



JACKSON COUNTY MULTI-HAZARD MITIGATION PLAN



FEMA



Meeting 2
September 28, 2021
10:00 AM



Agenda

1. Welcome and Introductions
2. Multi-Hazard Mitigation Planning Updates
Tyler Carpenter, Environmental Planning Director, Greater Egypt
3. Hazard Ranking Review
Kelsey Bowe, Environmental Planner, Greater Egypt
4. Jackson County Hazard Modeling
5. Introduction to Mitigation Strategies
6. Mitigation Strategies Exercise
7. Adjourn

Tyler Carpenter, Environmental Planning Director - Greater Egypt

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Match Requirements

- 75% Federal Dollars for Planning
- 25% Local Match Needed
- Match is Met by Your Participation
 - Meeting Attendance
 - Outside Work on Plan
 - Travel
 - Other Costs
- Current Match: 40% (\$3,372/8,333)
- MHMP Match Survey

MHMP-Salary and Benefit Request

As you are aware, Greater Egypt has contracted with Jackson County to assist with the completion of the 5-year update to the Multi-Hazard Mitigation Plan. As a federally-funded project, 25% of the cost of the update must be met by Jackson County and other local agencies that participate in the plan update. The match is met through in-kind support or "sweat equity" by the representatives of the participating agencies who attend meetings and take part in the update process. IEMA and FEMA require the actual salary and benefit rates to be used to calculate the cost.

We respectfully request that you provide the names and compensation information for the employees and representatives of your agency who have attended meetings so far, or who have not attended meetings but will eventually be involved in the update process. Please provide this information in the Salary and Benefit Request. This information will remain in strict confidence and will only be utilized to complete the required reports for the IEMA Grant Manager in Springfield.

For questions regarding this request, feel free to contact Greater Egypt at 618-997-9351.

Email *

Valid email

This form is collecting emails. [Change settings](#)

First Name *

Short answer text

Last Name *

Short answer text



Responsibilities of Planning Partners

- ~~Represent an authorized jurisdiction in the county~~
- ~~Attend two meetings during planning process~~
- ~~Complete Hazard Ranking exercise for your jurisdiction~~
- Propose two mitigation strategies for each hazard
- Assist with meeting match requirements through participation
- Assist with data collection for hazard modeling



Hazard Ranking Review

Hazard	Avg risk index	# lists included	total lists received	% importance	weighted risk index
tornado	13.07692308	26	29	0.896551724	11.72413793
epidemic	15.0952381	21	29	0.724137931	10.93103448
earthquake	10.66666667	27	29	0.931034483	9.931034483
winter storm	7.92	25	29	0.862068966	6.827586207
thunderstorm	7.538461538	26	29	0.896551724	6.75862069
flooding	7.863636364	22	29	0.75862069	5.965517241
hazmat release	6.652173913	23	29	0.793103448	5.275862069
extreme heat	6.05	20	29	0.689655172	4.172413793
levee failure	10.4	10	29	0.344827586	3.586206897



Hazard Ranking Review

Hazard	Avg risk index	# lists included	total lists received	% importance	weighted risk index
cyber attack	10.25	4	29	0.137931034	1.413793103
terrorism	3.416666667	12	29	0.413793103	1.413793103
ground failure	3.153846154	13	29	0.448275862	1.413793103
dam failure	7.6	5	29	0.172413793	1.310344828
utility disruption	10	3	29	0.103448276	1.034482759
meteor	3.833333333	6	29	0.206896552	0.793103448
wildfire	2.75	8	29	0.275862069	0.75862069
active shooter	6.5	2	29	0.068965517	0.448275862
landslide	2	4	29	0.137931034	0.275862069
infestation	2	3	29	0.103448276	0.206896552
invasive spp	2	3	29	0.103448276	0.206896552



Hazard Ranking Review

- Vote on final hazard ranking
- Last chance to add or remove any hazards for the Plan

