

# Catastrophic Disaster Planning Higher Education Workshop

Emergency Management Institute

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June 6, 2007



**FEMA**

# Catastrophic Planning

## Overview

- **A Catastrophic Incident:**
  - A sudden event which results in tens of thousands of casualties and tens of thousands of evacuees
  - Response capabilities and resources of the local jurisdiction will be overwhelmed
  - Characteristics of the precipitating event will severely aggravate the response strategy and further tax the capabilities and resources available to the area
  - Life saving support from outside the area will be required, and time is of the essence
  - Likely to have long-term impacts within the incident area as well as, to a lesser extent, on the Nation.
- **Catastrophic Plans are a specialized type of emergency plan**
  - Directed at specific scenarios
  - Integrated Concept of Operations for Local, Regional, State, Area Regional, Federal Regional, and the NRP
  - Horizontally integrated: Across agencies and organizations at the same level of government
  - Vertically integrated: Across Federal, State and local entities

# Catastrophic Planning

## Budget

- **2006**

- Evacuation Planning (Gulf Coast Recovery Office)
- Mass Evacuee Support Planning
- ESF-6 Regional Mass Care Planning
- Florida Catastrophic Planning
- New Madrid Seismic Zone Catastrophic Planning

- Total

**\$20.0M**

- **2007**

- New Madrid Seismic Zone Catastrophic Planning
- California Catastrophic Planning
- Florida Catastrophic Planning
- Catastrophic Housing
- National Shelter System
- Debris Operations
- Debris Technology
- Public Assistance Program Management
- Operational Planning Capability

- Total

**\$20.0M**



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New Madrid Seismic Zone Catastrophic Planning:

# Catastrophic Disaster Funding?

FY 2005 – Disaster Support Initiative (\$20M)

FY 2006 – \$ 20 M Base Line Funding (Fenced)

FY 2007 - \$ 20 M

FY 2008 - \$ 21.5 M

FY 2009 through 2013 – \$ 23 M to \$ 23+ M based upon inflation

Current Catastrophic Disaster Response & Recovery Planning Initiative focused on Florida & NMSZ

FY 2007 – contract support to Region IX and CA

This is a joint Response (Disaster Operations Directorate) & Recovery (Disaster Assistance Directorate) funded initiative which includes Mitigation and Preparedness participation – What is the message?



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Catastrophic Disaster Planning

# Florida Catastrophic Planning (FLCP)

## Regional Response and Recovery Planning

- Notice Event -

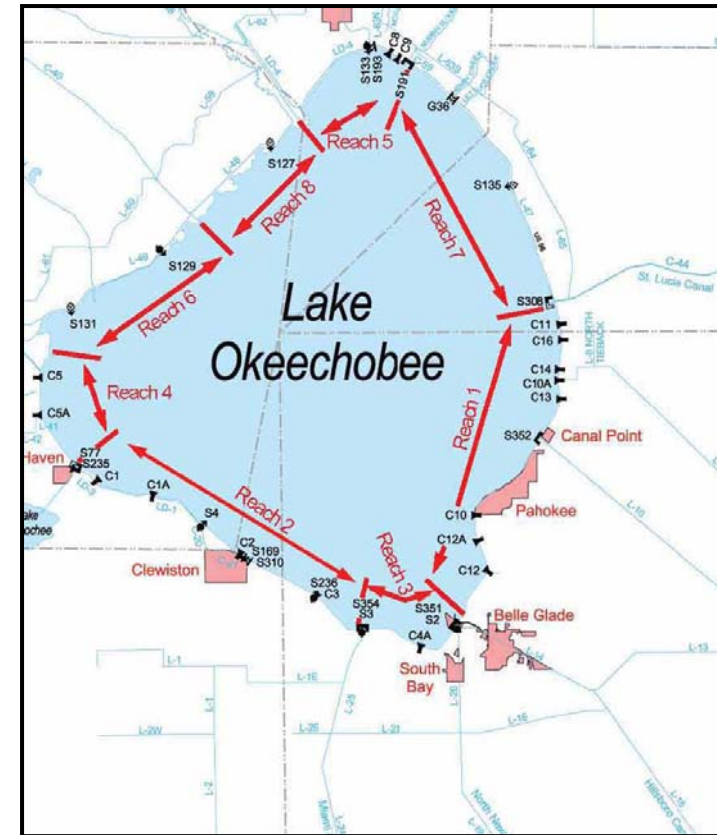


# Background

## Catastrophic failure of the HDD around Lake Okeechobee would result in:

*“...A catastrophic failure of the dike [that] will impact the lives and livelihoods of thousands of Floridians. It would be devastating to our economy, environment and quality of life. While preparing for the impacts of a dike failure is critical to prevent the loss of life, the priority should be preventing such a failure from ever occurring....”*

–Former Florida Governor Jeb Bush





US Army Corps  
of Engineers

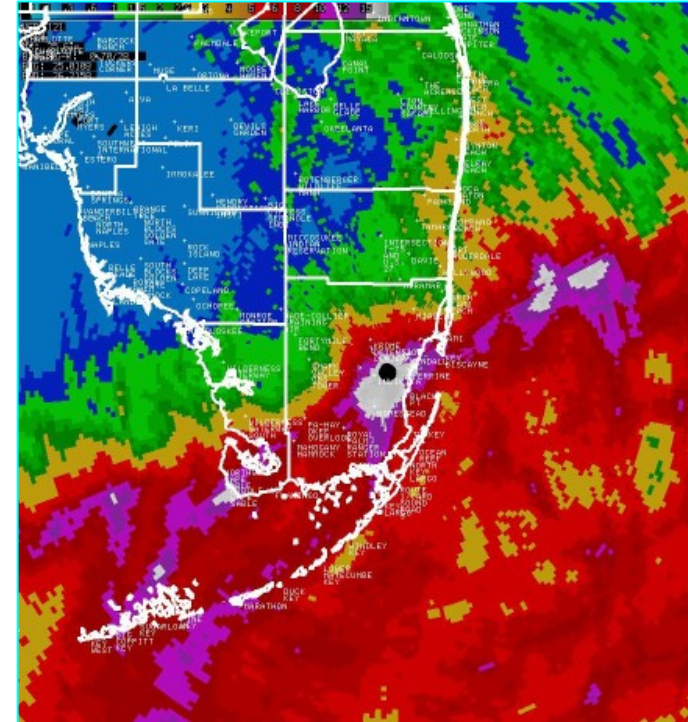
## Catastrophic Disaster Planning-South Florida



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### Lake Okeechobee/Herbert Hoover Dike

### Miami, Florida



Regional evacuation and response planning for the **Herbert Hoover Dike** in the event of a rupture in the southern end of **Lake Okeechobee**. Includes Glades, Hendry, Palm Beach, Martin and Lee Counties, Florida.

Response and recovery planning for a Category 5 Hurricane impacting South Florida, making landfall in **Miami, Florida**.



## Florida Catastrophic Disaster Planning

# Background

- **Impact of 2004 Florida Hurricanes**

- Charley (cat. 4): \$14 billion in damages, 15 deaths in Florida
- Frances (cat. 2): \$9 billion, 5 deaths in Florida
- Ivan (cat. 3): \$13 billion, 92 deaths in US; 25 in FL
- Jeanne (cat. 3): \$7 billion, 3,025+ deaths (Haiti, Dominican Republic, Puerto Rico); 3 in Florida



- **A category 5 hurricane could completely devastate the Miami Southern Florida area**

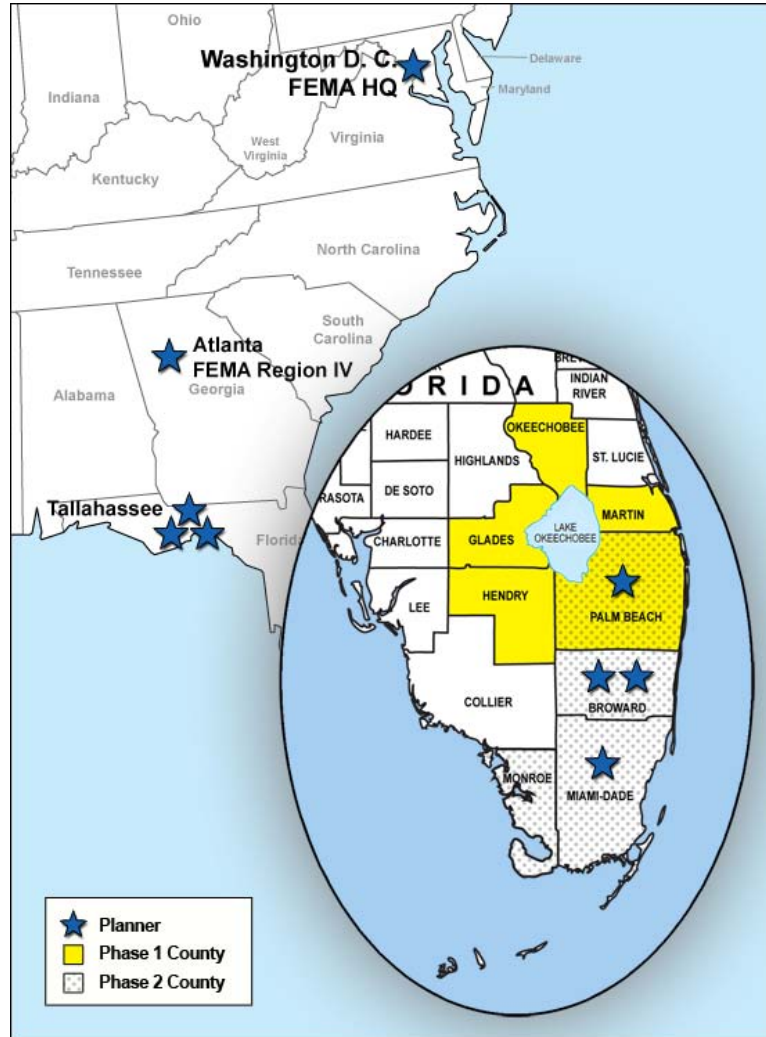
- History of three storms with category 5 status at landfall
  - Hurricane Andrew (1992) devastated southern Miami-Dade County, causing \$26 billion in damages in Florida
- The 1926 Hurricane (category 4) devastated the Miami area
  - Scientists estimate a similar hurricane would cause almost \$140 billion in damages today





# Florida Catastrophic Disaster Planning

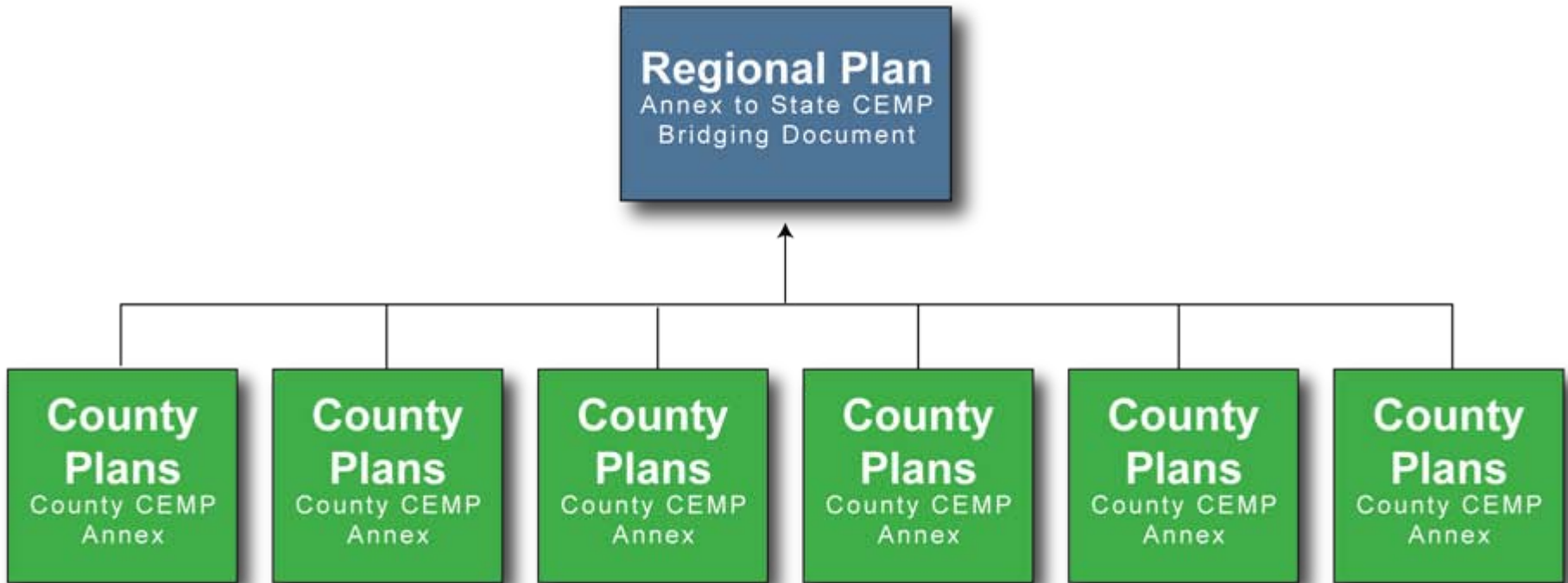
## Direct Technical Assistance to Meet Planning Goals

