

OKLAHOMA Water News

4th Quarter 2007



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OWRB Delivers in 2007

The OWRB concludes a very productive and noteworthy year. Among events of note were the second annual Water Appreciation Day, held on May 8 at the State Capitol, which served as the kick-off for 42 public input meetings held across the state as part of the Oklahoma Comprehensive Water Plan, and the October Governor's Water Conference, where attendees were treated to a special 50th Anniversary Banquet and given the first copies of the new Centennial Edition *Oklahoma Water Atlas*.

A special insert is included in this issue (pages five through eight) with a look back at agency accomplishments and programs in 2007, including the following:

- Agency Expenditures and Budget*
- Permitted Water Totals*
- Legal Issues Update*
- Oklahoma Comprehensive Water Plan*
- Arbuckle-Simpson Hydrology Study*
- Water Quality Programs*
- Financial Assistance Program*
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- Well Drillers Program*
- Floodplain Management Program*



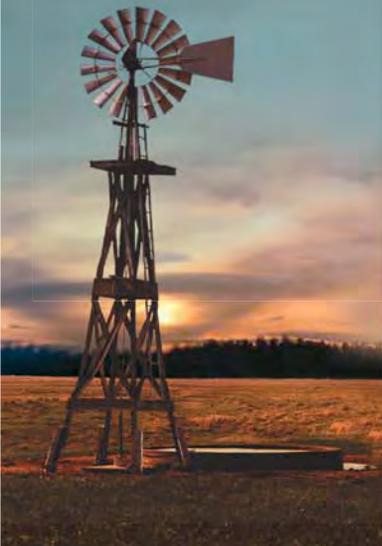
From the Director

Water planning and a special celebration highlighted a landmark year at the Water Resources Board. In 2007, the OWRB concluded its first year of updating the Oklahoma Comprehensive Water Plan and the agency received a vote of confidence through reauthorization of the Water Resources Development Act, which included \$6.5 million for Water Plan development. Of course, crucial to passage of this vital legislation was the enthusiastic support of Senator Jim Inhofe, Ranking Member of the Senate Environment and Public Works Committee.



OWRB Chairman Mark Nichols, Sen. Jim Inhofe, and OWRB Executive Director Duane Smith

(continued on page 2)



From the Director (continued from page 1)

Not only was 2007 Oklahoma's Centennial but the OWRB also celebrated 50 years as a state agency. The extended three-day Governor's Water Conference, which included a banquet "birthday party" of sorts, was a huge success. We cohosted the event along with the Water Resources Research Institute, our partner in the Water Plan update.

The Conference also provided both agencies with an opportunity to update Oklahomans on accomplishments made during the first full year of Plan development, including 42 meetings held throughout the state to gather public opinion on the state's most important water issues. Also, the Centennial Update of the *Oklahoma Water Atlas* was officially released at the Water Conference. We've received tremendous feedback from the public on the publication's quality, professionalism, and wealth of information on Oklahoma's water resources.

Our Financial Assistance Program, celebrating its 25th year in 2007, continues to be the major player behind water and wastewater project construction and improvements in

Oklahoma. Responsible for nearly \$1.7 billion in financing to date, the OWRB provides approximately 65 percent of the state's total water/wastewater financing needs. It is estimated that the FAP has been directly responsible for the creation of almost 68,000 jobs in Oklahoma with a \$41-dollar direct return on investment for every dollar appropriated to the program.

As the OWRB begins its next half-century, 2008 promises to be another ground-breaking year. On tap for the Water Plan are Regional Input Meetings. We will also develop water supply and demand projections as well as conduct preliminary water supply and engineering studies that will figure heavily in how we use and manage Oklahoma's water supplies. We will continue to wrestle with important issues, such as increasingly stringent drinking water standards, shrinking funding for water/wastewater infrastructure, aging dams and water supplies, and Texans' growing thirst for Oklahoma water. However, we proceed with both enthusiasm and confidence as we face these water management challenges.

WRDA's Oklahoma Provisions

Information from Oklahoma Publishing Today

The federal Water Resources Development Act, which became law in November, authorizes funding for many important water projects in Oklahoma, including the following:

- \$6.5 million for the ongoing update of the Oklahoma Comprehensive Water Plan.
- Arcadia Lake–Edmond has been in a dispute with the U.S. Army Corps of Engineers (USACE) over whether the city owes additional money as interest on water payments related to its water storage contract. The WRDA clarifies that Edmond is not liable for interest during the period when the city was not exercising its future use water supply from Lake Arcadia, saving the city nearly \$10 million. Edmond has no further obligations to pay the federal government under the water storage contract after 2008.
- Arkansas River Corridor–The WRDA authorizes \$50 million for the ecosystem restoration, recreation, and flood damage reduction components of the Arkansas River Corridor Master Plan in coordination with Tulsa County, surrounding communities, and the Indian National Council of Governments.
- Lake Eufaula–The WRDA creates a lake advisory committee that will let citizens give recommendations to the (USACE) regarding the operations of the lake and authorize a reallocation study.
- Lake Texoma–Local plans for more recreational development on land previously conveyed to the state by the (USACE) at Lake Texoma are being hindered by reversionary interest language included in that conveyance. The WRDA removes that language, allowing local development plans to move forward.
- Oklahoma Lake Demonstration–The WRDA creates a program that encourages recreational development on (USACE) lakes through public-private partnerships.
- Ottawa County, Tar Creek–WRDA authorizes \$30 million

