

2001 Annual Report

Oklahoma Water Resources Board



2001 Annual Report

Oklahoma Water Resources Board

OKLAHOMA WATER RESOURCES BOARD

3800 N. Classen
Oklahoma City, OK 73118
(405)530-8800
(405)530-8900 FAX

Visit the OWRB Web site at
www.owrb.state.ok.us

Welcome

OKLAHOMA WATER RESOURCES BOARD

Grady Grandstaff, *Chairman*; Richard C. Sevenoaks, *Vice Chairman*; Ervin Mitchell, *Secretary*
Lonnie L. Farmer, Richard McDonald, Bill Secrest, Dick Seybolt, Wendell Thomasson, Harry Currie

Brian Vance, *Writer/Editor* • Darla Whitley, *Writer/Layout/Graphics*
Cover photo by Michael Hardeman; inside photos by OWRB staff.

This report, printed by Oklahoma University Printing Services, Norman, Oklahoma, was published by the Oklahoma Water Resources Board as authorized by Duane A. Smith, Executive Director. Seven hundred copies have been printed and distributed at an approximate cost of \$1.90 each. Copies have been deposited at the Publications Clearinghouse of the Oklahoma Department of Libraries.

BOARD MEMBERS



Grady Grandstaff
Chairman



Richard Sevenoaks
Vice Chairman



Ervin Mitchell
Secretary



Harry Currie



Wendell Thomasson



Dick Seybolt



Lonnie Farmer



Bill Secrest



Richard McDonald

ORGANIZATIONAL CHART



TABLE OF CONTENTS

Introduction	5
Administrative Services Division	7
Planning and Management Division	9
Financial Assistance Division	13
Water Quality Division	15



I

NTRODUCTION

From the Director:

2001 was a landmark year for the OWRB in furthering our directive to manage and protect Oklahoma's surface and groundwater resources and enhance our standing as Oklahoma's water agency. The agency's Strategic Plan again proved to be an invaluable tool in guiding our water use administration and protection efforts.

Perhaps the most significant legislative development in 2001 was passage of House Bill 1480 in response to a Supreme Court decision in 2000 that required the Board to consider the ultimate use of water in the "waste by pollution" aspect of its groundwater use permit deliberations. HB 1480 clarifies the role of the OWRB and other state agencies in the permitting of confined animal feeding operation (CAFO) facilities. It precludes the OWRB from making waste by pollution determinations on groundwater use applications related to activities under jurisdiction of the Department of Agriculture and/or Department of Environmental Quality. Although this measure appears to limit our involvement in the waste by pollution matter, the ODA, DEQ, and OWRB will continue to work in close partnership to ensure that any proposed or ongoing water use activity is conducted in a manner that sufficiently protects the waters of the state.

The State Legislature again renewed their confidence in our renowned Beneficial Use Monitoring Program with a \$1.2 million dollar appropriation, a 20 percent increase from 2000. As a result, the program again made great strides in 2001. Direct legislative support also allowed the Board to participate with the Corps of Engineers in two significant studies. Staff studied the suitability of an offstream storage site on the Barren Fork River to augment instream flows and protect the stream's Scenic River status. Staff also cooperated with the Corps of Engineers to investigate potential construction of Mangum Reservoir and the recreation benefits it could provide western Oklahoma.

Water Board management and staff also made enormous headway in fulfilling a 2000 legislative mandate that required state environmental agencies to promulgate into rule how Oklahoma's Water Quality Standards, maintained by the OWRB, are addressed and adhered to through their individual programs. We will continue to modify our permitting, financial assistance, and other programs to best comply with Standards requirements.

As directed by Senate Concurrent Resolution 18, passed last year, the OWRB began pursuit of U.S. Supreme Court action against the State of Texas for violating terms of the Canadian River Compact. Texas' development of Palo Duro Reservoir (on Palo Duro Creek, a tributary of the Beaver-North Canadian River) in 1991, approximately 12 miles upstream from the Texas/Oklahoma state line, precludes water releases sufficient to satisfy Oklahoma's apportionment under terms of the 51-year-old Compact. Of specific concern are reduced flows for Canton Lake, a primary source of water for Oklahoma City on the



Duane A. Smith,
Executive Director

North Canadian River, which could be further impacted by a second proposed reservoir on a separate tributary of the North Canadian in Texas. The State of Oklahoma takes this court action following 10 years of talks with Texas water officials and after exhausting all possible remedies to the issue.

