Upstream Impacts: A Collaborative Approach to Nutrient Loss Reduction in the Midwest

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CO-AUTHORS: ELIANA BROWN & ANJANETTE RILEY
Illinois in perspective

Gulf of Mexico
Hypoxic Zone
The strategy started with a Science Assessment: *Nutrient contributions by source*
For Ag. Nonpoint Source - there are no simple solutions

1) To reach the 45% reduction target it takes a practice on every acre

2) No one practice reaches the goal by itself

3) Interim N goal is 15% reduction by 2025
Science assessment and estimated adoption rates used to determine interim goal

<table>
<thead>
<tr>
<th>Practice</th>
<th>Median adoption rate (%)</th>
<th>N reduction (million lb N)</th>
<th>P reduction (million lb P)</th>
<th>Needed adoption rate 45% reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timing change (either fall to spring or fall/spring/side dress)</td>
<td>65</td>
<td>17</td>
<td>0</td>
<td>100% (?)</td>
</tr>
<tr>
<td>Cover crops - tile drained corn and soybean acres</td>
<td>25</td>
<td>21</td>
<td>0.5</td>
<td>87.5-100%</td>
</tr>
<tr>
<td>Ephemeral gulley control</td>
<td>65</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Buffers on ag streams</td>
<td>50</td>
<td>13</td>
<td>2.4</td>
<td>All ag. streams</td>
</tr>
<tr>
<td>Wetlands on tile drained acres</td>
<td>10</td>
<td>11</td>
<td>0</td>
<td>25%</td>
</tr>
<tr>
<td>No P fertilizers with STP above maintenance</td>
<td>78</td>
<td>0</td>
<td>1.5</td>
<td>12.5 mil acres (~65%)</td>
</tr>
<tr>
<td>No manure application on frozen ground</td>
<td>93</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>Convert 1.8 million acres of conventional till eroding &gt; T to reduced, mulch, or no till</td>
<td>60</td>
<td>0</td>
<td>1.1</td>
<td>100%</td>
</tr>
<tr>
<td>Summed</td>
<td>60 (15%)</td>
<td>5.5 (15%)</td>
<td></td>
<td>+ more BMPs = 45%</td>
</tr>
</tbody>
</table>
For Ag. P NPS- there also are no simple solutions

1) P reduction similar to N requiring practices on all acres

2) No one practice reaches the goal by itself

3) Interim P goal is 15% reduction by 2025

Can get to ½ of goal with Point Source reduction
Data and Tools

Facilitate Statewide Policy Discussions

- 1 year to Develop
- 19 meetings
- 1 year for public comment, revisions, agency approval, and publication
Data and Tools
Facilitate Statewide Policy Discussions

INLRS Policy Work Group Participation

Agriculture
Point Source
Stormwater

University/Technical Assistance
Government
Public Water Supply
Environmental
3 Overarching points of agreement

- **Local** water quality improvement must be a priority
- Emphasis is on Nutrient Loss Reduction – not nutrient Reduction
- Nutrients losses are being contributed by all major sectors- we all have a role to play
Developed criteria for setting watershed priorities

- Contribution (yield) of N or P
- Source of inputs (PS or NPS)
- Restoration potential of watersheds
- # of watershed based plans/HUC8
Perspectives by Sector – Agriculture
(Lauren Lurkins, Il Farm Bureau 10/14)

- Focus on building upon existing programs and resources
- Reinvigoration of voluntary conservation adoption and nutrient management
- New focus on tracking implementation of BMPs and resulting water quality impacts
- No “one size fits all” approach for all of Illinois agriculture
Agriculture Partners Coordinating Outreach and Communication: Ongoing Efforts

- Newsletter articles
- Direct correspondence
- Meetings with members
- Roadshows (9)
- Social media
- Connecting NLRS to existing programs
• Over 90% have tried nutrient management practices and over 50% and done so for over 10 years
• Over 90% have tried no-till or strip-till practices
• Over 90% wait until the soil temps fall to 50 degrees to apply anhydrous ammonia
• Over 80% use a nitrification inhibitor
• Over 40% have tried cover crops
• Over 70% that attended will try a new practice or a combination of practices for the first time
Ag: New Initiatives

- IL Corn Growers – Grant
- IFCA – N-Watch
- NREC – Research Summary
- IDNR – CREP
- NRCS – Cost share and coordination
- PRN – Absentee landowner
- IDOA – Cover crop initiative
- TNC – Funded projects
- AFT – Women landowner program
- IFB – Small Grant Program
Coordinating Outreach Strategies with Agriculture Communication Partners: “We are all in this together!”