- to complete the relocation assistance for residents in the Tar Creek communities of Picher, Cardin, and Hockerville at risk from subsidence and environmental contamination. In addition, the WRDA bill provides the authority EPA requires to re-evaluate remediation plans at Tar Creek to conduct both remediation and resident assistance. Finally, it preserves the legal claims the Quapaw Tribe is pursuing on behalf of its members. This bill also immediately makes available to the state \$3.5 million dollars in previously appropriated funds to be used for relocation assistance.
- Red River Chloride Control Project–The WRDA clarifies that operation and maintenance of Oklahoma chloride control projects at the Red River will be at full federal expense. The Red River Chloride Control Project is authorized to identify and implement measures to reduce naturally occurring brine emissions into several sub-basins within the Red River Basin in northern Texas and southern Oklahoma. The project's primary purpose is to improve water quality for municipal, industrial and agricultural uses along the Red River within Oklahoma, Texas, Arkansas, and Louisiana.
- Waurika Lake Project–Section 3082 of the WRDA eliminates the obligation of the Waurika Project Master Conservancy District to pay its outstanding debt related to the construction of a water conveyance project. Because of an accounting error, the (USACE) inadvertently undercharged the district for costs associated with a land purchase related to the water project in the early 1980s. Under terms of the construction contract, the district is required to pay all costs associated with building the project, including the full cost of the land purchases. The section would eliminate the requirement for the district to pay the difference between the full cost of the property and the initial (undercharged) amounts. The Congressional Budget Office estimates enacting this section would cost the federal government less than \$200,000 a year over the 2008-2017 period. Waurika Lake provides water supply to the communities of Comanche, Lawton, Duncan, Temple, Walters, Waurika, and several rural water districts.



Recent Developments

In cooperation with the Oklahoma Water Resources Research Institute (OWRRI) at Oklahoma State University, the OWRB has completed the first phase of the public input portion of the planning process. This well-received and exhaustive effort involved holding 42 local listening sessions across the state from April to November in 2007. Participation at the Public Input Meetings was excellent. As a result, over 2,000 comments have been received.

As a part of a Planning Assistance to States grant from the US Army Corps of Engineers, the technical studies track of the OCWP has commenced with efforts underway to outline the fundamental work plan for the OCWP, including the delineation of OCWP Goals and Objectives, the establishment of a common technical platform to evaluate supply and demand, and the development of a programmatic work plan that includes an outline of work to be performed.

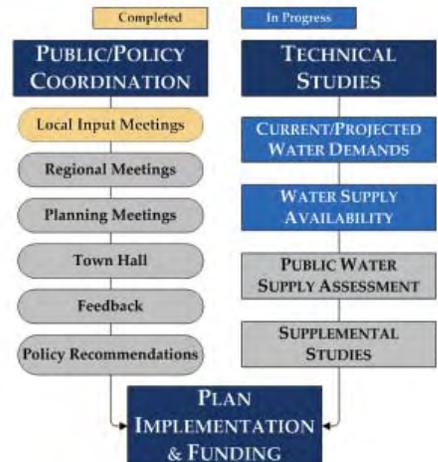
Upcoming

Based upon the comments received at the local listening sessions, the OWRRI is preparing eleven regional issues reports, one for each of the eleven sub-state planning districts (see below), and a statewide issues report to be distributed to regional team members prior to their respective regional meetings. Each regional team will consist of 30 representatives of all water-related interests. The teams will review the findings of the listening sessions, validate regional issues and concerns, consolidate issues into categories based upon their similarity, and suggest priorities for further consideration in the planning process.

Meeting dates and locations will be posted on OWRRI's Web site as soon as they have been determined. The meetings will be open to the public and comments will be recorded.

The Oklahoma Comprehensive Water Plan, published and continuously updated by the Oklahoma Water Resources Board, establishes guidelines for the present and future use of the state's water resources and outlines policy recommendations for water resources management.

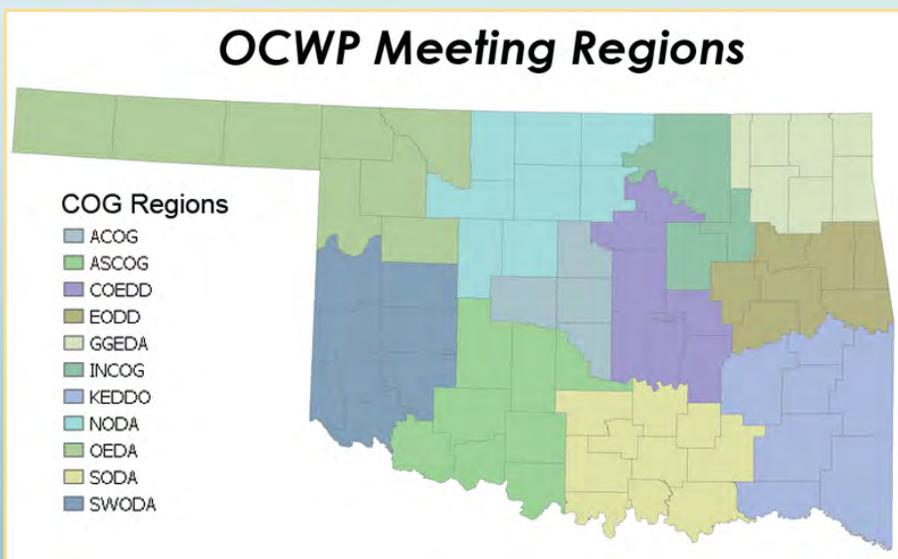
Oklahoma Comprehensive Water Plan Process



Goals of the OCWP Update

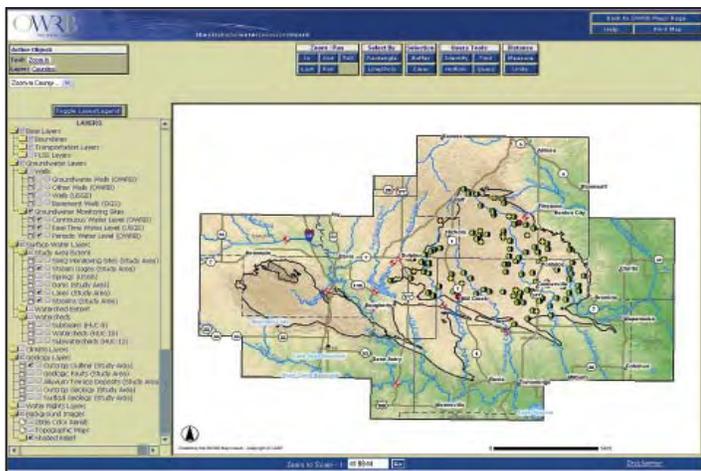
- To provide safe and dependable water supply for all Oklahomans while improving the economy and protecting the environment.
- To provide information so that water providers, policy-makers, and water users can make informed decisions concerning the use and management of Oklahoma's water resources.

