

Solid Waste Management of Disaster Debris Events



- Overview
 - About the Presenter
 - Preparations
 - Processes
 - Regulatory
 - Contractors
 - Community
 - Administrative
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- **DRC Sr. Advisor for Government & Client Relations**
 - 28 years with City of Houston
 - Appointed/retained by 3 successive Mayoral administrations.
 - Chief Operating Officer 2014 – 2020.
 - SWM Director 2007 – 2020.
 - Oversaw multiple disaster responses to include hurricanes, floods, tornados and drought.
 - Successfully collected, disposed/recycled more than 12 million cubic yards of disaster debris at a cost of nearly \$400 million.
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When Havoc Strikes! (and it will)

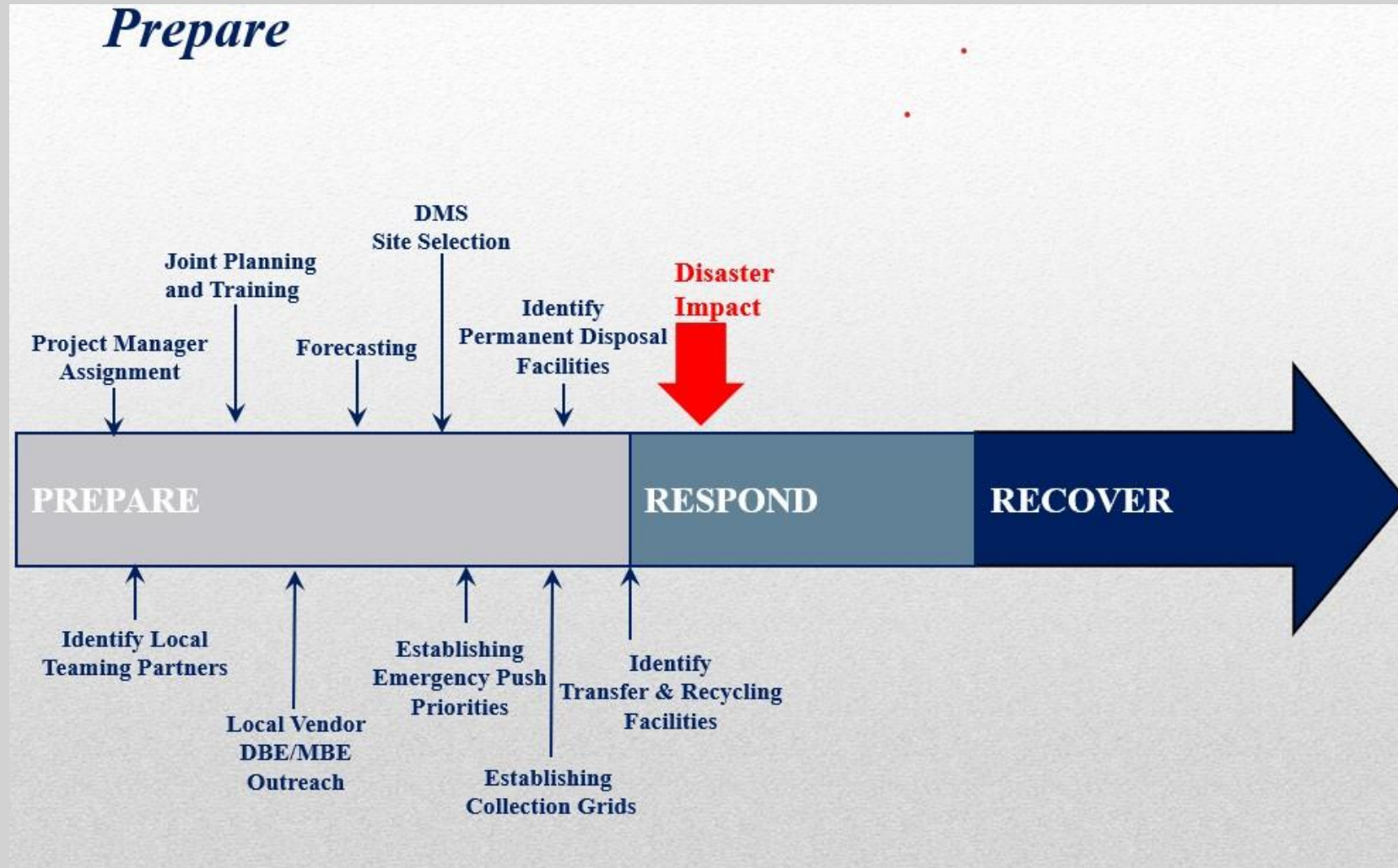
Sometimes local governments must respond to disasters that destroy large numbers of homes, **businesses and** buildings.

Cleanup activities related to returning to homes and businesses after a disaster can pose significant health and environmental challenges.

Effective debris management is critical to the economic and psychological health of a community and may have national or international implications if not properly executed.



