



WHAT IS A DEBRIS MANAGEMENT PLAN?



WHAT IS A DEBRIS MANAGEMENT PLAN?



- **Written Document**
- **Establishes procedures and guidelines for managing disaster debris**
 - **Coordinate response**
 - **Environmentally responsible**





IMPORTANCE OF HAVING A PLAN



- Facilitate response and recovery activities
- Return to normalcy
- Reduce impacts to humans and environment
- Ensure effective use of resources
- Minimize costs





IMPORTANCE OF HAVING A PLAN

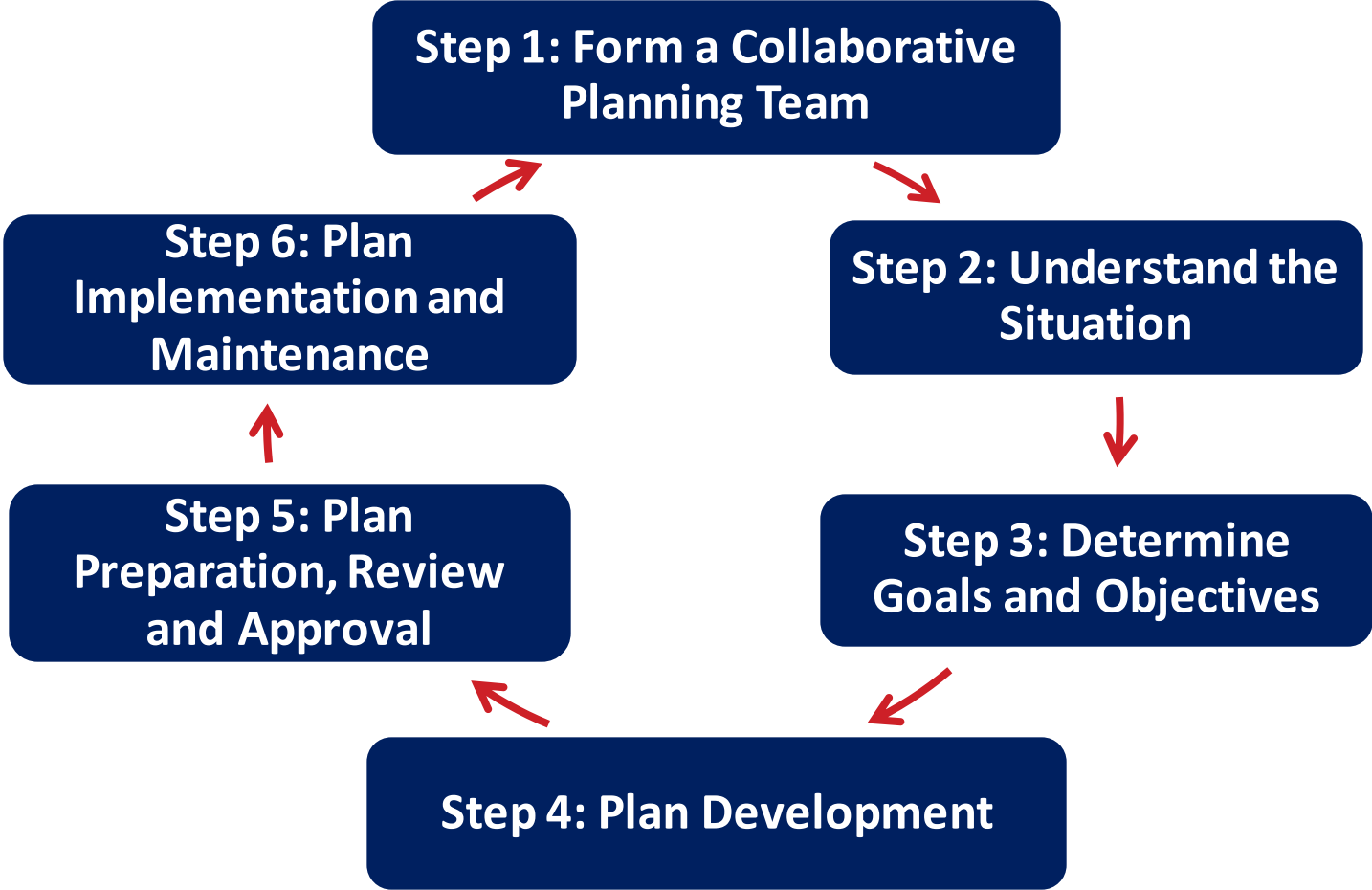


**It's not just
the plan, it's
the process**





PLANNING PROCESS





PLANNING PROCESS



Identify Planning Team

- **Whole Community**
 - Task force or committee
 - Planning officials
 - First Responders
 - Key Stakeholders



Step 1: Planning Team

Step 2:
Understand
Situation

Step 3: Goals &
Objectives

Step 4: Plan
Development

Step 5: Prepare,
Review, &
Approve

Step 6:
Implement &
Maintain



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SAFETY • SERVICE • PROTECTION



PLANNING PROCESS



- Identify threats and hazards
- Perform threat analysis
- Forecast potential debris impact and quantities
- Review other plans



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PLANNING PROCESS



Determine Goals and Objectives

- **Response**
 - Initial clearance
- **Recovery**
 - Removal operations



Xenia tornado of 1974

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PLANNING PROCESS





PLANNING PROCESS



Develop the plan

- Scenario based events
- Plan requirements
- Consider needs and demands
- Determine task assignments/ areas of responsibility

