Oklahoma's Nonpoint Source Program

Annual Report 2011

OKLAHOMA CONSERVATION COMMISSION

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For more information on activities discussed in this report, visit our website:
www.conservation.ok.gov

Oklahoma Conservation Commission
Water Quality Division
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Cover photo: Spavinaw Creek in Delaware County, Oklahoma (2010)

Oklahoma's Nonpoint Source Program

Overview:

Oklahoma's Nonpoint Source (NPS) Pollution Management Program is a combination of federal, state, and local agency programs. The NPS Program is authorized federally by Section 319(h) of the Clean Water Act, which requires states to develop an assessment report that identifies NPS problems and a Management Program that develops and implements objectives for addressing them. These and other core program elements are contained in the State's NPS Management Plan.

By state statute, the Oklahoma Conservation Commission (OCC) serves as the technical lead agency of Oklahoma's NPS Program and is responsible for monitoring and assessing waterbodies for NPS impacts and implementing programs to reduce these NPS issues and thereby restore support of the designated beneficial uses of affected waterbodies. With input from multiple agencies, tribes, organizations, and universities who form the NPS Working Group, the state follows an organized process to identify NPS threats and impairments to water resources, to determine causes, extent, and sources of the problems, and to prioritize the watersheds needing improvement. Solutions to the NPS problems are then planned and addressed, primarily through projects in priority watersheds to provide implementation and education.

Oklahoma's NPS program is largely funded through the Environmental Protection Agency (EPA) Clean Water Act Section 319(h) NPS Pollution Program. These federal funds are matched by monies from the State's Conservation Infrastructure Revolving Fund, state and local partners, and most importantly, local landowners who voluntarily participate in cost-share programs to install conservation practices which facilitate agricultural production goals while protecting soil and water resources. In recent years, Oklahoma has formed strong partnerships, networking with multiple agencies to secure matching funds to increase the total amount of funding available to address NPS issues.

IMPLEMENTATION: The OCC currently manages five priority watershed projects, where intensive, focused implementation of best management practices (BMPs) is the goal. Each of these projects is described briefly in this report. In addition, the OCC conducts a locally-led, statewide cost-share program, providing state funds to install BMPs on a cost-share basis through its network of 87 local conservation districts. In 2011, $738,192 was spent installing these important conservation practices, with $347,717 provided by the state and the remainder by the participating landowners.

MONITORING: Effective monitoring and assessment are essential to being able to document NPS problems and show improvement due to conservation programs across the state. The OCC monitors wadeable streams across the state on a rotating basis, collecting water quality and biological data from approximately 150 streams a year. The OCC also conducts separate, more intensive monitoring and assessment efforts to determine the impacts of all priority watershed implementation projects. The total cost of the monitoring program, which is funded solely by 319, is approximately $1,000,000 annually.

EDUCATION: The OCC's water pollution education program, Blue Thumb, provides hands-on learning to citizens throughout the state about NPS causes and prevention and is an integral part of the NPS program in the state. Approximately $350,000 in EPA 319 funds are used annually to conduct this program.

This concise report offers highlights of Oklahoma's NPS program for 2011. While efforts funded through 319 are emphasized, projects conducted by NPS Program partners are also included. Readers are encouraged to access more details on project and program efforts via web links where provided.

Oklahoma Conservation Commission

Mission Statement:

To conserve and improve the water resources of the State of Oklahoma through assessment, planning, education, and implementation.

As Oklahoma's lead technical agency for the nonpoint source (NPS) program, the Oklahoma Conservation Commission's (OCC) Water Quality Division works with partners across the state to protect waters from runoff-driven pollution. Oklahoma's NPS Program is *non-regulatory*. On-the-ground conservation is the primary focus of OCC's NPS program, and less than 10% of OCC funds support administrative duties. ***Planning*** and ***educating*** to address NPS problems are the backbone of OCC's program and are critical to its success. Long-term water quality ***monitoring*** and ***assessment*** are essential to help prioritize areas to target through the program and evaluate its effectiveness. ***Implementation*** of best management practices (BMPs) through cooperative, targeted, voluntary efforts allows improvement and protection of water quality and other resources while maintaining agricultural production goals.

Implementation:

Current OCC priority watershed implementation projects are located in two general parts of the state: the east and the central-west. The predominant agricultural practices vary between these two general areas, so the implementation focus is slightly different in each area. In the east, extensive poultry production and related land application of waste as fertilizer has contributed to the build-up of high levels of phosphorus and nitrogen in the soils. Consequently, BMPs focus on riparian buffers and animal waste management. In the central-western part of the state, wheat and cattle production dominate agricultural activity, often contributing to water- and wind-driven soil erosion in conventional tillage operations in the sandy soils. No-till and field conversion BMPs are the focus of implementation efforts in this area. Establishing riparian buffers is an important component of all projects, as these vegetated regions act as filters to take up nutrients, and roots help stabilize streambanks to reduce erosion. Fencing livestock out of riparian buffer areas also reduces the amount of fecal bacteria in the stream.

