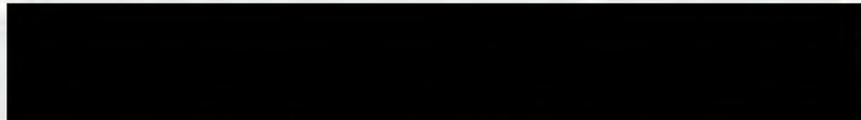


Projects Impacting Federal Power

Tulsa District



18 June 2015



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- **Interior Least Tern Operations and Habitat Creation**
- **Arkansas River Corridor**
- **Lake Eufaula Advisory Committee**
- **Tenkiller Downstream Fishery Issues DO / Minimum Flows**
- **Broken Bow Seasonal Pool Update Cultural Resources Impacts**
- **Arkansas River Navigation Improvement**



Interior Least Tern Operations and Habitat Creation

- A new biological opinion is underway and expected to be available in the coming weeks. We expect no change in the Least Tern program resulting from the opinion. The nesting this year was disrupted by the flood waters. Numbers are based on a five year rolling average and should not have an impact on the program moving into next year. Effort to enhance habitat is being concentrated on the Navigation pools since they do not fluctuate as much as the power pools.



Arkansas River Corridor

- **Sec 3132 of WRDA 07 authorized the Corps to participated in ecosystem restoration, flood damage reduction and recreation components of 2005 Master Plan.**
- **In 2014 funding was received to conduct a planning charette. Primary output from this was that no dams other than upper most dam near HWY 97 in Sand Spring could be considered for Federal implementation. In the 1980's Tulsa District removed a dam near this location that was part of the original Keystone Lake project.**



Arkansas River Corridor

- **Feasibility Cost Share Agreement amended in May 2015**
- **Scope and schedule revised to be no more than 3M and take no longer than 3 years**
- **Fed funding of \$270K received for FY 15.**
- **Study costs shared 50/50 with Tulsa County as sponsor.**

Schedule

- **2015 will result in identification of alternatives that may be considered and analysis of them initiated.**
- **2016 - draft feasibility report will be ready for review.**
- **2017 - final report to ASA-CW for approval.**



Lake Eufaula Advisory Committee

- **Committee Objective:** To provide information and recommendations to the Corps for operation of Lake Eufaula to balance uses of the lake
 - Authorized by Section 3133 of WRDA 2007
- **Committee Composition:** Members will equally represent the project purposes for Lake Eufaula, which are: flood control, water supply, hydroelectric power, navigation, fish and wildlife and recreation
- Subject to appropriation of funds the Corps will conduct a reallocation study at federal expense
- **Current Status:** DOD Office General Council (OGC) had questions regarding our request to designate the members as representatives rather than special government employee members. SWT submitted a revised package to SWD and HQ Counsel on 27 February and HQ Counsel coordinated the package with Army General Counsel. Army General Counsel has approved our rationale for representative members and is coordinating with DOD OGC for further review.



Tenkiller Lake Downstream Fishery Issues

- Tenkiller authorized purposes are FC, HP and WS
- Year round “put and take” trout fishery below the dam
- No authorization or storage to support minimum flows for the trout fishery
- HP installed “baffles” to increase DO but decreases HP efficiency in 90s
- Sluice gates had leakage of 35 CFS after repairs reduced to 6 CFS.
- Short-term: Water and storage has been donated by a water supply customer, to support trout fishery.
- No significant actions to report. The low-flow pipe is in operation and the S-DOX system is installed (has not been used).



Broken Bow Seasonal Pool Update

Cultural Resources Impacts

- **Study purpose is to provide for the reallocation of water supply for the Mountain Fork Trout Fishery; no expense to the State of Oklahoma.**
- **Study examined a range of Alternatives**
- **Pool rise of 3 feet; flood storage was identified as an alternative**
- **Current Hydropower outputs would be maintained**
- **As a result of the recent flood the fishery is basically destroyed. It is likely that the stream will require more flow to support the trout fishery due to the channel width increasing with the flood discharge.**
- **No funding available to proceed with further evaluation of reallocation or cultural resource survey.**

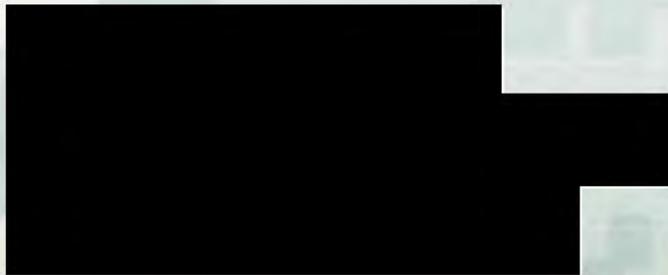


Arkansas River Navigation Improvement

- SWL is working the major rehab study. It would be a construction new start for funding if approved when the study is completed. Construction new starts with a CBR less than 2 are not being considered at OMB.
- \$250,000 is programmed at both Kerr and Webbers for the FY15 work plan as well as currently in the budget for FY 16 and is being requested for FY 17 as a temporary solution for necessary gate repairs.
- Emergency dredging actions currently under development to resolve high spot in the Kerr pool.



