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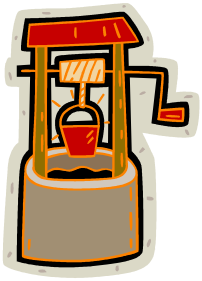
Louisiana Public Square

H₂Woe: Louisiana's Water Worries



Louisiana is a state with an abundance of water. Approximately 17.5% of its territorial area is covered by water. Below ground are 11 aquifer systems, the source of drinking water for more than half of its residents and nourishment for two-thirds of the state's agricultural demand. Lakes and bayous dot the landscape while the Mississippi River, the tenth largest in the world, ends its journey at our coast.

Beginning in 1682 when La Salle claimed all of the territory drained by the Mississippi River as "Louisiana," water has played a central role in the state's history and growth. It is a habitat for fisheries and wildlife and a source of recreation for humans. It is critical to Louisiana industries, many which located here due to the abundance and quality of this resource.

Rarely has the state had to worry about not having enough water. Concerns have usually focused on keeping communities dry and citizens safe. But regional and interstate water needs are growing.

Each day over 8.5 billion gallons are withdrawn from Louisiana's surface and groundwater supplies. Industrial and agricultural activity, drought and saltwater intrusion threaten aquifer levels and water quality. Deteriorating supply, treatment and distribution systems may not meet future demands. What can be done to combat Louisiana's looming water problems? Who owns and controls the state's water supply? How do corporate and governmental policies affect one of Louisiana's most precious resources?

WHO USES IT

- Louisiana ranks first among all of the states in uses of water for industrial purposes - about 2,680 million gallons per day, or about 17 percent of the U.S. total.
- Nearly half of the state's drinking water is from groundwater:
  - 12% of residents get from domestic wells
  - 88% of residents get from public system
    - 49% comes from aquifers
    - 51% from surface water sources

Louisiana Total Water Withdrawals by Use Category, 2010
(USGS, 2011)

Power Generation (4,429 Mgal/d)	52 %
Industry (2,076 Mgal/d)	24 %
Irrigation (928 Mgal/d)	11 %
Public Supply (746Mgal/d)	9 %
Aquaculture (303 Mgal/d)	4 %
Rural Domestic and Livestock (49 Mgal/d)	1 %

- The Louisiana 2012 Infrastructure Report Card gave the state a D+ for *Drinking Water* based on capacity, condition and funding.
- A 2007 Needs Survey found 11 of Louisiana's 89 public water systems were unable to meet the demands of its customers on a regular basis.
- Not only is a reliable supply of fresh water important for consumers, fisheries, and even recreation, it's also critically important to the long-term success of *Louisiana's Master Plan for Coastal Restoration and Protection.*

HOW IT'S CONTROLLED

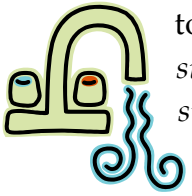
- *"Currently in Louisiana there are at least four federal agencies, eight state agencies, two groundwater conservation districts and more than 700 local entities…with management or regulatory authority over the resource." (SOURCE: 2012 La Groundwater Commission Report)*
- *"Clearly, if Louisiana intends to continue to attract new business and industry to every region of our state, comprehensive water management is required to ensure that this commodity of the 21st century is sustained for all public and private water users." (SOURCE: A Defining Resource: Louisiana's Place in the Emerging Water Economy)*
- Movement towards a more comprehensive mgt. plan has occurred over the last decade
    - Following a severe drought impacting ground and surface water supplies, in 2001 the Legislature created the Louisiana Ground Water Resources Commission (LGWRC) and Ground Water Mgt Advisory Task Force (LGWMATF).
    - In 2003 the Legislature placed the LGWRC and LGWMATF under the Office of Conservation in the Louisiana Department of Natural Resources (DNR), essentially giving it authority to manage groundwater sustainability statewide.
    - In 2009, duties given to the Dept. of Transportation and Development over water well drillers licensing, construction and registration requirements in 1972, was transferred to the Office of Conservation.
    - In 2012 the Legislature added fact finding duties with regard to surface water to the LGWRC and their name was changed to the Water Resources Commission.

