Challenges to Managing Flood Events and Drought Management in Oklahoma

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Tulsa District Commander
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US Army Corps of Engineers
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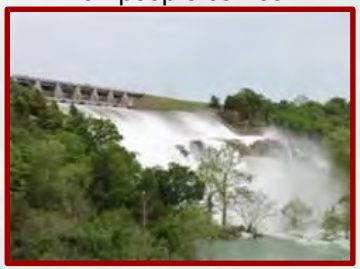
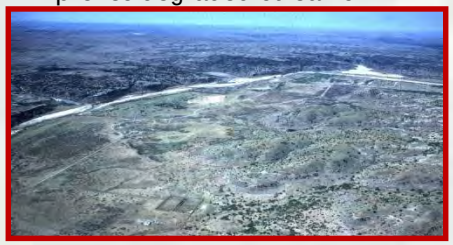
Civil Works Mission Areas

Water Supply
- 50% of Corps water supply contracts
- 18 lakes, 104 water supply customers
- 2.2 million people served

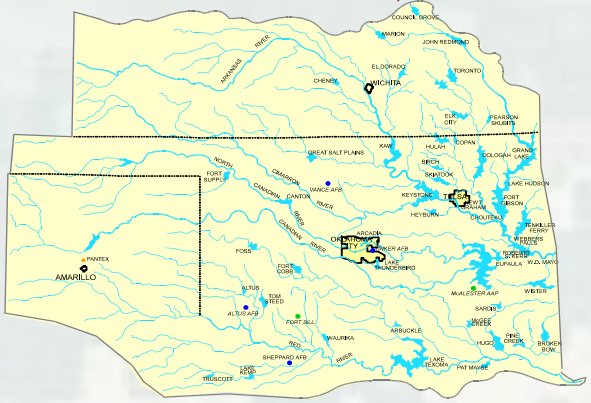


Tenkiller Lake

Water Quality
- Enhances municipal, industrial, irrigation usage
- Protects endangered species
- Improves degraded streams



Red River Chloride, Area VI



Flood Risk Management
- 38 Corps dams + 10 others
- 15,950,000 acre feet of flood storage
- Arkansas River Basin: $11,144B in cumulative flood damage reductions
- Red River Basin: $1,936B in cumulative flood damage reductions

Grand Lake

Webbers Falls Turbine

Hydroelectric Power
- 8 power plants produce 585,000 kw capacity
- Generates power to 8 million customers

Honors Cottage, Skiatook Lake

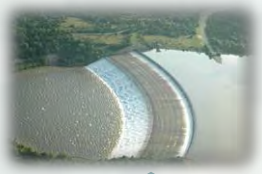
Recreation
- 267 recreation areas at 33 projects
- 22.5 million visitors in 2012

Inland Navigation (MKARNS)
- 5 locks & dams
- 3 major ports

Environmental Stewardship
- Tenkiller Low Flow Pipe
- Supersaturated Dissolved Oxygen System (SDOX)