- | | |
|-------------------------------|---|
| 1. Tornado | 11. Terrorism/ active shooter |
| 2. Disease outbreak/epidemics | 12. Ground failure (mine subsidence or karst sinkholes) |
| 3. Earthquake | 13. Dam failure |
| 4. Severe winter weather | 14. Utility disruption/power outages |
| 5. Severe thunderstorm | 15. Meteor |
| 6. Flooding | 16. Wildfire |
| 7. HazMat release | 17. Landslide |
| 8. Drought/extreme heat | 18. Infestation/invasive species |
| 9. Levee failure | |
| 10. Cyber attack | |



Hazard Modeling

- Earthquakes: Hazus 5.0 (FEMA software)
 - County can decide magnitude and epicenter location
- Hazardous Material Release: Aloha (EPA software)
 - *Aloha can only model 1 chemical at a time
 - Each county must decide which chemical(s) they want to model
- Tornadoes: ArcGIS
 - Any EF rating and path direction can be modeled
- Floods: Hazus 5.0
 - Floods will be modeled on a case by case basis if the county does not rank the hazard in the top 4
- Heat: Google Earth Engine
 - Land surface temps can be mapped from LandSat8 data for a desired date range

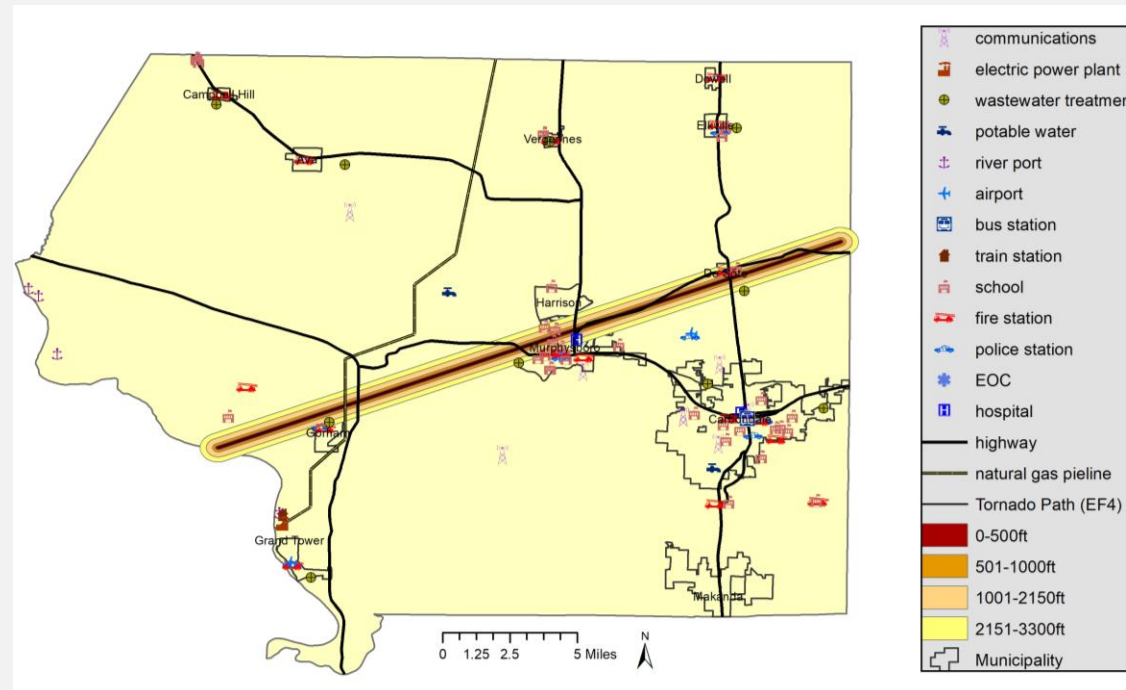
**Greater Egypt will not model pandemics/disease outbreak. Detailed information and maps of positivity rates for Covid19 are widely available from the CDC and Illinois Department of Public Health*

Reminder – Hazus Datasets: Last Chance to Update

- **Updating is optional**
 - Can make models more accurate
 - May be useful in determining mitigation strategies
 - Anything built after 2010 is likely not included in current datasets
- **Features of the datasets that are estimated (from aggregated census and homeland infrastructure data):**
 - Building & foundation type
 - Square footage
 - Replacement value
 - Number of stories
- **Potentially important structures currently not included in models:**
 - Nursing homes or other live-in care facilities
 - Urgent care clinics
 - City halls, courthouses
 - Dams & levees
 - Military buildings