Roles and Responsibilities Flow



Preparations

- Proper
- Preparation
- Planning
- Prevents
- Piss
- Poor
- Performance



The Anomaly Event and No Plan



Don't Get Too Comfy

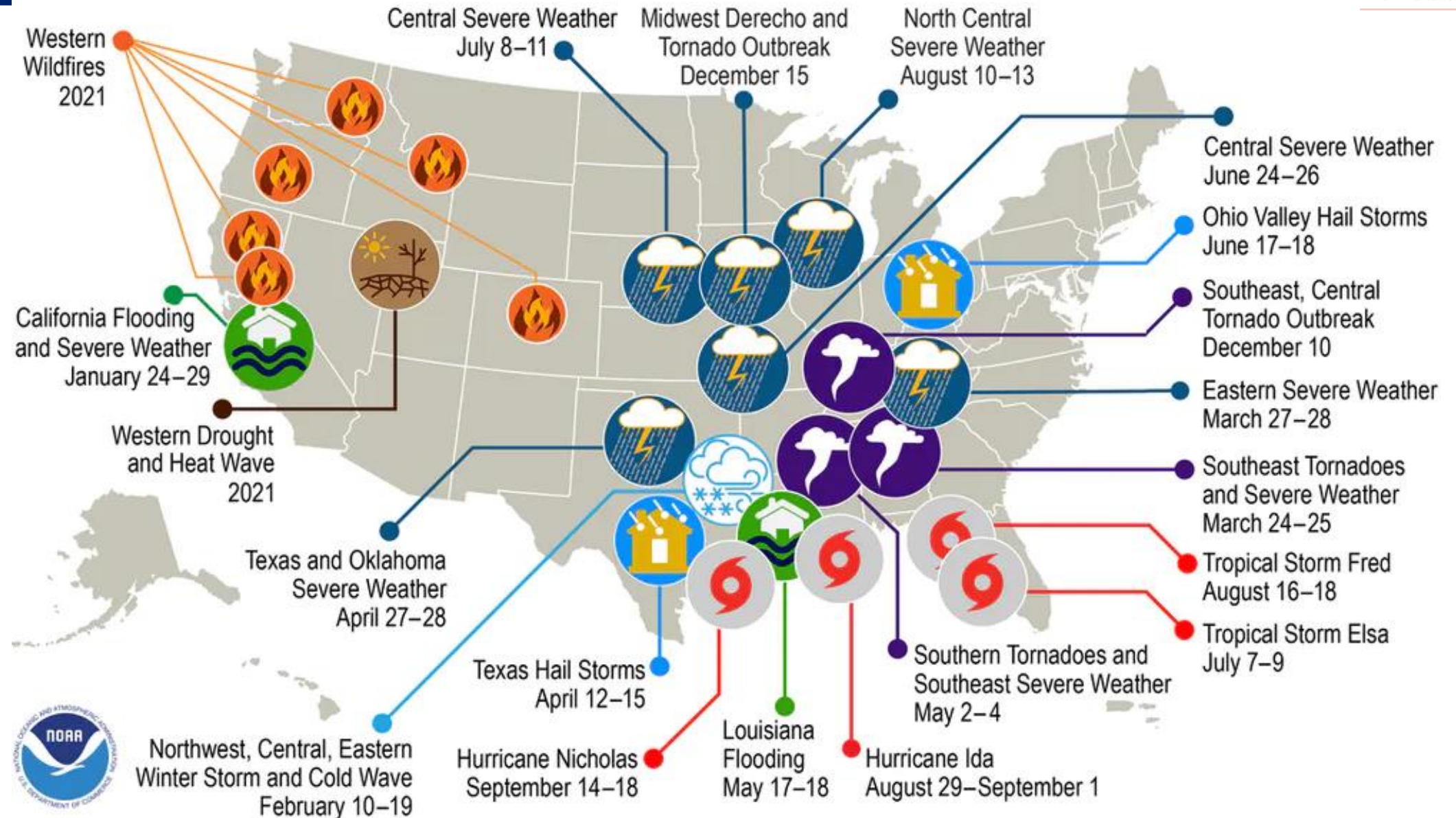
Risks Abound

- No jurisdiction is immune from disaster weather events.
- Every jurisdiction has a disaster risk profile.
- There are always anomalies to include man-made disasters:
 - Chemical, Biological
 - Explosions
 - Human Tragedies
- A jurisdiction's economic viability, community health and resilience is at risk when planning and preparedness aren't properly maintained or updated.
- Question: Is your jurisdiction willing to risk its economic viability and quality of life?
- Lowest prices are necessarily the best value.

Feeling Lucky?



U.S. 2021 Billion-Dollar Weather and Climate Disasters

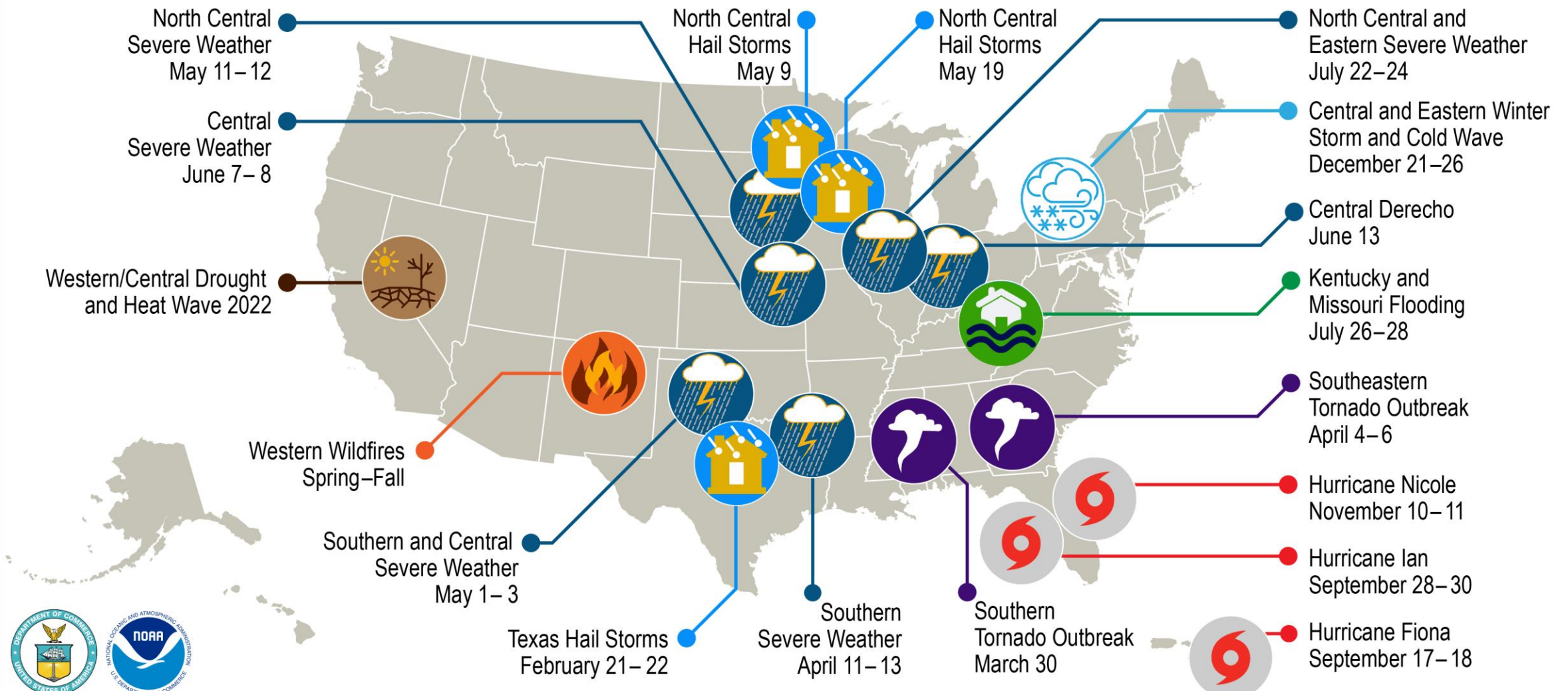


This map denotes the approximate location for each of 20 separate billion-dollar weather and climate disasters that impacted the United States in 2021