Despite some differences in BMP focus, all OCC priority watershed implementation projects share a **common design** which has resulted in success both in number of participants who are implementing BMPs in each area and in actual, measurable water quality improvement:

- Planning: have data/information that indicates NPS problems that can be addressed with project
- Local leadership and buy-in: get support of local Conservation District and hire local coordinator; establish a Watershed Advisory Group (WAG) that includes all interests to drive implementation planning
- Targeting: use an effective model (e,g., SWAT) to locate pollution hotspots to target for implementation
- Effective monitoring: use a proven study design (e.g., EPA's Paired Watershed Method) and sampling method (e.g., continuous, flow-weighted sampling) to obtain sufficient data to evaluate impacts on water quality
- Demonstration/Education: establish a demo farm where landowners can see a suite of BMPs in action
- Partnerships: look for creative ways to engage other agencies, leveraging hard dollars and matching funds
- Long-term commitment: commit to have multiple phases in the project (i.e., be in watershed for more than 5 years) to allow project concepts to take hold and prove their way from producer to producer

Water Quality Division

During FY2011, the EPA provided $1,073,068 in 319 funds and Oklahoma contributed $333,094 in state funds for implementation of BMPs in priority watersheds. Cost-share funds from participating landowners comprised a significant addition to implementation monies. A brief summary of each of the OCC priority watershed implementation projects is given below. With the exception of the Lake Thunderbird project, all of these projects have been ongoing for a number of years. Details of each project, including reports and Watershed Based Plans, can be accessed via the OCC Water Quality Division website under Priority Watershed Projects.

Current Priority Watershed Implementation Projects

Honey Creek: In 2011, $243,625 was spent on BMP implementation, with $156,024 from EPA funds, $15,746 from state funds, and $71,855 from landowners. The following BMPs were installed:

- 6 acres riparian buffer
- 1,586 linear feet riparian fence
- 28,284 linear feet cross-fence
- 30 alternative water supplies (ponds or tanks)
- 21 heavy use areas
- 2 septic systems

Illinois River: In 2011, $341,844 was spent on BMP implementation, with $211,361 from EPA funds, $33,933 from state funds, and $96,550 from landowners. The following BMPs were installed:

- 824 acres riparian buffer
- 21,894 linear feet riparian fence
- 14,439 linear feet cross-fence
- 1 waste storage facility
- 10 alternative water supplies (ponds or tanks)
- 2 heavy use areas
- 12 septic systems

North Canadian River: In 2011, $345,103 was spent on BMP implementation, with $258,069 from EPA funds, $80,169 from state funds, and $6,865 from landowners. The following BMPs were installed:

- 50 acres riparian buffer*
- 10,560 linear feet riparian fence*
- 4,500 linear feet cross-fence *
- 5 septic systems
- 576 acres conversion to no-till
- 48 acres supplemental grass planting *(note: extreme drought has limited planting; >900 acres are pending)*
- 3 alternative water supplies (ponds or tanks)

***contracts pending**

Spavinaw Creek: In 2011, $612,071 was spent on BMP implementation, with $289,078 from EPA funds, $97,555 from state funds, and $225,438 from landowners. The following BMPs were installed:

- 214 acres riparian buffer
- 17,665 linear feet riparian fence
- 20,500 feet cross-fence
- 5 waste storage facilities (cattle)
- 25 alternative water supplies (ponds or tanks)
- 21 heavy use areas
- 45 acres of supplemental grass planting
- 1 septic system

Lake Thunderbird: In 2011, $264,227 was spent on the planning and installation of a Low Impact Development (LID) demonstration project, with $158,536 from EPA funds and $105,691 from state funds.

Phase I: Approximately 75% of the LID features have been installed in the demonstration neighborhood.

Phase II: Monitoring runoff from paired streets, one with LID features and the other without, is in the planning process currently.

2011 Implementation Project Spotlight:
Honey Creek Watershed

The second phase of the Honey Creek Watershed project concluded in 2011, and preliminary data analyses were performed. Monitoring for this project was accomplished with automated samplers to obtain continuous, flow-weighted loads for pollutants. One autosampler was located just upstream of the project location and the other was placed lower in the watershed to capture any effects of BMP implementation. Two years of pre-implementation data were compared with one year of implementation data using a paired watershed analysis.

<u>Highlights of Success</u>: Expected total phosphorus loading was reduced by between 9 and 15 percent after the first year of implementation. Expected load reductions of nearly 40 percent were calculated for *E. coli* and Enterococcus bacteria.

