

# Oklahoma's Nonpoint Source Program: Highlights from 2013

By state statute, the Oklahoma Conservation Commission (OCC) serves as the technical lead agency of Oklahoma's Nonpoint Source (NPS) Management Program, a program comprised of multiple federal, state, and local agency programs working to identify and reduce NPS impacts to restore or maintain beneficial uses in Oklahoma waterbodies. The OCC implemented its 2013 NPS Management Program efforts with \$2.35 million in U.S. Environmental Protection Agency (USEPA) Clean Water Act Section 319(h) funding, received and administered through the Oklahoma Office of the Secretary of the Environment (OSE), as well as with \$1.6 million in state funds.

The long- and short-term goals of the NPS Management Program are summarized in the table below and described in detail in the State's NPS Management Plan. This document is currently being updated with input from more than 30 agencies, tribes, organizations, and universities in order to lay out the process for identifying NPS threats and impairments to water resources, determining cause, extent, and source of the problems, prioritizing watersheds needing improvement, and planning solutions in the highest priority watersheds. In 2013, the working group reworked the ranking system and is considering ranking the eastern and western halves of the state separately, so that the more arid regions of the state will be fairly represented with the wetter regions when determining priority watersheds and considering where success might be most likely. The updated goals and new plan are forthcoming in 2014. For more information on activities discussed in this report, visit our website: www.conservation.ok.gov

Long-Term Goals	Progress Toward Attaining	
By 2020establish a Watershed Restoration Action Strategy (WRAS), Total Maximum Daily Load (TMDL), or Watershed Based Plan (WBP) to restore or maintain beneficial uses in all watersheds identified as impacted by NPS pollution on the 1998 303(d) list, unless the original basis for listing is no longer valid.	Oklahoma currently has approximately 700 TMDLs for waterbodies impaired by bacteria, turbidity, low dissolved oxygen, and nutrients, and work to address additional impairments is ongoing.	
By 2040attain and maintain beneficial uses in waterbodies listed on the 1998 303(d) list as threatened or impaired solely by NPS pollution.	Oklahoma ranks third in the nation for NPS delisting success stories, with a total of 37.	
Short-Term Goals		
Reduce NPS loading in Priority Watersheds as indicated in relevant WBPs.	Sec. 319-funded implementation of practices to reduce NPS pollution has occurred in 7 of the top 10 priority watersheds. NRCS-funded implementation has occurred in all 10.	
Identify pollutant sources within watersheds monitored by the NPS Rotating Basin Monitoring Program for inclusion in the State's Integrated Report.	The water quality of more than 14,665 stream miles has been assessed and presented in the State's Integrated Report, which also provides potential sources of pollution for all impaired waterbodies.	
Maintain Blue Thumb coverage across the state to include at least 100 monitored sites and 40 active Conservation District education programs.	Oklahoma's Blue Thumb Education Program currently has active volunteers in 42 of the 77 counties of the State, with 85 active monitoring sites.	
Draft WBPs in NPS impaired watersheds with sufficient data as requested by local groups.	Seven WBPs have been approved, and NRCS- and/or 319-funded work is ongoing in all of these watersheds.	
Identify alternative sources of funding to target and implement practices to achieve the long-term goals of the NPS Management Plan.	Oklahoma's NPS program has been successful at partnering with various agencies to secure funding and match federal funds to increase the total amount of funding available to address NPS issues, including CW-SRF, NRCS, public companies, and private 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 total cost of the monitoring program is approximately \$1,000,000 annually. In 2013, due to the successful partnership between the OCC and NRCS to document improvements in streams, the Oklahoma state legislature granted \$500,000 in state funds to the OCC specifically to support monitoring.

The OCC's monitoring program 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. The data collected is also used to



create TMDLs for impaired streams. OCC monitors 245 fixed stream sites across the state every five years (about 150 streams per year) 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.

