Ag Sector Perspective

BEN WICKER
EXECUTIVE DIRECTOR

INDIANA AGRICULTURE NUTRIENT ALLIANCE

Water Matter to Agriculture

Water Matters to Agriculture

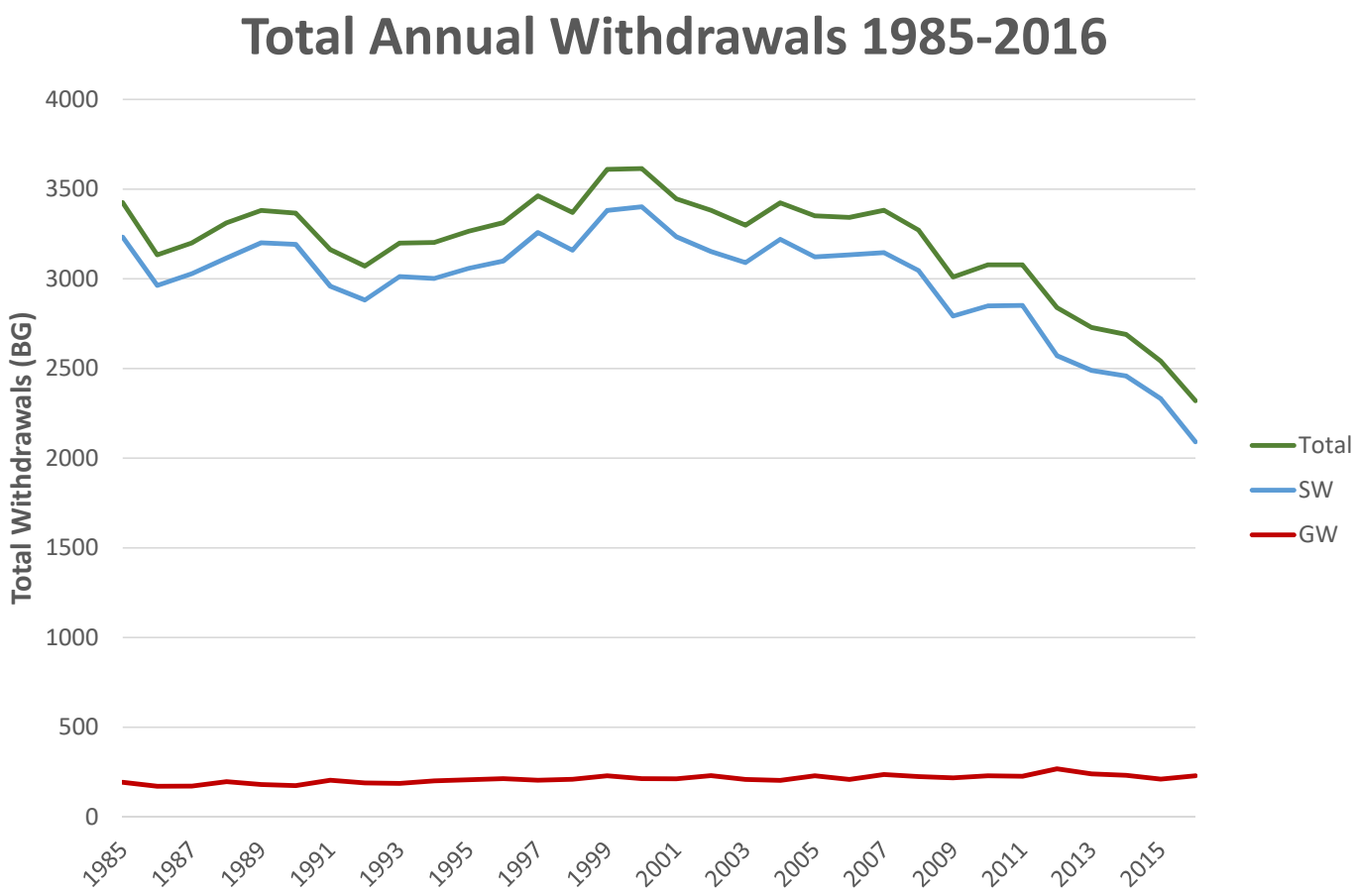
Source: USDA RMA

IC 14-25-7:
Water Resources Management Act

