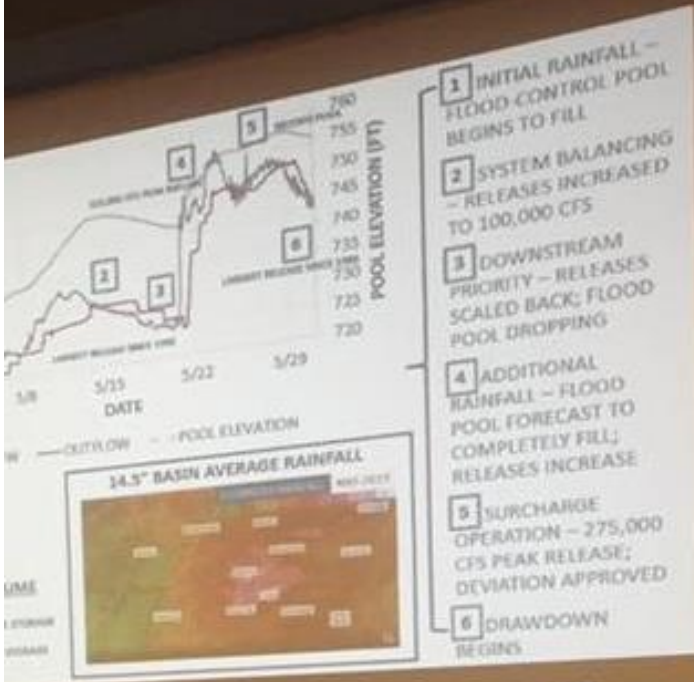# Presenters and Agenda

Welcome – Dan Young

Discussion About Hazard Mitigation Assistance Programs and Vulnerability assessments – Miro Kurka

Resilience exercise – Miro Kurka

Question, Answers, and Lessons Learned

Lunch/Spotlight Presentation – Mead & Hunt

Driving Partnerships to Build Resilient Communities

Miro Kurka – Mead & Hunt

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The SAME resilience efforts contribute to government and private sector collaboration, helping to minimize the impacts of natural and man-made threats and to enhance effective response and recovery to these dynamic events

- *Leverage local, regional, national, and international partnerships to educate and train members and stakeholders on infrastructure risks, mitigation efforts, and joint response strategies to natural and man-made events.*

- *Utilize SAME's multidisciplinary network to connect and educate stakeholders on new and existing technologies and to develop solutions to problems across critical infrastructure sectors.*

- *Promote partnerships and collaboration supporting the needs of military installations in pursuit of mission assurance and readiness (such as energy, water, and industrial control system cyber security).*

- *Utilize SAME's national relationships and local Posts to furnish vertical collaboration between all levels of government and private business.*

- *Lead collaboration to advocate for streamlined acquisition and implementation of resilience solutions.*

Agenda

Hazard Mitigation Assistance Programs

Vulnerability assessment overview

Updated vulnerability assessment protocols

Resilience exercise

Question, Answers, and Lessons Learned

Hazard Mitigation Assistance (HMA) Programs

FEMA HMA programs support hazard mitigation activities that reduce or eliminate potential losses to state, local, tribal and territorial governments, fostering resilience against the effects of disasters.

Hazard Mitigation Grant Program (HMGP)

Hazard Mitigation Grant Program Post Fire (HMGP Post Fire)

Building Resilient Infrastructure and Communities (BRIC)

Flood Mitigation Assistance (FMA)

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Table 2. HMA Program Comparison

HMA Program Comparison	HMGP	HMGP Post Fire	BRIC	FMA
Program Type	Post-disaster	Post-disaster	Pre-disaster	Pre-disaster
Funding Availability	Presidentially declared disaster	FMAG-declared disaster	6% set aside from federal post-disaster grant funding	Annual appropriations
Competitive?	No	No	Yes	Yes
Eligible Applicants	States, federally recognized tribes, territories and the District of Columbia (DC)	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC
Eligible Subapplicants	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments, tribes and private nonprofit organizations	State agencies, local governments and tribes	State agencies, local governments and tribes
Applicant Hazard Mitigation Plan Requirement*	Yes	Yes	Yes	Yes
Subapplicant Hazard Mitigation Plan Requirement*	Yes (except for a planning subapplication)	Yes (except for a planning subapplication)	Yes (except for certain capability- and capacity-building activities)†	Yes (except for a planning subapplication)
NFIP Participation	Communities with projects in SFHAs	Communities with projects in SFHAs	Communities with projects in SFHAs	Subapplicants and properties

Assessing Vulnerabilities

"

By failing to plan, you are planning to fail

- Benjamin Franklin

"

Assessing Vulnerabilities

- A Vulnerability Assessment identifies, quantifies, and prioritizes the vulnerabilities in a system...