Education and farm tours were instrumental to the success and the continuing interest in this project. The next phase of this project is underway and will allow further implementation of BMPs and additional monitoring. It is expected that water quality will continue to show improvement as the BMPs already installed mature and new BMPs become

Poultry Waste Storage Facility (Cake-out House)

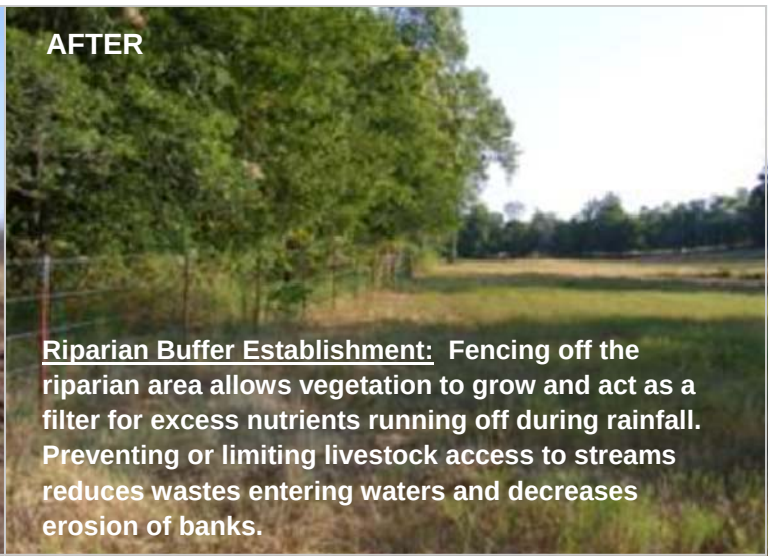
Winter Feeding / Waste Storage Facility (cattle)

Cross-Fence for Pasture Management

Riparian Area Protection (exclusion fence)

BMPs in Action:

BMPs have proven effects on improving water quality. Here are some visible examples from Honey Creek.



Other 319 Funded Projects

Oklahoma Water Resources Board (OWRB)

The OWRB received funding for two 319 "special project" grants in 2011:

The first project, "*Reducing the Impact of NPS Pollution Through the Establishment of Floating Wetlands in Eucha Lake*," began in March 2011 and will continue for two years. This project will require $235,715 in EPA 319 funds and $157,143 in state funds. To date, 80 of the 160 total islands have been installed. Each island, a floating mat, is 8 feet x 10 feet, and over 4.000 wetland plants were planted on these mats. Samples of the above-ground biomass were taken to determine nutrient uptake/ removal by the plants, and sediment traps will be installed below the floating wetlands at a later date.

The second project is to create a vegetated wetland throughout the littoral zone of Ft. Cobb Lake in order to reduce shoreline erosion and reduce the turbidity of the lake. This project requires $144,935 in EPA 319 funds and $96,624 in state funds. Installation of wetland plants was accomplished in one of the three coves chosen for wetland establishment. Within this cove, two ¼ acre enclosed areas were constructed to deter herbivores from eating the 820 installed plants. Most plants showed growth and expansion despite the dropping level of the lake due to drought. In the next year, the other two coves will receive enclosed pens with wetland plants, and it is hoped that natural spread of founder colony species within the habitable littoral zone of the lake will be successful.

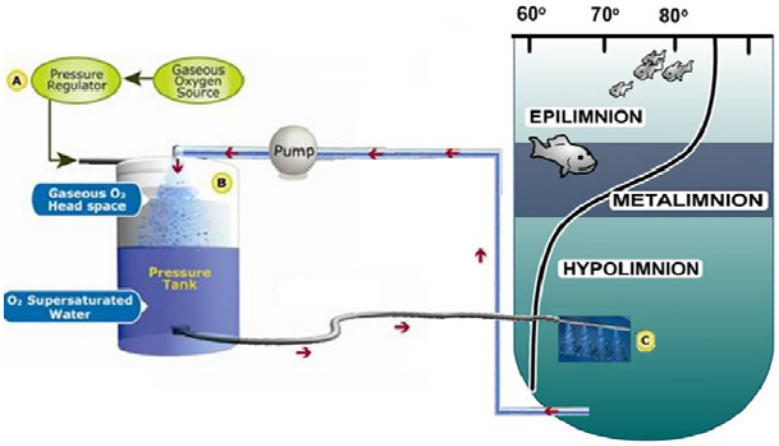
ARRA Projects

The OWRB oversees the American Recovery and Reinvestment Act (ARRA) funding in the state. Of eleven state projects funded in 2009, five projects were characterized as addressing nonpoint source pollution, of which three are still ongoing (see table below). Prior to implementation, these projects were reviewed by the Oklahoma Conservation Commission and determined to be consistent with Oklahoma's NPS Management Plan.

