

Rural Louisiana

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Water Quality and Quantity

Louisiana is a state that is strongly associated with water. People are attracted to Louisiana for its fishing and water sports. Our rivers provide both transportation and recreation. Water is a key input to many of our state's industries.

It may therefore seem odd to devote an issue of this newsletter to water scarcity in a state that is framed by the flow of two rivers and is world famous for its wetlands and bayous. But, there are many parts of the state that rely on groundwater for their drinking and industrial water supply. In some parts of the state, groundwater is being consumed at a rate that is not sustainable into the future.

In this issue we examine some issues concerning aquifers. We discuss some simple methods of water conservation in the home and garden. We outline some suggestions for wellhead safety to reduce the threat of contamination of private wells, and provide information about grants, loans, and technical assistance providers for community water projects.

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Ground Water - A Finite Resource?

Groundwater from the Sparta aquifer is the source of the water used by most of Northern Louisiana and Southern Arkansas. This aquifer has been in the news a lot lately, because the demand for water in the region from the Sparta is exceeding its ability to replenish itself. The figure to the right (on page 3) graphically illustrates that much of North Louisiana is withdrawing water from the Sparta at an unsustainable rate.

Aquifers are geological formations that keep underground water in place, usually in gravel and sand, above an impermeable layer. Sometimes, there is another impermeable layer of clay above the water bearing sands of the aquifer.

Typically aquifers have a recharge zone where rainwater and runoff find a way to enter the aquifer between the impermeable layers. Large aquifers may have small recharge zones. Think of the aquifer as a sandwich with the bread representing the impermeable layers, and the jam representing the water. The only way to put more jam in would be to tilt the sandwich on edge and apply the jam between the slices. The recharge zone is often on the edge of the aquifer, which has been tilted up by geological forces.

The recharge zone for the Sparta aquifer is a narrow band on the western edge of the aquifer. Only the water that falls or flows across this small area can put water back into the aquifer.

Sustainable use is when the amount of water flowing into the aquifer is equal to or greater than the amount that is being pumped out. Under these circumstances there will not be a problem with the aquifer. But once withdrawals start to consistently exceed the level of recharge, certain problems may emerge.

The first problem is that wells pull the nearby water out of the water bearing sands and it can take a very long time for the water to trickle back in. This leaves a “cone of depression” around the shaft of the well.

Another problem, is that salt (or brackish) water will rise up to fill in the space left after the fresh water has been drawn out. This “salt water intrusion” can be insidious, since it is difficult to detect in its early stages, because most fresh water has salt in it already. But, as more water is pumped out of the aquifer, the rising salinity becomes a serious problem. The water level in the Sparta aquifer is decreasing by two feet per year, and there has been salt water intrusion in parts of Arkansas.

Water quality can become an issue. The water from the Sparta aquifer is generally of good quality. However, reducing the level of water can concentrate the existing level of pollutants, such as agricultural chemicals, petroleum distillates, and sewage, increasing water treatment costs.

Finally, there is the problem of subsidence. When water is removed from an aquifer, the pressure of the layers above it can compress the porous layer causing the aquifer to collapse. When this happens, the aquifer is less capable of holding water, and it is more difficult to extract the water that is still there. Also subsidence can cause roads, sewers and houses--everything built on top of the aquifer--to collapse.

Because groundwater is such an important natural resource in Louisiana we have compiled the following sources of information to assist you in understanding some of the issues around groundwater management.

Groundwater Resources:

The United States Geological Survey (USGS) conducts research
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Resources for Community Water Systems

Here is a listing of some of the grants and resources available to assist rural community water projects.

Grants to communities for publicly owned infrastructure to assist industrial or business development projects is available through the Louisiana Economic Development's (EDAP) program. Sewer upgrades are a typical use of these funds. The contact person for the program is:

Clark Forrest
225-342-1130
forrest@la.gov

<http://www.led.state.la.us/businessresources/edap.aspx>

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on groundwater. They have a website devoted to the Sparta Aquifer with links to research, reports, and data:

http://ar.water.usgs.gov/sun/sparta_recovery/header.phtml

Louisiana Tech's library developed a Sparta Aquifer Information Center. It has not been updated recently but provides some history of the issues surrounding the Sparta.

<http://www.latech.edu/tech/library/aquifer.html>

The Trailblazer RC&D has been leading Sparta education efforts for some time. Their website is:

<http://www.trailblazer.org>

Another good source of information is the Governor's Office of Rural Development (GORD). In addition to providing a clearing house of information, GORD provides grant funding for water systems and sewers. Their website is:

<http://www.rurallouisiana.com/>

The Louisiana Rural Water Association (LRWA) provides technical assistance to rural communities for the operation of their water and sewer systems.