# **Documenting Success**

The OCC Water Quality Division submitted eleven NPS success stories to EPA in 2013. These stories detail the results of cooperative efforts of the NRCS, OCC, conservation districts, and landowners to implement voluntary, cost-shared best management practices (BMPs) to improve water quality and result in delisting of at least one parameter from the 303(d) impaired waters list. In general, BMPs focused on improving grazing land and cropland and protecting riparian areas. Examples include grazing and nutrient management, cross-fencing, alternative water supplies, conservation tillage, conservation crop rotations, riparian fencing, and supplemental grass planting, among others. These practices reduce runoff of soils, waste products, and associated nutrients and bacteria. Improved dissolved oxygen values often indicate reduced nutrient runoff. Funding for the implementation of these practices came from NRCS programs (over \$32 million since 2003 in these watersheds), local cost-share (over \$150,000 in state funds since 2003 in these watersheds), EPA (\$1,000,000 per year for monitoring), and from the landowners themselves.

# Oklahoma's 2013 Success Stories:

With the submission of the 2013 stories,
Oklahoma has 37 streams that are recognized as EPA NPS Success Stories.
Oklahoma is now third in the nation for documenting NPS pollution reduction.

Site	Parameter Delisted	County
Beaver Creek	Turbidity	Jefferson
Big Creek	Escherichia coli	Nowata
Bitter Creek	Escherichia coli	Kay
Bois d' Arc Creek	Escherichia coli	Kay
Clear Creek	Escherichia coli	Harper
Indian Creek	Fishes Bioassessment	Woodward
Ionine Creek	Fishes Bioassessment	Grady
Medicine Lodge River	Fishes Bioassessment	Alfalfa
Sandstone Creek	Turbidity	Roger Mills
Stinking Creek	Turbidity	Kiowa
Wildhorse Creek	Turbidity	Stephens

# Implementation in Priority Watersheds

During FY2013, nearly a million dollars in federal §319 and Oklahoma state funds were expended for implementation of

BMPs in five priority watersheds (see map). Cost-share funds from participating landowners comprised significant additional implementation monies. BMP implementation in the three northeastern watersheds and the North Canadian watershed is proceeding through two §319 "special funding" grants. A brief update of implementation in each of the OCC priority watershed projects is given below. Details of each project, including reports and Watershed Based Plans, can be accessed via the OCC Water Quality Division website under Priority Watershed Projects. All projects are scheduled to conclude in December 2014.



## **Honey Creek Watershed**

A watershed implementation project has been ongoing in this watershed since 2006, and extra funding has been awarded twice to continue implementation due to the high interest of landowners. In 2013, \$155,035 was spent on BMP implementation, with \$108,557 from EPA funds and state funds and \$48,392 from landowners. The following BMPs were installed:

- 29.819 linear feet cross-fence
- 10 heavy use areas
- 10 alternative water supplies (tanks)
- 6 wells for alternative water
- 2 ponds
- 1 septic system



## Spavinaw Creek Watershed

Implementation of BMPs has been ongoing in this 230,000 acre watershed since 2003. Beaty Creek, a subwatershed, has been the focus of NPS projects and paired watershed monitoring since 1999. In 2013, \$391,035 was spent on BMP implementation, with \$228,949 from EPA and state funds and \$162,086 from landowners. The following BMPs were installed:

- 1,468 linear feet riparian fence
- 40,714 linear feet cross-fence
- 74 acres of pasture planting
- 23 heavy use areas
- 24 alternative water supplies (tanks)
- 5 ponds
- 1 cakeout structure
- 1 septic system



#### Lake Thunderbird Watershed

This project focuses on urban BMPs and, in cooperation with the University of Oklahoma and local developers, has a research aspect to it. A demonstration neighborhood was constructed, with half of the houses having Low Impact Development (LID) features and the other half without these features. In 2013, the monitoring phase of the project commenced. Concrete flumes and automated samplers were installed in late 2012 to capture runoff from each of the streets, and data is currently being collected to assess any differences in nutrients and sediment that



could be due to BMPs. Approximately \$61,000 was spent in 2013 in equipment and monitoring.

#### Illinois River Watershed

Implementation of BMPs in this watershed has been ongoing for a number of years through several projects. Currently, implementation efforts are focused on cooperating with the Conservation Reserve Enhancement Program (CREP) to protect large tracts of riparian areas. In 2013, \$412,679 was spent on BMP implementation, with \$295,711 from EPA and state funds and \$116,969 from landowners.

