NLRS Conference 2017

Tracking BMP Adoption: Agriculture Voluntary BMPs

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Agency Coordinator, NLRS
Illinois EPA, Bureau of Water
Tracking Measures

**Resources**
- Staff
- Funding & Grants

**Outreach**
- Partner organization’s events & media
- Farmer knowledge

**Land & Facilities**
- Land use changes
- Facility & permit updates

**Water**
- Calculated load reduction
- Measured loads at existing monitoring stations
<table>
<thead>
<tr>
<th>Practice/scenario</th>
<th>Nitrate-N reduction per acre (percent)</th>
<th>Nitrate-N reduced (million lb)</th>
<th>Nitrate-N reduction from baseline (percent)</th>
<th>Cost ($/lb removed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing N rate from background to MRTN on 10 percent of acres</td>
<td>10</td>
<td>2.3</td>
<td>0.6</td>
<td>-4.25</td>
</tr>
<tr>
<td>Nitrification inhibitor with all fall-applied fertilizer on tile-drained corn acres</td>
<td>10</td>
<td>4.3</td>
<td>1</td>
<td>2.33</td>
</tr>
<tr>
<td>Split application of 50 percent fall and 50 percent spring on tile-drained corn acres</td>
<td>7.5-10</td>
<td>13</td>
<td>3.1</td>
<td>6.22</td>
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<tr>
<td>Split application of 50 percent fall, 10 percent pre-plant, and 50 percent side dress</td>
<td>15-20</td>
<td>26</td>
<td>6.4</td>
<td>3.17</td>
</tr>
<tr>
<td>Split application of 40 percent fall, 10 percent pre-plant, and 50 percent side dress</td>
<td>15-20</td>
<td>26</td>
<td>6.4</td>
<td>3.17</td>
</tr>
<tr>
<td>Cover crops on all corn/soybean tile-drained acres</td>
<td>30</td>
<td>84</td>
<td>20.5</td>
<td>3.21</td>
</tr>
<tr>
<td>Cover crops on all corn/soybean non-tiled acres</td>
<td>30</td>
<td>33</td>
<td>7.9</td>
<td>11.02</td>
</tr>
<tr>
<td>Bioreactors on 50 percent of tile-drained land</td>
<td>25</td>
<td>35</td>
<td>8.5</td>
<td>2.21</td>
</tr>
<tr>
<td>Wetlands on 35 percent of tile-drained land</td>
<td>50</td>
<td>49</td>
<td>11.9</td>
<td>4.05</td>
</tr>
<tr>
<td>Buffers on all applicable crop land (reduction only for water that interacts with active area)</td>
<td>90</td>
<td>36</td>
<td>8.7</td>
<td>1.63</td>
</tr>
<tr>
<td>Perennial/energy crops equal to pasture/hay acreage from 1987</td>
<td>90</td>
<td>10</td>
<td>2.6</td>
<td>9.34</td>
</tr>
<tr>
<td>Perennial/energy crops on 10 percent of tile-drained land</td>
<td>90</td>
<td>25</td>
<td>6.1</td>
<td>3.18</td>
</tr>
<tr>
<td>Point source reduction to 10 mg/L</td>
<td>14</td>
<td>3.4</td>
<td></td>
<td>3.3</td>
</tr>
<tr>
<td>Practice/scenario</td>
<td>Total P reduction per acre (percent)</td>
<td>Total P reduced (million lb)</td>
<td>Total P reduction from baseline (percent)</td>
<td>Cost ($/lb removed)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
<td>------------------------------</td>