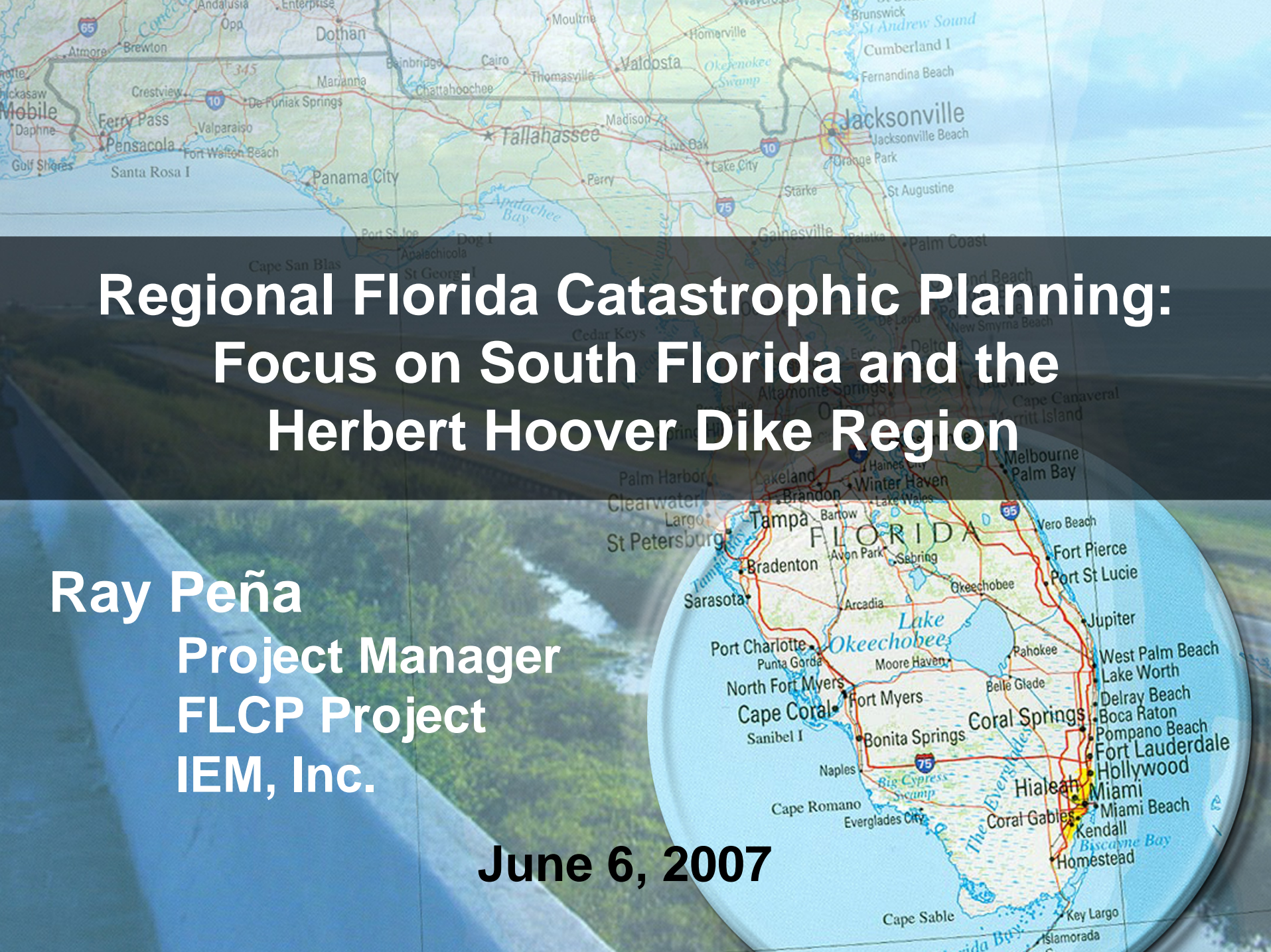




## Florida Catastrophic Disaster Planning

# Starting Local



A map of Florida with a semi-transparent dark grey banner across the middle. The banner contains the title text. The map shows major cities like Jacksonville, Tallahassee, and Tampa, along with water bodies like Lake Okeechobee and the Atlantic Ocean. Major highways are also visible.

# Regional Florida Catastrophic Planning: Focus on South Florida and the Herbert Hoover Dike Region

**Ray Peña**  
Project Manager  
FLCP Project  
IEM, Inc.

**June 6, 2007**

# Overview of Florida Catastrophic Planning

**Phase 1:** To develop a regional response and recovery annex for the counties and communities surrounding Lake Okeechobee in the event of a **Herbert Hoover Dike (HHD)** failure

**Phase 2:** To develop a regional response and recovery annex for a catastrophic hurricane impacting **South Florida**

## **Direct technical assistance to target counties**

Planning Team assists the State in a host of planning activities

Conduct workshops, meetings & research

Coordinate w/State, local, **tribal, private enterprise, non-profit**, critical infrastructure, and Federal stakeholders

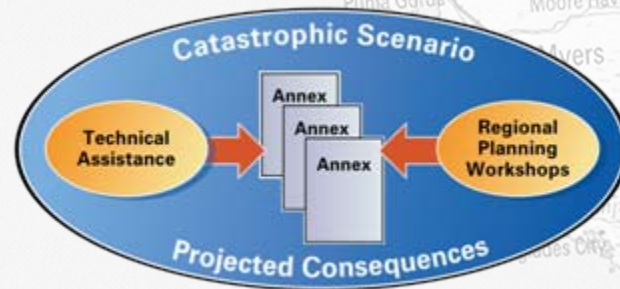
- **Ensure a “local up” approach** that results in regionally sound, comprehensive and **cohesive** planning efforts
- **Develop decision matrices** & identify resource shortfalls that can focus additional planning activities
- **Examine policies** and procedures to identify challenges to coordinated response and recovery activities

# Workshops & Exercises

- **November 2006** – HHD Kickoff
- **February 2007** – Regional Workshop joining Phase 1 and Phase 2
- **March 15, 2007**– Agency Head & Emergency Coordinating Officer Project Orientation
- **April 2007** – State-Level Workshop
- **May 2007** – Statewide Hurricane Exercise
- **June 2007** – Regional Workshop in Miami-Dade (local focus)
- **Fall 2007** – State-Federal Workshop
- **Winter 2007/2008** – Second Regional Workshop
- **Spring 2008** – Target Completion & Preparation for Statewide Exercise in May of '08

# Scenario-Driven Planning

- “Hurricane Ono” scenario sets the “catastrophic bar,” helping to establish the necessary capacity of the resulting plans.
- Participants at all levels of government contribute to the planning solutions, and the operational knowledge and experience captured make the resulting plans more viable.
- Utilizes a **realistic** and comprehensive set of consequences for ALL stakeholders
- Response and recovery actions will be based on the **same planning assumptions** & projected consequences
- Allows **ALL** stakeholders to assess their existing and future plans **in context** of each other
- Facilitates updates to and development of plans that address **functional areas**

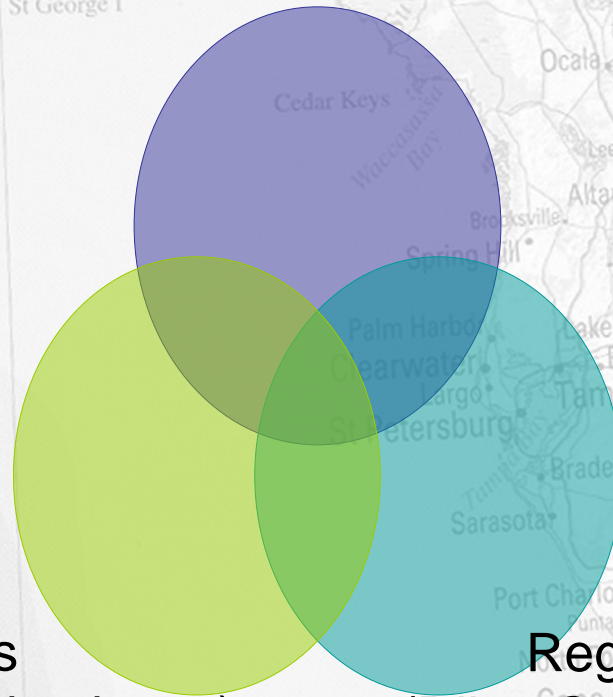


# Decision Matrices & Resource Shortfalls

- **Assess** required capabilities based on Catastrophic Scenario
  - **What do we need to do?**
- **Develop** scalable and adaptable methods, formulas, or matrices that indicate the quantity and type of assets needed to meet the capability
  - **What do we need to do it?**
- **Determine** available resources within local, regional or States inventories, including pre-disaster contracts
  - **What do we already have?**
- **Establish** protocols & policies that clearly articulate how to meet both required capabilities and fill gaps and **identify** resource limitations
  - **How are we going to get our hands on what we have, and how will we get more?**
- **Integrate** with other scenario-based resource planning schemes across disciplines
  - **What does this mean for the rest of the response and recovery activities?**
- **Sustain** the planning process to facilitate updates and changes

# Comprehensive – Cohesive Planning, Complimenting Concurrent Efforts

Regional Evacuation Studies  
Statewide Shelter Study



County Annexes  
(Dike, Catastrophic, Pandemic . . .)

Regional/State Annexes  
(Dike, Catastrophic, Pandemic . . .)



# Comprehensive – Cohesive Planning, Complimenting Concurrent Efforts

## ■ Regional Evacuation Studies

- Behavioral Studies
- Vulnerability Assessment

## ■ Statewide Sheltering Plans

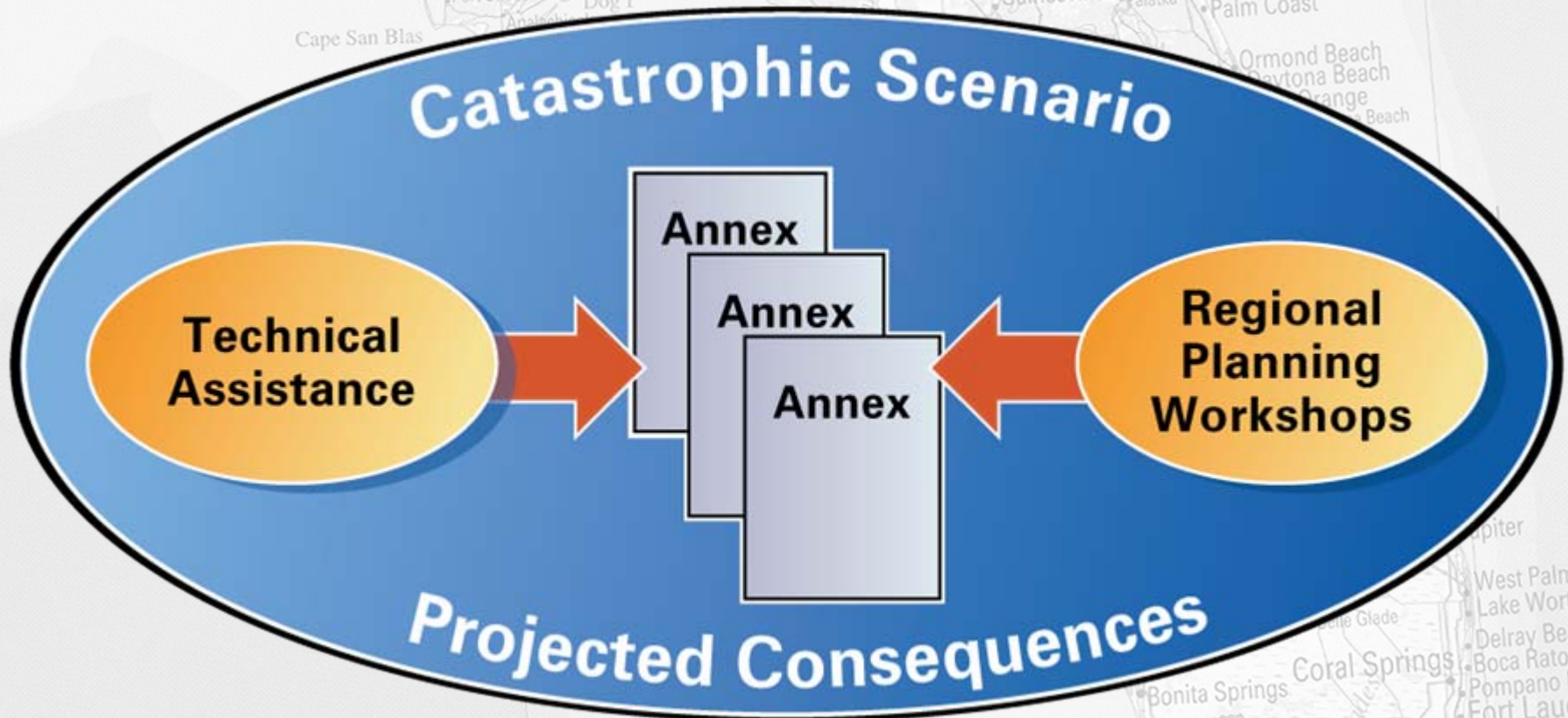
## ■ County Annexes

- Comprehensive Emergency Management Plans
- Herbert Hoover Dike Annexes
- Catastrophic Plan Annexes