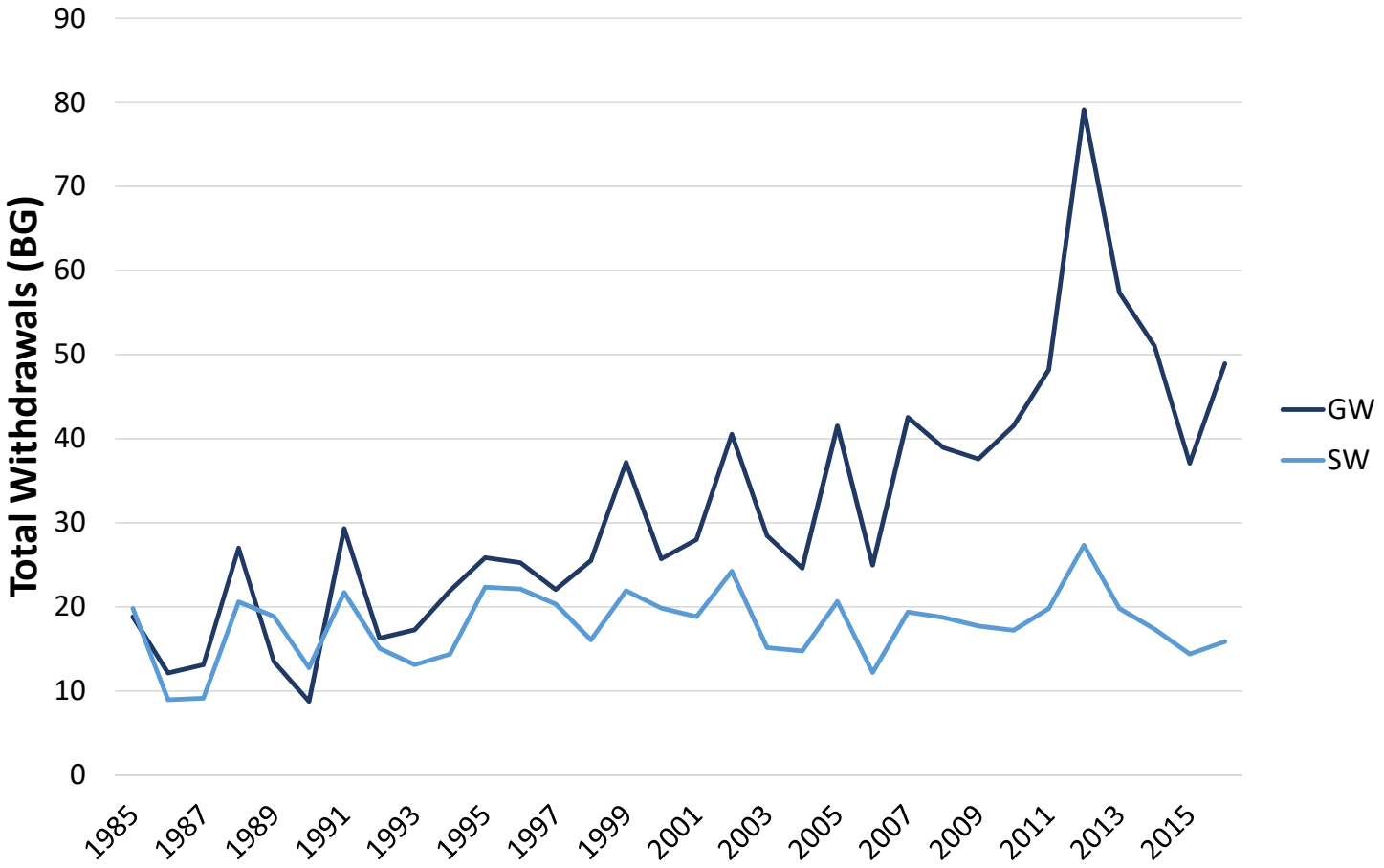
- Enacted in 1983
- Requires registration of all SWWF (gw & sw)
- Facility defined as greater than 100,000 gpd capability
- Capability is aggregate of all wells & intakes
- Annual water use reporting
- Approximately 4100 SWWFs currently registered

