

Integrating Soil Health Principles Into Water Quality Projects



Oklahoma Conservation Commission



- **State's lead technical agency** for nonpoint source pollution; receives much of EPA Sec. 319 funding for State
- Monitor small/mid-sized, “wadeable” streams/rivers



amb educa



ices



vat



OCC Watershed Implementation Projects



Watershed Project Model



- Plan: obtain data that indicates causes and sources of impairments
- Local leadership and buy-in:
 - recruit support of local Conservation District and hire local coordinator
 - form WAG that includes all interests in watershed
- Implement: prioritize conservation practices so that we get highest cost-share rate
- Demonstration/Education:
 - establish a demo farm where landowners can see a suite of conservation practices in action
 - provide educational events for all ages
- Monitor: obtain sufficient data to evaluate impacts
- Long-term commitment: maintain project efforts



Northeastern Projects



- Illinois River, Eucha-Spavinaw
- **Impairments since the 1990's**
- Primarily related to high nutrients
 - algal blooms, high chlorophyll-a, total phosphorus, low dissolved oxygen



- Lots of poultry production; litter spread on pastures as fertilizer
- Cattle grazing streams and riparian areas



Northeastern Projects



- Conservation Practice Priorities:
 - Riparian area establishment and management
 - Pasture establishment and management
 - Buffer strips and streambank protection
 - Proper waste management and utilization
 - Heavy use area protection

Goal: To reduce nutrients and bacteria running off into streams

Conservation Practice Priorities

(Northeastern Projects)



- Riparian area establishment and management
 - Fencing livestock out of streams (buffers of up to 150 ft on each side of stream)
 - Providing alternative water sources (ponds, tanks, wells)
 - Paying an incentive for keeping that area out of production



Conservation Practice Priorities

(Northeastern Projects)



- Pasture establishment/management
- Buffer strips and streambank protection
 - Vegetative plantings
 - Cross-fencing
 - Alternative water sources



Conservation Practice Priorities

(Northeastern Projects)



- Animal waste management
 - Waste storage structures



Conservation Practice Priorities

(Northeastern Projects)



- Proper waste utilization
 - Poultry litter transport out of watershed
 - Soil tests



- Rural waste septic system improvement

Conservation Practice Priorities

(Northeastern Projects)



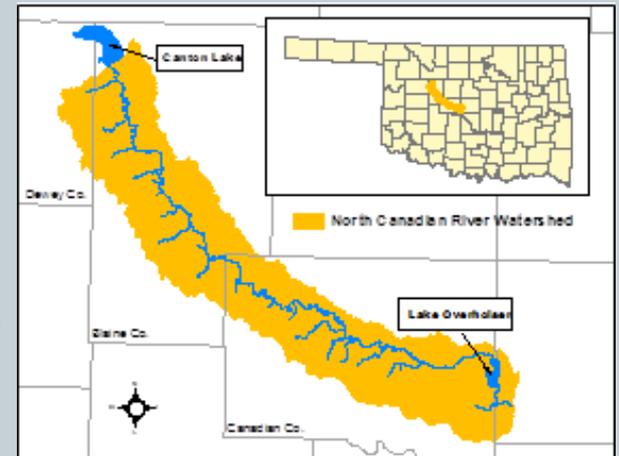
- Heavy use area protection



North Canadian River Project



- In 2007, began implementation project focused on reducing erosion
- Bacteria and turbidity were impairments
- Lots of cropland (wheat) and cattle
- Very sandy soils



North Canadian River Project



- Conservation Practice Priorities:
 - Erosion control
 - Conversion to no-till
 - Riparian area / buffer strip establishment and management
 - Pasture establishment and management
 - Heavy use area protection

Goal: To reduce erosion and secondarily reduce bacteria and nutrients in water

Conservation Practice Priorities

(North Canadian River)



- Erosion control
 - Vegetative plantings
 - Field borders
 - Structural practices



Conservation Practice Priorities

(North Canadian River)



- Conversion from conventional to no-till farming

No-till wheat field



Conventional till wheat field



Conservation Practice Priorities

(North Canadian River)



- Riparian areas / buffer zones
 - Fencing
 - Alternative water supply
 - Vegetative plantings
 - Stream crossings



Feb 2009

June 2009

2009: Cattle trails into the river have caused erosion.

regrown in the previously bare area.