## ■ Regional Annexes

- HHD Annex
- Catastrophic Annex

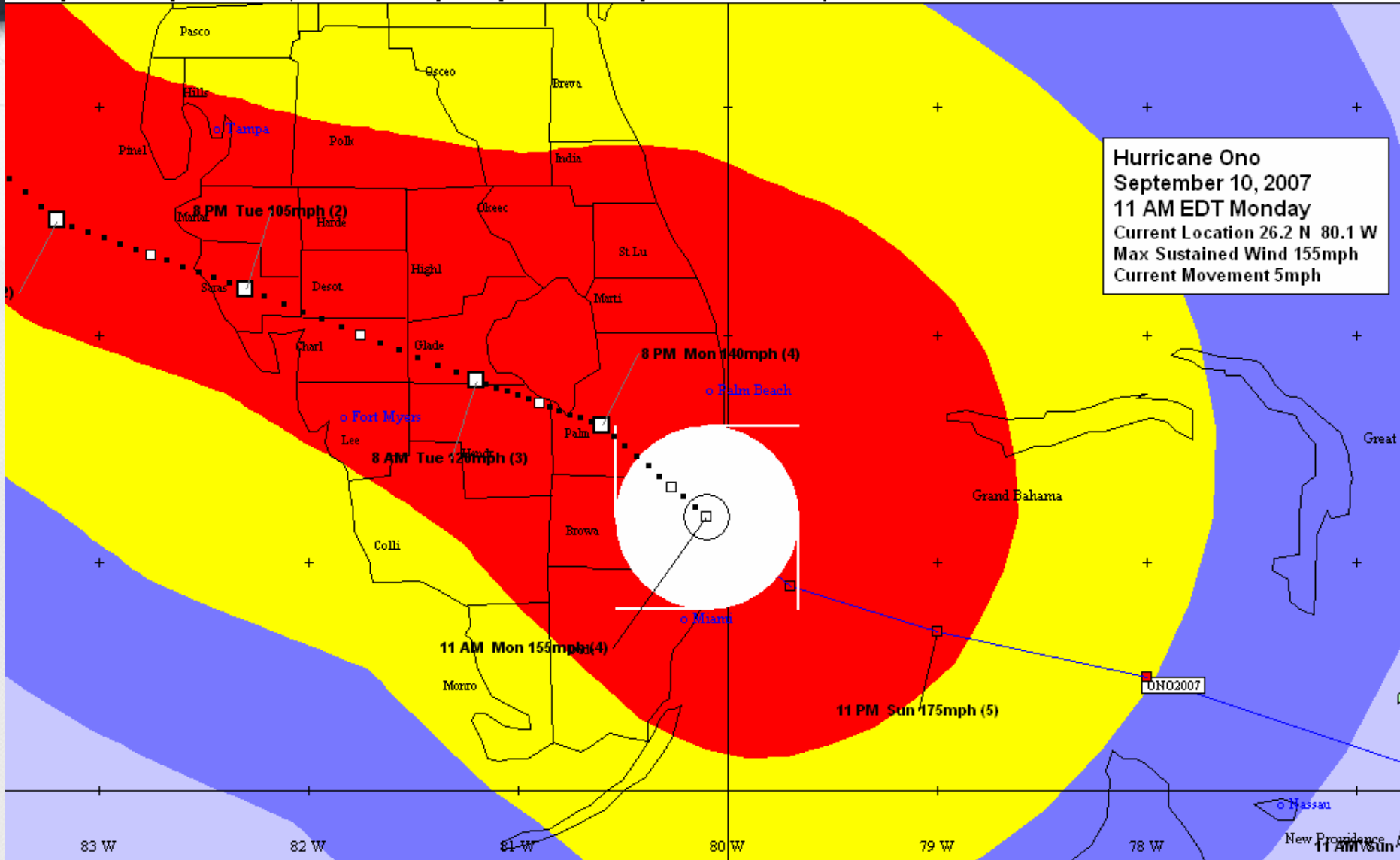
# Scenario-Driven Planning Workshops



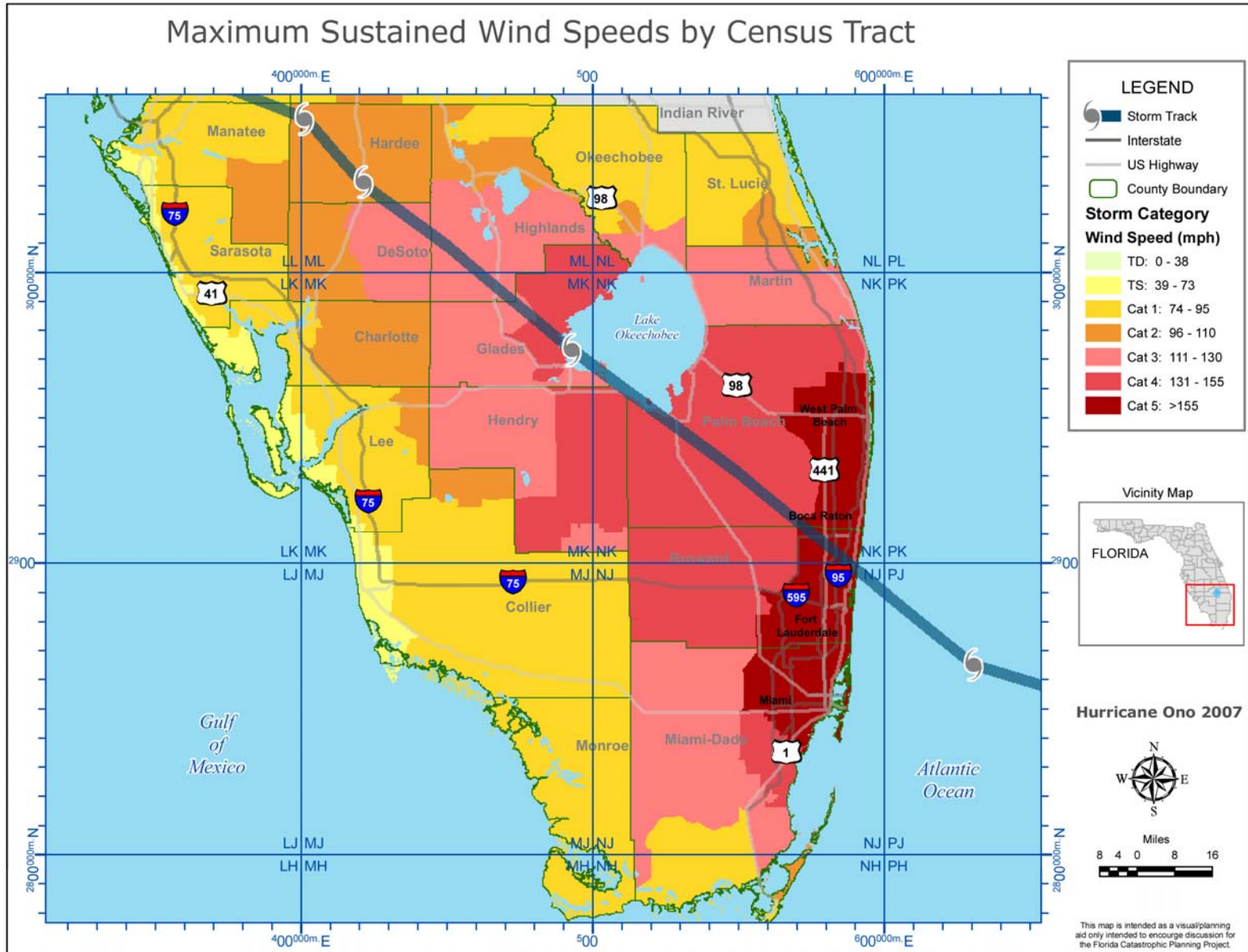
# Category 5 Hurricane Ono Nearing the Bahamas



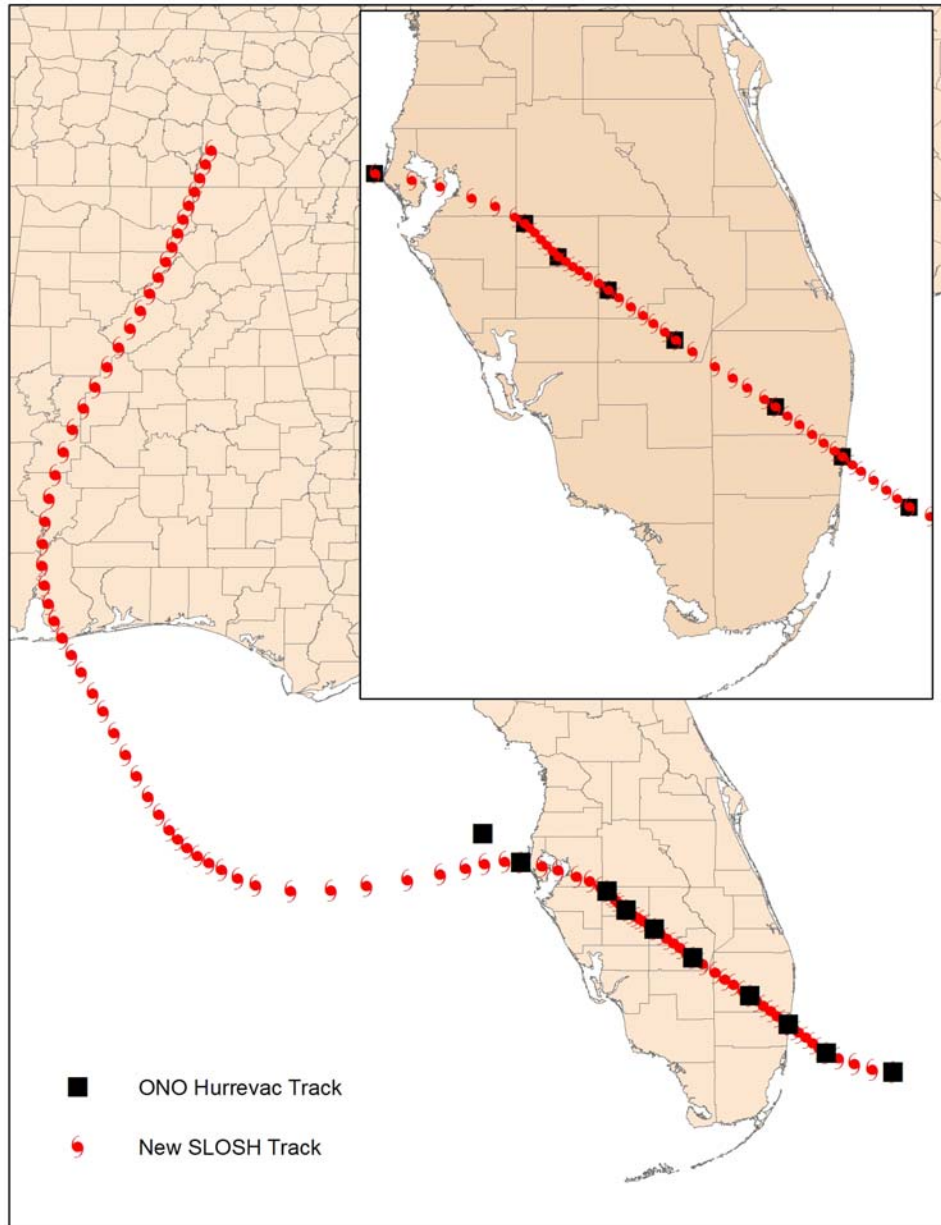
National Hurricane Center Disclaimer: 'Depictions of forecast wind swaths are determined from radii that represent the maximum possible extent of a given surface wind speed within each quadrant. Therefore, not all locations falling within a particular swath will experience the winds indicated by the swath.



