

# Elevating the Foundation

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## Next Steps in Resilience for Oklahoma's First State Flood Plan



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# Phase 1 Overview



- Statewide inventory based on best available data
  - NFHL, BLE, Building Footprints
  - Insurance (NFIP Policies)
  - Damages (NFIP Claims, RL, SRL, PA, IA)
  - Infrastructure Projects (limited based on engagement)
  - Dams
  - Social Vulnerability
  - Hazard Mitigation Plan Status
- Funding Summary
- Legislative Recommendations



# OFP Flood Plan Products – Middle Arkansas

Oklahoma State Flood Plan  
Oklahoma Water Resources Board

Select a Planning Region  
Middle Arkansas

Select a County  
All Counties

Select a Community  
All Communities

Select a Senate District  
All Senate Districts

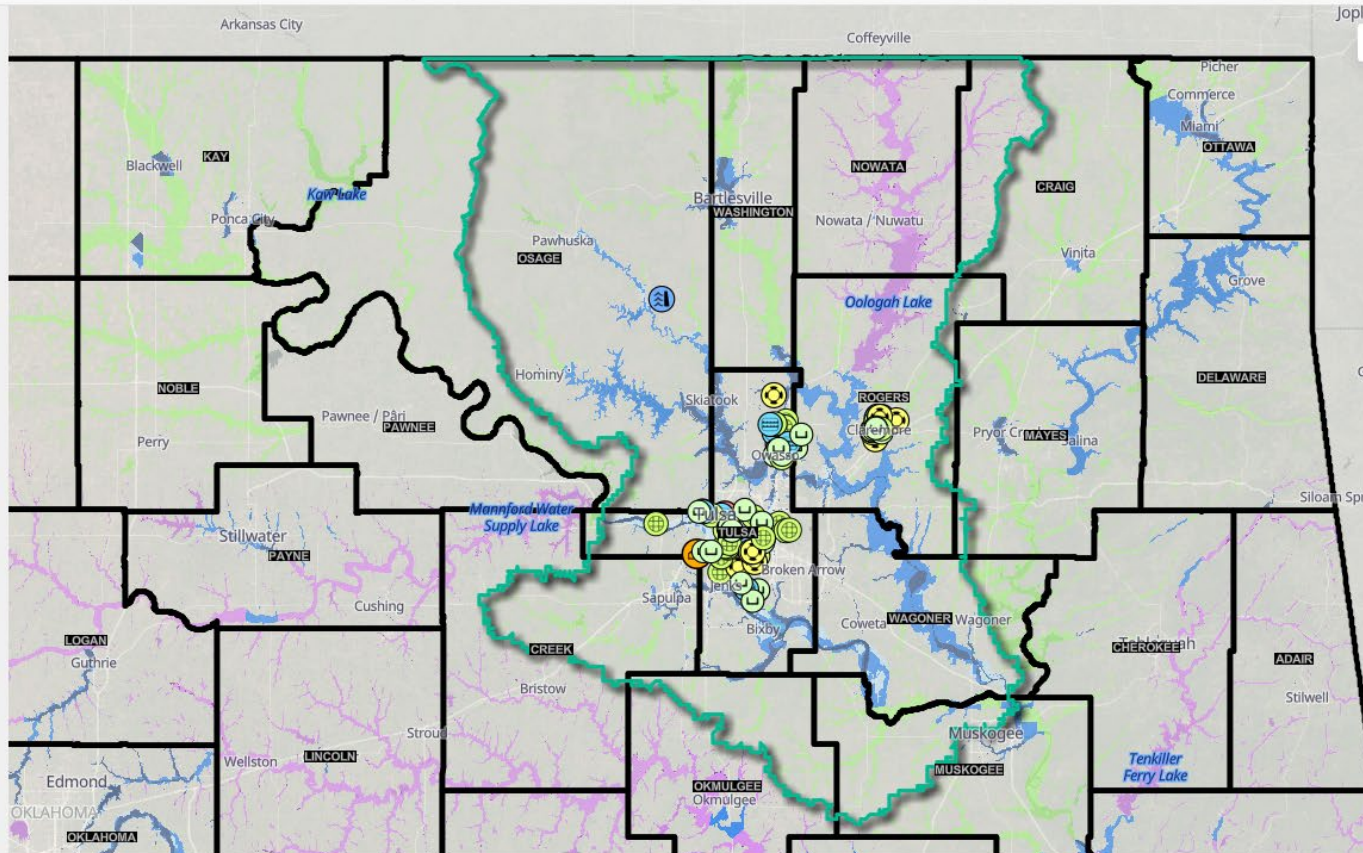
Select a House District  
All House Districts

Select A Tribe  
All Tribes

## State Flood Plan Stormwater Projects

### Project Type

- Channel
- Storm Drain
- Infrastructure
- Detention Pond
- Dam or Reservoir
- Flood Walls and Levees
- Property Acquisition



