Ag Sector Perspective

BEN WICKER
EXECUTIVE DIRECTOR
Water Matter to Agriculture
Water Matters to Agriculture

2001-2015 INSURED PERILS - SHARE OF INDEMNITY

- Drought, 45%
- Precip/Flood/Storm, 27%
- Hail, 7%
- Other, 7%
- Disease/Insects, 1%
- Cold, 6%
- Price, 7%

Source: USDA RMA
IC 14-25-7: Water Resources Management Act

- Enacted in 1983
- Requires registration of all SWWF (gw & sw)
- Facility defined as greater than 100,000 gpd capability
- Capability is aggregate of all wells & intakes
- Annual water use reporting
- Approximately 4100 SWWFs currently registered
## 2016 Indiana Registered SWWFs

<table>
<thead>
<tr>
<th>Water Use Code</th>
<th>Number of Facilities</th>
<th>Number of Wells</th>
<th>Number of Intakes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EP</td>
<td>92</td>
<td>255</td>
<td>98</td>
</tr>
<tr>
<td>IN</td>
<td>378</td>
<td>697</td>
<td>291</td>
</tr>
<tr>
<td>IR</td>
<td>2755</td>
<td>3766</td>
<td>808</td>
</tr>
<tr>
<td>MI</td>
<td>136</td>
<td>238</td>
<td>50</td>
</tr>
<tr>
<td>PS</td>
<td>708</td>
<td>2187</td>
<td>68</td>
</tr>
<tr>
<td>RU</td>
<td>58</td>
<td>145</td>
<td>12</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>4127</strong></td>
<td><strong>7288</strong></td>
<td><strong>1327</strong></td>
</tr>
</tbody>
</table>
Total Annual Withdrawals 1985-2016

- Total
- SW
- GW
Irrigation Ground and Surface Water Withdrawals 1985-2016
Count of Irrigation SWWFs
1985-2017

The graph shows the count of Irrigation SWWFs from 1985 to 2017. The count increases steadily over the years, with a notable rise in the last few years.
Indiana Farm Net Income

Source: U.S. Department of Agriculture, with a Purdue University estimate for 2017
Water Matters to Agriculture
Agriculture must be proactive
Figure 9. USGS SPARROW model estimates of sources of total nitrogen and total phosphorus transported from Mississippi River Basin to Gulf of Mexico (Robertson and Saad 2013).
25 Largest Total Nutrient Contributions (N & P)

- Wabash River: 20%
- Illinois River: 12%
- Tennessee River: 5%
- Des Moines River: 6%
- Missouri River: 5%
- Mississippi River: 5%
- Ohio River: 4%
- Missouri River (branch): 4%
- Allegheny River: 3%
- Susquehanna River: 3%
- St. Francis River: 3%
- Flint River: 3%
- Ohio River (branch): 3%
- Green River: 3%
- Delaware River: 3%
- Waccamaw River: 3%
- Cape Fear River: 3%
- Waccamaw River (branch): 3%
- Cape Fear River (branch): 3%
- Wabash River (branch): 2%
- Muskingum River: 2%
- Kaskaskia River: 2%
- Grand River: 2%
- Wisconsin River: 2%
- Allegany River: 2%
- Allegany River (branch): 2%
Expectations Have Been Established

- Gulf Hypoxia Taskforce
- Western Lake Erie Basin

- 20% Nitrogen Loading Reduction by 2025
- 40% Phosphorus and Sediment Loading Reduction by 2025
About half of Indiana’s farmers either don’t know of or don’t see specific water pollutant problems in their area.  

