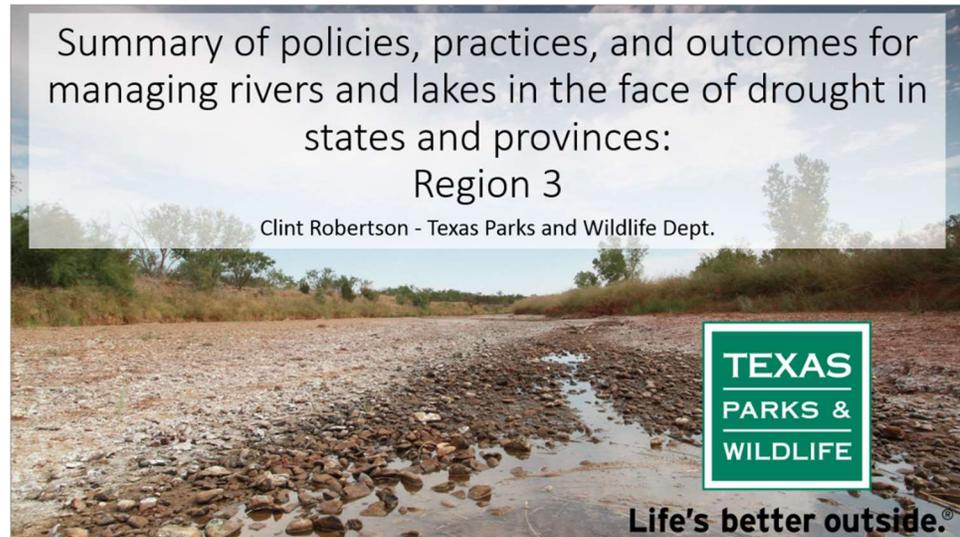
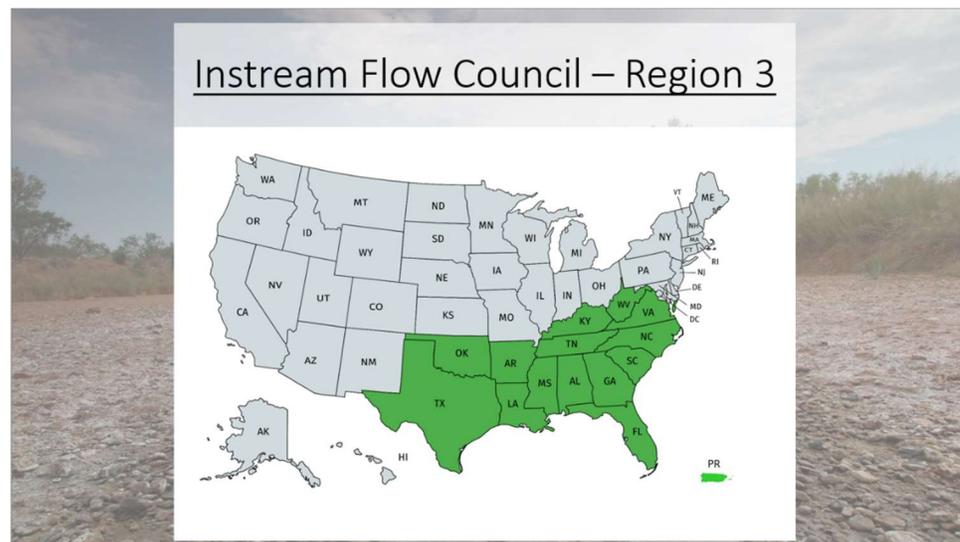


Clint Robertson:

Good afternoon, I'm Clint Robertson. I'm an aquatic biologist in the River Studies Program with Texas Parks and Wildlife Department and want to thank the states in Instream Flow Council (IFC) Region 3 for responding to the information request of what plans, or do they have any plans as they relate to drought in their respective states?



Region 3 is comprised of states in the southwest region and also includes Puerto Rico. I think I got responses from every state except Kentucky, South Carolina, Puerto Rico and Alabama. Because there's so many states in this region we're just going to hit the highlights of every state that responded here today.



Each respondent state was categorized into three very general categories of: 1. states that had either no formal drought plan or coordination, 2. states that had some form of a drought plan but there was no really clear defined coordination with other agencies, and 3. states that actually had formal drought plans and

clearly defined coordination with other agencies. And as you heard this morning, communication and coordination is critical when you're dealing with water situations.

