 2021: another year of frequent and costly extremes. The year came in second to 2020 in terms of number of disasters (20 versus 22) and third in total costs (behind 2017 and 2005), with a price tag of $145 billion.

2021 U.S. billion-dollar weather and climate disasters in historical context | NOAA Climate.gov



2022 Atlantic Hurricane Season Likely to Be Active, CSU Report Says | The Weather Channel - Articles from The Weather Channel | weather.com

2022 Hurricane Season outlook

- NOAA Forecast Released in May
- 13–16 Named Storms
- 6–8 Hurricanes
- 2–3 Major Hurricanes

[Colorado State University releases first look at 2022 Hurricane Season (fox4now.com)]

Lawrence Malizzi

- 32 years experience
- Emergency Response Coordinator
- Example Experience- Hurricanes Katrina, Rita, Isaak, Harvey, Irma, Florence, Michael, Ida; Superstorm Sandy; and numerous oil/chemical spills
- Insurance loss control & claims support and due diligence

Brian Reilly

- 30 years of experience
- Oil Spill Response, NRDA, Natural Area Restoration, Disaster Response
- Disaster Experience: Hurricanes, Wildfires, Structure Fires, Freezes
- Oil Spill Experience: Deepwater Horizon, Texas City Y, Rattlesnake Bayou
- Weird Work: Packaging contaminated cash from flooded banks

Michael B. Kaniuga, CIH, CSP

- Over 20 years of experience
- Specializes in forensic investigations related to IAQ and built environments.
- Leads large teams of environmental professionals during natural disaster response.
- Provides internal technical leadership and development of standards for response staff

Alie Nicotera

- 11 years experience
- Post-storm work includes Katrina, Rita, Gustav, Unnamed Storms 2016 (LA), Maria, Laura, Delta, Zeta, and Ida.
- Project/emergency work includes CDBG-Disaster NEPA, wetland delineations/impact permitting, endangered species, wildlife rehabilitation, NRDA, due diligence, disaster response, moisture/mold mapping, and air monitoring.

Emergency response (ER) safety moment

- Become familiar with and follow the approved response H&S Plan
- Travel risks (car, boat, ATV, helicopter, walking)
- Weather risks (check with situation unit)
- Communication risks (follow communication plan/have backup)
- Chemical risks (approved PPE)
- Biological risks (snakes, insects, noxious plants)
- Exposure risks (sun, heat, cold)

Agenda

1. Overview
2. Client Representatives Perspective – Brian Reilly
3. Licensing Requirements, Staffing and Logistical needs, and Reporting and Quality Control – Michael Kaniuga
4. Field Staff Considerations – Alie Nicotera

Attendee introductions

- Name, Title
- Disaster Response Experience
- Day Job and Location
- Course Expectations?
- Ask Questions!

Client Representatives Perspective

Brian Reilly

Types of disaster response

Natural disaster

- Tornados
- Earthquakes
- Floods
- Blizzards
- Wildfires
- Hurricanes

Natural disaster

- Fire
- Crime
- Sabotage
- Terrorism
- Vandalism
- Spills
- Explosions
- Cyber

Response considerations

- There are different requirements of emergency response, depending on the size and complexity of facilities.
- Certain strengths and weaknesses at the impacted site will either help or hinder the emergency response. It is important to know what they are.
- Response and recovery work in disaster-impacted areas presents safety and health hazards that should be properly identified, evaluated, and controlled in a systematic manner to reduce or eliminate occupational safety and health risks to response and recovery workers.

Disaster Response

Goal

get the properties open as quickly as possible while keeping employees and customers safe

Challenge

more than 1500 sites nationwide, hundreds of properties could be impacted by a storm

What we do?

CK is an environmental consulting firm specializing in Emergency Response

We follow the Incident Command System that establishes a clear chain of command and organizational structure

We are on site to manage the environmental vendors and assist with cash and SDB recovery

We review the environmental reports and recommend cleanup actions to get the banks open safely