For questions or comments about the Oklahoma Comprehensive Water Plan or the public participation process, contact the Water Research Institute at 405-744-9994, by e-mail at waterplan@okstate.edu, or go to <http://okwaterplan.info>.



Online Map Viewer Created for Arbuckle Study Data

The OWRB has created a customized Arbuckle-Simpson Hydrology Study map viewer for study participants and the public to use to examine and download data collected for the study. To access the viewer, go to the OWRB's Water Information Mapping System (WIMS) page at www.owrb.ok.gov/maps/server/wims.php. The initial view consists of a map of the study area that users can customize by selecting an area of interest and one or more of the 45 currently



Arbuckle-Simpson Hydrology Study map viewer. One example of the viewer's available layers is "Periodic Water Level," which maps the locations of area wells measured for water levels. By clicking on a well with the "identify" tool, measurement data can be viewed and downloaded.

available map layers to display, including groundwater and surface water monitoring sites, gages, geology, watersheds, springs, weather stations, surface and groundwater permits, and roads and highways.

Data from the study's monitoring sites, including real-time stream gage data and groundwater level information from the USGS and OWRB, can also be viewed and retrieved from the site. Also available for download are GIS layers associated with the Arbuckle-Simpson Hydrology Study. Datasets in ESRI shapefile format are available through the OWRB Data page at www.owrb.ok.gov/maps/data/owrbdata.php. Additional layers and datasets will be added as they become available.

Arbuckle-Simpson Hydrology Study

The Arbuckle-Simpson aquifer in south-central Oklahoma is the source of a number of important springs and headwater streams in the region. The OWRB initiated the five-year Arbuckle-Simpson Hydrology Study in 2003 to acquire an understanding of the region's hydrology to enable development and implementation of an effective water resource management plan that protects the region's springs and streams. A multidisciplinary team of scientists is conducting a variety of studies to obtain information on the climate, geology, groundwater, and streamflow of the system. In addition, the researchers are employing several methods to assess the consequences of ground and surface water withdrawals on the environment and water users.

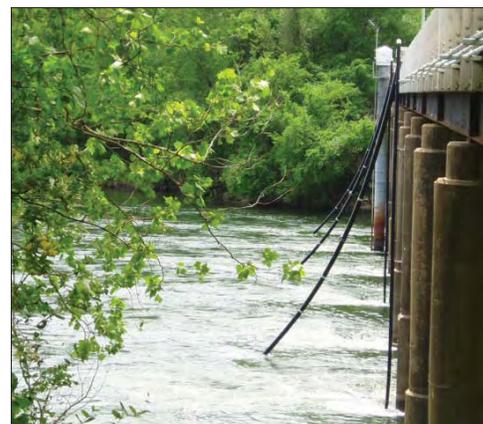
Agreement Clears Way for Additional GRDA Projects

Beginning in February, through a new contract with the Grand River Dam Authority (GRDA), the OWRB will begin bathymetric mapping at Grand, W. R. Holway, and Fort Gibson Lakes. According to the project time line, OWRB Water Quality Division staff will complete bathymetric mapping at Grand Lake around April 2009, and at W. R. Holway and Fort Gibson by September of that year. In



cooperation with the U.S. Army Corps of Engineers, a second component of this project will result in updated dependable yield determinations for these three lakes and Lake Hudson, another GRDA impoundment that was mapped in 2007 as part of a separate contract.

The existing partnership between the OWRB and GRDA also includes several other water quality projects. Since 2004, the OWRB has led successful efforts at Grand Lake to revitalize shoreline habitat and reduce erosion by introducing native aquatic plants. Shoreline habitat restoration work is also underway at Lake Hudson. Joint support of Oklahoma Water Watch volunteer monitoring in the Grand River Basin includes Grand Lake and a new monitoring group at Lake Hudson. In addition, the OWRB is also providing detailed real-time dissolved oxygen monitoring below Grand and Hudson Lakes and flow release testing below Hudson to support Federal Energy Regulatory Commission (FERC) relicensing. Currently, there are three dissolved oxygen probes below Grand and one below Hudson, each collecting data from March through October on 15 minute intervals.



Dissolved Oxygen probe at Grand Lake

OKLAHOMA WATER RESOURCES BOARD

Oklahoma Comprehensive Water Plan

In 2007, the OWRB signed a five-year contract with the Oklahoma Water Resources Research Institute (OWRRI) at Oklahoma State University to coordinate the public input activities for the update of the Oklahoma Comprehensive Water Plan (OCWP). From April through November, 42 public input meetings were held across the state. More than 2,200 Oklahomans attended these meetings and submitted more than 2,000 comments about water in Oklahoma - - what they thought was important, what they would like to see changed, what they would like to see remain the same, and where they think Oklahoma should be 50 years from now. The OWRB and OWRRI are currently planning and assembling teams for the next phase of public participation, regional input meetings that will be held in each of Oklahoma's 11 substate planning regions.

Also in 2007, the OWRB entered into a cost-share agreement with the US Army Corps of Engineers (USACE) through the Planning Assistance to States (PAS) program to begin the technical studies portion of the OCWP process. Through this agreement, the USACE has contracted with the engineering firm of Camp Dresser McKee (CDM) to develop a fundamental work plan that includes delineation of goals and objectives, a common technical platform to evaluate supply and demand, and a programmatic workplan. To facilitate these developments, OWRB and CDM have met with several key partners to

receive feedback. Through the PAS agreement, the OWRB and others will also be working with CDM on the development and distribution of a survey to provide baseline information for characterizing existing conditions and future supply and infrastructure needs of individual water providers. Additionally, a water system infrastructure mapping pilot project will be completed for Pontotoc County with the hope the effort can be extended to the majority of water systems in Oklahoma.



In late 2007, the Water Board received welcome news regarding passage of the Water Resources Development Act (WRDA) of 2007. This federal legislation, crucial to the development and completion of a truly comprehensive water plan for Oklahoma, contains authorization of up to \$6.5 million to be used specifically for the OCWP. Also, the 2008 federal omnibus appropriations bill included money for studies to be performed as a part of the OCWP process, including the Southeast Study, Washita Study, and Planning Assistance to States.

