

OKLAHOMA Water News

Bimonthly Newsletter of the Oklahoma Water Resources Board

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From the Director



*Duane A. Smith
OWRB Executive Director*

As 2004 comes to an end, I look to 2005 as a year of great promise for the OWRB. As we chart our course for the coming year, I am filled with renewed optimism about the OWRB, our people and our current direction. Again, the agency, its Board and staff, look forward to making opportunities out of challenges.

Of course, the agency's Strategic Plan defines our role in managing and protecting the water resources of Oklahoma. Specifically, the plan includes nine high priority programs through which the OWRB will focus efforts in fiscal year 2005.

Without question, our top priorities in 2005 include updating the Oklahoma Comprehensive Water Plan, last modified in 1997, and recapitalizing the Statewide Water Development Revolving Fund, the primary source of

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Nine Programs Comprise OWRB's Highest Priorities

The OWRB's Strategic Plan contemplates the following agency High Priority Programs for FY-2005.

Comprehensive Water Plan

The 10-year revision of the *Oklahoma Comprehensive Water Plan*, mandated by the State Legislature, is due in 2005. In conjunction with the Bureau of Reclamation, the OWRB has already completed updated population projections, which will be used to formulate estimates of future water use throughout the state. These estimates will provide critical information on Oklahoma's future water supply infrastructure needs. The state's most pressing water policy issues will also be reevaluated.

Special Water Resource Studies

The OWRB's existing water management authority and technical capabilities place the agency in a unique position to answer important questions related to Oklahoma water quality and quantity. As a result, the agency is often called upon to design, direct and/or participate in various local, state, and federal studies of Oklahoma's water resources and issues related to water management. While the impetus for many of these studies is due to intense, and often unanticipated, public interest—such as the deterioration of water quality near the Arkansas border due to increased nutrient loadings and the recently proposed groundwater transfer from the Arbuckle-Simpson Aquifer to central Oklahoma—the OWRB will strive to identify additional investigations and appurtenant funding that will



OWRB geologist Bob Fabian takes GPS location readings at a well near Dougherty, Oklahoma, as part of the agency's Arbuckle-Simpson Hydrology Study.

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water and wastewater system project funding in Oklahoma. In addition to the ongoing study of water resources in the Arbuckle-Simpson region of South central Oklahoma, we also need to identify additional water resource studies as well as potential avenues for funding these important technical investigations that guide the usage and protection of our water resources.

Water quality/quantity monitoring, such as that accomplished through the Board's highly successful Beneficial Use Monitoring Program, will continue to be an integral aspect of the Board's mission as we look to expand the effort to include groundwater. Measures through which we implement Oklahoma's Water Quality Standards, which are closely linked to BUMP, must be continually refined and improved to reflect ever-changing state and national priorities. And through data

Programs . . . Continued from page 1

be required to allocate and preserve the state's water resources more fairly and efficiently .

Statewide Water Development Revolving Fund Capitalization

In response to Oklahoma's anticipated \$2 billion demand for water and wastewater infrastructure financing through FY 2010, it is critical that the OWRB identify and obtain additional external revenue sources to support its financing activities. A \$40 million initial investment in the OWRB's financial assistance programs has generated a perpetual asset base of almost \$350 million while providing \$1.35 billion in water and wastewater loans and grants to Oklahoma communities. These funds have resulted in a total savings of more than \$415 million to cities, towns, and rural water districts throughout the state.

Water Quality/Quantity Monitoring

While the OWRB's Beneficial Use Monitoring Program continues to provide definitive benchmark data vital to the protection of Oklahoma's surface water quality, particularly in determining where Oklahoma's most pressing water quality problems are occurring, Oklahoma lacks a comprehensive groundwater monitoring strategy. If equipped with an appropriate long-term source of funding, BUMP is the logical vehicle for such an effort, as well as to support ongoing initiatives related to biological monitoring, streamgaging, and citizen volunteer monitoring.

Water Quality Standards and Implementation

Oklahoma's Water Quality Standards, the cornerstone of state water quality management and protection efforts, will continue to evolve to reflect changing federal and state priorities and regulations. Foremost among standards-related issues are development of standards to protect Oklahoma's groundwater resources; development of Standards implementation procedures by the state's environmental agencies; integrating quality and quantity issues into the Standards; improvement of use support

management and dissemination programs and public outreach efforts, the OWRB will solidify its status as Oklahoma's primary source of water information.