Example Tornado Path

- Model EF4 tornado
 - Average path length: 32 miles
 - (path on right is 23 miles)
 - Average path width: 3271 feet
 - Based on all U.S. tornadoes reported from 2007-2013
- **Assessor's/parcel data (with building values) required for detailed estimates of damage**
- Planning partners can request other paths and tornado EF ratings





Historic Tornadoes - Jackson County

Location	Date	Rank	Deaths	Injuries	Property Damage
	12/18/1957	F4	11	180	2500000
	11/13/1951	F2	0	7	250000
	4/5/1958	F3	0	6	250000
	4/5/1958	F3	0	5	250000
	12/18/1957	F2	0	5	25000
	6/1/1970	F2	0	5	25000
GORHAM	9/22/2006	F2	0	1	800000
	3/25/1970	F2	0	1	250000
CORA	2/28/2017	EF3	0	0	6000000
MAKANDA	2/29/2012	EF2	0	0	100000
SATO	5/8/2009	EF1	0	0	80000
DOWELL	3/23/2012	EF1	0	0	75000
ELKVILLE	4/19/2011	EF0	0	0	70000
MT CARBON	4/24/2014	EF1	0	0	35000
	12/18/1957	F2	0	0	25000
	8/21/1971	F1	0	0	25000
	6/14/1990	F1	0	0	25000
MURPHYSBORO	6/19/2015	EF1	0	0	25000
ELKVILLE	5/8/2009	EF0	0	0	10000
ETHERTON	2/20/2014	EF1	0	0	10000
CRAIN	4/7/2010	EF0	0	0	5000
AVA	12/23/2015	EF0	0	0	5000
DE SOTO	11/10/2002	F0	0	0	4000
	5/8/1988	F1	0	0	2500
ETHERTON	3/1/2017	EF0	0	0	2000

- **EF4 and EF5 tornadoes are rare**
 - (average of 8/ year and 1/year for the entire United States) - but devastating when they do occur (Elsner et. al 2014)
 - 24 EF4/EF5 tornadoes in IL since 1950
- **The Marion Tornado of 1982 (Williamson County) killed 10 and injured nearly 200**
 - Path length 17mi and width 400ft (NOAA Storm events database)

Historic Tornadoes - Jackson County

- Tri-State Tornado of 1925
- 625 deaths and 2,000+ injured
- 15,000 homes destroyed

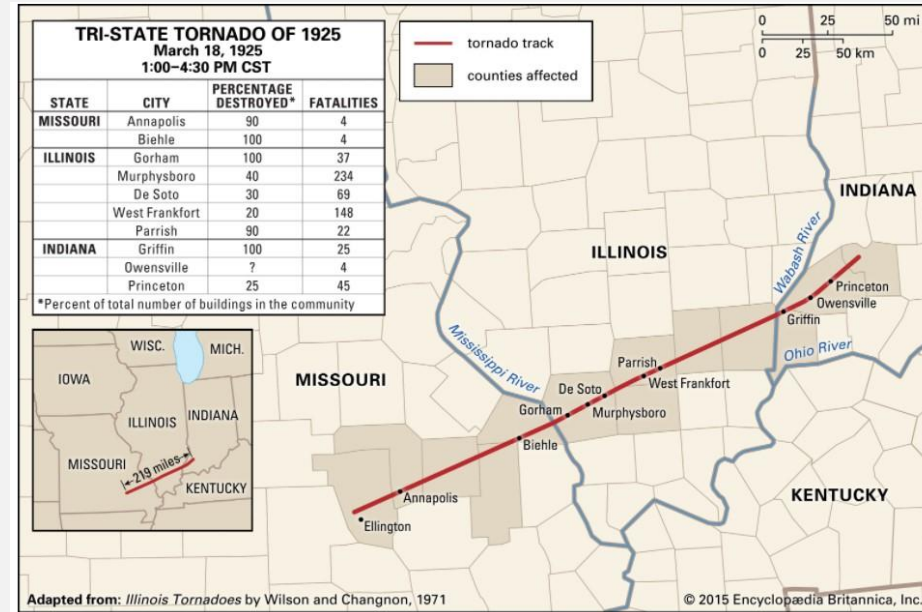
THE SOUTHERN ILLINOISIAN SUNDAY, MARCH 18, 2012

Contact Us: paul.newton@thesouthern.com 9A



Damage is shown in De Soto after the 1925 Tri-State Tornado.