Objective is to maintain safety and logistical field efficiency

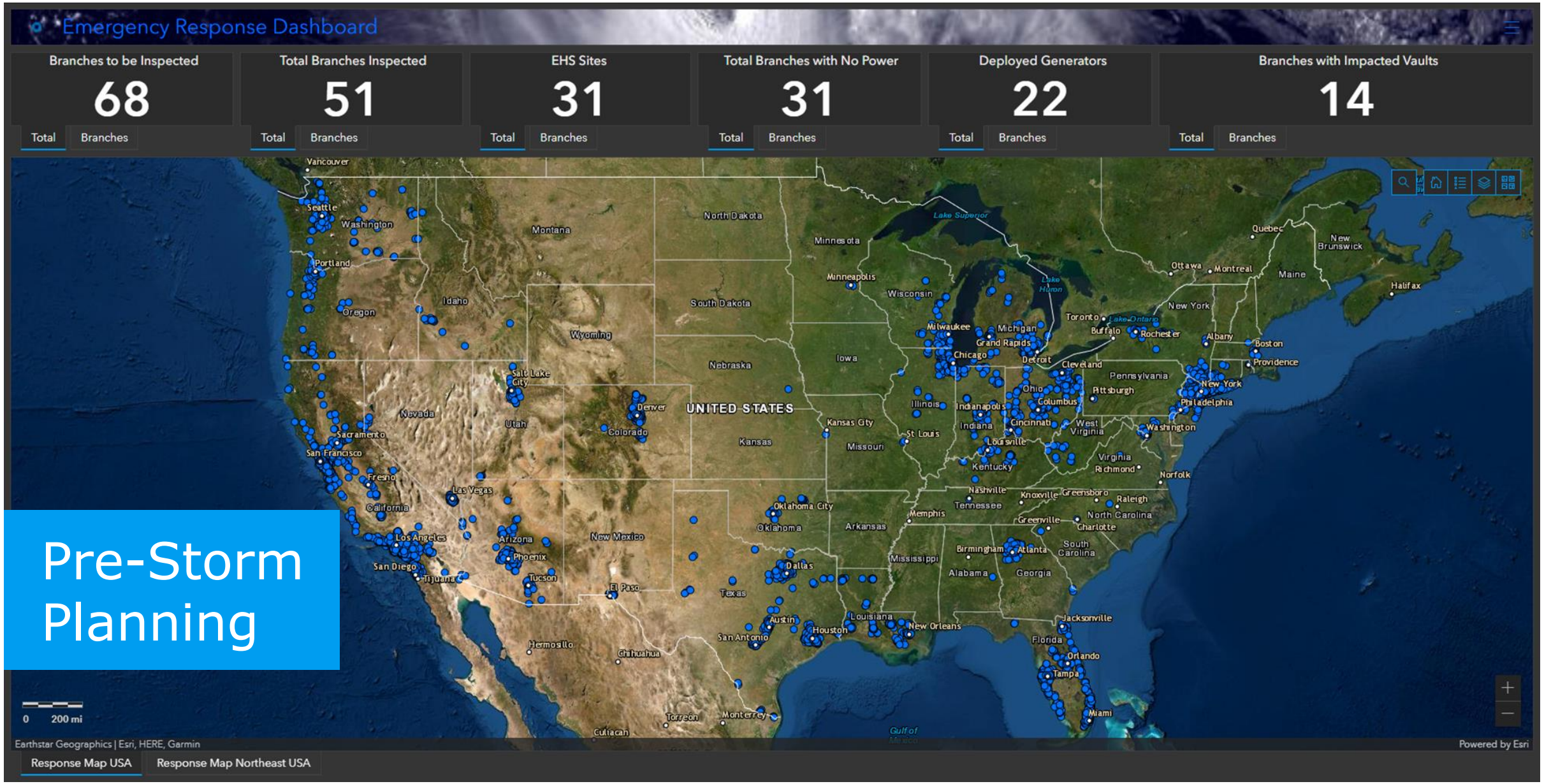
Response Planning

Start Planning Early

- Drill storm response in April
  - Know your roll
  - Know your team
- Review policies so everyone understands what is expected
- Review the process so everyone understands the steps that will occur
  - ACM testing before demolition
  - Cash removal before rebuild

Pre-Storm

- CK provides storm tracking for Bank using the EHS dashboard
- CK will staff the command center to have boots on the ground 2 days prior to landfall
- CK will contact EHS vendors for a commitment of teams to survey branches as needed
  - Strategically place EHS vendors to divide the work so one company or lab is overworked
  - Arrange for EHS vendors to have Knox Box keys18