Agency	Project	Loan Amount
OCC	Riparian Restoration in the Illinois River and Eucha/Spavinaw Watersheds	$2,000,000
Oklahoma State University with OCC	Riparian Restoration Along Cow Creek in Stillwater	$2,000,000
OWRB and Central Oklahoma Master Conservancy District	Lake Thunderbird In-Lake Restoration	$1,501,285

ARRA Projects, *continued*

The OWRB is conducting the Lake Thunderbird in-lake restoration ARRA project. The goal of this project is to mitigate the low dissolved oxygen in Lake Thunderbird by installing a supersaturated dissolved oxygenation system (SDOX) in the lake. The summer of 2011 was the first summer of operation for the SDOX system at Lake Thunderbird and provided data that indicated the system was effective in increasing dissolved oxygen, reducing oxidation-reduction potential conditions responsible for sediment phosphorus release, and reducing average chlorophyll-a values. Small changes in the dissolved oxygen delivery pipes in the fall of 2011 should provide more effective delivery of the oxygen to the target area for subsequent years. For more information related to the SDOX system and Lake Thunderbird restoration efforts visit the project website at *http://www.owrb.ok.gov/studies/reports/reports.php*



The OCC's streambank restoration work in the Illinois River and Eucha/Spavinaw Watersheds is another 2009 ARRA-funded project. In 2011, the initial list of over 45 sites needing streambank stabilization was narrowed to a final twelve. Bids were taken for the required work, which includes reestablishing native vegetation along streambanks, re-sloping banks, and installing instream structures as necessary, and a firm was selected to do the work. All twelve sites are scheduled for completion by September 30, 2012. Their completion will restore over 7,000 linear feet of streambank in the project area, reducing sediment and nutrient loading.

The third ARRA-funded project which addresses NPS issues is the Cow Creek stabilization project, a project accomplished through a partnership between the OCC and OSU. Cow Creek is a typical Oklahoma stream whose natural course was manipulated, causing deepening and widening with the formation of associated side-gullies. Structures that were threatened by bank erosion included the Oklahoma Gardening Studio Garden, OSU service roads, and utility lines. In 2011, OCC personnel conducted pre-implementation surveys of in-stream habitat and biological communities. Construction began in August, with stabilization of access roads and grading of streambanks. Stormwater control structures, bank drainage structures, and irrigation structures were installed, and 40% of planned native vegetative plantings have been accomplished. A wetland area will be finished in 2012 as part of a new multi-disciplinary riparian and streambank research, education, and demonstration facility.

~~~~~~~~ Oklahoma Conservation Commission ~~~~~

Oklahoma's NPS Management Program is a cooperative effort, blending partners from multiple state and federal programs to accomplish water quality protection and improvements. Each of the programs described here is coordinated by the OCC. With support from EPA 319 funds, OCC staff have been able to engage relevant partners, generate interest, and obtain grants to leverage additional funds for these various programs by using contributions from partners as match for non-EPA grant dollars.

Multiple Program Partners Leverage More $$'s for Optimal Water Quality Benefit

Carbon Program

http://www.ok.gov/conservation/Carbon_Sequestration/

The Oklahoma Carbon Program works within the NPS program to encourage practices that protect soil, air, and water quality. In 2011, $37,765 in EPA 319 funds were used to leverage $116,109 in non-EPA grant funds and $72,220 in non-federal matching grant funds. Program highlights include:

- Held one classroom and five field trainings to advance verifier trainees to independent verifiers of no-till and seeded grasslands.
- Worked with OSU to develop a standardized soil carbon sampling protocol for field verifiers.
- Verified 9,650 acres of no-till in the North Canadian Watershed 319 project area to assess adherence to carbon contracts and estimate the carbon offset value.
- Used draft OCC-developed methods and worked with conservation districts to verify carbon contracts for approximately 30,000 acres of no-till and grasslands.
- Partnered with Oklahoma State University (OSU) on an "ecosystem services" project, which takes a holistic approach to conservation implementation by layering multiple conservation practices at the field scale to garner and measure the synergistic effects of the practices.
- Partnered with a national aggregator of carbon offsets, a national wildlife organization, and OSU on a project to generate market-quality greenhouse gas credits by optimizing nitrogen application using N-Rich Strips in fields.
- Worked with OK-NRCS and Oklahoma Forestry Services to develop rangeland and forestry verification methods.

Wetlands Program

Wetland activities initiated by the OCC provide demonstration, restoration, and protection of wetland resources. Every wetland project the OCC pursues has the potential to improve water quality, particularly with regard to NPS pollution. Specifically, these projects include youth and adult wetland education, watershed-based assessment and planning, wetland assessment, stream corridor restoration, and wetland restoration. The program is primarily funded through CWA Section 104(b)(3) Wetlands Program Development Grants (WPDG) with matching funds from state and local sources. In 2011, approximately $312,000 in non-319 EPA funds were used to accomplish the activities below:

- Received a grant for the development of a wetland program plan to prioritize statewide wetland management activities for the next 3-5 years. Will also result in creation of a wetland website.
- Completed a cooperative project with the City of Norman to implement a natural design plan for an urban stream and wetland enhancement project to address stormwater in the Brookhaven Creek area. In addition, staff worked with the City to update its stormwater master plan and provided education about low impact development in urban areas.
- Cooperated with the University of Oklahoma (OU) to complete Oklahoma's portion of the National Wetland Condition Assessment utilizing a special CWA Section 106 grant. This assessment utilized randomly selected wetland sites across the nation to characterize the condition of the Nation's wetlands. The survey included data for hydrology, water quality, soils, vegetation, algae and disturbance factors. The final report will be authored by EPA and is expected to be complete in 2013.