50%

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**Indiana Agriculture Nutrient Alliance**

**Indiana Nutrient Management and Soil Health Strategy (NMSH)**  
*Agribusiness Council of Indiana (ACI)  
American Dairy Association of Indiana (ADAI)  
Indiana Beef Cattle Association (IBCA)  
Indiana Corn Growers Association (ICGA)  
Indiana Dairy Producers (IDP)  
Indiana Farm Bureau (IFB)  
Indiana Pork  
Indiana Soybean Alliance (ISA)  
Indiana State Department of Agriculture (ISDA)  
Indiana State Poultry Association (ISPA)  
Purdue University (PU)

**Primary Goals:**  
Nutrient Management & Soil Health for Better Water Quality  
Reach Farmers Not Currently Engaged

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**Indiana Conservation Partnership (ICP)**  
Indiana Association of Soil and Water Conservation Districts & 92 Soil and Water Conservation Districts (IASWCD)  
Indiana Department of Environmental Management (IDEM)  
Indiana Department of Natural Resources (DNR)  
Indiana State Department of Agriculture Division of Soil Conservation (ISDA)  
Purdue University Cooperative Extension Service (PU)  
State Soil Conservation Board (SSCB)  
USDA - Farm Service Agency (FSA)  
USDA - Natural Resources Conservation Service (NRCS)

**Indiana State Nutrient Reduction Strategy (SNRS) - Gulf Hypoxia Task Force**  
Agribusiness Council of Indiana (ACI)  
Conservation Cropping System Initiative  
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*Leads/Authors

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**Indiana Agriculture Nutrient Taskforce (ANT)**  
Agricultural Executives  
Indiana Conservation Partnership  
The Nature Conservancy

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*Leads/Authors
## Farm Bill Cost-Share Programs ($ to Private Landowners)
- Agricultural Conservation Easement Program (ACEP)
- Conservation Innovation Grant (CIG)
- Conservation Reserve Enhancement Program (CREP)
- Conservation Stewardship Program (CSP)
- Environmental Quality Incentives Program (EQIP)
- Great Lakes Restoration Initiative (GLRI)
- Mississippi River Basin Initiative (MRBI)
- National Water Quality Index (NWQI)
- Regional Conservation Partnership Program (RCPP)
- Western Lake Erie Basin (WLEB)
- Wetlands Reserve Program (WRP)

## Other Cost-Share Programs ($ to Private Landowners)
- Clean Water Indiana (CWI)
- IDEM 319 Watershed Program Grants
- Lake and River Enhancement Program (LARE)
- Water Quality Trading Program (EPRI & GLCP)

## Indiana Initiatives
- 4R Programs (Time, Place, Form & Rate)
- Conservation Cropping Systems Initiative (CCSI)
- Healthy Rivers Initiative (HRI)
- INfield Advantage (INFA)
- Small Changes / Big Impact
- Soil Health Partnership (SHP)

## Indiana State Strategies
- Domestic Action Plan (DAP)
- Indiana State Nutrient Reduction Strategy (SNRS)
- Nutrient Management & Soil Health Strategy (NMSH)
- State Nonpoint Source Management Plan

## Monitoring Agencies/Organizations/Partners
- Indiana Water Monitoring Council (IWMC)
- Indiana Water Resources Association (IWRA)
- United States Geological Survey (USGS)
- Indiana Department of Environmental Management (IDEM)
- Universities
- Municipalities

## Other Engaged Organizations
- Agree
- American Farmland Trust (AFT)
- Conservation Technology Information Center (CTIC)
- Crop Production Services - CARES Program (CPS)
- Environmental Defense Fund (EDF)
- Land O'Lakes - SUSTAIN Program (LOL)
Indiana Agriculture Nutrient Alliance

Agriculture Organizations

+ Indiana Conservation Partnership

+ Conservation Organizations

• Keeping Indiana farmers at the forefront of proactive nutrient management and soil health practices that improve farm viability and, ultimately, reduce nutrient loss to water
Our Mission:

Healthy Soil
Clean Water
Viable Farms
IANA Board Members

Executive Committee
• Agribusiness Council of Indiana
• Indiana Farm Bureau
• National Resources Conservation Services of Indiana
• Indiana Soybean Alliance