Arbuckle-Simpson Hydrology Study

The five-year Arbuckle-Simpson Hydrology Study remains on schedule for completion by the end of 2008. While the first three years of the study were devoted to monitoring efforts and conducting field investigations, the primary focus of the fourth year (2007) was developing methods to assess impacts of groundwater withdrawals on streamflow. Several noteworthy accomplishments were made in 2007:

- An instream flow assessment was initiated to quantify fish habitat in spring runs of the Blue River and Pennington Creek.
- A river-basin network model was developed to assess the impact of groundwater withdrawals on downstream surface water rights.
- A three-dimensional geologic framework model was developed to gain a better understanding of the hydrologic connectedness of the water-bearing units across fault zones and provide the geologic framework for groundwater flow models.
- Rainfall-runoff modeling of the Blue River and Clear Boggy Creek watersheds was conducted to identify components of the hydrologic water balance, especially streamflow and recharge. The model results, which simulate the runoff component of the stream hydrograph, will be coupled with the groundwater flow model to simulate the total streamflow hydrograph.
- Digital groundwater flow models of the eastern portion of the aquifer were developed to test our understanding of the aquifer and predict the consequences of aquifer-scale groundwater withdrawals on streamflow.
- A 300-year tree-ring chronology was developed and used to reconstruct streamflow, precipitation, and temperature of the region.
- Several geophysical techniques (including gravity and magnetic surveys, seismic testing, electrical resistivity imaging, and helicopter electromagnetic surveys) were used to characterize the subsurface

geology and evaluate groundwater flow through the highly faulted, structurally complex, carbonate aquifer.

- An investigation of the geochemistry of the Arbuckle-Simpson aquifer was completed. Analysis of water samples collected from 32 wells and springs were used to characterize the groundwater in the aquifer and to improve understanding of the groundwater flow system.
- Potentiometric surface maps of the aquifer were created from water level measurements. Subsurface watersheds (the area within the aquifer that contributes groundwater to a certain point) were then delineated from the potentiometric maps, revealing that some subsurface watersheds are substantially different from the surface watersheds.

The last year of the investigation will be devoted to writing reports, conducting computer simulations, evaluating various water management options, disseminating information, and soliciting input from stakeholders. After reviewing the study results, OWRB staff will submit management recommendations to OWRB members for determination of the allocation of water rights. As directed by SB 288, the Board must approve a maximum annual yield that will not reduce the natural flow of water from springs or streams emanating from the aquifer.

For more information about the Arbuckle-Simpson Hydrology Study, visit the Study's Web page: http://www.owrb.ok.gov/studies/groundwater/arbuckle_simpson/arbuckle_study.php.

Annual Report

2007

Water Quality Programs

The OWRB continued to refine water quality monitoring in 2007 to address emerging water quality issues. This involved integrating biological sampling into the Beneficial Use Monitoring Program (BUMP) in order to more fully implement a holistic monitoring program for Oklahoma. Additionally, stream gaging increased greatly to address use support questions and provide needed information on water quality and quantity issues. Further improvements to agency gaging activities are expected to continue into 2009 and beyond.

A three-year successful partnership with the Grand River Dam Authority (GRDA) continues to grow as OWRB staff now begin working at Lake Hudson. With bathymetric mapping of the lake nearing completion, the OWRB is also providing detailed dissolved oxygen monitoring to support FERC relicensing. Additionally, Oklahoma Water Watch has been contracted to assist at Lake Hudson with volunteer monitoring.

During the summer of 2007, 52 randomly selected Oklahoma lakes were sampled by the OWRB in partnership with the EPA as part of a statewide assessment of Oklahoma Lakes. The data collected will also contribute to EPA's regional and national assessment of lake conditions.

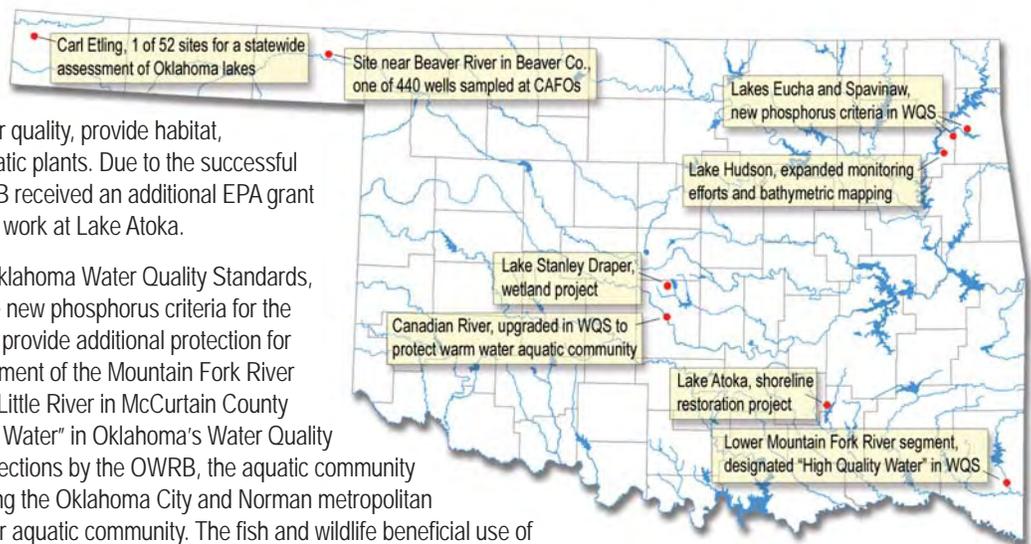
The OWRB partnered with Oklahoma City's Water and Wastewater Utilities, EPA, and the Oklahoma Department of Wildlife Conservation for a multi-year, federally funded wetland project at Lake Stanley Draper to enhance water quality, provide habitat, and beautify the lake by introducing aquatic plants. Due to the successful partnership at Stanley Draper, the OWRB received an additional EPA grant award to perform similar lake restoration work at Lake Atoka.