<td>------------------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>1.8 million acres of conventional till eroding &gt; T converted to reduced, mulch, or no-till</td>
<td>50</td>
<td>1.8</td>
<td>5</td>
<td>-16.6</td>
</tr>
<tr>
<td>P rate reduction on fields with soil test P above the recommended maintenance level</td>
<td>7</td>
<td>1.9</td>
<td>5</td>
<td>-48.75</td>
</tr>
<tr>
<td>Cover crops on all corn/soybean tile-drained acres</td>
<td>30</td>
<td>4.8</td>
<td>12.8</td>
<td>130.4</td>
</tr>
<tr>
<td>Cover crops on 1.6 million acres eroding &gt; T currently in reduced, mulch, or no-till</td>
<td>50</td>
<td>1.9</td>
<td>5</td>
<td>24.5</td>
</tr>
<tr>
<td>Wetlands on 25 percent of tile-drained land</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Buffers on all applicable crop land</td>
<td>25-50</td>
<td>4.8</td>
<td>12.9</td>
<td>11.97</td>
</tr>
<tr>
<td>Perennial/energy crops equal to pasture/hay acreage in 1987</td>
<td>90</td>
<td>0.9</td>
<td>2.5</td>
<td>102.3</td>
</tr>
<tr>
<td>Perennial/energy crops on 1.6 million acres eroding &gt; T currently in reduced, mulch, or no-till</td>
<td>90</td>
<td>3.5</td>
<td>9</td>
<td>40.4</td>
</tr>
<tr>
<td>Perennial/energy crops on 10 percent of tile-drained land</td>
<td>50</td>
<td>0.3</td>
<td>0.8</td>
<td>250.07</td>
</tr>
<tr>
<td>Point source reduction to 1 mg/L (majors only)</td>
<td>8.3</td>
<td>22.1</td>
<td></td>
<td>13.71</td>
</tr>
<tr>
<td>Name</td>
<td>Combined practices and scenarios</td>
<td>Nitrate-N reduction (percent)</td>
<td>Total P reduction (percent)</td>
<td>Cost of reduction ($/lb)</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>NP1</td>
<td>MRTN, spring-only N application, bioreactors on 50 percent of acres, wetlands on 35 percent of acres, no P fertilizer on 12.5 million acres above STP maintenance, reduced till on 1.8 million conventionally tilled acres eroding &gt;T, buffers on all applicable lands, point source to 1 mg total P/L and 10 mg nitrate-N/L</td>
<td>35</td>
<td>45</td>
<td>**</td>
</tr>
<tr>
<td>NP2</td>
<td>MRTN, spring-only N application, bioreactors on 50 percent of acres, wetlands on 10 percent of acres, no P fertilizer on 12.5 million acres above STP maintenance, reduced till on 1.8 million conventionally tilled acres eroding &gt;T, cover crops on all corn/soybean acres, point source to 1 mg total P/L and 10 mg nitrate-N/L</td>
<td>45</td>
<td>45</td>
<td>**</td>
</tr>
<tr>
<td>NP3</td>
<td>MRTN, spring-only N application, bioreactors on 30 percent of acres, no P fertilizer on 12.5 million acres above STP maintenance, reduced till on 1.8 million conventionally tilled acres eroding &gt;T, cover crops on 87.5 percent of corn/soybean acres, buffers on all applicable lands, perennial crops on 1.6 million acres &gt;T and 0.9 million additional acres</td>
<td>45</td>
<td>45</td>
<td>**</td>
</tr>
</tbody>
</table>
Types of Ag BMPs recommended in NLRS