# Planning Scenario – Path of Hurricane Ono



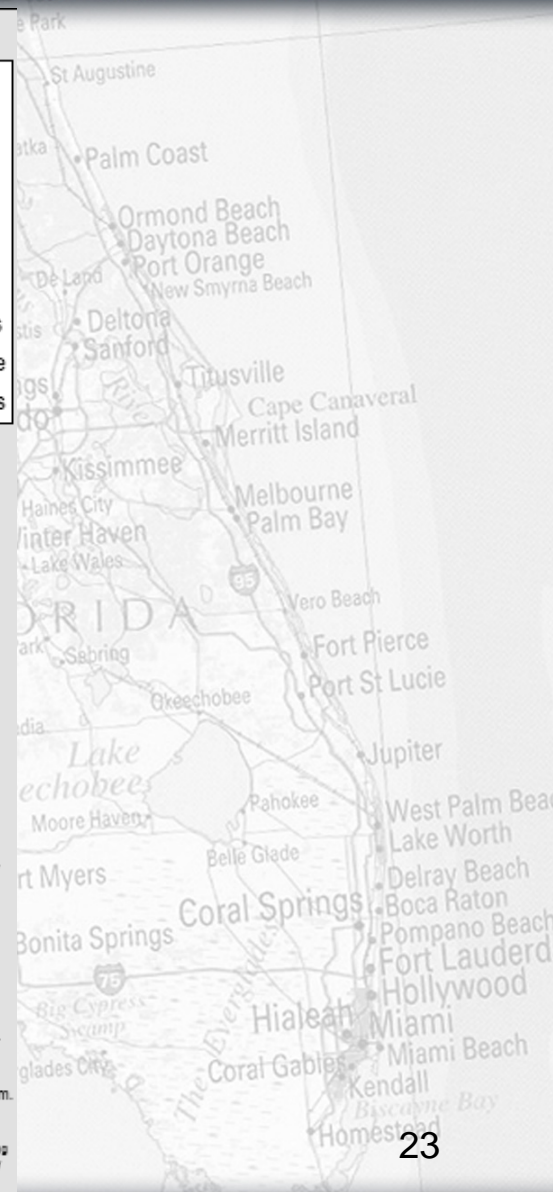
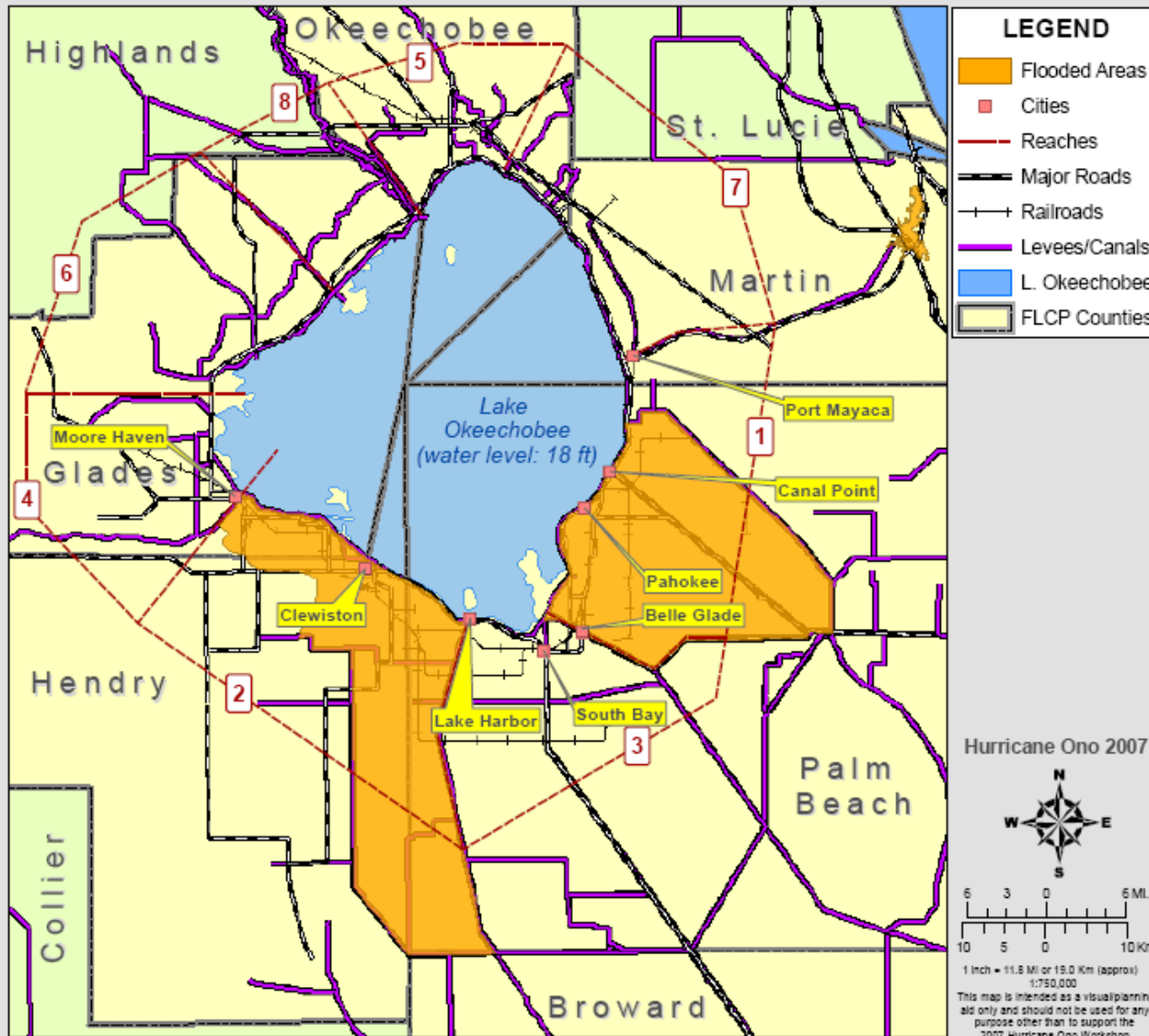
# Extended Track



- How does this affect in-state mutual aid/resources?
- How does this affect out-of-state assistance?

# Planning Scenario – Herbert Hoover Dike Breaches

FLOODED AREAS DUE TO HDD BREACHES



# Consequence Projections

## Percent of Building Stock by Wind Damage Category

County	Percent with No Damage	Percent with Minor Damage	Percent with Moderate Damage	Percent with Severe Damage	Percent Destroyed	Percent with Any Damage
Broward	0.08%	1.36%	8.56%	36.05%	53.95%	99.92%
Collier	94.96%	3.87%	1.04%	0.10%	0.03%	5.04%
Glades	4.33%	9.98%	22.40%	23.75%	39.54%	95.67%
Hendry	8.72%	14.74%	21.13%	19.74%	35.66%	91.28%
Lee	90.82%	7.55%	1.45%	0.14%	0.04%	9.18%
Martin	32.32%	32.61%	22.24%	8.73%	4.10%	67.68%
Miami-Dade	1.78%	5.87%	14.47%	36.28%	41.60%	98.22%
Monroe	96.95%	2.56%	0.46%	0.03%	0.01%	3.05%
Okeechobee	16.45%	17.24%	22.58%	16.82%	26.90%	83.55%
Palm Beach	0.30%	2.46%	9.57%	33.47%	54.20%	99.70%
<b>Total</b>	<b>18.72%</b>	<b>4.91%</b>	<b>9.81%</b>	<b>27.88%</b>	<b>38.68%</b>	<b>81.28%</b>



# Consequence Projections

## Number of Buildings by Wind Damage Category

County	Number of Structures in County	Total Structures Affected	Number of Structures with No Damage	Number of Structures with Minor Damage	Number of Structures with Moderate Damage	Number of Structures with Severe Damage	Number of Structures Destroyed
Broward	464,079	463,711	368	6,330	39,702	167,294	250,384
Collier	92,935	4,686	88,249	3,595	968	95	29
Glades	5,279	5,051	228	527	1,182	1,254	2,087
Hendry	11,599	10,588	1,011	1,710	2,451	2,290	4,137
Lee	193,979	17,802	176,177	14,652	2,813	265	71
Martin	53,274	36,055	17,219	17,373	11,847	4,651	2,183
Miami-Dade	531,131	521,667	9,464	31,188	76,840	192,677	220,962
Monroe	43,366	1,324	42,042	1,109	200	12	3
Okeechobee	14,526	12,136	2,390	2,505	3,280	2,443	3,908
Palm Beach	397,425	396,227	1,198	9,776	38,022	133,020	215,409
<b>Total</b>	<b>1,807,593</b>	<b>1,469,245</b>	<b>338,348</b>	<b>88,766</b>	<b>177,305</b>	<b>504,002</b>	<b>699,173</b>

# The Word Problem

- SF impacted by a Category 5 Hurricane making landfall 35mi N of Miami producing upwards of 22" of rainfall in and north of Lake Okeechobee. Winds and surge damage or destroy nearly 700,000 structures. Note: this doesn't include the Counties to the North West of Lake Okeechobee where the storm exits FL as a Category 2.
- Winds from the storm leave large amounts of debris in canals used by SFWMD to control water movement in South Florida making it difficult to impossible to reduce flood waters impacting the environment, economy, citizens and visitors. Flood waters are expected to remain for as many as 22 days – or more

# Key Assumptions

- Estimated Population – 6,358,934
- 2,867,295 people are projected to evacuate in advance of the storm
- 796,214 people are expected to seek public shelter (10's of miles)
- 3,826,822 homes will be destroyed
- Up to 3,000,000 customers will be w/o power from Miami-Dade to Indian River on the East and Manatee/Sarasota on the West

# Pick ONE – Break It Down

- Pick ONE decision point and break it down
  - Clearly identify the GOAL
  - Identify the CRITICAL criteria/information needed on which to base a decision
  - Document what you know from past experience
  - Calculate/Adjust/Recalculate/Cross Check
  - Repeat as necessary

# Example – Search and Rescue

Structures per Strike Teams per Op Period	500
Hours per Day	12
Structures per Strike Team per Day	500

Hours Allowed	24
Deployment Time	6
Hours Available	18

7.2

County	Structures	Strike Teams	Personnel
Miami-Dade	352,332	940	18,800
Broward	335,252	895	17,900
Palm Beach	293,881	784	15,680
Martin	8,368	23	460
Okeechobee	6,185	17	340
Hendry	5,916	16	320
Glades	3,134	9	180
Lee	408	2	40
Monroe	50	1	20
<b>Total</b>	<b>1,005,526</b>	<b>2,687</b>	<b>53,740</b>

# Example – Search and Rescue

Structures per Strike Teams per Op Period	500
Hours per Day	12
Structures per Strike Team per Day	500

Hours Allowed	72
Deployment Time	6
Hours Available	66

7.2

County	Structures	Strike Teams	Personnel
Miami-Dade	352,332	257	5,140
Broward	335,252	244	4,880
Palm Beach	293,881	214	4,280
Martin	8,368	7	140
Okeechobee	6,185	5	100
Hendry	5,916	5	100
Glades	3,134	3	60
Lee	408	1	20
Monroe	50	1	20
<b>Total</b>	<b>1,005,526</b>	<b>737</b>	<b>14,740</b>

# Pick ONE – Break It Down

- Pick ONE decision point and break it down
  - Clearly identify the GOAL
    - **Provide 3 Hot Meals/day for survivors in impacted area**
  - Identify the CRITICAL criteria/information needed on which to base a decision
    - **How many survivors remained in the area**
      - Approximately 4.3 Million
    - **Quantity of food/meal**
    - **How many staff required to prepare/deliver**

# Pick ONE – Break It Down

- Document what you know from past experience
  - **Operational Period**
  - **Deployment time – (notification to operational)**
  - **Staff required to prepare X number meals**
- Adjust/Recalculate/Cross Check/ - Repeat
- Don't forget **LOGISTICAL** support for your staff, mutual aid assets, volunteers



# # Meals = # resources required

<b>Meals required (initial 14 days)</b>	<b>2,178,000</b>				
Shelf stable meals available	875,000				
Field Kitchen production	1,440,000				
Mobile kitchen production	840,000				
Vendor production	0				
<b>Production shortfall/surplus</b>	<b>977,000</b>				
Delivery requirement	1,440,000				
Delivery capacity	2,100,000				
Delivery shortfall/surplus	660,000				
<b>Shelf stable meals available</b>	<b>875,000</b>				
State	50,000				
Federal	500,000				
ARC	300,000				
TSA	25,000				
<b>Kitchens available:</b>	<b>Capacity</b>	<b>Quantity</b>	<b>Days</b>	<b>Meals</b>	
Field Kitchen Class A (Type IV)	5,000			0	
Field Kitchen Class B (Type III)	10,000	5		0	
Field Kitchen Class C (Type II)	20,000	6	12	1,440,000	
Field Kitchen Class D (Type I)	30,000		12	0	
Total Field kitchen meal capacity		11		1,440,000	
Mobile kitchen (Type II)	1,000	30	14	420,000	
Mobile kitchen (Type I)	1,500	20	14	420,000	
Total mobile kitchen capacity		50		840,000	
Vendor meals available					
ARC Emergency Response Vehicles					
TSA Canteens					
Cargo vans					
<b>Food Service Delivery units</b>	<b>1,500</b>	<b>100</b>	<b>14</b>	<b>2,100,000</b>	

