



USACE - VISION OF TEXAS FIRO

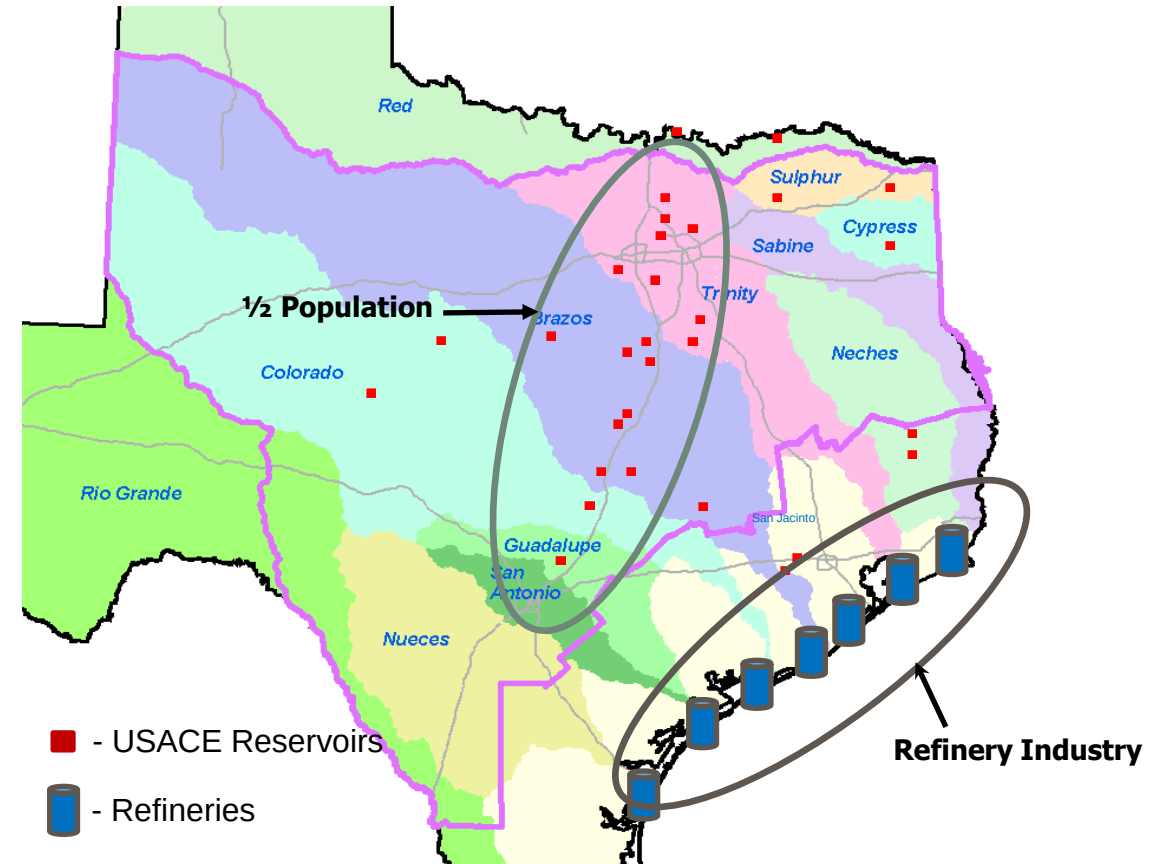


Presented at Texas FIRO Workshop, UT-Arlington
21SEP23
John Hunter, P.E. – Chief of Water Management
Max Strickler, P.H. CFM - Lead Civil Engineer
USACE – Fort Worth District Water Management Section



WHY FIRO? - STATEWIDE FEDERAL RESERVOIR DEVELOPMENT

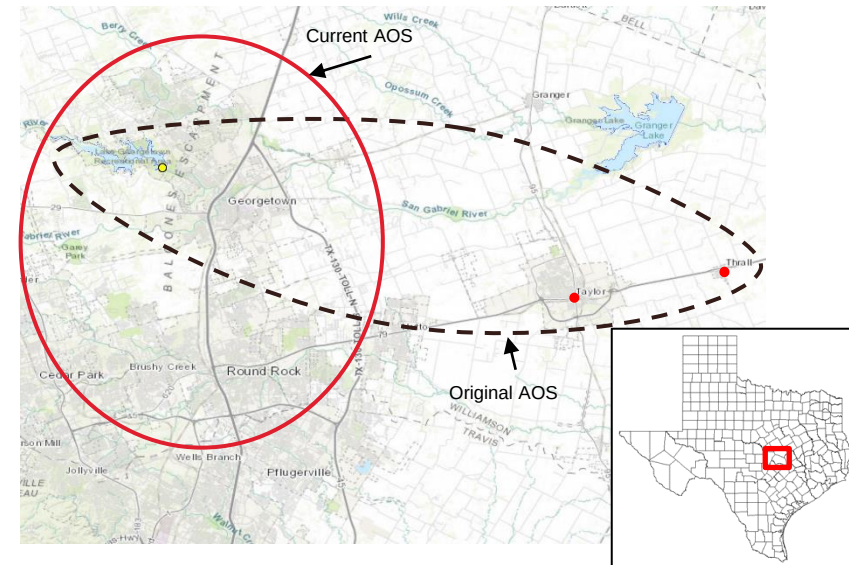
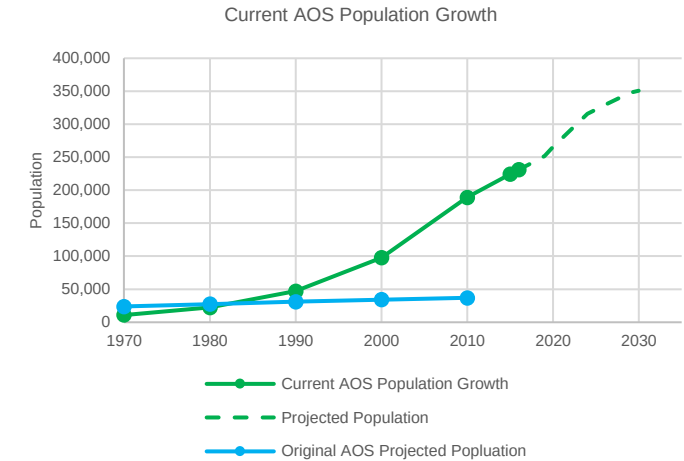
- Federally funded multi-purpose reservoirs, 400+ nationally, 32 statewide
- Nationally 10M ac-ft supplies 85M people, 115 communities
- Statewide WS storage 6.5 M ac-ft contracted, 1/3 TX surface water.
- Navigation, hydropower, environmental and rec.
- Population growth, 1100/day, 30M to 54M 2050
- 1/2 population along I35
- 2nd largest in GDP,
- 3rd largest ag. production
- 32% of refinery capacity
- Significant drought vulnerabilities
- Significant current and future WS deficits
- \$80B projected cost including 23 new reservoirs
- Pumping
- **What about adaptive management?**
- **Flood storage 13.4 M ac-ft**
 - 5% - 20% FIRO



