



What Would Elvis Say?

Mississippi v. Memphis

and the

Curious Case of the Memphis Sand Aquifer

**Tanner Conference on *Water, Conflict, and
Human Rights: Emerging Challenges & Solutions***

23-25 February 2011 University of Utah

Michael E. Campana

**Professor of Hydrogeology and
Water Resources Management**

Oregon State University, Corvallis, OR, USA

President, American Water Resources Association

<http://www.awra.org>

President and Founder, Ann Campana Judge Foundation

<http://www.acjfoundation.org>



Presentation Outline

- **Definitions**
- **Memphis Background**
- **Memphis Sand**
- **The Issues**
- **The Lawsuit**
- **The Appeal**
- **The Supreme Court**
- **Observations**
- **Implications for Groundwater Management**
- **References**

Definitions

- **Expert:** “Someone who travels more than 1 000 km (600 miles) to a meeting and uses multi-colored presentations.”
-- Source unknown (1970s)
- **Expert:** “Someone who *blogs and/or tweets on a topic.” – Source unknown (early 2000s)
- **What This Means:** By **any definition**, I am an **expert** on the Memphis Sand aquifer.
* **shameless plugs** for WaterWired blog (aquadoc.typepad.com/waterwired) and Twitter (twitter.com/waterwired)





Memphis Background - 1

- **Memphis, Tennessee, on the Mississippi River, is a major southern USA city (population c. 700,000)**
- **Memphis metropolitan area encompasses surrounding Shelby County and parts of other counties in Tennessee, Arkansas, and Mississippi (c. 1.3M people)**
- **Has world's largest (in tonnage, as of 2009) cargo airport (MEM); FedEx headquarters and its major hub.**
- **Great musical heritage: Jazz; Blues; Rock and Roll; Rhythm & Blues; Country & Western. Elvis Presley!**

Location of Memphis and Shelby County, Tennessee





Memphis Background - 2

- **City-owned utility, Memphis Light, Gas, and Water (MLGW) provides water to about 1.1M people. Started pumping groundwater c. 1924.**
- **MLGW pumps high-quality groundwater, primarily from Memphis Sand and Fort Pillow Sand aquifers.**
- **Daily pumpage: 160 – 200 million gallons per day (MGD).**
- **Cameron (2009) claims Memphis is the largest city in the world relying solely on groundwater.**

