SWT SPRING FLOOD EVENT
State GI Council

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GIS Program Manager

Tulsa District

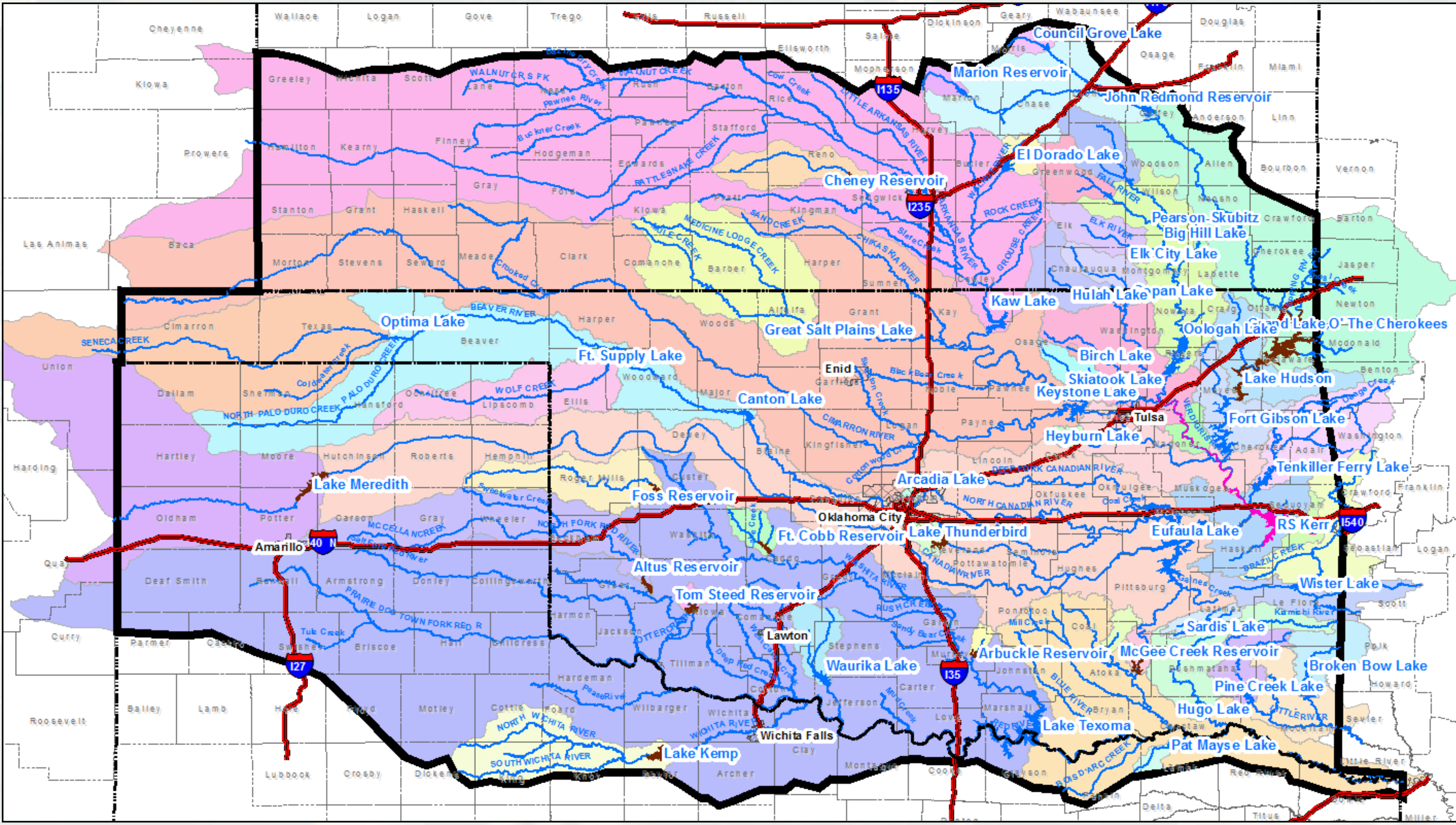
06 November 2015

U.S.ARMY

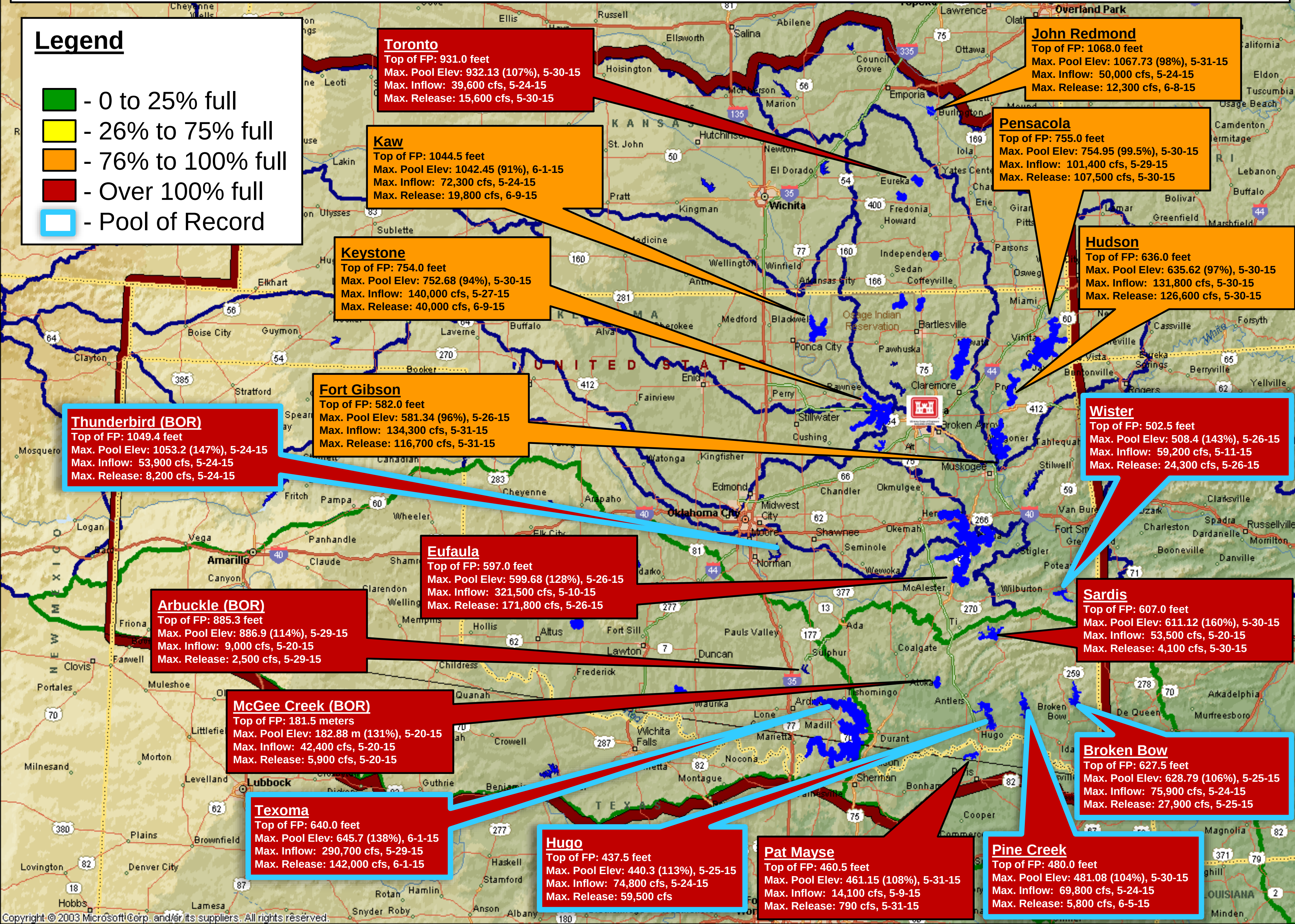
US Army Corps of Engineers
BUILDING STRONG®