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PLANNING PROCESS



Plan Components

Debris Management Plan

Purpose

Scope

Assumptions

Concept of Operations

- Debris collection & removal
- Debris management of sites & disposal locations

Assignment of Responsibility

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DEBRIS MANAGEMENT PLAN COMPONENTS



- Debris Plan Overview
- Events and Assumptions
- Debris collection and removal
- Debris management sites and disposal locations
- Debris removal on private property
- Procurement and contractual services
- Use of force account resources
- Monitoring of debris operations

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DEBRIS MANAGEMENT PLAN COMPONENTS



- Health and safety requirements
- Environmental considerations and other regulatory requirements
- Public Information
- Identification of debris removal contractors
- Annexes
 - FEMA Summary Forms
 - List of FEMA information requirements
 - MOUs/MOAs
 - Contracts
 - Debris Certifications

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PLANNING PROCESS



Additional Considerations

- Procurement
- Private Property
- Mutual Aid Agreements
- Public information
- Environmental considerations & regulatory requirements

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PLANNING PROCESS



Standalone →



EOP Annex →





PLANNING PROCESS



Prepare/Review/Approval





PLANNING PROCESS



Train & Exercise



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PLANNING PROCESS



- **Review**
 - Major events
 - Change in resources
 - Change in key stakeholders
 - Change in legislation or ordinance (landfills)
- **Revise**
- **Maintain**

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PLANNING RESOURCES



- HAZUS data for your jurisdiction
- Current/Prior Disaster EPA Greensheets
- FEMA Debris Management Guide
(<https://www.fema.gov/pdf/government/grant/pa/demagde.pdf>)
- FEMA Public Assistance Program and Policy Guide
(https://www.fema.gov/media-library-data/1525468328389-4a038bbef9081cd7dfe7538e7751aa9c/PAPPG_3.1_508_FINAL_5-4-2018.pdf)



PLANNING RESOURCES



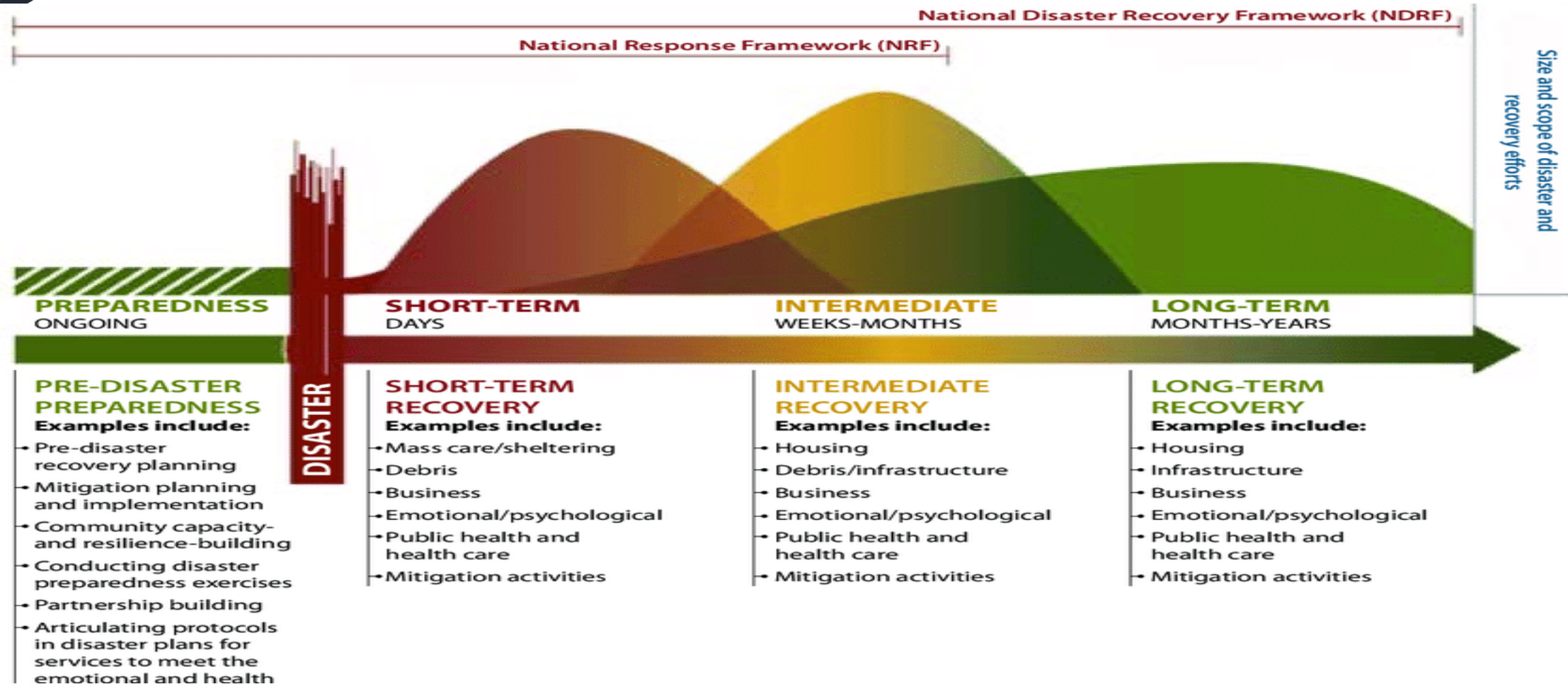
- Ohio EMA Webpage
(https://ema.ohio.gov/recovery_debrisinfo.aspx)
 - Sample Debris Management Plan Outline
 - Debris Fact Sheet for Local Officials
 - Debris Management Plan Handbook
- Brock Metzger, Ohio Emergency Management Agency, (614)799-3668, brmetzger@dps.ohio.gov



LOCAL PARTNERS ROLE IN A DISASTER



DISASTER LIFE CYCLE





REVIEW EMERGENCY OPERATIONS CENTER (EOC)



- **The EOC helps coordinate and support by:**
 - Identify capabilities and shortfalls
 - Identify tasks and activities that they must accomplish to prevent, protect against, prepare for, respond to, and recover from high-threat incidents
 - Work together with local governments and responders to achieve operational priorities
 - Manage resources to support incidents
 - Manage activities necessary to protect the community during major incidents.