Maintaining a System Balance

Competing Water Resource Interests



Flood Risk Management

Water Supply Storage

Hydropower

Navigation

Recreation

Environmental and Fish & Wildlife

Water Quality

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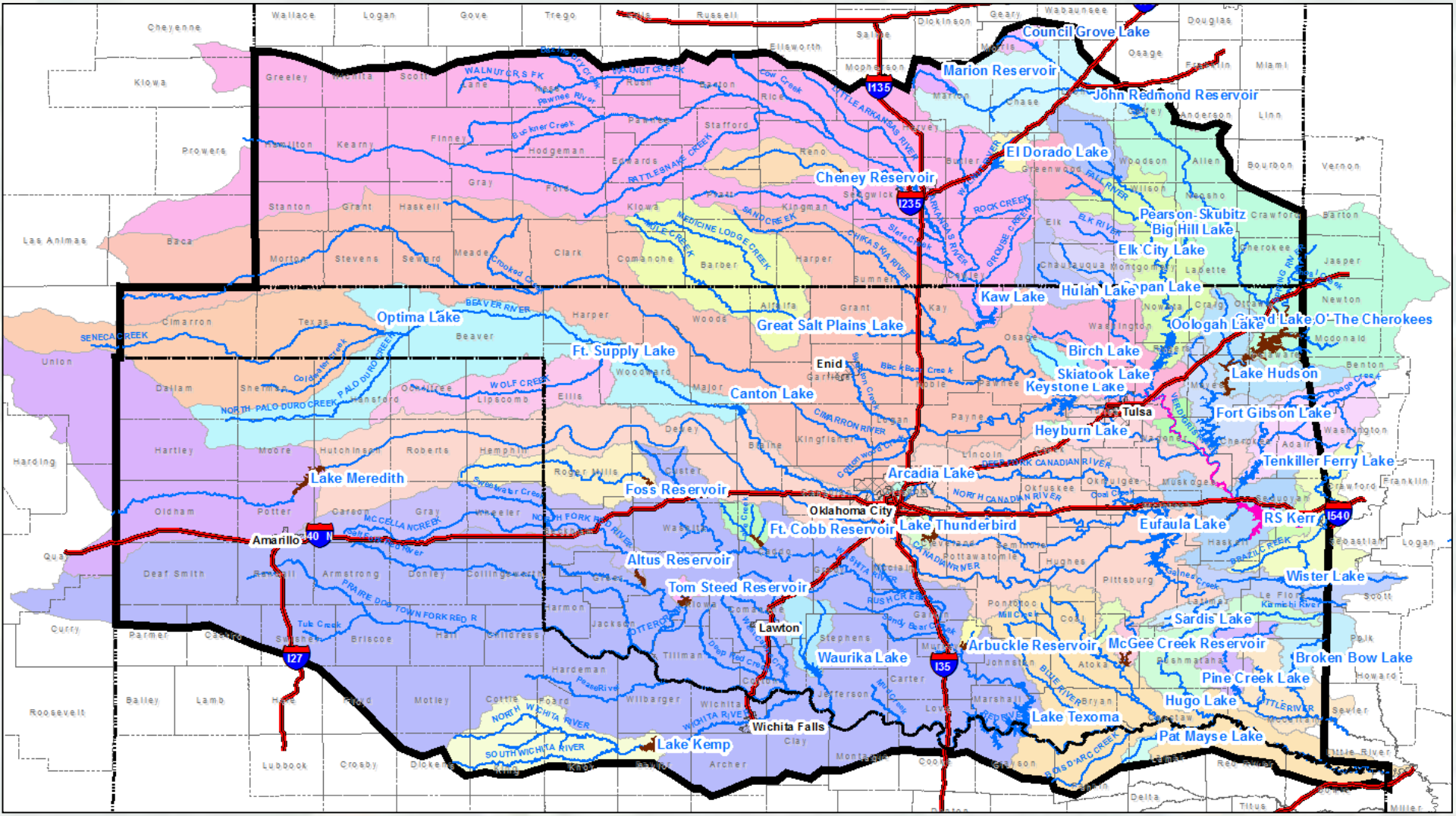
Tulsa District Water Management