Tulsa District Water Management

- 50 Projects
  - 15 in the Red River Basin
  - 35 in the Arkansas River Basin
- 12 Section-7 lakes (owned by others)
- 23 lakes with gated spillways
- 8 COE Hydropower
- 5 Navigation Locks
- 1 Chloride Control Project

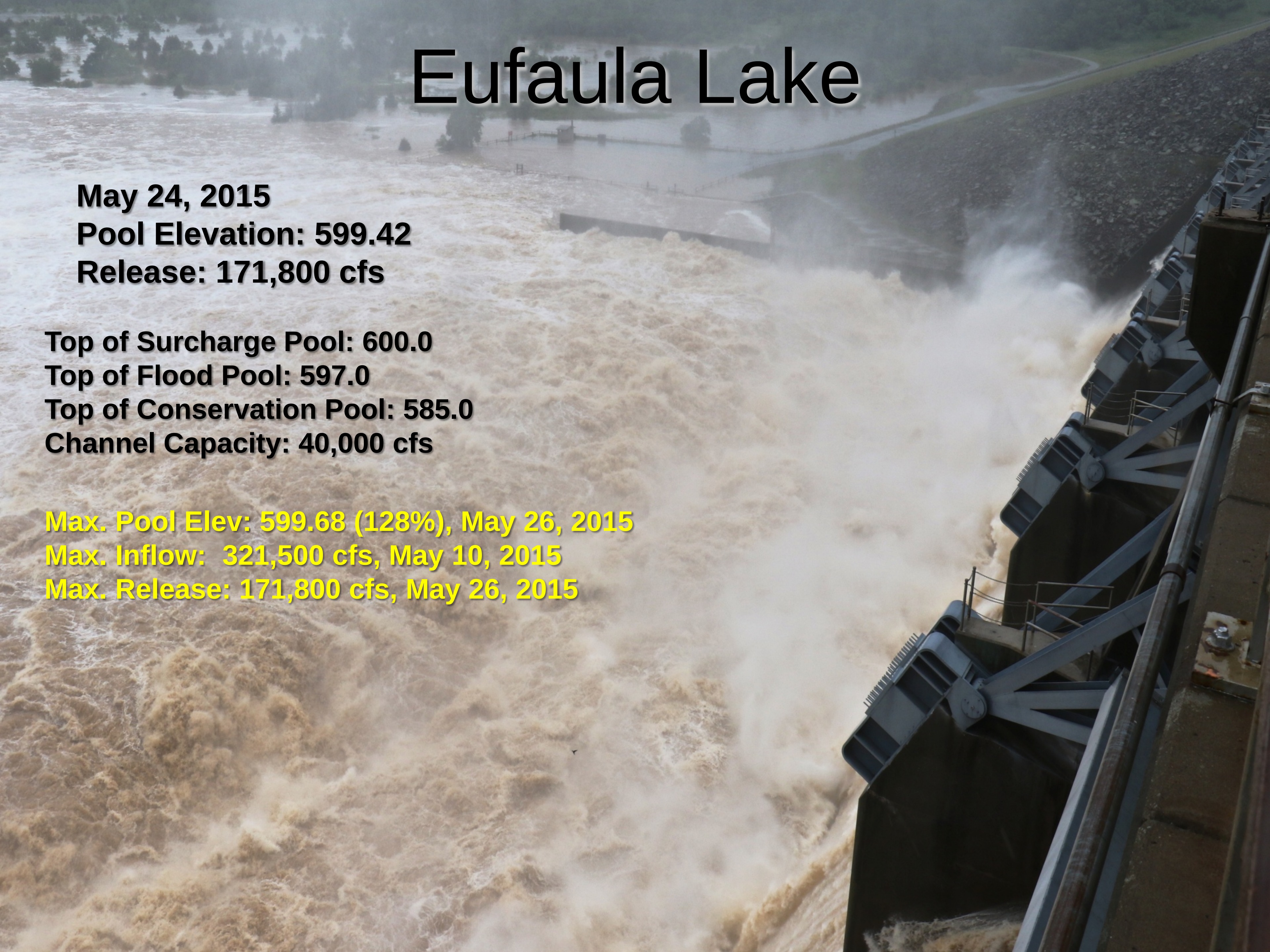


Tulsa District Reservoirs Over 90% Full – May 2015



DAMAGE SUMMARY

- 27 Projects Sustained Flood Damages
- Total Flood Damages - $45.5M+
- $14.6M Identified for Emergency Relief Funds For Federally Owned Roads (Includes Roads, Parking Lots, Bridges)
- Most Recreation Areas Closed for 60-120 days
- Huge Economic Impacts to State and Local Areas