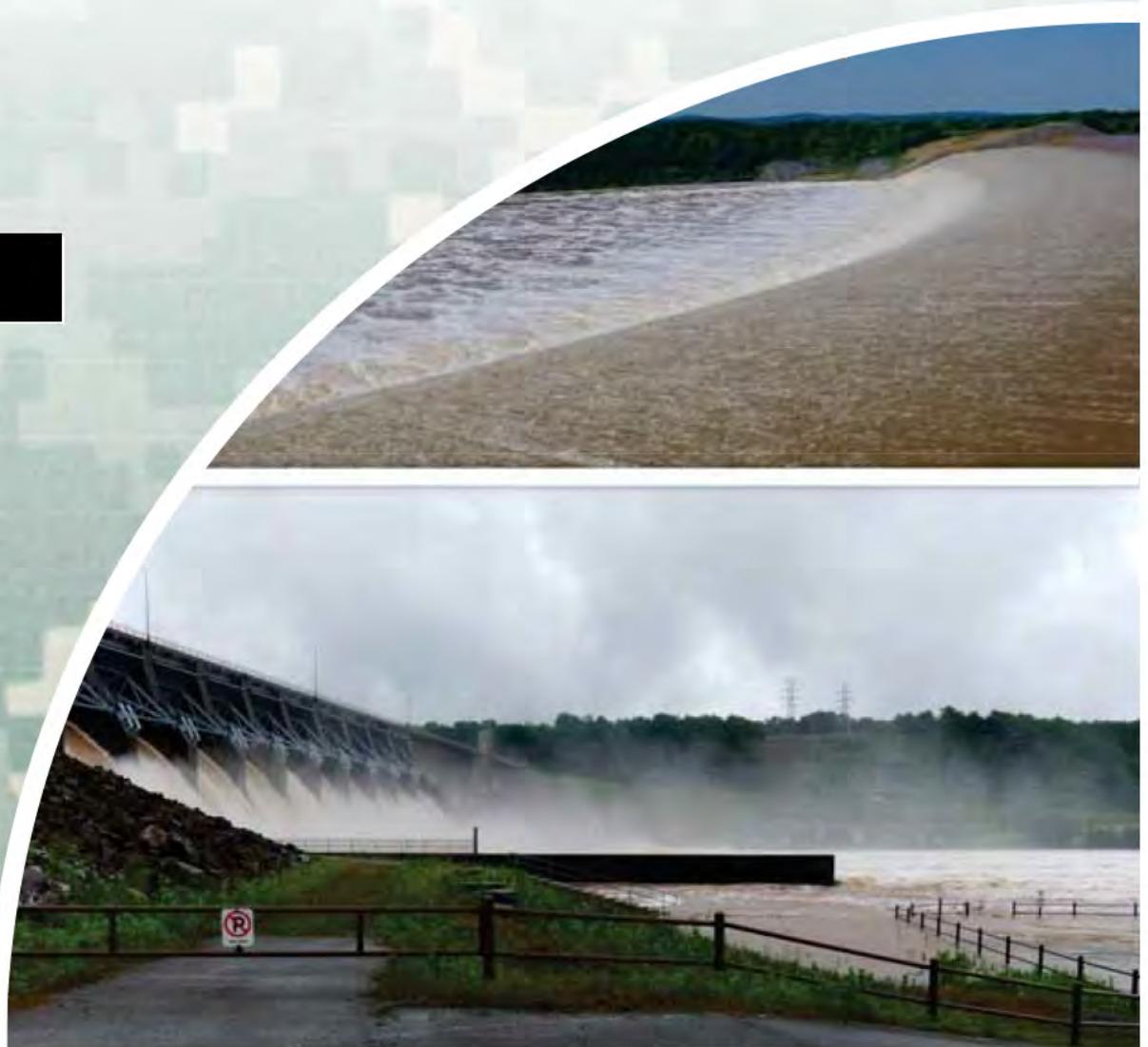
U.S. Army Corps of Engineers Tulsa District