New Madrid Seismic Zone Catastrophic Planning:

# New Madrid Seismic Zone Planning

Michel S. Pawlowski



# Key Goals

- To improve response capabilities for a **no-notice Catastrophic** Earthquake Event and related hazards in the New Madrid Seismic Zone (NMSZ) – develop a **template** for use everywhere
- To plan for a coordinated response and recovery effort for Federal, State, and local agencies – **includes participation with mitigation and preparedness**
- To incorporate key lessons from the Hurricane Katrina response, the Southeast Louisiana Catastrophic Hurricane planning, and previous earthquake response and recovery actions
- Project briefed to President, Secretary DHS, Capital Hill Senate and House Members and Staff, US Chamber of Commerce, Delta Regional Authority, International Development Group, National Hurricane Conference, ESLFG, RISCs

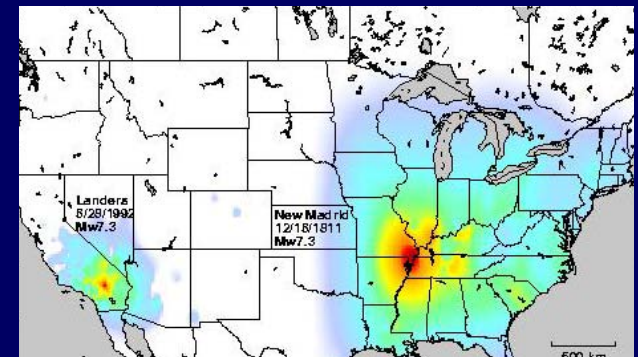


# New Madrid Seismic Zone Catastrophic Planning: The Challenge in New Madrid

- NMSZ = Significant Fault Systems, High Consequences
- Significant national impact
  - Ripple effect across America
- **Wider-reaching effect than quake in CA**
  - (See Maps)
- Tremendous impact on civil infrastructure and critical facilities
- 44M people live in eight-state region
  - 12M in high risk area
- Weather & evacuation complications



Northridge (M 6.7) vs. 1886 (M 6.8)

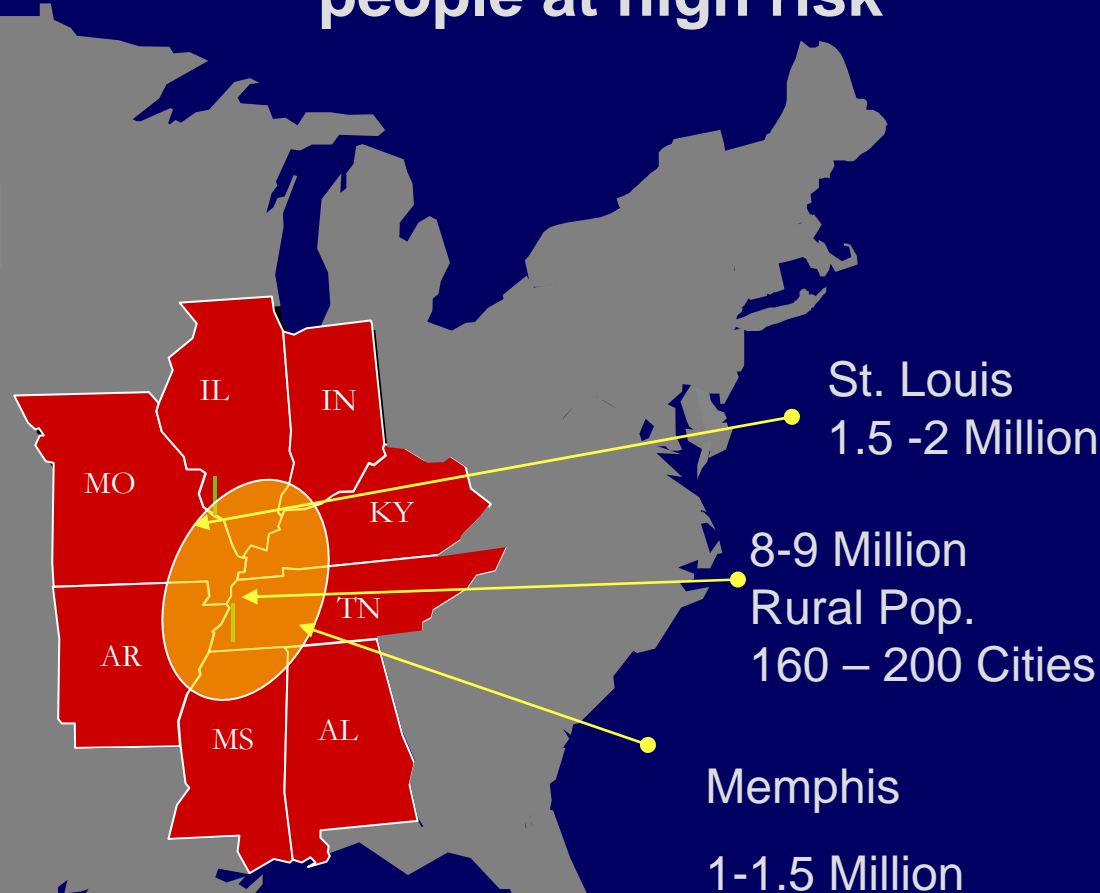


Landers, CA (M 7.3) vs. 1812 (M 7.3)

# The Response Challenges

- No-Notice Event
- Impacts may eclipse Katrina
- Large area of impact approx. 126,575 Sq. Miles
- Multiple aftershocks
- Poor situational awareness
- Seasonal variation
- Public Safety needs may exceed resources
- Mass care/shelter resources may be inadequate
- Major housing, evacuation, & relocation
- Urban & rural areas impacted

Approximately 12 million people at high risk



FEMA

New Madrid Seismic Zone Catastrophic Planning:

# How Catastrophic Could It Be?

Earthquakes occur with no notice, so evacuation of any population before the event is not possible



Post-event self-evacuation will be problematic if fuel resources are impacted

# How Catastrophic Could It Be?

## What Is Likely To Be Severely Impacted?

- Fire-fighting Resources - Multiple simultaneous fires, complicated by lack of firefighting water systems
- Local Incident Commanders face decisions on Firefighting vs. Search & Rescue operations, often with limited resources
- 20-25% of local public safety responders, equipment, and facilities unavailable
- Public access to food and water may be compromised
- Local medical facilities and equipment damaged, destroyed, without power, water and/or other essential medical supplies (usually only one week inventory of medical supplies)



# How Catastrophic Could It Be?

## What Is Likely To Be Severely Impacted?

- **Local shelter facilities** damaged, destroyed, or uninhabitable
- **Commercial traffic on navigable waterways** blocked and disrupted, loss of navigational aids (many unknowns)
- **HAZMAT risk** to immediate area as well as to communities outside the primary impact area
- **Drainage and irrigation networks, and water retaining systems** destroyed or damaged resulting in unusual flooding





# How Catastrophic Could It Be?

## What Is Likely To Be Severely Impacted?

- **Structures** on certain soils and grounds
- **Crude Oil & Natural Gas Transmission and Distribution Lines** - very significant system
- **Major Fiber Optic Cable Routes**
- **FedEx hub in Memphis TN** - the heart of the NMSZ
- **Transportation Systems** – Highways, Rail and Air Traffic – heavy damage & rerouting during repairs



**Noto Tollway in  
Kanazawa, Japan**



# How Catastrophic Could It Be?

## What Is Likely To Be Severely Impacted?

- **Aging Infrastructure** - bridges, homes and critical infrastructure
- **Critical Facilities** (Shelters, Hospitals, Emergency Operations Centers, Fire Stations, Police Stations, etc.)
- **Human Resources** overwhelmed
- **Power Plants** – many located on grounds susceptible to liquefaction, along the Mississippi and Missouri Rivers
- **Storage Tanks** – above and below-ground



# How Catastrophic Could It Be?

## Damages: Cost Estimates

- A 1994 FEMA study estimated that a repeat of a 7.5 to 7.7 NMSZ earthquake would cause \$30 Billion in damage
- A 2006 Mid-America Earthquake (MAE) Center study estimated that a 7.7 NMSZ earthquake on the southwest arm alone would cause \$70 Billion in damage to the region.
  - HAZUS Database update and other modeling support
- Damage cost estimates expected to increase with improved modeling data being prepared by MAE Center for the NMSZ Project
- Point of Comparison - Hurricane Katrina estimated at \$10 – \$40 Billion

# NMSZ PROJECT

**The Federal Government and all levels of government in the NMSZ recognize the need for comprehensive catastrophic planning.**

**The NMSZ Project addresses this need, providing:**

- A Bottom-Up Planning Approach with participation from all levels of Government and the Private Sector “*All Disasters are Local*”
- Comprehensive Project Work: Plan Development and Enhancement, establishment of Sustainable Planning Processes
- A template to use in other parts of the country for all hazard no-notice catastrophic disasters



# Participation

- Federal, State, Local partnership
- Central US Earthquake Consortium (CUSEC)
  - AL, AR, IL, IN, KY, MS, MO, TN
  - Leading the way with the States – funding by FEMA
- DHS components
- FEMA Hq and Regions IV, V, VI, VII
- Federal and Sector Specific Agencies
  - Critical Infrastructure
  - SANDIA National Library – funding by DHS & FEMA
- Emergency Management Assistance Compact (EMAC)
- Local governments and Tribal Nations
- Private Sector: Business, Industry, and Voluntary Organizations
- Mid-America Earthquake Center (MAEC) – funding by FEMA
- Institute for Crisis, Disaster & Risk Management – funding by FEMA
- Innovative Emergency Management
  - FEMA funded full time planners in each State/Region/HQ

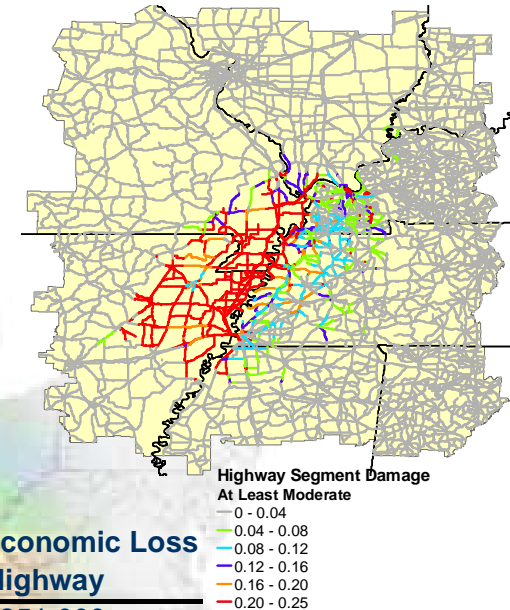




## New Madrid Seismic Zone Catastrophic Planning:

# Roadway Networks

- 30,314 highway bridges and over 86,000 miles of highway in 230 counties
- Transportation systems most effected by EQ in northeast AR or western TN
- Greatest regional impact to AR, MO & TN with approx. 85% (\$3.4 B) of highway losses



	No. Highway	Highway Bridge Damage		Bridge Functionality		Direct Economic Loss Highway
		Moderate	Complete	Day 1	Day 7	
Alabama	1,935			98.8%	99.6%	\$251,000
Arkansas	2,879			76.7%	80.6%	\$1,590,988,000
Illinois	6,554			97.7%	98.1%	\$171,264,000
Indiana	2,214	1,987	530	99.6%	99.8%	\$2,636,000
Kentucky	2,082			92.2%	93.7%	\$355,964,000
Mississippi	4,032			93.7%	95.9%	\$119,202,000
Missouri	7,803			91.8%	93.1%	\$923,199,000
Tennessee	2,815			90.2%	92.1%	\$903,136,000
<b>TOTAL</b>	<b>30,314</b>			<b>28,356</b>	<b>29,142</b>	<b>\$4,066,640,000</b>

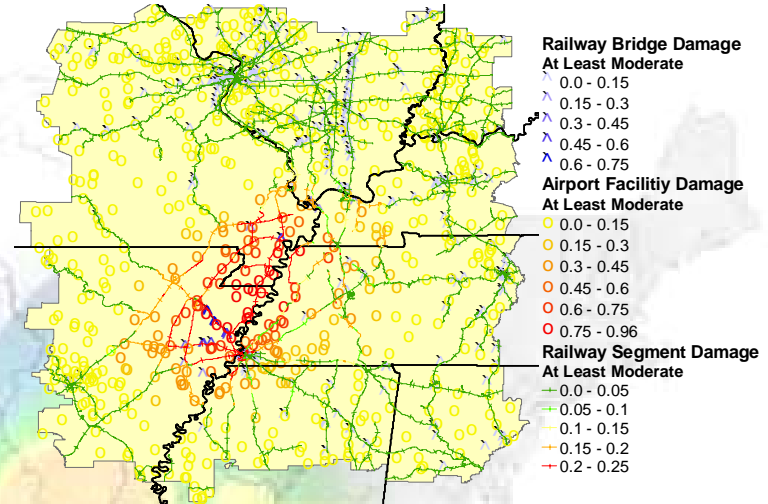
Total Economic Loss due to Highway Damage: ~\$4.1 billion