Acting on other legislation, HCR 1008, the OWRB has initiated early dialogue with the states of Nebraska, Colorado, Kansas, New Mexico, and Texas, as well as appropriate federal agencies and organizations, to form a High Plains Ogallala Aquifer Compact. This Compact would represent a first-ever interstate agreement to preserve this vitally important, shared groundwater resource.

The 2001 election of new officers for the Water Board resulted in Grady Grandstaff replacing Lonnie Farmer as Chairman, Richard Sevenoaks remaining Vice Chairman, and Ervin Mitchell assuming Grady's Secretary position. These highly qualified Board members continue to face challenging and varied water issues as they lead the agency's decision-making process.

Undoubtedly, the most controversial task last year was the investigation of water supply development opportunities in southeast Oklahoma, especially potential marketing of the region's available supplies to Texas. Hand-in-hand with that effort, directed through HCR 1109 in 2000, was the Board's role as technical advisor to the Governor's Office and Choctaw and Chickasaw Tribes in developing the draft State/Tribal Water Compact. The goal of this document was not only to establish a first-ever cooperative water rights and water quality administration system throughout the two tribal territories, but to implement, through water sale revenues, much-needed economic development projects in the area.

Although discussions with Texas to establish a water marketing agreement were terminated in January 2002, we will continue to support the Governor's Office and Tribes in identifying promising water marketing and management opportunities in the southeast. We remain convinced that the draft State/Tribal Water Compact is an exceptional and worthwhile document that is imperative to the future, unimpeded use and development of waters within the Choctaw and Chickasaw Nation territories of southeast Oklahoma. The working relationship established between the state and Tribes has been outstanding, and the Compact itself, even in draft form, stands as a model for the future. Still unresolved are the state's outstanding water storage obligation for Sardis Lake, the vast need for water treatment and distribution systems in southeast Oklahoma, and future water supply for Oklahoma City and other central Oklahoma communities.

With more than 400 attendees, the 2001 Governor's Water Conference, in Oklahoma City, once again featured outstanding speakers with varied and insightful viewpoints on water rights, water quality, project financing, and other emerging issues in the water arena. The conference was highlighted by release of the draft State/Tribal Water Compact, with Governor Keating's Chief of Staff, Howard Barnett; Choctaw Chief Greg Pyle; and Chickasaw Governor Bill Anoatubby each commenting on its historical significance.



ADMINISTRATIVE SERVICES DIVISION

Employees of the Board's Administrative Services Division, including sections devoted to accounting, drafting and mapping, human resources, information services, and the reception area, again seamlessly implemented agency policies and programs during 2001.

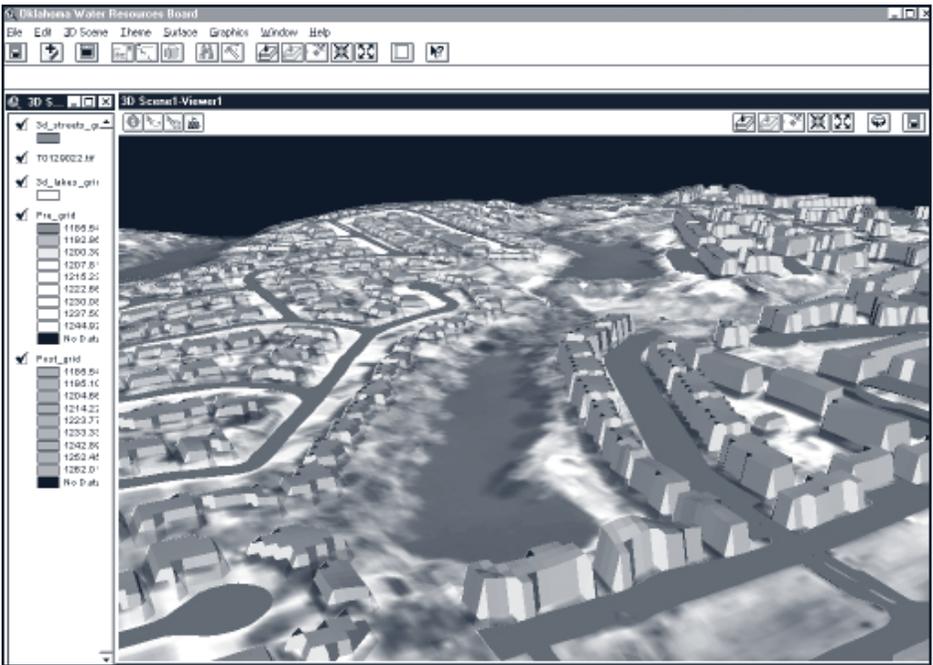
Accounting staff worked with administration to develop the comprehensive budget for FY2002 in compliance with statutory limits established by the Legislature and Governor and approved by the Board.