~~~~~~~~ Other Programs ~~~~~~~~~~~~~~~~~~~~~~~~~

Conservation Reserve Enhancement Program (CREP)

The CREP is a Farm Service Agency (FSA) program which protects and improves water quality by retiring environmentally sensitive land from agricultural production for up to fifteen years. In Oklahoma, the OCC, City of Tulsa, Oklahoma Scenic Rivers Commission (OSRC), Land Legacy, United States Department of Agriculture (USDA), and Natural Resource Conservation Service (NRCS) are partnering with the FSA CREP to restore approximately 24,000 acres of riparian buffer areas in the Oklahoma portion of the Illinois River and Eucha/Spavinaw Watersheds. The CREP program requires a 20% non-federal match from the State in order to receive the federal dollars. The City of Tulsa and the OSRC have committed funding to match the program, and the OCC is providing 319 funding for staff to administer the program and to complete water quality monitoring associated with the implementation to document success over time. Initial commitments are sufficient to implement a $15 million dollar program in the Eucha/Spavinaw and Illinois River Watersheds. In 2011, approximately $342,000 in CREP funding and nearly a million dollars in match were expended.

The Oklahoma CREP, which began in 2007, has accomplished the following:

- 532 acres of riparian buffer (164 acres in 2011)
- 47,446 linear feet of riparian fencing (11,792 lf in 2011)
- 123 acres of supplemental planting; 65,732 tree seedlings planted

With the matching programs from partners, over 2,223 acres of riparian buffer are being protected with conservation easements. The 319 program is an especially important partner in protecting riparian areas since it allows fencing off of currently wooded areas, while the CREP only addresses areas that are in agricultural production and devoid of trees at the time of enrollment. The combination of the two programs allows continuous fencing of a riparian area instead of piece-meal participation and optimizes the 319 funding to enable more implementation to occur overall. Visit OCC's CREP web page for more information!

Sugar Creek Cooperative Conservation Partnership Initiative

The Sugar Creek Cooperative Conservation Partnership Initiative (CCPI) is a $3,000,000 effort involving the Oklahoma NRCS, the OCC, the South Caddo Conservation District, the North Caddo Conservation District, the Caddo County Board of Commissioners, and local landowners. Two million dollars in NRCS EQIP funding is being matched by one million dollars from partners to install practices to control gully and streambank erosion in the channel and floodplain of Sugar Creek and its territories. This work enhances the benefits achieved with FEMA funding after the extreme flooding event in 2007 (photo lower left) by making repairs on private lands in the Sugar Creek watershed that did not qualify for FEMA assistance. This past year, CCPI funds have been used to install six grade stabilization structures and associated embankments, similar to the one in the photo lower right, and one small dam to divert runoff from a gully to an existing stable route into the stream. More work was planned for 2011 but has been delayed due to the extreme drought conditions that existed during the summer.

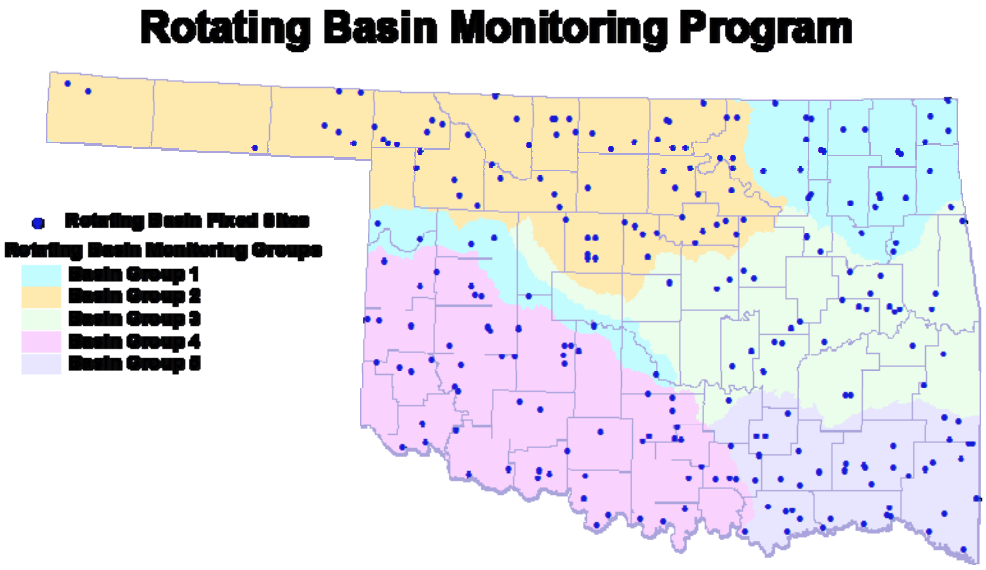
Oklahoma Conservation Commission

Monitoring:

http://www.ok.gov/conservation/Agency_Divisions/Water_Quality_Division/WQ_Monitoring/index.html