**Nitrate**
- In Field Practices
  - Nitrogen Management
    - MRTN, Inhibitors, Split appl.
  - Cover Crops
- Edge of Field Practices
  - Bioreactors
  - Buffers (non-tile drained)
  - Wetlands
- Land Use Change
  - Perennial/Energy Crops

**Phosphorus**
- In Field Practices
  - Reduced Tillage Systems
  - Soil Tests/Nutrient Management
  - Cover Crops
- Edge of Field Practices
  - Buffers
  - Wetlands
- Land Use Change
  - Perennial/Energy Crops
AWQPF Objectives

- Steer and Coordinate Outreach and Education
- Training for farmers and advisors
- Strength Connections between industry, CCAs, State initiatives
- Track BMPs
- Coordinate Cost-share targeting
- Develop other tools as need.
Tracking Land and Facilities Measures

- Used 2011 as baseline year
  - 2011 last year of data used in the Science Assessment to calculate nutrient loads
  - BMP implementation data reported for years 2015/2016
  - Determine BMP implementation during this time period.
### Tracking Land and Facilities Measures

<table>
<thead>
<tr>
<th>BMPs</th>
<th>FSA</th>
<th>Illinois DNR</th>
<th>USDA-NRCS</th>
<th>Illinois EPA</th>
<th>NASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced N rate from background to MRTN on 10 percent of acres</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Nitrification inhibitor with all fall-applied fertilizer on tile-drained corn acres</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Split application of 50 percent fall and 50 percent spring on tile-drained corn acres</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Spring-only application on tiled-drained corn acres</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Split application of 40 percent fall, 10 percent pre-plant, and 50 percent side dress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Cover crops on all corn/soybean tile-drained acres</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Cover crops on all corn/soybean non-tiled acres</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Bioreactors on 50 percent of the tile-drained land</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Wetlands on 25 percent of tile-drained land</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Buffers on all applicable crop land</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Perennial/energy crops equal to pasture/hay acreage from 1987</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Perennial/energy crops on 10 percent of tile-drained land</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
Conservation Reserve Program

Table 4.4. Acres in nutrient BMPs reported by producers to FSA

<table>
<thead>
<tr>
<th></th>
<th>2011 Acres</th>
<th>2015 Acres</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover crops(^1)</td>
<td>768</td>
<td>11,064</td>
<td>1,340%</td>
</tr>
<tr>
<td>CRP Wetlands</td>
<td>57,463</td>
<td>45,790</td>
<td>-20%</td>
</tr>
<tr>
<td>CRP Buffers</td>
<td>145,813</td>
<td>279,534</td>
<td>92%</td>
</tr>
<tr>
<td>Perennial/Energy/Pasture(^2)</td>
<td>985,531</td>
<td>1,524,379</td>
<td>55%</td>
</tr>
</tbody>
</table>

- Data provided Statewide and at HUC 8 scale
Conservation Reserve Enhancement Program

Data provided Statewide and at HUC 8 scale

<table>
<thead>
<tr>
<th>Wetlands</th>
<th>2011 Acres</th>
<th>2015 Acres</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands</td>
<td>483</td>
<td>22,609</td>
<td>▲ 4,581%</td>
</tr>
<tr>
<td>Buffers</td>
<td>202</td>
<td>17,893</td>
<td>▲ 8,758%</td>
</tr>
<tr>
<td>Perennial/Energy</td>
<td>81</td>
<td>6,043</td>
<td>▲ 7,360%</td>
</tr>
</tbody>
</table>

Table 4.5. Acres with Illinois DNR Conservation Reserve Enhancement Program Easements
Environmental Quality Incentives Program

Table 4.6. Acres enrolled in nutrient BMPs through the NRCS Environmental Quality Incentives Program 2009-2015

<table>
<thead>
<tr>
<th>Conservation Practice</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrient management</td>
<td>49,932</td>
</tr>
<tr>
<td>Cover crops</td>
<td>80,659</td>
</tr>
<tr>
<td>Buffers</td>
<td>18.8</td>
</tr>
<tr>
<td>Residue and tillage management</td>
<td>22,388</td>
</tr>
<tr>
<td>Wetland restoration</td>
<td>0.7</td>
</tr>
</tbody>
</table>

- Data provided by Illinois NRCS from a spreadsheet generated by NRCS Headquarters in D.C. for the Hypoxia Task Force.
- Data available on a HUC 12 scale, aggregated by Illinois EPA on HUC 8 scale
Conservation Stewardship Program

Agricultural Conservation Easement Program

- Statewide data only
Data provided by
- U of I/NRCS
- Voluntary Reporting
# Illinois EPA Section 319 Grant Program

## Table 4.7. Illinois EPA Section 319 Grant program

<table>
<thead>
<tr>
<th></th>
<th>2001-2011 Acres</th>
<th>2012-2015 Acres</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation tillage</td>
<td>9998</td>
<td>734</td>
<td>▼</td>
</tr>
<tr>
<td>Cover and green manure crop</td>
<td>3924</td>
<td>0</td>
<td>▼</td>
</tr>
<tr>
<td>Filter strip</td>
<td>8</td>
<td>13,882</td>
<td>▲</td>
</tr>
<tr>
<td>Nutrient management</td>
<td>0</td>
<td>107,061</td>
<td>▲</td>
</tr>
<tr>
<td>Wetland restoration</td>
<td>936</td>
<td>464</td>
<td>▼</td>
</tr>
</tbody>
</table>
### Illinois EPA Section 319 Grant Program