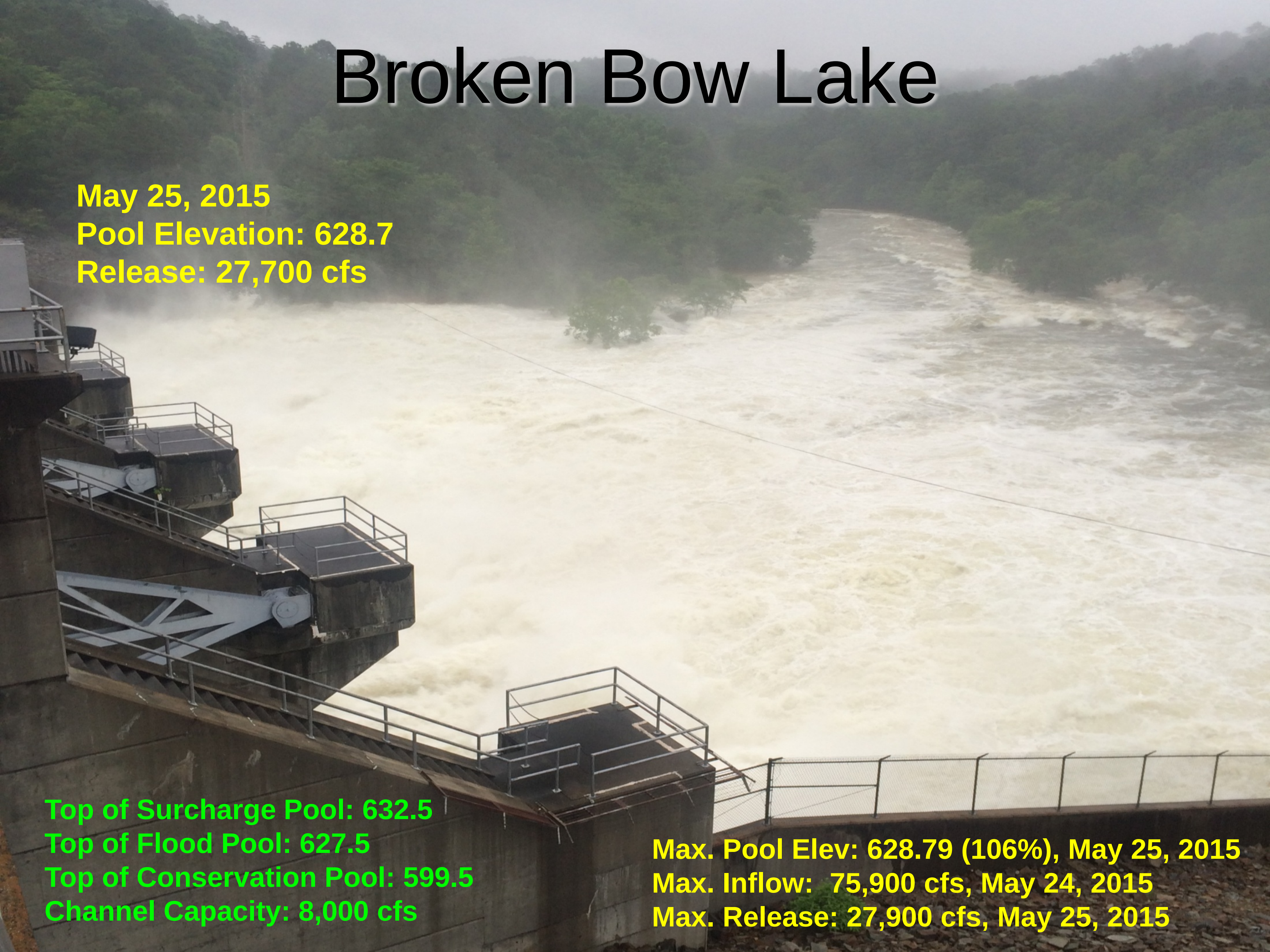


Eufaula Lake

May 24, 2015
Pool Elevation: 599.42
Release: 171,800 cfs

Top of Surcharge Pool: 600.0
Top of Flood Pool: 597.0
Top of Conservation Pool: 585.0
Channel Capacity: 40,000 cfs

Max. Pool Elev: 599.68 (128%), May 26, 2015
Max. Inflow: 321,500 cfs, May 10, 2015
Max. Release: 171,800 cfs, May 26, 2015


Broken Bow Lake
May 25, 2015
Pool Elevation: 628.7
Release: 27,700 cfs
Top of Surcharge Pool: 632.5
Top of Flood Pool: 627.5
Top of Conservation Pool: 599.5
Channel Capacity: 8,000 cfs
Max. Pool Elev: 628.79 (106%), May 25, 2015
Max. Inflow: 75,900 cfs, May 24, 2015
Max. Release: 27,900 cfs, May 25, 2015