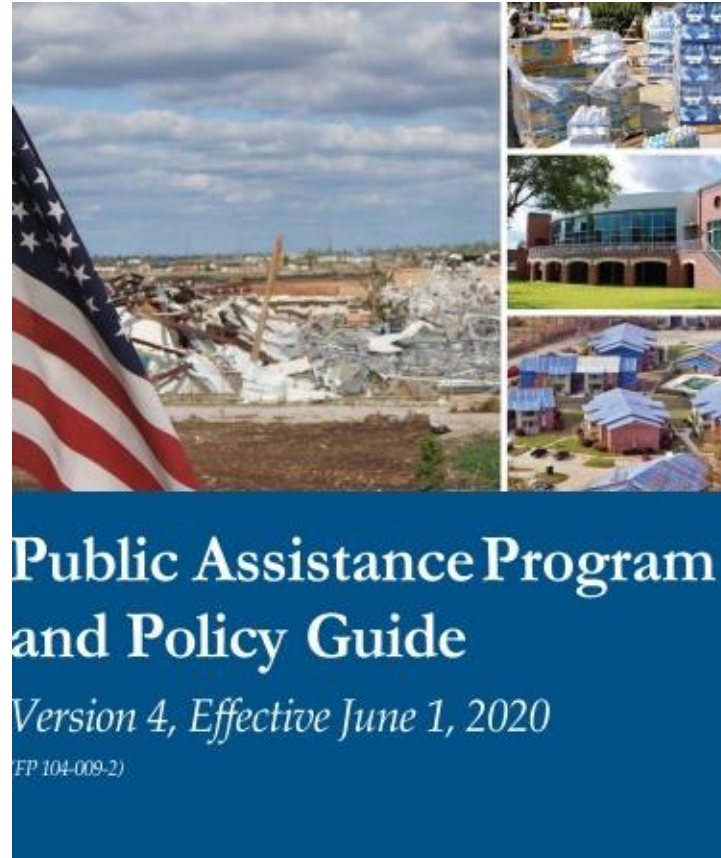
U.S. 2022 Billion-Dollar Weather and Climate Disasters

- Drought/Heat Wave
- Flooding
- Hail
- Hurricane
- Severe Weather
- Tornado Outbreak
- Wildfire
- Winter Storm/Cold Wave



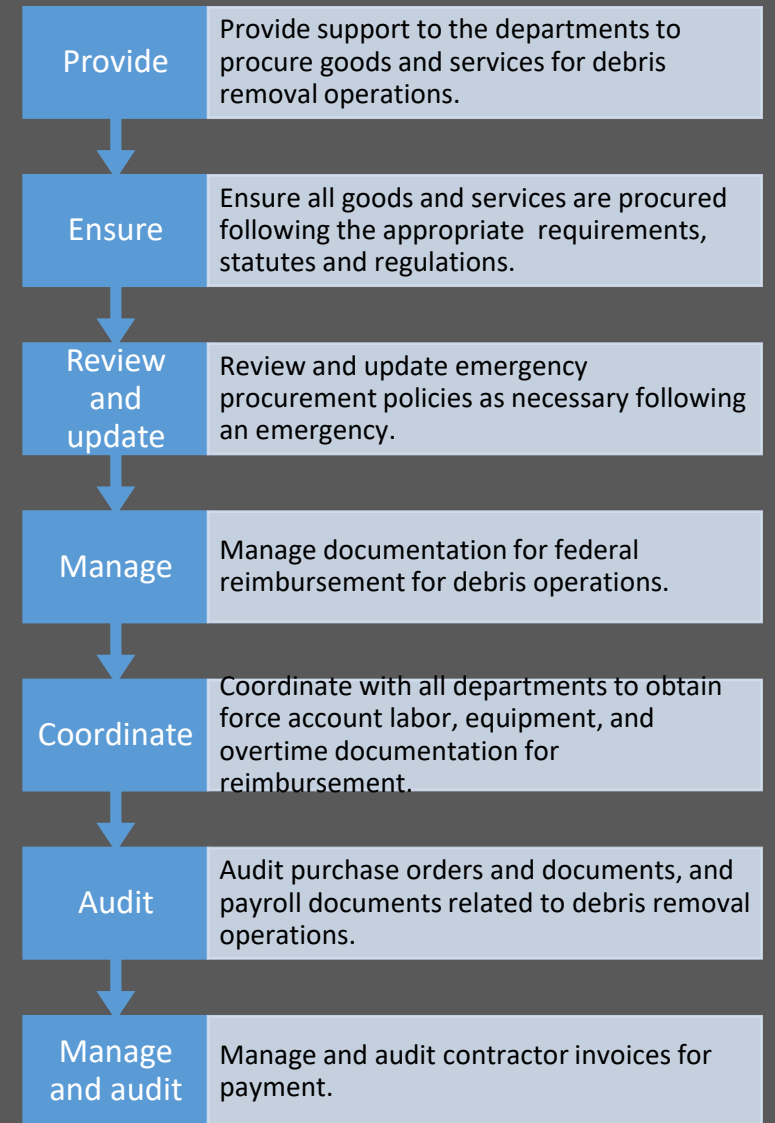
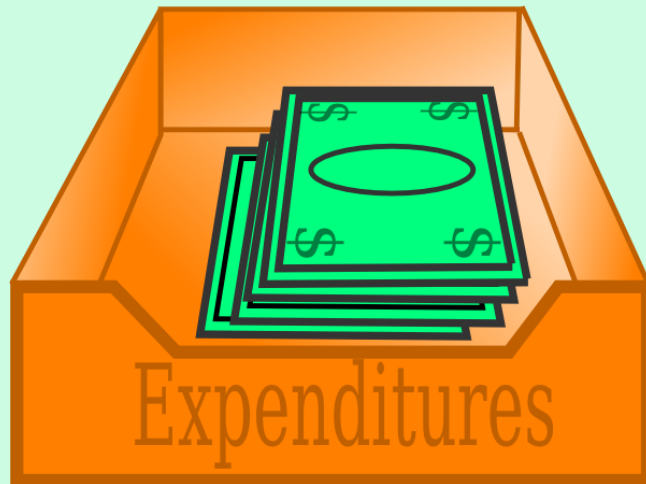
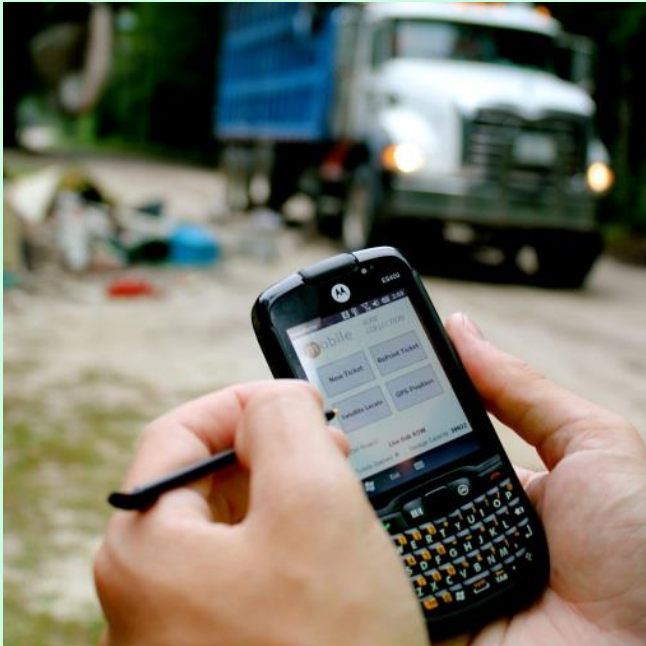
This map denotes the approximate location for each of the 18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.