May 14, 2015

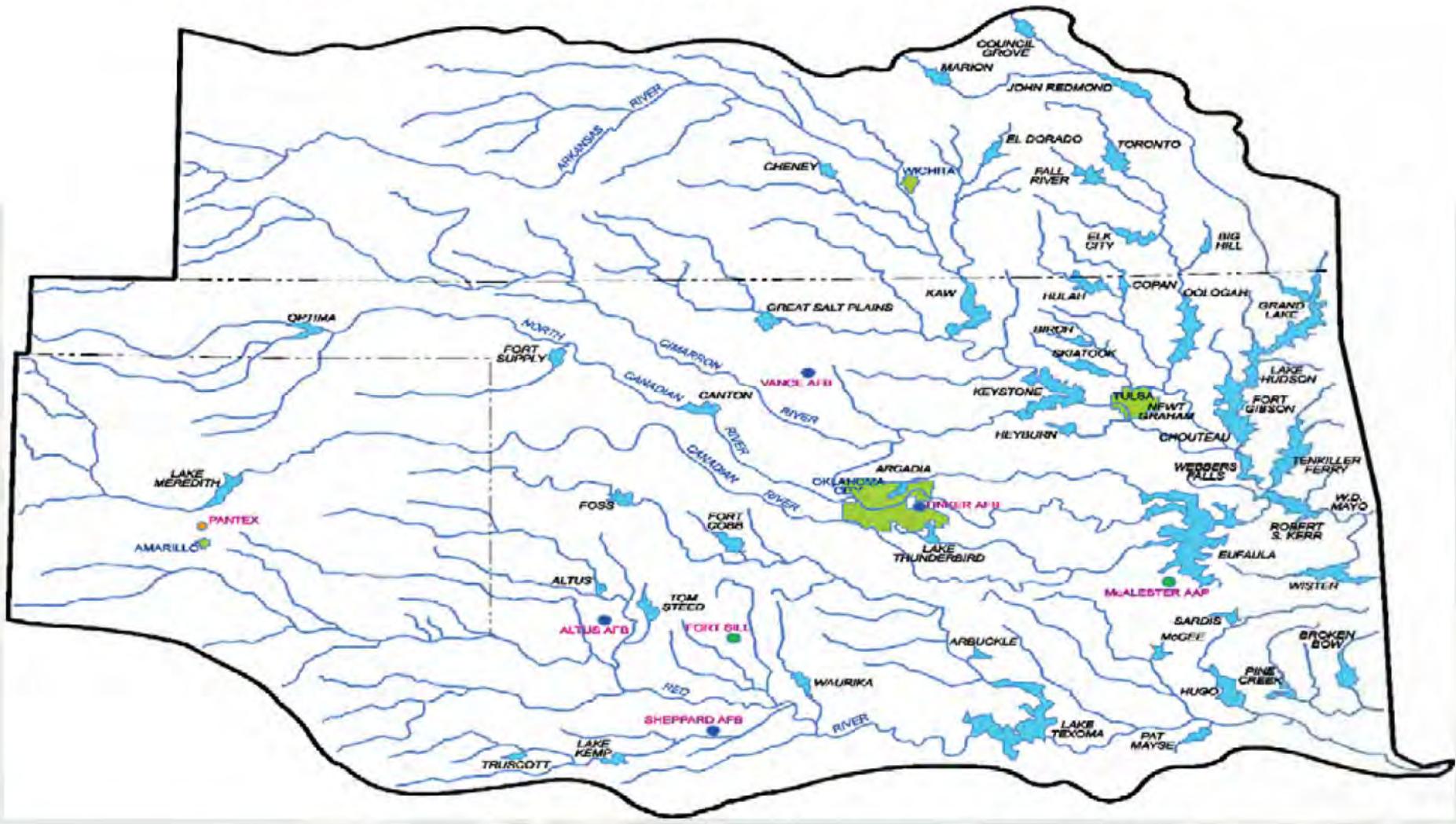


US Army Corps of Engineers
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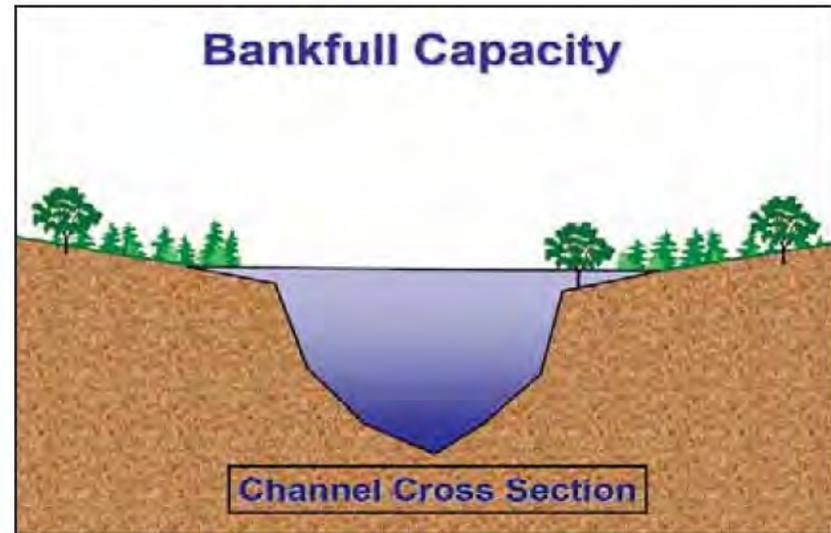
Tulsa District Water Management