Summary of Drought Planning in IFC Region 3

- Respondent IFC state representatives drought plans placed into three general categories:
 - No formal statewide drought coordination
 - Mississippi
 - Some formal statewide drought coordination
 - Oklahoma, Louisiana, Texas, Arkansas, Virginia, and Tennessee
 - Statewide drought coordination
 - Georgia, Florida, North Carolina, and West Virginia

The only state that I got a response from that actually don't have any formal drought plans would be Mississippi. Although, their water permitting agency does issue permits with minimum flow levels and they coordinate with water users when those minimum flows are being approached and they notify the users that they need to cut back or to stop pumping. So there is some drought contingencies and some drought planning at a very minimal level.

No Formal Statewide Drought Coordination

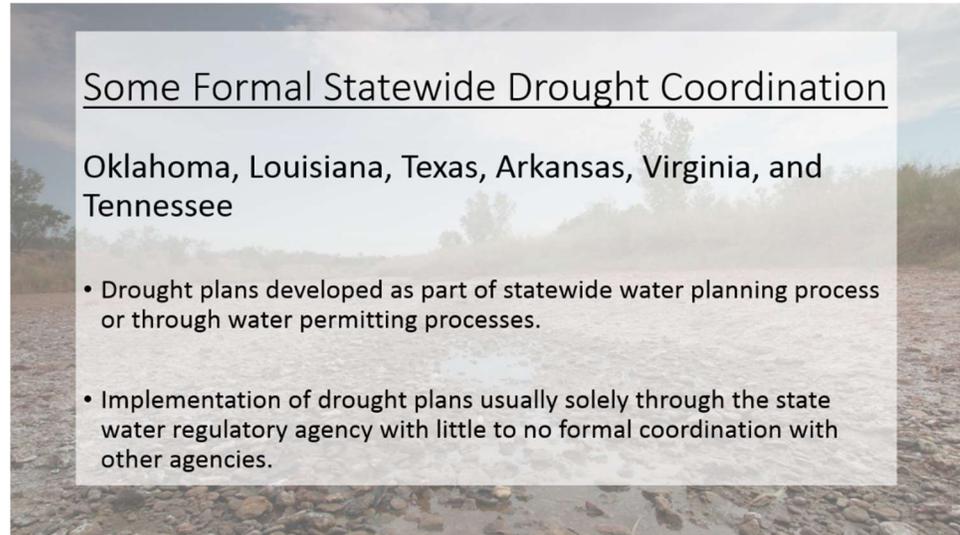
Mississippi

- No formal drought plan.
- Mississippi Department of Environmental Quality (MDEQ) responsible for issuing permits for surface water withdrawals
- Default flow standard is minimum flows set at 7Q10 levels and MDEQ has authority to set minimum lake levels
- MDEQ notifies surface water users to cease withdrawals when flows reach 7Q10 levels



Our next set of states are those with some form of a statewide drought plan. These plans are typically either developed as part of a statewide water planning process or through their state's water permitting process, and implementation

is typically done by the state water regulatory agency with little to no formal coordination with other agencies within the state.