The following BMPs were installed:

- 1,755 acres riparian buffer
- 34,689 linear feet riparian fence
- 43,767 linear feet cross-fence
- 56 alternative water supplies (tanks)
- 24 heavy use areas
- 1 pond
- 2 septic systems



#### North Canadian River Watershed

The OCC began an implementation project in this watershed in 2007. Due to high landowner interest, additional funding for BMP implementation was made available through two subsequent 319 projects, Phase II initiated in 2010 and Phase III in 2011. The focus of these projects is implementation of no-till farming methods and exclusion of livestock from riparian areas. In cooperation with Oklahoma State University, an educational aspect has also been emphasized, with various workshops and outreach programs offered to landowners, local schools, and various other groups, and the creation of a demonstration farm where landowners can view many of the available BMPs in action. In 2013, \$260,902 was spent on BMP implementation, with \$201,375 from EPA and state funds and \$59,548 from landowners to install the

following:

- 24,900 linear feet riparian fencing
- 105 acres riparian area exclusion
- 11,260 linear feet cross-fence
- 162 acres grass planting
- 168 acres no-till
- 12 alternative water supplies (tanks)
- 1 well for alternative water
- 2,076 acres nutrient management

- 8.3 acres waterways
- 2 septic system upgrades



# **Estimating Improvements**

The OCC conducts intensive monitoring and assessment efforts to determine the impacts of BMP implementation in all watershed implementation projects. Automated water samplers are installed in either an upstream/downstream design, with BMP implementation occurring in the area between the samplers, or in a control/treatment design, where an adjacent watershed is used as a control for the implementation watershed. Load reductions have been calculated for several of the implementation projects based on this continuous flow-weighted sampling, and ongoing monitoring will allow further

assessment in the future. Load reductions are estimated each year using the EPA's STEPL model and submitted through EPA's Grants Reporting and Tracking System (GRTS). These estimates are based on landuse and BMP implementation within each specific watershed.

Watershed	2013 STEPL Load Reduction Estimates			
	Phosphorus	Nitrogen	Sediment	
Honey Creek	3,250 lbs/yr	35,491 lbs/yr	585 tons/yr	
Illinois River	18,279 lbs/yr	205,814 lbs/yr	2,816 tons/yr	
North Canadian	2,904 lbs/yr	28,662 lbs/yr	358 tons/yr	
Spavinaw Creek	5,081 lbs/yr	60,760 lbs/yr	515 tons/yr	



# Other OCC Programs:

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 and works to complement NPS efforts of the agency. With support from EPA §319 funds, OCC staff have been able to engage relevant partners, generate interest, and obtain grants to leverage additional match for non-EPA grants.

## 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. The program is primarily funded through CWA §104(b)(3) Wetlands Program Development Grants (WPDG) with matching funds from state and local sources. In 2013, approximately \$82,000 in non-319 EPA funds were used to accomplish the activities below:

- Completed a wetland program plan to prioritize statewide wetland management activities for the next 5 to 6 years.
- Developed an assessment method to identify and prioritize areas with the best chance for successful wetland restoration/creation and NPS reduction in receiving waterbodies. This methodology is currently being applied and tested in three priority watersheds.
- Developed the Oklahoma Wetland Website, which hosts information on wetland activities and programs from government agencies (all levels), academia, and tribes.
- Secured a grant to develop a database of restorable wetlands which will be continually updated and linked to the wetlands website.
- Participated on the US Army Corps of Engineers Interagency Review Team to consider a potential mitigation bank proposal and an in-lieu fee mitigation program.





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# **Carbon Program**

The Oklahoma Carbon Program encourages implementation of agricultural practices that sequester carbon dioxide and reduce runoff of bacteria, nutrients, and sediment. Since 2010, the program has focused on a pilot project developing methodologies to verify eligibility of agricultural practices for carbon credits. This year, the three-year pilot project, funded in part by a USDA Conservation Innovation Grant (CIG), ended. Notable achievements associated with this project included:



- Completed and submitted drafts of field verification methodologies for no-till, seeded grasslands, and improved rangeland management to USDA-NRCS
- Estimated load reductions of participating acres
- Created an ecosystem services progressive management crediting matrix
- Created end-of-project personalized summaries for participating producers
- Created a 4-Level Verifier Training Program
- Estimated carbon dioxide sequestered during the project at 37,721 metric tons, which is roughly equal to the annual greenhouse gas emissions from 7,859 passenger vehicles (according to EPA's online Greenhouse Gas Equivalencies Calculator). The practices that achieved this included 20,264 acres of continuous no-till, 123 acres of riparian buffer, 7,975 acres of seeded grassland, and 10,317 acres of rangeland.