PROVIDED BY JACKSON COUNTY HISTORICAL SOCIETY

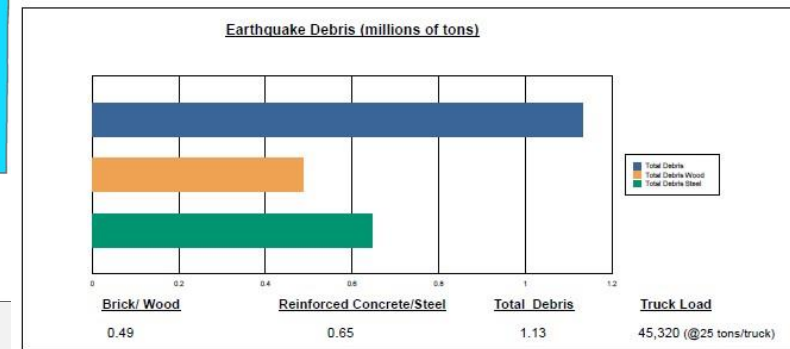
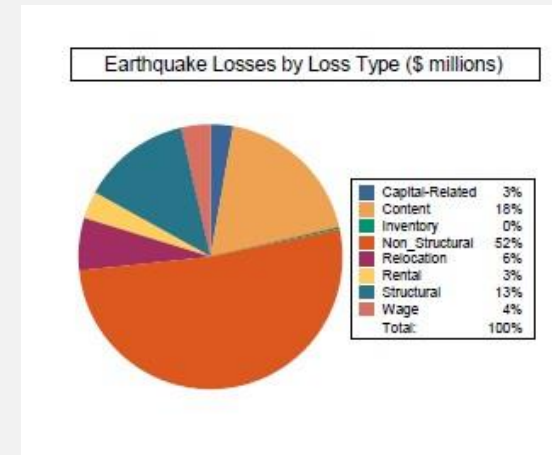
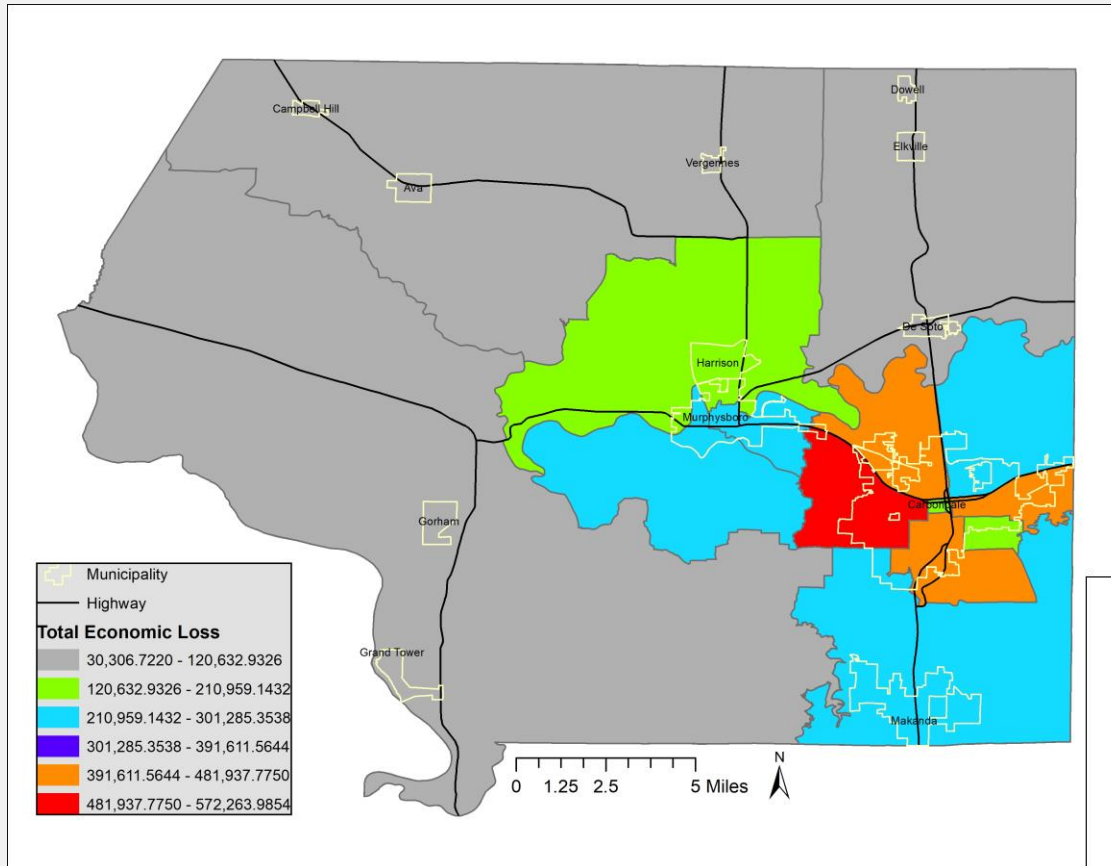