MONITORING

"Within the last ten years there's been a lot of movement toward making sure that our water resources are managed in a proper way." Jim Devitt with DNR recently told LPB, *"This is dependent upon getting enough information to accurately do that. That right now is a big need."*

- Peak monitoring of groundwater and surface water was in the early 1980's with 739 groundwater and 184 gauging stations. Due to budget cuts, by the mid-80's those numbers had dropped to 164 and 59 respectively.
- On July 1st DNR and U.S. Geological Survey (USGS) entered into a three-year, $2.7 million partnership to upgrade the state's groundwater monitoring. The "Enhanced Groundwater Monitoring and Resource Assessment" program will use federal funds to add approximately 200 monitoring sites around the state.

WHO OWNS IT?



Jim Wilkins with the Louisiana Sea Grant Law Program recently told LPB, "*There's this artificial fiction in the law that there are separate resources but the surface water recharges the ground water and the ground water will ultimately come to the surface; so it's all part of the same system. The reason we have a distinction is for legal purposes. In an ideal world we would manage it as a whole.*"

In "A Defining Resource: Louisiana's Place in the Emerging Water Economy", authors Mark Davis and Jim Wilkins write, *"Louisiana water law, like that of most water-rich states, is more of a hodgepodge than a systematic approach to ordering and managing water resources. It has been shaped more by the abundance of our waters than by any experience with scarcity."*

In its March 2012 report to the legislature, the Louisiana Ground Water Resource Commission notes that conflicting legal concepts about the state's water have created a paradox that results in *"the state charging for surface water resources that are normally in abundance, while allowing uncompensated withdrawal of groundwater resources that are often in limited supply."*

GROUNDWATER: Devitt with DNR says that when it comes to groundwater, typically Louisiana law has recognized the *absolute ownership theory*. *"This was a traditional theory that a landowner owns everything on his property up to heaven and down to hell,"* Devitt recently told LPB, *"and so that would include groundwater, oil and gas and anything else that's there."* But by 1963 the Louisiana courts recognized this was not an adequate way to deal with ownership of groundwater so they adopted *the rule of capture theory* for water. This theory had been recognized for oil and gas in the 30's and basically means that whatever water the landowner can get to the surface, he owns. *"Groundwater is available for the taking,"* Wilkins recently told LPB, *"Any landowner can drill a well and suck out basically as much as they want."*

SURFACE WATER Since 1808, the *riparian rights theory* in Louisiana's Civil Code has been recognized for surface water. Under this theory, the landowner whose property is adjacent to a water body has rights to the use of that water. At one time, this use was restricted to purposes such as cooking, drinking, and providing water for cattle. Commercial uses were forbidden and the "natural flow" of the stream (its fundamental quality and quantity) could not be reduced. Davis and Wilkins point out that *"Unsurprisingly, the 'natural flow' doctrine was incompatible with the industrialization and the growth of our state. Something had to change, and it was riparianism that changed, ushering in the development of the doctrine of reasonable use."*

The *reasonable use doctrine* allowed for traditional domestic uses and other, largely commercial, uses to the extent they were deemed "reasonable." Davis and Wilkins note, *"The reality that the determination of what is reasonable comes only after the fact … was enough to allow for the commercial exploitation of flowing streams and the flowering of American industry and commerce."* This has been the approach that Louisiana courts have taken in determining who could use surface waters and for what purposes, until the enactment of the Surface Water Management Act in 2010.

HAYNESVILLE SHALE SPAWNS NEW WATER LAW Hydraulic fracturing, or fracking, uses the high-pressure injection of water, sand, and chemicals to remove natural gas from rocks deep in the earth's surface.

In 2008, at the onset of natural gas exploration of the Haynesville Shale formation in Northwest Louisiana, operators were relying primarily on local groundwater resources to supply water for drilling and fracking since most of the gas fields are not on riparian land – that is land adjacent to surface water.

Large volumes of water were withdrawn from three aquifers including the Carrizo-Wilcox, the main source of drinking water in lower Caddo and Bossier Parishes and DeSoto Parish.

The average hydraulic fracking job in Louisiana uses five millions of gallons of water.