- 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



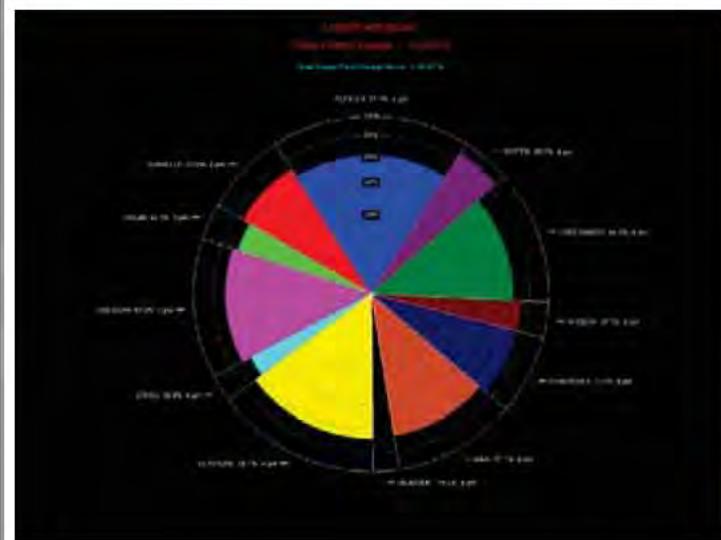
FLOOD OPERATION INDIVIDUAL PROJECT

- The goal of any flood risk management operation is to not exceed the downstream bankfull capacity.
- Releases from the lake, when combined with downstream runoff will not cause the river to exceed bankfull capacity, if possible.
- Flood waters will be stored as long as possible in order to accomplish this goal.