Emergency Response Dashboard
Branches to be Inspected
68
Total
Branches
Total Branches Inspected
51
Total
Branches
EHS Sites
31
Total
Branches
Total Branches with No Power
31
Total
Branches
Deployed Generators
22
Total
Branches
Branches with Impacted Vaults
14
Total
Branches
Pre-Storm Planning
UNITED STATES
Vancouver
Seattle
Washington
Portland
Oregon
Idaho
Montana
North Dakota
Minnesota
Minneapolis
Wisconsin
South Dakota
Wyoming
Nebraska
Iowa
Salt Lake City
Nevada
Utah
Colorado
Denver
Sacramento
San Francisco
Fresno
California
Las Vegas
Los Angeles
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El Paso
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Pittsburgh
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Greensboro
Raleigh
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Charlotte
Greenville
South Carolina
Birmingham
Atlanta
Georgia
Florida
Jacksonville
Orlando
Tampa
Miami
Lake Superior
Lake Huron
Lake Ontario
Toronto
Buffalo
Rochester
New York
Albany
Boston
Providence
Philadelphia
Washington
Pennsylvania
Ottawa
Montreal
Quebec
New Brunswick
Maine
Halifax
Hermosillo
Chihuahua
Torreon
Monterrey
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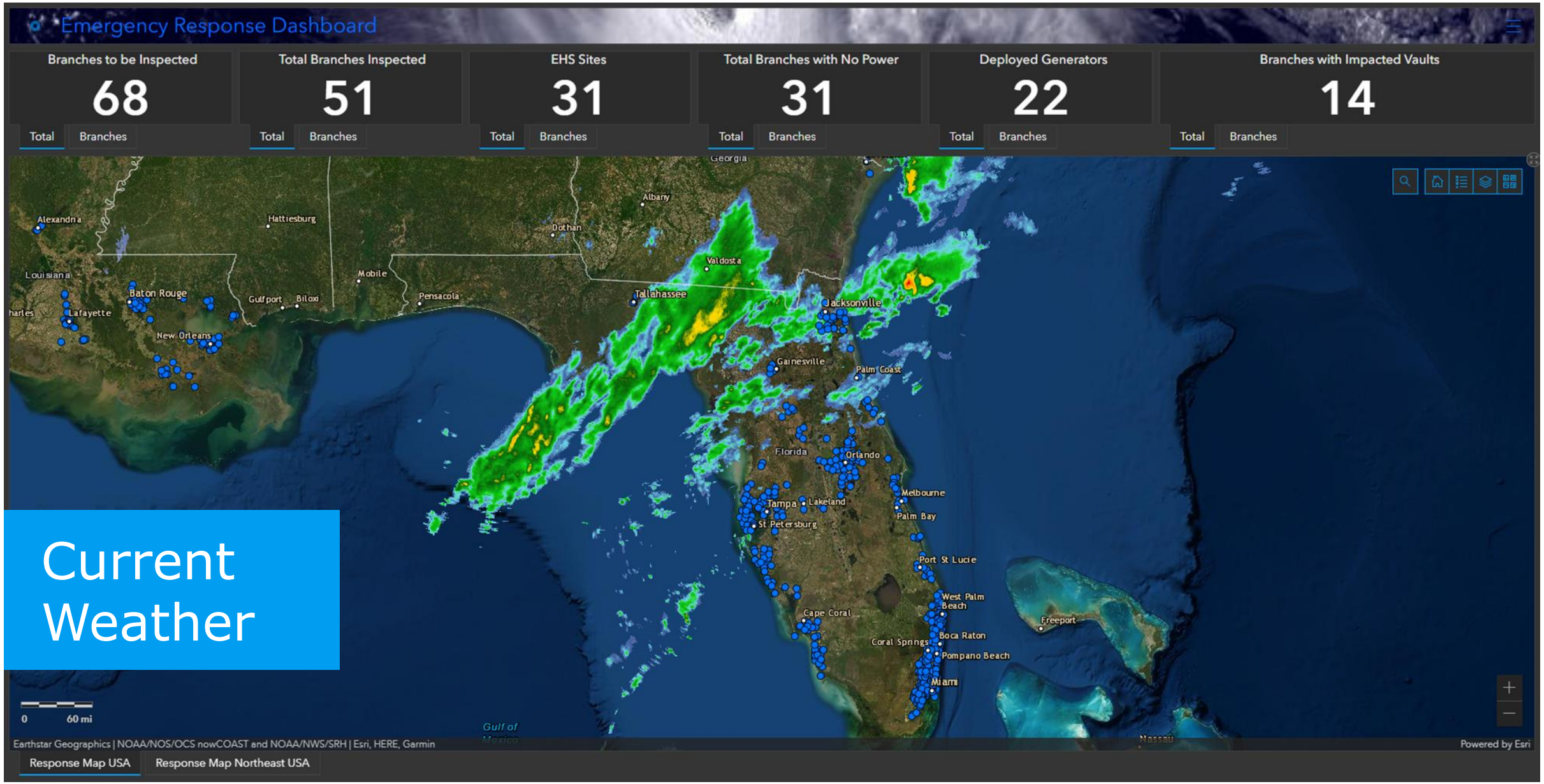
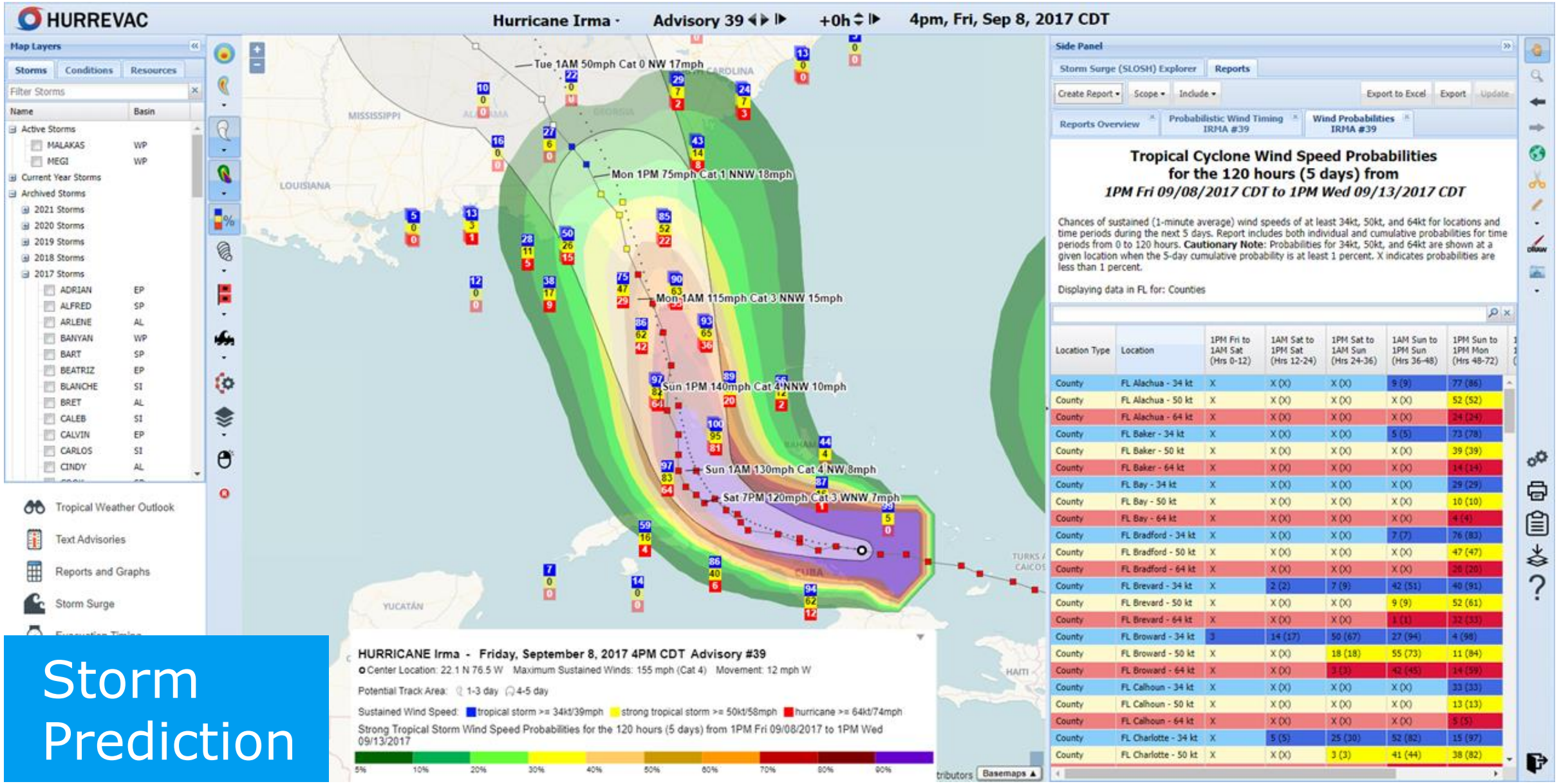
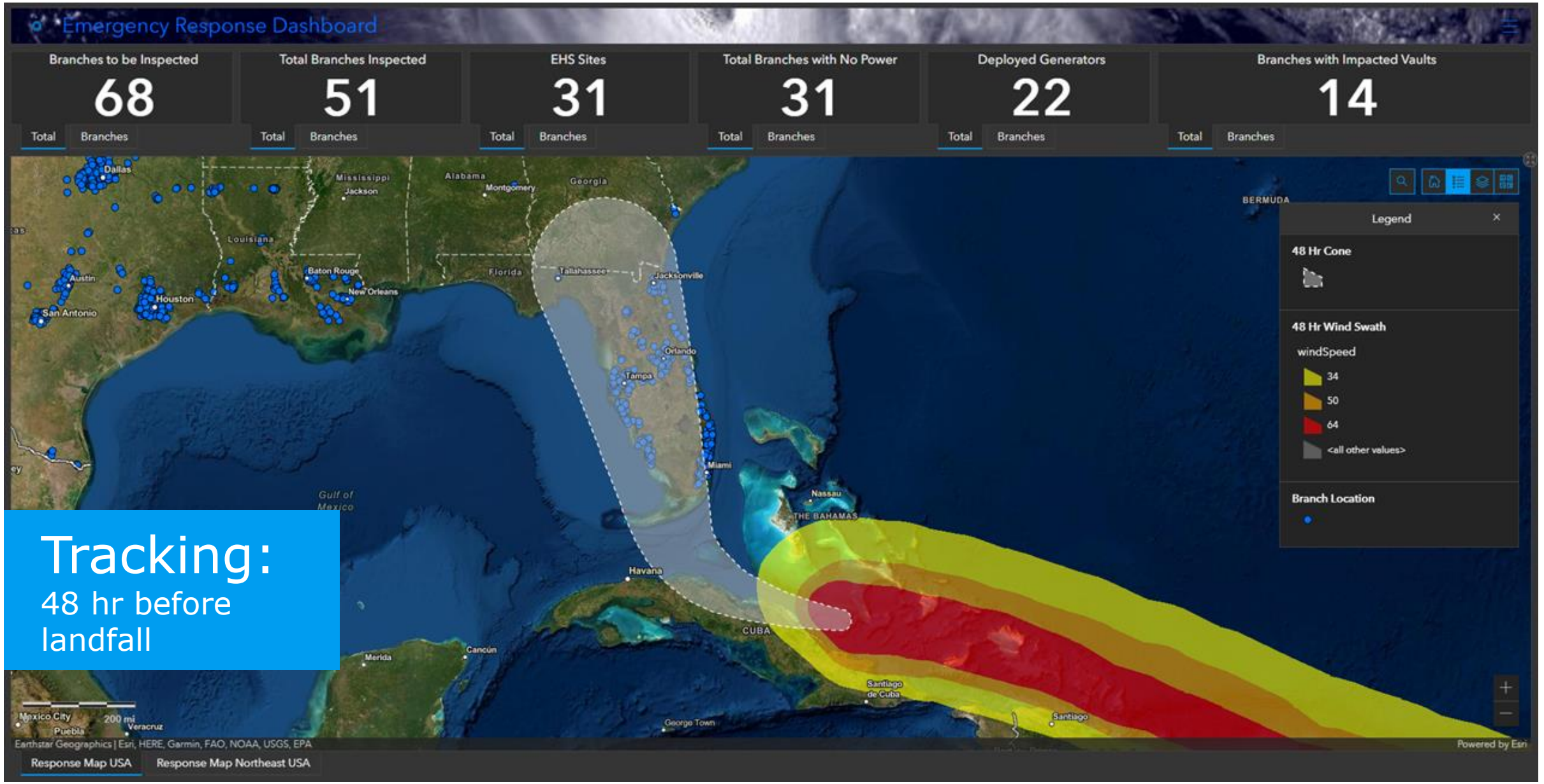
200 mi
Earthstar Geographics | Esri, HERE, Garmin
Powered by Esri
Response Map USA
Response Map Northeast USA