The OCC has an extensive monitoring program which has allowed identification of impaired streams to target for implementation projects in addition to finding high quality streams used as reference sites to gauge the health of other streams. OCC monitors 245 fixed stream sites and 250 probabilistic (randomly selected) sites across the state every five years through the Rotating Basin Monitoring Program. Through this crucial monitoring program, OCC conducts the majority of the state's assessment of wadeable streams for Integrated Reporting (305b and 303d) and documents improvements due to NPS program activities by OCC and its partners in watersheds across the state.

During the five year cycle, **18 physical and chemical parameters are measured at each fixed site every five weeks for two consecutive years**. In addition, an intensive fish collection and instream habitat assessment are performed once every five years at each site, and aquatic macroinvertebrates are sampled twice a year for the two consecutive years. Each of the probabilistic sites are visited once for collection of the same chemical, physical, and biological data. Data generated from this assessment allows for statistical representation of a basin's water quality based upon the sites monitored.



In March of 2011, the OCC water quality monitoring specialists received a governor's commendation for their willingness to learn more about the data that they collect. Field staff participated in a "cross-training" day with the Oklahoma Department of Agriculture, Food, and Forestry lab staff in order to show the chemical analysts how the water samples are collected out in the field and then go and observe how the chemical analyses are performed. This exchange has resulted in more efficient data collection and analysis and facilitated an even better partnership between all staff.

Education:

http://www.ok.gov/conservation/Agency_Divisions/Water_Quality_Division/WQ_Blue_Thumb/index.html

The OCC accomplishes much of its public education through its nationally recognized Blue Thumb Education Program, a program designed to teach citizens about reducing NPS pollution through hands-on involvement. In 2011, over 200 volunteers participated in regular monthly water quality monitoring of 110 stream sites across the state, in addition to completing 22 fish collections and habitat assessments and 132 macroinvertebrate collections. Counting middle school, high school, and college students, more than 500 volunteers participated in stream activities during the year. Approximately 6,515 volunteer hours were logged in 2011.

Blue Thumb hosted a number of guest speakers to educate members about environmental issues such as drought, sustainable living, rain gardens, and invasive species. Blue Thumb held three stream monitoring trainings, four mini-academies, and seven groundwater screenings, providing meaningful hands-on education to participants. The Blue Thumb program provided presentations at Earth Day events, demonstration farms, schools, churches, festivals, and fairs. Several rain gardens were built in the Tulsa area, and educational information about their effectiveness to filter NPS pollution was provided at these sites.

One of the unique events that Blue Thumb hosted in 2011 was a three-day program for teachers, the North Canadian River Watershed Tour. This event was designed to provide education on general water quality issues, such as pollution prevention, stream ecology, and groundwater dynamics, while touring one of the watersheds where the OCC has an implementation project. Participants were given presentations and materials that could be used in the classroom to create more student interest in these subjects.

Blue Thumb receives another award! In March of this year, the Tulsa Business Journal awarded OCC's Blue Thumb program with its "Blue-Green Award" for conservation. This competitive award recognizes efforts of programs in effective conservation activities in the City of Tulsa. In addition, the *Keep Oklahoma Beautiful* program presented longtime Blue Thumb volunteer Beth Landon and the Biology Department of Oklahoma City University (OCU) with an **"Environmental Excellence" award**. The award was presented for the "Collegiate Effort, Institution Driven" category. Besides stream monitoring, Oklahoma City University has used the Blue Thumb Program to expand a stewardship and conservation ethic to OCU students and beyond.

NPS Program Partner Activities

Oklahoma's Nonpoint Source (NPS) Program is a collaborative effort of federal, state, and local agencies as well as the citizens of the State of Oklahoma. The following pages provide brief summaries of some of the activities of NPS program partners which usually do not receive federal 319 funding* yet contribute to the goal of reducing NPS pollution in the state.

***The Land Legacy project, below, did receive some 319 funding in 2007**

Oklahoma Department of Agriculture, Food, and Forestry (ODAFF)

In 2011, the Agricultural Environmental Management Services Division of ODAFF conducted several projects with potential NPS impact:

- A swine feeding operations monitoring program was established to determine if ground water is being affected by the management, operation, storage, or land application of swine waste. Four hundred and sixty wells were sampled, and those which had elevated nitrate and conductivity levels were required to complete corrective actions.
- 38,836 tons of poultry waste was exported out of the Eucha-Spavinaw Nutrient Limited Watershed.
- Investigations, inspections, and compliance activities were conducted which resulted in corrective actions for animal/poultry facilities not in compliance with permits.
- Waste management training and education classes were provided for nearly 1,500 poultry and swine operators to inform them of best management practices relating to their industry.
- A three-year project was initiated in August, 2011, to evaluate the utilization and improvement of BMPs at poultry feeding operations. As part of this project, poultry operators will be educated about proper disposal of wastes, nutrient management plans, BMPs, and soil sampling.