Earthquake Preliminary Models

- Arbitrary Earthquake Model (Hazus 5.0)
- Epicenter: Carbondale, IL
 - Most populous city chosen to estimate damages in a worst case scenario
- Magnitude: 6
 - Any higher magnitudes are extremely unlikely
- Depth: 10km
 - This is the average, or “fixed depth” of earthquakes as determined by USGS
- Attenuation Function: CEUS 2008
 - The rate of loss in energy from the epicenter
 - CEUS 2008 was designed for the Eastern/Central United States

Earthquake Preliminary Models



Damage Categories by General Occupancy Type

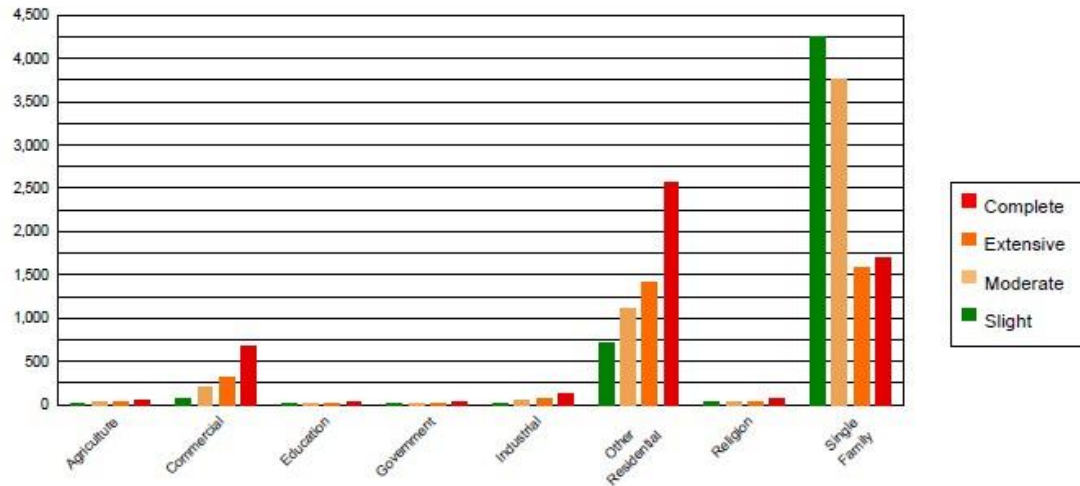
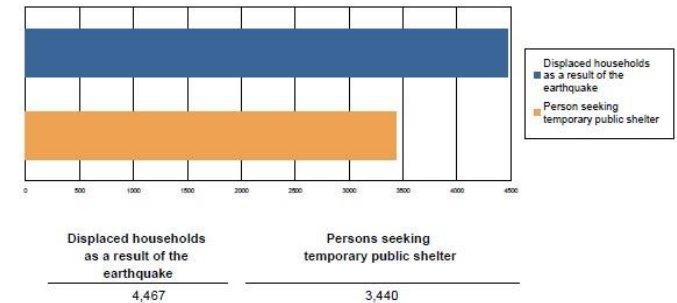