### Stormwater Project List

- Lake Waxhoma Dam Improvements  
Dam or Reservoir Project - **Barnsdall Public Works Authority**  
\$2,062,000 (2022 Cost: \$2,000,000)
- Collinsville Stormwater line improvements  
Infrastructure Project - **City of Collinsville**  
\$3,786,533 (2022 Cost: \$3,672,680)
- City of Owasso stormwater improvements  
Infrastructure Project - **City of Owasso**  
\$6,510,000 (2005 Cost: \$4,200,000)
- City of Owasso Detention Pond  
Detention Pond Project - **City of Owasso**  
\$5,208,000 (2005 Cost: \$3,360,000)
- Sand Springs drainage improvements  
Storm Drain Project - **City of Sand Springs**  
\$11,270,000 (2004 Cost: \$7,000,000)
- Tupelo Creek - Cherokee Village Relief Drainage  
Storm Drain Project - **City of Tulsa**  
\$13,068,750 (2002 Cost: \$7,687,500)
- North Fork Little Joe Creek - Storm Sewer improve  
Storm Drain Project - **City of Tulsa**  
\$3,136,500 (2002 Cost: \$1,845,000)
- North Fork Little Joe Creek - Storm Sewer improve  
Storm Drain Project - **City of Tulsa**  
\$2,380,000 (2002 Cost: \$1,400,000)
- Storm sewer Relief Line  
Storm Drain Project - **City of Tulsa**  
\$28,400,000 (2008 Cost: \$20,000,000)
- 73rd Street Bridge  
Infrastructure Project - **City of Tulsa**  
\$1,854,234 (2016 Cost: \$1,460,027)
- Little Joe Creek - Thornton YMCA Stormwater  
Detention Pond Project - **City of Tulsa**  
\$4,206,600 (2004 Cost: \$2,565,000)
- Perryman - 51st Street - Phase III  
Storm Drain Project - **City of Tulsa**  
\$6,351,200 (2011 Cost: \$4,670,000)
- Fry Ditch No. 2 - Bank Stabilization & Erosion

Channel	Storm Drain	Infrastructure	Detention Pond	Dam - Reservoir	Walls & Levees	Acquisition	Total Projects
29	31	10	14	1	1	1	87
\$120.1M	\$226.3M	\$23.8M	\$74.8M	\$2.1M	\$3.9M	\$12.6M	\$463.4M

Consumer Price Index (CPI) Adjusted Costs





# OFP Flood Plan Products – Broken Arrow


**Oklahoma State Flood Plan**  
 Oklahoma Water Resources Board

 **Select a Planning Region**  
 All Planning Regions

 **Select a County**  
 All Counties

 **Select a Community**  
 Broken Arrow

 **Select a Senate District**  
 All Senate Districts

 **Select a House District**  
 All House Districts


 **Select A Tribe**  
 All Tribes


### How to Use This Dashboard

Welcome to the State of Oklahoma Flood Plan Dashboard, an interactive tool for reviewing and prioritizing flood mitigation needs.

This dashboard is controlled using the **Selectors** across the top of the map and the **Tabs** along the bottom.


Please use the **Selectors** to filter the map and reporting widgets to match the Watershed, County, Community, State Congressional District, or Tribal Boundary selected.