ROLES AND RESPONSIBILITIES WITHIN THE EOC



- **Coordinating & prioritizing resources**
- **Developing & maintaining situational awareness**
- **Managing information**
- **Coordinating with elected / appointed officials**



PRIMARY FUNCTIONS OF AN EOC



- At the EOC, partners can act at the Operational Level to translate the “*What Needs to be Done*” from Strategic Level into “*How Can it be Done*” for the Field Level
 - Managing Information
 - Managing Resources
 - Managing Consequences



PRIMARY FUNCTIONS OF AN EOC



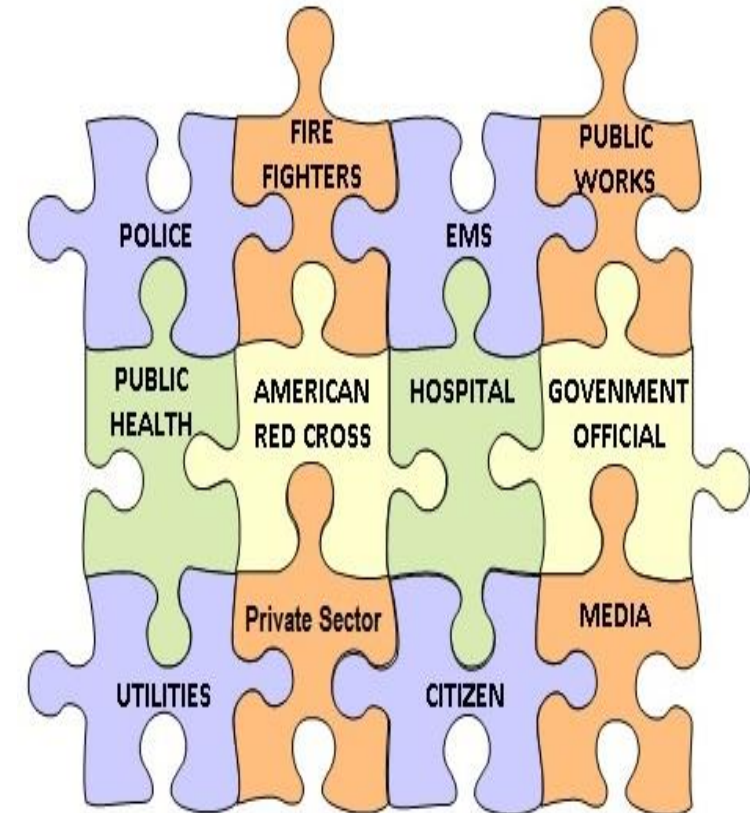
- **Managing Information**
 - **Information Collection**
 - Needs Assessment
 - Damage Assessment
 - **Information Display**
 - WebEOC/Charts/Maps
 - **Information Dissemination**
 - Public Information/Alert/Warnings
 - Communication with IC AND local Elected Officials
 - Preparing Situation Reports/Incident Action Plans



PRIMARY FUNCTIONS OF AN EOC



- **Managing Resources**
 - **Communicating resource information from the field**
 - What resources are currently available
 - What resources are currently being used
 - What resources are currently needed
 - **Sharing resources across disciplines**
 - **Activating MOUs/MOAs**
 - **Coordinating use of limited resources**
 - **Making resource requests from partners**



