EPA Update

Agriculture and Water Quality Partnerships

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Nonpoint Source Management Branch, Office of Wetlands, Oceans, and Watersheds
Office of Water
September 19, 2017
Section 319 of the Clean Water Act

• Nonpoint Sources are not specifically defined under the CWA – any source that EPA does not have authority to regulate as a point source
  • Includes agriculture stormwater discharge and irrigation return flows

• 319(b) - State NPS Management Programs

• 319(h) - Grant Program

• In addition to CWA, states follow EPA grant guidelines in spending 319 funds [https://www.epa.gov/nps/319](https://www.epa.gov/nps/319)
§ 319 Projects by Type 2008-2013
USDA and §319 Agricultural Projects

• Are complementary with §319 and best deliver water quality results when leveraged: the two programs share goals, rely on local partners and voluntary landowner action.

• §319 funds expand and complement USDA funds: provides planning framework and flexibility to support all aspects of watershed implementation, while USDA mainly funds cost-share for on-the-ground practices and some technical assistance.

• The 319 program has documented >680 waterways restored through NPS projects – USDA programs and conservation districts played important roles in about half these successes.
Partners for on-the-ground agricultural projects and landowner engagement

• USDA Natural Resources Conservation Service (NRCS)
• National Association of Conservation Districts
  • Soil and Water Conservation Districts
• Industry Service Providers: i.e. Certified Crop Advisors (CCAs) and Agricultural Retailers
• 4R Nutrient Stewardship Programs supported by The Fertilizer Institute, The Nature Conservancy (TNC), and other partners
• Nonprofits and NGO’s
  • Conservation Technology Innovation Center (CTIC)
  • TNC
  • Watershed groups, locally led producer networks etc.
• State Departments of Agriculture
Forums for Agricultural Research, Coordination, Education and Science

• Universities
  • Land-grant Universities
  • Water Quality Labs
  • Extension Service

• USDA
  • Agricultural Research Service (ARS)
  • National Institute of Food and Agriculture (NIFA)
  • Natural Resources Conservation Service (NRCS)

• Professional/Scientific organizations and Coalitions:
  • American Society of Agronomy, Crop Science Society of America, Soil Science Society of America (ASA/CSA/ASA or Tri-societies)
  • Soil and Water Conservation Society (SWCS)
  • Agricultural Drainage Water Management Task Force
  • National Working Group on Cover Crops and Soil Health
§319 Program Delivers Results: Ag Success Stories

Section 319
NONPOINT SOURCE PROGRAM SUCCESS STORY

Nonpoint Source Success Stories

This 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:

- Type 1. Stories about partially or fully restored waterbodies
- Type 2. Stories that show progress toward achieving water quality goals
- Type 3. Stories about ecological restoration

To find stories, either use the table below or choose a state from the map.

You will need Adobe Reader to view some of the files on this page. See Links About PDF page to learn more.

Partially or Fully Restored Waterbodies

684
Key Agricultural Partnership Programs- What’s next?

• Agricultural partnerships are key to success of 319 NPS program
• Continue to advance partnerships through:
  • National Water Quality Initiative
    • Emphasis on watershed planning, identifying critical areas, and outreach strategies
  • Hypoxia Task Force
    • Tracking progress, Land grant University Collaboration
  • Animal Ag collaborations
    • Facilitate open dialogue for a shared understanding of how to enhance agricultural practices and maintain clean water
• Implement grant-supported Ag partnerships for training and adoption of high impact practice systems and watershed planning
• Nonpoint Source Technical Exchange- information exchange on key issues for nonpoint source community
National Water Quality Initiative (NWQI)

• Launched in FY12; NRCS coordinates with EPA and state water quality agencies to address Ag nonpoint sources

• NRCS targets EQIP funds ($25-33M/yr) to *water quality-focused* conservation practices in small watersheds (currently 197) impaired by nutrients, sediment, and animal agriculture pathogens

• Designed for multiyear investment to treat all critical areas in watershed

• State agencies monitor water quality in at least one watershed to track practice impacts over multiple years

• NWQI has been an excellent path to greater collaboration towards water quality improvement among State agencies, NRCS and watershed partners

• What’s next? FY18 NWQI Readiness Phase emphasizes watershed planning, local collaboration, and on-farm conservation planning prior to targeted conservation practice implementation
Hypoxia Task Force

5 Federal Agencies and Tribes:
• US Army Corps of Engineers
• US Environmental Protection Agency
• US Department of Agriculture
• US Geological Survey
• National Oceanic and Atmospheric Administration
• National Tribal Water Council

12 State Agencies:
• Arkansas
• Missouri
• Iowa
• Tennessee
• Minnesota
• Indiana
• Ohio
• Louisiana
• Illinois
• Mississippi
• Kentucky
• Wisconsin