WHY FIRO - WATER SUPPLY CHALLENGES

Population growth is not happening as originally planned

- Many activities
- Little understanding of broader impacts
- Change in reservoir service area and population
- Impacts to all authorized purposes, recreation, cultural and environmental
- Conflicting goals and interests
- Outlet works modifications



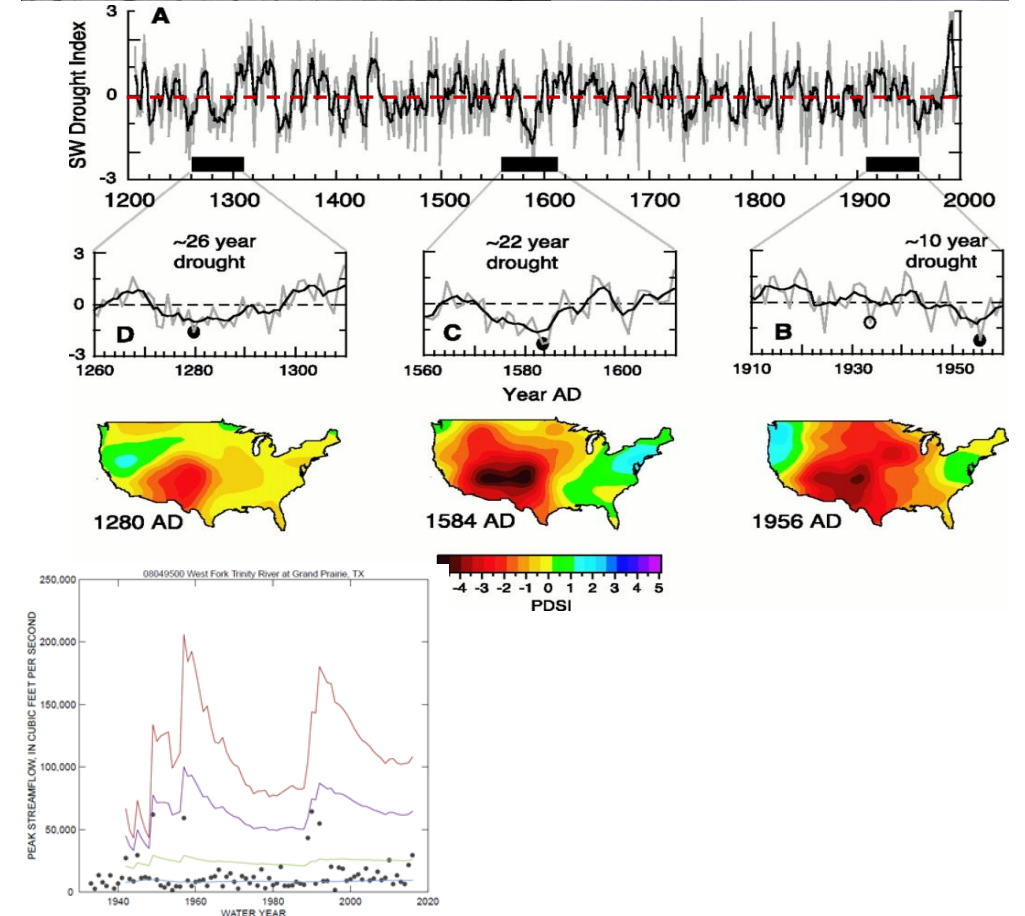
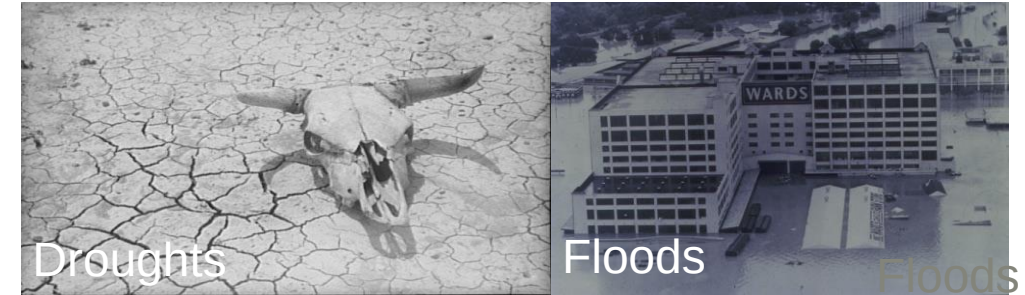