 **Select a County**  
 All Counties

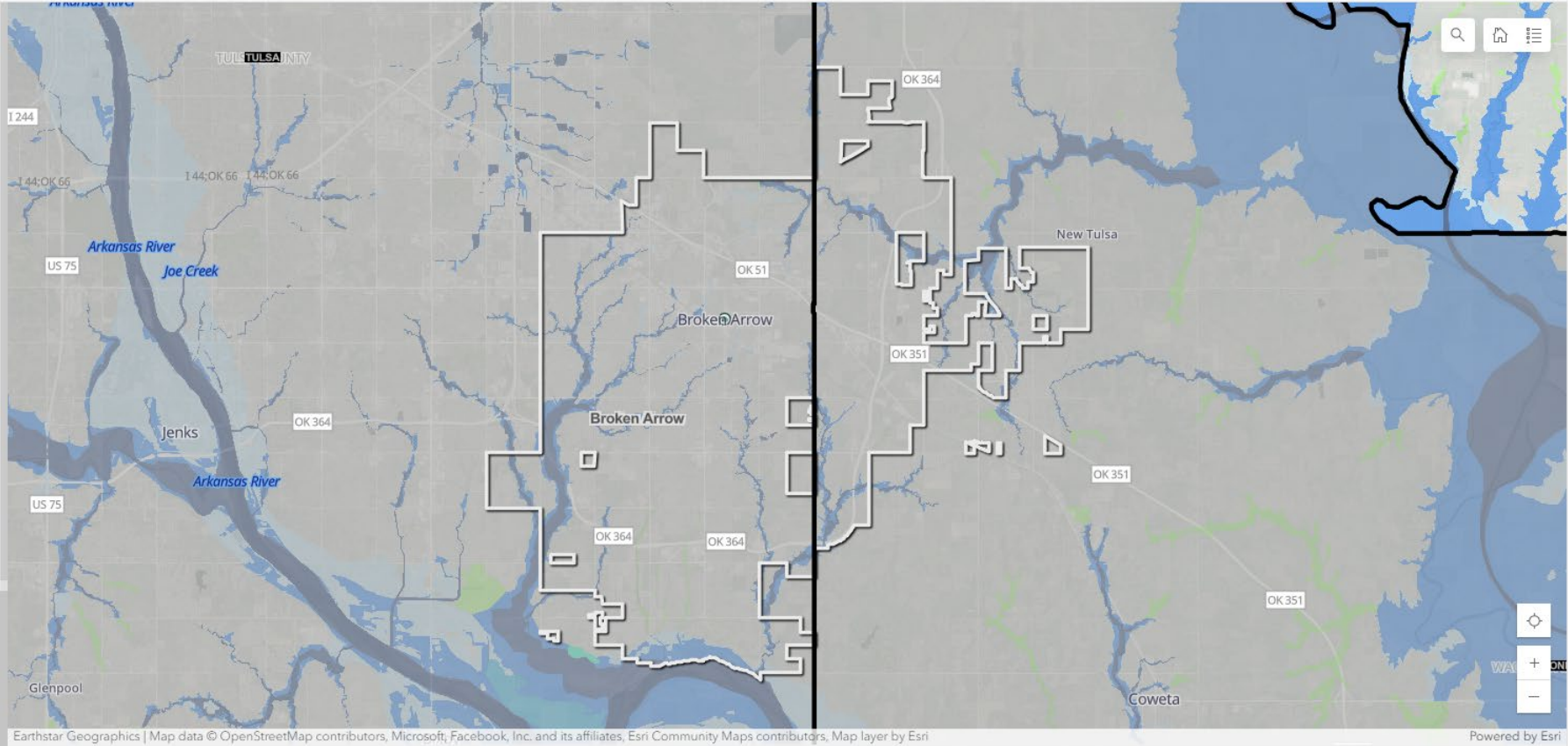
 **Select a Community**  
 All Communities

Please use the **Tabs** along the bottom of the dashboard to view different maps and reporting widgets. Each Tab highlights a specific area of interest of the State Flood Plan.

**STORMWATER PROJECTS** | **DAM INVENTORY** | **SOCK**

Open the **Legend**  tool for better understand of map symbols.

*Note: Some datasets are generalized for this dashboard. The OWRB assumes no legal liability for data aggregated/represented on these maps. Please contact the OWRB for more information.*



### NFIP Participation

Communities	Counties	Tribes
<b>1</b> out of 675	<b>2</b> out of 77	<b>1</b> out of 30

### Dam Inventory by Hazard Risk

High	Significant	Low
<b>1</b> Hazard	<b>1</b> Hazard	<b>4</b> Hazard

### State Plan Summary Metrics

NFIP Policies	NFIP Claims	NFIP Claims Paid	NFIP Repetitive Losses	Structures SFHA	Structures 0.2% Flood	Stormwater Projects	SW Projects Est. Costs
 <b>202</b> Active Policies (2024)	 <b>120</b> Total Claims (To Date)	 <b>\$3M</b> Total Claims Paid (To Date)	 <b>16</b> Total Rep Losses (To Date)	 <b>308</b> 1% Annual Chance Floodplain	 <b>759</b> 0.2% Annual Chance Floodplain	 <b>0</b> Projects Inventoried to Date	 <b>\$709M</b> CPI Adjusted for Inflation

**SUMMARY** | **STORMWATER PROJECTS** | **DAM INVENTORY** | **SOCIO-ECONOMIC (SVI)** | **OEM - PUBLIC ASSISTANCE** | **HOTSPOT SCORES**



# OFP Flood Plan Products

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Oklahoma Water Resources Board

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STORMWATER PROJECTS

DAM INVENTORY

SOCIO-ECONOMIC (SVI)

Open the **Legend** tool for better understand of map symbols.

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### NFIP Participation

Communities	Counties	Tribes
1	2	1
out of 675	out of 77	out of 30

#### Dam Inventory by Hazard Risk

High	Significant	Low
1	1	4
Hazard	Hazard	Hazard

### State Plan Summary Metrics

NFIP Policies	NFIP Claims	NFIP Claims Paid	NFIP Repetitive Losses	Structures SFHA	Structures 0.2% Flood	Stormwater Projects	SW Projects Est. Costs
202	120	\$3M	16	308	759	0	\$709M
Active Policies (2024)	Total Claims (To Date)	Total Claims Paid (To Date)	Total Rep Losses (To Date)	1% Annual Chance Floodplain	0.2% Annual Chance Floodplain	Projects Inventoried to Date	CPI Adjusted for Inflation