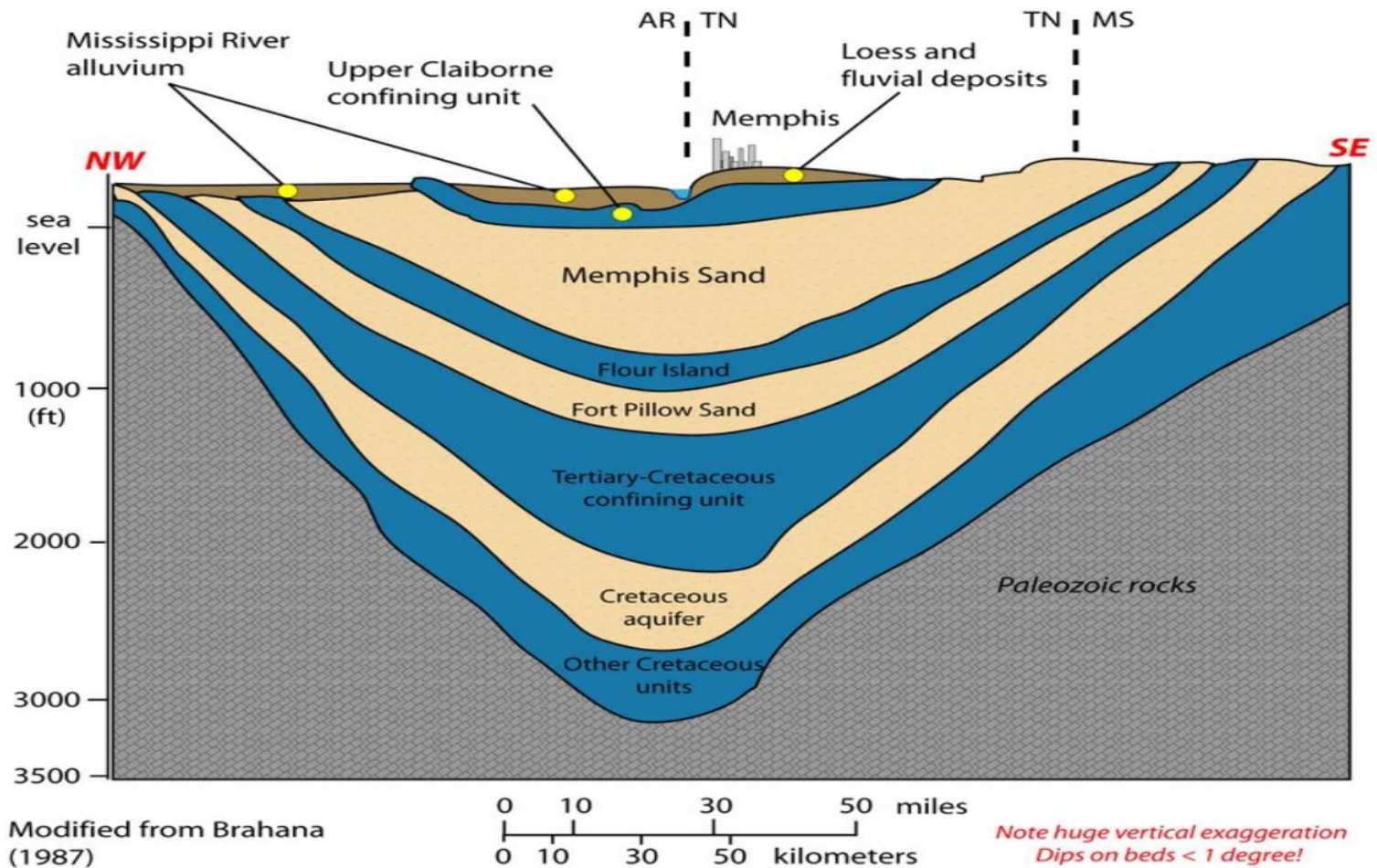
Memphis Sand

- Underlies 10 000 mi² of AR, TN, MS, KY; up to 900 feet thick
- Very coarse sand with interbedded lenses of clay and silt
- Good water storage & transmissive properties
- High quality, low total dissolved solids (TDS) water (19 – 333 mg/L)
- Recharged via precipitation (average annual precipitation ~ 55 inches) on outcrop belt in western TN, and downward percolation of water from overlying units



NW-SE Hydrostratigraphic Cross Section beneath Memphis, Tennessee (TN) and Adjacent States of Arkansas (AR) and Mississippi (MS)

(note vertical exaggeration – strata dip more like 1%)



[Courtesy of the Department of Geosciences, Mississippi State University, Starkville, MS; modified from Brahana et al. (1987)]