WHY FIRO - CLIMATE VARIABILITY & WATERSHED DEVELOPMENT



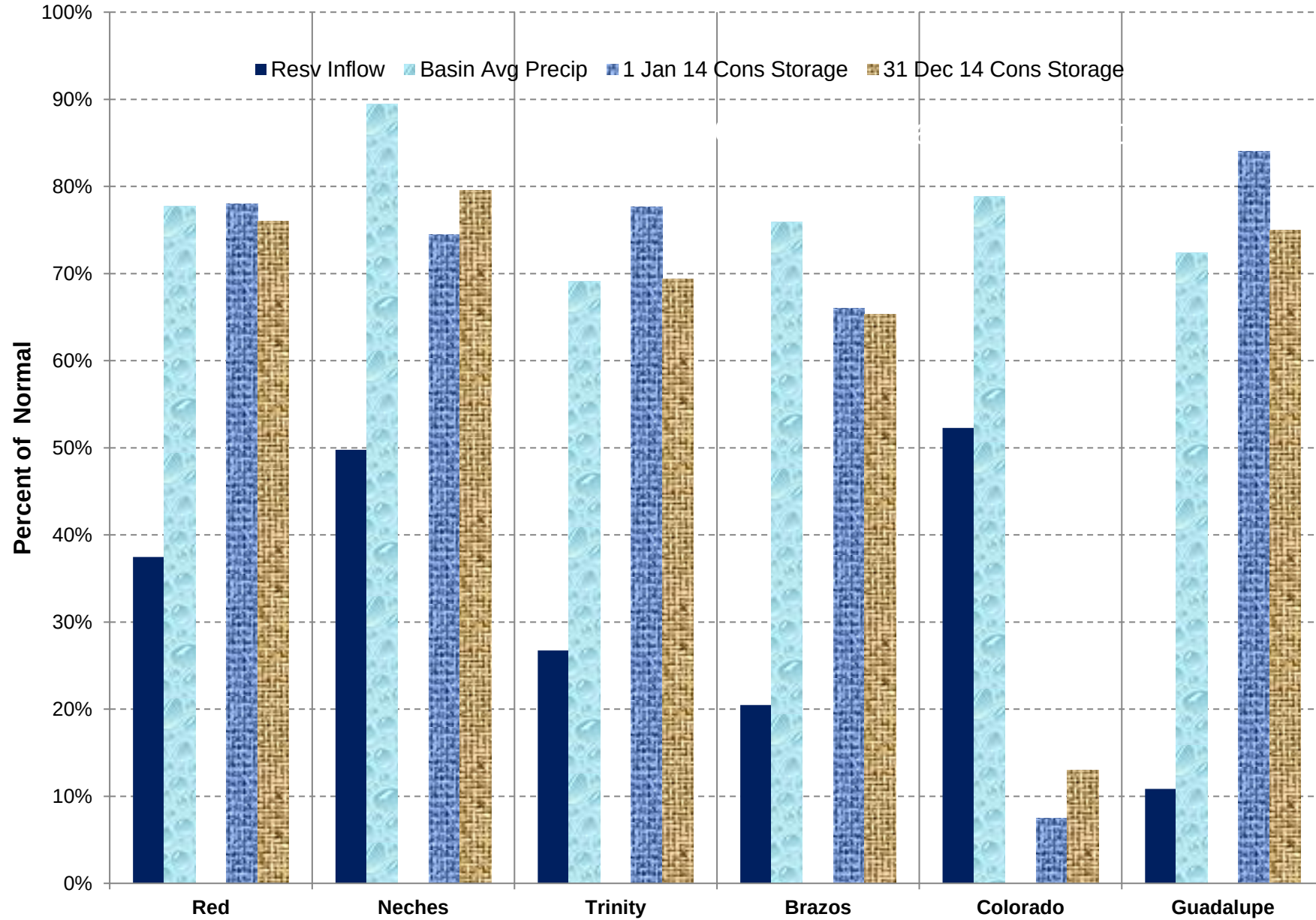
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- Annual rainfall totals in DFW from 20" – 60"
- Paleohydrology indicates more severe droughts have occurred historically
- Flood-flow-frequency analysis using historical data shows significant variability
- Brazos and Colorado River Basins show significant downward trends in runoff