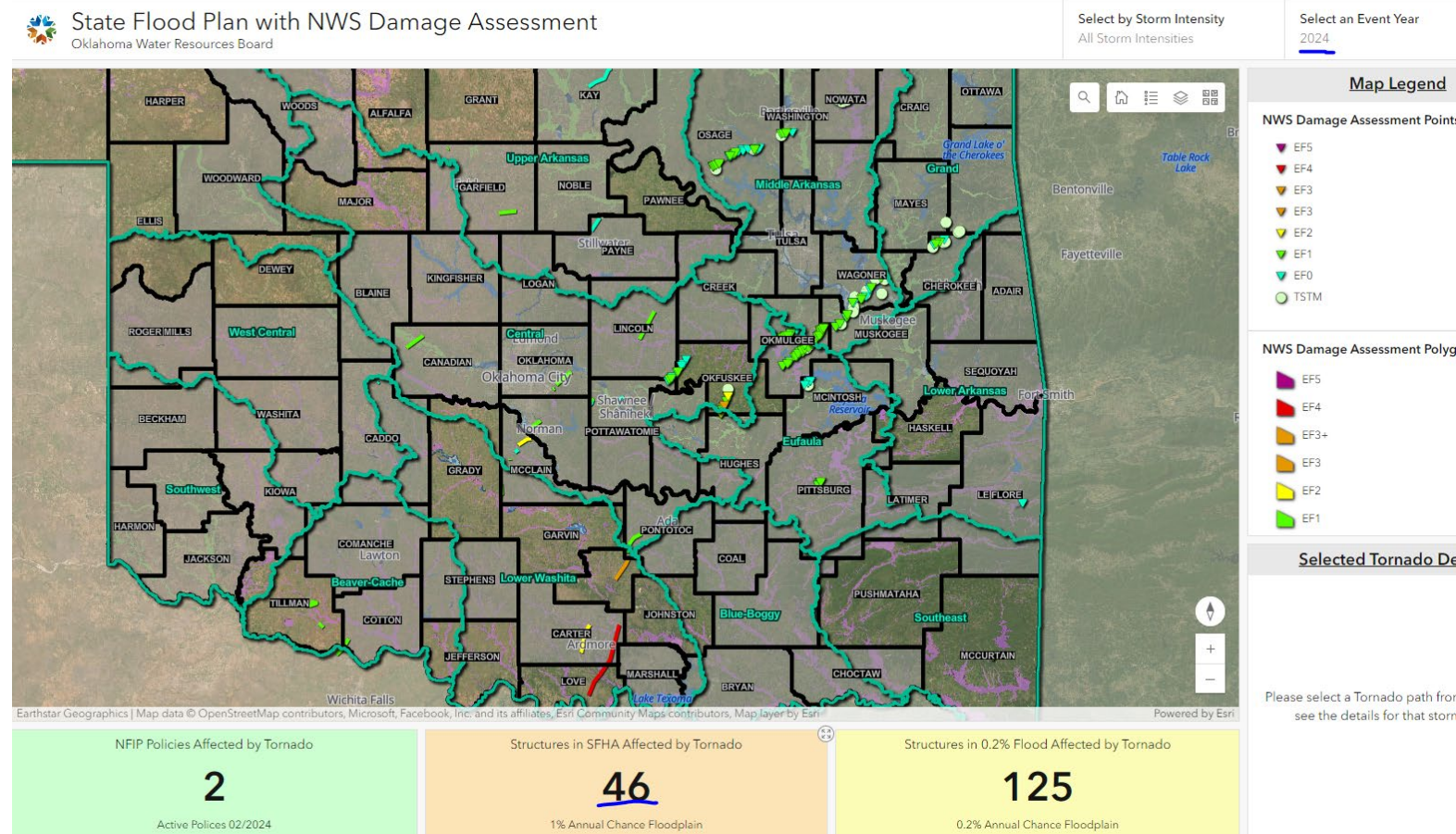
SUMMARY
STORMWATER PROJECTS
DAM INVENTORY
SOCIO-ECONOMIC (SVI)
OEM - PUBLIC ASSISTANCE
HOTSPOT SCORES