On the legal front, reevaluation of Oklahoma's current water laws is needed to determine if they are truly protective of our precious water resources, especially in light of new state and federal regulations.

I encourage all Oklahoma citizens to join the Water Resources Board in our continuing challenge to balance all water uses. The results of our actions impact not only the water user community, but all Oklahomans. Voice your opinion about the state's water issues by contacting the OWRB or your local, state or federal representatives on how best to utilize and protect the state's water resources. We look forward to hearing from you.

assessment protocol procedures, including those pertaining to biological thresholds of water quality protection; and development of nutrient criteria.

Data Management and Dissemination

As Oklahoma's water agency, the OWRB will strive to maintain a technical infrastructure—including network environment, databases and data storage, in-house and online applications, and mapping capabilities—that allows the agency to provide accurate and expedited water-related information and services to the public, State Legislature, Congress, and other customers.

Public Outreach

The OWRB will continue to further public knowledge of agency objectives and water management/protection programs, as well as the general importance of Oklahoma's most valuable natural resource.

Resolution of Tribal Water Claims

In addition to previous claims involving water quantity, several Indian tribal governments in Oklahoma are currently seeking treatment as a state authority to administer water quality programs, particularly water quality standards. To resolve Indian tribal claims to water resources in Oklahoma, the OWRB plans to provide administrative support to the Oklahoma Secretary of Environment, Governor, and Legislature; facilitate meetings between state and tribal officials; review claims; prepare informational materials; and complete other tasks that encourage resolution of claims.

Review of Oklahoma Water Law

OWRB staff will conduct appropriate research—including review of appropriate statutes and cases—and prepare initial written summaries of the principles of Oklahoma's water laws. It is envisioned that the agency and/or Legislature will bring together representatives of large water users, academics, attorneys, and others to review principles of law and suggest updates and changes to members of the State Legislature.

Board Approves Four REAP Grants

At its December 14 meeting, the Oklahoma Water Resources Board approved four Rural Economic Action Plan (REAP) grants to finance local water and sewer system improvements.

The grant awards, approved by the nine-member Board, are the first attributed to a fiscal year legislative appropriation of \$2.4 million. The OWRB anticipates additional REAP grants throughout the year for at least 20 eligible community water systems in direct relation to monthly program allocations received by the agency. The REAP program, created by the State Legislature in 1996, primarily targets small towns that are often excluded from traditional funding programs. As a result, it is a key component of the state's overall economic development program for rural Oklahoma. To date, the Board has approved 408 REAP grants for more than \$35 million. When combined with other funding sources, REAP grants have contributed to the construction of water/wastewater projects totaling more than \$64 million throughout the state.

Okfuskee County Rural Water District #1 will use its \$88,000 grant to replace an aging sanitary lift station with a submersible lift station, complete with associated

sewer lines, manholes, instrumentation, controls and other necessary construction and appurtenances.

Noble County Rural Water, Sewer and Solid Waste Management District #4 will use its \$39,999 grant to move water lines that are dangerously close to adjoining sewer lines of another entity. The relocation of some 4,100 feet of lateral lines will prevent potential contamination.

The Town of Stonewall in Pontotoc County will use its \$99,863 REAP grant to repair a leaking structure in its water treatment plant and replace two failing service pumps and backwash pumps, along with related necessary appurtenances and construction.

Wapanucka Public Works Authority in Johnston County will use its \$59,000 grant to extend water sewer and fire protection service to a new sports complex for the Wapanucka School System. The project will consist of approximately 2,000 feet of water line and 700 feet of sewer line along with related construction and appurtenances.