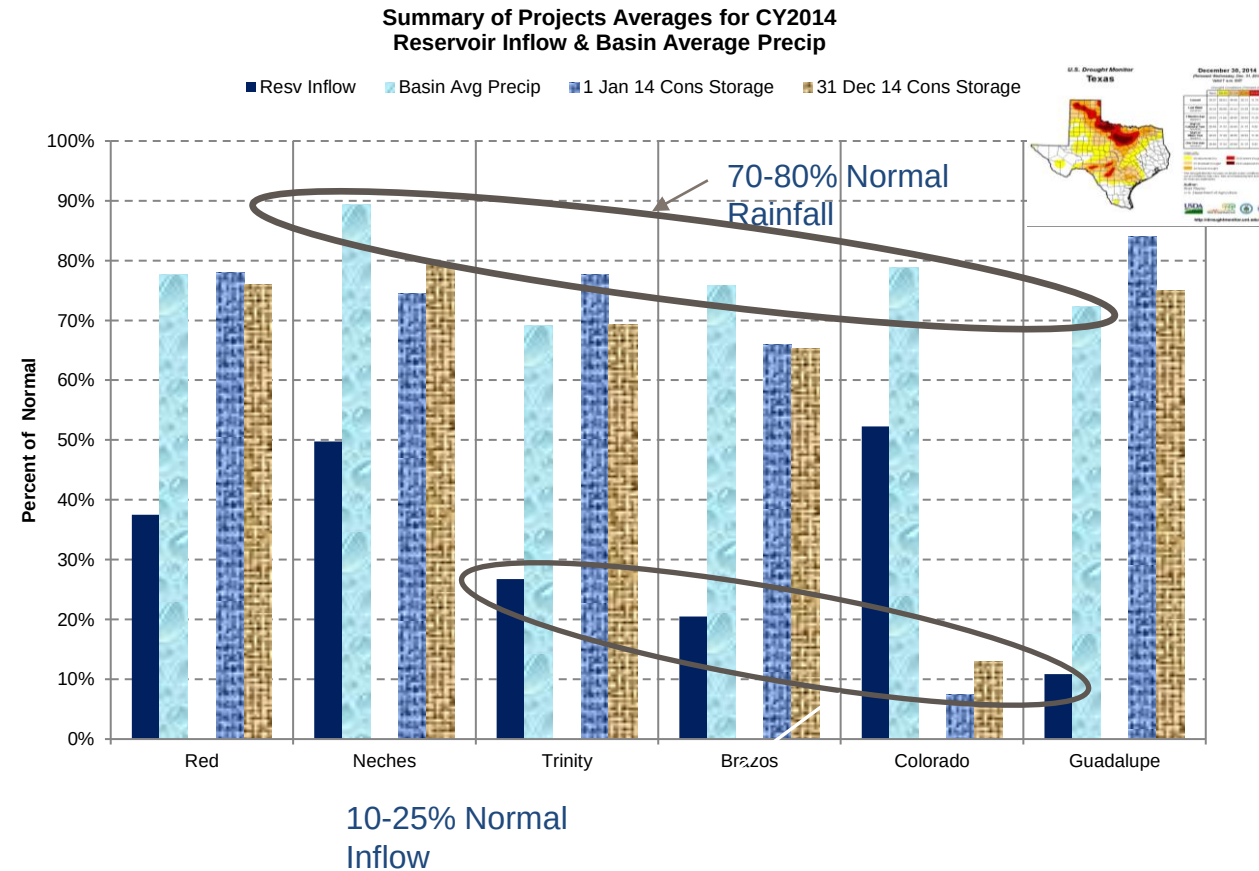
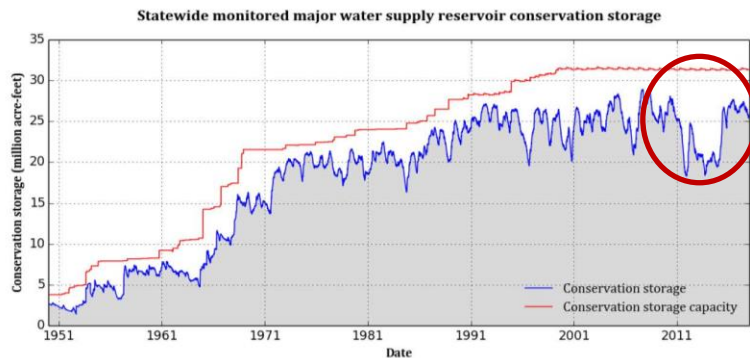
RESERVOIR PERFORMANCE DURING DROUGHT





IMPACTS OF DROUGHT ON WATER AVAILABILITY

- Runoff potential changes rapidly with small changes in precipitation
- Cumulative impacts of drought over time
 - Sequential drought years are greatest threat