FY2002 BUDGET

FUND	FY99	FY2000	FY2001	FY2002
Constitutional Reserve (Rainy Day)	\$731,381	\$1,232,460	\$36,158	
State Appropriated Funds:	3,423,349	3,653,022	3,741,005	\$3,961,854
Carryover	207,893	340,740	94,140	
State Continuing/Revolving:				
205 Weather Modification Rev Fund	263,819	1,139,977	1,087,787	800,000
210 Well Drillers & Pump Installers Fund	818	34,374	23,711	21,700
225 Rural Economic Action Plan - Proj		24,022	1,055,502	1,640,700
240 Water Management Fund	352,704	272,120	279,297	326,000
245 Well Drillers and Installers Fund				20,000
420 USGS Cooperative Fund	293,575	187,850	129,680	120,000
443 Reimbursement Fund	1,111,483	1,273,621	1,141,928	1,701,824
444 Drinking Water Loan Admin Fund		58	353	92,126
445 Wastewater Facility Const Fund		446,834	490,343	749,652
472 WRF-SRF Account	20,008	2,403	220,545	500,000
Total Revolving Funds	2,042,407	3,381,259	4,429,146	5,972,002
400 Federal Funds	569,374	895,722	425,087	1,794,659
410 Federal Water Quality Management	3,465,128	4,768,211	3,756,477	6,667,079
Total Expenditures by Fund	\$10,439,532	\$14,271,414	\$12,482,013	\$18,395,594
ACTIVITY/NUMBER AND NAME				
01 Administration	1,802,566	2,167,943	1,991,873	2,638,020
02 Water Quality Programs	863,659	2,030,039	1,827,909	2,515,797
04 Financial Assistance	871,784	1,153,636	1,358,845	2,367,404
07 Planning & Management	3,121,054	2,698,435	2,084,850	3,230,684
08 Weather Modification		1,100,326	1,087,787	800,000
15 Office of Secretary of Environment	3,780,469	5,121,035	4,130,749	6,843,689
Total Expenditures by Activity	\$10,439,532	\$14,271,414	\$12,482,013	\$18,395,594

As the agency's first line of defense against e-mail viruses, IS staff implemented proactive security policies to protect valuable agency data and computer assets from hackers, viruses, and other security threats during 2001.

The Information Services unit also supervised imaging of more than 130,000 pages of water rights and well log documents, organizing an agency team to review the OWRB's records disposition schedule. Application/database development was also a priority to support important agency efforts, such as the Beneficial Use Monitoring, Water Quality Standards, and Clean Lakes Programs and the Lugert-Altus project.



The OWRB's GIS provides vital support for a variety of agency programs

The agency's Geographic Information System (GIS) staff completed bathymetric mapping and analysis of seven Oklahoma lakes, including Atoka, Draper, Hefner, McGee Creek, Overholser, Murray, and Thunderbird. GIS continued to play an important technical role in support of the Southeast Oklahoma Water Resources Development Plan and State/Tribal Water Compact through analysis of conceptual water marketing plans and related projects.