#### Load Reductions

<table>
<thead>
<tr>
<th>Illinois EPA Section 319 Grant</th>
<th>AGRICULTURE</th>
<th>2002-2011</th>
<th>2011-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Nitrogen Load Reduction (lbs/year)</td>
<td>Phosphorus Load Reduction (lbs/year)</td>
</tr>
<tr>
<td>Conservation Tillage (329)</td>
<td>9998</td>
<td>47169</td>
<td>23691</td>
</tr>
<tr>
<td>Cover and Green Manure Crop (340)</td>
<td>3924</td>
<td>14827</td>
<td>1190</td>
</tr>
<tr>
<td>Filter Strip (393)</td>
<td>8</td>
<td>1360</td>
<td>725</td>
</tr>
<tr>
<td>Nutrient Management (590)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland Restoration (657)</td>
<td>936</td>
<td>5028</td>
<td>2103</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>-</td>
<td><strong>68,384</strong></td>
<td><strong>27,709</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Illinois EPA Section 319 Grant</th>
<th>AGRICULTURE</th>
<th>2011-2015</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Nitrogen Load Reduction (lbs/year)</td>
<td>Phosphorus Load Reduction (lbs/year)</td>
</tr>
<tr>
<td>Conservation Tillage (329)</td>
<td>734</td>
<td>3913</td>
<td>2005</td>
</tr>
<tr>
<td>Filter Strip (393)</td>
<td>13882</td>
<td>329813</td>
<td>167170</td>
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<tr>
<td>Nutrient Management (590)</td>
<td>107061</td>
<td>109915</td>
<td>54325</td>
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<tr>
<td>Wetland Restoration (657)</td>
<td>464</td>
<td>2,760</td>
<td>1668</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>-</td>
<td><strong>446,400</strong></td>
<td><strong>225,168</strong></td>
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</tbody>
</table>
National Agricultural Statistical Service
NLRS Producer Survey

- Survey developed to capture implementation done outside of cost-share programs
- Mailed to producers in July 2016
- Results published December 2016
- Compared 2011 baseline year data to 2015
### Table 4.8. Fertilizer application strategies for corn on tiled acres (NASS survey result)

<table>
<thead>
<tr>
<th>Strategy</th>
<th>2011 Acres</th>
<th>2015 Acres</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 50% fall/winter applications, with remaining nitrogen applications split between</td>
<td>1,730,000</td>
<td>2,220,000</td>
<td>▲ 28%</td>
</tr>
<tr>
<td>pre-plant and side-dress applications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall/winter nitrogen was 0% of total nitrogen (all spring applications)</td>
<td>2,480,000</td>
<td>2,660,000</td>
<td>▲ 7%</td>
</tr>
<tr>
<td>Fall/winter nitrogen was 50% or less of total nitrogen</td>
<td>940,000</td>
<td>950,000</td>
<td>▲ 1%</td>
</tr>
<tr>
<td>Fall/winter nitrogen was applied with a nitrification inhibitor²</td>
<td>3,240,000</td>
<td>2,970,000</td>
<td>▼ 8%</td>
</tr>
<tr>
<td>Total acres of corn planted</td>
<td>12,600,000</td>
<td>11,700,000</td>
<td>▼ 7%</td>
</tr>
<tr>
<td>Percent of total corn acres</td>
<td>25.7%</td>
<td>25.4%</td>
<td>▼ 1%</td>
</tr>
</tbody>
</table>

### Table 4.9. Acres with cover crops (NASS survey result)

<table>
<thead>
<tr>
<th>Type of Cover Crop</th>
<th>2011 Acres</th>
<th>2015 Acres</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn/soybean acres planted to cover crops on tiled ground</td>
<td>220,000</td>
<td>490,000</td>
<td>▲ 123%</td>
</tr>
<tr>
<td>Corn/soybean acres planted to cover crops on non-tiled ground</td>
<td>380,000</td>
<td>630,000</td>
<td>▲ 66%</td>
</tr>
</tbody>
</table>

### Table 4.10. Acres with edge of field practices and perennial crops (NASS survey result)

<table>
<thead>
<tr>
<th>Type of Perennial Practice</th>
<th>2015 Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiled acres draining into bioreactors</td>
<td>(D)</td>
</tr>
<tr>
<td>Tiled acres draining into constructed wetlands</td>
<td>160,000</td>
</tr>
<tr>
<td>Tiled acres planted to perennial crops, including CRP plantings, hay, and miscanthus</td>
<td>230,000</td>
</tr>
</tbody>
</table>

(D) - Number withheld to avoid disclosing data for individual farms.
New Initiatives Supporting NLRS Goals