Each state is represented by one of:
Agriculture agency, Environmental Quality agency, or Natural Resources agency
Current HTF Focus Areas

• Tracking progress towards the goal
  -Coastal Goal:
  By 2035, reduce 5-year running average size of the Gulf hypoxic zone to 5,000 km²
  -Interim Target:
  20% reduction of nitrogen and phosphorus loading by 2025

• Nutrient Reduction Strategies
• SERA-46 Priorities for Collaboration
• Collaboration and Partnerships
• Communicating Success
Grant-supported Partnerships: Training and Research on High-Impact Practices and Watershed Planning

• EPA is enhancing water quality-focused training opportunities to agricultural advisors, including crop advisors, through a series of grants, including:
  • Connecting certified crop advisors and conservation districts
  • Two grants to train ag industry, CCAs and other consultants on conservation systems and watershed planning efforts that protect water quality
  • Grant with land-grant universities to enhance understanding of soil health and water quality interactions
### Cover Crop Facts

Cover Crops are tools to keep the soil in place, build soil health, improve water quality and reduce pollution from agricultural activities.

- They include cereals, brassicas, legumes and other broadleaf species, and can be annual or perennial plants. Cover crops can be adapted to fit almost any production system.

Cover Crops and Infiltration

Cover crops can successfully increase the infiltration of water into the soil layer. They do this by covering the ground with their biomass and by improving soil structure with their roots. Some specific conclusions include:

- Preventing soil surface sealing (when the soil becomes impermeable after rainfall).
- Improving soil structure with increased soil aggregate stability, soil porosity and water storage capacity.

Different types of cover crops may have different effects on infiltration because of their unique biomass growth and composition, and results vary based on how long the cover crop is grown.

- Winter legume cover crops, including barleygrass and ryegrass, increased infiltration by 80–90% based on range of studies.
- Legume cover crops, including crimson clover, hairy vetch and strawberry clover, increased infiltration by 60–90%.
- Soil surface cover by residue alone increased infiltration by up to 80% in field trials.

### Management Decisions Matter

Management that encourages continuous ground cover by residues and cover crops will be the best suited to protect the infiltration of water to the soil surface. Tillage practices are another important management decision for water infiltration.

- No-till management has been found to increase infiltration.
- The study reported that rainfall from north Texas fields was three to four times lower than their conventional till plots.

### A Far-Reaching Solution

When water is able to enter the soil profile, rather than running off the soil surface, it is clearly a win for both soil and water quality. Infiltration increases soil moisture, reduces erosion and provides possible benefits to the water conditions within the soil profile. By keeping the soil in place and improving soil conditions, cover crops are mitigating pollution risks while also helping to build active soil carbon.