# Phase 1 Benefits

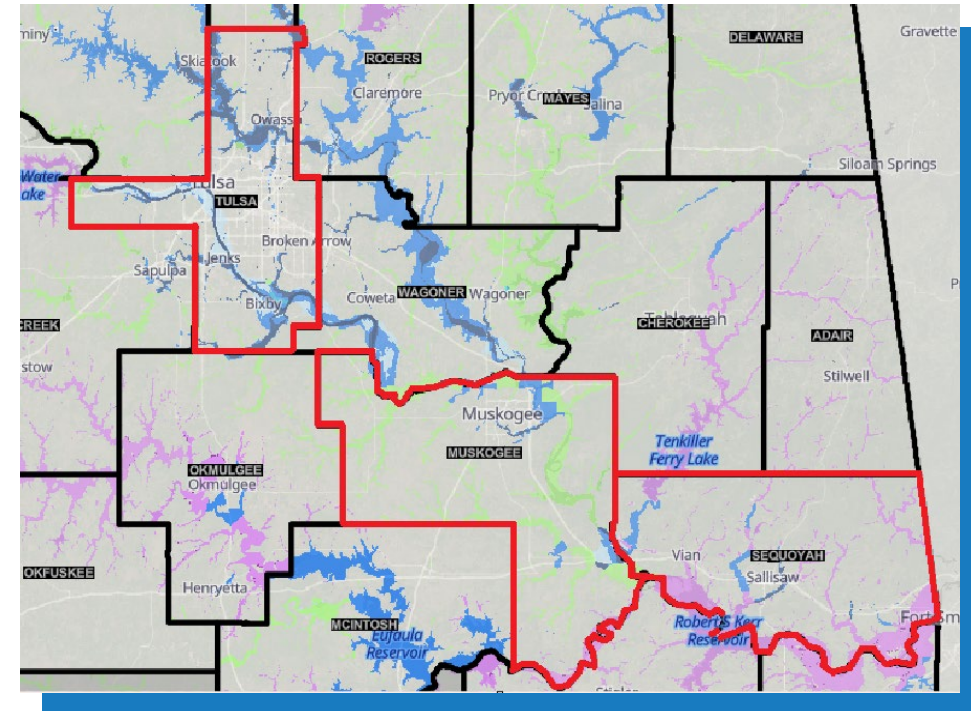
- Identify Mitigation Need
- Identify Insurance/Data Gaps
- Identify Structures in SFHA Impacted Disasters



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## Kicking Off Phase 2

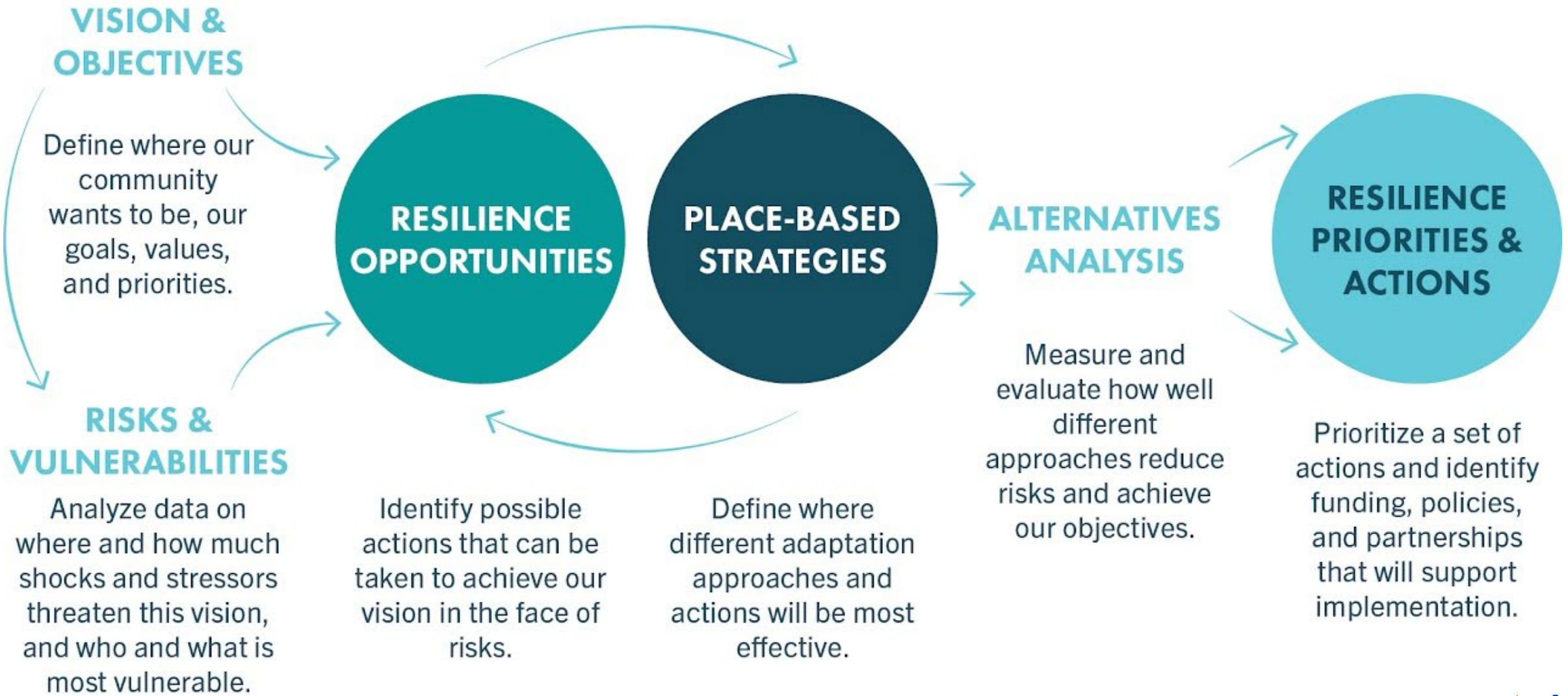
- Build upon Phase 1
- Determine top priority projects for Phase 2
  - Tulsa County
  - Muskogee County
  - Sequoyah County (Moffett)
- Potential of additional projects dependent on funding available
- Schedule: 18-24 months