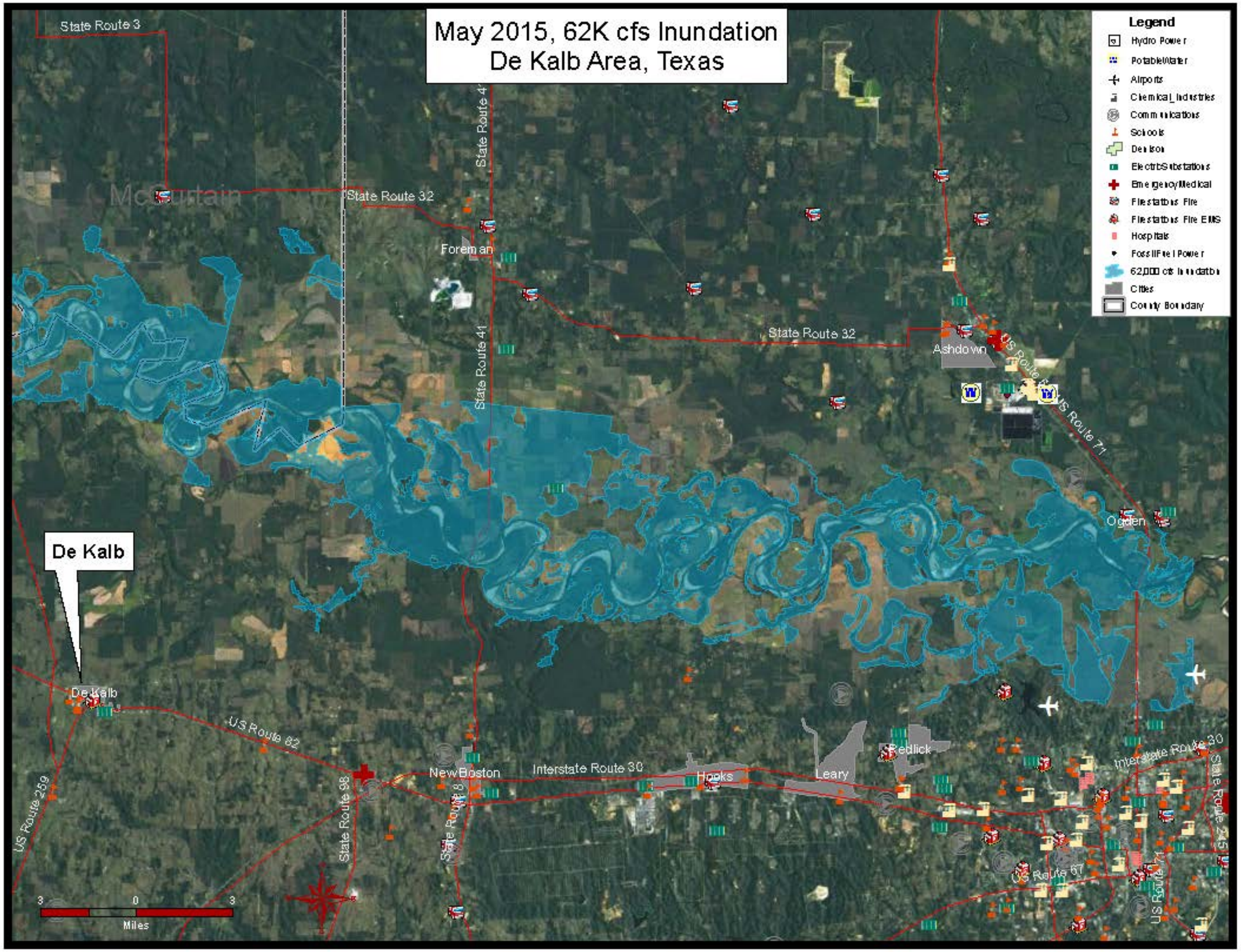
Hugo Lake

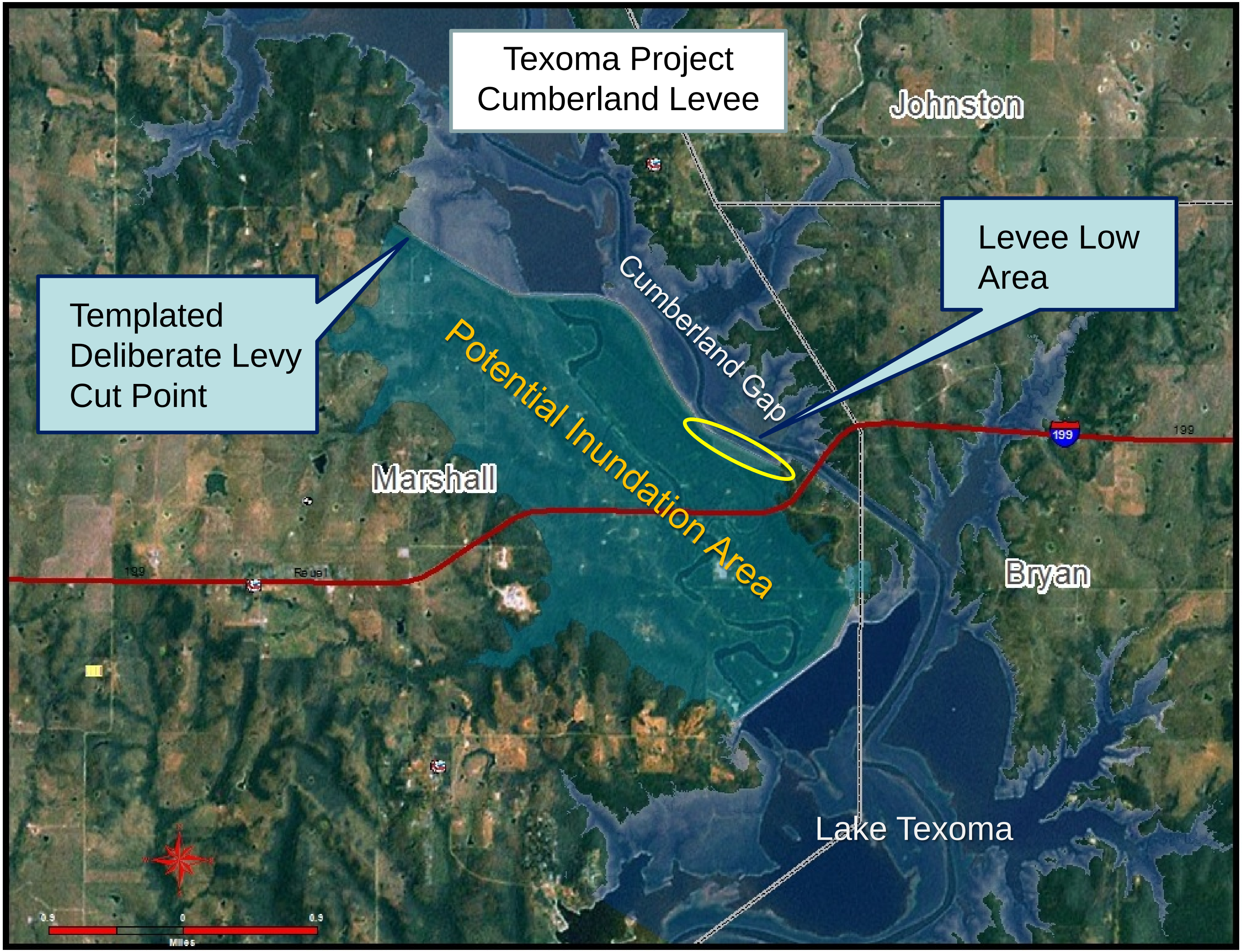
Max. Pool Elev: 440.3 (113%), May 25, 2015
Max. Inflow: 74,800 cfs, May 24, 2015
Max. Release: 59,500 cfs, May 27, 2015

Top of Surcharge Pool: 440.5
Top of Flood Pool: 437.5
Top of Conservation Pool: 404.5
Channel Capacity: 20,000 cfs

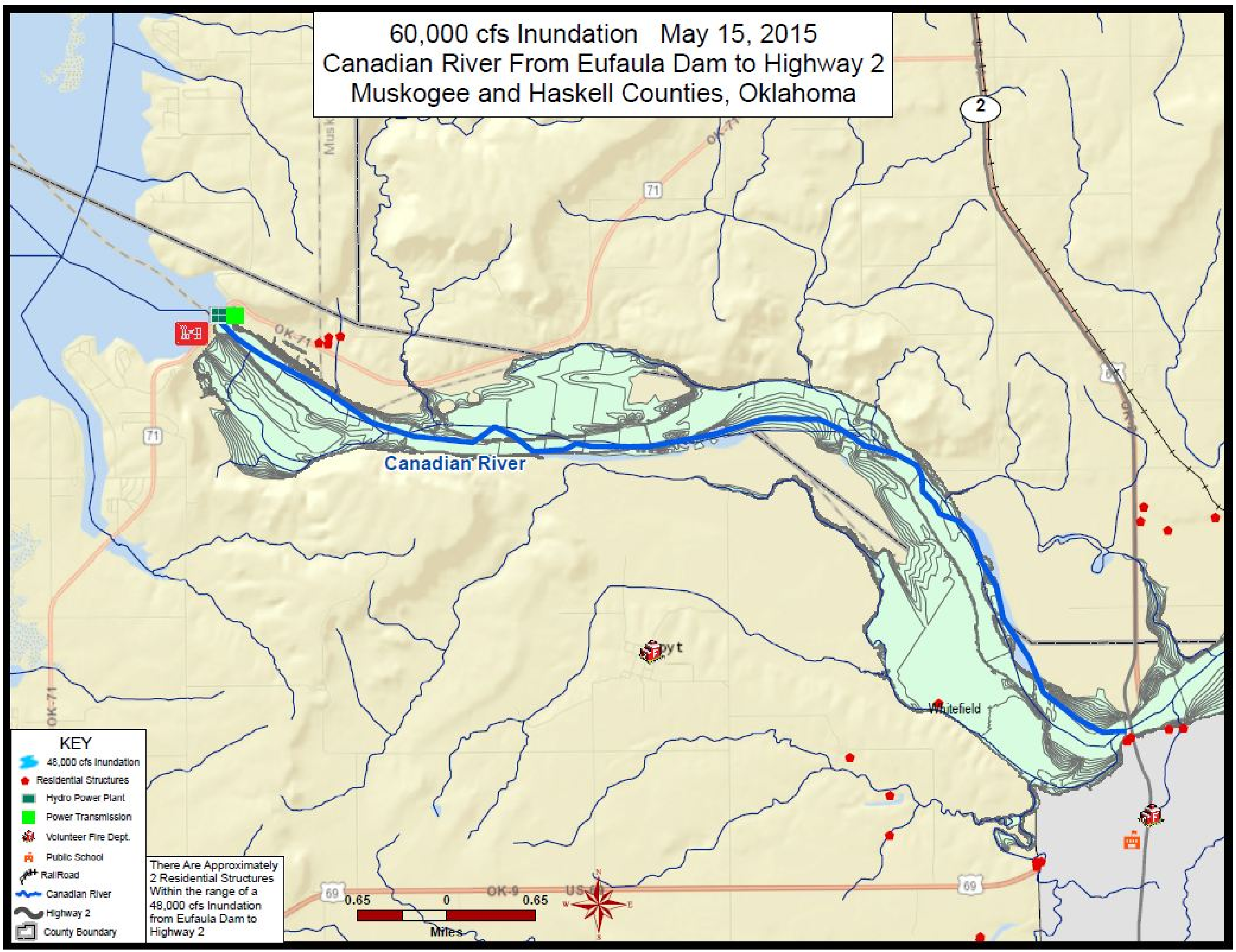
Top of Tainter Gate

In-House Inundation Mapping




Texoma Project
Cumberland Levee
Johnston
Levee Low
Area
Templated
Deliberate Levy
Cut Point
Cumberland Gap
Potential Inundation Area
Marshall
Bryan
199
Lake Texoma