Fiscal Year 2004 EXPENDITURES

Oklahoma Water Resources Board

<u>Fund Description</u>	<u>FY-01</u>	<u>FY-02</u>	<u>FY-03</u>	<u>FY-04</u>
Constitutional Reserve	49,809	0	0	0
State Appropriations	3,534,986	3,580,729	3,289,614	3,817,113
Carryover	283,714	75,143	67,432	376,887
Weather Modification	1,087,787	0	0	0
Drillers & Pump Installers	23,711	8,282	24,303	-22
Rural Economic Action Plan	1,055,503	1,177,606	1,643,265	473,170
OWR Revolving Fund	282,896	278,353	261,822	292,412
Drillers & Installers Regulation Fund	0	8,799	17,313	41,856
USGS Cooperators	129,680	118,435	223,885	251,650
Reimbursement	1,141,932	1,289,555	1,157,333	1,296,970
Drinking Water Loan Administration Fund	353	12,369	171,363	143,999
Wastewater Facility Construction Fund	490,343	464,641	588,111	693,938
State Revolving Fund - Operations	<u>220,546</u>	<u>141,035</u>	<u>128,365</u>	<u>0</u>
Total Revolving Funds	4,432,751	3,499,075	4,215,760	3,193,973
Federal Funds	476,126	1,064,723	1,071,802	1,600,951
Federal Water Quality Management Funds	3,756,478	3,343,020	4,034,206	7,422,924
Expenditure Totals	12,533,864	11,562,690	12,678,814	16,411,848
Activity				
Administration	1,991,875	2,398,540	2,073,221	2,198,420
Water Quality	1,827,910	2,027,235	2,166,694	2,482,280
Financial Assistance	1,358,849	1,298,484	1,675,741	1,395,711
Planning & Management	2,136,693	2,328,164	2,576,367	2,755,600
Weather Modification	1,087,787	0	0	0
Secretary of Environment	<u>4,130,750</u>	<u>3,510,267</u>	<u>4,186,791</u>	<u>7,579,837</u>
TOTAL	12,533,864	11,562,690	12,678,814	16,411,848

Old Trees Sought for Arbuckle Tree Ring Study

As part of the Oklahoma Water Resources Board's ongoing study of the Arbuckle-Simpson aquifer, researchers are seeking old trees that could be used to gather information on the region's climatic and hydrologic history.

Widely used since the 1930s, the analysis of tree rings not only provides a glimpse of a particular tree's life and growth history, it can be used to reconstruct streamflow and precipitation records for the surrounding area. According to Dr. Andover Tarhule, Assistant Professor of Hydrology at the University of Oklahoma, who is directing this portion of the Arbuckle study, researchers are particularly looking for old Post Oaks or Burr Oaks (see samples at right).

"We are asking citizens to provide us with information on the locations of either of these tree species in or around the Arbuckle-Simpson aquifer region. The information we receive will remain confidential," Tarhule says.

He also emphasizes that the procedure utilized to collect cores will do absolutely no harm to the trees. All samples will be less than 0.2 inches in diameter.

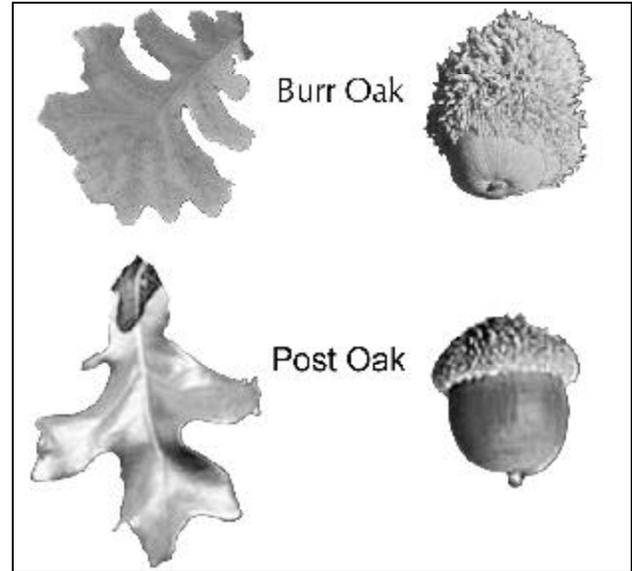
The following criteria will be used to determine the best candidates for the tree ring study:

- Trees should be located away from water, preferably on hilly or rocky terrain.
- There should be a reasonable chance of obtaining

about five similar trees within one square mile.

- Trees should be at least 100 years old.

Anyone with information on the whereabouts of old Post Oak and/or Burr Oak trees in the Arbuckle region is asked to contact Rachel Turney, OU Graduate Research Assistant, at turney@ou.edu or 405-325-5325, or the OWRB's Technical Studies section at 405-530-8800.