- For our purposes, that "system" is a municipality

- Assessment should include
  - ✓ Identification of the vulnerabilities or potential threats to each resource
  - ✓ A catalog of resources (assets and capabilities)
  - ✓ Assignment of quantifiable values and importance of those resources
  - ✓ Mitigation of the most serious threats to the most valuable resources (prioritization)

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Hazard Vulnerability Assessment (HVA) Model

- Kaiser model is the most recognized
  - Probability
  - Human, property, and service impacts
  - Preparedness all considered as separate issues
- Relative threat is reported in a percentage of risk at the end of the process
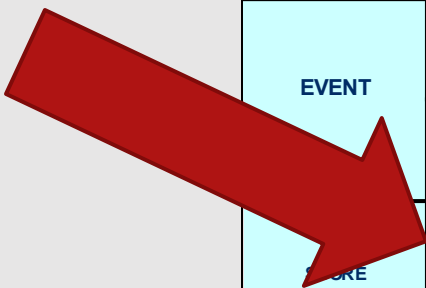
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Probability of Occurrence

- Probability may be based on statistics and objective information, but can also be intuitive and highly subjective
- Extremely important to have a multidisciplinary group to complete the HVA
- The following factors are often considered for probability:
  - Known risk
  - Historical risk

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Probability for an Event

EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	SERVICE IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	Likelihood this will occur	*Possibility of death or injury*	*Physical losses and damages*	*Interuption of services*	*Preplanning*	*Time, effectivness, resouces*	*Community/ Mutual Aid staff and supplies*	*Relative threat**
SCORE	*0 = N/A* *1 = Low* *2 = Moderate* *3 = High*	*0 = N/A* *1 = Low* *2 = Moderate* *3 = High*	*0 = N/A* *1 = Low* *2 = Moderate* *3 = High*	*0 = N/A* *1 = Low* *2 = Moderate* *3 = High*	*0 = N/A* *1 = High* *2 = Moderate* *3 = Low or none*	*0 = N/A* *1 = High* *2 = Moderate* *3 = Low or none*	*0 = N/A* *1 = High* *2 = Moderate* *3 = Low or none*	*0 - 100%*
Hurricane								0%
Tornado								0%
Severe Thunderstorm								0%
Snow Fall								0%
Blizzard								0%
Ice Storm								0%
Earthquake								0%
Tidal Wave								0%
Temperature Extremes								0%
Drought								0%
Flood, External								0%
Wild Fire								0%
Landslide								0%
Dam Inundation								0%
Volcano								0%
Epidemic								0%
AVERAGE SCORE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

Threat increases with percentage.

0				
0		RISK = PROBABILITY * SEVERITY		
		0.00	0.00	0.00

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Magnitude of the Event

The magnitude of an event is assessment based on:

 Probability of death or injury

 Physical losses or damage

 Interruption of services

Magnitude of the Event

	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	SERVICE IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	lihoo this	*Possibility of death or injury*	*Physical losses and damages*	*Interuption of services*	*Preplanning*	*Time, effectivness, resouces*	*Community/ Mutual Aid staff and supplies*	*Relative threat**
SCORE	*rate* 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 - 100%
Hurricane								0%
Tornado								0%
Severe Thunderstorm								0%
Snow Fall								0%
Blizzard								0%
Ice Storm								0%
Earthquake								0%
Tidal Wave								0%
Temperature Extremes								0%
Drought								0%
Flood, External								0%
Wild Fire								0%
Landslide								0%
Dam Inundation								0%
Volcano								0%
Epidemic								0%
AVERAGE SCORE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

Threat increases with percentage.