The web site of the program is:

<http://www.lrwa.org>

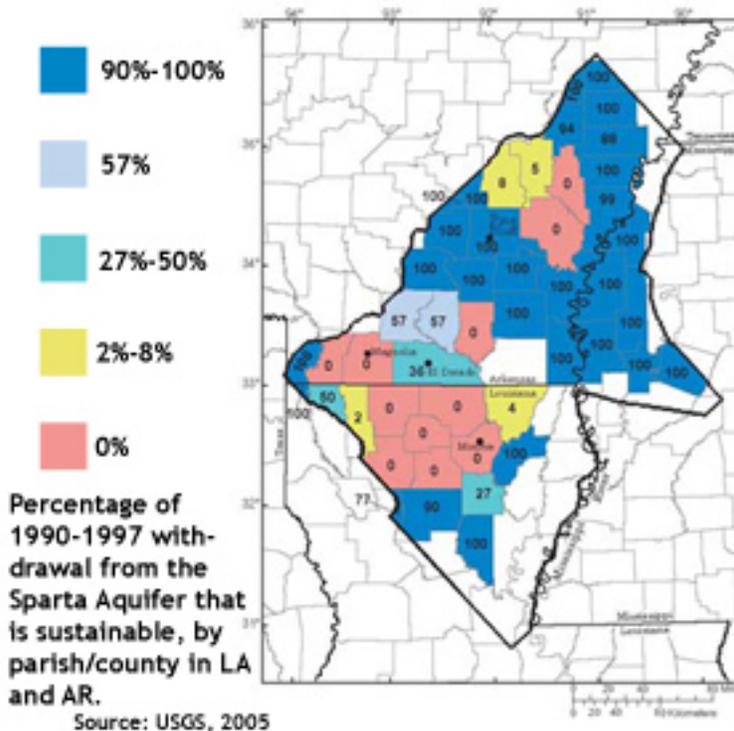
USDA Rural Development offers grants and loans for rural water systems and sewers. The website for their programs is located at:

<http://www.usda.gov/rus/water/program.htm>

The Environmental Protection Agency (EPA) also provides grants for public water systems. The website for this program is located at:

<http://www.epa.gov/rus/water/program.html>

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Wellhead Protection Tips for Private Wells

95% of people living in rural areas use private wells for drinking water. If you drink well water, wellhead protection is vital to the safety of you and your family. The Environmental Protection Agency (EPA) does not provide legislation for private wells, but recommends yearly testing of all privately owned wells. Well water samples should be tested for levels of bacteria, nitrates, total dissolved solids, and for pH.

High levels of coliform bacteria can indicate leaky septic tanks, or feedlot runoff. Coliform bacteria can cause flu-like symptoms and diarrhea. Elevated levels of nitrates can be caused by fertilizers, and are particularly dangerous to babies.

An increase in total dissolved solids is a signal that something is changing in the water system and is a clear signal for increased vigilance, and increased testing. The actual effect on the safety of the water would depend on what the dissolved solids were.

A change in pH is also cause for increased vigilance. A lower pH indicates increased acidity, which, if it gets bad enough, can actually cause damage to the mechanical parts of the well. A higher pH indicates alkalinity, which can be caused by hard water. Pure water is neither acidic nor alkaline, which gives it the perfectly neutral pH of seven.

The EPA recommends that, under certain conditions, the

water in a private well should be checked more often than the yearly standard. If a member of the household is either pregnant or nursing, the water should certainly be checked, and particular notice should be taken of the level of nitrates.

If there is an unexplained illness in the family, or particularly in a group of people drinking water from the same well, then the water should be checked.

The EPA recommends that if there is a change in local conditions, such as a new gas station or dry cleaning establishment opening up nearby, it would be good to take a closer look at the water. A change, particularly a change for the worse, in color or odor of the water would also invite a closer look. Changes in the well itself, such as new parts, might also provide a good reason to test the water.

In order to prevent water quality problems in private wells, the EPA recommends certain actions:

- Keep the wellhead above grade and guide the flow of water away from it.
- Get the septic tank cleaned on a yearly basis and put no caustic chemicals into the septic system.
- Owners of a well should lower their usage of pesticides and fertilizers around the well. Petrochemicals and

other volatile organic chemicals (VOCs), such as gasoline or lighter fluid, should be avoided around the wellhead, as well.