2016 Indiana Registered SWWFs

Water Use Code	*Number of Facilities*	*Number of Wells*	*Number of Intakes*
EP	92	255	98
IN	378	697	291
IR	2755	3766	808
MI	136	238	50
PS	708	2187	68
RU	58	145	12
TOTAL	4127	7288	1327

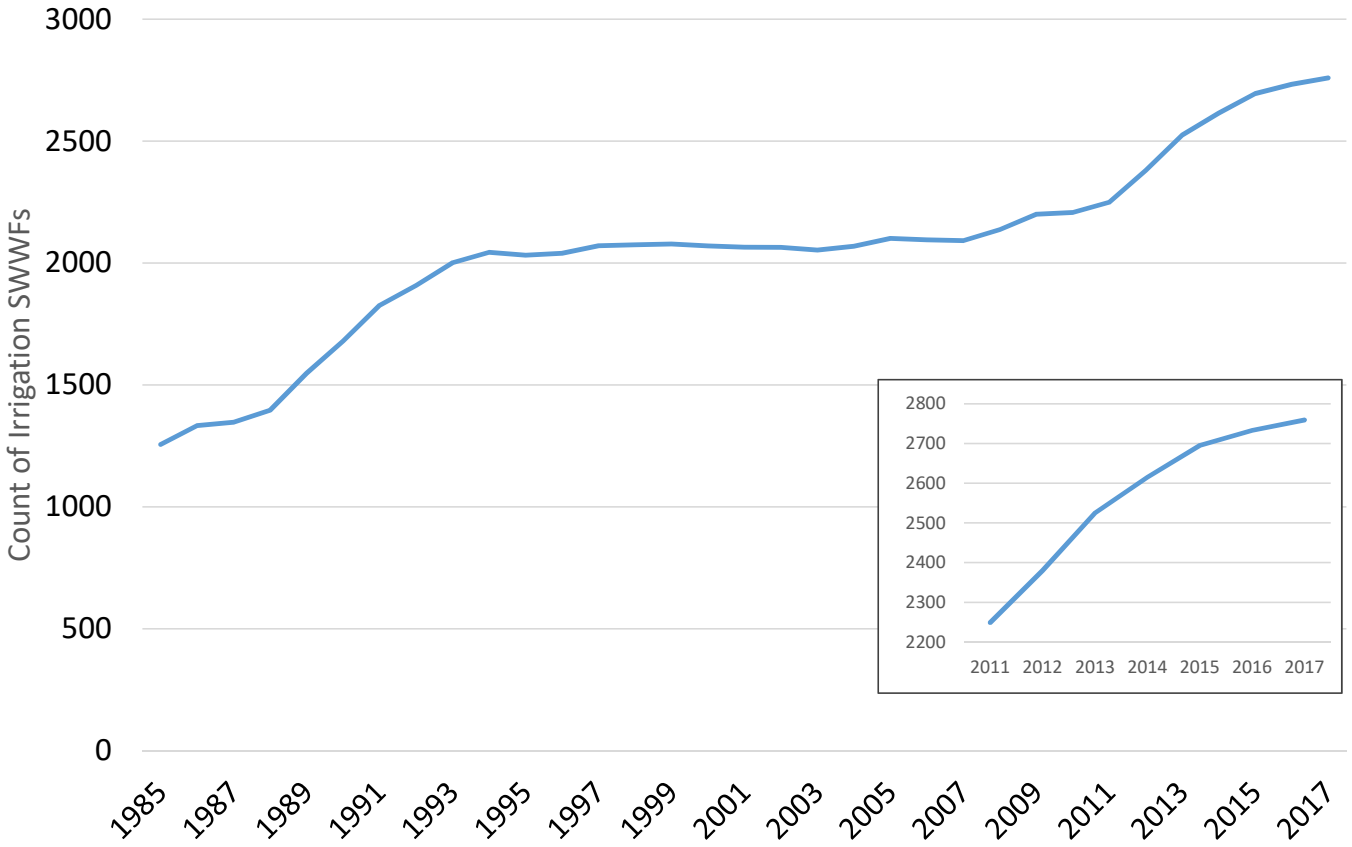

Total Annual Withdrawals 1985-2016
Total Withdrawals (BG)
4000
3500
3000
2500
2000
1500
1000
500
0
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Total
SW
GW