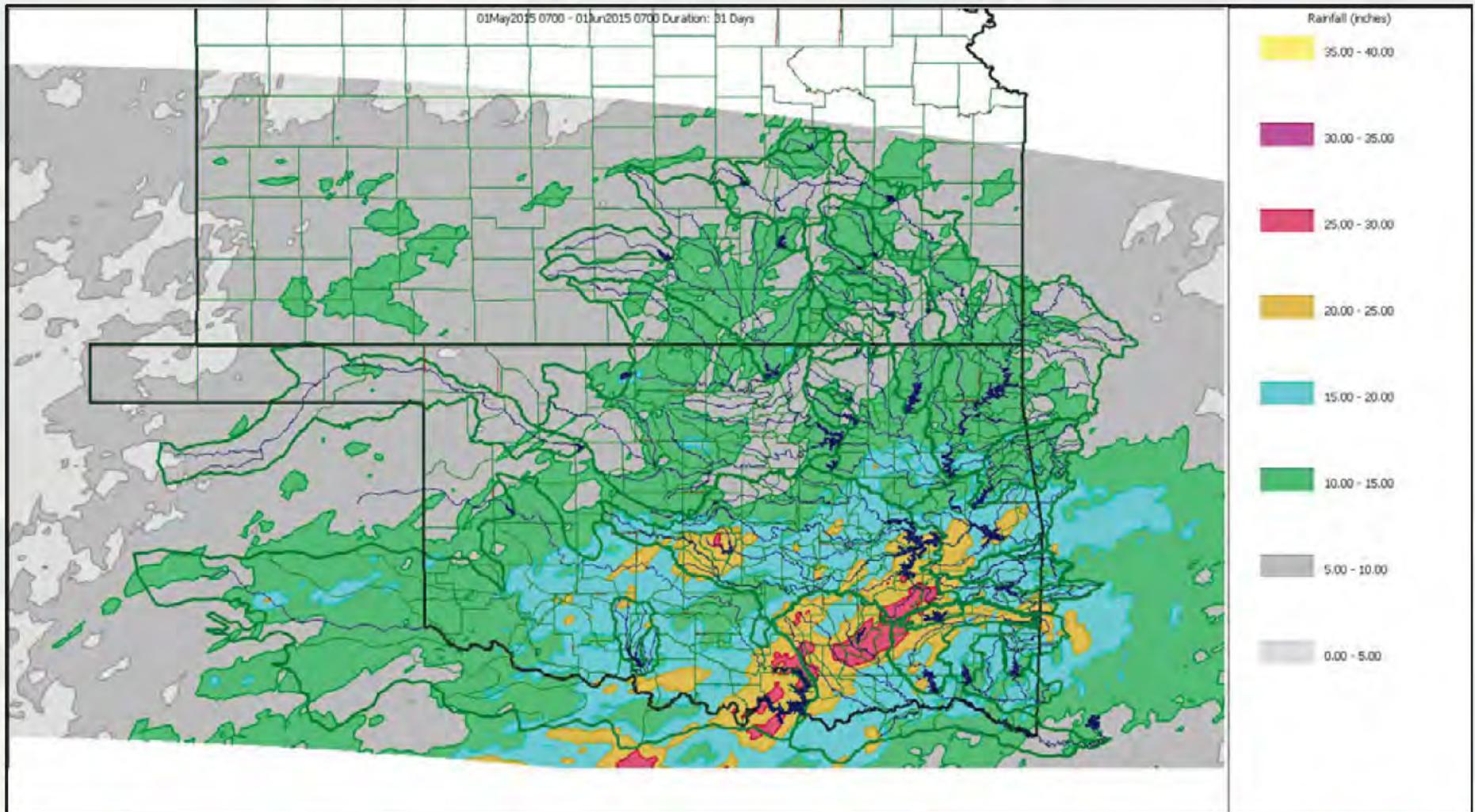
SYSTEM WATER CONTROL PLAN

- 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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May 2015 Rainfall