Processes: Regulatory



- Stay abreast of state and federal regulations for monetary support. Not all events qualify.
- <https://www.fema.gov/assistance/public/tools-resources/per-capita-impact-indicator>
- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq.
- Keep your partners informed and up to date on administrative and operations actions/needs.

The End is the Beginning: Audit & Financial Readiness

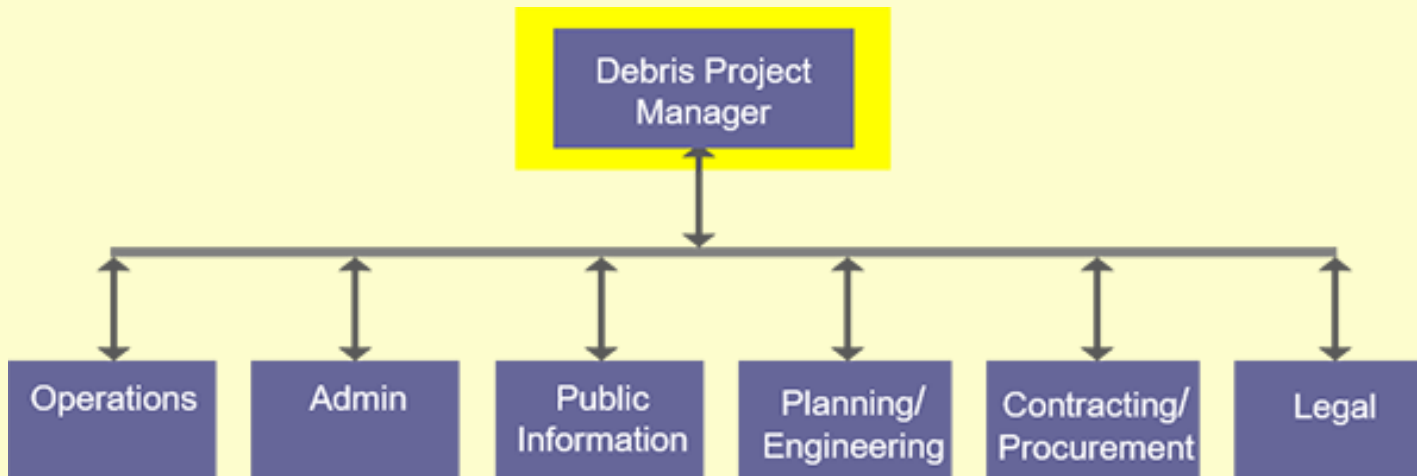


Roles and Responsibilities- Debris Manager (SWMD)

- Pre-qualify debris removal and monitoring service providers for municipalities to use during a large-scale debris-generating event
- Provide oversight of debris operations..
- Coordinate with OEM, other jurisdictions, state, and federal officials regarding debris operations.
- Coordinate with private owners of potential debris management sites. (DMS).
- Obtain DMS approval from regulatory agencies.
- Provide situational updates on debris operations to the emergency management coordinator and political leadership
- Maintain documentation for federal reimbursement for debris operations (through monitor firm).
- Coordinate with municipalities to negotiate inter-local agreements for disaster support for debris operations.
- Coordinate with regional, state and federal agencies for disaster support for debris operations.
- Ensure compliance with federal assistance programs for debris removal.



Processes: Debris Vendors



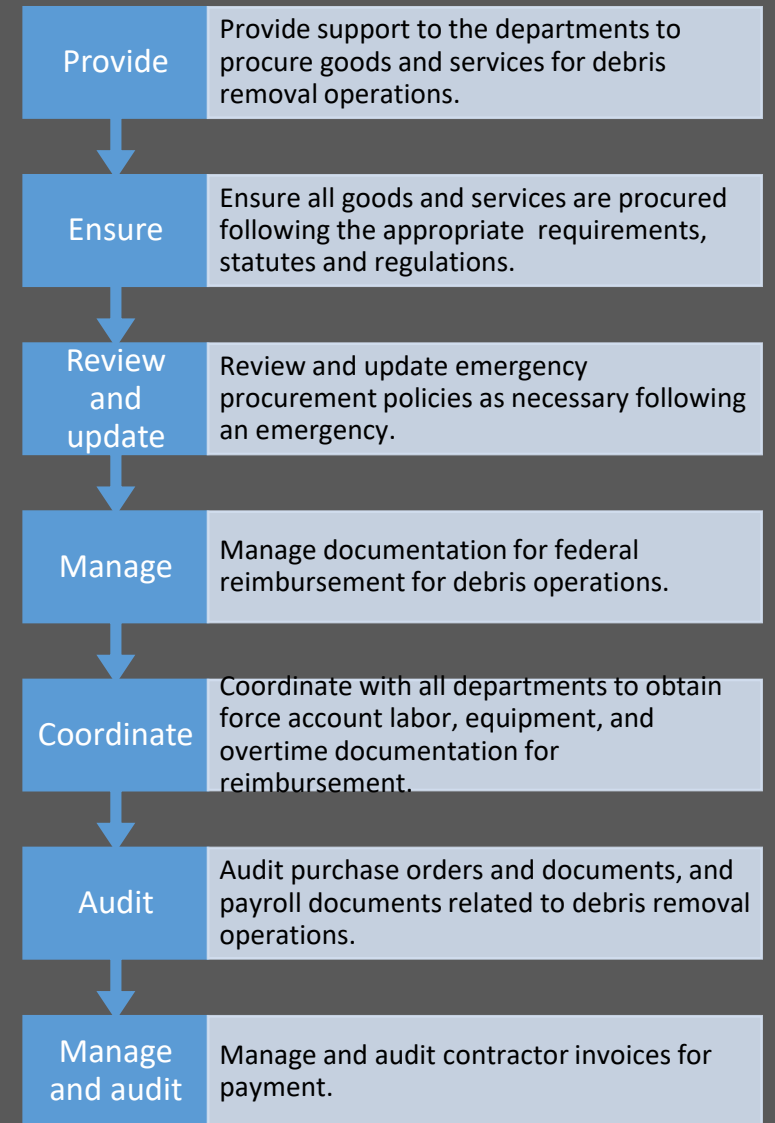
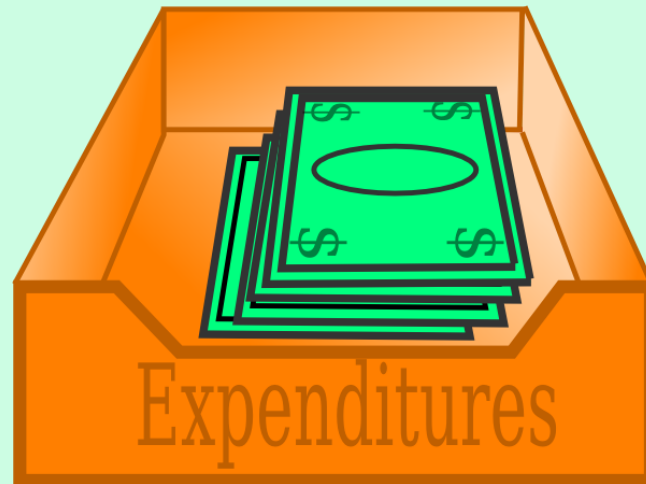
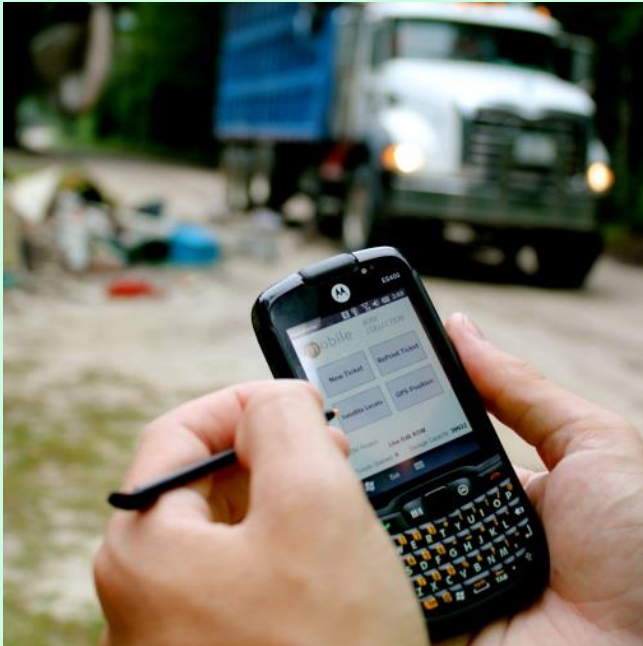
- A debris event is wieldy and requires a well-rounded team, both internally and externally.
- Contracted partners will and can include the following:
 - Debris Collectors
 - HHW Collectors
 - Debris Site Property
 - Debris Monitors/Admin
 - Recycling Vendors/Processors
 - Disposal Partners