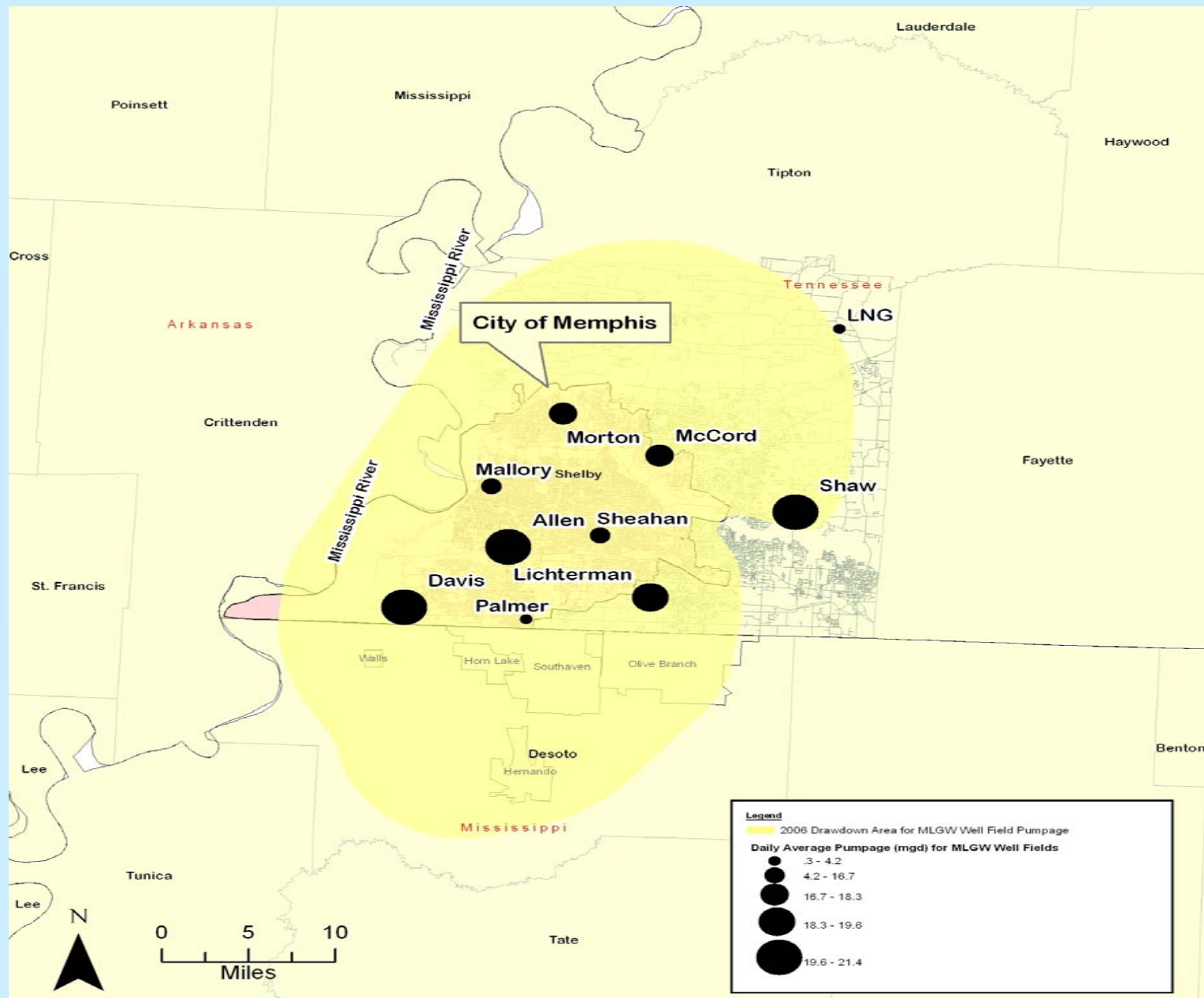
The Issues

- **MLGW pumping from 10 well fields (as of 2009) has caused pumping effects to expand into Mississippi**
- **Mississippi claims that MLGW is 'stealing' its groundwater: currently ~24 MGD and 365 billion gallons since 1965**
- **Mississippi lists Memphis as its biggest user of its groundwater!**