• American Dairy Association of Indiana
• Indiana Association of SWCDs
• Indiana Beef Cattle Association
• Indiana Corn Marketing Council
• Indiana Dairy Producers
• Indiana Pork
• Indiana State Department of Agriculture
• Indiana State Poultry Association
• Purdue University
• The Nature Conservancy of Indiana
SHARE GOALS

Establish goals for statewide practice adoption that encourage fertilizer and nutrient loss reductions:

- Aggressive
- Adaptive
- Measurable
- Viable
Identifying Barriers to Practice Adoption

Education and awareness
• Lack of awareness or depth of understanding to either the problem or the available solutions

Social
• Stigmas associated with changing practices, implementing new ideas or being an early adopter

Policy
• Rules and regulations that do not force implementation, and/or the fear of regulations being set based on undeterminable factors

Agronomic
• Lack of understanding about small practices changes that can have large impacts, or, lack of advisor for agronomic decisions

Economic
• Determination of practices used, or not used, based on economic factors
Overcoming the Barriers Strategically

Advance the Science
• To lead research for implementable on-farm changes

Track Progress
• To set metrics for gains against baselines

Awareness & Educational Outreach
• To share impact opportunities

Organization, Policy & Funding
• To create consistency in multi-partner efforts
SHARED OUTCOMES

IANA partner collaboration opportunities include:

- Content experts
- Researchers and/or expertise in subject areas to inform content development
- Content developers
- Educators or other resources that take relevant content to develop outreach materials
- Content deliverer
- Communication infrastructure and/or access to desired outreach targets
- Researchers
- Organization conducting research
- Project managers
- Organizational capacity to lead or manage state or local projects
- Funding supporters
- Organizational capacity to raise/provide funds for projects and initiatives
Common Practice Adoption Goals

4R Principles of Nutrient Stewardship

- **RIGHT SOURCE**: Matches fertilizer type to crop needs.
- **RIGHT RATE**: Matches amount of fertilizer to crop needs.
- **RIGHT TIME**: Makes nutrients available when crops need them.
- **RIGHT PLACE**: Keeps nutrients where crops can use them.
# Common Practice Adoption Goals

## Healthy Soil, Clean Water, Viable Farms

<table>
<thead>
<tr>
<th>Action</th>
<th>2025*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utilization of 4R Principles for Nutrient Management:</td>
<td>Farmer %</td>
</tr>
<tr>
<td>Nutrient Management</td>
<td></td>
</tr>
<tr>
<td>Farmers Regularly Performing Soil Sampling</td>
<td>100%</td>
</tr>
<tr>
<td>Farmers Planning for Nutrient Management</td>
<td>100%</td>
</tr>
<tr>
<td>Application Timing</td>
<td></td>
</tr>
<tr>
<td>Farmers Making Frozen or Snow Covered Ground Application of Nutrients Applied Only as Last Resort Option</td>
<td>100%</td>
</tr>
<tr>
<td>Farmers Making Application of Nutrients to Crops at Planting or Post Emergence</td>
<td>75%</td>
</tr>
<tr>
<td>Statewide Soil Health Practices:</td>
<td>Acre %</td>
</tr>
<tr>
<td>Soil Health</td>
<td></td>
</tr>
<tr>
<td>30% Increase of Green Living Cover Crop Acres</td>
<td>40%</td>
</tr>
<tr>
<td>25% Increase of Minimum Tillage Acres</td>
<td>75%</td>
</tr>
<tr>
<td>10% Increase of No-Till and Strip-Till Acres</td>
<td>35%</td>
</tr>
</tbody>
</table>

*Base year 2014
Ag Sector - Water Quality

• Challenges
• Needs
• Strategies
Ag Sector - Water Quality Challenges

- Nutrients = Nitrogen and Phosphorus
- Ag = Non Point Source, more variables and interaction with nature
  - Edge of field vs in stream monitoring
- Legacy nutrients and pace of change
- Lack of continuous monitoring with flow at strategic “pour points”
- Inefficiencies with Nitrogen uptake in crops