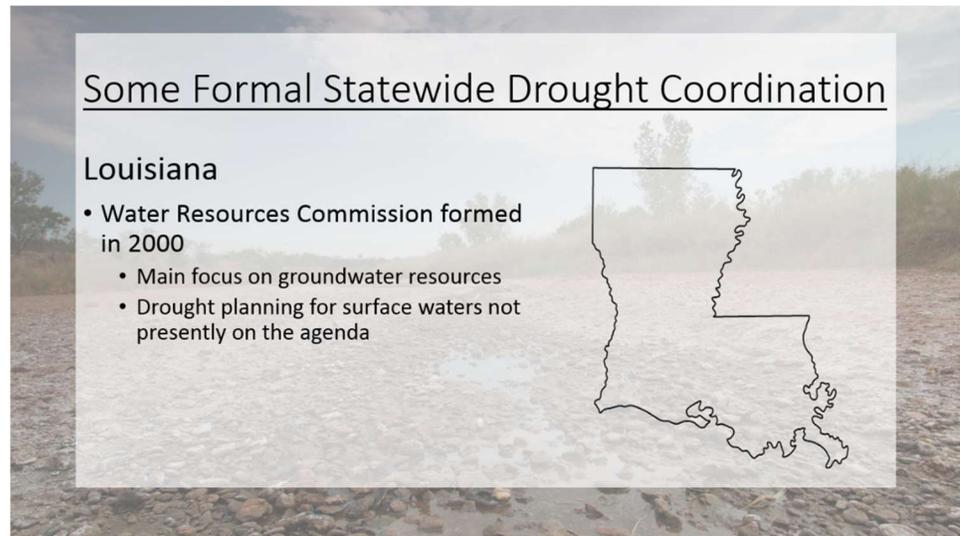


Some Formal Statewide Drought Coordination

Oklahoma, Louisiana, Texas, Arkansas, Virginia, and Tennessee

- Drought plans developed as part of statewide water planning process or through water permitting processes.
- Implementation of drought plans usually solely through the state water regulatory agency with little to no formal coordination with other agencies.

The first state in this group is Louisiana. They have established a Water Resources Commission, although the focus of that commission is groundwater resources and protection and they currently don't have any plans to include surface waters and drought planning for surface waters.



Some Formal Statewide Drought Coordination

Louisiana

- Water Resources Commission formed in 2000
 - Main focus on groundwater resources
 - Drought planning for surface waters not presently on the agenda



Arkansas also has some form of drought planning through their All Hazards Mitigation Plan, but their Natural Resources Commission is currently in the process of developing a drought plan for the state.

Some Formal Statewide Drought Coordination

Arkansas

- Arkansas Department of Emergency Management
 - All Hazards Mitigation Plan included minor amount on drought planning
- Arkansas Natural Resources Commission
 - In the beginning stages of developing drought plan



Oklahoma and Texas are actually two states that have drought planning within their statewide water planning process. I'll talk about Texas drought planning process in more detail towards the end of this presentation since I'm a little more familiar with Texas, but in Oklahoma they do have this drought management team and also provide tools for municipalities to help in their planning for water shortages.

Some Formal Statewide Drought Coordination

Oklahoma and Texas

- Some drought planning through statewide water planning process.

Oklahoma

- Has a state Drought Management Team
- Developed "Tool for Planning Temporary Water Supply Response in Drought Emergencies" to assist in planning for water shortages.



Then we have Virginia and Tennessee. Both of these states department of environmental quality are responsible for the enforcement and development of their drought plans. Interestingly in Virginia, although domestic consumption is prioritized during drought situations, fish and wildlife resources are treated equally as other beneficial uses of water during drought. This was interesting that they actually recognized the importance of providing water for natural resources. Then Tennessee, I'm not a lawyer here, but they apparently need some conflict resolution or better coordination with Georgia. They claim that the current state line boundary between the two states was incorrect because

the surveyors were drunk on Tennessee Whiskey. Now, I wouldn't be surprised if a legal precedent has been set for this in the south already.

Some Formal Statewide Drought Coordination

Virginia and Tennessee -

- State department of environmental quality developed and enforced drought plans.

Virginia

- Domestic consumption prioritized, but fish and wildlife resources equally important as other beneficial uses during droughts

Tennessee

- Georgia proposes redrawing Tennessee state line to gain access to the Tennessee River claiming the current boundary was drawn by surveyors overcome by Tennessee whiskey.

These last groups of states actually had provided well defined drought management plans and actually specified coordination with other state agencies or federal agencies or NGOs and stakeholders.

Statewide Drought Coordination

Georgia, Florida, North Carolina, and West Virginia

- Well defined drought management plans developed with specified coordination with other state/federal agencies.

So for Georgia, their DNR is responsible for the implementation and coordination with the other agencies. They also have the ability to convene a Drought Response Committee with these various stakeholder groups if necessary, so it seems that they have pretty good coordination.

Statewide Drought Coordination

Georgia

- Georgia Department of Natural Resources responsible for implementing state drought management plan with coordination with other state and federal agencies to implement portions of the plan as appropriate.
- Drought Response Committee may be convened and is comprised of state/federal agencies, NGOs, business and agriculture representatives



Similarly, in Florida, their Department of Environmental Protection is the one that administers their multi-agency developed drought plan and coordinate with the water management districts throughout the state.

Statewide Drought Coordination

Florida

- Mult-agency development of the Florida Drought Action Plan administered by the Florida DEP to provide guidance to the Water Management Districts across the state.
- Protection of natural resources included the plan.



Similar to Virginia, in West Virginia protection is afforded to natural resources which is specified within their drought plan. Within their drought plans, similar to what Michael talked about earlier, they also listed at least two categories of drought, agricultural and hydrologic.