Processes: Community and Public Information

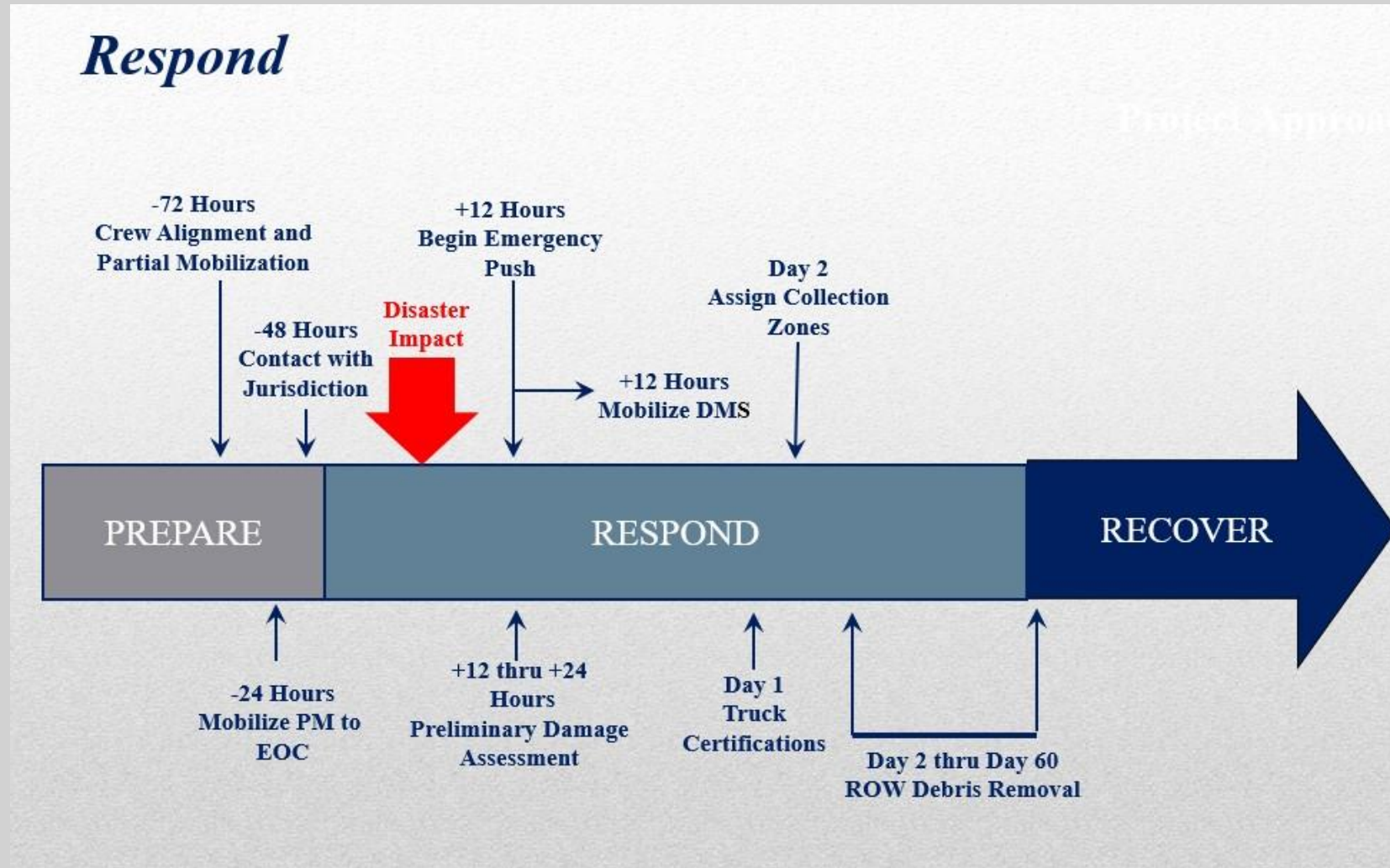
- Reliable and effective communication is a premium for a smooth and participative collection program.
- Public information messages can help ease the stress of what's currently at hand and help with the "psychological recovery".
- Provide press releases related to debris removal operations, set out procedures, and citizen debris drop off locations.