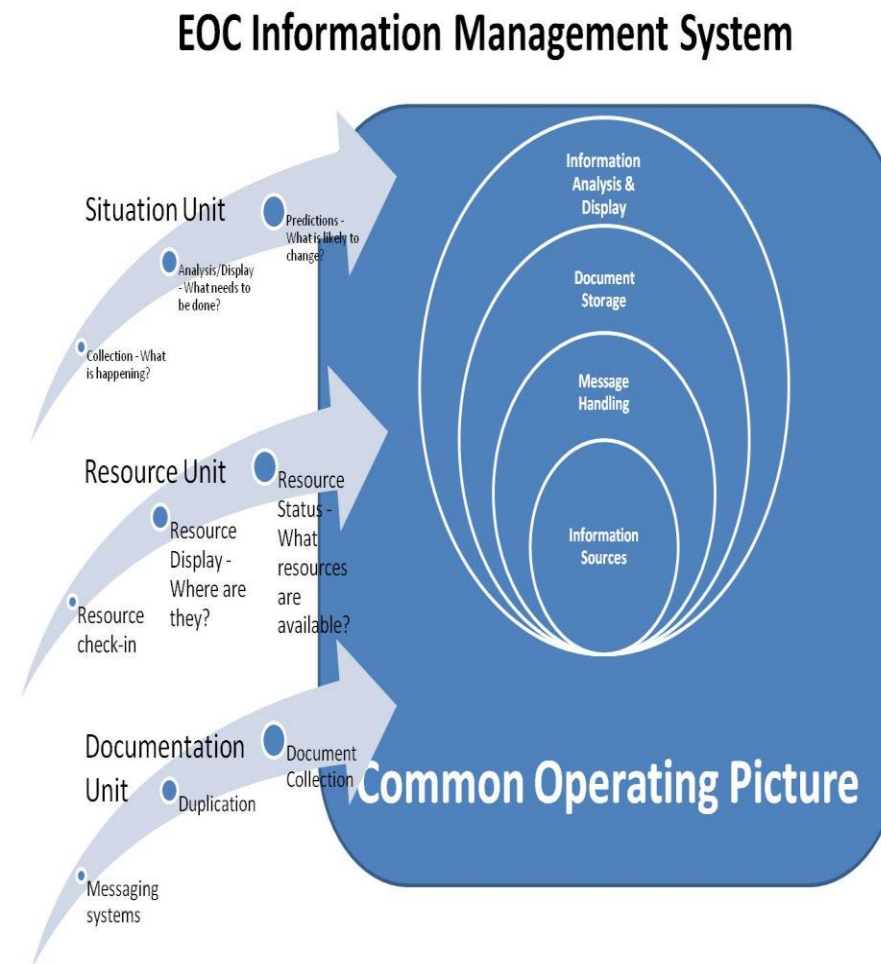


PRIMARY FUNCTIONS OF AN EOC



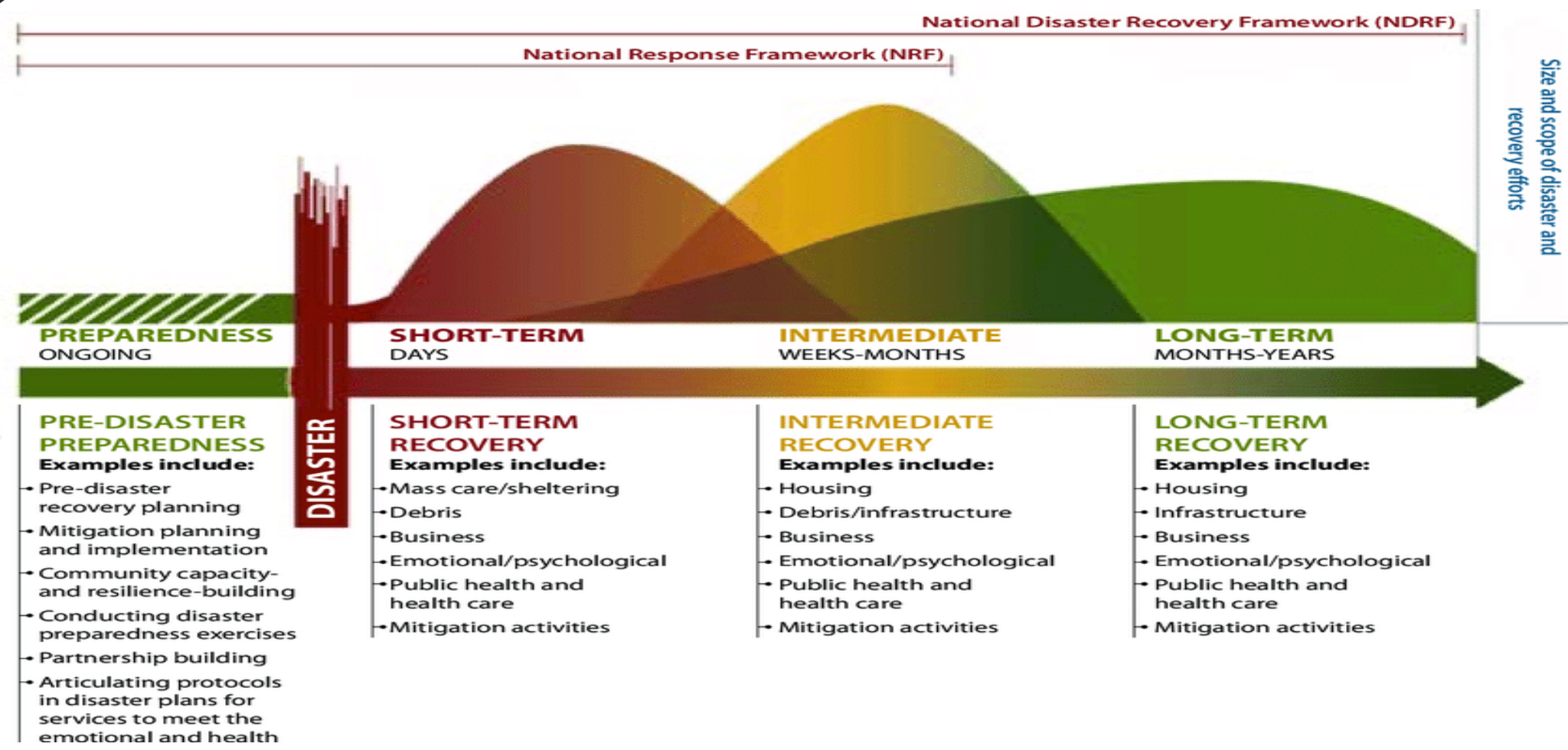
- **What are the benefits of opening an EOC?**
 - **Face-to-face contact**
 - Issues can be discussed between varying disciplines in a common setting
 - Helps to avoid communication issues
 - Problems can be addressed rapidly, quicker decision making
 - **Increased situational awareness**
 - Information from multiple disciplines, all addressing various parts of an emergency, shared in a common setting
 - **Aids in decision making**
 - With more information in a single location, enhances the ability to make decisions to address issues
 - **Easier public information dissemination**
 - Coordinate messages to the public to ensure consistency and accuracy of messaging