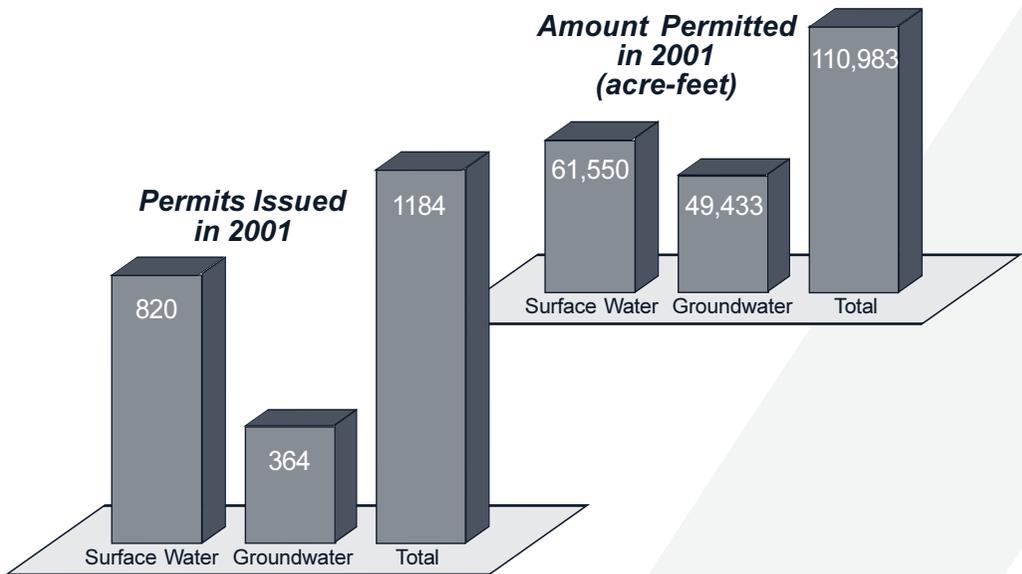
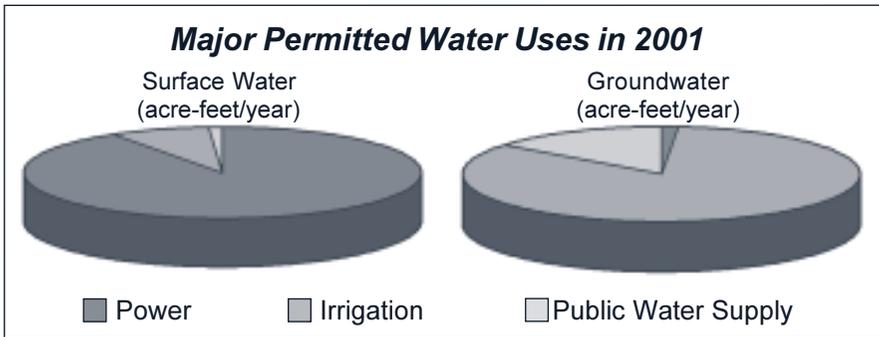
Staff continue to integrate GIS datasets from the 2000 Census to the OWRB GIS database. Last year, they also designed and conducted numerous GIS-related training classes for agency staff, including data collection and processing procedures, and demonstrated projects to members of the Legislature, universities, and various organizations. The IS unit also continued to represent the agency on the state's GIS Council, established to support implementation of GIS programs throughout various state agencies.

In cooperation with other select agency staff responsible for agency Web site development and maintenance, Information Services expanded and enhanced the Board's "presence" on the World Wide Web. Integral to future Web site development, staff compiled an exhaustive inventory of the agency's extensive data products, conducted a survey of water rights holders to establish their Internet usage, reviewed issues associated with hosting an in-house Web server, and prepared a detailed Web development plan to maximize interactivity between the agency and its customers. Two pilot Web development application projects were proposed in anticipation of site upgrade and redesign during 2002.

Permitting Section

Water use permitting, the foundation of the Board’s water management activities, was driven by yet another dry period in 2001. Permitting staff remained busy fulfilling the individual water needs of Oklahomans. Hundreds of water use permit applications were logged by staff in preparation for approval by the nine-member Water Board or the Executive Director, in the case of 90-day provisional temporary and “limited quantity” permits. Last year, 820 surface water and 364 groundwater permits were issued for 61,550 and 49,433 acre-feet, respectively. Electric power generation and irrigation were the most permitted uses of water during 2001, followed by public water supply.

Staff also administered and maintained approximately 12,000 stream and groundwater use permits on file at the agency, and provided an annual report of water use.



Technical Section

Technical Section staff completed several major studies in 2001 that have expanded agency knowledge of Oklahoma's water resources. These studies will allow staff to maximize amounts of water available for appropriation while reserving supplies for future use.