Processes: Finance & Admin



Roles and Responsibilities



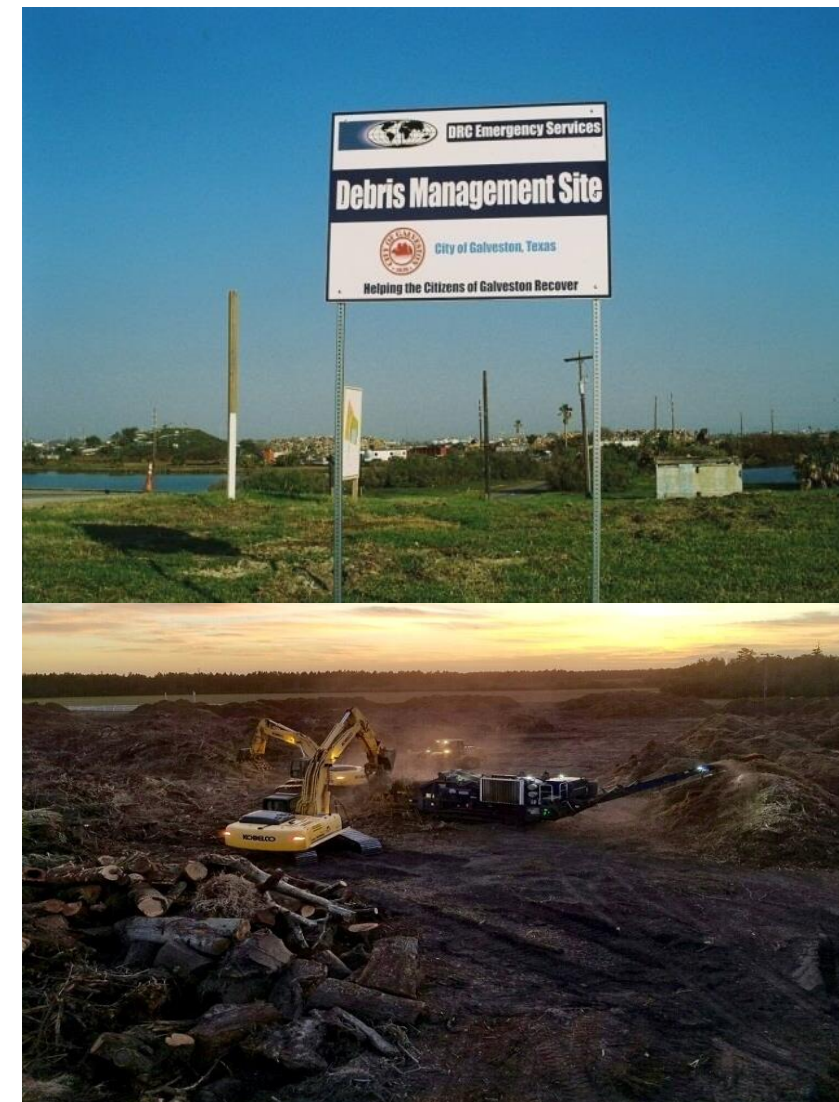
Pre-Identification of Debris Management Sites

DMS Site Selection and Criteria

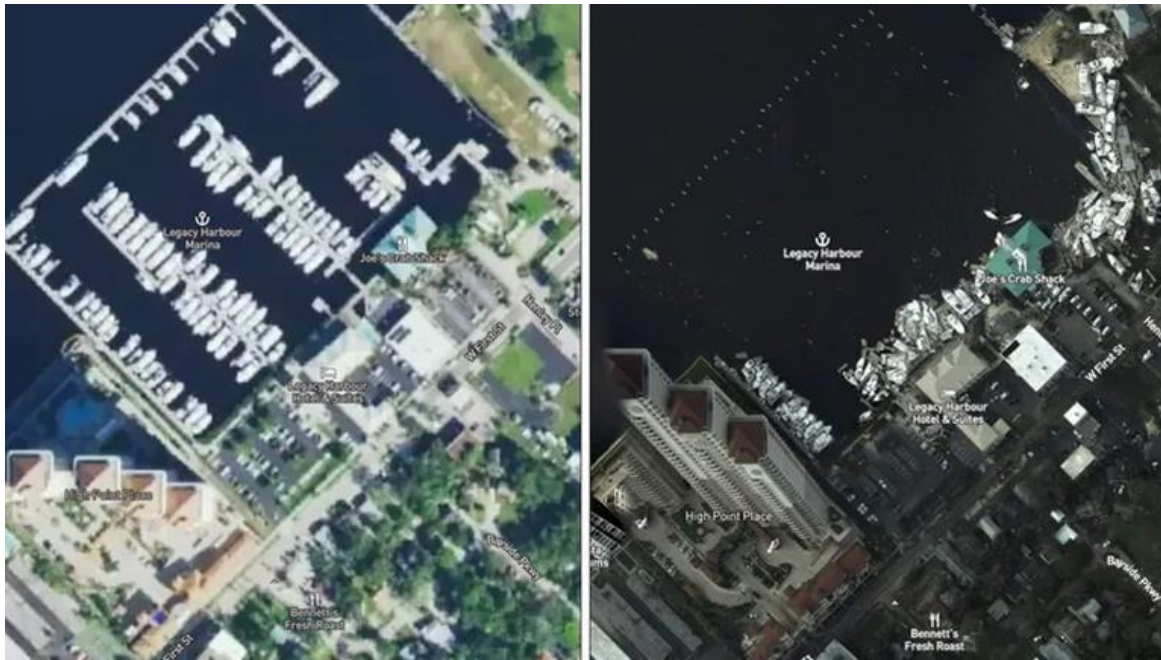
Criteria at a minimum will include:

- 🌐 Public versus private land considerations
- 🌐 Environmental agency approvals
- 🌐 Dust and fire mitigation
- 🌐 Ingress and egress considerations
- 🌐 Security features
- 🌐 Storm water controls considerations
- 🌐 Elevation
- 🌐 Sound buffers and fencing

Identification of Permanent Disposal Facilities, Transfer and Recycling Facilities



Preliminary Damage Assessment



Conduct windshield and/or aerial survey of impacted area(s) to formulate debris estimation by type.

Use USACE debris impact model tool:<https://www.usace.army.mil/Missions/Emergency-Operations/Disaster-Impact-Models/>

70 HOUR EMERGENCY PUSH

- **First Priority of debris removal is to provide safe passage for Medical, Power, Gas, Water, and Emergency Responders**

- Certify equipment
- Use unit rate tickets to log daily activity
- Advanced coordination with OEM and Transportation or Public Works Departments to manage priorities



Disaster Debris Collection



PICKING UP THE PIECES

Following these specific guidelines when hauling hurricane-related debris and household garbage to the curb will make for a speedier removal process

WRONG WAY

CROSSING THE LINE

➤ Any debris placed from the sidewalk toward your property will not be picked up. Contractors cannot collect items on private property.