- **Managing Consequences**
 - Establishment of priorities
 - Develop a Common Operating Picture
 - Coordinate across levels of government
 - Facilitate smooth transition between operational periods
 - Address response and recovery needs





CYCLE OF A DISASTER LIFE CYCLE REVISITED





DEBRIS FORECASTING AND ESTIMATING



DEBRIS FORECASTING



Forecasting is a planning activity

- Takes place *before* an event
- Provides a general idea of debris generation for particular events
- Essential for proper preparation

Multiple methods to create forecasts

- Historical analysis
- Community-based risk analysis
- Computer modeling



DEBRIS FORECASTING: HISTORICAL ANALYSIS



- Review historical events, newspapers, photos
- Interview staff and citizens
- Review changes over time
 - Land use changes
 - Landfill capacity changes
 - Response capability of community
 - Laws and regulations



DEBRIS FORECASTING HISTORICAL VALUES



- **Mobile home**
 - Single wide = 290 CY
 - Double wide = 415 CY
- **Flooded homes - personal property on right of way**
 - Slab on grade home 25-30 CY
 - Home with basement 45-50 CY



DEBRIS FORECASTING: COMMUNITY RISK ANALYSIS



- **Determine potential risk for various events**
 - Locate flood zones, unusually wind prone areas, etc.
- **Review land use & overlay with risk areas**
- **Predict debris generation**
 - Categorize like land uses & risk areas
 - Project for major, moderate, & minor events
- **Predict effects on debris response infrastructure**
 - Waste handling facilities
 - Waste removal capacity
 - Interruption of services/utilities



DEBRIS FORECASTING: COMMUNITY RISK ANALYSIS



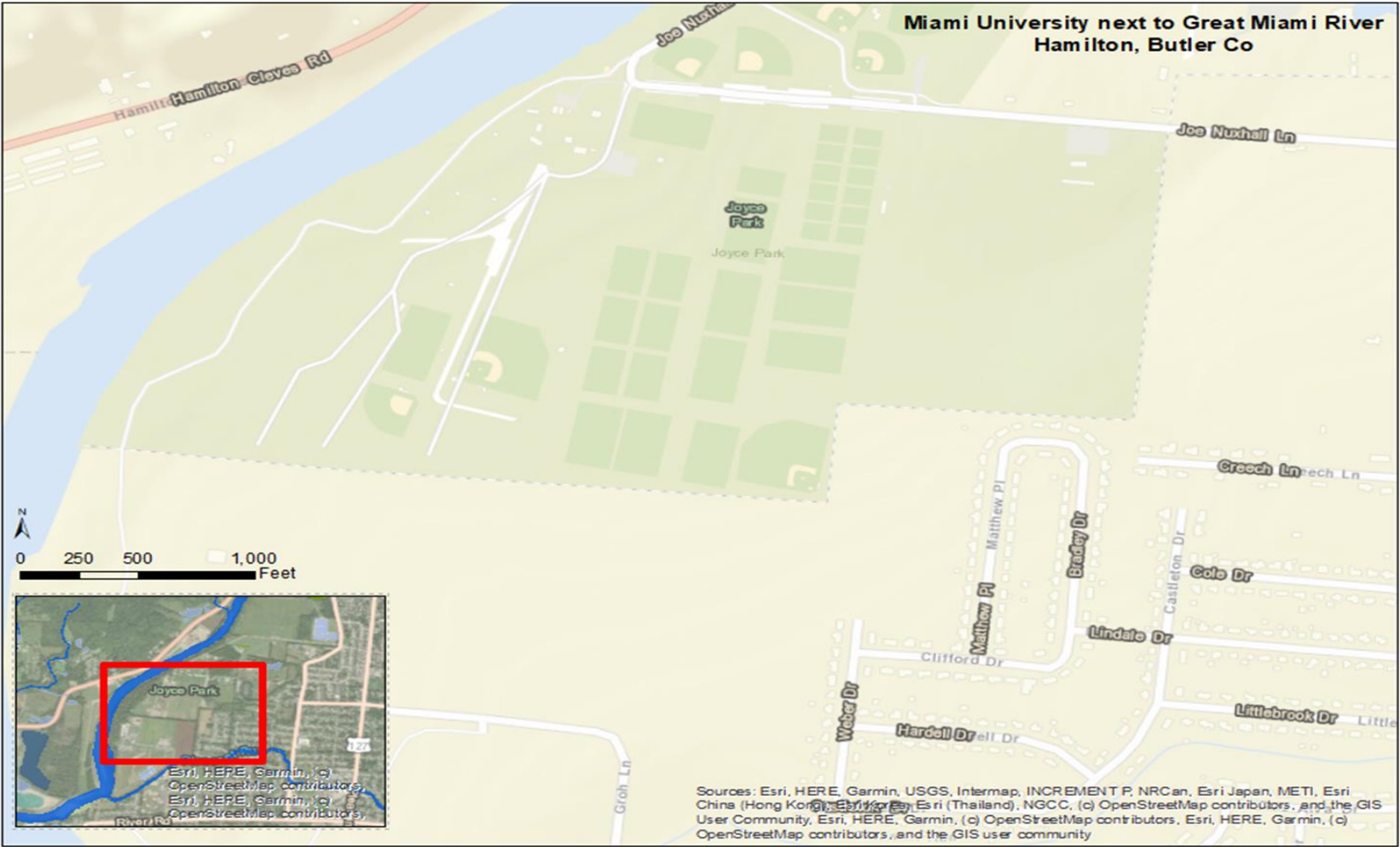
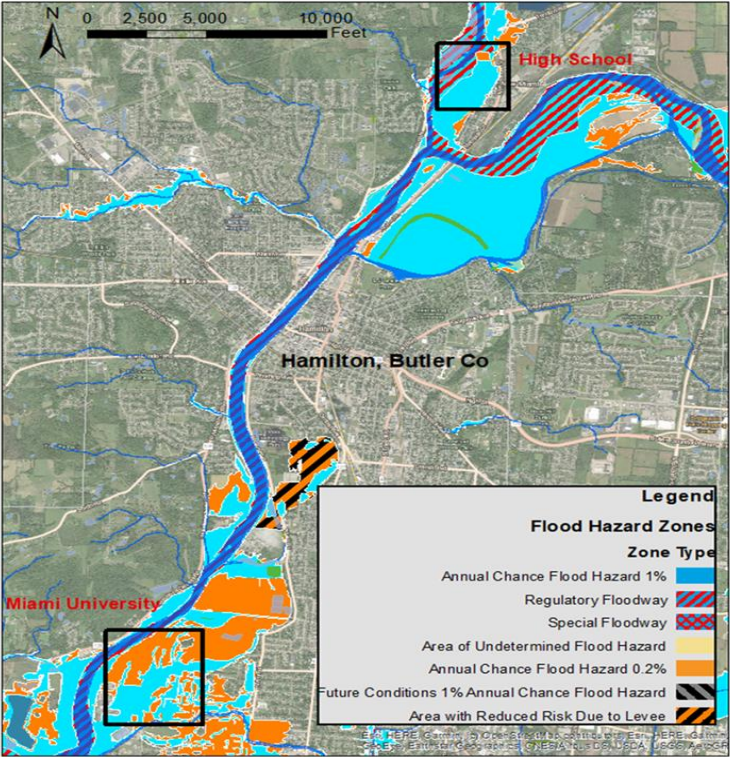
- **Community risk analysis tools**
 - **Aerial photography**
 - Auditor/recorder's office
 - Google Earth or other satellite mapping sites
 - **US flood insurance rate maps**
 - **Weather almanacs**
 - **GIS maps**
 - **Ground surveys**