Current Weather



Storm Prediction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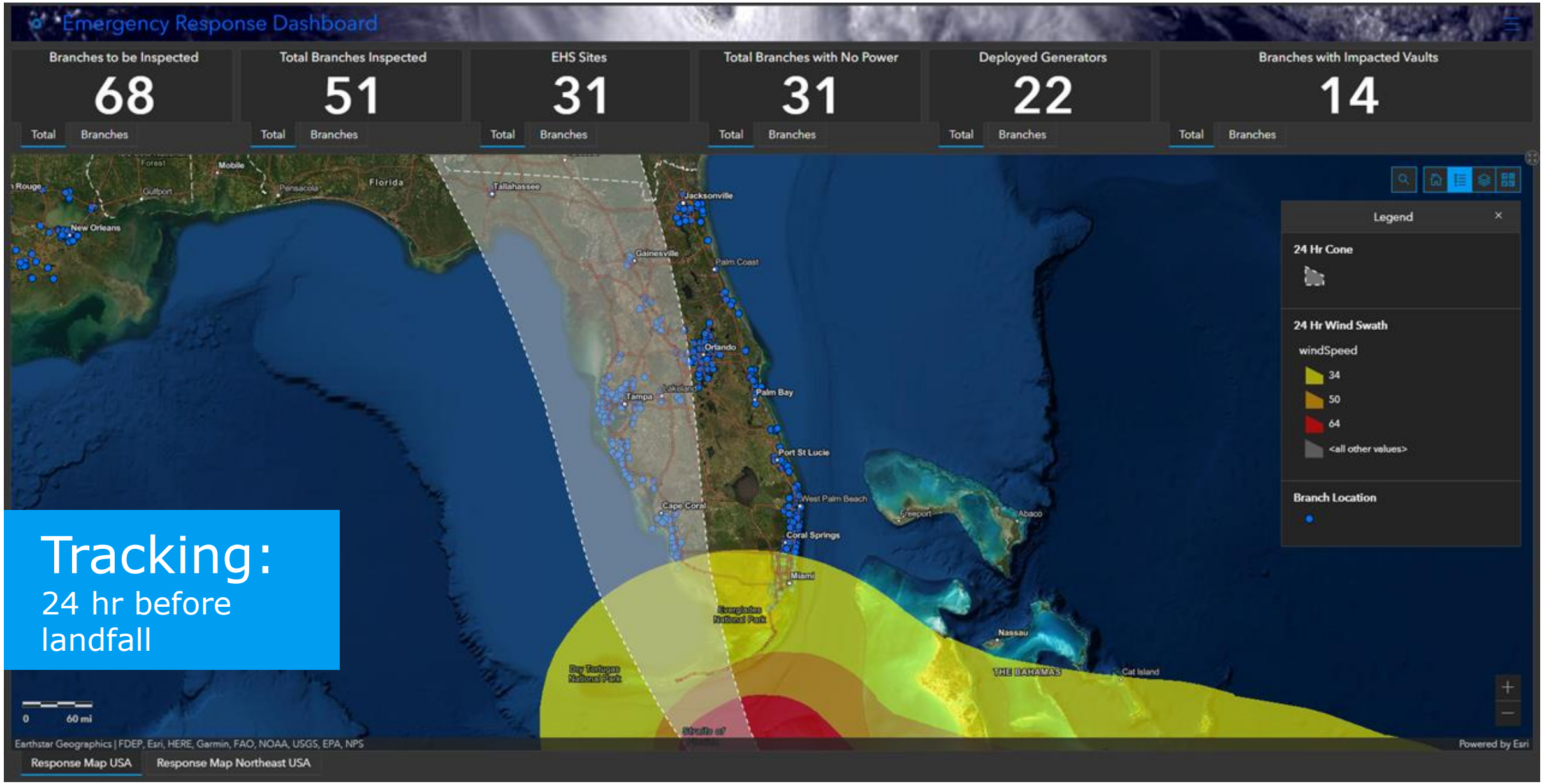
Branches
Branches with Impacted Vaults
14
Total
Branches
Legend
48 Hr Cone
48 Hr Wind Swath
windSpeed
34
50
64
<all other values>
Branch Location
Tracking:
48 hr before landfall
Response Map USA
Response Map Northeast USA
Earthstar Geographics | Esri, HERE, Garmin, FAO, NOAA, USGS, EPA
Powered by Esri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windSpeed
34
50
64
<all other values>
Branch Location
Tracking:
24 hr before landfall
Jacksonville
Gainesville
Palm Coast
Orlando
Tampa
Palm Bay
Port St Lucie
West Palm Beach
Cape Coral
Coral Springs
Miami
Nassau
THE BAHAMAS
Cat Island
Abaco
Freeport
Tallahassee
Pensacola
Mobile
Gulfport
New Orleans
Florida
0
60 mi
Earthstar Geographics | FDEP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS
Powered by Esri
Response Map USA
Response Map Northeast USA

Post Storm

NOTIFY ERC IMMEDIATELY FOLLOWING EVALUATION OF EACH SITE!