In-House Inundation Mapping



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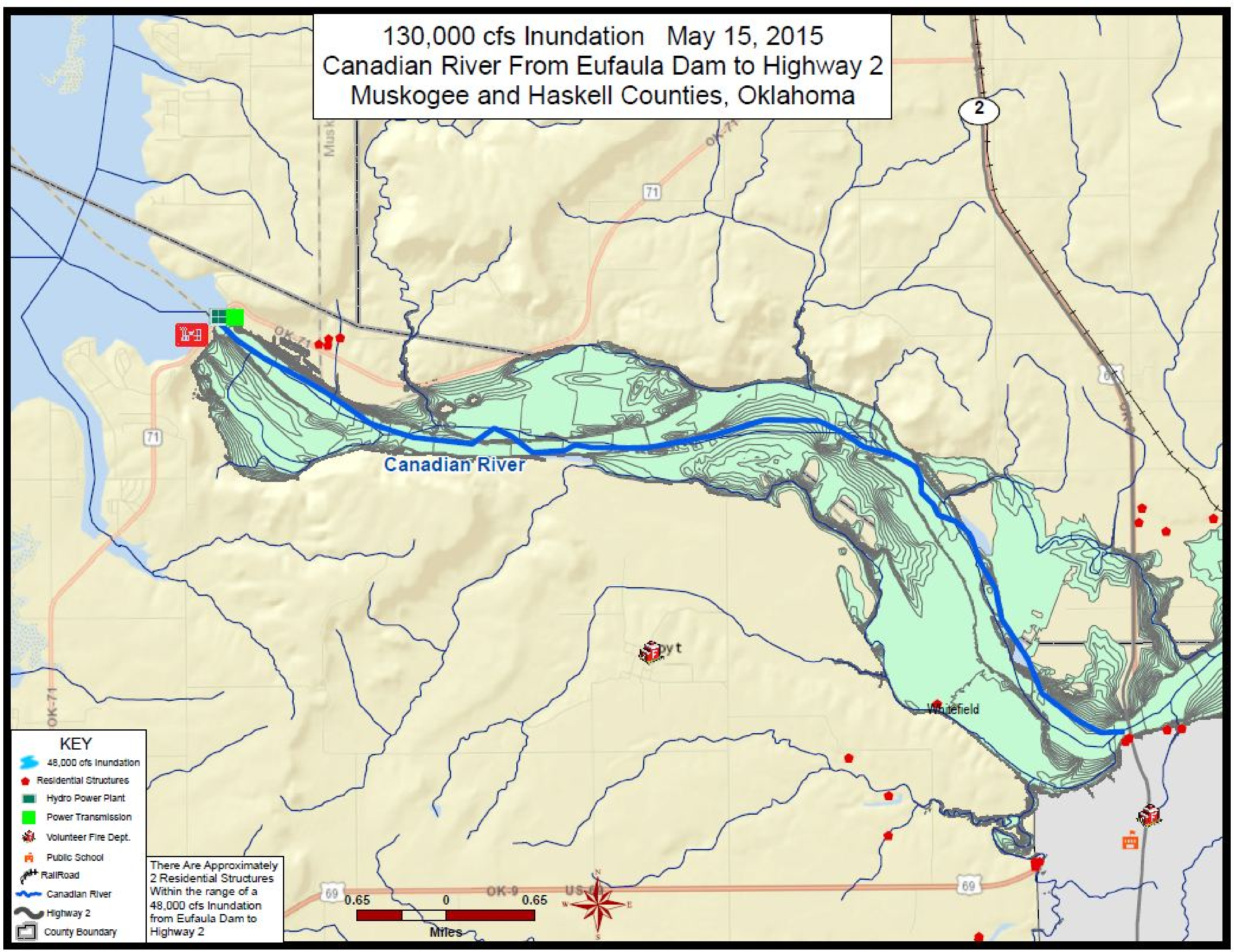
In-House Inundation Mapping