- IFB Nutrient Stewardship Mini-Grants
- 4R4U
- 4R Metrics
- Advanced Soil Health Training
- Leadership for Midwestern Watersheds
- Absentee Farmland Owners
- PCM
- Sustainable Ag Partnership
- IL Corn waters testing
- Illinois Cover Crops Program
- Field Laboratories
- MRBI and RCPP Projects
Other Measures Tracked

Resources

Outreach

Table 4.1. Summary of outreach and education events held by partner organizations in the agricultural sector in 2016

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Number of events</th>
<th>Total Reported Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outreach (fairs, tours, community education, presentations)</td>
<td>457</td>
<td>16,000</td>
</tr>
<tr>
<td>Field days</td>
<td>130</td>
<td>3,692</td>
</tr>
<tr>
<td>Workshops</td>
<td>607</td>
<td>12,695</td>
</tr>
<tr>
<td>Conferences</td>
<td>27</td>
<td>6,935</td>
</tr>
<tr>
<td>Total</td>
<td>1,221</td>
<td>39,325</td>
</tr>
</tbody>
</table>

2016 Total = $54,834,638
What Data Do We Need In The Future?

- Tillage Data
  - Was not included in Biennial Report
What Are The Action Steps for Getting It?

- **IL Dept. of Ag Soil Transect Survey**
  - Tracks Tillage practices and acres meeting “T”
    - By county and statewide. Conducted every two years
  - Ability to track by HUC 8 watershed
  - Include summaries from previous Soil Transect Reports.
  - Reports are available online
  - Use 2011 Report as Baseline
  - Include data from 2013-2017 Reports
  - Continue performing Transect Surveys every two years.
What Data Do We Need In The Future?

- More accurate reporting of Cover Crop acres
- 2015 FSA showed 11,064 acres of farmer-reported data
- 2009-2015 EQIP data showed 80,659 acres cost-shared
- NASS Survey: 1.2M acres in 2015
- Other states using remote sensing to estimate cover crops
What Are The Action Steps for Getting It?

- Farmers report cover crop acres when reporting crop acres to FSA would be most accurate
  - Potential barriers for not reporting
    - Suggest discussing overcoming barriers with FSA, farm organizations

- Remote Sensing

- NASS Survey
What Data Do We Need In The Future?

- Track 4R metrics (Right Rate, Source, Time, Place)

What Are The Action Steps for Getting It?

- Work with IL Fertilizer and Chemical Assoc., ag retailers to define, track, and report 4R metrics
What Data Do We Need In The Future?

- Establish baseline for structural BMPS
  - Filter strips, grass waterways, etc.

What Are The Action Steps for Getting It?

- Remote sensing, mapping software, other?
What Data Do We Need In The Future

- Track voluntary implementation of other organizations programs, and individual reporting

What Are The Action Steps for Getting It?

- Develop database for organizations or individual reporting of voluntary BMP implementation.
- Work being done at national level for this through Hypoxia Task Force
Where do we go from here?

- Continue education and outreach efforts
  - Stay on message
- Target Cost-share funding, priority watersheds
- Continue and expand non-governmental cost share programs
- Scale up implementation
- CONTINUE COLLABORATIONS!
University of Illinois Extension
Watershed Coordinators

- Illinois EPA is partnering with University of Illinois Extension to hire two watershed coordinators to work in priority watersheds.
- Provide outreach and technical assistance.
- Assist local stakeholders in:
  - Watershed Planning
  - Implementation of Watershed Plans
-Coordinate local initiatives, collaborate with other organizations.
Illinois Point Source Nutrient Control

AMY DRAGOVIĆH, P.E.
MANAGER, NORTHERN MUNICIPAL UNIT, PERMIT SECTION, IEPA
Nutrient Discharges

- November 2, 2011 letter to USEPA Region 5
- Response to EPA letter concerning DO and algae impaired waters
- Steps to address the discharge of nutrients
  - Current activities
  - Enhancement to current activities
  - Future tools
Nutrient Discharges

- November 2, 2011 letter to USEPA Region 5
  - Current Activities
    - WQ standard for lakes and reservoirs
    - Effluent standard for new/expanded facilities
    - Waste load allocations in TMDL reports
    - Antidegradation assessments
    - DO effluent limits included in permits
Nutrient Discharges