## New Madrid Seismic Zone Catastrophic Planning:

# Railway Networks & Airports

- 425 railway bridges and nearly 28,000 miles of track in 230 counties
- Greatest damage in Memphis area; most bridges and airports non-operational



	Regional Quantity	Structural Damage		Component Functionality		Direct Economic Losses
		Moderate	Complete	Day 1	Day 7	
<b>Railway Bridges</b>	425	9	0	416	421	\$330,879,000
<b>Railway Facilities</b>	393	85	0	358	376	
<b>Airport Facilities</b>	637	64	8	596	624	\$400,673,000
<b>Port Facilities</b>	691	109	14	638	660	\$228,239,000
<b>TOTAL</b>						<b>\$628,912,000</b>

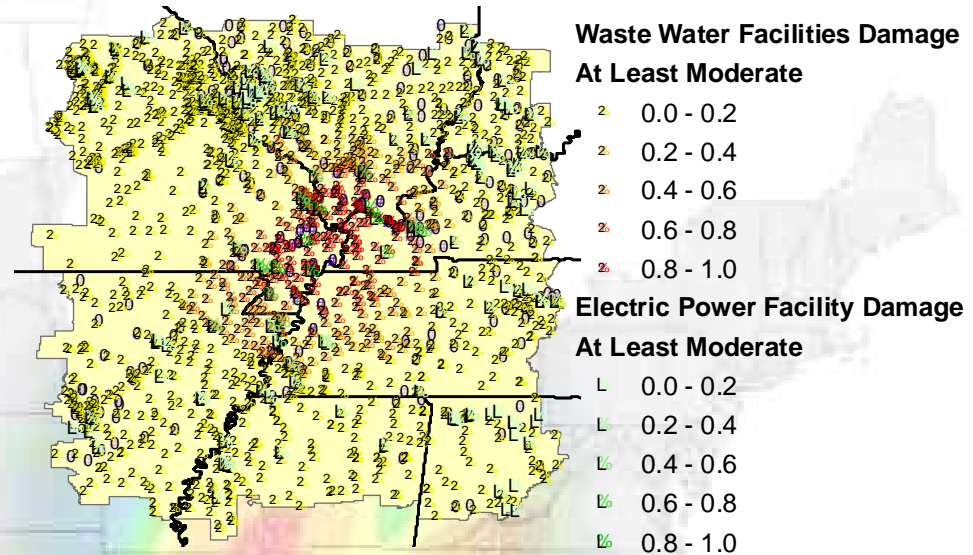
Total Transportation Economic Loss: ~\$5.44 billion



## New Madrid Seismic Zone Catastrophic Planning:

# Utility Facilities

- Utility lifelines most affected by EQ in southern IL/ southeast MO
- Most damage and economic loss to utility facilities incurred by waste water facilities
  - 75% of all utility facility damage
- Most severe damage to facilities in southern IL, southeastern MO and western KY



	No. of Facilities	Facility Structural Damage		Facility Functionality		Direct Economic Loss
		Moderate	Complete	Day 1	Day 7	
Potable Water Facilities	249	36	2	213	238	\$810,170,000
Waste Water Facilities	1,646	162	14	1,295	1,571	\$8,389,390,000
Oil Facilities	49	1	0	47	49	\$8,320,000
Natural Gas Facilities	114	12	0	102	111	\$200,000
Electric Power Facilities	158	16	0	130	155	\$1,307,810,000
Communication Facilities	940	98	6	883	932	\$7,020,000
<b>TOTAL:</b>						<b>\$10,522,910,000</b>

Total Economic Loss due to Utility Facilities: ~\$10.05 billion

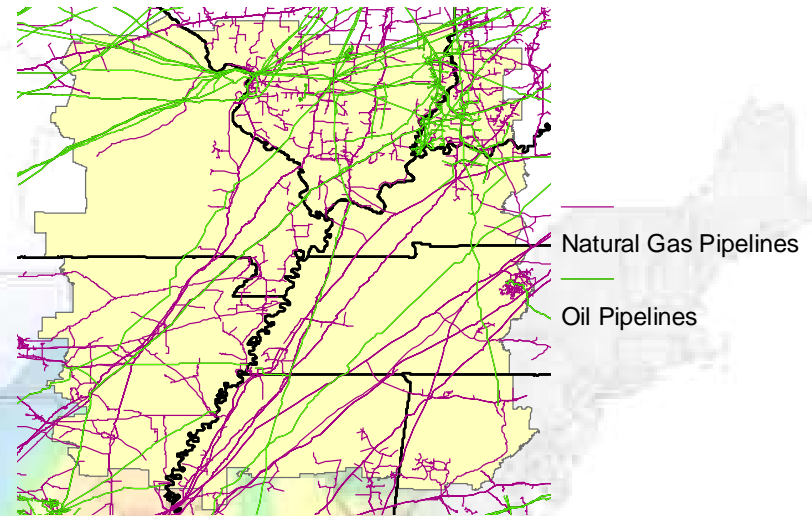




## New Madrid Seismic Zone Catastrophic Planning:

# Utility Pipeline Networks and Service

- Largest losses of electricity and potable water in MO & TN
- Greatest pipeline damage incurred by potable water lines, though highest break rates in natural gas lines
- Economic losses for pipelines are nearly \$2 billion, or 16% of regional utility losses



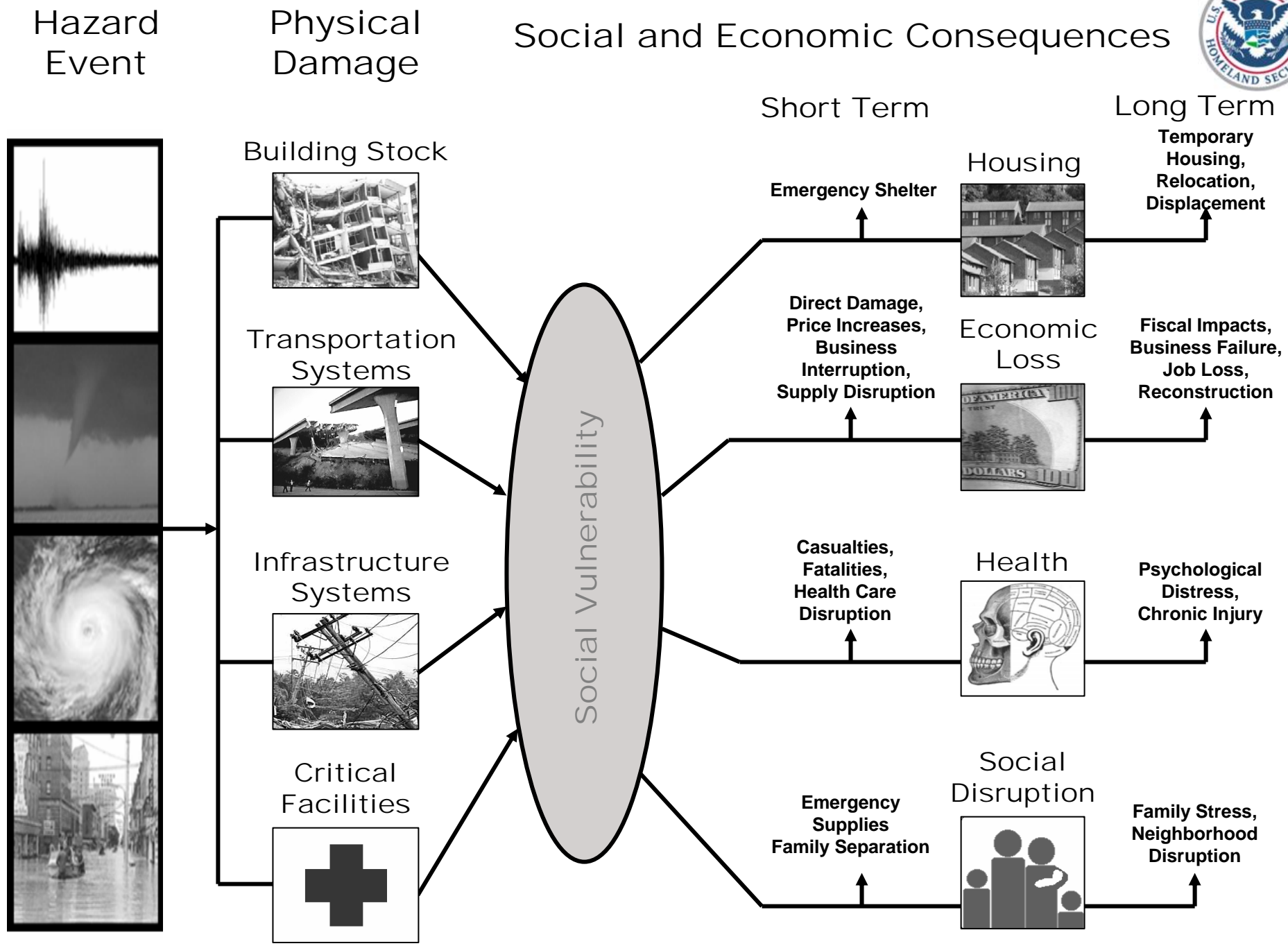
Only major distribution lines shown here

	Households without Water		Households without Electricity		Total Households
	Day 1	Day 7	Day 1	Day 7	
Alabama	0	0	0	0	248,471
Arkansas	139,438	119,529	6,731	1,959	519,225
Illinois	87,601	37,623	39,058	14,188	524,859
Indiana	43,628	4,403	0	0	188,251
Kentucky	134,323	92,805	65,367	25,302	253,853
Mississippi	19,180	2,236	0	0	275,342
Missouri	163,558	96,267	76,114	31,030	1,184,976
Tennessee	348,187	304,363	37,244	11,562	1,041,220
<b>TOTAL</b>	<b>935,915</b>	<b>657,226</b>	<b>224,514</b>	<b>84,041</b>	<b>4,236,197</b>

	Length of Pipe (mi)	No. Breaks	No. Leaks
Potable Water	311,034	41,246	65,795
Waste Water	186,620	32,622	52,038
Natural Gas	124,413	33,430	49,860
Oil (Major Dist. Lines ONLY)	8,003	7,460	1,951
<b>TOTAL</b>	<b>630,070</b>	<b>114,758</b>	<b>169,644</b>

Total Utility Economic Loss: ~\$12.48 billion

# Social and Economic Consequences



Hazard Event

Physical Damage

Short Term

Long Term

Building Stock



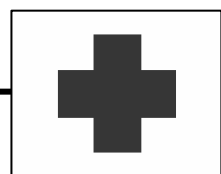
Transportation Systems



Infrastructure Systems



Critical Facilities



Social Vulnerability

Emergency Shelter

Direct Damage, Price Increases, Business Interruption, Supply Disruption

Casualties, Fatalities, Health Care Disruption

Emergency Supplies Family Separation

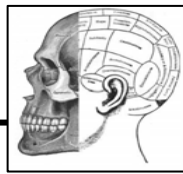
Housing



Economic Loss



Health



Social Disruption



Temporary Housing, Relocation, Displacement

Fiscal Impacts, Business Failure, Job Loss, Reconstruction

Psychological Distress, Chronic Injury

Family Stress, Neighborhood Disruption



# Response/Recovery/Mitigation Planning Areas To Include

- Command & control
- Saving lives
- Search & rescue
- Evacuation including medical/special needs
- Temporary medical care
- Hosting
- Temporary housing
- National Disaster Housing Strategy
- Mass care
- Transportation/staging & distribution of critical resources
- Sheltering
- Mitigation
- Access control & reentry
- Power, water & ice distribution
- Volunteer & donations management
- Hazardous materials
- Enhanced State & local debris management
- External affairs
- Business Industry & Government (BIG) partnership
- Private sector coordination
- Critical infrastructure

New Madrid Seismic Zone Catastrophic Planning:

# The Concept

# REX COBLE

Lead Program Manager – IEM FEMA HQ



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# The Concept

**The Scenario-Driven Catastrophic Response Plan Development Process** puts *Response Operations Personnel* and *Emergency Planners* in the same room to develop plans based on real world data



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# New Madrid Seismic Zone Catastrophic Planning: Scenario-Driven Catastrophic Planning Process