Plugging a water well in Hughes County

Last year, staff completed a minor groundwater basin study on the Boone Aquifer in northeast Oklahoma, as well as a 20-year update for the Tillman Terrace Aquifer in the southwest, which has undergone significant development in recent years. Staff also completed maximum annual yield determinations for the Ogallala Aquifer in the Panhandle and northwest counties. The Ogallala investigations were arrived at through detailed, comprehensive studies of

the hydrogeology and water-yielding characteristics in those areas of the formation. Specifically, the northwest study resulted in a tentative determination that the annual amount of fresh groundwater that can be safely withdrawn from the northwest Oklahoma region of the Ogallala (in portions of Dewey, Ellis, Harper, and Woodward Counties) is 1.4 acre-foot per acre of land. The allocation supplants the temporary amount of 2 acre-feet per acre of land. The second study, specifically for the Panhandle counties of Beaver, Texas, and Cimarron, establishes a regular permit allowance of 2 acre-feet, which is identical to the existing, regular amount for Texas County (established in 1985) and the current, temporary allocation for Cimarron and Beaver Counties. In addition, a complex groundwater flow model was developed in cooperation with the U.S. Geological Survey to support the studies. The Oklahoma Groundwater Law requires the OWRB to determine maximum annual yields for all state groundwater basins.

Technical staff also assisted the Water Quality Division in evaluating the groundwater component of the Eucha-Spavinaw Study and teamed to develop the early stages of the Beneficial Use Monitoring Program's groundwater monitoring component.

Planning Section

In addition to making initial preparations for the 2005 update of the *Oklahoma Comprehensive Water Plan*, the OWRB's Planning Section coordinated several projects with the Tulsa District of the U.S. Army Corps of Engineers funded through the Corps' Planning Assistance to the States Program. A study on the feasibility of a regional sewer system in the Lake Texoma area of south central Oklahoma was completed in November. Other ongoing Planning Assistance studies included an investigation of a regional water treatment and distribution

system in the Kaw Reservoir area of north central Oklahoma and a study on water management strategies for the Oologah Lake watershed in northeast Oklahoma. Projects initiated in 2001 include an investigation of water supply alternatives for Adair County Rural Water District Number 5 and geotechnical work at the proposed Mangum Reservoir site in southwestern Oklahoma.

In support of state efforts to investigate water development opportunities in the southeast, the Corps and OWRB also entered into a feasibility cost-sharing agreement in 2001 for a comprehensive study of southeast Oklahoma's water resources. This indepth 10-year study, authorized by Congress under the Corps' general investigations authority, focuses on the Kiamichi River Basin but includes adjacent watersheds in the region that collectively produce more than 6 million acre-feet of water each year. Phase One, scheduled for completion in early 2002, focused on water availability analyses and interstate compact requirements.

As part of the OWRB's directive to promote the safety of numerous non-federal dams existing throughout Oklahoma, Planning Section staff hosted a seminar on Plant and Animal Penetrations of Earthen Dams in December. Attended by more than 80 engineers, inspectors, dam owners, and others interested in various aspects of dam safety, the workshop served to increase understanding of dam safety issues associated with plant and animal penetrations of dams and provide guidance on remedial and preventative measures.

In June 2001, the State of Oklahoma was presented with the Tom Lee State Award of Excellence for the quality of its floodplain management program. The award was presented by the Association of State Floodplain Managers (ASFPM) at the organization's annual conference in North Carolina. Also at the meeting, the organization presented the first John Ivey Award for Superior Certification Program to the Oklahoma Floodplain Managers Association for superior efforts in floodplain managers' certification. OFMA, supported by the OWRB through the agency's state floodplain management coordination efforts, established the first nationally accredited, certified floodplain manager (CFM) program in the U.S. Oklahoma currently boasts 107 CFMs.

The OWRB also coordinates state efforts under the National Flood Insurance Program, including the floodplain management activities of 363 member communities throughout Oklahoma. Reflecting federal initiatives, last year the agency integrated a new "no adverse impact" floodplain approach that focuses on responsibility, community involvement and planning, sustainable development, and local land use management, while preserving private property rights.

In a renewed effort to provide accurate and reliable data on the state's rural water systems and reflect recent growth that has occurred among those systems, the Planning Section initiated an update of the *Oklahoma Rural Water Survey* in 2001. Questionnaires requesting background water system information and maps to update locations of system facilities were mailed to some 800 system operators throughout the state. Resulting information will be updated for inclusion in the new publication. The update will provide

important water planning benefits through the identification of potential regionalization opportunities and sources of water supply for new or expanding industry.