Irrigation Ground and Surface Water Withdrawals 1985-2016

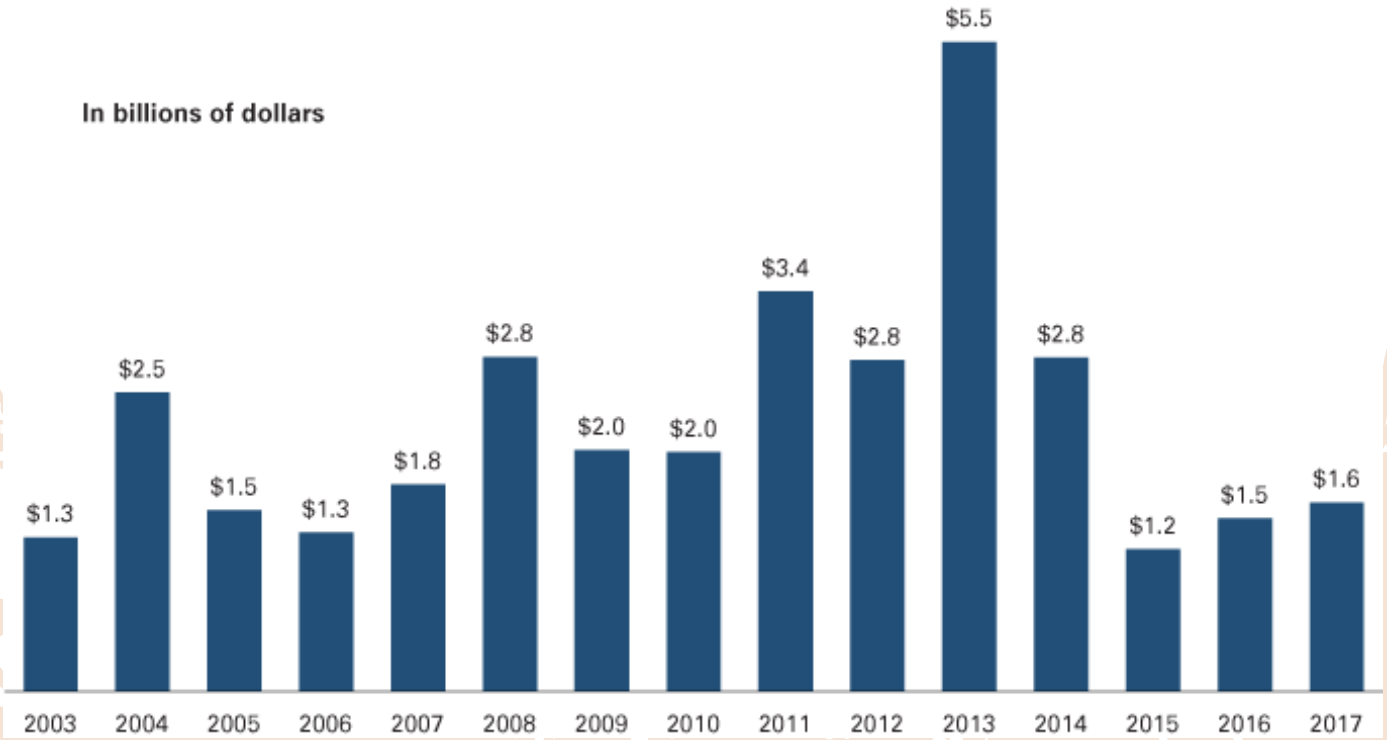


Count of Irrigation SWWFs