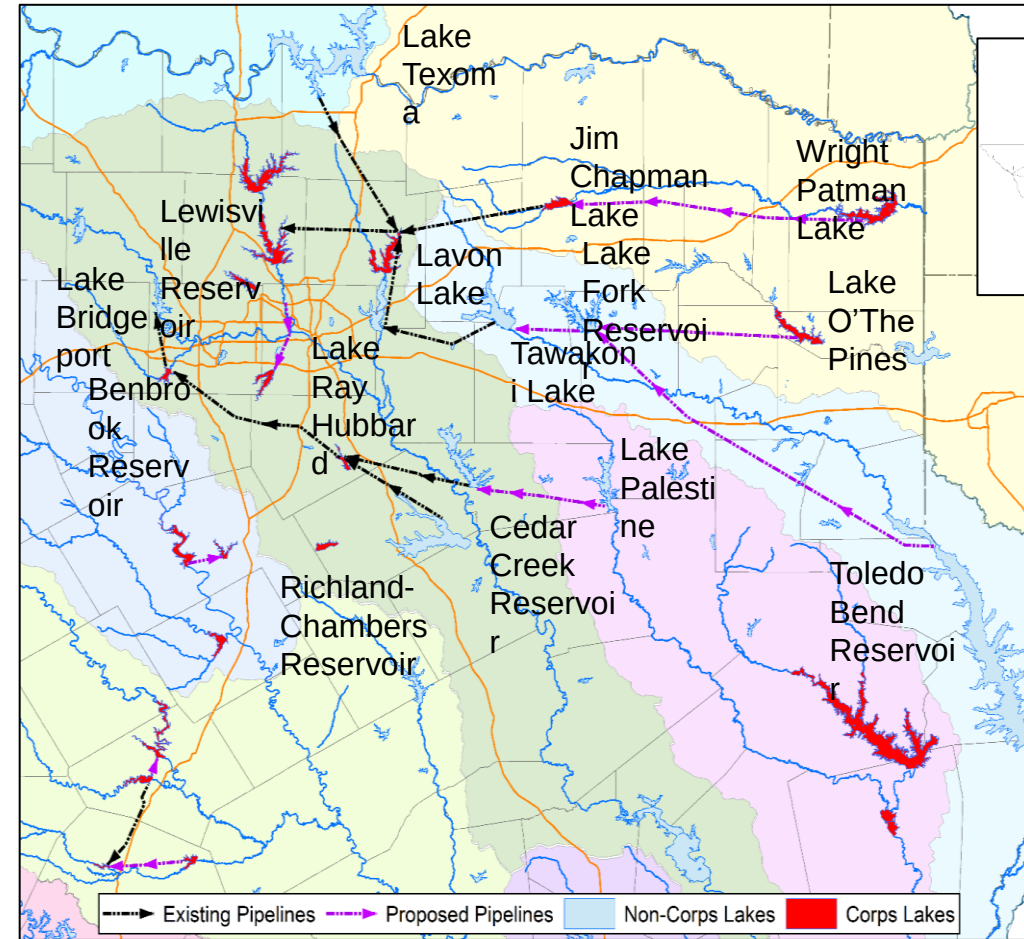
WHY FIRO – FUTURE CHALLENGES EXISTING AND PROPOSED PIPELINES



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Water Supply Community

- ~1500 miles of constructed or planned pipelines
- Transport of water to population centers
- Can be seasonal or shortage driven
- Population will continue to increase
- Conservation will be needed
- Significant impacts on some USACE reservoirs



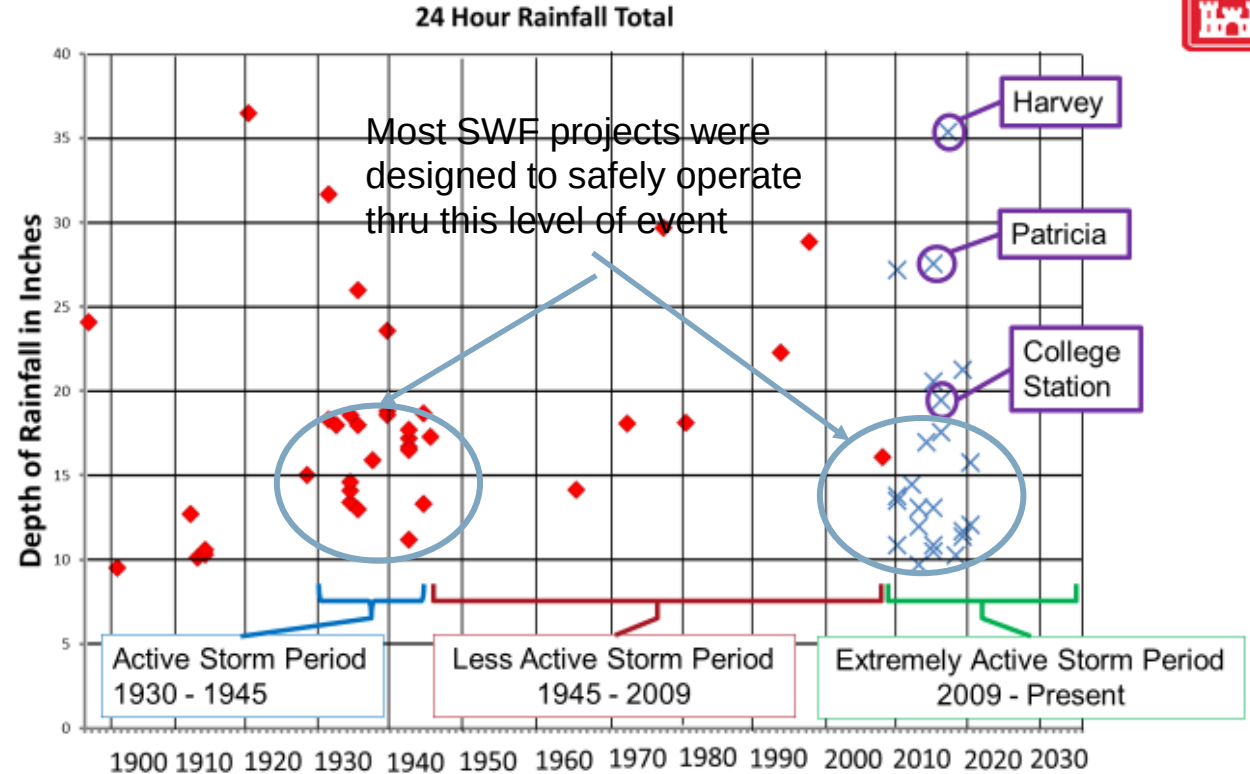


CAN FIRO BE SAFELY IMPLEMENTED - MOST SWF PROJECTS ARE OPERATE SAFELY THRU LARGE STORM EVENTS



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- SWF multipurpose reservoirs designed to operate full range of loading including historical observations
- 100-yr events (10 inches in 24 hours for DFW area) are easily managed
- This capacity may provide operational flexibilities that could be leveraged for FIRO
- FIRO, if implemented properly should not increase the risk of flooding



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USACE - TRINITY OPERATIONS STUDY