Last June, the Oklahoma Weather Modification Program (OWMP) suspended operations due to insufficient funds. The 2001 program, initiated March 1, was slated to continue statewide operations uninterrupted through October 31. During the extremely active, 16-week 2001 season, Weather Modification, Inc., the program's contractor since 1996, completed 136 flights totaling more than 334 hours. The three aircraft employed by WMI dispersed 481 kilograms of silver iodide through 13,574 ejectable and 1,213 burn-in-place flares. Approximately 446 gallons of silver iodide-acetone solution were distributed to promising cloud systems through aircraft wing-tip generators.

The Oklahoma Weather Modification Advisory Board (OWMAB), created in 1999, oversees the program while the OWRB has supervised daily operations since inception. The goal of the program is to demonstrate the effectiveness and applicability of cloud seeding technology in mitigating severe weather events, especially hail damage, and as a drought and water resource management tool. The OWRB closely monitors precipitation, soil moisture conditions, drought indices, crop moisture and stock pond water needs, harvesting requirements, flooding potential, and other essential factors to determine priority areas for both rainfall enhancement and hail suppression operations as well as stand-down areas where flight activities should be prohibited. Both the OWMAB and OWRB continue to seek sources for long-term funding of the effort.

Late in 2001, Congress approved \$2 million in funding for a weather damage modification program, administered by the U.S. Bureau of Reclamation. The goal of the effort, which will draw upon expertise and high-tech tools provided through the Oklahoma Weather Center at OU, is to conduct regional weather modification research involving states with operational cloud seeding programs. Congressman J.C. Watts was integral to passage of this important legislation.



An OWMP radar at Oklahoma City's Sundance Airpark

With consolidation of many state environmental programs in 1993, the OWRB became the state's only lending body specifically providing loans and grants to qualified entities for the construction, renovation, and replacement of water supply treatment and distribution systems and wastewater facilities. The Board's FAP Bond Loan program and Clean Water and Drinking Water State Revolving Fund loan programs were responsible for approximately 60 percent of all water/wastewater infrastructure project financing in the State of Oklahoma during 2001.

A frenetic demand for water and wastewater infrastructure, exacerbated by recent drought episodes and related water shortages affecting Oklahoma communities, especially in rural areas, provided the impetus for the Water Board's record \$110 million revenue bond



Installation of two new clarifiers near Pocola (funded by the CWSRF)

issue last September. This was the largest obligation issued by the state in 2001. The bond issue, approved by the nine-member Water Board at its July meeting, eclipses the previous record bond sale of \$109 million in 1994. Standard and Poor's exceptional 'AA' long-term rating, assigned to the 2001 revenue bond series, reflects the maturity of the OWRB's loan program, its excellent history of borrower repayment, strong financial management and oversight, and sound underwriting standards.

The Statewide Water Development Revolving Fund, the cornerstone of the agency's Financial Assistance Program (FAP) and bond loan program, was created by the State Legislature in 1979 through an initial \$25 million investment. From that seed money and subsequent development of additional funding programs, the Water Board has initiated almost \$931 million in state water and wastewater system improvements. Twenty-seven FAP bond loans for more than \$52 million were approved by the Board in 2001 for a wide variety of water and sewer projects. The tremendous popularity of the 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.

Through interest garnered from the Revolving Fund, the agency also approved 21 emergency grants for \$1.5 million during 2001. 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. The OWRB also offers water and wastewater system grants through the Rural Economic Action Plan (REAP)

Program, created by the State Legislature in 1996. REAP grants target primarily rural communities with populations of 7,000 or less, but priority is afforded to those with fewer than 1,500 inhabitants. In 2001, 49 REAP grants were awarded totalling \$4,256,109 in water/wastewater system improvements.

Two sister loan programs, the Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) Programs, complete the OWRB's financial assistance offerings. Created in 1988, the CWSRF Program was established to provide a renewable financing source for communities to draw upon for their wastewater infrastructure needs. Launched through \$14.5 million in legislative seed monies, and \$17.1 million in subsequent state match notes, the program has capitalized almost \$157 million in federal grant funds. The Board's CWSRF is Oklahoma's largest self-supporting wastewater financing program, providing more than \$429 million in low-interest loans to communities in need. During 2001, the OWRB approved 23 CWSRF loans totaling \$89.5 million, including the second largest loan in program history, to the Stillwater Utility Authority for \$20,280,000.