Southeast & South Central Regions Property Evaluation

Greens Crossing ERC Phone 281-775-1801

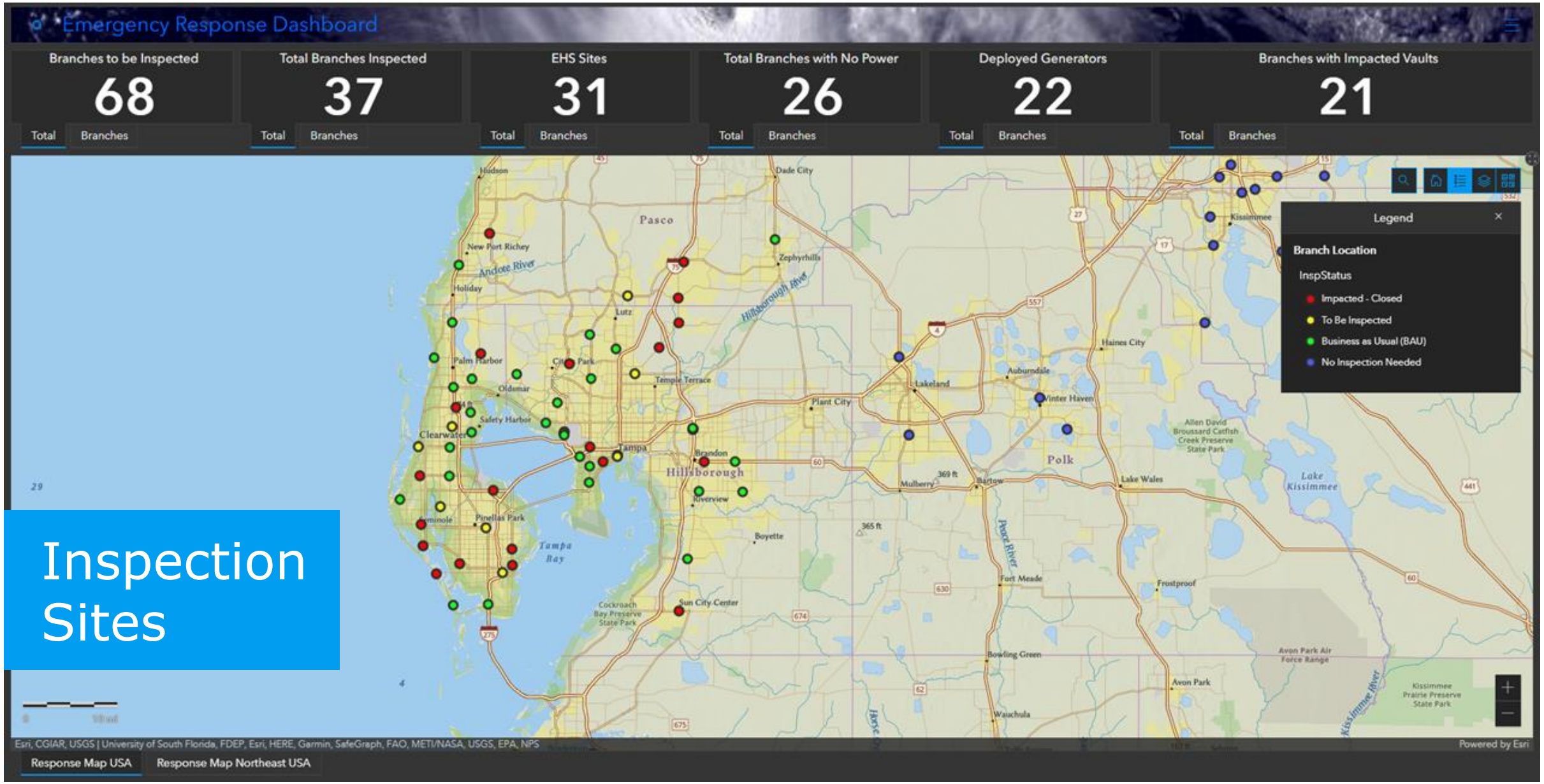
Zachary ERC Phone 225-658-5866
Plantation ERC Phone 954-453-0380
Tampa ERC Phone 813-432-3169

SAFETY FIRST - If you answer YES to any of the questions below, DO NOT ENTER site and contact ERC immediately.

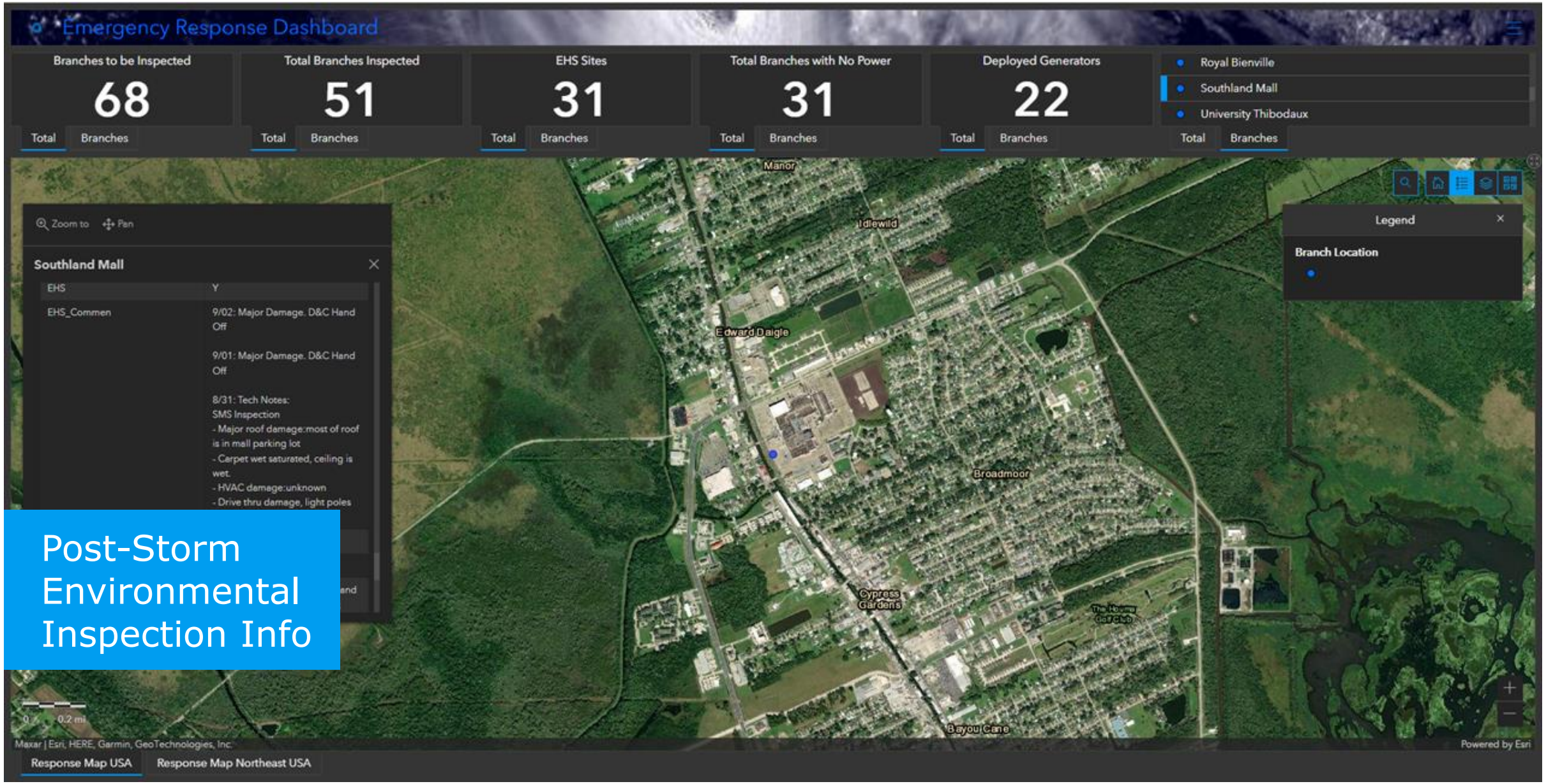
Is there possible structural damage?
Are there potential electrical hazards?
Are there potential environmental hazards?