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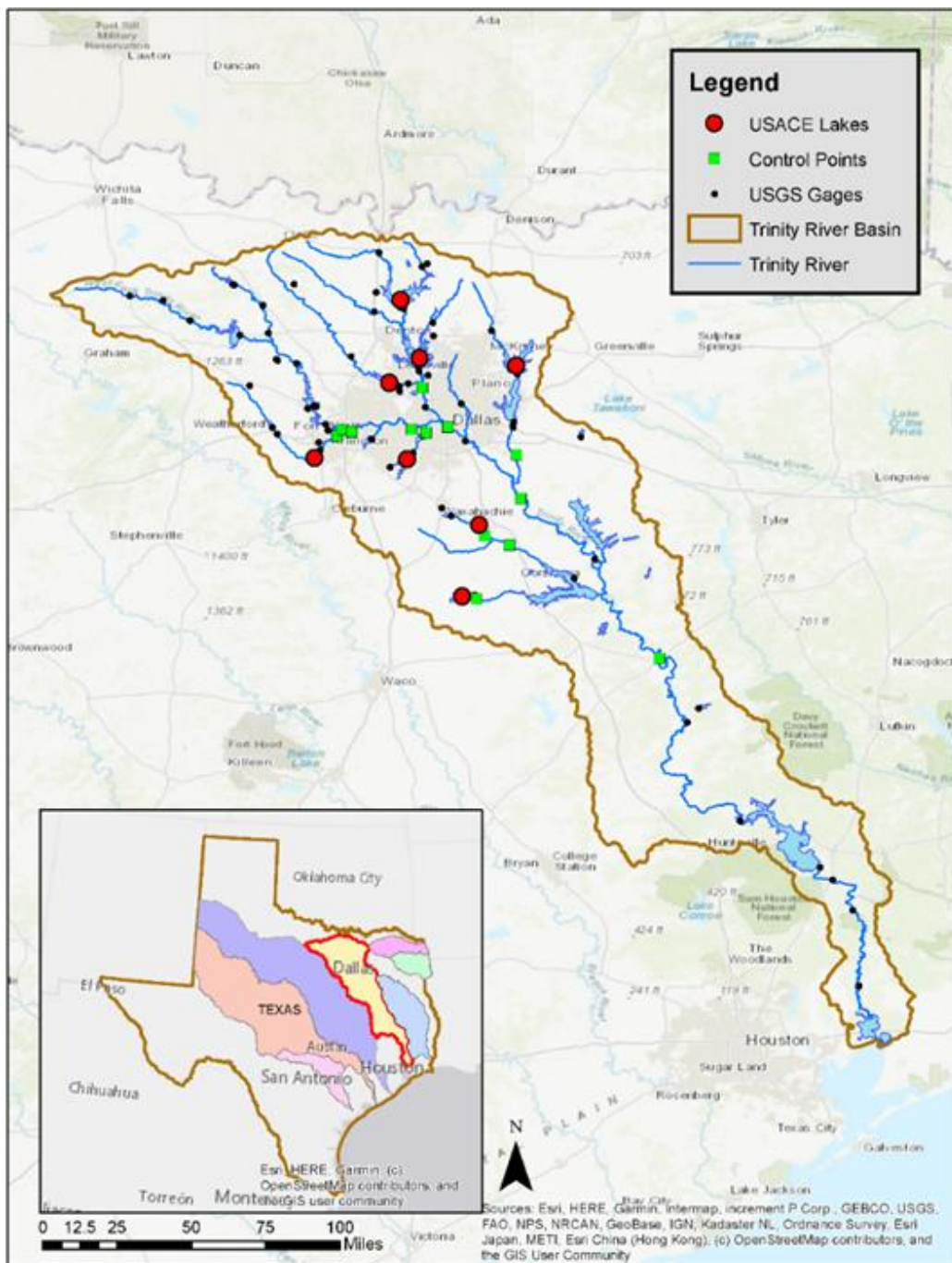
Lead Civil Engineer

USACE – Fort Worth District Water Management Section



- **Fort Worth District Owns and Operates 8 Multi-Purpose Reservoirs in the Trinity Watershed:**

- Benbrook
- Joe Pool
- Ray Roberts
- Lewisville
- Grapevine
- Lavon
- Navarro Mills
- Bardwell





TRINITY OPERATIONS STUDY (TOS)

PURPOSE AND SCOPE

- Ground up approach to identify flexible USACE reservoir operation plans to better serve the reservoir's authorized purposes and stakeholders.
- Several phases including an Outreach Phase, Planning Phase, and Modeling and Analysis Phase(s).
- The goal of the project will be to understand system weaknesses and maximize flood damage reduction, water supply, environmental, and recreational benefits by re-evaluating the Reservoir Operation Plans stated in the Water Control Manuals.



SCHEDULE & BUDGET

• Fall 2023 – Fall 2026

• \$400,000



TOS STAKEHOLDERS AND PARTNERS



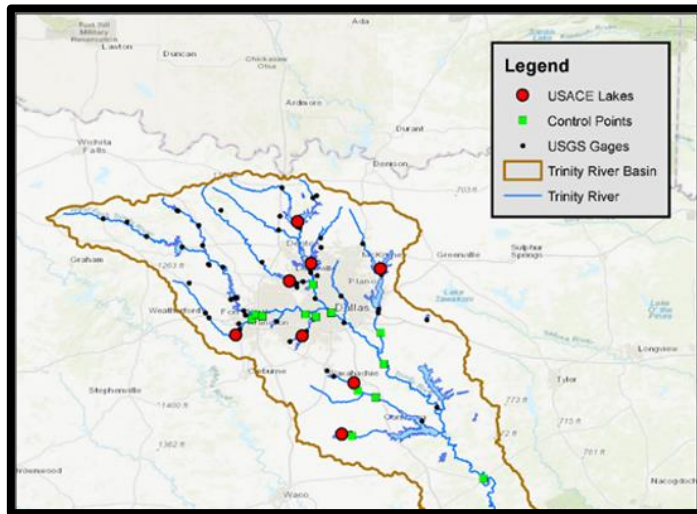
North Central Texas
Council of Governments