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# Planning Lifecycle



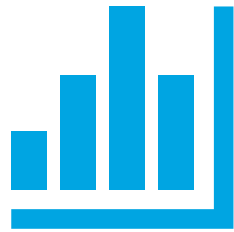


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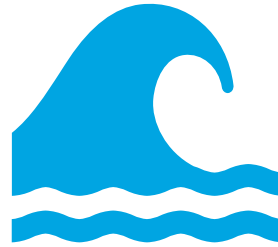
# Scope of Work Tasks



**Engagement**



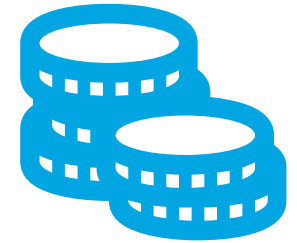
**Data  
Collection and  
Analysis**



**Develop  
Hazard  
Mitigation  
Projects**



**Coordination**



**Implementation**



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## Key Tasks for Phase 2

- Conducting meetings, outreach and coordination
  - In-Person and Hybrid meetings
    - Per study Area:
      - 1 Kickoff meeting
        - Initiate the project and to aid in alternative identification
      - 2 Coordination meetings with OWRB
        - Modeling design approach
      - 1 Presentation of results
        - Feedback and buy-in
      - Coordination with communities on projects as needed





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## Key Tasks for Phase 2

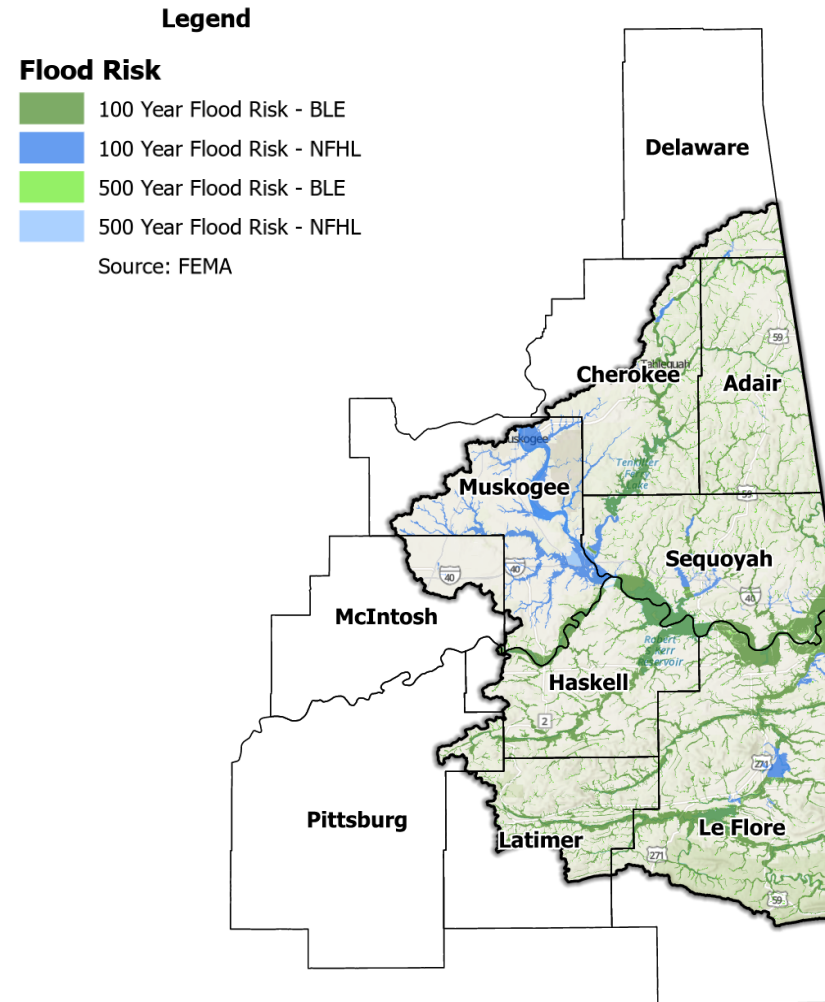
- Conducting meetings, outreach and coordination (October 2024)
  - In-Person and Hybrid meetings (Muskogee, Sequoyah, Tulsa)



# Key Tasks for Phase 2



- 2. Conducting H&H analyses of unmapped zones
  - Closing data gaps
    - 2D modeling
  - Initial meetings will help to identify where studies may be needed
    - Key to have feedback from communities