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	17.84	0.39	15.04	0.30	29.97	0.58	32.61	0.94	48.54	0.93
Commercial	41.35	0.91	61.08	1.20	204.01	3.92	314.73	9.08	665.84	12.73
Education	4.42	0.10	4.62	0.09	11.69	0.22	17.34	0.50	34.92	0.67
Government	4.65	0.10	4.90	0.10	12.19	0.23	17.27	0.50	30.99	0.59
Industrial	13.27	0.29	15.90	0.31	45.23	0.87	64.34	1.85	128.26	2.45
Other Residential	457.32	10.05	714.59	14.03	1112.19	21.37	1417.14	40.79	2567.76	49.10
Religion	21.15	0.47	21.98	0.43	28.12	0.54	26.40	0.76	57.34	1.10
Single Family	3989.04	87.69	4256.53	83.55	3761.47	72.27	1584.76	45.61	1696.20	32.43
Total	4,549		5,095		5,205		3,475		5,230	

Displaced Households/ Persons Seeking Short Term Public Shelter



Injury Estimations

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	20.29	6.19	0.95	1.87
	Commuting	0.07	0.09	0.15	0.03
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	11.03	3.34	0.51	1.00
	Other-Residential	794.66	231.69	31.71	61.23
	Single Family	543.27	159.55	24.67	48.65
	Total	1,369	401	58	113
2 PM	Commercial	1231.84	376.27	58.28	113.68
	Commuting	0.61	0.83	1.38	0.27
	Educational	1053.83	336.36	56.34	108.97
	Hotels	0.00	0.00	0.00	0.00
	Industrial	81.61	24.73	3.78	7.34
	Other-Residential	187.57	55.94	8.06	15.08
	Single Family	125.35	37.85	6.08	11.43
	Total	2,681	832	134	257
5 PM	Commercial	895.85	274.38	42.86	82.43
	Commuting	10.12	14.07	23.05	4.50
	Educational	402.76	128.88	21.52	42.05
	Hotels	0.00	0.00	0.00	0.00
	Industrial	51.01	15.46	2.37	4.59
	Other-Residential	306.44	90.96	12.99	24.28
	Single Family	219.39	66.27	10.64	20.02
	Total	1,886	590	113	178

Level 1: Treatable with basic first aid
 Level 2: Hospitalization, not life threatening
 Level 3: Hospitalization, life threatening unless treated quickly
 Level 4: killed by earthquake

2 AM: Population at home
 2 PM: Population at work/school
 5 PM: Population Commuting

*General trends of peak occupancy loads
 **This model does not estimate casualties of livestock or pets

Damages to essential and critical facilities

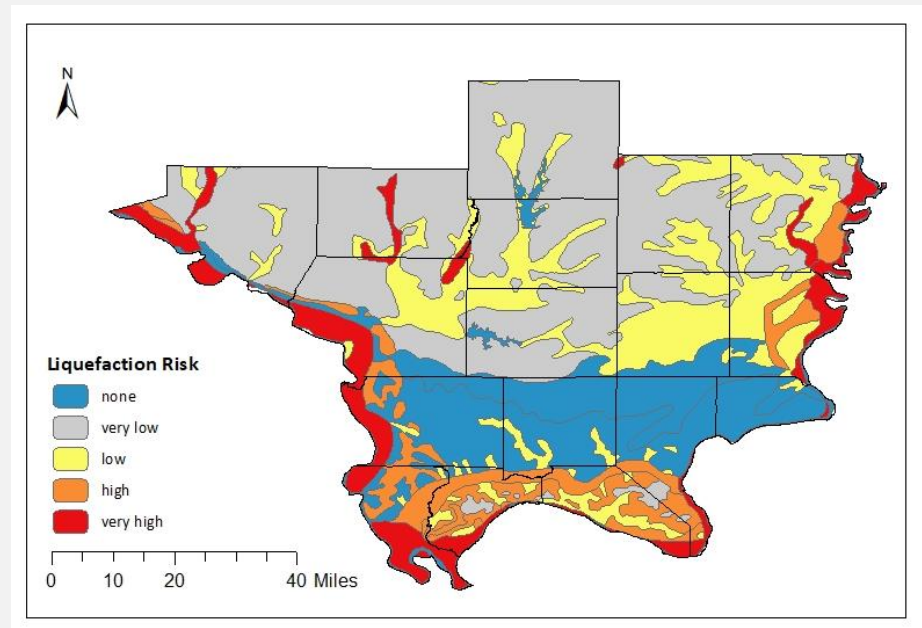
Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	2	2	2	0
Schools	32	26	19	3
EOCs	2	2	2	0
PoliceStations	12	8	7	1
FireStations	17	10	8	2