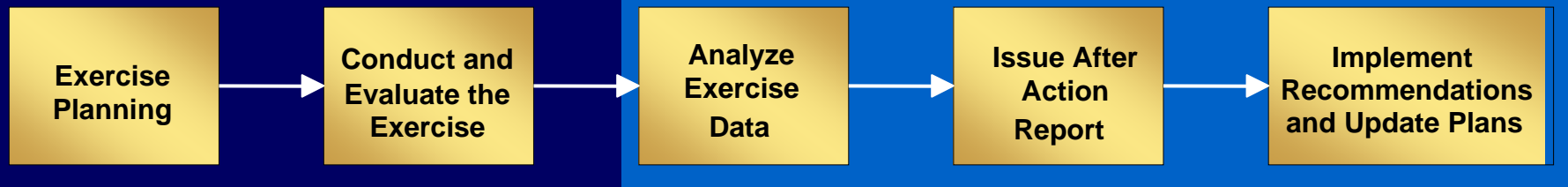
- Combines the planning and exercise phases of plan development
- Uses breakout rooms and action rooms for planning on specific topics
- Produces functional plans ready to use immediately post-workshop
- Promotes communication and builds strong relationships between Federal, State, local, and volunteer agencies,
- Addresses jurisdictional conflicts by the participation of a variety of Federal, State, local, and volunteer agencies, enhancing the interoperability of the plans



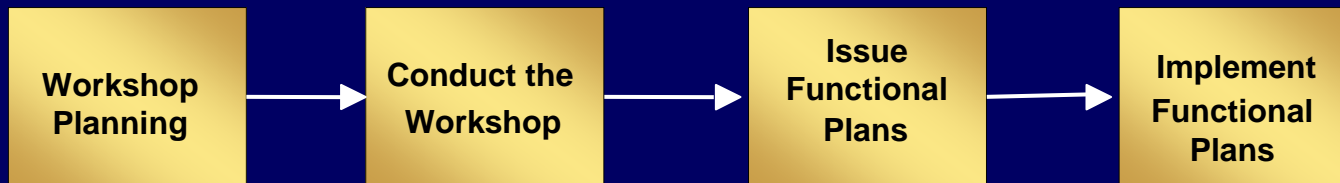
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# Process Comparison

## Traditional Exercise Process



## Scenario Based Workshops: Less Steps – Faster Results



The Scenario-Driven Planning Process produces functional plans “**On the Spot**”

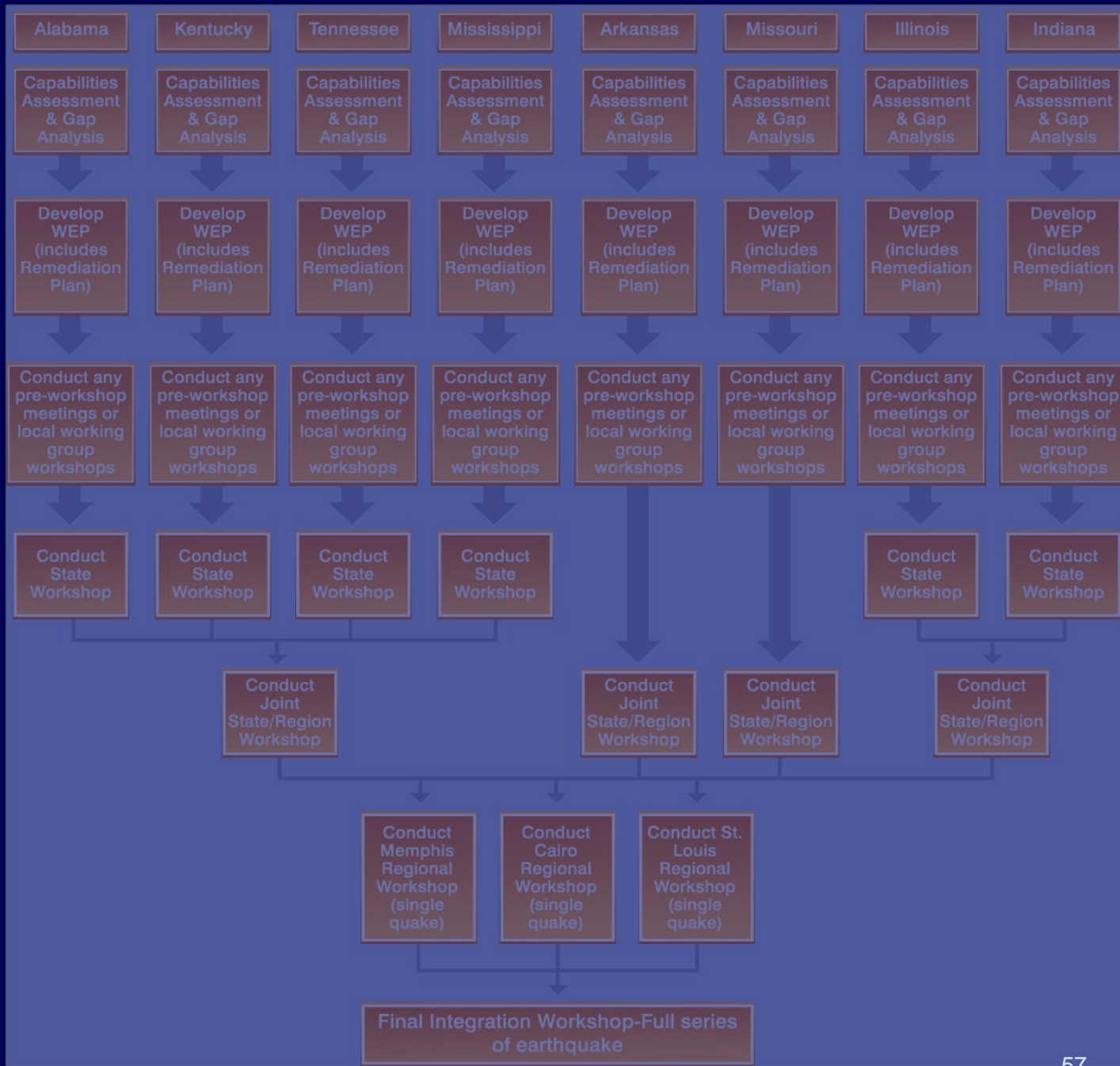
# Workshop Structure

- Three levels of workshops:
  - State workshops in all 8 NMSZ States
  - Regional Workshops
  - Final integration workshop includes results from all regions





We are here 



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# **WORKSHOP Schedule - In Development**

## **State Workshops (8)**

Arkansas Workshop – June, 2007

Indiana Workshop – September, 2007

Missouri Workshop – October, 2007

Alabama Workshop – October, 2007

Illinois Workshop – November, 2007

Tennessee Workshop – November, 2007

Mississippi Workshop – January, 2008

Kentucky Workshop – February, 2008

## **Regional & Final Integration Workshops**

Schedule TBD, 3rd & 4th Quarters of FY08

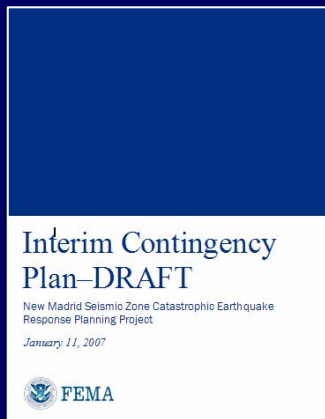


# Products and Achievements

- A comprehensive real world scenario for a catastrophic earthquake in the central United States
- State, local, and/or state-regional earthquake response annexes
- An overall national plan for an NMSZ earthquake scenario that integrates all plans into a single response system
- A plan maintenance and monitoring schedule, and materials for training and exercises for individual and national plans
- Federal regional catastrophic earthquake response annexes



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# New Madrid Seismic Zone Catastrophic Planning: Exercises

- Through FY 2008
  - Issues uncovered during exercises and other events factored into scenario-driven workshops and addressed in catastrophic plans
- FY 2009-2010
  - Scenario-based training and exercise of the plan
  - States to independently and regionally exercise their plans
  - State and local community participation
- FY 2011
  - Major command exercise (proposed)
    - 200<sup>th</sup> Anniversary of 1811 New Madrid Earthquake



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New Madrid Seismic Zone Catastrophic Planning:

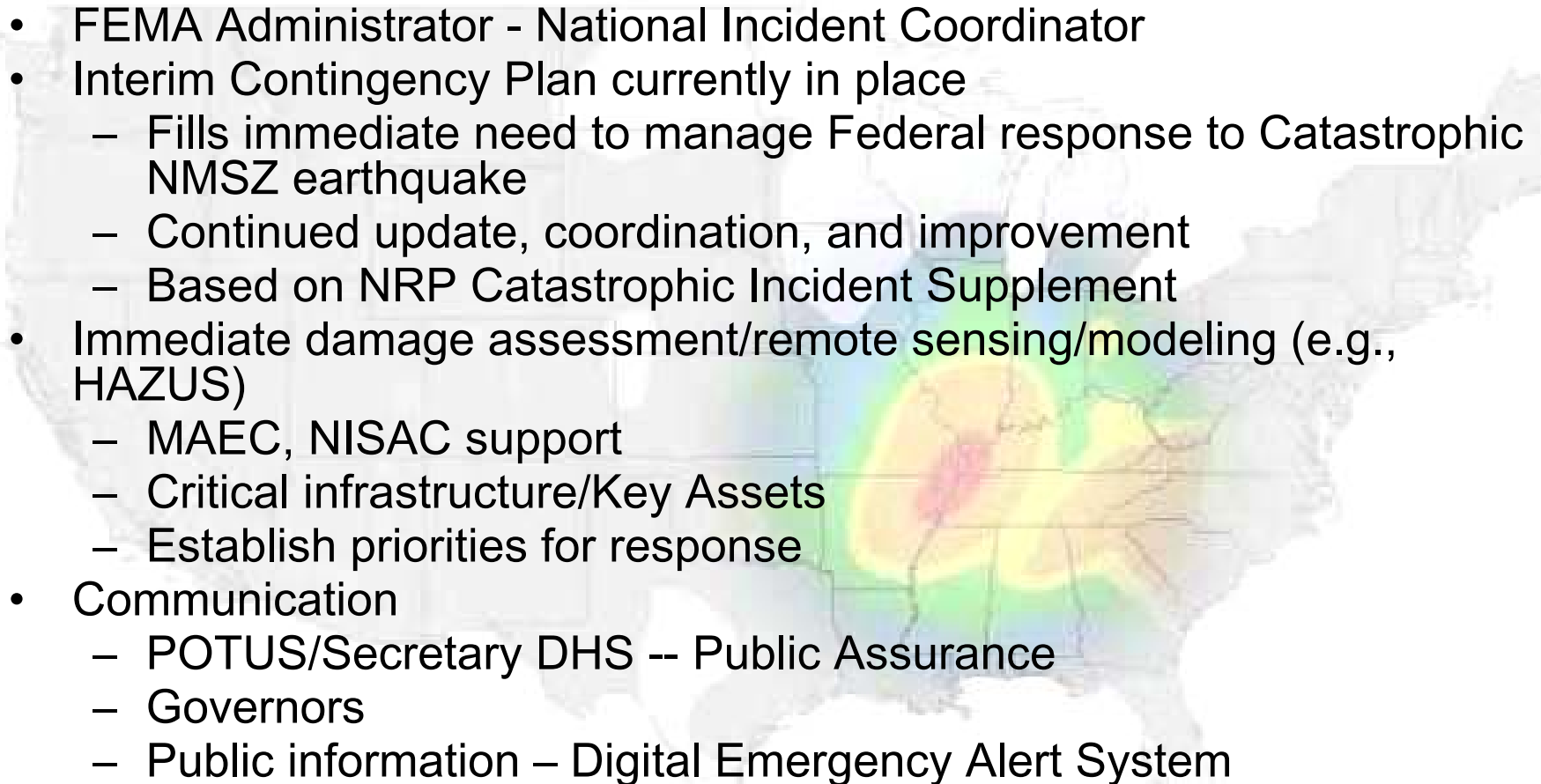


# **What If It Happens Today?**

William P. McGann  
Emergency Management Specialist  
FEMA HQ  
Disaster Operations Directorate

New Madrid Seismic Zone Catastrophic Planning:

# What If It Happens Today?

- FEMA Administrator - National Incident Coordinator
  - Interim Contingency Plan currently in place
    - Fills immediate need to manage Federal response to Catastrophic NMSZ earthquake
    - Continued update, coordination, and improvement
    - Based on NRP Catastrophic Incident Supplement
  - Immediate damage assessment/remote sensing/modeling (e.g., HAZUS)
    - MAEC, NISAC support
    - Critical infrastructure/Key Assets
    - Establish priorities for response
  - Communication
    - POTUS/Secretary DHS -- Public Assurance
    - Governors
    - Public information – Digital Emergency Alert System
- 

New Madrid Seismic Zone Catastrophic Planning:

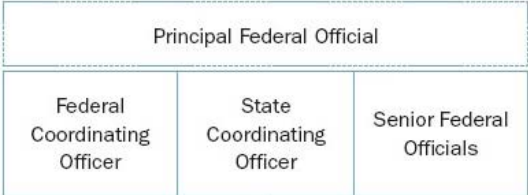
# What If It Happens Today?