In response to complaints from well owners that their wells were running dry, the Commissioner of Conservation in DNR issued a Water Use Advisory in 2008. Haynesville Shale operators were advised to seek frack water supply alternatives to groundwater from water sources such as the Toledo Bend Reservoir or the Red River.

According to Gary Snellgrove, with DNR's Environmental Division, the response was significant. While drillers were using 100% groundwater in 2008, Snellgrove says, "W*hat we see now is approximately 77 percent of water used for frack supply is coming from surface water resources."*

ACT 955 AND PAYING FOR SURFACE WATER As oil and gas exploration companies in northwest Louisiana began substituting their use of groundwater with surface water, the Louisiana Attorney General got involved. In 2010 he issued a series of opinions that held that the surface waters of the state are "public things" and can't be given away because the Louisiana constitution prohibits the donation of things of value.

The 2010 Legislature followed up by enacting Act 955, or the Surface Water Management Act (SWMA). The act created a process whereby users who want to withdraw surface water can have their request evaluated by the state. If the usage is approved, the state and the company then enter into a cooperative agreement that may or may not have recommended limitations on the withdrawal and use.

The SWMA allows the agreements to put a price on water withdrawn on a per gallon basis but it also allows industry to show some other form of compensation to the state. Devitt says this includes demonstrating an economic benefit such as jobs and taxes. The program is voluntary yet Devitt say it's received a lot of response especially from the oil and gas sector.

FOR FRACKING: LOCAL REGS ARE PRE-EMPTED

In 1990, prompted by concerns about contamination from fracking, the city of Shreveport adopted an ordinance banning drilling within 1,000 feet of Cross Lake, the city's main water source. An energy company holding state-granted mineral leases under and around the lake sought a waiver, was denied and filed suit.

The district court upheld the local law, but the U.S. 5th Circuit Court of Appeals reversed.

The Louisiana Supreme Court also has described the authority of the Louisiana Office of Conservation as near-absolute, and the State Attorney General likewise has found local regulations to be preempted.

TEXAS WANTS OUR WATER *"As Louisiana plans for water management beyond 2012…the path Louisiana chooses will have far-reaching implications. If large-scale uses of surface water are allowable—even encouraged—for one purpose, it may be impossible to restrict it for others, such inter-basin or interstate freshwater diversions."* (SOURCE: *A Defining Resource: Louisiana's Place in the Emerging Water Economy*)

What Wilkins and Davis point out is not an academic point. Texas, for example, has had plans since at least the 1960s to divert up to 1.5 million acre-feet of the Mississippi River per year to augment its fresh water supplies. And just last year, Texas interests made a preliminary agreement to buy Toledo Bend Water.

In 2011 the Sabine River Authority (SRA) entered into a deal to sell water from Toledo Bend Reservoir to Texas. After objections among residents, farmers, coastal activists and the Governor's Office, the SRA put the issue on hold. The proposal would have sold Texas 660 thousand acre feet of water for 99 years and yielded nearly $55 million dollars a year for the SRA.

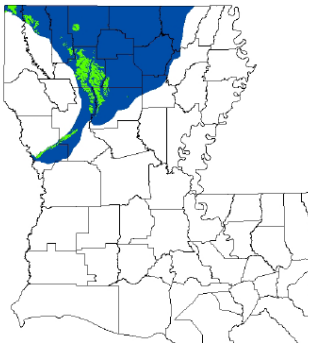
SB 436, co-authored by Sen. Gerald Long, R-Winnfield, and passed in the 2012 legislative session says such actions by the SRA in the future will need the Governor's signature and approval from House and Senate Natural Resources Committees and other local entities.

Wilkins says, *"…wherever there are a lot of people that have a compelling need for water such as Houston, there are going to be arguments that people use to justify why they should have some of the water that passes through this state."*

KEY AREAS OF CONCERN

The Louisiana Ground Water Resource Commission identified several major issues facing the resource in its 2012 report. Below are some of the primary ones around the state. Refer to the report online to see the entire list.