Two debt issues highlighted CWSRF program accomplishments during 2001. On April 11, the OWRB completed issuance of \$4.35 million in CWSRF Revenue Notes to provide state matching funds for FY2001 and FY2002 Capitalization Grants. Also, on August 15, the OWRB issued \$28.8 million in CWSRF Interim Construction Loan Revenue Bonds. The August bond issue represented the first time that the state has provided leveraged funds to meet its loan demand in excess of a state match or capitalization grant.

The 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. Last year, the Board awarded 10 DWSRF loans for \$33.3 million.

The Board's April 11 note issue, \$4,465,000 in DWSRF Revenue Notes, provided the required state matching funds for FY2000 and FY2001 federal capitalization grants. It marked the first time the OWRB had funded the program's state match through a debt issuance.

Finally, in a unique intra-divisional effort, the Financial Assistance Division utilized data collected through the agency's Beneficial Use Monitoring Program (BUMP) to evaluate the effectiveness of previously-funded CWSRF wastewater projects.

Water Quality Standards Section

During 2001, staff conducted extensive research to develop appropriate Water Quality Standards and Implementation language and rules pertinent to the agency's water management programs. Particular emphasis was placed upon development of biological thresholds, establishment of nutrient criteria, refinement of Use Support Assessment Protocol (USAP) procedures, and further development of increasingly important groundwater quality standards.

Biological thresholds for the determination of beneficial use support were developed for three more ecoregions in the state. These thresholds allow any entity to use a standardized biological collection protocol and a decision matrix published in the Water Quality Standards to determine whether or not the designated aquatic life beneficial use subcategory is being supported. Previous work accomplished in the Ouachita Mountains region laid the groundwork for this process.



Collecting invertebrates along a tributary of the Canadian River

Significant work was also accomplished to make groundwater protection more consistent between and among agencies that utilize Water Quality Standards in their decision-making processes.

In 2001, the agency proposed criteria to control the adverse impact of nutrients on Oklahoma waters. Limited to Oklahoma's Scenic Rivers, the effort focused on "anti-degradation implementation." Extensive research has provided a range of total phosphorus concentrations previously measured in unimpacted streams with undeveloped watersheds of similar size to the state's Scenic Rivers. As a result of widespread opinion and public sentiment, it was decided that these special waterbodies should be among the best 75 percent of these unimpacted streams, and an appropriate total phosphorus criterion for the Scenic Rivers was proposed by the OWRB. The agency will continue to work toward promulgation of nutrient criteria for all state waters.

With valuable assistance from other agencies and interested groups, staff also continued to investigate and develop wetland-related language, toxics criteria, biomonitoring requirements, mixing zone application, and several site-specific metals criteria.

Monitoring Section

Many notable changes and enhancements occurred during 2001, including the addition of monitoring parameters to the Beneficial Use Monitoring Program (BUMP), initiation of a pilot groundwater monitoring effort, and several new cooperative efforts with state and federal partners.



Collecting water samples from Lake Murray (BUMP)

The State Legislature allocated \$200,000 in additional monies to the BUMP, allowing a total of \$1.2 million to expand the program and pursue new monitoring initiatives. Results of 2001 sampling activities indicate that the majority of the state's lake and river resources were meeting their beneficial uses. Turbidity (solid materials, such as soil and algae) and low dissolved oxygen levels were the major factors limiting beneficial uses in state lakes.

The BUMP experienced an increase in the number of lakes sampled both annually and quarterly, resulting in a valuable increase in lake water quality information. Staff also initiated a cooperative effort with the USGS

to conduct flow monitoring on streams not currently monitored continuously by either state or federal agencies. Resulting information will help assess stream beneficial use support and prove integral to development of future priority environmental management activities of the state, such as determining Total Maximum Daily Loads (TMDL).

For the third consecutive year, in cooperation with counterparts at the Oklahoma Corporation Commission, OWRB staff sampled numerous state streams to determine the presence of adverse impacts attributable to oil and gas activities. In addition, the OWRB began working with the Oklahoma Department of Environmental Quality to sample selected waters on the state's 303(d) list to verify or refute the presence of beneficial use impairments. BUMP staff also worked with the Indian Nation Council of Governments (INCOG) to sample rivers and streams in the Tulsa area.