1985-2017



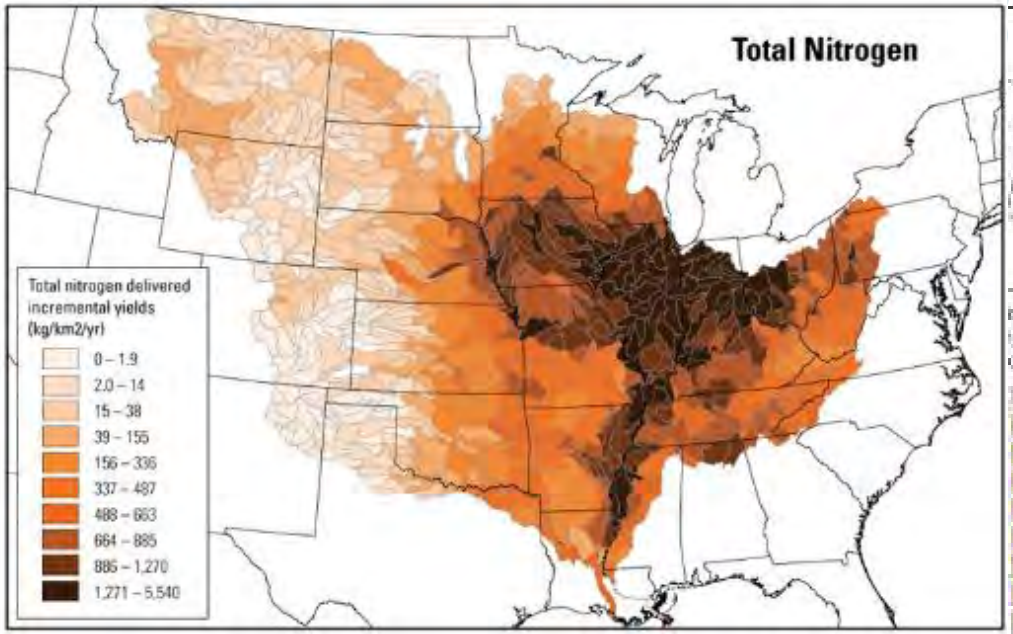
Indiana Farm Net Income

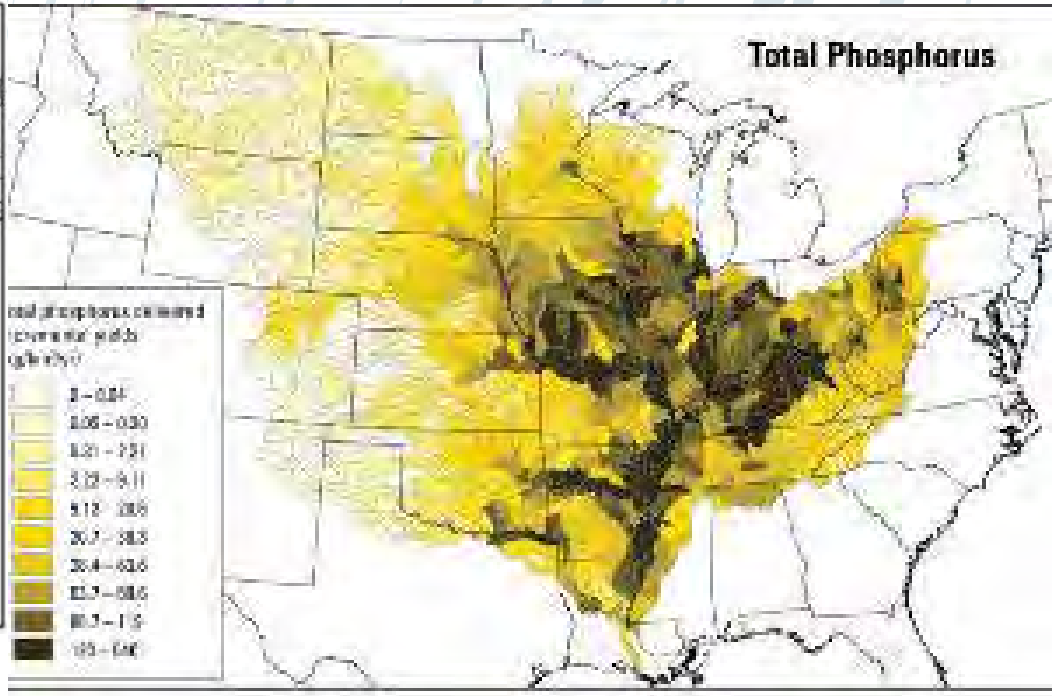