Statewide Drought Coordination

West Virginia

- Statewide multi-agency drought plan administered by the West Virginia Office of Emergency Services
 - Two drought categories:
 1. Agricultural Drought – moisture deficiency seriously injurious to crops, livestock, or other agricultural commodities.
 2. Hydrological Drought – reductions in streamflow and in lake and reservoir levels, depletion of soil moisture, lowering of ground water table, decrease in ground water discharge to streams and lakes.



The last state that I'll talk about before talking about Texas is North Carolina. So in addition to their statewide Drought Management Council, several river basins within the state also have these Drought Management Advisory Groups. It was interesting to know that these groups originated from FERC relicensing processes. Seems to be pretty good coordination with multiple agencies in those situations.

Statewide Drought Coordination

North Carolina

- Statewide Drought Management Advisory Council
- Several river basins with drought management advisory groups (DMAGs)
 - Composed of representatives from state and federal agencies, local governments, and other water users.
 - DMAGs typically originate as outcomes of the FERC hydropower relicensings.



Now I can get a little bit more critical because I'm from Texas and can talk about what our drought planning process is like in my state. As I mentioned before, we do have a statewide water planning process that's actually implemented at the regional level. A component of all the regional water plans is the inclusion of drought contingency plans. These drought plans are triggered or implemented based on some trigger level, either reservoir storage or spring flow or aquifer level.

Texas Drought Planning

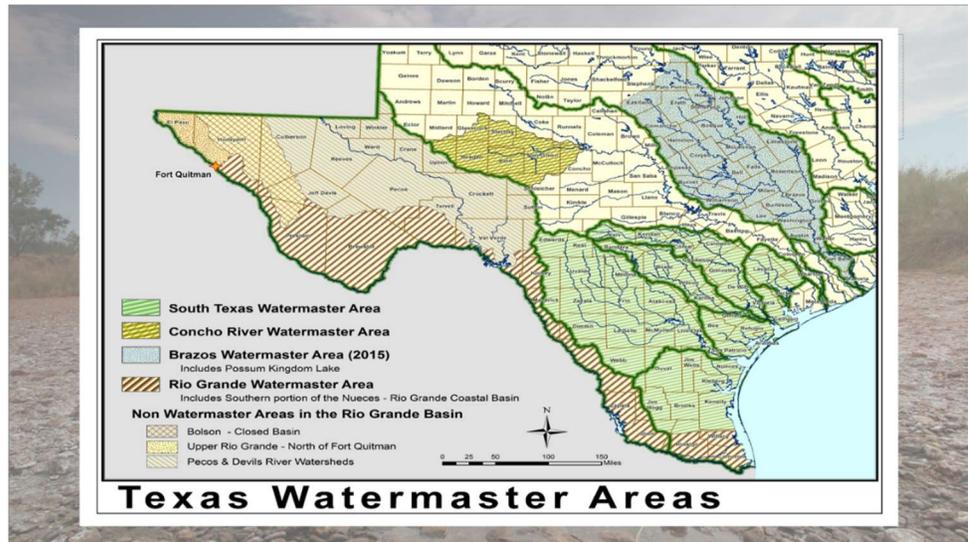
- Legislation requires water suppliers to create and implement “drought contingency plans” to ensure critical water needs are met during a dry period, minimizing the economic, social, and environmental impacts of droughts.
- Plans are an essential part of the state’s water planning process and updated every five years.
 - Water planning is done at the regional level in Texas
- Most plans are based on trigger levels (e.g. reservoir storage level, aquifer level, or spring flow) that municipalities or water suppliers must take steps to cut back on demand.

Our water regulatory agency, the Texas Commission on Environmental Quality (TCEQ) is the one that helps coordinate those drought contingency plans, and what was news to me was that we actually did have a Drought Preparedness Council that was established in 1999, but last month was the first time I ever heard about it while I was preparing this talk here. That can give you a clue of how much they do or coordinate in the state.