Included in the triennial revision of the Oklahoma Water Quality Standards, approved by the EPA in November, were new phosphorus criteria for the waters in Lakes Eucha and Spavinaw to provide additional protection for the City of Tulsa's water supply. The segment of the Mountain Fork River extending from State Highway 70 to the Little River in McCurtain County was given a designation of "High Quality Water" in Oklahoma's Water Quality Standards. As a result of routine fish collections by the OWRB, the aquatic community of the Canadian River segment bracketing the Oklahoma City and Norman metropolitan area was shown to support a warm water aquatic community. The fish and wildlife beneficial use of the Canadian river was consequently upgraded in Oklahoma's Water Quality Standards to provide protection appropriate for the warm water aquatic community.

As part of an ongoing partnership with the EPA, the Office of the Secretary of the Environment, and the Oklahoma Department of Agriculture, Food, and Forestry, the OWRB sampled 440 groundwater wells in 2007 at Concentrated Animal Feeding Operations (CAFOs) to assure that groundwater and surface water are not being contaminated by waste.

2007 Expenditures & 2008 Budget

Fund Name	FY 2007 Expended	FY 2008 Budgeted
General Appropriations	\$4,545,149.31	\$4,609,796.00
Drillers & Installers Indemnity Fund	4,905.00	50,000.00
Rural Economic Action Plan (REAP) Fund	764,020.07	475,201.00
Water Resources Revolving Fund	335,451.63	458,140.00
Drillers & Installers Regulation Fund	25,924.78	14,841.00
Water Infrastructure Development Fund	291,192.60	2,082,594.00
Federal Funds-OWRB	1,618,611.62	2,539,867.00
Federal Funds-OSE	8,384,993.65	9,531,774.00
Environmental Remediation Fund		18,000.00
USGS Cooperative Agreement	564,413.00	278,800.00
Interagency Reimbursement Fund	1,219,001.87	1,359,892.00
DW Loan Administration Fund	341,331.94	729,936.00
CW Loan Administration Fund	1,021,574.14	987,888.00
CW Loan Fund	61,048.30	350,000.00
	19,177,617.91	23,486,729.00
Activity Name		
Administration	2,350,702.24	2,594,857.00
Water Quality	3,717,660.94	3,591,708.00
Financial Assistance	1,669,867.36	2,610,088.00
Planning & Management	2,885,441.22	4,950,446.00
Secretary of Environment	8,553,946.15	9,739,630.00
	\$19,177,617.91	\$23,486,729.00



Financial Assistance Program

During 2007, the OWRB's Financial Assistance Division provided approximately \$68.6 million in loans and \$2 million in grants to Oklahoma communities for water and wastewater infrastructure projects, bringing the total for all OWRB financing to almost \$1.7 billion since 1985. Five programs, including Emergency and Rural Economic Action Plan (REAP) grants, Clean Water (CWSRF) and Drinking Water State Revolving Fund (DWSRF) loans, and State Revenue Bond loans, feature diverse financing options to meet the needs of both small and large communities and rural districts.

The OWRB's loan programs provide financing at up to 40% below the market interest rate with up to a 30-year repayment term. In 2007, the CWSRF program generated a cumulative return of \$2.32 for every federal dollar expended. It is anticipated that the State Revenue Bond Loan (FAP) program will continue to provide market rate funding and the CWSRF and DWSRF will continue to provide loans at 40% and 30% below the market rate, respectively, through continued leveraging of federal capitalization dollars and revolving financing structures.

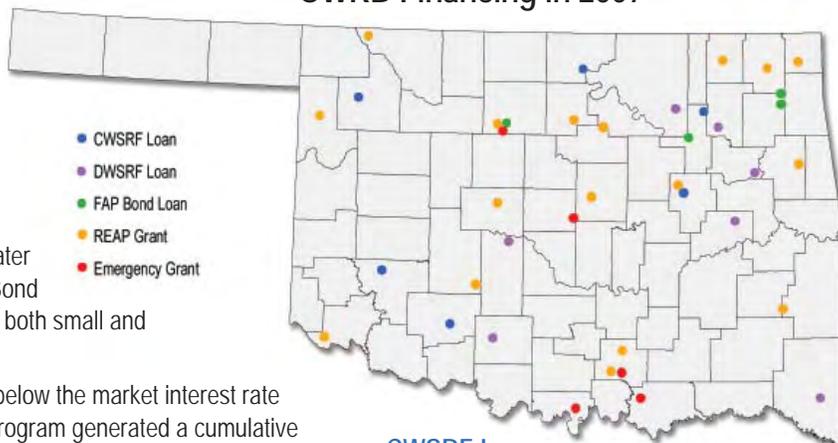
Through CWSRF and DWSRF loans approved in 2007, \$26.1 million and \$13.1 million, respectively, will be used to construct wastewater and water system improvements required to comply with Oklahoma Department of Environmental Quality and US Environmental Protection Agency (EPA) permit orders to eliminate contaminants discharged into state waters as well as to comply with human health criteria. \$16.6 million will go toward the treatment of discharge into priority stream segments, which are provided additional protection under Oklahoma's water quality standards, to ensure adequate treatment levels to safeguard high quality or highly vulnerable waters.



During 2007, progress was made in expanding project eligibility to polluted runoff control, source water protection, and water conservation and reuse activities and infrastructure. During the year, the Oklahoma Conservation Commission promulgated emergency rules for reviewing proposed CWSRF projects for consistency with the State's Nonpoint Source Management Program and the EPA issued draft guidance outlining expanded uses of the fund.

As a result of these actions, the City of Tulsa requested \$1.25 million in funding to purchase permanent conservation easements from landowners along streambanks in the Lake Eucha/Spavinaw basins, the city's primary drinking water source, as a means to lessen the amount of pollutants entering contributing waterways and thus reduce drinking water treatment costs. These loan funds, combined with state funds, will also be considered as required matching funds and will allow the state, through the Conservation Commission, to access an estimated \$9.77 million in federal dollars to establish the Conservation Reserve Enhancement Program in Oklahoma.