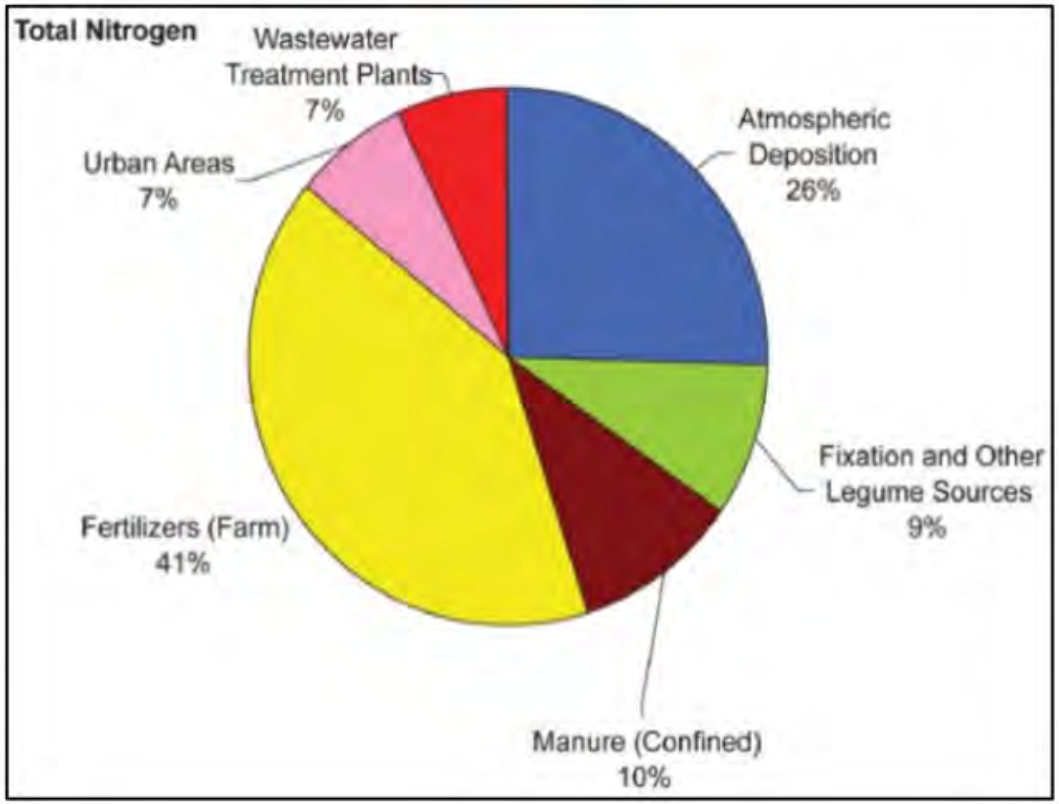
Source: U.S. Department of Agriculture, with a Purdue University estimate for 2017