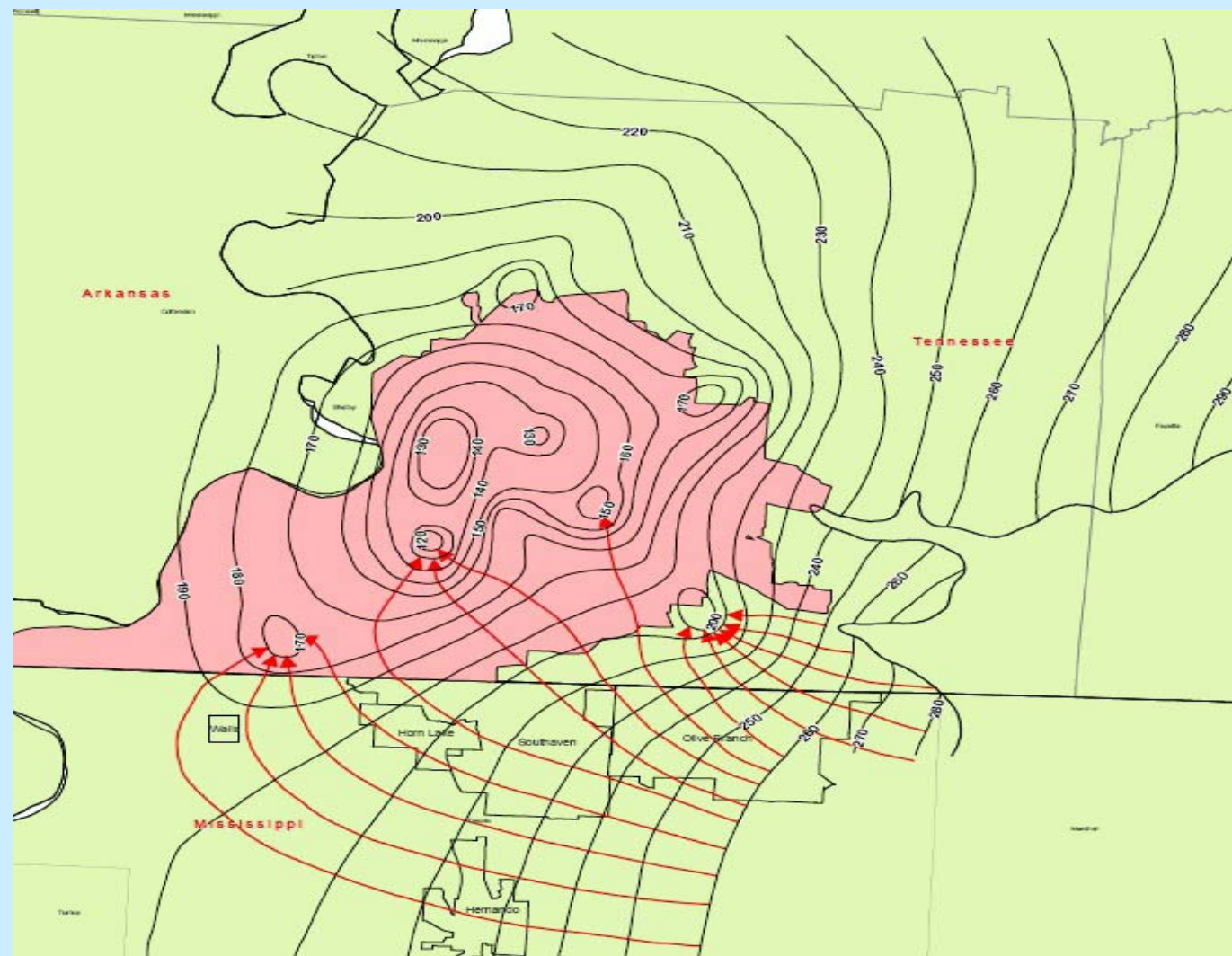
MLGW Well Fields

(Cameron 2009)



Memphis Sand Aquifer Flow Net showing Groundwater Movement from Mississippi to MLGW Well Fields