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### Tables

#### Table 1: Cover crop impacts on nitrate and nitrite levels and yields in water quality experiments

<table>
<thead>
<tr>
<th>Source</th>
<th>Location</th>
<th>Type of Crop</th>
<th>N or Roll***</th>
<th>Control plan management***</th>
<th>Change in volume or conclusions based on research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acosta et al. (2015)**</td>
<td>Denmark</td>
<td>FR</td>
<td>U</td>
<td>No cover crop</td>
<td>-8%</td>
</tr>
<tr>
<td>Acosta et al. (2014)**</td>
<td>Denmark</td>
<td>RO</td>
<td>U</td>
<td>No cover crop</td>
<td>-8%</td>
</tr>
<tr>
<td>Acosta et al. (2014)**</td>
<td>Denmark</td>
<td>RA</td>
<td>U</td>
<td>No cover crop</td>
<td>-3%</td>
</tr>
<tr>
<td>Acosta et al. (2011)**</td>
<td>Denmark</td>
<td>M</td>
<td>U</td>
<td>No cover crop</td>
<td>-0%</td>
</tr>
<tr>
<td>Acosta et al. (2010)**</td>
<td>Sweden</td>
<td>FR</td>
<td>U</td>
<td>No cover crop</td>
<td>-14%</td>
</tr>
<tr>
<td>Acosta et al. (2010)**</td>
<td>Sweden</td>
<td>RO</td>
<td>U</td>
<td>No cover crop</td>
<td>-3%</td>
</tr>
<tr>
<td>Sevbold et al. (2010)**</td>
<td>Finland</td>
<td>RO</td>
<td>U</td>
<td>No cover crop</td>
<td>-6%</td>
</tr>
<tr>
<td>Acosta et al. (2010)**</td>
<td>Norway</td>
<td>FR</td>
<td>U</td>
<td>No cover crop</td>
<td>-6%</td>
</tr>
<tr>
<td>Sevbold et al. (2010)**</td>
<td>Sweden</td>
<td>RO</td>
<td>U</td>
<td>No cover crop</td>
<td>-4%</td>
</tr>
<tr>
<td>Emann et al. (2012)**</td>
<td>Kansas</td>
<td>WT</td>
<td>Y</td>
<td>No-tilt winter wheat, fall</td>
<td>-5%</td>
</tr>
<tr>
<td>Emann et al. (2013)**</td>
<td>Kansas</td>
<td>SP</td>
<td>Y</td>
<td>No-tilt winter wheat, fall</td>
<td>-7%</td>
</tr>
<tr>
<td>Emann at al. (2014)**</td>
<td>California</td>
<td>M</td>
<td>U</td>
<td>No-tilt winter wheat, fall</td>
<td>-3%</td>
</tr>
<tr>
<td>Deutel et al. (2014)**</td>
<td>Iowa</td>
<td>R</td>
<td>Y</td>
<td>No-tilt continuous corn, no cover crop</td>
<td>-5%</td>
</tr>
<tr>
<td>Driewin et al. (2015)**</td>
<td>Pennsylvania</td>
<td>LO</td>
<td>U</td>
<td>Corn and soybean rotation treated with nitrogen fertilizer and pesticides</td>
<td>-5%</td>
</tr>
<tr>
<td>Raske et al. (2012)**</td>
<td>Iowa</td>
<td>O</td>
<td>Y</td>
<td>No-tilt corn-soybean rotation, no cover crop</td>
<td>-2%</td>
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<tr>
<td>Kaspar et al. (2012)**</td>
<td>Iowa</td>
<td>R</td>
<td>Y</td>
<td>No-tilt corn-soybean rotation, no cover crop</td>
<td>-4%</td>
</tr>
<tr>
<td>Heitche et al. (2014)**</td>
<td>Indiana</td>
<td>W</td>
<td>Y</td>
<td>Continuous corn, double-planted soybean</td>
<td>-6%</td>
</tr>
<tr>
<td>Marthins, J., and O. Fradling (1980)**</td>
<td>France</td>
<td>RO</td>
<td>U</td>
<td>Continuous corn, double-planted soybean, no cover crop</td>
<td>-6%</td>
</tr>
<tr>
<td>Stens et al. (2004)**</td>
<td>Minnesota</td>
<td>Y</td>
<td>Y</td>
<td>No-tilt corn-soybean rotation, no cover crop</td>
<td>-12%</td>
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<tr>
<td>Tersome et al. (2000)**</td>
<td>Sweden</td>
<td>RO, FL, N</td>
<td></td>
<td>Corn, soybean, winter wheat</td>
<td>-3%</td>
</tr>
<tr>
<td>Volk, G.M. and C.E. Ball (2014)**</td>
<td>Florida</td>
<td>EN</td>
<td>U</td>
<td>No cover crop</td>
<td>-8%</td>
</tr>
</tbody>
</table>

**In this study, a literature review, the data in this row has been pulled from multiple sources and does not represent one specific area or one specific experiment. Please use the summary for this source to identify the original data.**

***Change in volume or conclusions based on research.
EPA Office of Wastewater Management’s Collaborations with Animal Agriculture

Open Dialogue
- Animal Agriculture Discussion Group

Partnership Projects
- Outreach piece on Beneficial Uses of Manure and Environmental Protection

EPA OWM Collaborations with Animal Agriculture

Goal: Improve water quality through voluntary partnerships

Practices and Technologies
- Nutrient Recycling Challenge

Better Information
- AADG’s Ag Education Project

For more information, contact:
Joseph Ziobro: Ziobro.Joseph@epa.gov
Animal Ag Discussion Group
Ag Education Project

2-Way Ag & Water Quality Education Program for Farmers and State/Federal Employees

https://extension.org/73649
• Competition to develop affordable technologies that recycle nutrients from livestock waste.
• We asked producers what they needed.
• Built program from the ground up with our ag partners.
Engagement opportunities

• Information exchange between EPA, State water quality agencies and Certified Crop Advisors
  • Webcast: EPA/State agencies learn about CCA program
  • Mid-Atlantic Crop Management School: EPA presentation

• CCA state boards- Engage with water quality agencies and local projects

• Nonpoint Source Technical Exchange- webcasts on agricultural topics

• How best to engage/communicate?
EPA Regions & Ag Advisors

- Randy Rush
- Vacant
- Kelly Shenk
- Kristina Heinemann
- Steven Winnett
- Gerald Winn
- Rebecca Perrin
- Karen Flournoy
- Nick Peak
- Doug Luehe
- Vacant

Guam
Trusted Territories
American Samoa
Northern Mariana Is.
Questions/Discussion

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