Land Legacy, City of Tulsa, & US Fish and Wildlife Service (USFWS)

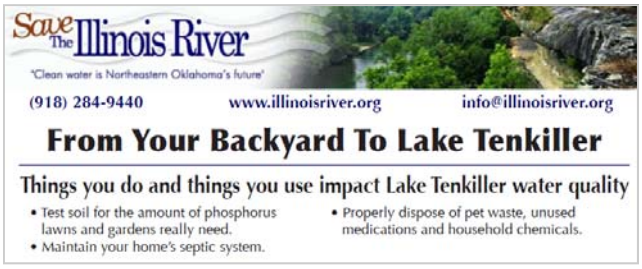
Land Legacy, the City of Tulsa, and the USFWS are working in partnership to create riparian buffers throughout the Eucha/Spavinaw watershed. Funding for this project included approximately $570,000 from a 2007 Section 319 grant in addition to partner funds. The buffers will help protect stream water quality and habitat for fish and wildlife, including critical habitat for several endangered cave species in the region. The riparian buffers have been established through the purchase of permanent conservation easements, prioritized by highest potential for phosphorus loading, from willing landowners within the watershed. To date, 1,389 acres of riparian buffers (13,635 linear feet) have been permanently protected through conservation easement in the watershed.

The City of Tulsa has also partnered with the United States Geological Survey (USGS) in monitoring water data at 14 stream and 9 lake sites in the Eucha/Spavinaw Watershed. The focus of the monitoring is to quantify nutrient inputs (concentrations, loads, and yields) from particular tributaries/subbasins and to evaluate trends in these parameters. This monitoring helps evaluate the effectiveness of BMPs implemented in the watershed in order to achieve an adaptive management approach to watershed protection. Real-time data is accessible at *www.usgs.gov*

NPS Program Partner Activities

Save The Illinois River, Inc. (STIR)

Save the Illinois River, Inc., STIR, cooperated with the City of Tahlequah to install and equip eight pet waste disposal stations in city parks adjoining Tahlequah Creek, a tributary of the Illinois River. Pet waste is contained in biodegradable plastic bags which are disposed of in trash containers. Additional pet waste disposal stations are planned in Tahlequah and in some Oklahoma Scenic Rivers Commission public use areas. The total cost for these eight stations was approximately $1,200, and STIR contributed half that amount.



STIR and the Greater Tenkiller Area Association (lake association) cooperated in an ad in the 2012 Tenkiller Lake Guide. The ad promotes homeowner management of fertilizer and pesticides. More information about STIR can be found at *http://www.illinoisriver.org*

City of Oklahoma City Storm Water Quality Mgmt. Division

Oklahoma City's municipal separate storm sewer system (MS4) discharge is permitted through the Oklahoma Department of Environmental Quality. Although regulated as a point source, many pollutants which discharge from the system originate as non-point sources throughout the draining landscapes. The Storm Water Quality Management Division is composed of five sections: Construction Auditing, Industrial Auditing, Environmental Water Quality, the Household Hazardous Waste Collection Facility, and Public Outreach. The purpose of the Division is to provide inspections, enforcement, water quality assessments, household hazardous waste services, and public outreach to citizens, businesses, and government agencies so they can comply with the Clean Water Act and enjoy a safe and clean environment. The two auditing sections insure that best management practices to control runoff water quality are in place.

In the past year, the Storm Water Quality Management Division accomplished the following:

- Reached over 2,602,000 through presentations, public service announcements, paid advertisements, quarterly e-newsletters, workshops, and exhibitions.
- Removed over 272,685 pounds of floatable debris from segments of the Oklahoma River.
- Received 631,701 pounds of hazardous home chemicals, used oil, and batteries.
- Distributed 13,435 pounds of various viable products for re-use to the public through the Solid Waste Abatement Program (SWAP).
- Performed over 8,150 construction and industrial site inspections; worked with facility managers, operators, or owners when water quality issues were identified to eliminate or reduce runoff contaminants.
- Responded to 309 spills, HAZMATS, and pollution reports which included vehicle accidents where pollutants may enter the MS4, illegal dumping, sediment discharges, illicit connections to the storm drainage systems, and private/public sanitary sewer discharges.