OWRB Financing in 2007



- CWSRF Loan
- DWSRF Loan
- FAP Bond Loan
- REAP Grant
- Emergency Grant

CWSRF Loans

Tulsa MUA	\$5,131,177
Collinsville MA	\$1,370,000
Beggs PWA	\$2,170,000
Hobart PWA	\$1,040,000
Woodward MA	\$1,400,000
Lawton WA	\$10,420,000
Ponca City UA	\$5,565,000

DWSRF Loans

Osage Co. RWMD #15	\$2,953,170
Tuttle PWA	\$3,400,000
Wagoner Co. RWD #7	\$1,850,000
McCurtain Co. RWD #8	\$4,806,000
Rogers Co. RWD #5	\$4,700,000
Duncan PUA	\$7,755,000
Checotah PWA	\$5,360,000

FAP Loans

Tulsa MUA	\$8,800,000
Garfield Co. RWSD #5	\$200,000
Langley PWA (2 loans)	\$1,785,000

REAP Grants

Garfield Co. RWSD #5	\$99,999
Talihina PWA	\$99,999
Cement PWA	\$89,999
Eldorado PWA	\$97,300
Beggs PWA	\$150,000
Woods Co. RWD #2	\$30,900
Canadian Co. RWSSWMD #4	\$100,000
Delaware PWA	\$99,990
Lincoln Co. RWD #3	\$79,999
Cherokee Co. RWD #8	\$99,999
Lone Chimney WA	\$99,990
Ravia PWA	\$79,999
Craig Co. RWD #1	\$150,000
Ellis Co. RWD #1	\$150,000
Noble Co. RWD #2	\$99,999
Ottawa Co. RWSSWMD #6	\$70,000
Johnston Co. RWSSWMD #4	\$99,900

Emergency Grants

Harrah	\$70,000
Marietta PWA	\$29,325
Tishomingo MA	\$65,000
Garfield Co. RWSD #5	\$100,000
Bryan Co. RWSSWMD #2	\$55,000

Dam Safety Program

This year's near record-setting rains caused damage to several dams in Oklahoma. Some dams suffered damage to the earthen embankment and spillways, whereas other dams collapsed. Dam Safety Program staff of the OWRB travelled to numerous sites to offer assistance and advice.

One example of an affected dam was SCS-Sugar Creek Site L44, a high hazard dam in Caddo County. When floodwaters began to overtop the dam, causing a collapse of a downstream portion of the earthen embankment, Natural Resources Conservation Service personnel forced a controlled breach of the dam in an effort to save it from a total collapse. Area residents downstream from the dam were alerted and evacuated in order to alleviate possible flooding and loss of life.

Well Driller & Pump Installer Program

The OWRB licensed 28 new drilling/pump installation firms and 56 new operators in 2007, and processed license renewals for 180 existing firms. Approximately 7,700 new well reports were entered into the OWRB well log database and maintained by OWRB staff. In cooperation with the Oklahoma Ground Water Association, the OWRB cohosted five regional workshops and a two-day trade show and conference, which provided continuing education credits for approximately 325 licensed operators.

OWRB Legal Issues Update

Sardis Lake Litigation

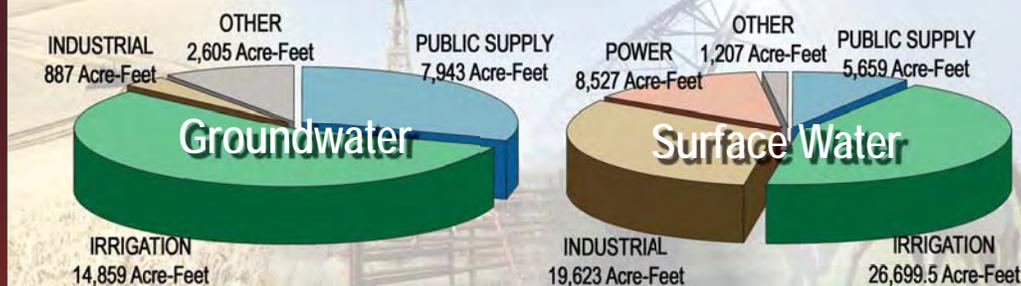
On January 5, 2007, the U.S. denied review of a federal 10th Circuit Court of Appeals' decision involving Sardis Lake. In July 1998, the U.S. filed a lawsuit in the federal district court in Tulsa, claiming that the State of Oklahoma had breached a 1974 contract with the Corps of Engineers calling for the repayment of the costs of water supply storage in Sardis Lake, located in Pushmataha County. The State of Oklahoma made several annual payments after the lake was completed in 1983, but then the State Legislature decided to take advantage of a provision in the 1974 contract which indicated that the contract did not obligate the Legislature to appropriate funds. In May 2005, the federal district court in Tulsa determined that the 1974 contract was valid and enforceable. On appeal to the 10th Circuit court, the court affirmed the district court's order. The U.S. Supreme Court refused to review the case.

In ongoing discussions with the federal Department of Justice, the state has agreed to seek funding to make a one-time lump sum payment for the present use storage costs, now estimated to be approximately \$38 million.

Tarrant Regional Water District Litigation

Also in January 2007, the Tarrant Regional Water District, located in north Texas, filed applications to divert 460,000 acre-feet of water from three different stream systems through diversion points in Oklahoma. In 2002, the Oklahoma Legislature enacted a moratorium against the sale or use of water from Oklahoma in another state. The Tarrant Regional

Permitted Water in 2007



Floodplain Management Program

FEMA has recognized nine disaster declarations in Oklahoma this year, leaving California as the only State to have more. Record rainfall in parts of Oklahoma lead to flooding in most counties with Ottawa County and the City of Miami hit the hardest. More than 800 homes sustained flood damage in Ottawa County with over 600 of those in Miami alone. Local officials assessed damages and mitigated many of the structures located in the floodplain, trying to break the cycle of repetitive flood loss in this area.

The OWRB continues to educate local Floodplain Administrators (FPAs) through its Accreditation and Training Program. With 378 Oklahoma communities participating in the National Flood Insurance Program (NFIP), the state's training cadre works diligently to assure all FPAs are accredited on an annual basis.