- Establish Unified Command Structure
  - Primary/multiple JFOs and coordination
  - Lead FEMA Region option
  - Initial deployment of JFO Coordination Group to affected State EOCs
- Key Federal response teams activated to support response
  - DSAT, FIRST, ERT-N, ERT-A, NDMS, US&R, MERS, RNA
- Implement Defense Production Act to meet requirements
- Leverage 2006 hurricane season experience
  - Pre-scripted mission assignments
  - Pre-positioned disaster supplies
- Full activation of NRCC; full activation of ESF teams
  - Transportation, housing, emergency power, logistics, commodities, communications, temp medical etc.
  - Establish working groups for long term issues (housing, mass care, medical, etc.)

New Madrid Seismic Zone Catastrophic Planning:

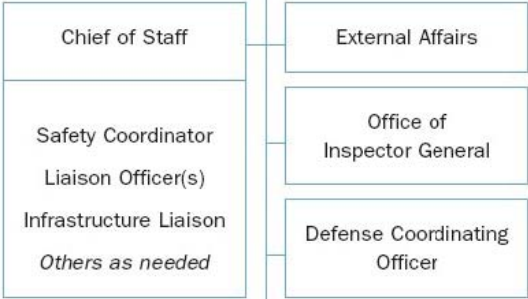
# Joint Field Office

JFO Coordination Group



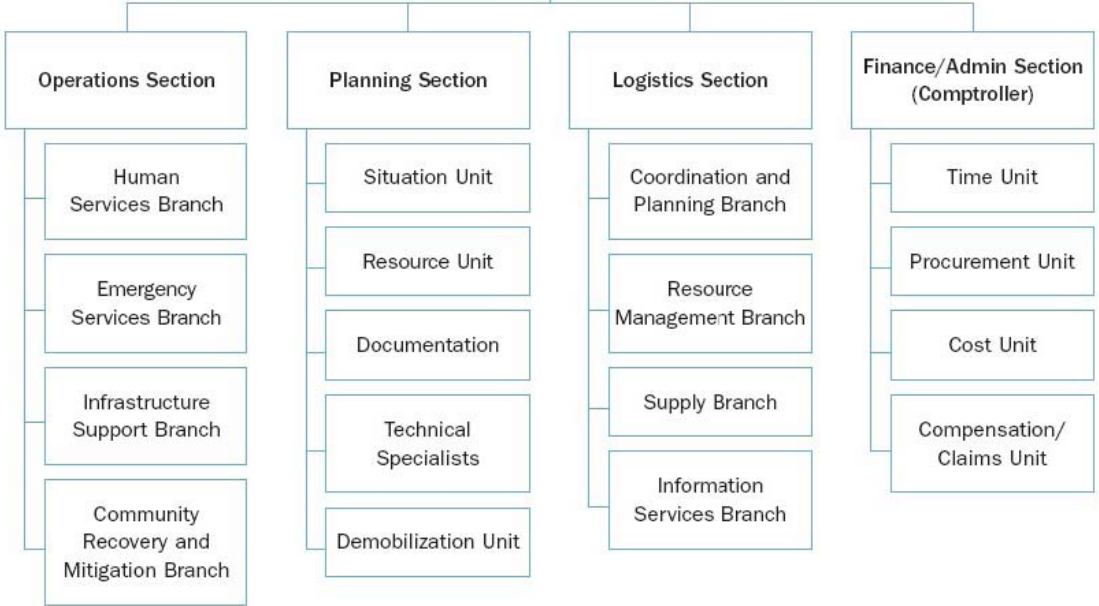
**Note:** Depending on the magnitude of the disaster, a Principal Federal Official may not always be designated, in which case the Federal Coordinating Officer will provide the Federal lead.

JFO Coordination Staff



The State Coordinating Officer represents the State, and in some instances, the JFO Coordination Group may include local and/or tribal representatives as well as NGO and private-sector representatives, as appropriate.

JFO Sections

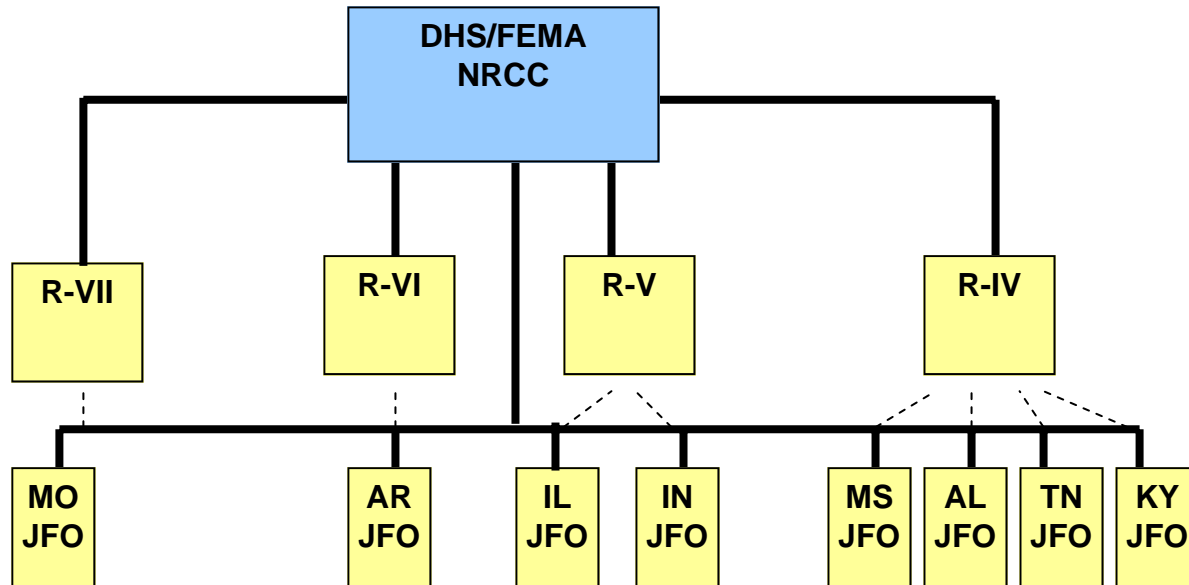




New Madrid Seismic Zone Catastrophic Planning:

# Command & Control Option 1

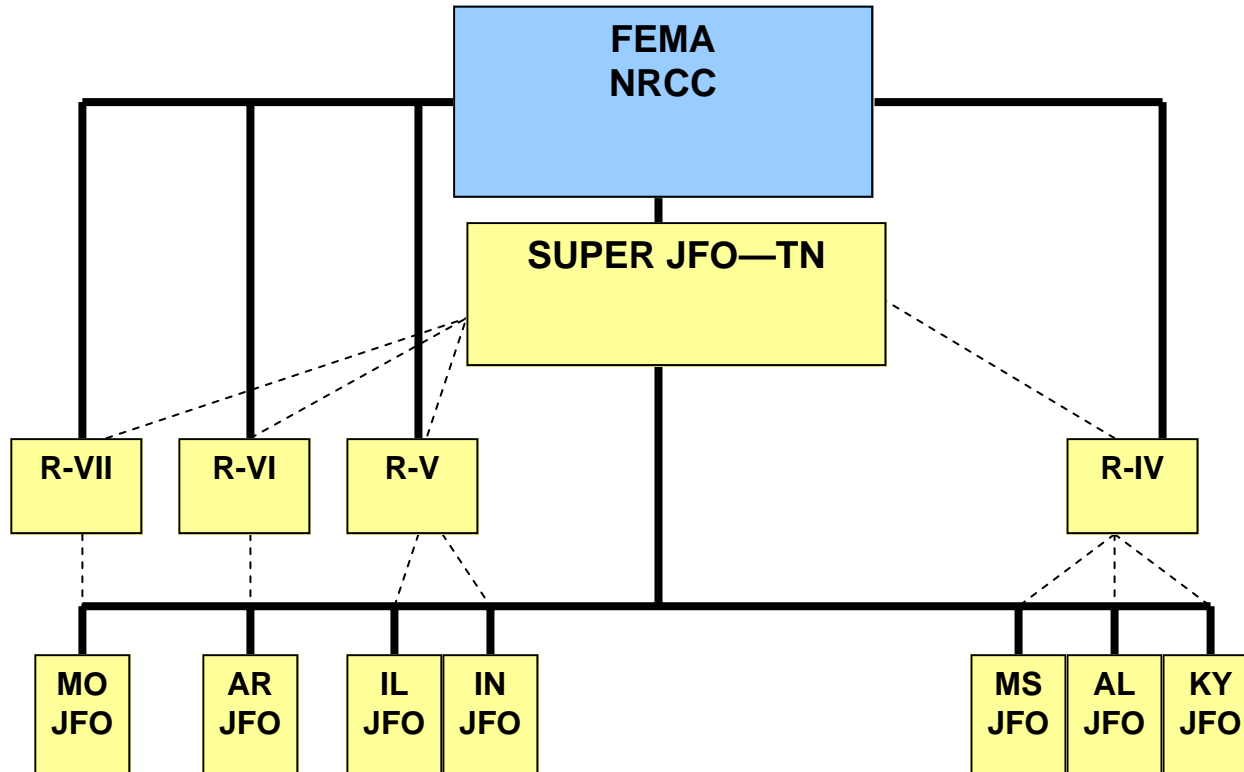
In this option, the FEMA regions provide command and control for all Joint Field Offices in their assigned states.



New Madrid Seismic Zone Catastrophic Planning:

# Command & Control Option 2

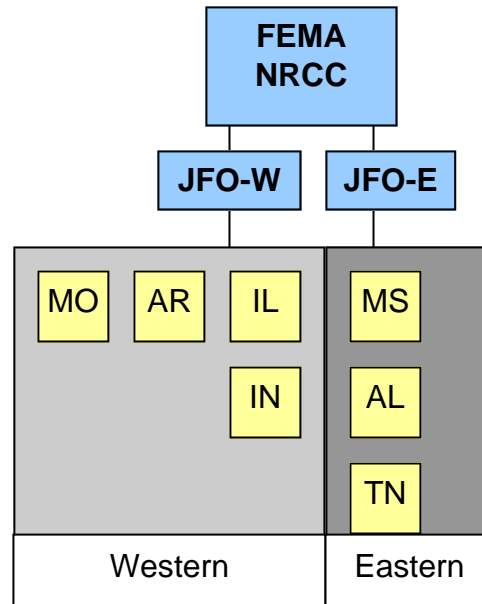
In this option, one of the states—probably the most impacted state—is designated a Super Joint Field Office. This Joint Field office becomes the center of gravity for federal disaster support operations.



New Madrid Seismic Zone Catastrophic Planning:

# Command & Control Option 3

This is a variation of Option 2 for circumstances where one Super Joint Field Office is not sufficient. For example, it may be used when damage is too severe for centralized management from one location or conditions of the infrastructure—such as all bridges across the Mississippi River are destroyed—does not support management out of one location.



# **Evacuation Planning**

**Paul K. Schwartz**

**Chief – Interagency Planning**

**FEMA HQ**

**Disaster Operations Directorate**

# Background

- Mass Evacuation Incident Annex to the NRP
- Overview of what needs to be considered and by whom
- Consistent with Post Katrina Reform Act 5441
- Like Katrina Reform Act, does not spell out “How?”
- Vital component for both Florida and NMSZ projects

# Step 1 – Starting Point

- Primary Embarkation Site
- Major Airport
- All contracted modes of transportation converge
- Primary responsibility of contracting transportation modes with FEMA Logistics

# Step 2 – Activities at Site

- Registration
- Manifesting
- Evacuee Processing
- Evacuee Tracking – Bar Code
- Pets and Special Needs Considerations

# Step 3 – Traffic Management/Flow

- Transportation/Sheltering Management Teams
- Responsible for ensuring proper coordination and dissemination of evacuees
- Team composition includes:
  - State, local, FEMA Region, ESFs as necessary
  - Disaster Assistance, Disaster Operations, Logistics, Communications (CIO)



# Step 4 – Debarkation Sites

- Likely multiple
- Dependent upon specific location, incident, and other variable

# Summary

- Florida & New Madrid is a major effort for DHS and FEMA
- Focus on bottom-up planning approach
  - Significant planning and coordination effort
  - Federal/State/local partnership
- Adequate funds programmed for planning effort
- Multi-year plan with rigorous exercise component
- Methodology exportable to ALL disasters across country
- Interagency support requirement
- Interim contingency plan for NMSZ



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New Madrid Seismic Zone Catastrophic Planning:

# THANK YOU

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**FEMA**

# New Madrid Seismic Zone Catastrophic Planning:

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