Photo Contest: “Water is ..”
Developing scientific messages for outreach products:

**Videos:** explaining the science

**Fact Sheets:** “Do a Soil Test”
Agriculture Water Quality Partnership Forum

- Steer and coordinate outreach and education efforts to help farmers address nutrient loss and select the most appropriate BMPs:
  - Identify needed education initiatives or training requirements for farmer and technical advisors.
  - Strengthen connections between industry initiatives, certified crop advisor continuing education requirements, state initiatives, and other technical services.
- Track BMP implementation
- Coordinate cost sharing and targeting
- Develop other tools as needed
  - Consider an agriculture water quality certification program.
Data and Tools

- Illinois EPA
  - Amy Walkenbach
- IDA
  - Warren Goetsch
- USDA-NRCS
  - Ivan Dozier
- IDNR
  - James Herkert
- AISWCD
  - Kelly Thompson
- The Nature Conservancy
  - Maria Lemke
- IFCA
  - Jean Payne
- American Farmland Trust
  - Mike Baise
- Prairie Rivers Network
  - Carol Hays
- LICA
  - Ryan Arch

Facilitate Statewide Policy Discussions

- Illinois Farm Bureau
  - Lauren Lurkins
- Illinois Pork Producers Association
  - Jennifer Tirey
- Illinois Soybean Association
  - Amy Roady
- University of Illinois - Extension
  - George Czapar and Laura Christianson
- Farm Service Agency
  - Scherrie Giamanco (Kim Martin)
- Illinois Certified Crop Advisor Board of Directors
  - Tom Kelley
- Illinois Stewardship Alliance
  - Rebecca Osland
- Illinois Soc of Prof. Farm Man. & Rural Appr.
  - Randy Fransen
- Illinois Corn Growers Association
  - Rodney Weinzierl
- Nutrient Research and Education Council
  - Julie Armstrong

Facilitate Working Groups and Collaboration

AWQPF Membership
Data and Tools
Facilitate Policy Discussions
Facilitate Working Groups and Collaboration
Research to Support Adaptive Management Frameworks

• Technical multi-agency groups needed to collect, summarize, & analyze performance data

• Ag, Water Quality Partnership Forum Technical Committee

<table>
<thead>
<tr>
<th>Land</th>
<th>Units</th>
<th>USDA-NRCS</th>
<th>Illinois EPA</th>
<th>FSA</th>
<th>IDNR</th>
<th>NASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red. N rate from backsp to MRTN 10% Nitrogen inhibitor w/ all fall-applied</td>
<td>Cropland acres</td>
<td>Cropland acres</td>
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<tr>
<td>Nitrification inhibitor on tile-drained corn</td>
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<tr>
<td>Spring-only appl. on tile-drained corn</td>
<td>Cropland acres</td>
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<td>Split appl. of 40% fall, 10% pre-plant, and 50% side dress</td>
<td>Cropland acres</td>
<td>Cropland acres</td>
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<tr>
<td>Cover crops on all corn/soybean tile ac.</td>
<td>Cropland acres</td>
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<tr>
<td>Cover crops/combean non-tile ac.</td>
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<tr>
<td>Bioreactors on 50% of tile-drained land</td>
<td>To HUC8 level</td>
<td>To HUC8 level</td>
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<td>To HUC8 level</td>
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<tr>
<td>Wetlands on 25% of tile-drained land</td>
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<td>Buffers on all applicable crop land</td>
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<td>Perennial/energy = to pasture/hay ac.</td>
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<td>Water table management:</td>
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<td># Acres treated</td>
<td>EQIP</td>
<td>319 Grant</td>
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<tr>
<td>Acres wetland/# Acres treated</td>
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<tr>
<td>Acres buffers</td>
<td>319 Grant</td>
<td>To HUC8 level</td>
<td>To HUC8 level</td>
<td>NASS Survey</td>
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<tr>
<td>Cropland acres</td>
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<tr>
<td># Acres affected</td>
<td>EQIP</td>
<td>319 Grant</td>
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</tbody>
</table>
Perspectives by Sector – Point Source (IAWA, Rick Manners 10/14)