Property ID** Must HAVE		Date of Evaluation	
Street Address		Time of Evaluation	
Scope of Damage	Minor Medium Major	Inspector	

		Yes	No	Unknown	Comments	Command Center Only
	Is Branch Open?					Work Order #/Vendor
	MTS Accessible?					
Exterior Assessment	Is Site Access Blocked?					
	Utility Power (electric/gas/water)					
	Power Lines Down					
	Trees Down					
	Exterior Façade Damage/Doors					
	Windows Damage					
	Roof Damage					
	Drive Thru Damage (Canopy, Lighting)					
	Parking Lot Flooding					
	Structural Damage					
	Fence/Trash Enclosure Damage					
	Light Poles Down/Damage					
Interior Assessment & Equip Evaluation	Carpet Damage					
	Walls Damage					
	Ceilings Damage					
	Water Infiltration/root cause					
	Elevator Damage					
	Electrical/Lighting Damage					
	HVAC Damage					
Bank Equipment	VAT Damage					
	ATM Damage					
	Night Drop Damage					
	Pylons/Signage/Letting Issues					
Life Safety & Environmental	Generator Connection Issues					
	Plumbing/Lift Station Damage					
	Fuel Leaks Observed					
	Telephones Working					
	Janitorial Services Required					
	Vandalism					
	Environmental Survey Required/Issues					
OTHER	Comments					
Municipality Approved for Re-Entry? Y/N		YES or NO				On the Tracker? Yes or NO
Next Inspection Location?						



Inspection Sites



Post-Storm Environmental Inspection Info

Inspection reports

Inspections will be completed by the Service Providers

- Bank EHS and CK will review every inspection sheet to determine if the site requires an Environmental Survey

EHS is looking for Damaged Building Materials

- Mold = health issues for bank employees and customers
  - Rubber backed carpet traps water and creates mold
  - Wet wallboard creates opportunity for mold
- Asbestos = requires abatement if disturbed during reconstruction
  - Carpet Mastic, Drywall and Ceiling Tiles could contain asbestos
  - Bank will get fined for improper disposal of ACM
- Floodwater is a Category 3 water
  - Includes sewer, storm surge, rising rivers
  - High potential for Contamination – Grossly Unsanitary

RAMBOLL CK

Actions

- Get building on power so the AC can lower humidity and slow mold growth
- Fix the minor damage and dry the banks so they can open
- More involved repairs are done at night and weeks
- Money is removed prior to major repairs/rebuilds

Vaults and cash

- Wet money is packaged for destruction by the Federal Reserve Bank
- Impacted Safe Deposit Box vaults may require restoration
  - Move SDB to recovery site
  - Emergency box openings

Licensing Requirements, Staffing and Logistical needs, and Reporting and Quality Control

Michael Kaniuga

Hurricane pre-planning and coordination for mitigation and recovery

Examples of hurricane plan activities to mitigate the impact of recovery include	
01	Implementing hurricane preparedness procedures as scheduled, including mitigation steps (discussed later) to minimize the impact on decontamination and recovery
02	Dispatching emergency teams to designated locations
03	Communications and notifications to site contacts
04	Shut down and isolate the facilities in a timely manner that protects personnel and equipment
05	Make the most efficient use of limited resources
06	Leave the facilities in the most protected situation possible, allowing for quick reactivation/re-occupancy

Built Environment Response Considerations

Pathogens in Flood Water

- Flood water with pathogens from sewage, farm animal wastes, and wild animal populations, or that occur naturally in bodies of water.
- The kind and level of contamination found in flood water varies considerably from one location to another and over time.
- A great deal of the hazard depends on the nature, size, and location of sources and the direction and volume of flood waters.

Pathogens in Flood Water

The following biological agents represent examples of pathogens that can be found in flood water and residue

Parasites

- Giardia
- Entameba

Bacteria

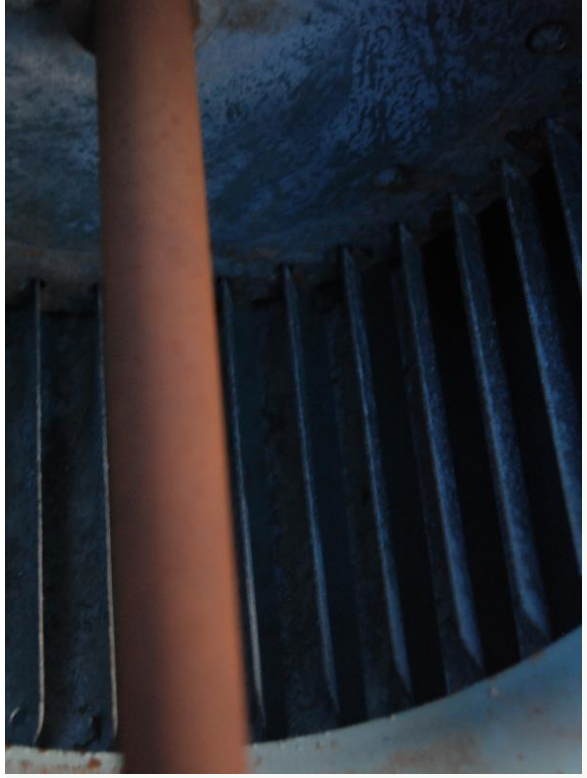
- Campylobacter
- Salmonella
- Norovirus
- Enterococci
- E. coli
- Legionella