	RISK = PROBABILITY * SEVERITY		
0	0.00	0.00	0.00
0			

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Preparedness / Mitigation

- Preparedness is the organization's ability to manage risks.
- The mitigation of an event is assessment based on:
  - Preparedness (preplanning)
  - Internal response (time, effectiveness & resources)
  - External Response (community mutual aid, staff and supplies)

- Examples of preparedness include:
  - Status of current plans
  - Training
  - Insurance
  - Back up systems
  - Community resources

Assessment of Preparedness on the Event

HVA

EVENT	PROBABILITY	SEVERITY = (MAGNITUDE - MITIGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	SERVICE IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	Likelihood this will occur	*Possibility of death or injury*		*of*	*Preplanning*	*Time, effectivness, resouces*	*Community/ Mutual Aid staff and supplies*	*Relative threat**
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 = N/A 1 = High 2 = Moderate 3 = Low or none	0 - 100%
Hurricane								0%
Tornado								0%
Severe Thunderstorm								0%
Snow Fall								0%
Blizzard								0%
Ice Storm								0%
Earthquake								0%
Tidal Wave								0%
Temperature Extremes								0%
Drought								0%
Flood, External								0%
Wild Fire								0%
Landslide								0%
Dam Inundation								0%
Volcano								0%
Epidemic								0%
AVERAGE SCORE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0%

*Threat increases with percentage.

		RISK = PROBABILITY * SEVERITY		
0		0.00	0.00	0.00
0				

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Completed Example

Alert Type	PROBABILITY	SEVERITY = (MAGNITUDE - MITGATION)						RISK
		HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPARED-NESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	
	Likelihood this will occur	Possibility of dealth or injury	Physical losses and damages	Interuption of services	Preplanning	Time, effectiveness, resources	Community/Mutual Aid staff and supplies	* Relative threat
SCORE	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = Low 2 = Moderate 3 = High	0 = N/A 1 = High 2 = Moderate 3 = Low	0 = N/A 1 = High 2 = Moderate 3 = Low	0 = N/A 1 =High 2 = Moderate 3 = Low	0 - 100%
Dam Failure	1	2	3	3	1	1	1	12%
Drought	3	1	1	1	2	2	2	30%
Earthquake	3	1	1	1	3	3	2	37%
Epidemic	2	2	1	1	2	2	2	22%
Wild fire	2	2	2	1	2	2	2	24%
Flood, External	3	1	2	2	2	2	1	33%
Severe Thunderstorm	3	1	2	1	3	2	1	33%
Hurricane	1	1	1	1	2	2	1	9%
Pandemic	1	3	1	2	2	2	2	13%
Power Outage	3	2	2	2	2	2	1	37%
Temperature Extremes	3	2	1	1	1	1	2	27%
Tornado	2	3	3	2	2	2	1	29%
Blizzard	2	2	2	3	2	2	2	29%
Landslide	1	1	1	1	3	2	2	11%
Ice Storm	3	2	2	3	2	2	1	40%
Average Score	2	2	2	2	2	2	2	26%

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Assessing Vulnerabilities

- Vulnerability Assessment Protocol Updates

Baseline Indicators for Community Resilience 2020 (County Level)

Assessing Vulnerabilities

- Vulnerability Assessment Protocol Updates
  - Disaster Vulnerabilities Assessment format replaced by the Baseline Indicators for Community Resilience (BIRC) in 2020...
  - More detailed data capture

Resilience Metrics	Social	Economic	Community Capital	Institutional	Housing/Infrastructure	Environmental
Variable						
Calculation						
Data Source						

Assessing Vulnerabilities

- Vulnerability Assessment Protocol Updates - 2025
  - Reintroduces a simpler evaluation protocol under the parent federal resilience program, Building Resilient Infrastructure and Communities (BRIC) as part of FEMA's 2025 Hazard Mitigation Assistance Program and Policy Guide...