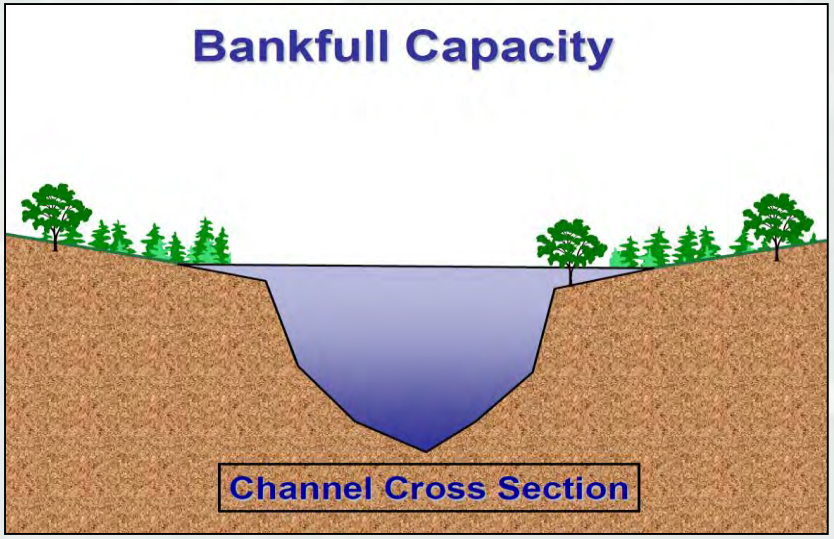
- 50 Projects
  - 15 in the Red River Basin
  - 35 in the Arkansas River Basin
- 12 Section-7 lakes (owned by others)
- 23 lakes with gated spillways
- 8 COE Hydropower
- 5 Navigation Locks
- 1 Chloride Control Project



Flood Risk Management Operation

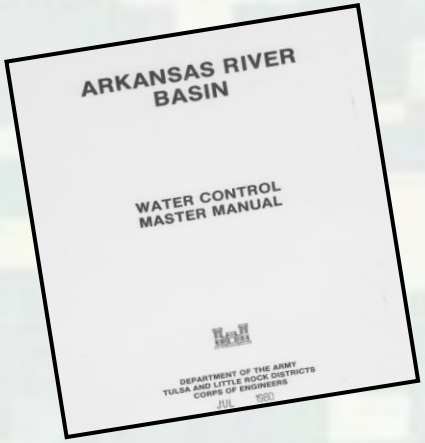
FLOOD OPERATION INDIVIDUAL PROJECT

- (ER 1110-2-240) Releases from reservoirs shall be restricted to making decisions based on the principle of water on the ground, which is observed precipitation or observed snowpack
- The goal of any flood risk management operation is to not exceed the downstream bank capacity
- Releases from the lake, when combined with downstream runoff will not cause the river to exceed bank capacity, if possible
- Flood waters will be stored as long as possible in order to accomplish this goal



SYSTEM WATER CONTROL PLAN

- Tulsa District has flood control projects in two river systems:
  - Arkansas River System
  - Red River System
- Each system water control plan attempts to balance the percent of storage contained in individual project flood pools



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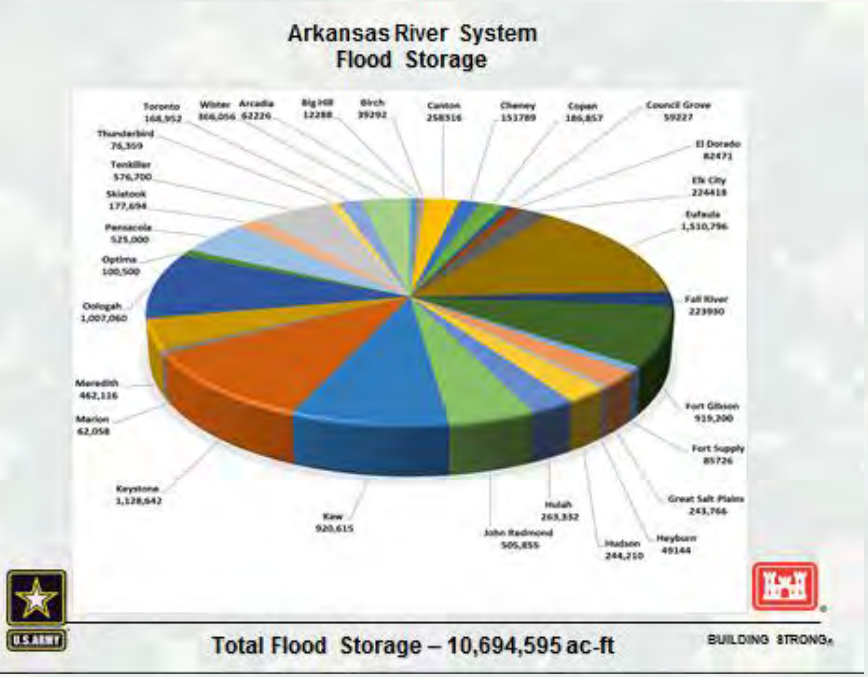