- Transportation system total losses: \$63.92 million
- Utility systems total losses: \$980 million
- Estimated 12,883 households without potable water and 20,353 households without electric power on day 1

Liquefaction Risk

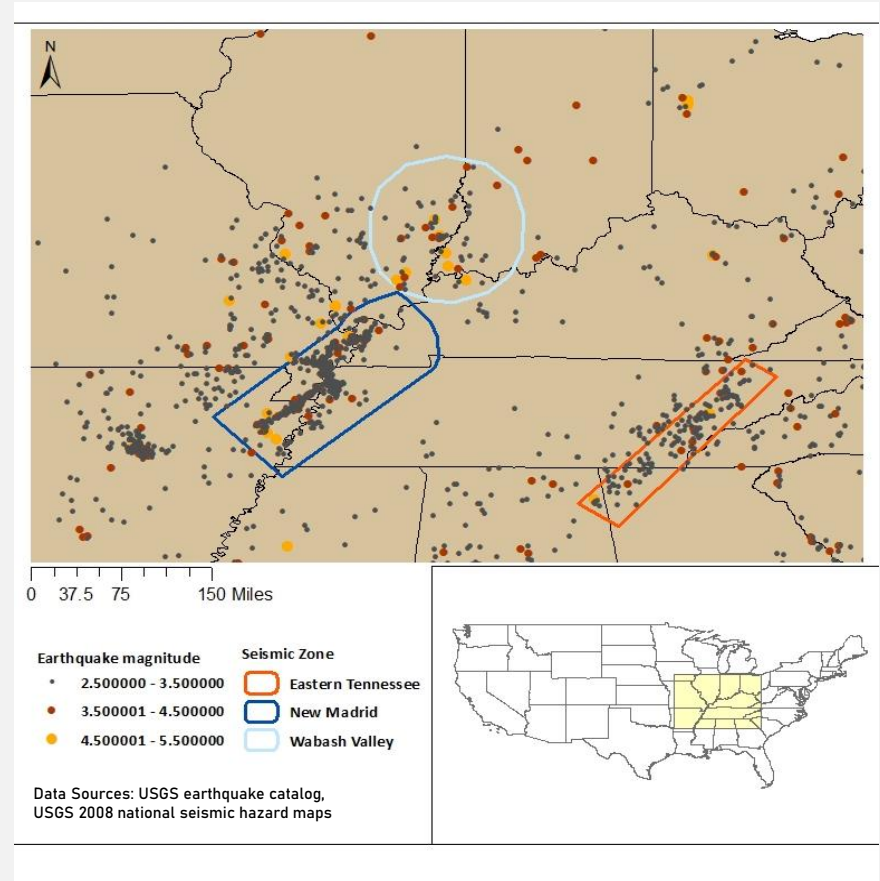
- Occurs when sandy soils behave like a liquid during ground shaking events
- Can cause severe damage to buildings and infrastructure



Data source: IL state geological survey

Historic Earthquakes – Jackson County

- 1994: Magnitude 3, NW of Murphysboro
- 2005: Magnitude 3, SW corner of county
- Severe earthquakes (magnitude 7 or higher) within the New Madrid or Wabash Valley seismic zones may be felt hundreds of miles away from the epicenters





Historic Earthquakes – New Madrid

- December, January, February of 1811-1812
 - 3 large earthquakes, estimated magnitude 7, with hundreds of aftershocks
 - The February earthquake destroyed the town of New Madrid MO
 - Among the 5 worst earthquakes to ever occur in the lower 48 states
 - Earthquakes of this severity are estimated to occur only every ~500 years



Floods

- Currently ranked 6th for Jackson county
- Can model upon request by county or census block
- Hazus software does not do a great job of estimating water levels behind levees
 - Grand tower/ Degognia- Fountain Bluff levees not accredited for a 1% annual (100yr) flood



Mitigation Strategies

The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources. (Stafford Act Title 44, Chapter 1, Part 201).