Hazard Mitigation Assistance Program and Policy Guide

Hazard Mitigation Grant Program, Hazard Mitigation Grant Program Post Fire, Building Resilient Infrastructure and Communities, and Flood Mitigation Assistance

Effective January 20, 2025
Version 2.1

Federal Enterprise Architecture (FEA) Number: FP-206-21-0001

FEMA

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Assessing Vulnerabilities

- Main Resilience Components Still Applicable
  - Guiding Principles to help communities undertake hazard mitigation projects to reduce risks from potential natural hazard events...
    - Identify hazard mitigation actions; implement projects that reduce natural hazard risks
    - Encourage and enable innovation, allow for flexibility, consistency, and effectiveness
    - Promote partnerships to strengthen ability to protect critical infrastructure

Public infrastructure	Public safety	Public health

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Assessing Vulnerabilities

- Main Components Still Applicable – Resilient Tulsa

JUNE 2018

RESILIENT TULSA

An equitable, action-oriented, and collaborative roadmap for all of Tulsa.
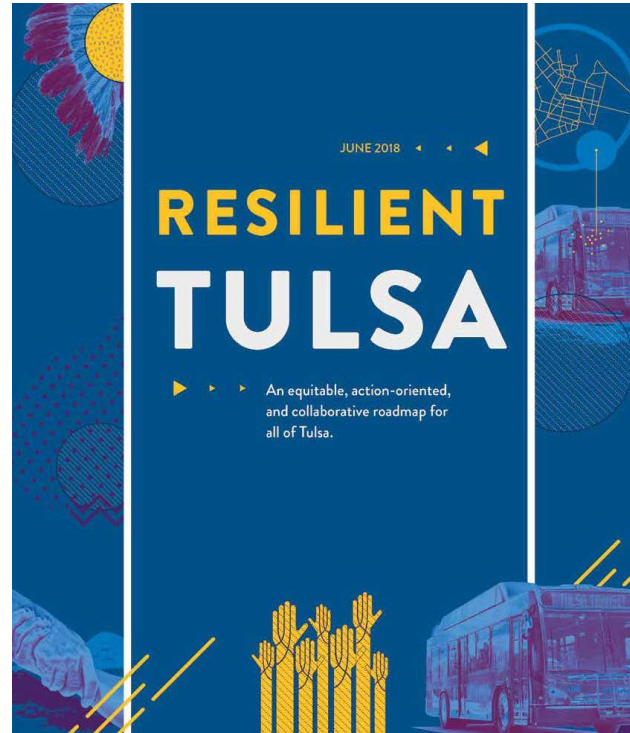
TYPE OF HAZARD	Occurrence		Vulnerability					Resources		TOTAL
	HISTORY	PROBABILITY	HUMAN	PROPERTY	INFRASTRUCTURE	BUSINESS	MIGRATION ACTIVITIES	INTERNAL	EXTERNAL	
Extreme Heat	5	5	5	3	4	3	3	4	4	5.4
Tornadoes	5	5	3	4	3	3	2	3	3	5.3
Winter Storm/Ice Storm	5	5	1	3	2	5	2	2	3	5.0
Lightning	5	5	3	2	2	2	1	2	1	4.9
Flooding	5	5	3	4	3	2	3	4	4	4.8
Dam Failure	3	3	4	4	4	3	2	2	2	4.7
Hail	5	5	1	4	2	1	2	2	1	4.6
High Wind Events	5	5	1	4	2	1	2	2	1	4.6
Levee Failure	3	3	3	3	3	3	2	2	2	4.0
Expansive Soils	5	4	1	3	3	1	3	4	4	3.4
Urban (Structure) Fire	5	5	1	2	1	1	4	4	4	3.1
HazMat Incidents, Fixed Site	3	3	4	2	1	2	1	2	3	3.3
Drought	3	3	2	1	2	2	2	2	3	2.8
Transportation Incidents	3	4	4	1	1	1	2	3	4	2.8
Wildfires	2	3	1	2	1	1	2	3	3	1.6
Earthquake	1	1	1	1	1	1	3	4	4	0.3

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Workshop

- Resilience
- Gap Analysis

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Workshop

Gap Analysis and Actionable Data

Foster Linkages Between the Risk, Vulnerabilities, Hazards. Develop both pre and post event actions that would minimize impacts of the event. (Gaps in Resiliency)

Collaborate to develop actions to be undertaken that will reduce risks and vulnerabilities to the Lowest Acceptable Level(s) to Homes, Businesses, Social and Political Systems (People We Serve)

Make Governance Recommendations to those who Govern – (Support) the Tulsa Resiliency Plan (and others) through our actions.