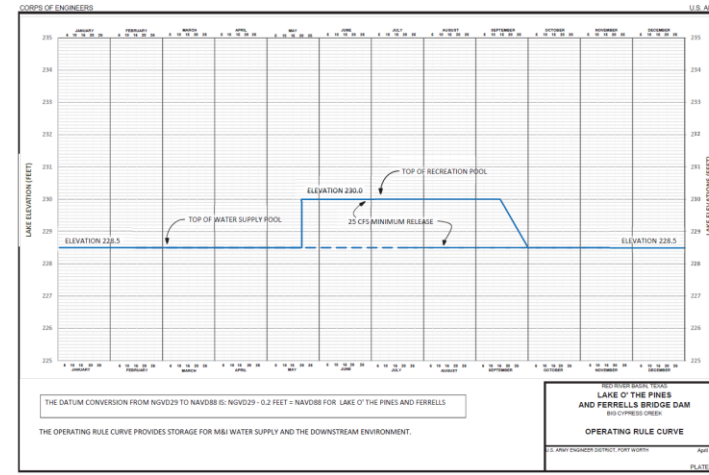
Looking for more!

POTENTIAL STUDY TASKS

Control Point Flow Analysis



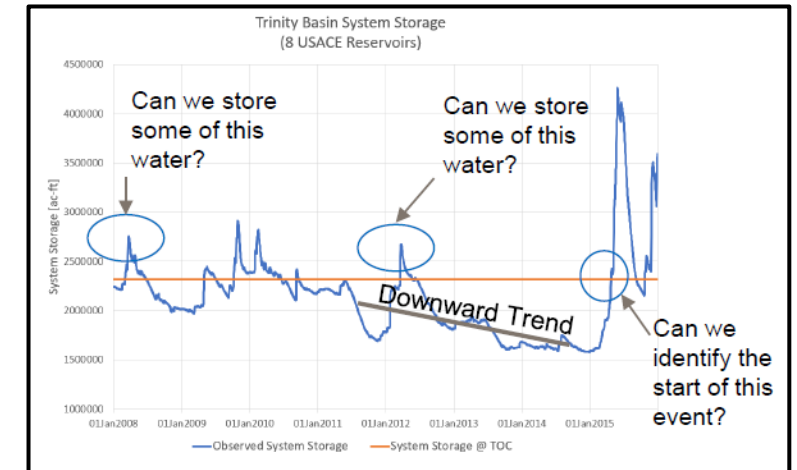
Seasonal Rule Curve Analysis



Environmental and Low flow Analysis



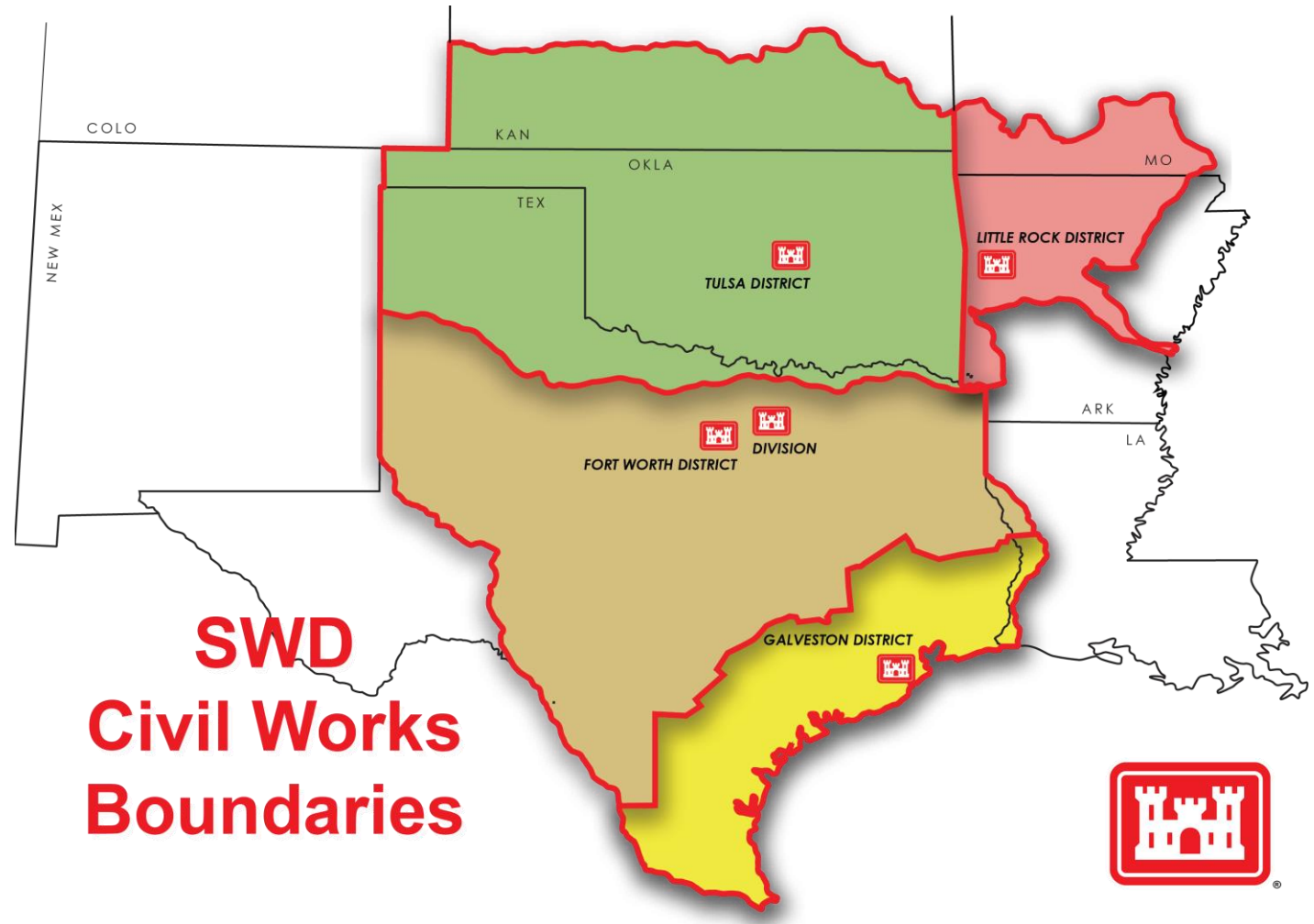
Water Supply Resiliency/FIRO Analysis





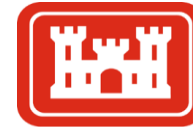
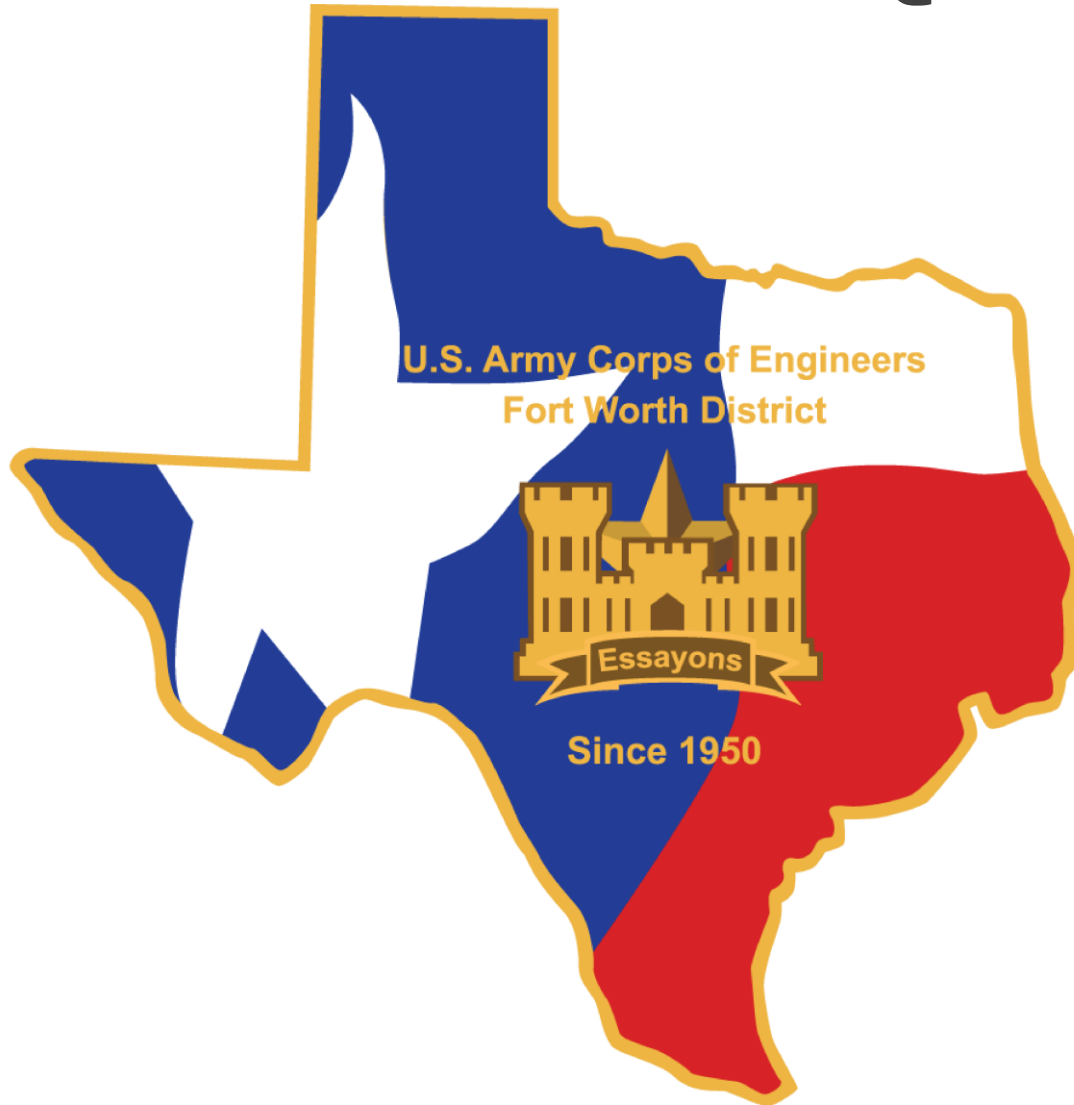
TOS USACE ADVISORY COMMITTEE

- **Jerry Cotter**, Fort Worth District
 - Water Resources Branch Chief
- **Dan Hernandez**, Southwestern Division
 - Water Management
- **Mike Southern**, Southwestern Division
 - Dam Safety Program Manager
- **Brian Phelps**, Fort Worth District
 - Operations Divisions Deputy Chief
- **Anthony Rodino**, Nashville District
 - Water Management Chief
- **Mandy McGuire**, Southwestern Division
 - RPEC Director
- **Brian Harper**, Southwestern Division
 - RPEC Director of Civil Works





QUESTIONS?



**US Army Corps
of Engineers**

Maxwell Strickler, P.H., CFM

Lead Civil Engineer
Water Management Section
(817) 886-1541 TEL

Maxwell.R.Strickler@usace.army.mil

U.S. Army Corps of Engineers
Fort Worth District (SWF)
819 Taylor Street
Fort Worth, TX 76102