Dry Outlook for Western U.S.

Citizens in the western United States, already suffering through an extended serious drought, should expect dry conditions to continue and even worsen, according to expert climate researchers.

A study of tree rings by scientists from the Lamont-Doherty Earth Observatory of the Earth Institute at Columbia University revealed that a 400-year-long drought dating back 1,000 years ago occurred during a time when the planet was warmer than usual, much like today. If the pattern holds up, it could mean worsening drought.

Dr. David Meko of the University of Arizona tree ring lab notes that according to the tree-ring record, the drought that has gripped the western United States for the past four years pales in comparison with some earlier droughts. Since 1999, the Southwest, central Rockies, and western Great Plains have been parched. The year 2002, in particular, was the driest of the past 100 years in Arizona and second driest for Arizona, New Mexico, Colorado, and Utah.

According to study results prepared for the journal *Science*, gridded drought reconstructions that cover most of the western United States over the past 1,200 years show that the current drought is mild compared to an earlier period of elevated aridity and epic drought in AD 900-1300.

The study's lead author, Dr. Edward R. Cook of the Lamont Doherty Earth Observatory's Tree Ring Laboratory,

says the culprit seems to be La Nina, a cold-water phenomena in the eastern Pacific Ocean that is generally believed to cause drier conditions throughout the western U.S.

"If warming increases in the future we ought to at least consider the possibility that we are going into a more drought-prone period than we have seen over the last few hundred years," Cook says.

Information courtesy Reuters and LDEO



The U.S. Drought Monitor is a cooperative effort between drought experts in Canada, Mexico, and the United States to monitor drought across the continent on an ongoing basis. Integrated assessments of drought conditions are available at www.drought.unl.edu/dm/monitor.html.

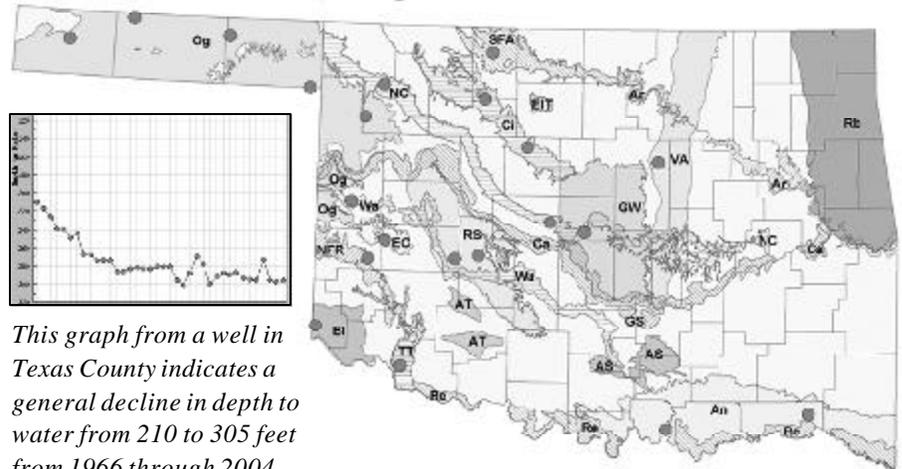
OWRB Adds Groundwater Monitoring Tool

The OWRB has developed a Web-based application to monitor aquifer levels at selected wells throughout Oklahoma. Part of the agency's Drought and Water Resource Monitoring system, located on the agency's web site at www.owrb.state.ok.us, the information is available through a map of 21 selected wells located in various major state aquifers.

Clicking on a well site, part of the agency's statewide mass measurement networkwide, generates a hydrograph and table specifying the well's depth to water over various (adjustable) time periods. The online program, developed through a contract with YourOklahoma, is also integrated into the OWRB's water well record search application and extensive well log data base.

Aquifers, especially deep groundwater formations, are often slow to respond to the effects of drought episodes and reduced recharge. Utilizing water well level data gathered over a number of years allows state officials to respond more efficiently to impending long-term drought conditions, especially for municipal water systems and other users who depend upon Oklahoma's groundwater supplies.

Major Aquifers of Oklahoma



This graph from a well in Texas County indicates a general decline in depth to water from 210 to 305 feet from 1966 through 2004.