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What will we work on today...

" Far and away the best prize that life has to offer is the chance to work hard at work worth doing". - Theodore Roosevelt "

Scenarios for Flood, Tornado and Severe Weather

- Identify Actions from our Disaster Scenario(s) Observations.

- What can be done pre and post event to mitigate impacts.

- Identify Mitigating Actions to reduce impacts/risk(s).

- SME Primers at each Step: Public Works, NWS, Emergency Manager, Planners, Authority Having Justification

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EVENT
RULES OF ENGAGEMENT

Groups all have input into the Scenario
Group Note Taker….Takes Notes
Group Leader Presents
Pre and Post Event Mitigation Efforts
Complete one worksheet for each event
20 Inputs on each event….Make Them Count!

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Mitigation Action Worksheet

Type of Event:

Mitigation Actions		Primary Agencies	
Pre Event	Post Event	Primary Agency	Support Agency

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FLOOD SME PRIMERS

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Traditional Dam and Levee Safety Activities

Annual Inspection (AI)

Periodic Inspection (PI) (Every 5 years) – Much more detail

Periodic Assessments (PA) (Every 10 years) – Detailed and Includes Risk Assessment

Instrumentation Data Collection and Evaluation

Routine Maintenance

Dam Safety Training

Emergency Action Plans (EAP)

Emergency Exercises

Scenario Introduction

Hurricane Tulsa has moved through the Gulf of Mexico, up through Texas and is now threatening Oklahoma as a Severe Weather event. Rain has already been occurring and the Keystone project is at 80% Flood Control Pool. Downstream releases are occurring at 30CFS.

National Weather Service reports on a QPF (80% Confidence) that the Tulsa Area will receive a minimum of 8 inches but most likely between 10 and 12 inches of rain over the next two days. River Forecast Center has predicted Arkansas River rise to flood stage within the next two days with major flood stage reached within 3 days. Due to the downstream rivers being at bank and over bank levels water is being held at 30,000cfs discharge at Keystone Lake in accordance with the Water Control Manuals.

Partner Coordination is occurring with daily NWS calls with the Response and Recovery Community.

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Since the weather pattern is continuing to fill Keystone Lake, USACE must increase releases from Keystone Lake to 150,000 cfs. USACE indicates if the weather pattern continues then releases of 310,000 will be necessary. This will be an increase of 6 cfs and be more water than both the 1984 and 1986 events.

In preparing for the event USACE sends out inundation maps indicating the anticipated area of flooding.

Mitigation Action Worksheet

Type of Event:

Mitigation Actions		Primary Agencies	
Pre Event	Post Event	Primary Agency	Support Agency

Brief Out

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Scenario

A wintry mix of rain, freezing rain, sleet, and snow will result in heavy accumulations for most locations today. Travel will be hazardous and temperatures will drop below freezing -- especially on elevated surfaces such as bridges and overpasses.

Snow will be more predominant across the Tulsa Area with accumulations greater than 5 inches. Day two and Three will result in ice accumulations above ¾ inch from the North at 412 to the South at I40. Expect ice and snow to remain for 5 to 7 days as temperatures will not reach above freezing for 7 days.

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Mitigation Action Worksheet

Type of Event:

Mitigation Actions		Primary Agencies	
Pre Event	Post Event	Primary Agency	Support Agency

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Brief Out

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Scenario

2 Days Out: Severe Weather Storms are predicted in the Tulsa Area. NWS and Local Television Stations report a very high confidence level that these storms will produce high damaging winds with the potential for Tornadoes to occur.

1 Day Out: NWS and Television stations update threat that Tornadoes are highly likely during this time frame and recommend all people take pre-event actions to prepare.

Day of Event: 6pm High Winds and ESF 1 and ESF 2 Tornadoes move through the area.

August 2017

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Mitigation Action Worksheet

Type of Event:

Mitigation Actions		Primary Agencies	
Pre Event	Post Event	Primary Agency	Support Agency

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End Exercise

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