Resources:

Information about where to get the water tested can be found at:

Louisiana Department of Environmental Quality
Office of Environmental Assessment
Environmental Evaluation Division
P. O. Box 4314
Baton Rouge, LA 70821-4314
(225) 219-3510

The United States Department of Agriculture (USDA) has a program that may assist private well owners. This information is at:

<http://www.usda.gov/rus/water/well.htm>

The Environmental Protection Agency website on wellhead protection is:

<http://www.epa.gov/safewater/privatewells/booklet/protectinggw.html>

The Louisiana wellhead protection site is:

<http://www.deq.state.la.us/evaluation/aeps/gwwhpbr.htm>

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Water Conservation Strategies

Water conservation is a good way to avoid water supply problems. A community concerned about its supply of water can encourage the use of pressure reduction valves for the home, or adopt citywide pressure reduction. This can lower community water usage by one third, according to the Environmental Protection Agency (EPA).

Although there are regional variations, 60% of the water used in America's homes is used inside, and 40% is used outside.

Inside the home, the bathroom is where most of the water is consumed. Therefore simply retrofitting homes or businesses with low flow toilets will save a significant amount of water.

To reduce water usage outside the home or business, choose plants that do not require much water. Apply mulch to the plants. Water at night or in the early morning, as less water evaporates.

Resources:

The EPA has an excellent water conservation site located at:

<http://www.epa.gov/OW/you/intro.html>

The United States Department of Agriculture (USDA) has a website that provides a list of water thrifty plants, and discusses efficient irrigation techniques:

<http://www.nrcs.usda.gov/feature/backyard/watercon.html>

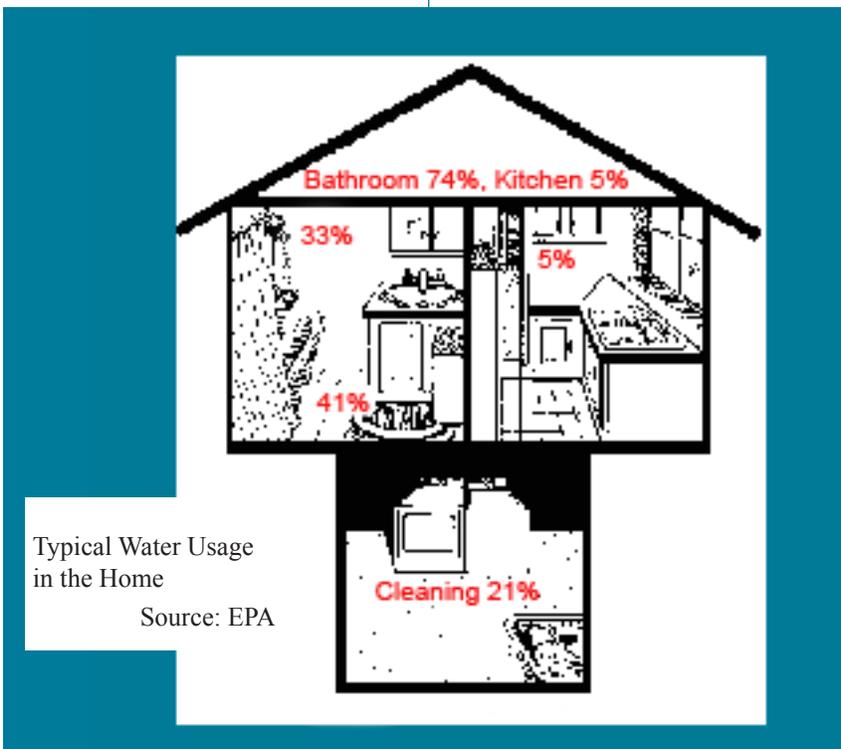
An excellent source of water saving rebate programs and information on low water landscaping, is available at a website developed by the City of Albuquerque, New Mexico.

<http://www.cabq.gov/waterconservation>

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Louisiana Community Development Block Grants (CDBG), available through the Housing and Urban Development (HUD) may be available to rural communities as well. The grants are for sewers and water systems. Click on the eligible projects button and follow the public infrastructure tab for more information. Their website is available at:

<http://www.state.la.us/cdbg/applications list.htm>



Typical Water Usage in the Home

Source: EPA

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The Center for Rural Development News:

Website Project

The Center for Rural Development has developed templates for community and non-profit websites that are freely available on our website <http://www.latech.edu/tech/rural/websiteproject>.

New Staff

Mr. Pat McCorkle has joined the Center's staff. He will be assisting the Center with Research Projects and outreach efforts. He can be reached by e-mail at mccorkle@latech.edu.

Grantwriting Course

Elizabeth Higgins will be teaching a 6 session grantwriting course this fall for LA Tech Continuing Ed. The course is \$75 +materials. For more information contact her at ehiggins@latech.edu or go to Continuing Education's website at: <http://www.latech.edu/ce/store/commerce.cgi>



Summertime in rural Louisiana

Southern Institute for Rural Development

The Center for Rural Development is working with many other leaders around the State to host the Southern Institute for Rural Development in Monroe, LA from September 12-15, 2005. Spaces are still available for this conference. For more information see: <http://srdc.msstate.edu/sird05/>