DEBRIS FORECASTING: COMMUNITY RISK ANALYSIS



- GIS Map from Butler County, Ohio

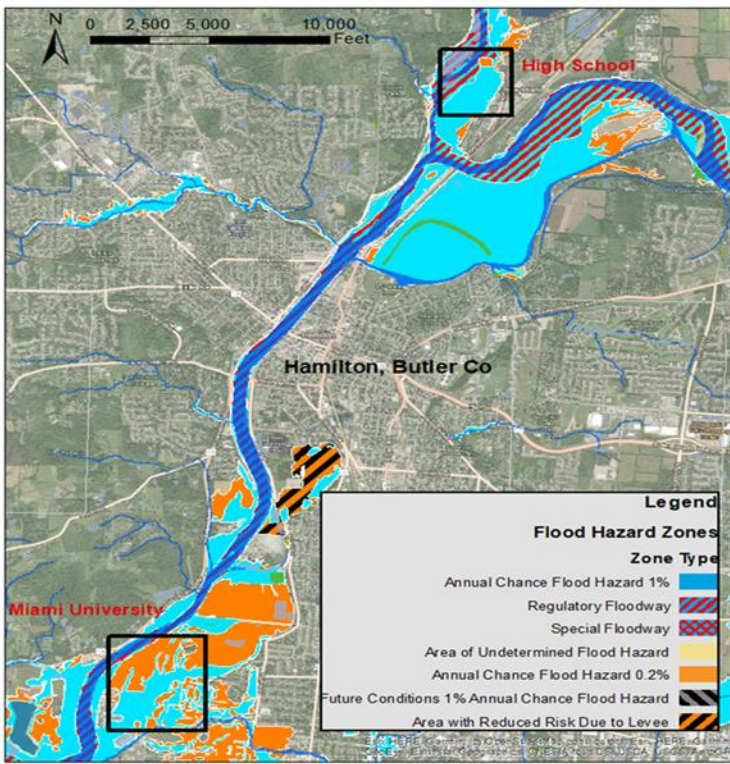




DEBRIS FORECASTING: COMMUNITY RISK ANALYSIS



- Satellite image from Bing.com or Google maps





DEBRIS FORECASTING: COMPUTER MODELING



- **USACE/NOAA Forecasting Tool – Primarily for hurricanes**
- **FEMA Hazus – Primarily for earthquakes**
- **Private industry products & consultants**



DEBRIS FORECASTING: COMPUTER MODELING - USACE



Formula: $Q = C(H)(V)(B)(S)$

- **Q = Volume of debris in cubic yards**
- **C = Storm category factor**
- **H = Number of households**
- **V = Vegetative characteristic**
- **B = Land use multiplier**
- **S = Precipitation multiplier**

The best forecasts are created using a combination of all available forecasting techniques



DEBRIS ESTIMATING



- Estimating is a post-event activity
 - Takes place *after* the damage is done
 - Provides a general idea of debris generated from a specific event
 - Essential for proper plan execution
- Multiple methods to create estimates
 - Ground measurement
 - Aerial photography
 - Before & after comparisons
 - Scaled debris pile measurement
 - GIS mapping