Well Measurement Program Underway

The OWRB's annual water level measurement program, which begins in the Oklahoma Panhandle in January, now includes more than 600 water wells statewide. This program has been in place for more than 25 years. Data gathered through the comprehensive network of observation wells enable OWRB hydrologists to observe and track aquifer water level fluctuations over a period of years or even decades.

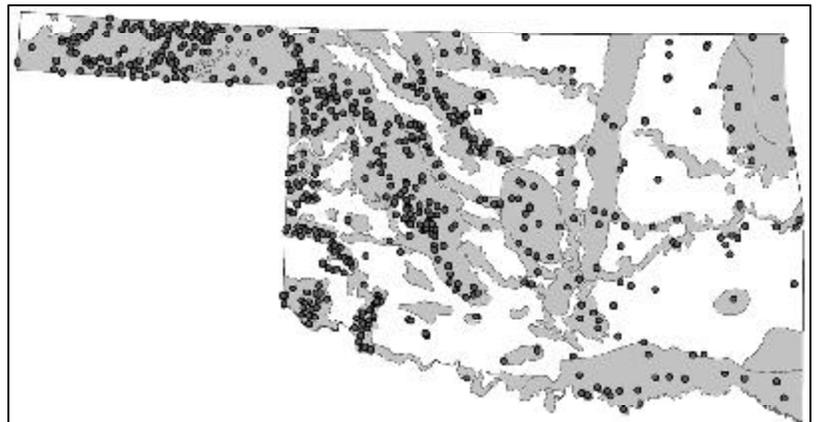
According to OWRB geologist Mark Belden, who supervises the program, water levels fluctuate either as a result of varying precipitation and recharge and/or from changes in water use and groundwater pumpage.

General declines in the irrigated portions of the Oklahoma Panhandle of the High Plains/Ogallala Aquifer have been observed, which typically range from ½ - to 1½ feet per year over the past 35 or 40 years. This period has been characterized by extensive withdrawals of water for irrigation, which in many areas exceed rates of recharge to the aquifer.

In most other aquifers and areas of Oklahoma, water level changes can be directly related to shifting climate patterns. Rising and falling water well levels typically reflect corresponding wet and dry periods, although measurement data may not reflect those events for a period of months or even

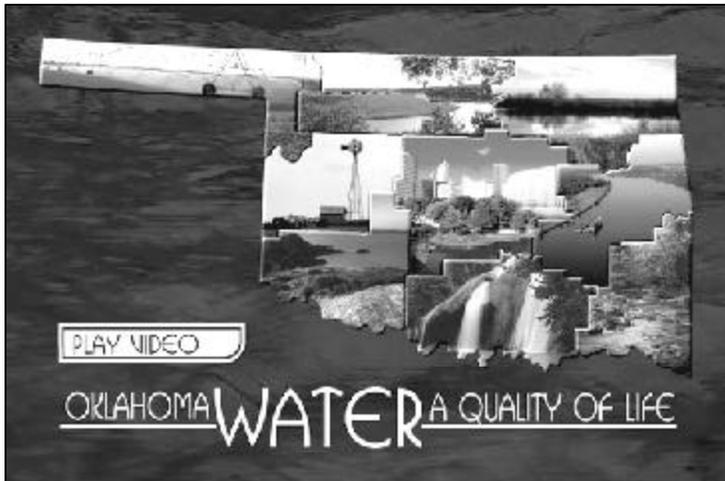
years for deeper formations and wells. In general, there has been no significant change in groundwater storage for the majority of the state's aquifers in the past 25 years.

Water level measurements are collected during the first months of each year when the majority of irrigation wells, especially in western Oklahoma, have been turned off and water levels are allowed to recover. Staff rely upon cooperation from landowners to secure and maintain the network of irrigation, domestic, stock, public water supply, and unused water wells at oil and gas sites. All measured wells include an identification tag that includes the measurement date, depth to water, and related information.



Water well locations of the OWRB's groundwater monitoring network

OWRB Video Available on DVD



A limited number of free copies of the OWRB's video, *Oklahoma Water: A Quality of Life*, are now available on DVD while supplies last. The informative 30-minute production debuted at the Governor's Water Conference on October 20, 2004. To request a copy, call 405-530-8800. Allow two to three weeks for delivery.