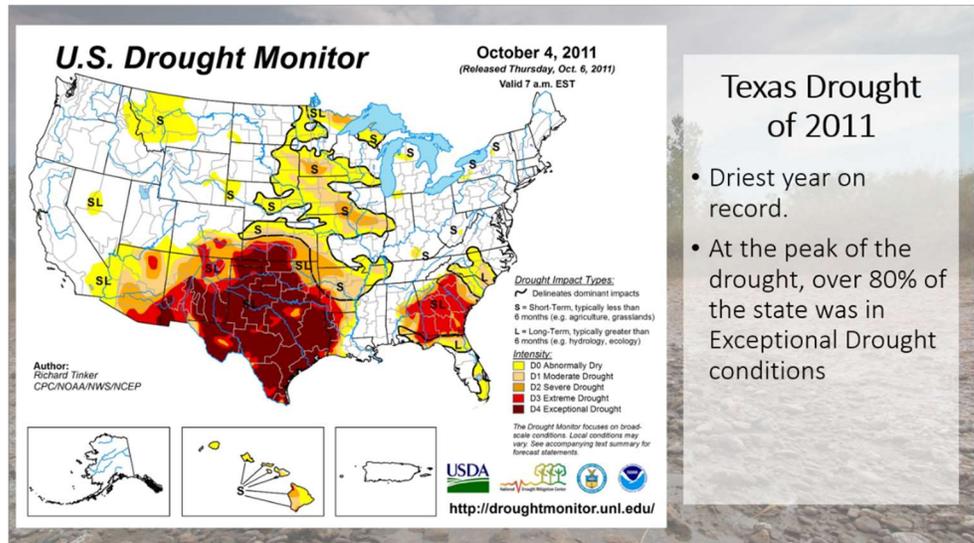
Texas Drought Response

- Drought Preparedness Council established in 1999
 - Drought Monitoring and Response Committee
 - Texas Division of Emergency Management is the state drought manager and responsible for managing and coordinating drought response component of the state water plan.
- Texas Commission of Environmental Quality
 - Coordinates with water suppliers on implementation of drought contingency plans
 - Oversees Texas Watermaster Program

An interesting program that I think that is beneficial in a drought situation in our state would be this Texas Water Master Program that is administered by the TCEQ. Basically, instead of water rights users being contacted from the headquarters in Austin, which may be removed from situations in other parts of the state, there's actually local people on the ground that are checking for compliance and enforcing water rights and potentially drought plans within their basins. As you can see, these are the only basins with water masters in our state right now. In the future, this could be a good approach for planning and dealing with drought in the future.



Speaking of drought, 2011 as you can see, was our worst, driest year on record for the state and this drought actually showed a lot of the shortcomings in a lot of these drought contingency plans that these planning groups had developed. Some cities were waiting until they were pretty much out of water before implementing some stricter conservation measures. So there's a lot of work to be done within our state when it comes to drought.



Texas Drought of 2011

- Driest year on record.
- At the peak of the drought, over 80% of the state was in Exceptional Drought conditions

Just in agricultural losses alone, approached almost eight billion dollars in that one year. That's not even including recreational or even the fact that it was a major fire year within our state as well so that's lots of impacts.

Texas Drought of 2011

- Drought Impacts:

AGRICULTURAL LOSSES 2011

\$7.62
BILLION

CATTLE SECTOR LOSSES 2011

\$3.23
BILLION

COTTON PRODUCTION LOSSES 2011

\$2.2
BILLION

I just quickly want to highlight another drought response that our agency had in Texas. The Double Mountain Fork of the Brazos River is located almost near the panhandle in Texas and is pretty much the last stronghold for these two minnow species that are endemic to the Brazos River. In 2011, during the height of the drought, the river ceased to flow and it was essentially just isolated pools which probably led to them being listed as endangered by the U.S. Fish and Wildlife Service in 2014.

Double Mountain Fork of the Brazos River

- Home to two endemic minnows
- Ceased flowing during the drought of 2011
- Listed as endangered by the U.S. Fish and Wildlife Service in 2014



Smalleye Shiner *Notropis buccula*



Sharpnose Shiner *Notropis oxyrhynchus*

We did a coordinated salvage and refuge operation, not part of a formal drought plan but a necessary action. We went out, and this was the last stronghold for these species, and if all these pools dried out these two species would be gone from the earth forever. So we coordinated with Texas Tech University and went out and collected several thousand individuals throughout the river to take back to one of our state hatcheries as a refuge population until flows returned to the river.



This again highlights the lack of coordination within our state, even within our agency, and the need to develop some tools to identify and prioritize areas where species of greatest conservation need are at high risk during droughts. Coordinated plans for these salvage efforts and identifying the priority of aquatic resources not only for fish but for mussels as well is critically important so that we can have a better response to impacts associated with future droughts as it relates to aquatic resources. Thank you.