DEBRIS ESTIMATING: IMPORTANT NOTES



- **Accuracy is important**
 - Establishes scale of recovery effort
 - Aids mobilization of adequate resources
 - Improves cost containment
 - Helps prevent fraud
- **Estimate quantity AND *types* of debris**
- **Accurate estimates require field work**
- **Safety is paramount**



DEBRIS ESTIMATING: TOOLS



Debris Volume Calculations

- One story building:

$$\frac{L' \times W' \times H'}{27} \times .33 = \underline{\hspace{2cm}} \text{CY}$$

(.33 factor accounts for airspace)

- Mobile Homes & Debris Piles:

$$\frac{L' \times W' \times H'}{27} = \text{CY}$$



DEBRIS ESTIMATING: TOOLS



Debris Pile Volume to Weight Equivalents

- CDD piles: $2 \text{ yd}^3 = 1 \text{ ton}$
- Solid Waste piles: $3 \text{ yd}^3 = 1 \text{ ton}$
- Wood (tree) debris piles:
 - Hardwoods: $4 \text{ yd}^3 = 1 \text{ ton}$
 - Softwoods: $6 \text{ yd}^3 = 1 \text{ ton}$



DEBRIS QUANTITIES TABLE



- This chart and calculations are inclusive of the structure and contents
- Vegetative Cover Multiplier (Yard Waste)

Typical House	None	Light (1.1)	Medium (1.3)	Heavy (1.5)
1000 SF.	200 cy	220 cy	260 cy	300 cy
1200 SF.	240 cy	264 cy	312 cy	360 cy
1400 SF.	280 cy	308 cy	364 cy	420 cy
1600 SF.	320 cy	352 cy	416 cy	480 cy
1800 SF.	360 cy	396 cy	468 cy	540 cy
2000 SF.	400 cy	440 cy	520 cy	600 cy
2200 SF.	440 cy	484 cy	572 cy	660 cy
2400 SF.	480 cy	528 cy	624 cy	720 cy
2600 SF.	520 cy	572 cy	676 cy	780 cy



USACE FLOOD DEBRIS MODEL



- Used to calculate debris quantity from a flood event only when the structure is not destroyed
- Formula: Square footage x .02 = cubic yards of debris
- 2400 sq. ft. x .02 = 48 cubic yards



DEBRIS ESTIMATING: EXAMPLES



- Typical single wide = 290 cubic yards
- Typical double wide = 415 cubic yards





FEMA PUBLIC ASSISTANCE ELIGIBILITY CRITERIA



GENERAL DEBRIS ELIGIBILITY CRITERIA



- Eliminate immediate threat to life, public health and safety
- Eliminate immediate threats of significant damage to improved public or private property
- Ensure economic recovery of the affected community to the benefit of the community-at-large.



ELIGIBILITY BUILDING BLOCKS





APPLICANT ELIGIBILITY



- State and local governments/agencies
 - Federally recognized Tribal governments
 - Certain Private Non-Profit entities
 - Certain other entities formed for a public purpose
-
- Individuals are NOT eligible applicants under the Public Assistance Program.



FACILITY ELIGIBILITY



- Legal responsibility of eligible applicant
- In active use at time of disaster
- Examples of eligible facilities:
 - Improved public property (e.g. roads, bridges, parks, etc.)
 - Public right-of-way
 - Certain PNP facilities



INELIGIBLE FACILITIES



- **An applicant's unimproved property or undeveloped land**
- **Facilities outside of the designated disaster area**
- **Agricultural land**
- **Federal property or facilities that fall under the authority of another Federal agency**
 - **Exception: Debris management activities performed along Federal-Aid Highways are eligible for reimbursement under FEMA's Public Assistance Program.**



PRIVATE PROPERTY DEBRIS REMOVAL



- **Eligibility criteria:**
 - **Must in the public interest**
 - **Pre-approval process**
 - **Public interest determination**
 - **Documentation of legal responsibility**
 - **Authorization by a legally authorized official**
 - **indemnification**
 - **Duplication of benefits (e.g. insurance)**



PRIVATE PROPERTY DEBRIS REMOVAL



- **Documentation Requirements:**
 - Right-of-entry
 - Site location, description and photos
 - Site assessment establishing eligible scope of work
 - Applicable insurance policy
 - Environmental and Historical review
 - Debris removal work completed



PRIVATE PROPERTY DEBRIS REMOVAL



- **Eligible Work:**

- Large debris piles in living, recreational and/or working areas
- Debris obstructing primary ingress and egress routes
- Hazardous trees and limbs
- Disaster-damaged interior and exterior materials



PRIVATE PROPERTY DEBRIS REMOVAL



- **Ineligible Work:**

- Debris from vacant lots, unimproved property, etc.
- Debris on agricultural land
- Concrete slabs or foundations on-grade
- Reconstruction debris
- Debris and materials unrelated to the disaster
- Damaged swimming pools and basements
- Debris removal from commercial property



WORK ELIGIBILITY CRITERIA



- Be required as a result of the declared incident
- Located within the designated disaster area
- Legal responsibility of an eligible applicant

Special Considerations:

- Public interest requirement
- Damage due to negligence is ineligible
- Normal maintenance items that existed prior to the disaster are ineligible



ELIGIBLE DEBRIS-RELATED ACTIVITIES



- Clearance
- Collection
- Reduction and recycling
- Disposal
- Environmental Monitoring
- Debris Monitoring
- Other debris-related activities