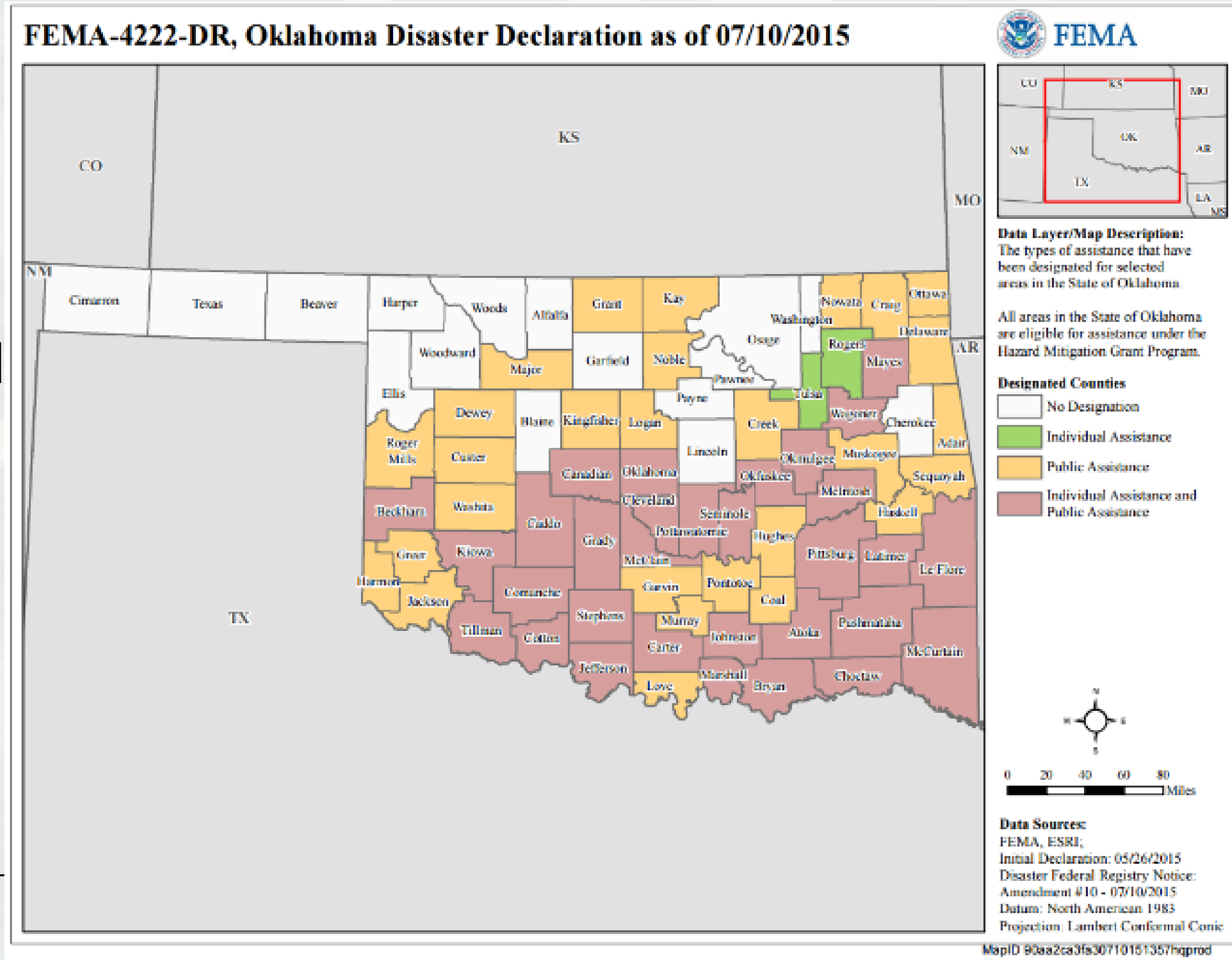


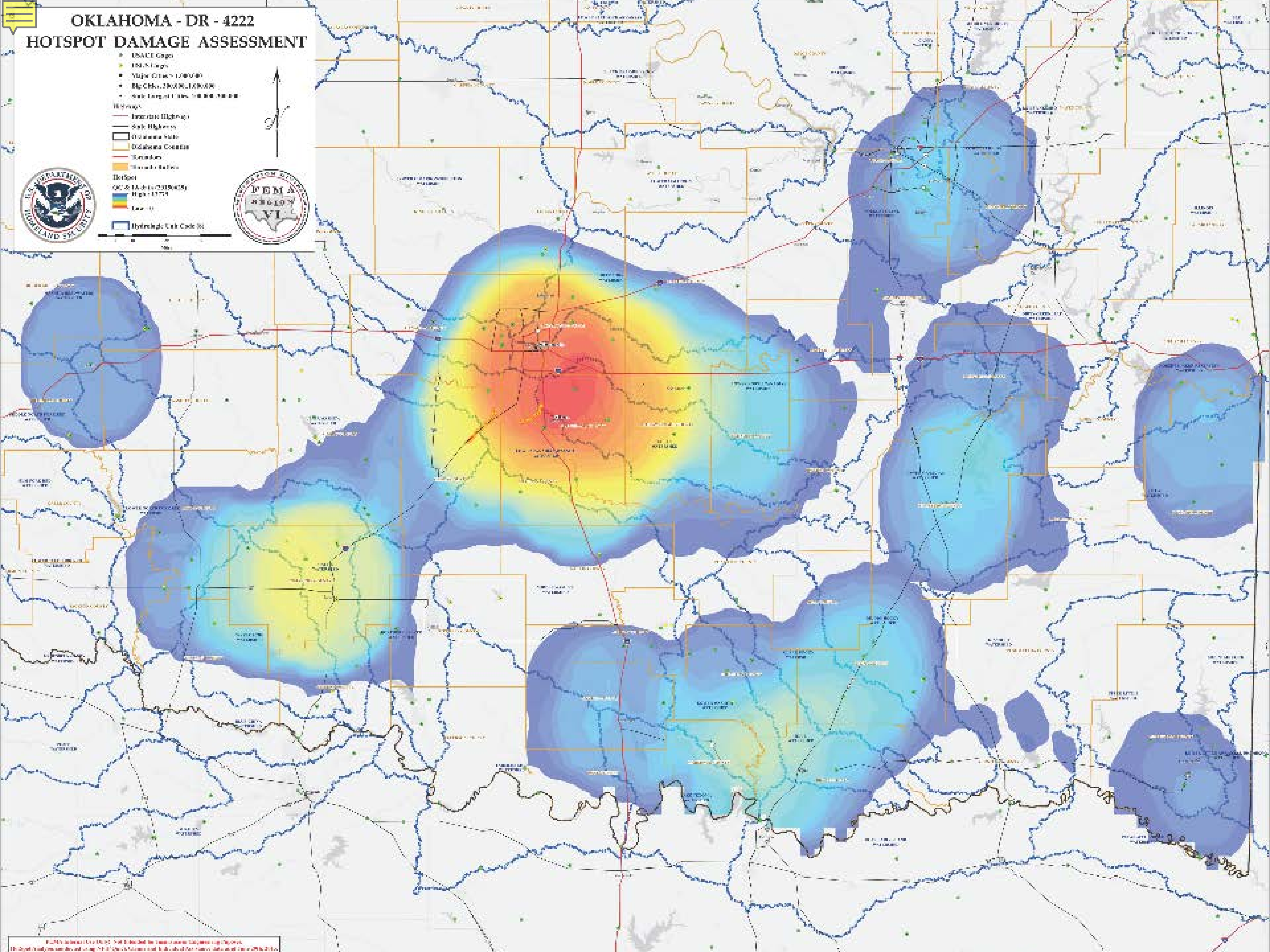
FEMA DISASTER DR-4222

Oklahoma Severe Storms, Tornadoes, Straight-line Winds, and Flooding

- **Major Disaster Declaration** declared on May 26, 2015
- **Incident period**

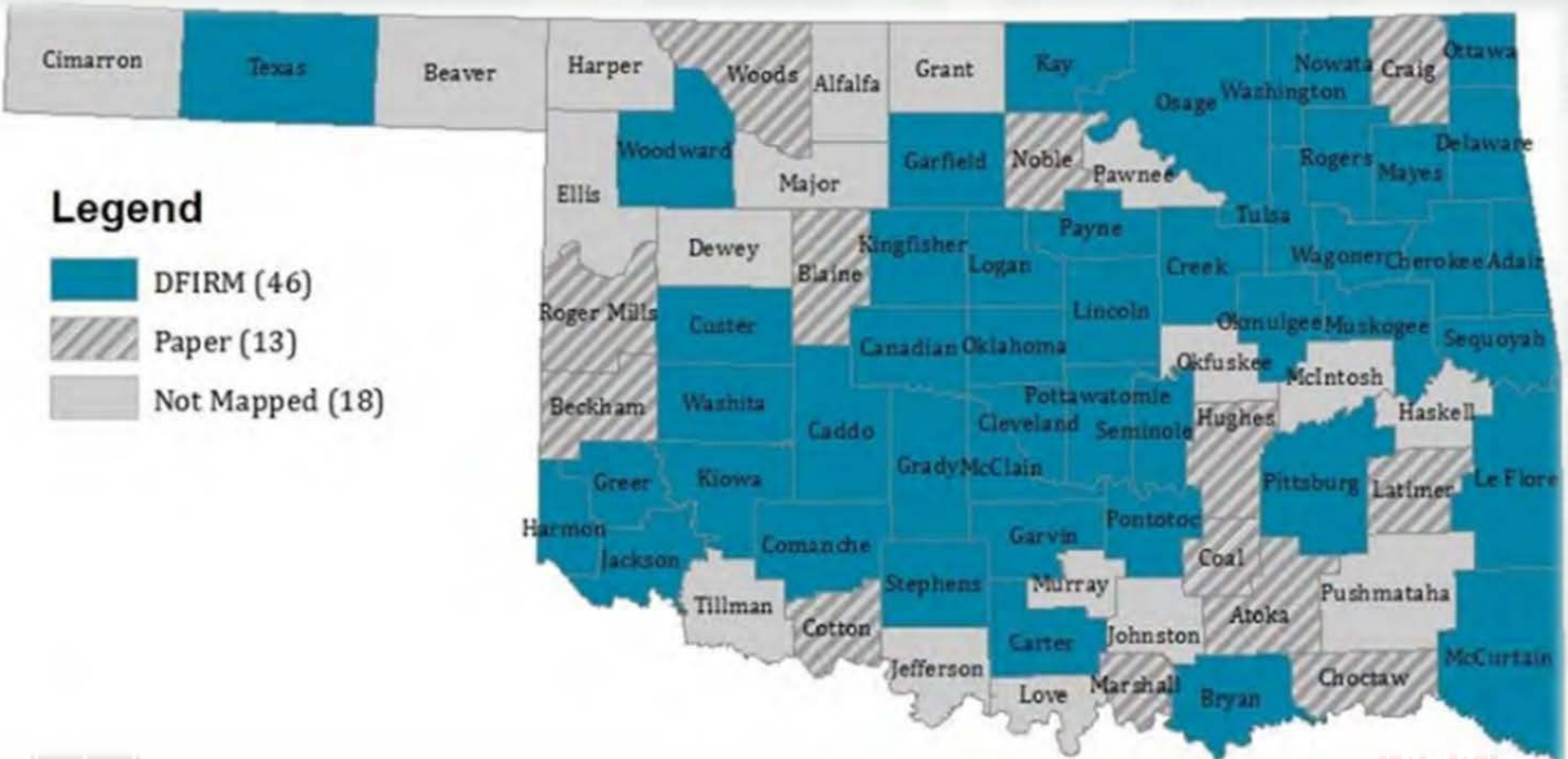
  May 5, 2015 to June 4, 2015





OKLAHOMA - DR - 4222
HOTSPOT DAMAGE ASSESSMENT
USACE Gages
HotSpot
FEMA
REGION
VI

Flood Insurance Rate Map Availability and Currency



High Water Marks & Event Determination

MA 4222DR-OK-COE-SWD-01/02

- Statement of Work includes tasks to:
  - Locate and identify high water marks for recording (water stains, debris lines, and other recordable items)
  - Collect location (lat/long) and elevation of mark
  - Supply photo documentation and field notes
  - Provide real-time HWM collection website for reporting and data access to Federal and State partners
  - High water mark Geodatabase deliverable
  - Review gage analysis and recent storm radar information to determine amount of rainfall
  - Perform statistical analysis to determine recent event frequency equivalence