# Conservation Reserve Enhancement Program (CREP)

The CREP, which began in 2007, is working to protect and improve water quality by restoring land in agricultural production in the Eucha/Spavinaw and Illinois River watersheds to natural riparian areas through 15-year easements. In 2013, expenditures totaled \$230,000 in federal CREP funding and \$247,000 in state match.

Seventy-three additional riparian buffer acres were enrolled in 2013, and the following BMPs were installed:

- 25,434 linear feet of riparian fencing (81,542 project total)
- 15,291 tree seedlings planted (97,573 project total)
- 11 alternative water supplies, 4 wells, and 1 pond
- 70 acres of brush management

Analysis of the topography in these watersheds has indicated that one riparian acre receives runoff from 13 upland acres. 2,100 acres of wooded riparian area have been protected through the 319 program to complement the 659 enrolled CREP acres, resulting in nearly 36,000 acres filtered through riparian vegetation.

# Sugar Creek Cooperative Conservation Partnership Initiative

The Sugar Creek 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 past year, \$1,245,045 in CCPI funds were used to install four grade stabilization structures (GSS) with riprap outlets, 15 earthen GSS, eight diversions, and one rock chute, all to divert runoff from unstable, erodible areas. In addition, tree sprigs were planted in six acres of vulnerable riparian area to provide stability, and gullies were reshaped and filled. STEPL load reduction estimates for these installed BMPs indicate 1,014 lbs/yr less phosphorus, 3,990 lbs/yr less nitrogen, and 489 tons/yr less sediment.



# ARRA Projects

The OCC received American Recovery and Restoration Act (ARRA) funding in 2009 for streambank stabilization projects in the Illinois River and Eucha/Spavinaw watersheds. Restoration of the last, and largest, of the 11 sites was completed in late 2012 (photos below). In March 2013, a riparian vegetation workshop was held to educate landowners, city park personnel, and interested citizens about the importance of a healthy riparian area. Participants planted over 10,000 trees along the restored sites. This two million dollar project is now concluded.









#### **Blue Thumb Education Program**

The OCC's Blue Thumb education program celebrated 20 years in 2013! Approximately \$350,000 in EPA 319 funds are used annually to conduct this hands-on education program designed to teach about reducing NPS pollution. In 2013, the nonprofit "Oklahoma Blue Thumb Association" was formed to support the Blue Thumb program with guidance and funds. Through the new OBTA, members have more ownership in the program, working at functions, seeking funds, and providing input as to how to strengthen the program. More than 180 volunteers participated in regular monthly water quality monitoring of 85 stream sites in 42 counties across the state. Counting middle school, high school, and college students, over 400 volunteers participated in stream activities during the year, with volunteer hours topping 8,000 in 2013. Blue Thumb also:

- Held five training sessions for new volunteers;
- Conducted 11 Blue Thumb mini-academies for students of teachers who have attended Blue Thumb training sessions;
- Successfully integrated OCC Water Quality staff to help Blue Thumb staff make field collections and perform field quality assurance activities in winter and summer;
- Completed 112 macroinvertebrate collections and subsampling at all active sites;
- Conducted 20 fish collections in the northeast part of the state;
- Hosted a booth at the Tulsa State Fair.







# **NPS Program Partner Activities**

Oklahoma's NPS Management Program is a collaborative effort of federal, state, and local agencies, as well as nonprofits and citizen groups. Here are just a few examples of partner agencies which usually do not receive federal 319 funds yet have programs that mitigate NPS pollution and improve and protect water quality in the state.

#### City of Oklahoma City, Storm Water Management Division

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. In 2013, the Division reached nearly 7 million people through various outreach activities, removed over 355,400 lbs of floatable debris from the Oklahoma River, received 645,825 lbs of hazardous home chemicals, oil, and batteries, distributed 15,448 lbs of viable products for reuse to the public through the Solid Waste Abatement Program, conducted more than 4,700 inspections to identify and reduce/eliminate runoff issues at construction and industrial sites, and responded to 427 spills, HAZMATS, and pollution reports.