PROPPING UP

➤ Do not set debris against trees or poles. Doing so makes it harder for cleanup crews to scoop up the items.



Sources:
Army Corps of
Engineers,
debris removal
contractors

STAFF GRAPHIC BY
DAN SWENSON

CORRECT WAY

Homeowners and businesses are being asked to separate debris into the following categories:

- 1 HOUSEHOLD GARBAGE**
- Bagged trash
 - Discarded food
 - Packaging, papers
 - All garbage should be placed curbside the night before the scheduled weekly pickup.

- 2 CONSTRUCTION DEBRIS**
- Building materials
 - Drywall
 - Lumber
 - Carpet
 - Furniture
 - Mattresses
 - Plumbing

- 3 VEGETATION DEBRIS**
- Tree branches
 - Leaves
 - Logs

- 4 HOUSEHOLD HAZARDOUS WASTE**
- Oils
 - Batteries
 - Pesticides
 - Paints
 - Cleaning supplies
 - Compressed gas

- 5 'WHITE' GOODS**
- Refrigerators
 - Washers, dryers
 - Freezers
 - Air conditioners
 - Stoves
 - Water heaters
 - Dishwashers

- 6 ELECTRONICS**
- Televisions
 - Computers
 - Radios
 - Stereos
 - DVD players
 - Telephones

HELPFUL HINTS

- A** Limit curbside garbage to two 32-gallon containers or eight trash bags
- B** Share piles with neighbors
- C** Refrigerator and freezer doors must be secured with duct tape

DEBRIS SEGREGATION PLAN



- Vegetative
 - Construction & Demolition
 - Bulky Waste (Carpet, Furniture, Mattresses)
 - White Goods
 - E-Waste (Appliances & Electronics)
 - HHW – Hazardous Waste – Oils
 - Soils & Sediment
 - Medical & Infectious Waste
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Leaners: Trees Must meet eligibility requirements:

- At least 6” in dia.
- Leaning 30% into ROW
- 50% crown destruction
- Exposed Heartwood
- Fallen in public area
- Falling is imminent

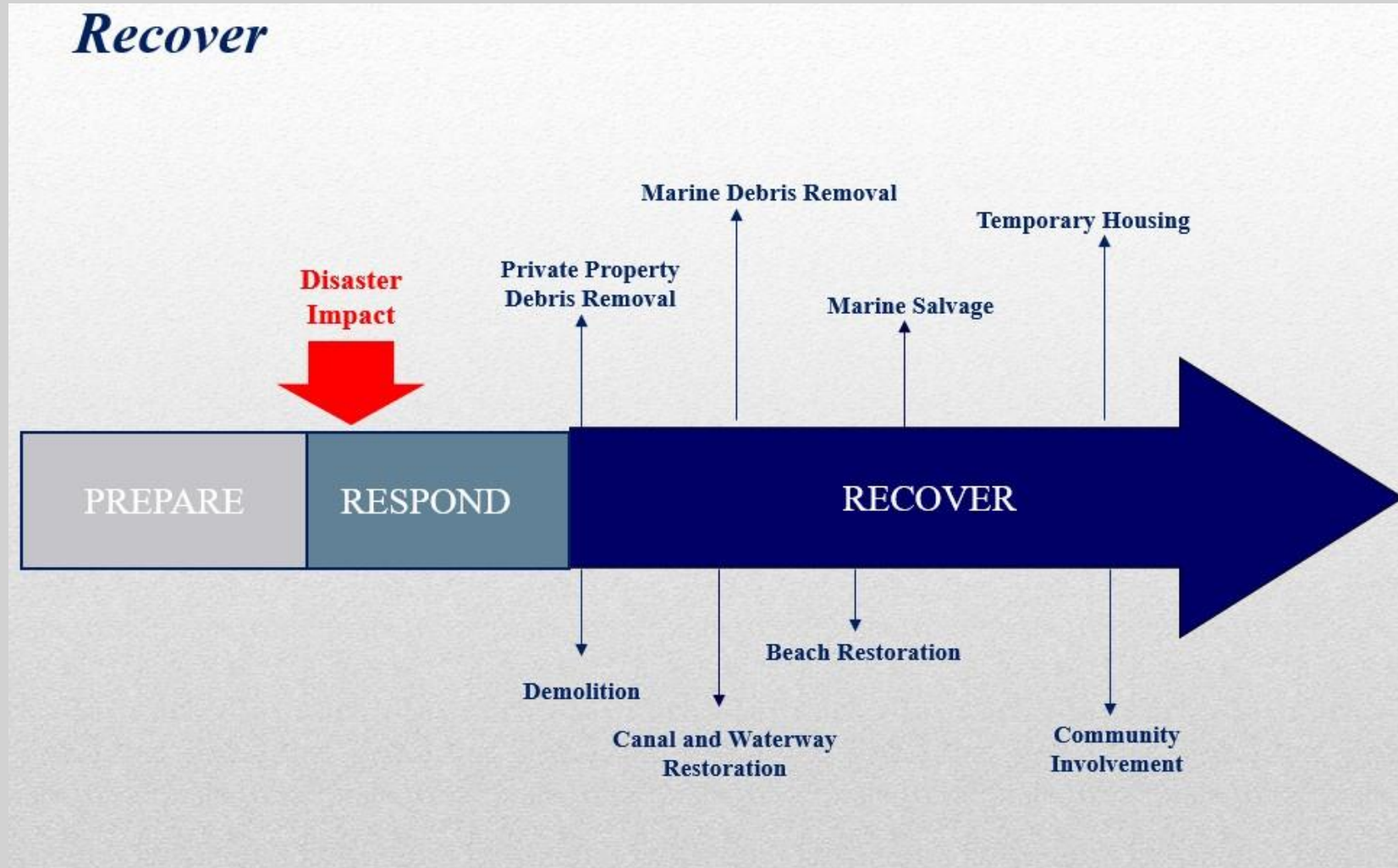


Hangers: Limbs must meet eligibility requirements:

- At least 2” in diameter
- On Improved Public Property
- Still in tree
- Public threat