ROADS & RIGHTS-OF-WAY



- Disaster-related debris is generally eligible
- Must be closely managed by applicant and have established limits
- Must be separated from normal garbage pickup and other ineligible debris removal



VEGETATIVE DEBRIS



- **Vegetative debris on public property and rights-of-way**
- **Hazardous trees**
- **Hazardous limbs**
- **Hazardous Stumps**



HAZARDOUS TREES



- **Must meet the following criteria:**
 - Condition was caused by the disaster
 - Present an immediate threat
 - Measures 6 inches or greater in diameter at 4.5 feet above ground level
- **Additionally must meet one or more of the following criteria:**
 - More than 50% or more of crown is damaged or destroyed
 - Has split trunk or broken branches exposing the heartwood
 - Has fallen or uprooted in a public-use area
 - Leaning at an angle of greater than 30 degrees and shows evidence of ground disturbance



HAZARDOUS LIMBS



- **Must be located on improved public property**
- **Limb must be greater than 2 inches in diameter at the point of break**
- **Limb must still be hanging in tree and threatening a public-use area**



HAZARDOUS STUMPS



- **Must have 50% or more of the root ball exposed**
- **Must be greater than 24 inches in diameter, measured 24 inches above the ground**
- **Must be on improved public property or a public right-of-way**
- **Must pose an immediate threat**



COST ELIGIBILITY



- **Cost must be reasonable and necessary to accomplish the work**
- **Applicants must comply with all applicable local, State and Federal procurement requirements**
- **Reduced by all applicable credits (e.g. insurance, recycling revenue, etc.)**

Potential Sources of Costs

- **Force account resources**
- **Mutual Aid**
- **Contracts**



FORCE ACCOUNT RESOURCES



- Labor (Limited to overtime labor hours only)
- Equipment
- Materials
- Leased/purchased equipment and supplies



ALTERNATIVE PROCEDURE FOR DEBRIS REMOVAL



- Retention of recycling revenues
- Reimbursement of straight time labor
- Increased cost share for FEMA “accepted” Debris Management Plan



MUTUAL AID/CONTRACTS



- The cost of debris-related work performed through mutual aid agreements or contracts between jurisdictions may be eligible.
- Receiving entity still responsible for non-federal cost share
- Regular and overtime labor is eligible



PROCUREMENT/CONTRACTING



- **You must follow local, state and federal procurement requirements**
 - **A list of some of the state/local requirements is included in the Public Assistance Handbook, pages 3-4. The list is not intended to be all inclusive**
- **Federal procurement rules can be found at 2 CFR 200.317-326**
 - **Types of allowable contracts: Lump sum, unit price, cost-plus-fixed fee and time and material**



PROCUREMENT/CONTRACTING



- Time and material contracts should be used only if no other type of contract is suitable and must include a do-not-exceed clause. There is a heavy administrative burden with these contracts
- Types of unallowable contracts: Cost-plus-percentage-of-cost and percentage of construction cost (including markups)
- Do not use debarred contractors. Check the following websites and be sure to document
 - Federal site: www.sam.gov
 - State site: <https://www.sos.state.oh.us/records/debarred-contractors/>



PROCUREMENT/CONTRACTING



- **Ensure that all contracts and supporting documentation include:**
 - A cost or price analysis
 - A history of procurement
 - Full and open competition
 - Source documentation, particularly with time and material type contracts
- **Davis Bacon is NOT required**



PROCUREMENT/CONTRACTING



- Allowable procurement methods per 2 CFR 200.317-326 and Appendix II:
 - Micro Purchase (up to \$10,000)
 - Small purchase (under \$250,000)
 - Sealed bids
 - Competitive proposals
 - Noncompetitive proposals (limited)



PROCUREMENT RESOURCES



- FEMA's Public Assistance Program and Policy Guide
- 2 CFR 200:317
- Small Business Administration
 - <https://www.sba.gov/>
- FEMA's Procurement Disaster Assistance Team
 - <https://www.fema.gov/procurement-disaster-assistance-team>



VARIABLES AFFECTING COST



- Quantity, type and location of debris
- Hauling distances and conditions
- Use of debris management sites
- Volume reduction and recycling
- Disposal fees
- Environmental monitoring
- Monitoring and project management



DOCUMENTATION ON ELIGIBILITY



- Debris quantities, types and exact locations (e.g. GPS coordinates)
- Immediate threat and legal responsibility
- Procurement process and procedures
- Contracts
- Force account resources (e.g. labor sheet, equipment logs, material invoices)
- Applicant monitoring information
- Mutual Aid Agreements



DOCUMENTATION ON ELIGIBILITY



- Donated resources
- Historic or local cost information
- Maintenance records
- Federal-aid roads
- Flood control works
- Public right-of-way
- Hazardous trees, limbs and stumps



TECHNOLOGY DURING A DISASTER DEBRIS MANAGEMENT EVENT



LOAD TICKET SURVEY





LOAD TICKET DATA



Debris Monitoring - Load Tickets

OverviewDesignCollaborateAnalyzeDataSettings

8/26/19 - 2/23/21

Filter

ReportExport

Open in Map Viewer

Form view

983/983



Debris Monitoring - Load Tickets							
Date And Time:	Hauler Company Name:	Driver Name:	Truck Plate Number:	Measured Bed Capacity (CY):	Debris loading site:	Debris Monitor Name:	Percentage full:
Aug 28, 2019, 2:35 PM	Journey	Troy	Ohpwh2102	Standard Dump Truck (30 CY)	City of Trotwood Site	127 Brandon Ballard	96