Water District filed a lawsuit in the federal district court in Oklahoma City against named members of the OWRB asking the court to declare that Oklahoma's moratorium was unconstitutional because it restricted interstate commerce relating to water. The Oklahoma Attorney General decided to represent the Board members.

In October 2007, the federal district judge denied the Board members' motion to dismiss. The Attorney General filed an appeal of the district court's decision with the 10th Circuit Court of Appeals.

Meridian Aggregates Groundwater Permit Litigation

In July 2007, the Murray County District Court issued an order affirming most of the findings of fact, conclusions of law and order issuing a permit to Meridian Aggregates in 2006. The district court determined that the Board's order was supported by the evidence and law, except on one point. The court interpreted the exemption in the Oklahoma Groundwater Law to apply to the quarry pit being mined by Meridian Aggregates. Accordingly, the court decided that the Board's order requiring Meridian Aggregates to obtain a groundwater permit before using water from the quarry pit was not supported by the law. Meridian Aggregates, local municipalities, a master conservancy district and the Water Resources Board appealed the district court's ruling to the Oklahoma Supreme Court.

Water Conservation Essay Emphasizes Xeriscaping

The Oklahoma Water Resources Research Institute, the Oklahoma Water Resources Board and 4-H Clubs of Oklahoma would like to thank all of the students who participated in the Oklahoma Comprehensive Water Plan Water Conservation Essay Contest. The 141 essays that were submitted had several innovative ideas as well as new takes on old ideas that will be submitted to the OWRB as part of the state's Comprehensive Water Plan. Winners were recognized in October at the OWRB 50th Anniversary Banquet.

Jo Eike of Fargo, Oklahoma, was the first place winner for 9-10th grade. Her essay is presented below:

Drought

I watched our pastures turn brown. We sold part of the cattle herd and struggled to keep the remaining cows watered and fed. Then range fires; when we went to town we wondered if our home would still be there when we returned. Finally, the rains came and almost overnight the grasses turned green and the wildflowers began blooming. It was a beautiful sight.

While we cannot control the weather, management of our water and plant resources is crucial to our survival. I enjoy visiting my grandparents' old homestead and I have noticed the plants and trees that they used to beautify and shade their home. Their heirloom varieties of iris, roses, lilacs and fruit trees are still surviving in Oklahoma's climate with no special care. People take pride in a beautifully landscaped home.

However, the plant choices we make can impact our land and water use for decades. That is why it is so important that people know how to use the best plants and grasses for our climate. Since it is estimated that over 50 percent of residential water use is for landscape watering, there is tremendous potential for water conservation, if we can combine the use of native and drought-tolerant plants and grasses, with minimal irrigation for urban and residential landscaping. As our state becomes more urban, the demands on Oklahoma's water will be even greater.

A wealth of information on xeriscaping, native grasses and irrigation technology is readily available. The problem is that the information on the importance of water conservation is not being effectively communicated to the citizens of Oklahoma. And even when citizens want to conserve water, they may not know what steps they personally need to take. By creating an education program, we can get the information on the importance of water conservation to all of our citizens and show them how to landscape with drought tolerant plants and grasses, and use irrigation efficiently.

This education program must include Oklahoma's schools. Our future leaders need to know how to conserve our water and how to landscape properly for our climate. Schools can also set a good example for water-efficient landscaping and other conservation measures, so that our education dollars won't be spent wasting water. Oklahomans enjoy an outstanding quality of life, but continuing to use water guzzling turf grass varieties and exotic plants will strain our water resources. We must develop a program to educate our citizens on how to conserve and protect our precious water resources for future generations.



Jo Eike (Fargo), first place winner of OCWP essay contest

2007 Centennial Edition of the Oklahoma Water Atlas

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Aquatic Nuisance Species Threaten Oklahoma Waters

The threat posed by non-native invasive aquatic species to the ecological integrity of Oklahoma lakes and streams is both real and immediate. Many of these species look harmless, and may even be considered attractive or desirable, but they can upset an entire ecosystem by choking out native plants, reducing fish habitat, decreasing water flow, stressing oxygen levels, out competing native species for limited food supplies, fouling beaches, producing harmful by-products, including nutrients, and a variety of other means that are damaging to the environment.

Non-indigenous aquatic organisms that have invaded and colonized Oklahoma waters include a variety of species. According to the Oklahoma Department of Wildlife



Conservation (ODWC), fish kills caused by **golden algae** (*Prymnesium parvum*) have occurred in the Red River and in Lake Texoma. Left unchecked, golden algae are capable of decimating fisheries.



Alligator weed (*Alternanthera philoxeroides*) is an aquatic mat-forming perennial that may sprawl along shorelines or cover the water surface, preventing flow, blocking up drainage channels and potentially increasing flood damage. Weed mats can also reduce oxygen exchange, which poses a threat to native organisms and reduces water quality.

In recent years, Alligator weed has made its way into residential ponds and lakes in the Metropolitan Oklahoma City area.

Eurasian Water Milfoil (*Myriophyllum spicatum*), a submersed, rooted perennial with branching stems, inhabits reservoirs, lakes, and ponds, and closely resembles native "coontail". It can quickly grow into dense mats that shade out native plants, reduce fish habitat, and limit recreational use. It is present in Oklahoma in several reservoirs, including Fuqua and Longmire.



Curly Pondweed (*Potamogeton crispus*) grows profusely until mid summer before dying off and providing a large crop of food for bacteria, which stress oxygen levels and release nutrients for algae growth.



Hydrilla (*Hydrilla verticillata*) causes major problems with water use by greatly reducing flow and causing clogging, which can result in flooding and damage to canal banks, structures, and pumps. Hydrilla, which can also interfere with boating, water skiing, and swimming, is known to occur in Arbuckle, Murray, and Sooner Lakes.

A complete list of these and other declared noxious aquatic plant species is available at <http://www.wildlifedepartment.com/aquaticplants.htm>.

In addition to these plants, aquatic nuisance species include many fish and invertebrates. **Zebra mussels** (*Dreissena polymorpha*) currently inhabit several systems in northeast Oklahoma and new infestations are being found annually. Zebra mussels can reduce aquatic productivity, foul beaches with their sharp shells, and clog pipelines, locks and dams, and outboard motors.