November 2, 2011 letter to USEPA Region 5

Enhancement to Current Activities
- Developing nutrient TMDLs
- Additional monitoring to develop TMDLs
- Reopener clause to incorporate permit limits
- Watershed study groups
- Interim phosphorus permit limits for algae or DO impaired waters
- Identification of operational modifications
Nutrient Discharges

- November 2, 2011 letter to USEPA Region 5
- Future Tools
  - Future regulations to address nutrients
    - Nutrient Science Advisory Committee
    - Future rules filed with Illinois Pollution Control Board
MWRDGC Permit Appeal

- Calumet, Stickney and O’Brien Permits issued December 23, 2013 with 1 mg/L P limit
- Permits appealed by environmental groups
- Decision by Illinois Pollution Control Board (IPCB) that permits did not violate the Act or Board regulations
- IPCB decision appealed to Illinois Appellate Court
- Appellate Court remanded permits back to the Agency
- Illinois Appellate Court decision:
  - “Must ensure that the permit prevents discharges of pollutants having the ‘reasonable potential’ of violating Illinois water quality standards contained in the narrative statements.”
MWRDGC Settlement Agreement

- Additional special conditions
  - Chicago Area Waterways Nutrient Oversight Committee
    - Develop Implementation Plan
    - Phosphorus input reductions (point and non-point)
  - Technology based Total Phosphorus effluent limit of 0.5 mg/L by 2030
  - Feasibility study – 0.5, 0.3 and 0.1 mg/L
  - Continuous monitoring gauge at Joliet, IL
MWRDGC Permits

- Calumet, Stickney and O’Brien Permits re-issued July 6, 2017
- Included interim 1 mg/L P limit with compliance schedules
- P improvements include:
  - Converting aeration zones to anaerobic zones
  - Optimizing P removal
  - Sidestream P recovery process
  - Supplemental carbon process
  - Centrate treatment
  - Investigating use of algae to recover P
- Included settlement special conditions – 0.5 mg/L P by 2030
Nutrient Loss Reduction Strategy

- Priority Watersheds for Point Sources
  - Upper Fox River Watershed
  - Des Plaines River/DuPage River Watershed
  - Upper Sangamon River Watershed
  - Lower Rock River Watershed
  - Illinois River - Senachwine Lake Watershed

All ranked high in both Total P and nitrate-nitrogen loading.
Fox River Study Group

- Located between Stratton Dam and Illinois River
- Impairments for DO, TP and nuisance algae
- 24 Major Municipal Facilities in Watershed
- NPDES conditions
  - Interim annual effluent limit of 1 mg/L P
  - Submit P removal feasibility report
  - Implementation Plan
  - Optimize the existing facilities
  - Compliance schedule for P limit (~4 ½ years)
- Permits issued in 2014/2015 for 3 years
Feasibility Report results:
- Most facilities would be adding chemicals to meet 1 mg/L P effluent limit
- Biological phosphorus removal/chemical backup for lower limits

Permits are in the process of being renewed

Additional requirements:
- Update Implementation Plan with improved modelling
- Additional projects for next permit cycle
- Optimization of existing facilities
- Lower technology based effluent limit for Total P with exceptions
DuPage River/Salt Creek Workgroup

- 24 Major Municipal Facilities in Watershed
- Address DO and offensive condition impairments
- NPDES conditions
  - Dam Removals
  - Collect additional data and update model
  - Submit P feasibility study
  - Submit P optimization evaluation plan
  - Participate in Chloride Reduction Program
  - Compliance schedule for P Limit (11 years for Bio-P removal)
- Submit Nutrient Implementation Plan – December 31, 2023
DuPage River/Salt Creek Workgroup

Feasibility Report results:

- Most facilities would be adding chemicals to meet 1 mg/L P effluent limit
- Biological phosphorus removal/chemical backup for lower effluent limits
Other Watershed Workgroups

- Des Plaines River Watershed Workgroup
- Lower DuPage River Watershed Coalition
- Hickory Creek Watershed Planning Group
- Lower Des Plaines Watershed Group
Negotiations between IAWA and Environmental Groups

- To address “reasonable potential” of violating narrative WQ standards
- Promoting biological nutrient removal
- Future conditions in NPDES permits for all major facilities may include:
  - Technology based effluent limit of 0.5 mg/L by 2030
  - Exceptions include not economically feasible
  - Implementation Plan if impaired waterbody or if waterbody has characteristics of an impaired waterbody
Questions?