Mitigation Strategies

Hazard Mitigation is any sustained action taken to reduce or eliminate long-term risk to human life and property from a natural hazardous event.

Hazard Mitigation Planning is a 4 step process that requires community input

- Organize resources
 - Creation of planning team, securing IEMA funds for updating plan (early 2020)
- Assessing risks
 - Review of historical hazards, hazard ranking exercise (meeting 1)
- Developing a mitigation plan (we are here)
 - Final hazard ranking, mitigation strategies worksheet (meeting 2)
- Implementing the plan and monitoring progress
 - Adoption of Plan by each jurisdiction & count
 - Applying for grants and undergoing projects



Mitigation Strategies

Each Jurisdiction is required to come up with 2 mitigation strategies per hazard

This does not mean you are required to implement them

This is designed to be a brainstorming exercise, and the final list of strategies will be an outline for the County EMA and cities/villages or other jurisdictions to apply for grant funds later.

Any and all ideas are encouraged, the goal is to make Jackson County better prepared to endure and respond to hazards, and more resilient after one has occurred.



Mitigation Strategies Exercise

Example Mitigation Strategy: Hazard- Flooding

Mitigation Strategy: *Institute a buy-out plan for repetitive loss properties*

Check One:

☒ Proposed ☐ Ongoing

Priority Ranking:

☐ High ☒ Medium ☐ Low

Funding Source:

☒ Local ☐ State ☒ Federal ☐ Private

Responsible & Coordinating Agencies: *Franklin County EMA*

Comments: Franklin County will apply for FEMA HMA funds to acquire repetitive loss properties. The properties will be demolished and the land will be deed-restricted to remain as open space. The non-federal share of the grant will be sought from local funds.

Mitigation Strategies Exercise

- **Do NOT “open with google docs”, click the download icon in top right corner!**

drive.google.com/file/d/1NvTnLbuHMezXjPm6Xc9UZJrWid9n3gSw/view

Apps Gmail Greater Egypt RP&... Google Earth Engine USGS Current Cond... Sediment Monitor... Hazard data GIS databases Southern Illinois Ne... Watershed Based Pl... Freshwater Networ... Reading list

Franklin Mitigation Strategies Exercise.pdf

Open with Google Docs

Franklin County Multi Hazard Mitigation Plan
Mitigation Strategies Exercise
Return to kelseybowe@greateregyp.org when completed

Name: _____
Title: _____
Jurisdiction: _____
Date: _____
Time spent on exercise: _____

The purpose of this worksheet is to develop effective mitigation strategies that reduce or eliminate long- term risk to life and property from a hazard event.

Each jurisdiction must come up with at least two mitigation strategies for each hazard identified for that jurisdiction.

A list of potential mitigation strategies is provided (see secondary attachment) to assist with the mitigation strategy selection process. This is not an exhaustive list. As such, you are also encouraged to develop mitigation strategies applicable to your region. Each strategy should include a priority ranking, responsible/coordinating agency, and comments.



Notice! Funding period for BRIC and FMA opens Sept 30th

- Building Resilient Infrastructure, Communities (BRIC)
 - \$1 billion available, competitive applications
 - Many projects types supported
 - Preference for underserved or at-risk communities; or those at high risk of climate change related disasters
- Flood Mitigation Assistance (FMA)
 - \$160 million available, competitive applications
 - Preference for underserved communities
 - Communities (and specific locations) seeking these funds MUST have current NFIP policies in place
- New application preferences part of President Biden's Justice40 Initiative
- See FEMA.gov or grants.gov for detailed NOFOs
- Contact Greater Egypt for assistance in applications
- Apps due no later than Jan 28, 2022



FEMA



Notice to county and city officials

- We are missing NFIP statistics for each county
- This is a FEMA requirement for Hazard Mitigation Planning
- Data request letter will be sent after meeting



Questions or Comments?

Thank you for attending!

Please remain in the zoom call to complete the exercise if time allows