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MICA

MOBILE INFORMATION COLLECTION APPLICATION

US ARMY CORPS OF ENGINEERS
ENGINEER RESEARCH & DEVELOPMENT CENTER

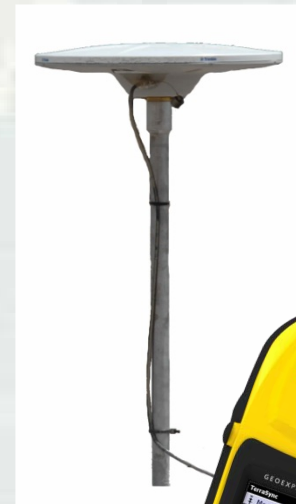
301-660-MICA

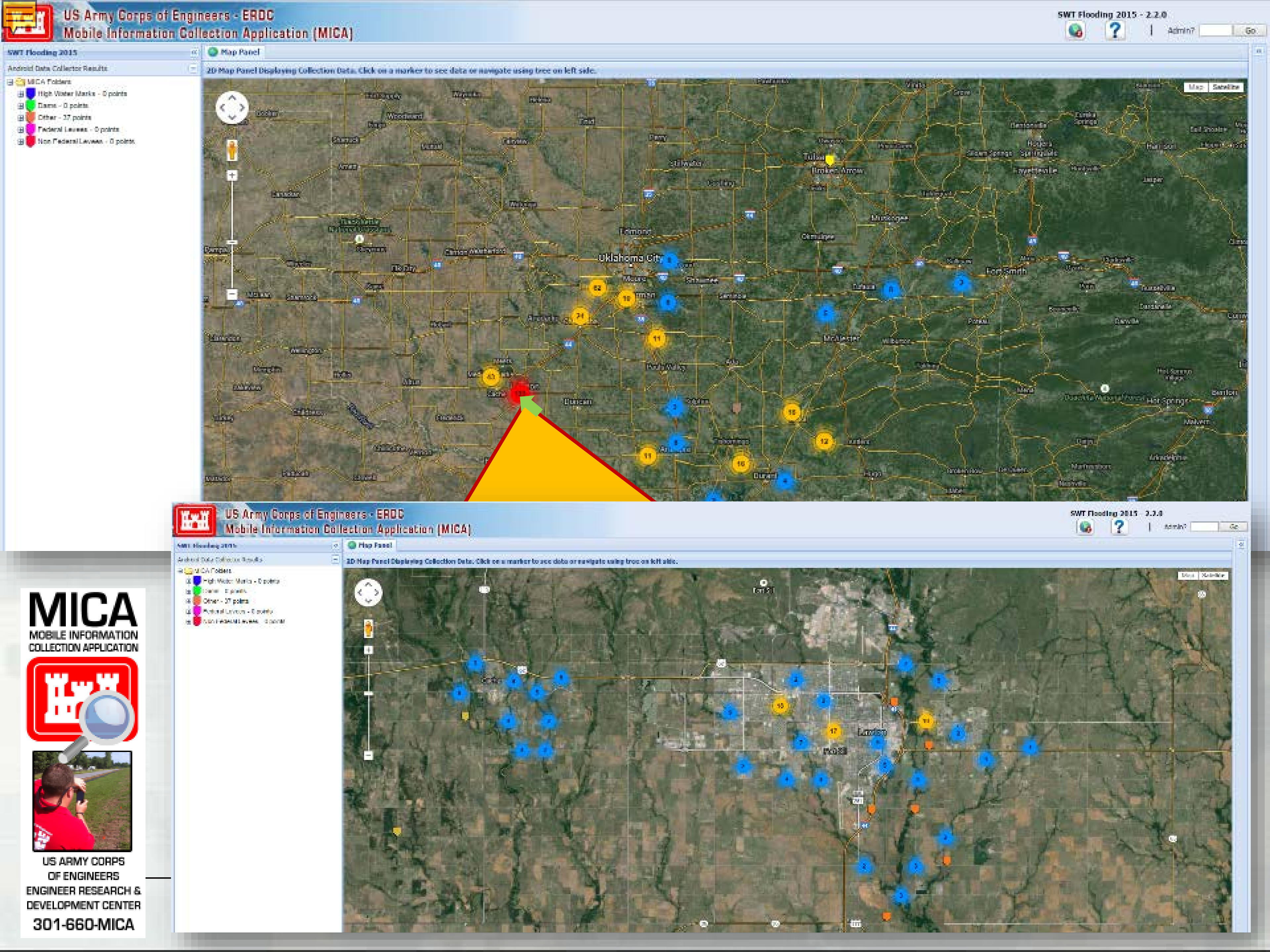
- Developed by USACE Engineering Research and Development Center (ERDC) Information Technology Laboratory
- Fully-Digital Data Collection and Rapid Data Transfer
- Mobile computing reduces errors and saves hours of time by **eliminating manual data entry**.
- With cellular internet access, mobile computing applications **immediately send data from the field to the server** for review and analysis.
- Centralizes data collection from multiple remote teams

Field Collection

- MICA
  - Longitude, Latitude
  - Field Notes
  - Photo Documentation

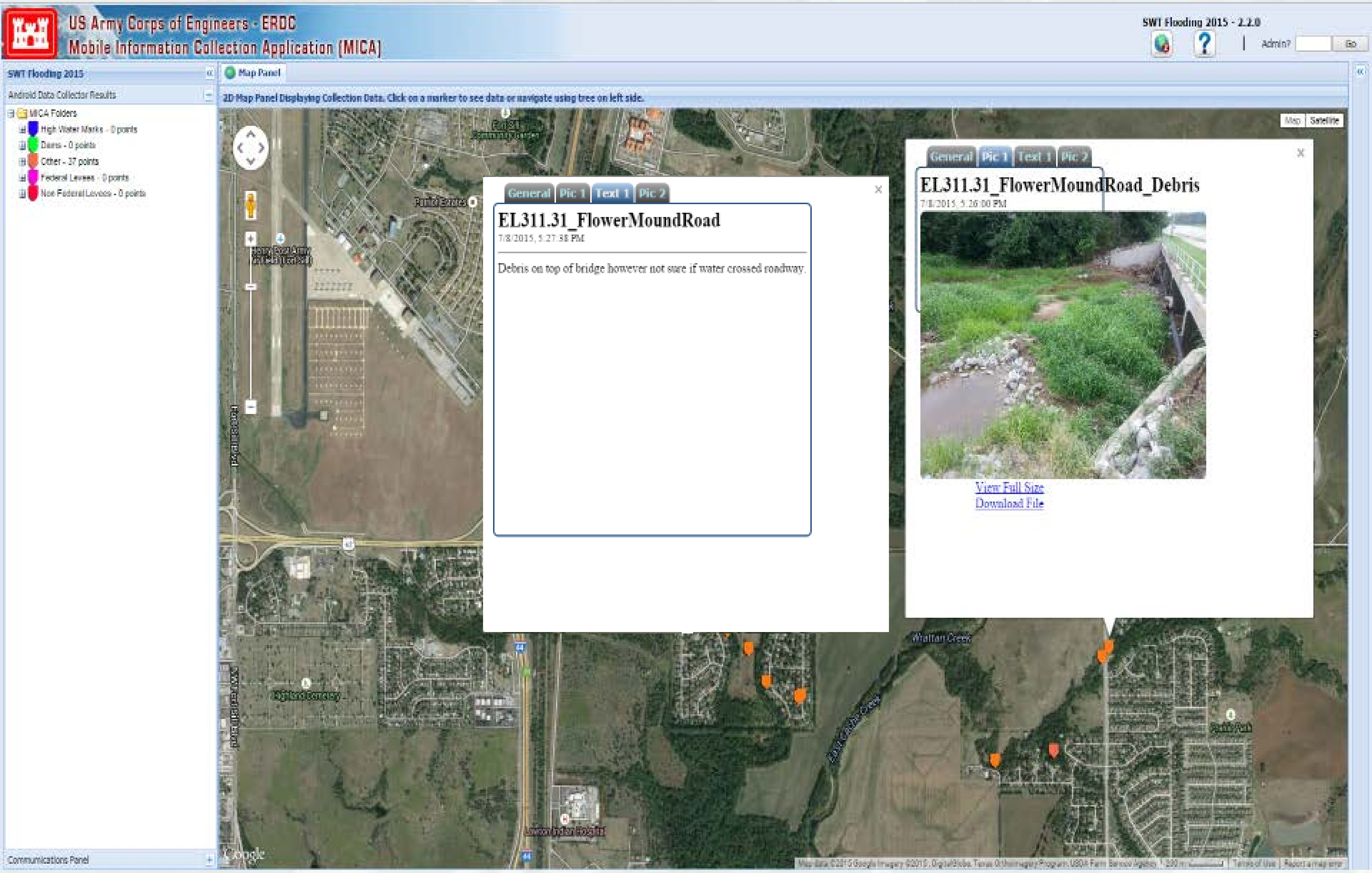
- TrimbleXH GPS Unit & Zephyr2 Antenna
  - Collects Elevation
  - 5-15cm Hz, 30cm Vert (post-processed)
- 4 Field Collection Teams of 2