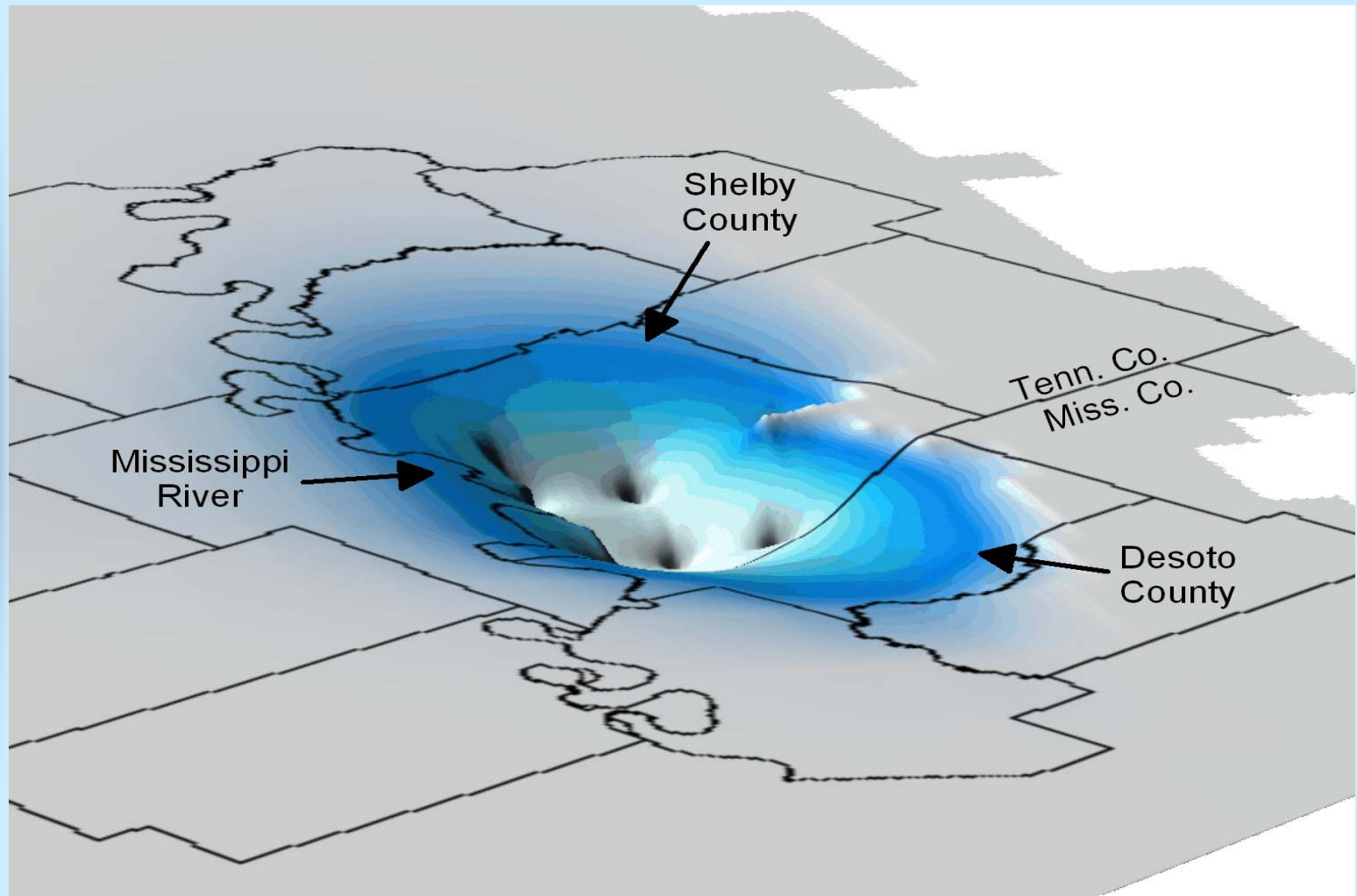
Note: Natural Flow is Generally East to West



[Cameron 2009]



Three-Dimensional Representation of the Cones of Depression Created by MLGW's Memphis Sand Aquifer Pumping



[Cameron 2009]

The Lawsuit

- In February 2005 Mississippi filed suit against the City of Memphis and MLGW, seeking over \$1B in damages for diversion of water belonging to MS.
- Suit was filed in U.S. District Court, Northern District of Mississippi, and went to trial in February 2008.
- Judge Glen H. Davidson said that TN was a “necessary and indispensable party” in the case and must be brought in as a defendant.
- Judge Davidson dismissed the case, saying that his court did not have jurisdiction since the case involved two states, MS and TN, and such cases must be heard by the U.S. Supreme Court.



The Appeal - 1

- **Mississippi chose to appeal Judge Davidson's decision to the Fifth Circuit Court of Appeals in New Orleans.**
- **Court upheld lower court's ruling, saying that Tennessee must be brought into the case as its exclusion would be enormously prejudicial to "Tennessee's sovereign interests in its water rights."**
- **Circuit Court also noted that since the aquifer is an interstate resource, its water must be formally allocated among the states before one state could sue another for "invading its share."**



The Appeal - 2

- **The Fifth Circuit Court also said the aquifer is *"indistinguishable from a lake bordered by multiple states or from a river bordering several states depending on it for water."***
- **The Court continued: *"The aquifer must be allocated like other interstate water resources in which different states have competing sovereign interests."***
- **Mississippi contended that the groundwater had been allocated to it when it became a state in 1817.**
- **Mississippi chose to take the case to the U.S. Supreme Court.**



The U.S. Supreme Court

The Supreme Court declined to hear the case, denying the motion *without prejudice*; Mississippi could refile the case at a later date if it believed it could prove damages.