#### City of Tulsa and United States Geological Survey (USGS)

The City of Tulsa, in collaboration with the USGS, has been monitoring 21 stream and 9 lake stations in the Eucha/Spavinaw Watershed since 2002, collecting monthly and storm-event water quality data and continuous hydrologic data. The goal is to quantify nutrient inputs from sub-basins in the watershed, as well as to monitor lake hydrology.

#### NPS Program Partner Activities, continued

#### **Indian Nations Council of Governments (INCOG)**

INCOG coordinates the ongoing activities of the Green Country Stormwater Alliance (GCSA). GCSA's 21 members (cities and counties) work together to improve water quality through illicit discharge elimination, construction BMPs, and pollution prevention and to decrease the volume of stormwater runoff. INCOG's educational outreach efforts help train community leaders, agencies, companies, and citizens in environmentally sound and sustainable practices. Project-specific stream monitoring is conducted as well, including a study on Bird Creek and Arkansas River tributaries near Tulsa.



#### **Land Legacy**

Land Legacy, the City of Tulsa, and the U.S. Fish and Wildlife Service are working in partnership to create riparian buffers throughout the Eucha/Spavinaw watershed through the purchase of permanent conservation easements from willing landowners. To date, 2,243 acres, including 7.1 linear miles of riparian area, have been permanently protected through conservation easement in the watershed. EPA awarded \$640,512 in 319 funds for this 2012-2015 project, of which 19% was spent in 2013.

#### Oklahoma Corporation Commission (Corp Comm)

Corp Comm receives and responds to citizen complaints and oil/gas well operator incident reports. Of the 890 citizen complaints in FY13, 467 were for visible oil or brine at active wells, which are likely sources of NPS pollution, in addition to 1,118 incident reports. Approximately 51% of these sites have been cleaned up, primarily through state funding. Fourteen larger sites totaling 767 acres of polluted area are slated for cleanup through the federally funded Brownfields program.

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

The Agricultural Environmental Management Services Division of ODAFF continued two NPS mitigating projects:

- Comprehensive Nutrient Management Plans (CNMPs) for poultry feeding operations (PFOs) were developed to evaluate
  and mitigate potential environmental risks associated with manure handling, storage, application, carcass disposal, and
  general land management. ODAFF drafted 31 management plans in 2013, and this program will continue in 2014.
- ODAFF staff conducted 45 farm meetings/inspections to provide technical assistance and education to poultry operators, reviewing topics such as pollution prevention and BMPs. Staff also collected soil samples from 263 fields where land application of manure occurs. 78% of the samples had acceptable soil test phosphorus (STP) values, indicating that poultry operators are working effectively to manage waste applications.

#### Oklahoma Water Resources Board (OWRB)

The OWRB received FY11 319 Special Funding for two projects, both of which concluded at the end of 2013:



- The "Floating Wetlands in Eucha Lake" project totaled \$392,858, with \$235,715 from §319 funds. Installation of the wetlands, constructed primarily of recycled plastic bottles, occurred in 2012, with monitoring in 2013. Results showed that the wetlands provided habitat for fish and wildlife and reduced water column nutrient concentrations by sequestering approximately 20 kg total phosphorus (TP) per year for two years total. Fifteen percent of the wetlands have now been moved to Hunter Park Lake where they are sequestering about 3 kg TP/yr.
- The "Vegetated Littoral Zone in Ft. Cobb Lake" project totaled \$241,559, with \$144,935 from 319 funds. The goal of this project was to reduce shoreline erosion and turbidity in the lake by installing wetland plants in four coves. Despite a severe and lengthy drought throughout the

duration of the project, most of the aquatic plants survived and spread. By the final sampling event in September 2013, 16% of the enclosed area was covered with introduced species and 40 additional plant colonies were growing unprotected, outside the fencing.

#### Save the Illinois River (STIR)

STIR expanded its pet waste disposal program yet again, installing new stations in three Illinois River watershed communities: Tontitown, Siloam Springs, and Lowell, AR. The nonprofit group also provided biodegradable plastic pet waste disposal bags to the Oklahoma Scenic Rivers Commission (OSRC) and to the City of Tahlequah and has agreed to provide additional pet waste disposal stations to the Tahlequah Parks Department for expansion of a trail along Town Branch Creek. STIR and OSRC held an auction which raised \$10,000 for portable toilets to be installed along the Illinois River in 2014 and also raised funds for OSRC to purchase trash bags which Illinois River float outfitters distribute to people who float the river.