# Key Tasks for Phase 2



## 3. Developing Hazard Mitigation Projects

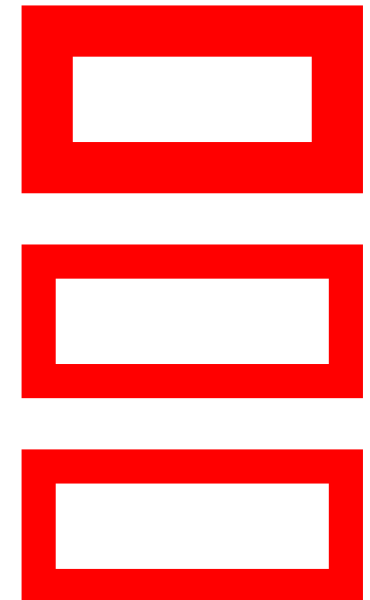
- 1 Potential Mitigation Project and 2 alternatives for each area
  - Environmental Planning and Historic Preservation- Beneficial vs implementable, in compliance with applicable laws
  - Cost estimation- Develop cost on an apples-to-apples basis for each community
  - Benefit Cost Analyses- Calculating costs of damage of modeled flood event scenarios using the standard BCA methods of calculating damages
- Project Prioritization

Middle Arkansas Planning Region Flood Risk Report	
<b>Housing in Flood Hazard Zones (Dwelling Units)</b>	
Dwelling Units in SFHL Zone AE	12,174.00
Dwelling Units in SFHL Zone A	3,985.00
Dwelling Units in SFHL Zone AO	85.00
<b>Total</b>	<b>16,244.00</b>
<b>Population in Flood Hazard Zones (Persons)</b>	
Population in SFHL Zone AE	27,570.00
Population in SFHL Zone A	9,371.00
Population in SFHL Zone AO	175.00
<b>Total</b>	<b>37,116.00</b>
<b>Jobs in Flood Hazard Zones (Employees)</b>	
Jobs in SFHL Zone AE	17,273.00
Jobs in SFHL Zone A	2,263.00
Jobs in SFHL Zone AO	8.00
<b>Total</b>	<b>19,544.00</b>
<b>Land Area in Flood Hazard Zones (Acres)</b>	
Area in SFHL Zone AE	232,302.47
Area in SFHL Zone A	327,249.30
Area in SFHL Zone AO	853.45
<b>Total</b>	<b>560,405.22</b>
<b>Parcels or Block in Flood Hazard Zones</b>	
Parcels or Blocks in SFHL Zone AE	15,901.00
Parcels or Blocks in SFHL Zone A	7,424.00
Parcels or Blocks in SFHL Zone AO	78.00
<b>Total</b>	<b>23,403.00</b>

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# Draft Prioritization Categories

1. Life, Safety and Structures
  - Population Impacted, Number of structures with reduced risk, Estimated Critical Facilities Impacted, Structural Damage Impact
2. Readiness to Proceed Factors
  - Planning or Design Documents
3. Regional Impact
4. Social Risk (SVI)
5. Benefits Multiple Hazard Types
  - Recreational or Environmental Enhancements
6. Programmatic



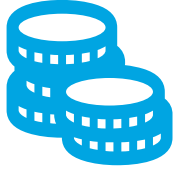


# High- and Low-Ranking Examples

-  "Overtopping occurs"
-  "Construct Storm Sewer System"
-  "Additional Culvert needed"
-  "Improve floodplain to remove homes from 1% AEP flood"
-  Overtopping occurs at 2% AEP flood, last occurrence 9/28/2019, channel eroding/vegetation lost, structural flooding of 30 homes and ~300 LF of roadway overtopping. Identified in 2018 MDP
-  Construct 1500' LF storm sewer, est. Cost \$100,000, state impact to roads and travel, NBS solutions identified
-  Add three 60-inch RCP to the existing culvert system at Rock Creek Road and Brookhaven Creek. Estimated cost \$350,000. Technical memo documenting design
-  Floodplain improvement project is a top priority in our CIP list. This improvement includes environmental benefits and improves downstream flooding in the main stream and removes 25 homes during 1%AEP flood. Bank Stabilization, rock riprap protection, and rock toe protection for 125 LF on both banks of the channel.