Nelson (2010) reported:

“The Supreme Court today rejected two legal actions by Mississippi, ending for now the state's quest to stop Memphis, Tenn., from using aquifer water that Mississippi claims as its own.”

“Today, in *Mississippi v. Memphis*, the Supreme Court refused to examine Mississippi's appeal of a lower court ruling that only the Supreme Court could consider the dispute. The justices also denied Mississippi's motion to file a complaint in a separate case, titled 139 Original, which would have brought the merits of the dispute before the Supreme Court.”



Observations - 1

- Prior to the 2005 lawsuit, the states of TN, MS, and AR were in discussions about developing a plan to manage the aquifer. MS withdrew from the discussions right before it filed suit.
- Lawsuit seemed more appropriate to the arid Western USA, not to an area that receives about 55 inches of precipitation annually. Shape of things to come?
- Does the 'public trust' doctrine apply to groundwater? Mississippi invoked it, claiming it was protecting groundwater for its citizens (Cameron 2009; Baxtresser 2010).



Observations - 2

- Institutional asymmetry is interesting: state v. city in a dispute over water resources. Are new approaches for resolution of such disputes needed?
- Should we establish regional interstate agencies to manage transboundary groundwater? USA has such agencies for river basins.
- Harder to prove groundwater is being diverted (compared to surface water)
- Does MLGW have right to pump so much groundwater? (Feldman and Elmendorf 2000)



Implications for Groundwater Management

- Groundwater ownership versus use
- Resolution of transboundary groundwater disputes that do not involve state versus state
- Value of groundwater and possible groundwater marketing
- Public trust doctrine as applied to groundwater
- Need for compacts/institutions designed specifically for transboundary groundwater



More Implications for USA Groundwater Management

Eckstein (2009) commented:

“Ground water resources, for too many years, have been treated as the ***neglected stepchild of water law***. This is especially true in a transboundary context but also in the domestic laws of many nations, including the US. The adage ‘out of sight, out of mind’ comes to mind.”

Cameron (2009, p. 14) added:

“At the opening of the twenty-first century, ***hydrogeology and law are still not wholly integrated***. However, lawyers and jurists have increasingly developed knowledge of hydrogeology and are drawing on that knowledge in litigation, in the administrative processes and in drafting of statutory enactments. Undoubtedly, the intertwined relationship between law and hydrogeology, that has had a long-established history, will become even more intimate in the future.”

Perhaps *Mississippi v. Memphis* will provide the impetus for transboundary aquifer riparians to develop joint management plans and avoid litigation.



References

Baxtresser, D., 2010. *Antiques Roadshow: The Common Law and the Coming Age of Groundwater Marketing*. Michigan Law Review 108: 773-794.

Brahana, J.V., W.S. Parks, and M.W. Gaydos, 1987. *Quality of Water from Freshwater Aquifers and Principal Well Fields in the Memphis Area, Tennessee*. U.S. Geological Survey Water Resources Investigations Report 87-4052, 22p.

Cameron, Alan B., 2009. *Mississippi v. Memphis: A Study in Transboundary Ground Water Dispute Resolution*. Sea Grant Law and Policy Journal Symposium. Oxford, MS, 48p.
http://nsglc.olemiss.edu/SGLPJ/Presentations_09/cameron.pdf

Eckstein, Gabriel, 2009. International Water Law Project blog. <http://www.internationalwaterlaw.org/blog/?p=150>

Feldman, David L. and Julia O. Elmendorf, 2000. *Water Supply Challenges Facing Tennessee: Case Study Analyses and the Need for Long-term Planning*. Knoxville, Tennessee: Energy, Environment and Resources Center, U. of Tennessee-Knoxville
http://eerc.ra.utk.edu/divisions/wrrc/water_supply/Report.PDF

Nelson, Gabriel, 2010. "Supreme Court rejects Miss. suit over Memphis aquifer use." E&E News PM (25 January 2010)



***Mississippi and Memphis Representatives
Discuss Water Allocation Without Their Lawyers***

(courtesy: www.duckboy.com)

Email: aquadoc@oregonstate.edu

Thank You!