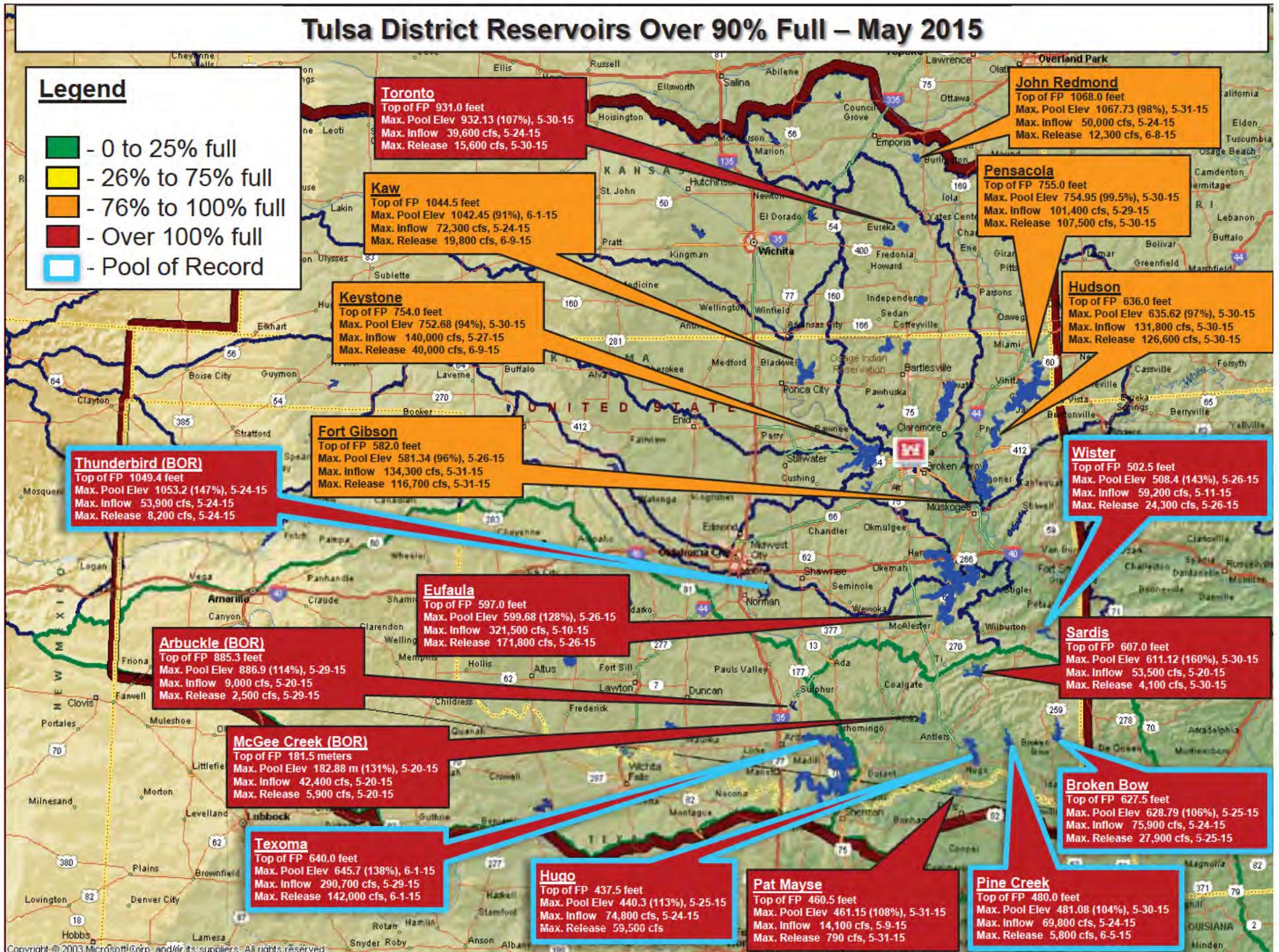


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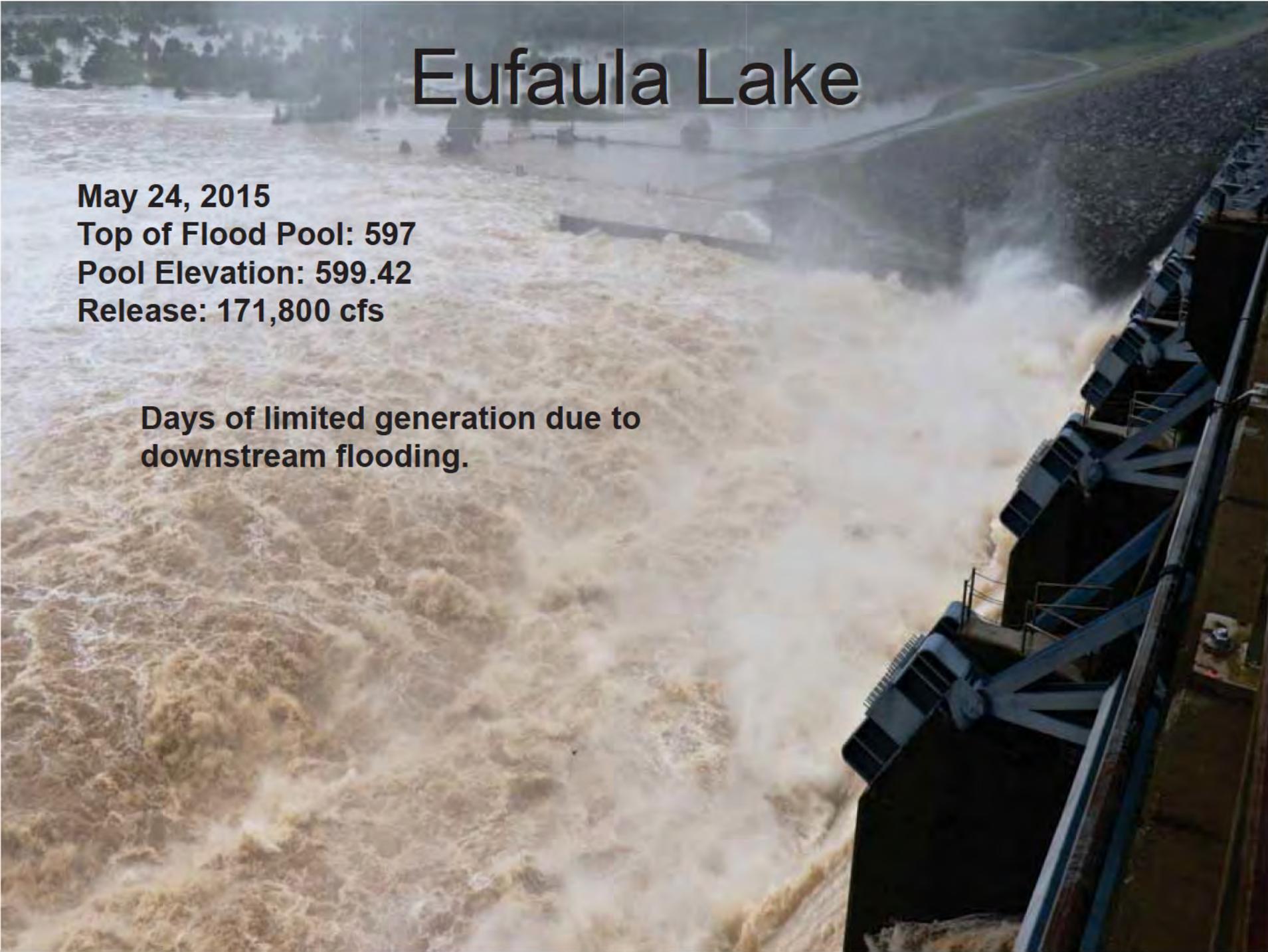
Tulsa District Reservoirs Over 90% Full – May 2015

Legend

- 0 to 25% full
- 26% to 75% full
- 76% to 100% full
- Over 100% full
- Pool of Record



Eufaula Lake



May 24, 2015

Top of Flood Pool: 597

Pool Elevation: 599.42

Release: 171,800 cfs

**Days of limited generation due to
downstream flooding.**

Eufaula Lake

May 18, 2015

Top of Flood Pool: 597

Pool Elevation: 598.6

Top of Tainter Gate



Fort Gibson Lake



May 30, 2015

Top of Flood Pool: 582

Pool Elevation: 580.6

Release: 98,800 cfs

**Days of limited generation due to
downstream flooding**

Keystone Lake



May 28, 2015
Top of Flood Pool: 754
Pool Elevation: 751
Release: 23,400 cfs

Days of limited generation due to downstream flooding.
Load limited due to net head exceeding design head for turbines.