US Army Corps of Engineers - ERDC
Mobile Information Collection Application (MICA)
SWT Flooding 2015 - 2.2.0
Admin?
Go
SWT Flooding 2015
Map Panel
Android Data Collector Results
MICA Folders
High Water Marks - 0 points
Dams - 0 points
Other - 37 points
Federal Levees - 0 points
Non Federal Levees - 0 points
2D Map Panel Displaying Collection Data. Click on a marker to see data or navigate using tree on left side.
Map
Satellite
Tulsa
Broken Arrow
Oklahoma City
Fort Smith
McAlester
Muskogee
Duncan
Lawton
MICA
MOBILE INFORMATION
COLLECTION APPLICATION
US ARMY CORPS
OF ENGINEERS
ENGINEER RESEARCH &
DEVELOPMENT CENTER
301-660-MICA

MICA Portal



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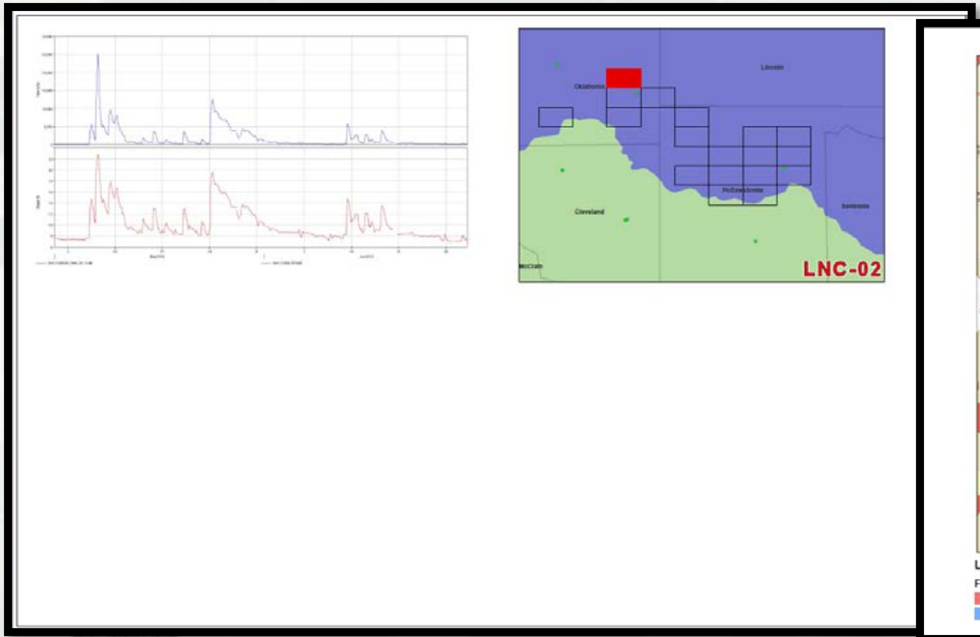
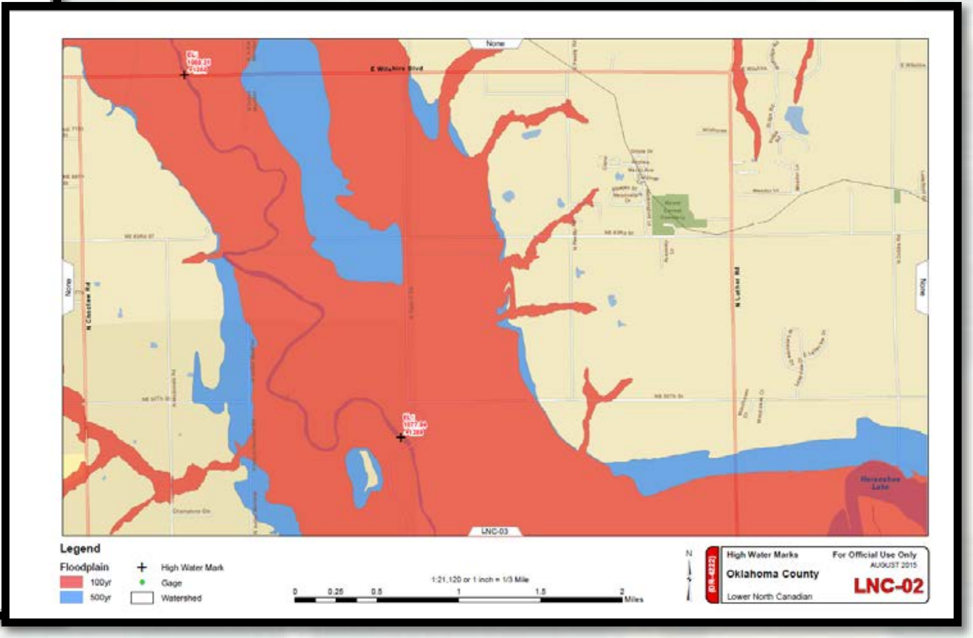
Map Panel
2D Map Panel Displaying Collection Data. Click on a marker to see data or navigate using tree on left side.
Map
Satellite
General
Pic 1
Text 1
Pic 2
EL311.31_FlowerMoundRoad
7/8/2015, 5:27:38 PM
Debris on top of bridge however not sure if water crossed roadway.
EL311.31_FlowerMoundRoad_Debris
7/8/2015, 5:26:00 PM
View Full Size
Download File
Communications Panel

Final Products

Mapbooks by Watershed

- 6 High Water Mark Mapbooks
- 6 60 day Event Precipitation Mapbooks
- 1 File Geodatabase
- 14 MICA Field Reports by County





Lessons Learned
MA 4222DR-OK-COE-SWD-01/02

- HWM data is EXTREMELY perishable
  - Suggest interagency coordination in “peace” time to allow data collection efforts to commence with event occurrence in the future
  - Begin data collection efforts during FEMA response efforts for best data availability
- Train crews just prior to field activation
- Scope of Work elements and specificity is critical to success
  - Leveraged FEMA’s Region 1 HWM Standard Operating Procedures