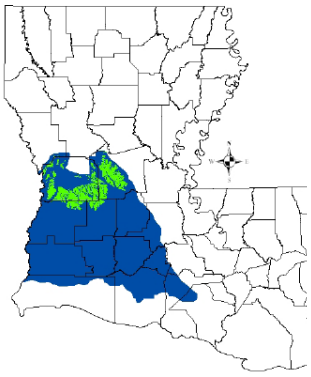
- **NORTH CENTRAL LA: *Sparta Aquifer***



The Sparta Aquifer provides groundwater for 16 parishes in north central Louisiana. In 1999 after facing decline the Legislature created the Sparta Groundwater Resource District to oversee the aquifer.

- Withdrawals from the Sparta Aquifer are 18 million gallons a day (18Mgd) more than the aquifer's recharge rate
- One industrial user, *Louisiana Graphic Packaging* in West Monroe, draws 10Mgd to support its cardboard manufacturing process.
- Using federal stimulus money, modifications were made to the West Monroe wastewater facility that will allow it to direct 10 Mgd of treated wastewater to *Louisiana Graphic Packaging*, thereby replacing the amount the company would have drawn from the Sparta Aquifer. An environmental benefit is that city wastewater is now directed to manufacturing instead of to the Ouachita River.

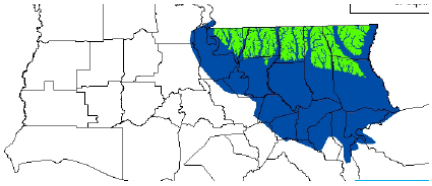
- **SOUTHWEST LA: *Chicot Aquifer***



- The Chicot Aquifer is the only fresh water source for 15 parishes and is the largest provider of groundwater in the state.
- Levels have declined as much as 50 feet or more in Calcasieu, Jefferson Davis, and Acadia Parishes since major industrial pumping began.
- The USGS says that the *"withdrawals are creating conditions favorable to saltwater encroachment"* – in other words, contamination of the fresh water with salt water.
- New activity by AGL Resources will use billions of gallons to leach out salt dome caverns in Jefferson Island. Environmentalists claim AGL's plan could pull arsenic into the aquifer.

- SB 532 would have required an environmental impact statement prior to authorization of certain uses over 2 Mgd. The bill's sponsor, Sen. Fred Mills, R – New Iberia, notes that "*The bill that I sponsored very much targeted water that would be used from the aquifer that would not be replenished in the aquifer in a natural way."* Mills recently told LPB, *"That's what separates this project from so many industrial or agricultural projects is that it's water taken out in great volumes and it doesn't go back into the system naturally."*
- SB532 did not pass. Mills says industry representatives, including those from the oil and gas sector testified that it was an unwarranted and additional regulatory burden.

- **SOUTHEST LA (Capital Area) *Southern Hills Aquifer***



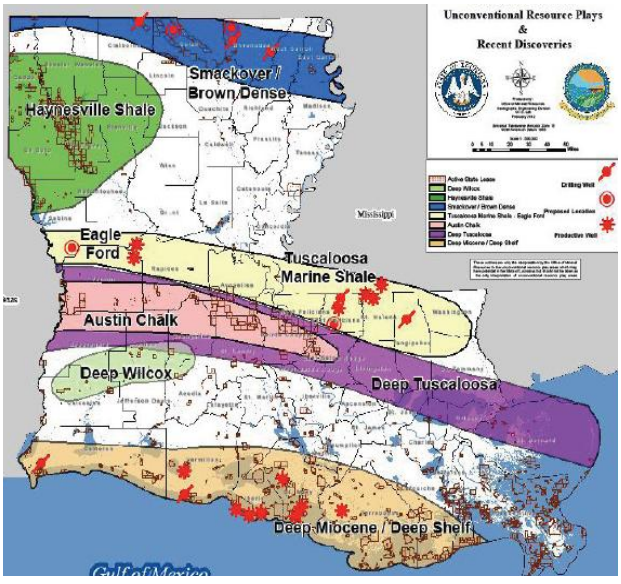
  - The USGS noted in the 1970's that large withdrawals of groundwater from the Southern Hills aquifer had caused groundwater flow patterns to change such that saltwater was encroaching into freshwater areas.
  - In 1974 the state passed legislation creating the *Capital Area Ground Water Conservation District* with permitting and funding authority over five parishes centered on East Baton Rouge.
  - In early 2012, a proclamation from Baton Rouge's City-Parish Council urged immediate action from the Commissioner of Conservation. This prompted an April public hearing.
  - Hays Town, Jr. a civil engineer and founder of *Baton Rouge Citizens to Save our Water*, spoke at the hearing. Town says demands to the aquifer are split 50/50 between industry and public use: "*Each of them uses about 80 million gallons a day,"* Town says, *"Right now, industry-wise, Georgia Pacific is using 40 million gallons of freshwater a day; Exxon Refinery is using 22 million gallons of fresh drinking water a day."*
  - The Baton Rouge Water Company has purchased property along the Mississippi River in case it has to switch sources. *"Then the people will pay 3 times as much for water that's one-third as good."* Hays says, *"It doesn't make sense that we ruin this water."*