Roles and Responsibilities



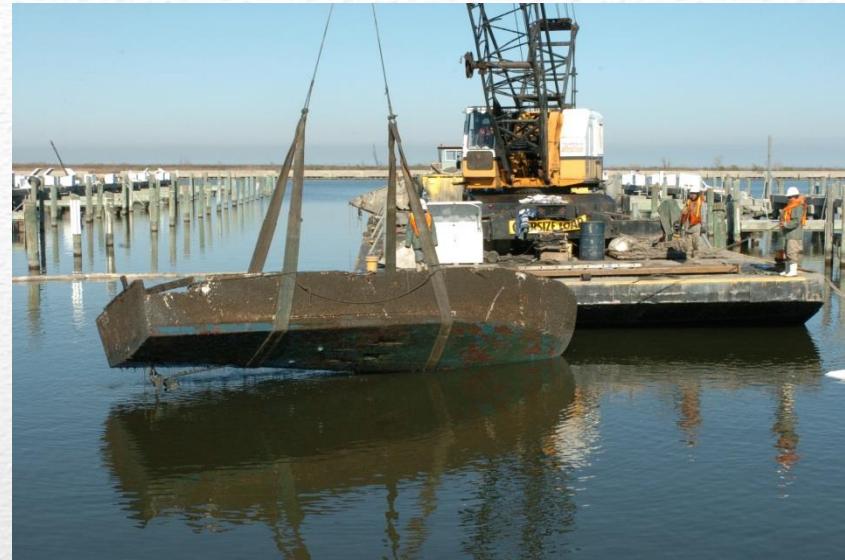
VEHICLE AND VESSEL REMOVAL



BEACH RESTORATION



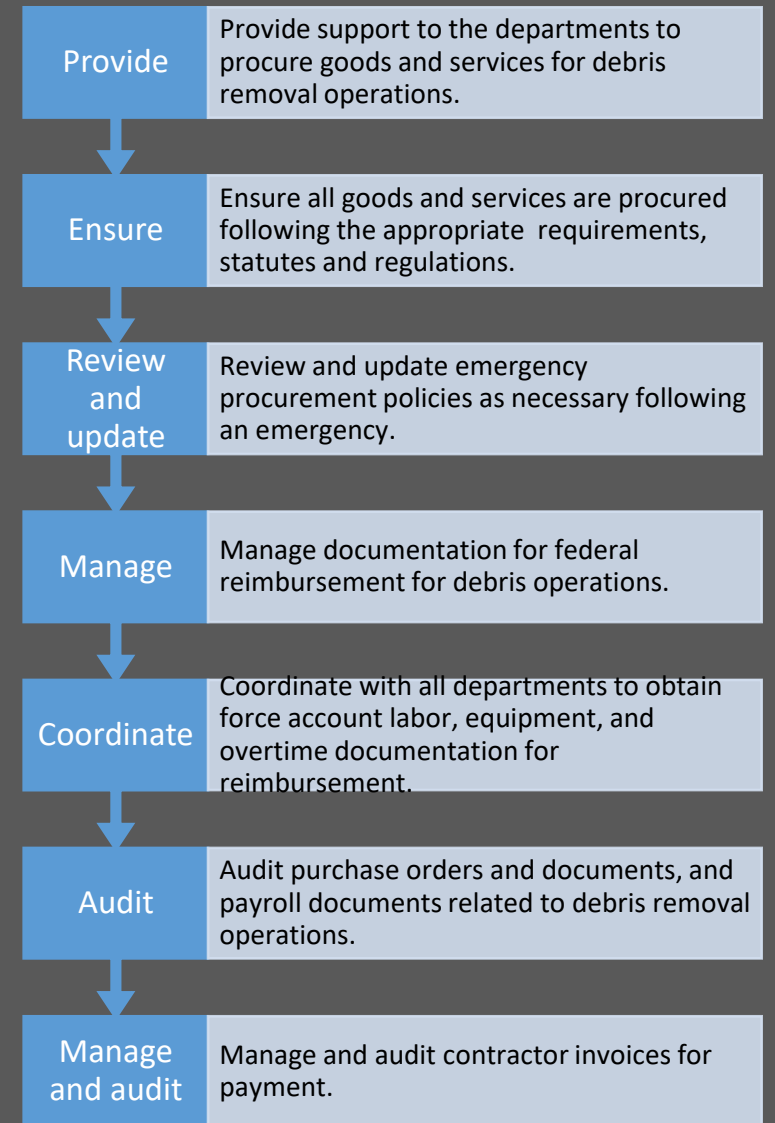
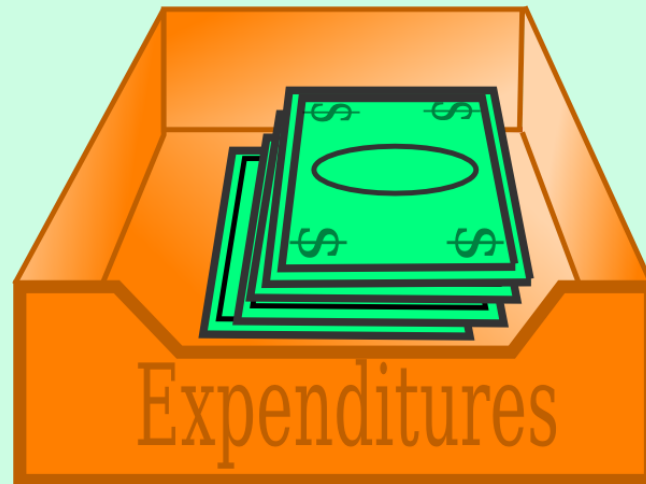
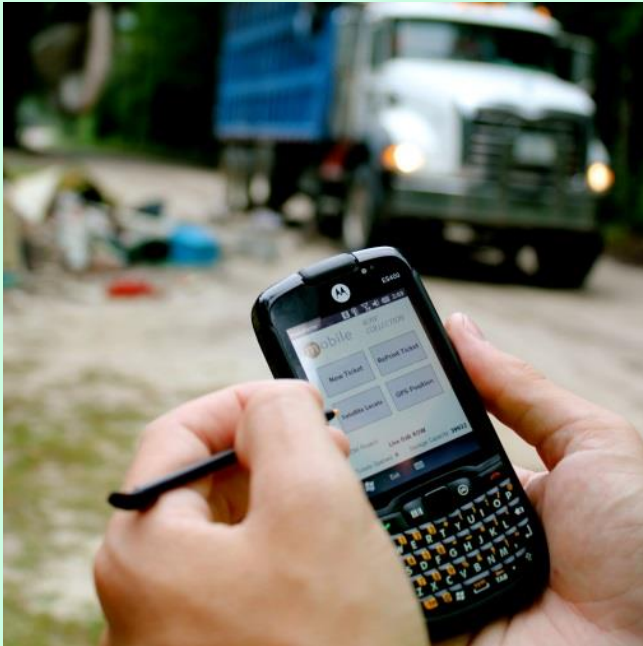
- **Marine vessel recovery: ports, lakes, rivers/channels/**
- **Waterways remediation: leaks/spills (BP Spill).**
- **Ensure you have an experienced and ready partner.**



CANAL AND WATERWAY DEBRIS REMOVAL AND RESTORATION



The End is the Beginning: Audit



Thank you - Questions