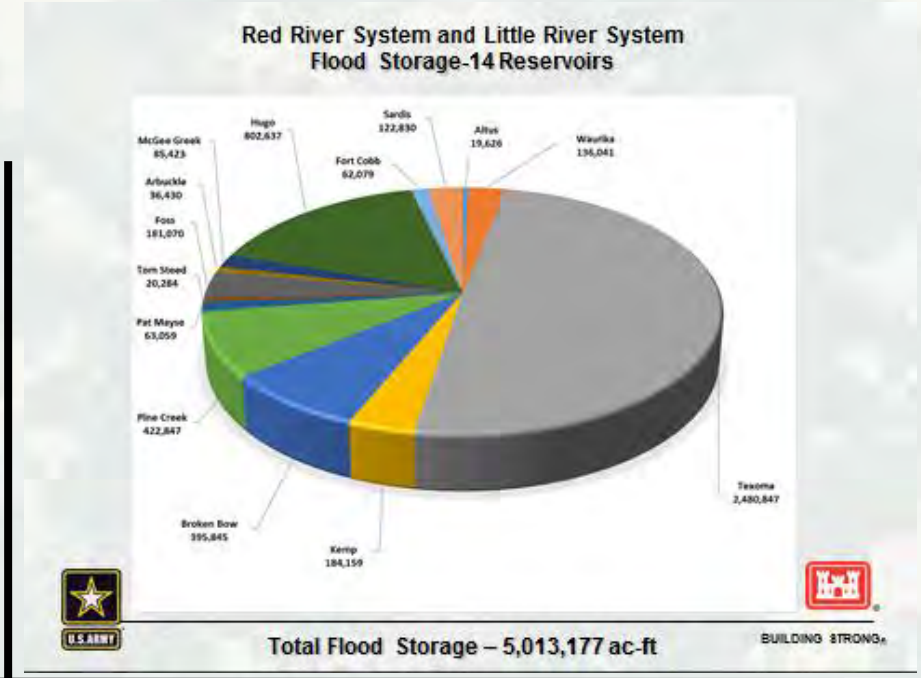

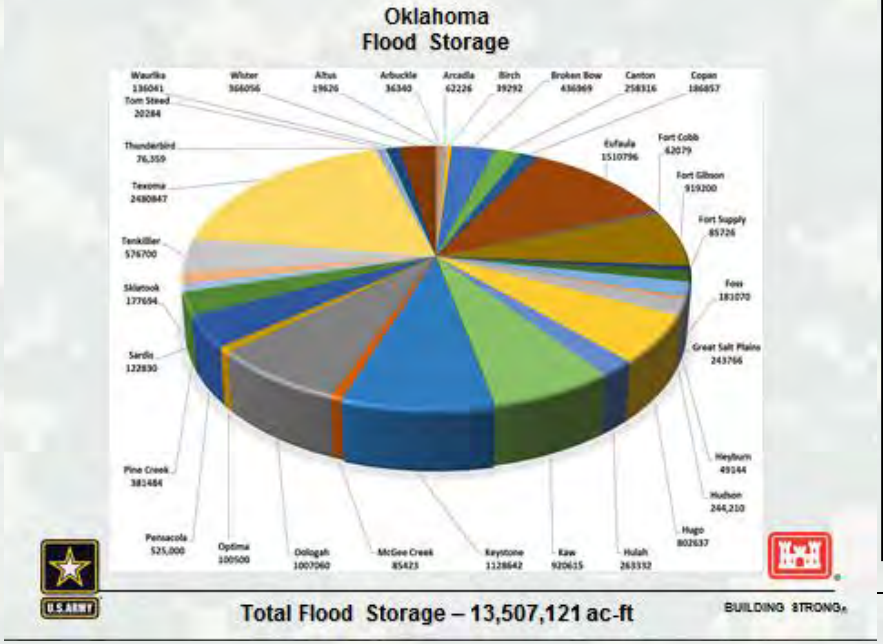

Flood Control Storage

- Ark River Total FC storage – 10.6 M ac-ft
- Red River Total FC Storage – 5.0 M ac-ft
- FC storage within Oklahoma – 13.5 M ac-ft