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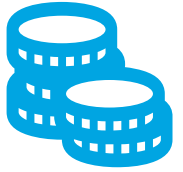
## Key Tasks for Phase 2



4. Coordinating Regional or Multi-County Hazard Mitigation Projects
  - Results presented to communities
  - Identify project with multiple sub-applicants
    - Counties, levee districts, federal agencies, and tribal nations
  - Multi-step strategy for all communities to improve flood resilience



# Key Tasks for Phase 2



## 5. Implementation and identifying potential funding sources

- Assisting sub applicants in identifying potential funding sources
- Resilience team will select the best funding opportunity for implementation

**Stormwater Project Funding Programs**

	Sponsor	Grant/Loan	Eligible Funding Activities	Cost Share	Availability	Requirements	Application Deadline
<b>Flood Mitigation Assistance Grant</b>	FEMA/ODEMHS	Grant	<ul style="list-style-type: none"> <li>Community Flood Mitigation</li> <li>Flood Control</li> <li>Infrastructure Updates and Green Solutions</li> <li>Individual Property Mitigation Projects</li> <li>Technical Assistance/Flood Hazard Planning</li> <li>Engineering</li> <li>Environmental</li> <li>Feasibility-Benefit Cost Analysis</li> </ul>	<ul style="list-style-type: none"> <li>0% Local/100% Federal, for projects involving Severe Repetitive-Loss Properties</li> <li>10% Local/90% Federal, for projects involving Repetitive-Loss Properties</li> <li>25% Local/75% Federal, for projects involving NFIP-insured properties</li> </ul>	<ul style="list-style-type: none"> <li>\$700 million available from FY2022 through FY2026</li> </ul>	<ul style="list-style-type: none"> <li>Community participation in the NFIP (and in good standing)</li> <li>Mitigated property insured by NFIP</li> <li>FEMA-approved and locally adopted HMP</li> <li>Cost-beneficial project</li> </ul>	<ul style="list-style-type: none"> <li>NOFO/E-grants access: typically August</li> <li>Application Period –September to January</li> </ul>
<b>BRIC Grant</b>	FEMA/ODEMHS	Grant	<ul style="list-style-type: none"> <li>Community Flood Mitigation</li> <li>Flood Control</li> <li>Infrastructure Updates and Green Solutions</li> <li>Individual Property Mitigation Projects</li> <li>Technical Assistance/Flood Hazard Planning</li> <li>Engineering</li> <li>Environmental</li> <li>Feasibility-Benefit Cost Analysis</li> </ul>	<ul style="list-style-type: none"> <li>Typically 25% local/75% federal</li> <li>May vary for certain communities</li> </ul>	<ul style="list-style-type: none"> <li>Annual</li> <li>6% set aside in total funding from federally declared disasters. IJA appropriated an additional \$200 million from FY2022 through FY2026</li> </ul>	<ul style="list-style-type: none"> <li>States that have had a major disaster declaration in the last seven years (COVID-19 resets seven years to start at 2020 for all states)</li> <li>Community participation in NFIP</li> <li>FEMA-approved HMP</li> <li>Cost-beneficial project</li> </ul>	<ul style="list-style-type: none"> <li>NOFO/E-grants access: typically August</li> <li>Application Period –September to January</li> </ul>
<b>Hazard Mitigation Grant Program - 404</b>	FEMA/ODEMHS	Grant	<ul style="list-style-type: none"> <li>Community Flood Mitigation</li> <li>Flood Control</li> <li>Infrastructure Updates and Green Solutions</li> <li>Individual Property Mitigation Projects</li> <li>Technical Assistance/Flood Hazard Planning</li> <li>Engineering</li> <li>Environmental</li> <li>Feasibility-Benefit Cost Analysis</li> </ul>	<ul style="list-style-type: none"> <li>25% Local/75% Federal</li> </ul>	<ul style="list-style-type: none"> <li>Following Presidential Disaster Declaration</li> </ul>	<ul style="list-style-type: none"> <li>Presidentially declared disaster</li> <li>Community participation in NFIP (for projects located in SFHA)</li> <li>FEMA-approved HMP</li> <li>Cost-beneficial project</li> </ul>	<ul style="list-style-type: none"> <li>Following Presidential Disaster Declaration. 30 days for letter of intent from state/local government, sup-applications usually due within one year</li> </ul>
<b>406 Mitigation Grant Program - Public Assistance</b>	FEMA/ODEMHS	Grant	<ul style="list-style-type: none"> <li>Mitigation measures in conjunction with the repair of the disaster-damaged facilities</li> </ul>	<ul style="list-style-type: none"> <li>25% Local/75% Federal</li> </ul>	<ul style="list-style-type: none"> <li>Following Presidential Disaster Declaration</li> </ul>	<ul style="list-style-type: none"> <li>Declared County</li> <li>Eligible damaged facility and applicant</li> <li>Cost-beneficial project OR Cost for mitigation measure doesn't exceed 15% of the damaged facility's repair cost OR mitigation measure is listed</li> <li>Cost Effective Hazard Mitigation Measures AND the cost doesn't exceed 100% of the damaged facility's repair cost</li> </ul>	<ul style="list-style-type: none"> <li>Following Presidential Disaster Declaration</li> </ul>





# Key Takeaways

- Phase 1 Dashboard is available
- Phase 2
  - Developing Top Priority Proposed Projects
  - Participation
    - Help identify projects in areas of study
  - Building a roadmap for other communities beyond defined project area