Viruses

- Hepatitis A
- Rotavirus
- Adenovirus
- Enterovirus
- Parvovirus

Impacted HVAC Systems

- Hygiene Evaluations
- Post-Remediation Verification
- IAQ Operations Review



Impacted Plumbing Systems

Hazardous Building Materials (HBMs)

HMBs which may be encountered during the response:

- Asbestos Containing Materials (ACMs)
- Lead and Lead Based Paint (LBP)
- PCB
- Mercury
- Arsenic
- Polychlorinated biphenyls (PCBs),
- Pesticides, fuels, and solvents,
- Radiological residues, and
- Other chemical and certain biological contaminants

HBM – Asbestos Containing Materials

What is it?

- Asbestos is a fibrous material
- It occurs naturally in many parts of the world.

Where is it?

- Decorative plaster finishes
- Suspended ceiling tiles
- Thickening agents in paints
- Exterior siding shingles
- Vinyl flooring
- And numerous other building materials

HBM – Asbestos Containing Materials

Regulations

- Identification
- Removal
- Handling
- Disposal
- Exposure

Licensing

- Licensing requirements vary from state to state
- During emergencies regulatory agency may elect to temporary modify licensing requirements

HBM – Lead and Lead Based Paint

What is it?

- A heavy metal which includes all metallic lead and all inorganic lead compounds
- Some of the properties of lead that make it a useful structural material are:
  - Low Melting Point and High density
  - Very abundant
  - Very malleable (easy to shape).

Regulations

- Identification
- Removal
- Handling
- Disposal
- Exposure

Where is it?

- Paint
- Plumbing components
- Window components
- And numerous other building materials

Licensing

- Licensing requirements vary from state to state
- During emergencies regulatory agency may elect to temporary modify licensing requirements

Mold and bacteria

- Mold growths, or colonies, can start to grow on a damp surface within 24 to 48 hours.
- Which disaster response can this apply
- What are the hazards of the item?
- What's are the response points of the item
- What are the regulations?
- What are some interesting sceneries for this hazard
- Assigned to who?

Steps in cleaning up and drying out

1. Evaluate and assess the water damage;
2. Determine the type of “water” involved;
3. Determine appropriate drying method;
4. Inspect and remove water;
5. Monitor restoration; and
6. Inspect and complete restoration.

Field Staff Considerations

Alie Nicotera

Percentages of post-Katrina illnesses

TABLE 1. Number and percentage of persons with selected illnesses after Hurricane Katrina, by residency status — New Orleans, Louisiana area, September 8–25, 2005

Selected illnesses	Relief workers		Residents		Unknown		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Infectious-disease–related								
Skin or wound infection	101	(19.1)	192	(12.8)	347	(16.2)	640	(15.4)
Acute respiratory infection	119	(22.5)	158	(10.5)	228	(10.6)	505	(12.1)
Diarrhea	11	(2.1)	52	(3.5)	83	(3.9)	146	(3.5)
Other infectious disease	36	(6.8)	109	(7.3)	143	(6.7)	288	(6.9)
Noninfectious-disease–related								
Rash	67	(12.7)	87	(5.8)	146	(6.8)	300	(7.2)
Heat-related	34	(6.4)	80	(5.3)	93	(4.3)	207	(5.0)
Nondiarrhea gastrointestinal	23	(4.4)	77	(5.1)	108	(5.0)	208	(5.0)
Renal*	8	(1.5)	44	(2.9)	35	(1.6)	87	(2.1)
Other classifiable illness†	22	(4.2)	52	(3.5)	88	(4.1)	162	(3.9)
Other illnesses	107	(20.3)	649	(43.3)	870	(40.6)	1,626	(39.0)
Total	528	(100.0)	1,500	(100.0)	2,141	(100.0)	4,169	(100.0)

* Includes kidney stones and renal failure (i.e., chronic and acute).
† Includes diabetes, cardiovascular conditions, obstetric/gynecologic conditions, and dental problems.

Field staff considerations

- Staff Availability
- Offsite Staff Support
- Travel/Lodging
- Training
- Equipment
- Site Access
- Safety
- Managing Subcontractor
- Conducting the Work/Stop-Work

- Text

Coordination of field staff for post-storm work

Items to have prepared prior to storm season:

- Management team in regions that can easily support field staff.
- Core staff with alternate options from across the country.
- Non-field staff for support in administrative tasks, such as logistics for travel/lodging and report writing.

Staff capabilities/needs

- It is important to understand the staffs capabilities prior to starting work.
- Do they need training prior to being onsite? Is onsite training easy/acceptable for the task?
- It is also important to be prepared for volume of work with available equipment.
- What equipment is needed for the work being conducted? Do we have enough? If we need rentals, do they need to be obtained from out of state prior to the event?

Conducting onsite work

- Safety – you are walking into buildings that could have extreme damage, no power, potentially people inside, hazardous substances, etc. How do you handle those conditions? What if you do not have access into the building at all?
- Conducting the Work - what is the best way to get everyone on the same page quickly? how to split staff appropriately to get work done correctly and efficiently?
- Managing Subcontractors – Have you worked together before? What is the best way to do separate task cohesively?
- Stop Work – What justifies a Stop Work in these situations?

STOP WORK AUTHORITY

Questions?

Thank you!

Bright
ideas.
Sustainable
change.

RAMBØLL