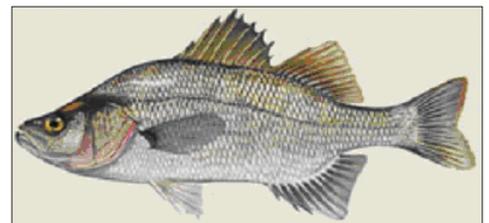


A more recent invader to Oklahoma is the **Bighead carp** (*Hypophthalmichthys nobilis*), which has been found in the Neosho River, Red River, and Grand Lake. This species has the potential to deplete zooplankton populations,



leading to reductions in populations of native species that rely on plankton for food. The ODWC has information on this fish and other Asian carp species in Oklahoma and what to do at <http://www.wildlifedepartment.com/asiancarp.htm>.

Also causing great concern is the **White perch** (*Morone americana*), which can quickly become the dominant species in freshwater lakes and is associated with declines in both walleye and white bass populations. The species is now established in Kaw Lake and populations have spread into Sooner and Keystone Lakes with continued migration downstream throughout the Arkansas River basin.



These are only a few of the many species that are a concern in Oklahoma. To learn more, visit the ODWC Aquatic Nuisance Species Web page at <http://www.wildlifedepartment.com/nuisancespecies.htm>.

Drought Update

Reservoir Storage

As of January 2, 10 reservoirs (of 31 selected major federal reservoirs across Oklahoma, see right) are operating at less than full capacity, according to information from the U.S. Army Corps of Engineers (Tulsa District); 10 reservoirs have experienced lake level decreases since December 3.

Palmer Drought Severity Index

According to the latest Palmer Drought Severity Index (November 3, bottom), state drought conditions continue to improve. No climate divisions are currently experiencing drought conditions. Only one of Oklahoma's nine climate divisions has undergone a PDSI moisture category decrease since December 1.

Standardized Precipitation Index

The latest monthly Standardized Precipitation Index (through November, bottom) reflects slight dryness in the Panhandle and southern Oklahoma. Among the selected time periods (3-, 6-, 9- and 12-month SPIs), the Northwest, Southwest, and South Central regions report dry conditions.



Storage in Selected Oklahoma Lakes & Reservoirs (January 3, 2008)

LAKE	Change in Elevation (feet) 12/3/07-1/3/08	Current Flood Control Storage (acre-feet)
North Central (2)		
Fort Supply	-0.04	338
Great Salt Plains	0.10	3,273
Kaw	1.97	7,679
Northeast (3)		
Birch	0.48	57
Copan	0.34	3,575
Fort Gibson	2.83	32,900
Grand	-0.09	-134,560
Hudson	0.62	10,276
Hulah	1.92	13,536
Keystone	2.16	43,555
Oologah	2.31	95,586
Skiatook	0.39	-6,961
West Central (4)		
Canton	-0.04	1,826
Foss	-0.11	-3,474
Central (5)		
Arcadia	0.25	818
Heyburn	0.23	284
Thunderbird	0.55	4,514
East Central (6)		
Eufaula	0.94	-48,219
Tenkiller	-0.11	8,515
Southwest (7)		
Fort Cobb	-0.10	2,959
Lugert-Altus	1.29	-38,611
Tom Steed	-0.12	-4,766
South Central (8)		
Arbuckle	-0.10	-951
McGee Creek	0.18	-1,334
Texoma	-0.17	-89,722
Waurika	0.26	4,055
Southeast (9)		
Broken Bow	-1.43	-25,316
Hugo	2.64	66,254
Pine Creek	3.14	13,214
Sardis	0.65	6,103
Wister	2.56	19,657

Standardized Precipitation Index (through November 2007)

Palmer Drought Severity Index

CLIMATE DIVISION	3-month	6-month	9-month	12-month	December 29, 2007
Northwest (1)	Very Dry	Moderately Dry	Near Normal	Near Normal	Near Normal
North Central (2)	Near Normal	Moderately Wet	Very Wet	Very Wet	Very Moist Spell
Northeast (3)	Near Normal	Moderately Wet	Very Wet	Very Wet	Moist Spell
West Central (4)	Near Normal	Very Wet	Extremely Wet	Extremely Wet	Extreme Moist Spell
Central (5)	Near Normal	Extremely Wet	Extremely Wet	Extremely Wet	Extreme Moist Spell
East Central (6)	Near Normal	Moderately Wet	Near Normal	Near Normal	Moist Spell
Southwest (7)	Moderately Dry	Very Wet	Very Wet	Very Wet	Very Moist Spell
South Central (8)	Moderately Dry	Moderately Wet	Moderately Wet	Very Wet	Moist Spell
Southeast (9)	Near Normal	Moderately Wet	Near Normal	Moderately Wet	Unusual Moist Spell

For more drought information, and to obtain updated information on Oklahoma's drought and moisture conditions, go to www.owrb.ok.gov/supply/drought/drought_index.php.

www.owrb.ok.gov

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The mission of the Oklahoma Water Resources Board is to manage and protect the water resources of the state and plan for Oklahoma's long-range water needs in a responsive, innovative, and professional manner to ensure that all Oklahomans have adequate quantities of good water.



4th Quarter 2007

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FINANCIAL ASSISTANCE PROGRAM UPDATE

Loans & Grants Approved as of December 11, 2007

FAP Loans—321 totaling \$629,870,000

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 very competitive interest rates, averaging approximately 4.762 percent since 1986.

CWSRF Loans—184 totaling \$652,022,629

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—72 totaling \$330,340,542

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—477 totaling \$43,118,924

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—534 totaling \$31,339,017

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

Drought Response Program Grants—3 totaling \$300,000

Through the OWRB's Drought Response Program, limited funding is available for communities in most dire need during state drought emergencies declared by the Governor. A maximum of \$300,000 is diverted from existing OWRB Emergency Grant funds to establish the Program.

Total Loans/Grants: 1,591 totaling \$1,686,991,112

Estimated Savings: \$530,724,228

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.

**For more information, call 405-530-8800
or go to www.owrb.ok.gov/financing.**