Staff continue to work with the OWRB's sister environmental agencies in updating and refining the state's 305(b) report to Congress, outlining the status of Oklahoma's water resources, and the state's 303(d) list of waters requiring a TMDL study.

Responding to an expanded monitoring role, the OWRB entered into a cooperative agreement with the Oklahoma Department of Agriculture to assist in groundwater monitoring of CAFO facilities. Staff initiated contact with the facility operators in anticipation of the implementation of the cooperative effort in 2002. In addition, BUMP staff began a pilot groundwater basin monitoring program to investigate water quality in the Cimarron Terrace of northwest Oklahoma with hopes that study results will demonstrate the worth of a permanent BUMP groundwater component in the near future.

The BUMP annual report, delivered to the State Legislature in March 2001, outlined results from the previous year's lake, river, and stream sampling activities and was well-received by both legislative members and the general public.

A full-time coordinator was assigned to the Oklahoma Water Watch (OWW) volunteer monitoring program, and the program benefited from more funding to increase knowledge and effectiveness of water quality monitors and enhance the quality of resulting data. A report on the "Status of Water Quality Monitoring" in Oklahoma was also completed and delivered to the legislature. The publication, a compendium of state and federal monitoring programs in Oklahoma, is a valuable tool for citizens and the legislature to use when making decisions on the protection and management of the state's valuable water resources.

Lakes and Special Studies Section

In a continuing effort to address individual water quality-related impairments to state surface waters, high priority lakes remained a point of emphasis, with local supplies receiving special attention. Staff worked on several important projects to define impacts and target acceptable remedial actions in waters suffering from a wide variety of impairments.

Results from sampling efforts to track nutrient loading at Lake Tenkiller established a critical link between ongoing efforts to reduce nutrients in the watershed and the effect of nutrient loading on the lake. Although beneficial uses are being maintained, increased nutrients continue to threaten the lake.

Directed through legislation passed in 1997, a draft report was completed to assess the impact of CAFOs on the City of Oklahoma City's water supply reservoirs extending from Canton Lake to McGee Creek Lake. The beneficial use status of each reservoir was assessed to discern links between CAFO water lagoons and lake tributaries. With few exceptions, all lakes met agriculture, fish and wildlife propagation, and primary body contact beneficial uses. Impairments were attributed to non-point source causes.

A cost-sharing agreement with the City of Tulsa enabled staff to address specific local water quality concerns at Eucha and Spavinaw Lakes (Tulsa's two-reservoir water supply system). Based on two years of data, the OWRB determined that algae growth in both Eucha and Spavinaw were impairing fish and wildlife uses. Phosphorus load reductions were developed to reverse the nutrient enrichment process.

Another agreement with the Central Oklahoma Master Conservancy District (COMCD) addressed water quality concerns at Lake Thunderbird. A water quality-based goal was determined for the lake to maintain chlorophyll-a concentrations below 20 micrograms per liter, the lowest concentration necessary to prevent excessive algae growth. Based on staff evaluation of 2000 lake management practices, the COMCD elected to discontinue use of an underpowered lake aeration system and subsequent monitoring indicated a considerable reduction in chlorophyll-a concentration. Staff also mapped Thunderbird and developed a bathymetric representation of the lake bottom. The COMCD has retained OWRB services for 2002.

Water Board staff also developed a plan to control shoreline erosion at Thunderbird, a common problem at many lakes and ponds in Oklahoma that increases suspended solids. The OWRB will utilize this plan, cooperatively with the U.S. Bureau of Reclamation, Oklahoma Department of Tourism and Recreation, and COMCD, to develop a pilot demonstration program in 2003.

An EPA-funded demonstration project was completed at Lake Wister to reduce suspended solids and control erosion. The project, which proved to be both effective and inexpensive, involved the introduction of native, non-invasive aquatic plants. Building on these results, a cooperative project was initiated between the OWRB and the Tulsa District COE to monitor water quality at Lake Wister and develop a plan to control suspended solids and increase oxygen in the lake. In 2002, the OWRB will submit preliminary plans to mitigate these chronic problems.



Recording the GPS location and health of transplanted vegetation at Lake Wister