Agencies Join Salvation Army for Kids

On December 10, OWRB volunteers delivered toys to underprivileged children and families as part of the Salvation Army's Corporate Angel Tree Program.

Mary Schooley has coordinated OWRB participation in the Christmas toy drive since 1996. Schooley says she is always amazed at the considerable generosity exhibited by staff of the OWRB and Office of the Secretary of Environment.

The unwrapped gifts went to over 50 children--infants to 14 years of age. According to the Salvation Army, last year's toy tree drive assisted more than 4,300 families and distributed over 31,000 toys and gifts to children in Oklahoma and Logan Counties.



OWRB staff member Hannah Harder gathers and loads toys for delivery to the Salvation Army in Oklahoma City.

Chili Cook-off Supports United Way

In November, the OWRB's annual Chili Cook-off fundraiser for the United Way of Oklahoma was one of several ways OWRB staff participated in the 2004 Oklahoma State Employee Charitable Contribution Campaign. According to Laura Oak, coordinator of the OWRB Campaign, the agency exceeded its 2004 goal by \$626, with contributions totalling \$7,826. In 2003, the agency raised \$7,128.

To encourage participation, activities also included a hot dog lunch, basketball and soccer balloon competitions, and a Halloween costume contest.



Above: Duane Smith proclaims Mary Nell Brueggen this year's Chili Cook-off Champ for the second year in a row. Second place went to Jalisha Petties, and Mary Schooley

received an honorable mention. At right: staff and guests line up to sample the chili.



Oklahoma Drought Monitor

Reservoir Storage

Lake storage in Oklahoma remains generally good, although lakes in the southwest continue to experience low levels. As of December 20, the combined normal conservation pools of 31 selected major federal reservoirs across Oklahoma (see below) are approximately 97.5 percent full, a 0.3 percent increase from that recorded on November 22, according to information from the U.S. Army Corps of Engineers (Tulsa District). Seventeen reservoirs have experienced lake level decreases since that time and only eight reservoirs are currently operating at less than full capacity (compared to eight last month). Two reservoirs—Lugert-Altus, only 37.7 percent full; and Tom Steed, 77.1 percent—remain below 80 percent capacity.

Storage in Selected Oklahoma Lakes & Reservoirs

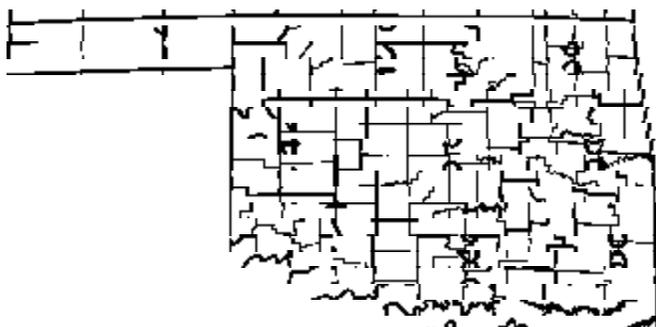
As of December 20, 2004

Climate Division	Conservation Storage (acre-feet)	Present Storage (acre-feet)	Percent of Conservation Storage
North Central	476,738	476,738	100.0
Northeast	3,710,194	3,636,794	98.0
West Central	276,790	270,422	97.7
Central	154,225	154,225	100.0
East Central	3,022,323	3,022,323	100.0
Southwest	301,810	73,685	24.4
South Central	3,005,444	3,001,592	99.9
Southeast	1,491,229	1,491,229	100.0
State Totals	12,438,753	12,127,008	97.5

Drought Indices

According to the latest Palmer Drought Severity Index (December 18, below), no regions in Oklahoma are currently experiencing drought conditions. Five of Oklahoma's nine climate divisions have undergone PDSI moisture decreases since November 20. The greatest decrease occurred in the West Central climate division.

The latest monthly Standardized Precipitation Index (through November, below) indicates no long-term dryness in Oklahoma. In fact, wet conditions dominate. Among the selected time periods (3-, 6-, 9- and 12-month SPIs), no climate divisions indicate dryness. Similar conditions are evident considering longer periods (through six years).