- Want: Flexibility, Alternatives, Integrated Planning, Time for Planned Construction
- Prefer: BNR and “Green” Solutions (where they can work, they often out-perform limits substantially)
- Local Impacts matter: Honor watershed groups, Interim P works for expansion, Narrative Std. to include DO swings, Protect low P streams
- Current suite of rules mostly sufficient
- Gulf is a National impact: reductions anywhere are equally effective, much progress already made, voluntary reductions 1st/best (can they suffice)
- “Nutrient facilities Plan” identify unique circumstances, barriers, & plan for future
An established timeline for reducing IL N&P loading by 45% to the GOM by 2040

Assure that discharges of N&P do not cause violations of IL DO stds. or Nar. Std. against unnatural plant or algal growth

Address nutrient pollution impacts to IL waters through:

1) NPDES permits,
2) TMDL’s or alt pollution reduction plans
3) fairly include reductions from NPS not covered under CWA permits
Establish P standard for river and streams in IL

After Scientific review, develop N standards for lakes, rivers, and streams

Consistently list rivers and streams as impaired by P when dissolved Oxygen and natural Stds. on unnatural plant and algal growth are violated

Develop TMDL’s for waters impaired by nutrients-related causes (Mechanism is needed so NPS contribute their fair share)

Address PS discharges contributing to nutrient impairments through permit limits

Set interim Ag. BMP adoption targets (eg. 20% by 2020, 40% by 2025)

Strengthen existing rules and programs (eg. Livestock mgmt. Fac. Act)

Expand authority to counties to establish stormwater mgmt plans and utility fees

Encourage innovation through locally led watershed efforts
- Technical multi-agency groups working together to collect, summarize, & analyze performance data

- Benchmark Working group

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### Data and Tools

**Facilitate Policy Discussions**

- Working Groups and Collaboration

### Technical Data

#### Facility/Land Measures

<table>
<thead>
<tr>
<th>Facility/Land Measures</th>
<th>Units?</th>
<th>Measurement provider</th>
<th>Next steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of permits issued that require nutrient reduction feasibility studies</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Determine if MINOR facilities should be included</td>
</tr>
<tr>
<td>Number of nutrient reduction feasibility studies submitted</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Number of permits with N removal/reduction compliance schedules (i.e. not currently removing nutrients)</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Number of permits with P removal/reduction compliance schedules (i.e. not currently removing nutrients)</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Number of N removal/reduction facilities in place (i.e. currently removing nutrients)</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Number of P removal/reduction facilities in place (i.e. currently removing nutrients)</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Number of facilities monitoring N in their effluent</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Number of facilities monitoring P in their effluent</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Number of permits with nutrient limits</td>
<td>Number</td>
<td>Illinois EPA</td>
<td>Same as above</td>
</tr>
<tr>
<td>Other measures (such as wetlands, tree program, biosolids BMP, etc)</td>
<td>Acres? Gal/yr?</td>
<td>Illinois EPA</td>
<td>Maybe add this question to IAWA survey</td>
</tr>
</tbody>
</table>

#### Water Measures

<table>
<thead>
<tr>
<th>Water Measures</th>
<th>Units?</th>
<th>Measurement provider</th>
<th>Next steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total N load discharged from point sources</td>
<td>lbs/yr</td>
<td>Illinois EPA</td>
<td></td>
</tr>
<tr>
<td>Load discharged from point sources</td>
<td>lbs/yr</td>
<td>Illinois EPA</td>
<td></td>
</tr>
</tbody>
</table>
We agreed on an Implementation approach which focuses on:

- Monitoring of WQ and BMP implementation
- Increase Ag. BMP adoption through outreach, education, cost share and targeting
- Identify and establish other incentives necessary for appropriate level of BMP adoption
- Make recommendation on numeric nutrient criteria
- Work on funding, legis. initiatives, and programs needed for green infrastructure expansion and stormwater management
- Development of an adaptive management framework
- Address funding and policy issues needed to implement and adapt the INLRS
• 5 statewide committees working to implement strategy
• 2 additional committees created for progress reporting and tracking
• 16 months so far
• Over 32 meetings
As you move from tracking actions to measuring actual water quality responses you have to combine and summarize data from multiple sources.

Nutrient Monitoring Council
Ongoing Efforts That Contribute to Adaptive Management Frameworks

- Funding integrated science assessment of models most appropriate for nutrient related decisions at various scales
- Developing decision support systems capable of retrieving and using data from multiple agencies to answer policy and management questions
- Integrating adaptive management features into decision support tools
THANK YOU!