Total Damages Prevented FY 2015

- Arkansas River Basin, the damages prevented: **$552,030,000**
- Red River Basin, the damages prevented: **$242,640,000**
- Total damages prevented in southern Kansas, Oklahoma, and northern Texas: **$794,670,000**

Drought Management

Drought Level 1- (617-612)
Alert Phase-Normal Operations

- Water storage accounting of conservation storage by users on a monthly basis when 75% of the conservation pool remains
- Meet monthly with SWPA to allocate power for the following month
- Obtain water supply withdrawal rates from users
- Monitor Basin and Lake Conditions
- Normal data collection

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Drought Level 2 (612-607)
Expanding Actions

- Begin monthly water storage accounting for users
- Activate the Corps Drought Management Committee (CDMC)
- Recommend SWPA to limit power production within Public Law 100-71; monitor pool draw down limits
- Promote conservation of water to users when they use over 50% of their authorized storage
- Provide resident offices with lake projections for concessionaires and dock owners
- Cease releases for non-critical project testing and inspections
- Schedule AD Hoc meeting of Interagency Drought Management Committee
- Notify public of possible boating safety hazards due to low lake levels

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Drought Level 3 (607-599.9)

- Activate the Interagency Drought Management Committee (IDMC)
- Post warnings, closings, and boating hazards
- Increase frequency of water supply accounting as needed
- Notify state Water Resources Boards and users when 25% of conservation storage remains
- Comments are sought by the CDMC from interested individuals and groups
- Schedule more frequent meetings of CDMC as necessary
- Evaluate water intakes of contracted in-lake water users
- Identify surplus water supply for municipal and industrial use and costs
- Minimize special event recreation releases
- Notify SWPA of restrictions of hydropower production within Public Law 100-71
- District Engineer and staff to determine surplus water available at Corps projects

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Drought Level 4 (599.9-590.0)

- Notify state Water Resources Board and users when 10% of conservation storage remains
- Make no releases for special events except as approved by District Engineer
- Begin planning priorities of usage for inactive storage
- Notify contract water users of impending need to arrange for emergency water needs
- Contract emergency water supplies if available

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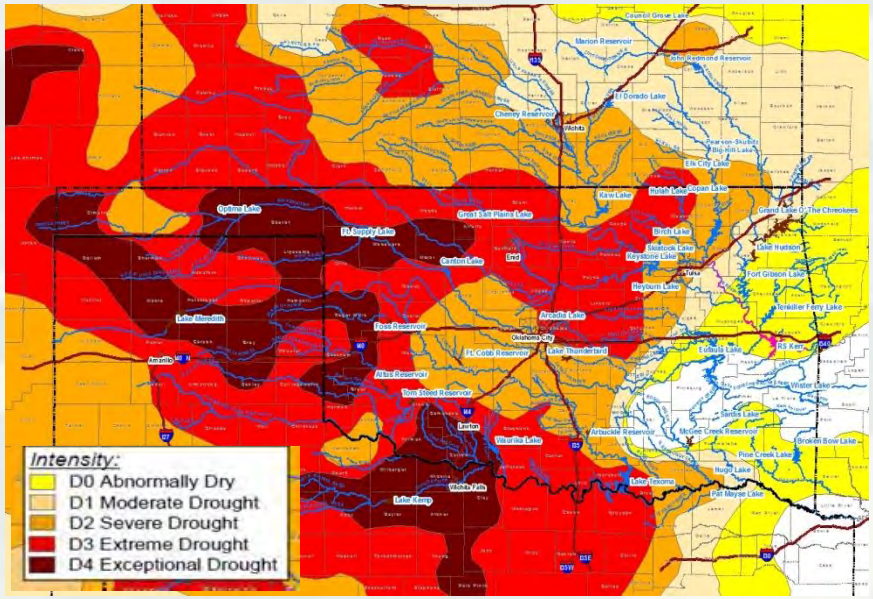
Drought Management Plans