Fritz Haber and Carl Bosch

Gulf of Mexico Deadzone

US Geological Survey Super Gage
Ag Sector - Water Quality Needs

• Better understanding and communication with legacy nutrients and pace of change reality
  • Paired watershed studies, edge of field studies, etc.
• More continuous water quality monitoring with flow at pour points along state border and other strategic locations
• More feedback mechanisms for farmers to measure and manage nutrient uptake in crops
Ag Sector - Water Quality Strategies

• Partnerships
  • Indiana Ag Nutrient Alliance
  • Gulf of Mexico Hypoxia Taskforce = State Nutrient Reduction Strategies
  • More opportunities to work with local watershed groups?

• Nutrient efficiency
  • “4Rs”, Soil Health, research, sensors, data sharing networks, etc.

• Legacy Nutrients/Pace of change
  • Paired watershed studies, edge of field research

• Strategic Water Quality Monitoring
  • Partnerships with US Geological Survey = New Harmony Super Gage on Wabash River
Ag Sector - Water Quantity

• Challenges
• Needs
• Strategies
Ag Sector - Water Quantity Challenges

- Most often challenge is too much, not too little
- “Large rain events occurring more often”
- Ag has a lot of wells (mostly to feed center pivot irrigation), but they aren’t used year round
- Flood management across large multi county river basins
Water Use Categories And Codes (DNR)

- IR—AGRICULTURE/IRRIGATION (Crop & golf course irrigation, farm field drainage, agricultural services)
- IN—INDUSTRY (Process water, cooling water, mineral extraction (except coal), quarry dewatering, waste assimilation)
- PS—PUBLIC SUPPLY (Public water supply, drinking water/sanitary facilities)
- EP—ENERGY PRODUCTION (Power generation, cooling water, coal mining, geothermal, oil recovery)
- RU—RURAL USE (Livestock, fisheries)
- MI—MISCELLANEOUS (Fire protection, amusement parks, construction dewatering, dust control, pollution abatement, hydrostatic testing, recreational field drainage)
2012 Surface Water Withdrawals by Water Use Category

Unit = Million gallons per year

Source: DNR
2012 Groundwater Withdrawals by Water Use Category

Unit = Million gallons per year

Source: DNR
2012 Total Withdrawals by Water Use Category

Unit = Million gallons per year

Source: DNR
Ag Sector - Water Quantity Needs

- Better understanding of future climate impacts – will we go from too much to too little?
- Crop management options and seed hybrids that are more resilient to weather extremes like drought and flooding – many farmers having success with soil health building conservation practices
- Adequate crop insurance coverage for flooding and drought damage
- Drainage water management applications?
Ag Sector - Water Quantity Strategies

- Indiana Department of Natural Resources Volunteer Water Quality Monitoring Network
  - Additional wells and volunteers?
- Indiana’s Water Shortage Plan (DNR)
- Indiana Climate Change Impacts Assessment (Purdue)
- River basin commissions, county drainage boards, etc.
Ag Sector - Investment

• Challenges
• Needs
• Strategies
Ag Sector – Investment Challenges

• No farm the same, return on investment per Best Management Practice, etc. varies, not one size fits all

• Clean Water Indiana = portion of cigarette tax revenue

• Water quality monitoring (both in stream and edge of field) expensive and time intensive
Ag Sector – Investment Needs

- Farm Bill with strong Conservation Title, support for technical assistance, working lands conservation, locally led conservation, and encouragement for multistate initiatives
- Partnerships to install and maintain continuous water quality monitoring at strategic locations
Ag Sector – Investment Strategies

- Partnerships
  - Pooling resources and expertise
  - Corporate investments
  - Multi state grant opportunities (Lake Erie, Mississippi, etc.)
- On farm research and farmer data sharing networks
  - Testing new technologies, practices, and management
- Monitoring
  - Water + BMP adoption trends + social indicators
Agriculture Sector - Table Activity

• Utilize cards on your table to submit planning goals and/or key action items that you see necessary for this sector.