At the public hearing a Louisiana Chemical Association rep said the encroachment is due to the water company's wells drilled too close to the source of the saltwater.

The USGS will be creating a model to simulate past, current and possible future conditions of the aquifer for release in October. The Commissioner of Conservation will use the model to determine what future actions to take. Town says, *"They've been studying it for 50 years; but they want to wait for this 4 year study to finish …I don't know that we'll ever get out of this situation."*

Gary Snellgrove with DNR says," "*The Commissioner of Conservation and the agency is committed to addressing this issue in the long term."*

EMERGING ENERGY EXPLORATION TECHNOLOGIES



Over the last several years, Louisiana has witnessed an increase in the use of new technologies to access oil and natural gas deposits once thought impossible to recover. The LGWRC report notes that, as fracking has demonstrated, "*the unlocking of these so-called 'unconventional resources' requires water, and lots of it."*

According to the report, potential areas of concern in the future include exploration in these formations in 3 regions of the state:

- Northeast La: "Smackover/ Brown Dense"
- Northwest La: "Haynesville Shale"
- Central La: "Tuscaloosa Marine Shale"

To protect what it perceives as water quality concerns, the Tangipahoa Parish Council recently tried to pass permitting regulations for oil and gas exploration of the Tuscaloosa Marine Shale in its region. The Oil and Gas Association opposed the initial legislation since some of its requirements were in conflict with state regulations. It is more supportive of a recent proposal which will require any company drilling in the parish to register the well with the parish permit office and pay a fee of $750 per well. Violators are fined $250/day.

FRACKING SAFETY CONTROVERSY

Despite a February 2012 study by the Energy Institute at the University of Texas at Austin that found no direct link between fracking and water contamination, several states according to the Robert Wood Johnson Foundation have either banned or restricted the practice of hydraulic fracturing. The EPA will release its own study on fracking in late 2012.

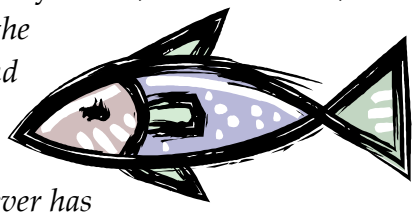
As the LGWRC report says, "*As the energy industry focuses more on the opportunities represented by these unconventional resources, and consequently requires more water, it is important that Louisiana likewise remains focused on water issues to avoid injuring one resource to take advantage of another. It is critical that we ensure the appropriate balance of theThree E's-Energy, Environment, and Economy.*"

WATER QUALITY

Louisiana's Department of Environmental Quality (DEQ) is tasked with enforcing the federal Clean Water Act and protecting groundwater and surface water resources from contamination.

Major metropolitan areas in the state such as Shreveport and New Orleans, get their drinking water from surface water sources, Cross Lake and the Mississippi River respectively. DEQ acts as the *"first line of defense"* against water pollution when it issues authorizations and permits for the release of wastewaters into the surface waters of the state.

When recently asked by LPB how Louisiana's water quality ranks, Chris Piehler, administrator of DEQ's inspection division said, *"Even though the state's waters are better now than they have been in over 50 years, and still improving, I'd have to rate them as 'still needs improvement'. There are issues within state waters in localized areas that we must continue to contain, quality of waters, but overall it is better than it ever has been."*



AREAS OF IMPROVEMENT The two primary pollution issues, Piehler says are mercury and dissolved oyxgens – from things such as fertilizers and organic materials. Piehler points out that aging treatment infrastructure may also prevent adequate treatment of the state's wastewater. The 2012 Infrastructure Report Card gave Louisiana wastewater treatment a "C-".