Conservation Practice Priorities

(North Canadian River)



- Livestock / pasture management
 - Vegetative establishment
 - Nutrient management



Carbon Sequestration Pilot Project



- **2008: Oklahoma's first agricultural carbon offset pilot program** launched in N. Can. R. watershed
- Western Farmers Electric Cooperative agreed to sponsor program
- Payments of \$3.50 per metric ton of CO₂ given as annual payments over three years when project participants implemented no-till, pastureland management, or rangeland management.
- These practices, which are known to improve water quality and reduce erosion, also sequester carbon dioxide at a known rate because they minimize soil disturbance while optimizing vegetative growth.

Innovative Technology

(North Canadian River)



- OSU partnered with North Canadian project to study methods to optimize nutrient usage:
 - Greenseeker system / N-rich strips: optical sensor, mounted **on tractor boom or handheld “pocket” version, calculates yield potential and response to varying nitrogen fertilizer rates**
 - Grid sampling to determine more specific nutrient needs in different areas of field
 - Integrated cropping systems (cover crops)
 - Carbon sequestration rate in no-till and perennial grass systems



Oklahoma's "Conservation Partnership"



- Landowners – voluntarily fund and implement practices
- OCC – funds, educates, monitors, provides tech support
- Conservation Districts – locally manage and support projects
- USDA-NRCS – funds, provides tech support
- EPA – funds, provides tech support
- Universities – provide tech, research, and education support

Installing Conservation Practices



- NRCS programs put conservation practices on the ground in every Oklahoma county:
 - ~\$30 million in 2013 cost-share programs and ~\$40 million in 2012
- OCC programs also provide cost-share for conservation practices across the state:
 - Locally-led cost-share, ~\$1.4 million in 2014
 - 319 Program, ~\$1 million per year

Partnering to Show Success



So, there is a lot of implementation in Oklahoma!

But what are the effects?
Are we making a difference?



Partnering to Show Success



When combine

NRCS implementation info

+

OCC monitoring data

=

***Documentation of Water Quality
Improvements Due to Implementation of
Conservation Practices***

Partnering to Show Success

Oklahoma is 2nd in nation for EPA success stories

The screenshot shows the EPA website's navigation menu with categories like 'LEARN THE ISSUES', 'SCIENCE & TECHNOLOGY', 'LAWS & REGULATIONS', and 'ABOUT EPA'. The main content area is titled 'Water: Nonpoint Source Success Stories' and includes a breadcrumb trail: 'You are here: Water » Pollution Prevention & Control » Polluted Runoff » Section 319 Nonpoint Source Success Stories'. The page features a map of the United States with state abbreviations, and a list of three story categories: 'Stories about partially or fully restored waterbodies', 'Stories that show progress toward achieving water quality goals', and 'Stories about ecological restoration'. A sidebar on the left lists various water-related topics such as 'Drinking Water', 'Education & Training', and 'Pollution Prevention & Control'.

EPA United States Environmental Protection Agency

Advanced Search A-Z Index

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You are here: Water » Pollution Prevention & Control » Polluted Runoff » Section 319 Nonpoint Source Success Stories

Section 319 Nonpoint Source Success Stories

This **Section 319 Nonpoint Source Success Stories** Web site features stories about primarily nonpoint source-impaired waterbodies where restoration efforts have led to documented water quality improvements. **Waterbodies are separated into three categories of stories**, depending on the type of water quality improvement achieved:

- Stories about partially or fully restored waterbodies
- Stories that show progress toward achieving water quality goals
- Stories about ecological restoration

To find stories, either follow the story category links above or choose a state from the map.

Water Home
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Our Waters
Pollution Prevention & Control
Applications & Databases
Green Infrastructure/ Low Impact Development
Impaired Waters & TMDLs
Permitting (NPDES)
Polluted Runoff
Sediments

New Soil Health Initiative



- Statewide initiative focused on teaching conservation districts about the relationship between soil health, air, and water quality; will enable outreach to local communities
- Housed under the Carbon Program, OCC Water Quality Division
- Hands-on learning to delve into soil health principles through easy-to-use techniques for understanding, assessing, and restoring soil health

Soil Health Education Program
@OKLAHOMA CARBON PROGRAM