Broken Bow Lake

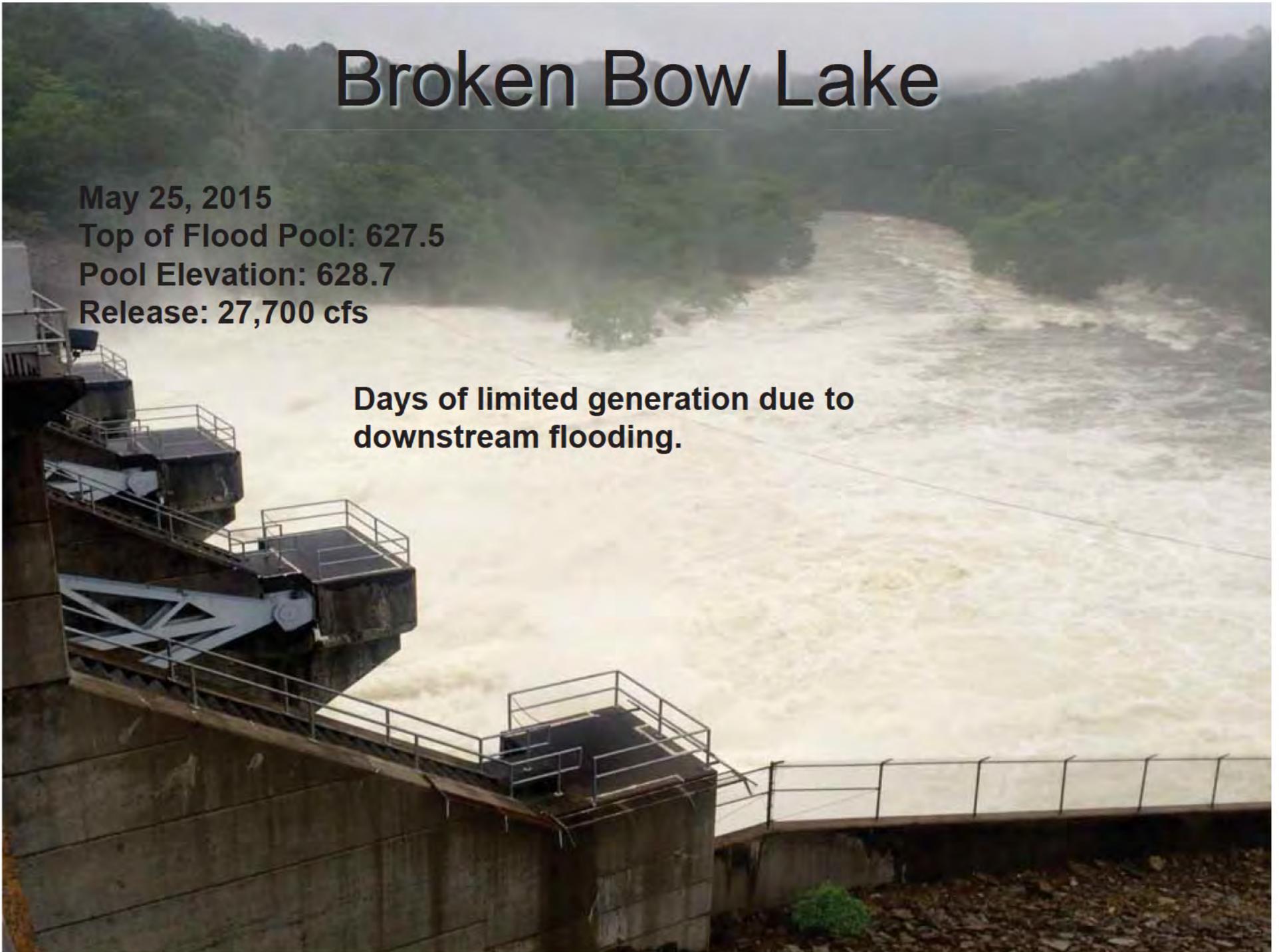
May 25, 2015

Top of Flood Pool: 627.5

Pool Elevation: 628.7

Release: 27,700 cfs

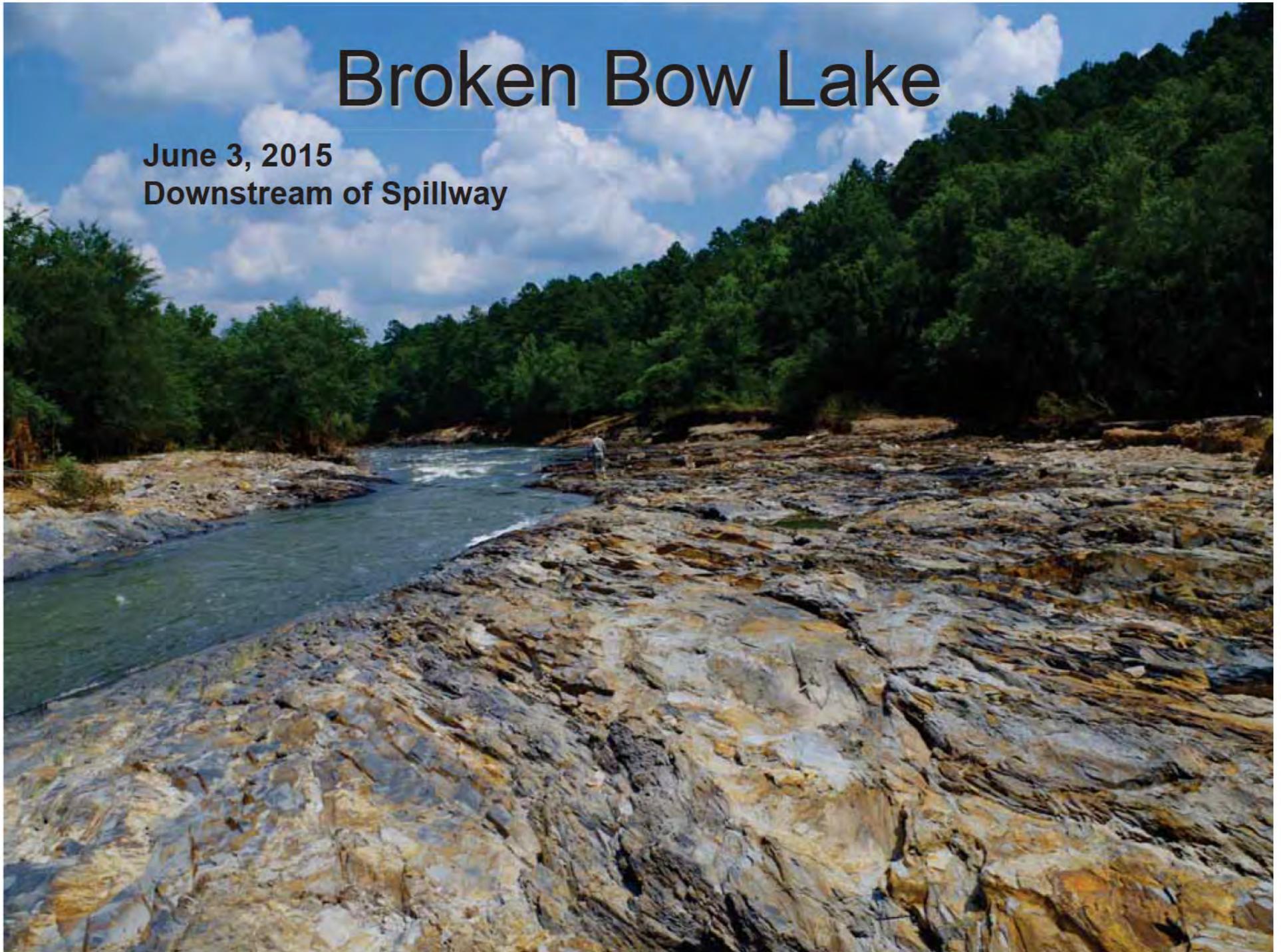
**Days of limited generation due to
downstream flooding.**



Broken Bow Lake

June 3, 2015

Downstream of Spillway





**Days of limited generation due to downstream flooding.
Tailwater elevation got to about 1 foot from powerhouse floor elevation**



**Cumberland Levee
May 22, 2015**



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8.87°W

Grid Off





U.S. ARMY

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Hydropower Impacts Due to May Flood

- **Broken Bow:**
 - ▶ Days of limited generation due to downstream flooding.
- **Keystone:**
 - ▶ Days of limited generation due to downstream flooding.
 - ▶ Load limited due to net head exceeding design head for turbines.
- **Eufaula:**
 - ▶ Days of limited generation due to downstream flooding.
- **Tenkiller:**
 - ▶ Days of limited generation due to downstream flooding.
- **Fort Gibson:**
 - ▶ Days of limited generation due to downstream flooding.
- **Robert S. Kerr and Webber Falls:**
 - ▶ Some issues due to high tailwater conditions.
- **Texoma:**
 - ▶ Days of limited generation due to downstream flooding.
 - ▶ Tailwater elevation got to about 1 foot from powerhouse floor elevation.