More information is available at *http://www.okc.gov/pw/SWQ/storm4.html*

OKLAHOMA CONSERVATION COMMISSION

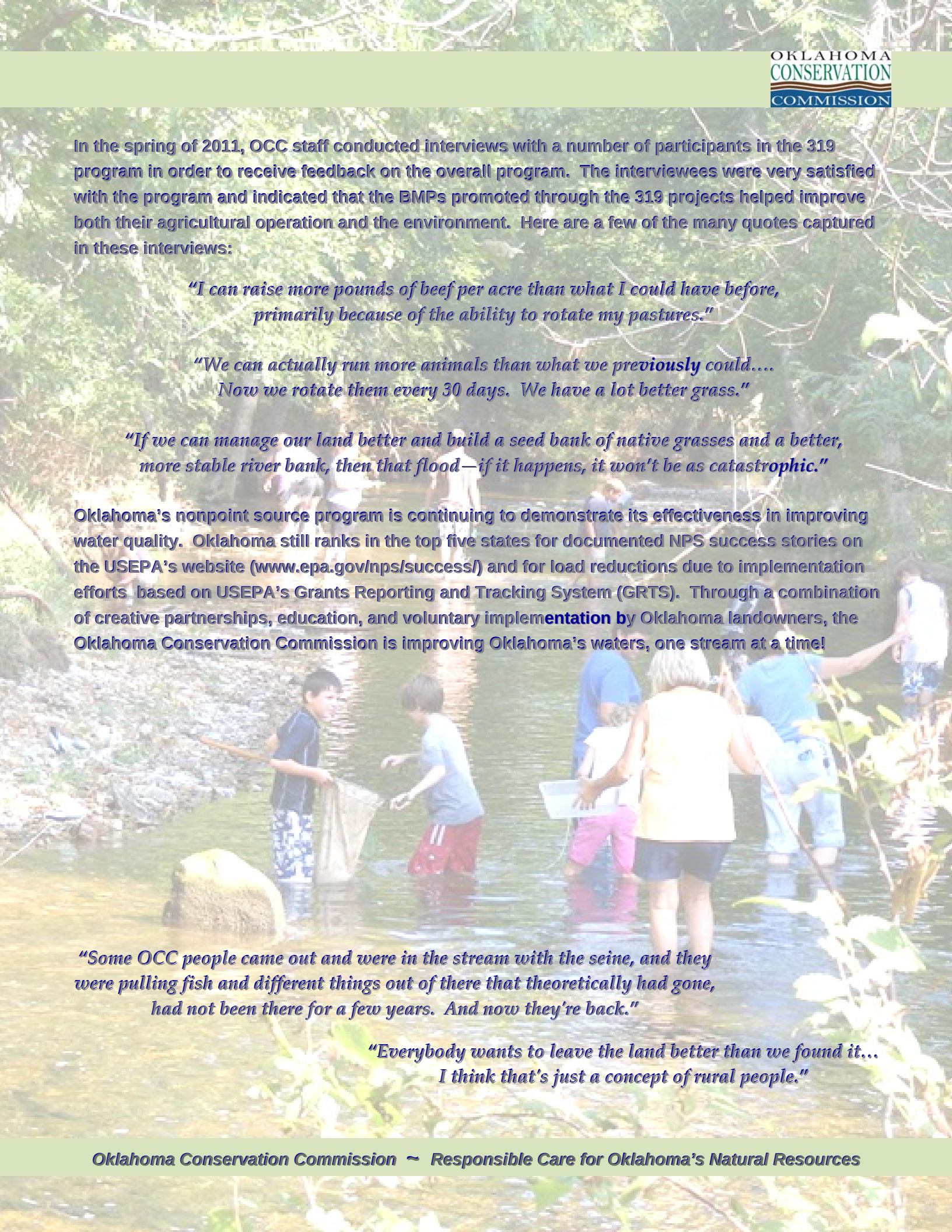
In the spring of 2011, OCC staff conducted interviews with a number of participants in the 319 program in order to receive feedback on the overall program. The interviewees were very satisfied with the program and indicated that the BMPs promoted through the 319 projects helped improve both their agricultural operation and the environment. Here are a few of the many quotes captured in these interviews:

"I can raise more pounds of beef per acre than what I could have before, primarily because of the ability to rotate my pastures."

"We can actually run more animals than what we previously could…. Now we rotate them every 30 days. We have a lot better grass."

"If we can manage our land better and build a seed bank of native grasses and a better, more stable river bank, then that flood—if it happens, it won't be as catastrophic."

Oklahoma's nonpoint source program is continuing to demonstrate its effectiveness in improving water quality. Oklahoma still ranks in the top five states for documented NPS success stories on the USEPA's website (www.epa.gov/nps/success/) and for load reductions due to implementation efforts based on USEPA's Grants Reporting and Tracking System (GRTS). Through a combination of creative partnerships, education, and voluntary implementation by Oklahoma landowners, the Oklahoma Conservation Commission is improving Oklahoma's waters, one stream at a time!



"Some OCC people came out and were in the stream with the seine, and they were pulling fish and different things out of there that theoretically had gone, had not been there for a few years. And now they're back."

"Everybody wants to leave the land better than we found it… I think that's just a concept of rural people."