MERCURY Mercury can enter water through landfills which contain waste with mercury. It also is in the atmosphere and can come down in rain. Coal-fired power plants are Louisiana's top source of mercury emissions. DEQ notes that because of mercury's long range transport in the atmosphere some sources of mercury to our environment are beyond local control.

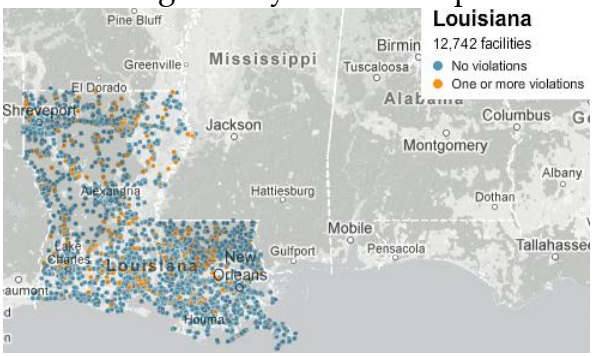
The 2007 Mercury Risk Reduction Act gave DEQ the authority to address mercury in products before they become waste. Piehler says prior to the Act, every year one ton of mercury ended up in the state's landfills.

The most significant risk of exposure to mercury by humans is from the consumption of fish. The Louisiana Mercury Program was formalized with intensive fish tissue sampling in 1993. Since then, advisories have been created where site specific data warrants. Currently DEQ has 49 advisories covering 100 different bodies of water.

DISSOLVED OXYGENS Piehler says through modeling and sampling it's known that a lot of nitrogen and phosphorus in our waters is coming from states upstream. These are the materials that ultimately make it to the Gulf and contribute to the so-called "Dead Zone" where algae blooms sap oxygen from the area. DEQ is working with upstream partners as well as overseeing a statewide nutrient reduction strategy to address the situation.

In addition, Piehler says, we can all do our part. *"A lot of people have a fear of chemicals and chemical conditions and certainly when we have an abundance of chemical plants here in Louisiana, it's something very obvious. But the truth is when it comes to water quality in the state; humanity is really its own worst enemy."* Piehler says we all contribute to what's known as *nonpoint source pollution, "Every time we fertilize our yard; every time we take our pets for a walk; every time we cut the grass; every time we drive our cars, we're releasing things into the environment that ultimately with every rainfall goes into our waterways and can release certain materials into the environment."*

ENFORCEMENT A 2009 *New York Times* analysis indicates over 1500 Louisiana facilities with one or more violations of the Clean Water Act which were never fined. The largest offender, a sewerage treatment facility in Lafayette, had 168 violations with a total of $0 in fines collected. Rodney Mallet, DEQ spokesperson, says that it's often more beneficial to work with a violator, such as a municipality, to help them meet their permits rather than take money that could be used for upgrades. *"The City of Denham Springs is near the top of the list for water violations."* Mallett says, *"Since this list was generated in 2009, the City of Denham Springs has spent approximately $20 million to build a new sewer treatment facility and is substantially compliant with their permit."* Mallett also points out that many of the privately owned offenders have recently been issued enforcement actions while settlements being negotiated with industrial dischargers may not show up as a fine on the database that the *Times* used.



Environmental groups point to recent industry infractions which have threatened state waters:

- In 2011 the Pearl River was contaminated by discharges from Temple-Inland Paper Mill, which will take 3 years to restore.
- A 2011 court ruling found Dow responsible for 1997 contamination of the Upper Plaquemine Aquifer which polluted drinking water with vinyl chloride.

CONCLUSION It is clear that we are headed for a future in which the availability and control over freshwater will increasingly determine who prospers and who suffers, who succeeds and who fails, and whether water will be just a commodity going to those with the ability to pay for it or whether it will also sustain our cultural and natural heritage. The only question is what role Louisiana will choose to play in charting that future.

(SOURCE: A Defining Resource: Louisiana's Place in the Emerging Water Economy)