Palmer Drought Severity Index

Climate Division (#)	Current Status 12/18/2004	Value		Change In Value
		12/18	11/20	
NORTHWEST (1)	VERY MOIST SPELL	3.59	3.84	-0.25
NORTH CENTRAL (2)	VERY MOIST SPELL	3.32	3.28	0.04
NORTHEAST (3)	UNUSUAL MOIST SPELL	2.19	2.23	-0.04
WEST CENTRAL (4)	UNUSUAL MOIST SPELL	2.79	3.28	-0.49
CENTRAL (5)	UNUSUAL MOIST SPELL	2.53	2.53	0.00
EAST CENTRAL (6)	MOIST SPELL	1.39	1.56	-0.17
SOUTHWEST (7)	UNUSUAL MOIST SPELL	2.76	2.82	-0.06
SOUTH CENTRAL (8)	UNUSUAL MOIST SPELL	2.76	2.61	0.15
SOUTHEAST (9)	MOIST SPELL	1.40	1.17	0.23

Standardized Precipitation Index

Through November 2004

	3-Month	6-Month	9-Month	12-Month
NORTHWEST (1)	VERY WET	VERY WET	VERY WET	VERY WET
NORTH CENTRAL (2)	MODERATELY WET	MODERATELY WET	MODERATELY WET	VERY WET
NORTHEAST (3)	NEAR NORMAL	MODERATELY WET	MODERATELY WET	MODERATELY WET
WEST CENTRAL (4)	VERY WET	VERY WET	VERY WET	VERY WET
CENTRAL (5)	MODERATELY WET	VERY WET	MODERATELY WET	MODERATELY WET
EAST CENTRAL (6)	MODERATELY WET	VERY WET	MODERATELY WET	MODERATELY WET
SOUTHWEST (7)	VERY WET	VERY WET	VERY WET	VERY WET
SOUTH CENTRAL (8)	MODERATELY WET	VERY WET	MODERATELY WET	MODERATELY WET
SOUTHEAST (9)	MODERATELY DRY	MODERATELY WET	NEAR NORMAL	NEAR NORMAL

Financial Assistance Program Update

Loans/Grants Approved as of December 14, 2004

FAP Loans—307 totaling \$531,875,000

The OWRB's Financial Assistance Program (FAP), created by the State Legislature in 1979, provides loans for water and wastewater system improvements in Oklahoma. The tremendous popularity of the bond loan program is due, in part, to extended payoff periods of up to 30 years at extremely competitive low-interest rates, averaging approximately 4.762 percent since 1986.

CWSRF Loans—160 totaling \$534,296,254

The Clean Water State Revolving Fund (CWSRF) loan program was created in 1988 to provide a renewable financing source for communities to draw upon for their wastewater infrastructure needs. The CWSRF program is Oklahoma's largest self-supporting wastewater financing effort, providing low-interest loans to communities in need.

DWSRF Loans—46 totaling \$189,283,938

The Drinking Water State Revolving Fund (DWSRF) loan program is an initiative of the OWRB and Oklahoma Department of Environmental Quality to assist municipalities and rural water districts in the construction and improvement of drinking water systems. These projects are often mandated for communities to obtain compliance with increasingly stringent federal standards related to the treatment of drinking water.

REAP Grants—408 totaling \$35,414,476

The Rural Economic Action Plan (REAP) Program was created by the State Legislature in 1996. REAP grants, used for water/wastewater system improvements, target primarily rural communities with populations of 7,000 or less, but priority is afforded to those with fewer than 1,750 inhabitants.

Emergency Grants—509 totaling \$29,920,332

OWRB emergency grants, limited to \$100,000, are awarded to correct situations constituting a threat to life, health, and/or property and are an indispensable component of the agency's financial assistance strategy.

Total Loans/Grants—1,430 totaling \$1,320,790,000

Applicants eligible for water/wastewater project financial assistance vary according to the specific program's purpose and requirements, but include towns and other municipalities with proper legal authority, various districts established under Title 82 of Oklahoma Statutes (rural water, master/water conservancy, rural sewage, and irrigation districts), counties, public works authorities, and/or school districts. Applications for agency financial assistance programs are evaluated individually by agency staff. Those meeting specific program requirements are recommended by staff for approval at monthly meetings of the nine-member Water Board.

More information about the OWRB's Financial Assistance Program can be obtained by calling the OWRB at (405) 530-8800.

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Harry Currie, Rudy Herrmann, Jack Keeley, Mark Nichols, Richard C. Sevenoaks

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