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Tracking Urban Stormwater BMPs

Reid Christianson, PE, PhD
University of Illinois

Inaugural Illinois NLRS Workshop
November 29, 2017
New Development vs. Retrofits

• New Development
  • Post-Construction Runoff Control
    • Minimum Control Measure
    • For simplicity, say this is net neutral

• Existing Development
  • Only option is to “retrofit”, or put stormwater control where there was none before
New Development ~2010

Stormwater control is included in the design with a pond to control peak flow leaving the site.
New Development ~2010

Stormwater control is included in the design with a pond to control peak flow leaving the site.
Established Development

No stormwater control is present. If we want to add, we have to "retrofit"
Rain Gardens

[Image of Rain Gardens]

https://prairierivers.org/raingardens/

Grade Control

[Image of Grade Control]


Stormwater Wetlands

[Image of Stormwater Wetlands]

http://chesapeakestormwater.net/download/3280/

Urban Filter Strip

[Image of Urban Filter Strip]

http://chesapeakestormwater.net/download/4323/

Permeable Pavement

[Image of Permeable Pavement]

http://vwrrc.vt.edu/swc/NonPBMPSpecsMarcH11/VASWMBMPSpec7PERMEABLEPAVEMENT.html
Established Development

No stormwater control is present. If we want to add, we have to "retrofit".
## Life of an Urban BMP

<table>
<thead>
<tr>
<th>Practice</th>
<th>Life (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain Garden</td>
<td>5 to 10</td>
</tr>
<tr>
<td>Sediment Basin</td>
<td>10 to 20</td>
</tr>
<tr>
<td>Grade Stabilization Structure</td>
<td>5 to 10</td>
</tr>
<tr>
<td>Urban Stormwater Wetlands</td>
<td>20 to 50</td>
</tr>
<tr>
<td>Urban Filter Strip</td>
<td>&gt;10</td>
</tr>
<tr>
<td>Grass-Lined Channels</td>
<td>10 to 20</td>
</tr>
<tr>
<td>Porous Pavement</td>
<td>15 to 20</td>
</tr>
</tbody>
</table>
Where are we now?

- 7 per year (2002-2011)
- 108 per year (2012-2015)

Number of Illinois EPA 319 urban stormwater projects (2002-2011 and 2012-2015)

- Infiltration Trench
- Wetland
- Grade Structure
- Rain Garden
Where are we now?

Figure 6.2. Calculated total nitrogen and total phosphorus load reduction (lbs/year) from Illinois EPA 319 urban non-point source projects
Where are we now?

[Bar chart showing load reduction (lbs/year) for Total N and Total P, with categories for 2002-2011 and 2012-2015]
Where can we go?

Table 6.5. Urban non-point source programs and projects working toward Illinois NLRS goals

<table>
<thead>
<tr>
<th>Program</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 319</td>
<td>69</td>
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<tr>
<td>Municipal Separate Storm Sewer System Permit</td>
<td>Illinois NLRS p. 7-2</td>
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<td>Clean Water Initiative and State Revolving Fund</td>
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<tr>
<td>Illinois Green Infrastructure Grants</td>
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<td>Rain Barrel Programs</td>
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<tr>
<td>Streambank Stabilization and Restoration Program</td>
<td>Illinois NLRS p. 7-4</td>
</tr>
<tr>
<td>Total Maximum Daily Load</td>
<td>Illinois NLRS p. 7-4</td>
</tr>
<tr>
<td>Calumet Stormwater Collaborative</td>
<td>75</td>
</tr>
</tbody>
</table>

Bold type and page number signify an update in this report. Details about programs listed in non-bold type and page number can be found in the strategy.
Strategic Actions

- Urban Stormwater Workgroup
  - Nutrient info for MS4s
  - Let us tell the *whole* story
- Stormwater Management Planning
- Storm Sewer System Mapping
- Encourage Stormwater Management Training
Future Data Sources?

- County/town/city/village inventory?
- Watershed plans?
- Private Groups
  - Non Profits
  - Foundations
  - Citizens
Suggested Minimum Measures

- Location
- Practice type
- Land area treated by BMP
  - Acres treated
- When the practice was installed
  - And program used for funding
    - 319
    - IGIG
    - Private
- Expected life of the practice
- Funding, if applicable
QUESTIONS?