- Every lake has one
- Devised into four phases
- Identify tasks to be taken at that phase

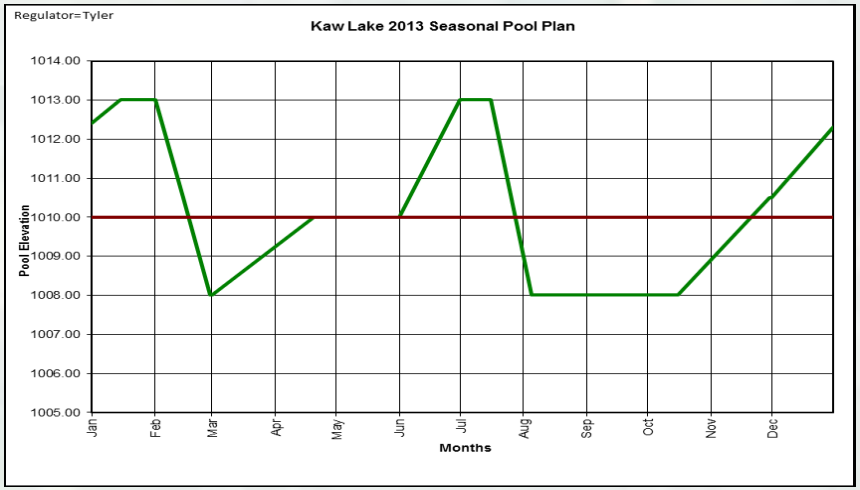
Interagency Drought Management Committee

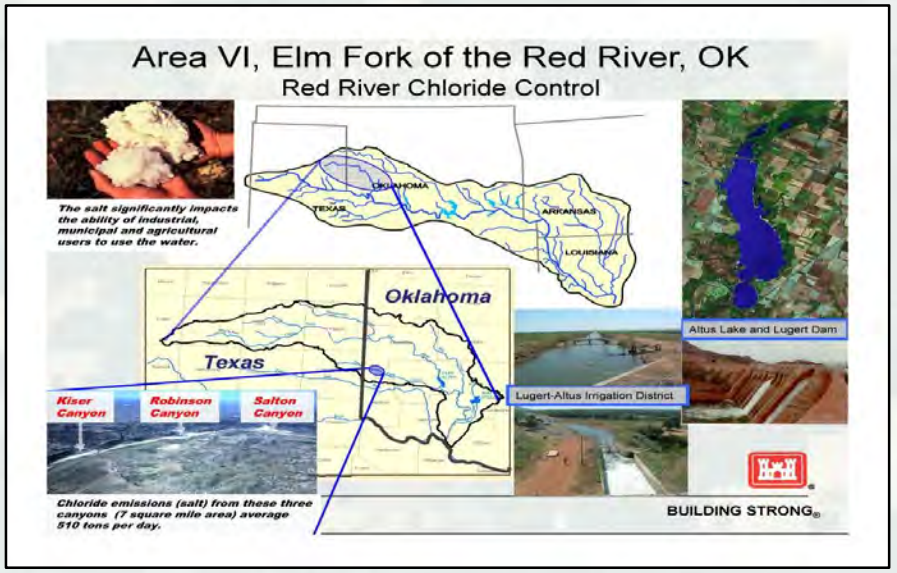
- Lesson learned from the last drought: Establish the committee earlier



Updates

Deviations from Approved Water Control Plan - ER 1110-2-240





Cumberland Levee Repair, Lake Texoma

Webbers Falls Lock and Dam 16 Dewatering

For More Information

Tulsa District website:

www.swt.usace.army.mil

Headquarters website:

www.usace.army.mil