Water Matters to Agriculture

Agriculture must be proactive







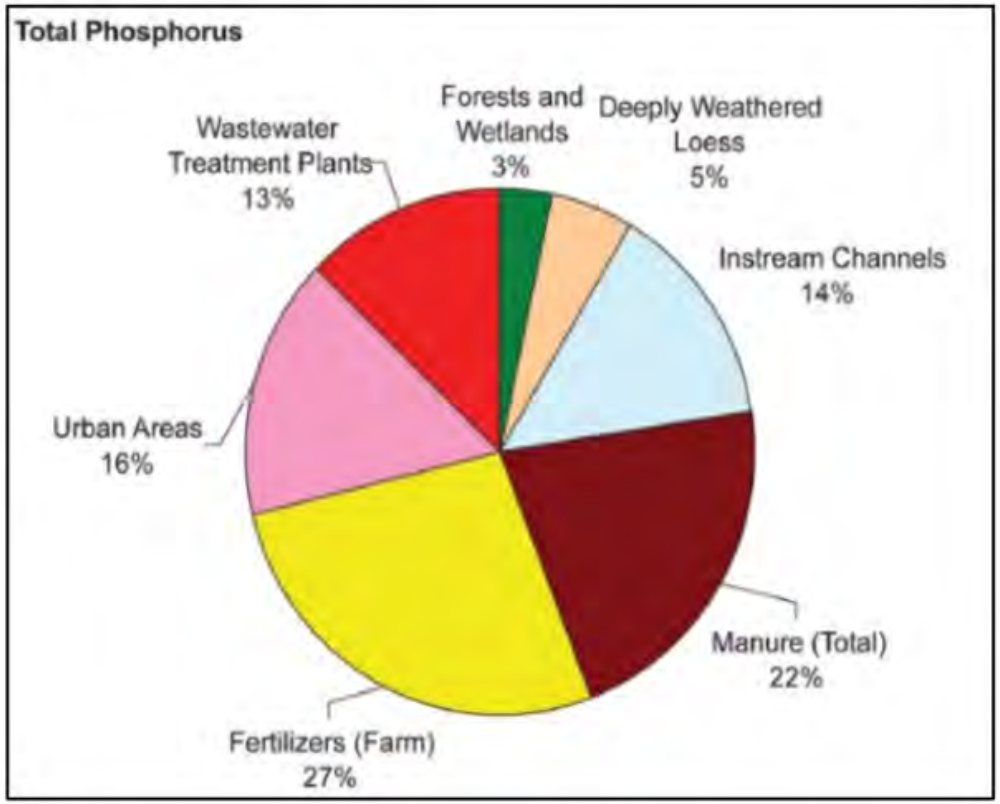
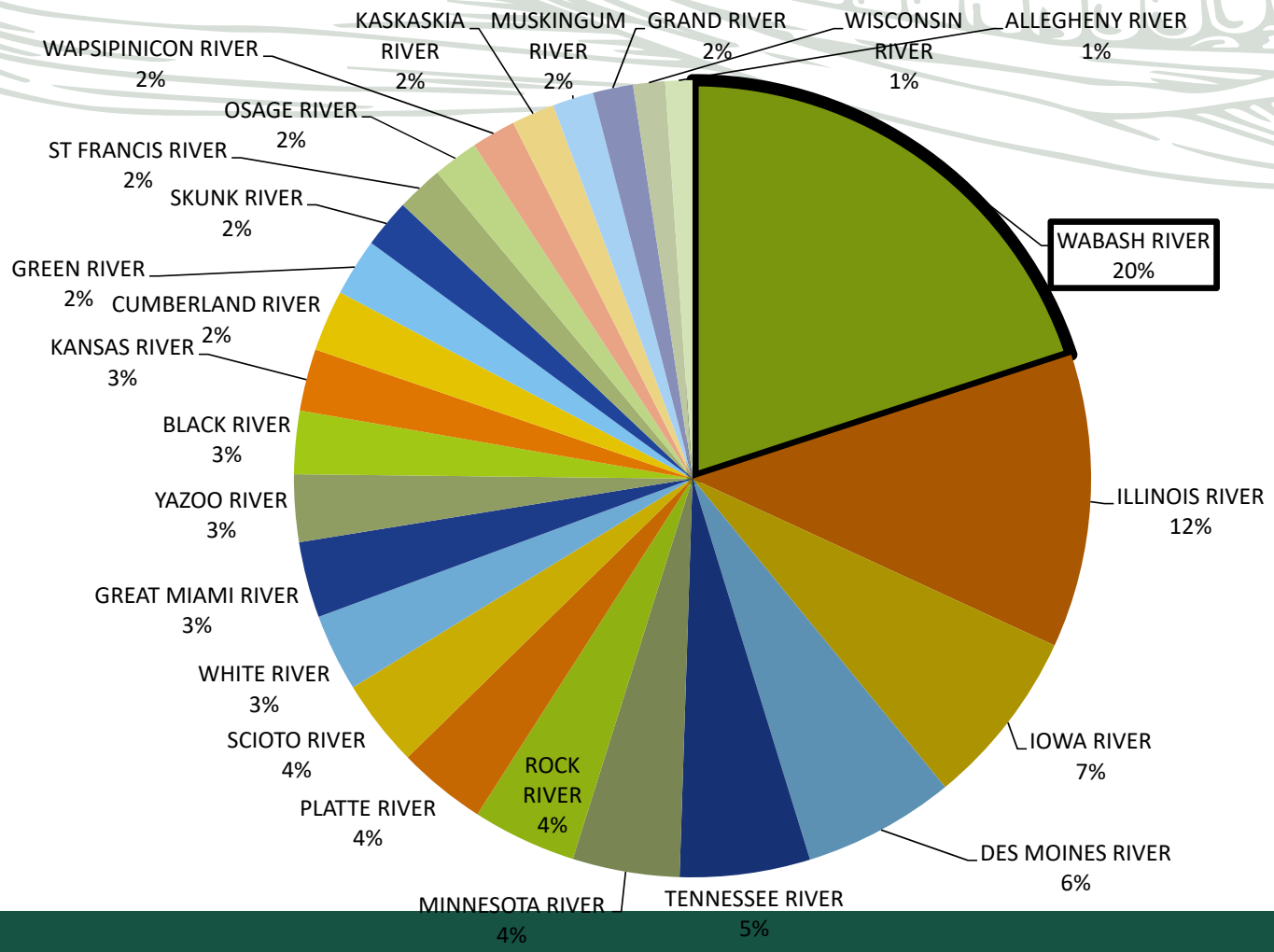


Figure 9. USGS SPARROW model estimates of sources of total nitrogen and total phosphorus transported from Mississippi River Basin to Gulf of Mexico (Robertson and Saad 2013).

25 Largest Total Nutrient Contributions (N & P)



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

Call to Action

50%

About half of Indiana's farmers either don't know of or don't see specific water pollutant problems in their area[1]

[1]Stalker Prokopy, L. and J. Ulrich-Schad. 2014. Understanding Nutrient Management Decisions: Examination of the Agricultural Community in Indiana. Purdue University, Department of Forestry and Natural Resources, Natural Resources Social Science Lab.

Indiana Agriculture Nutrient Alliance

Agricultural Nutrient Taskforce (ANT)

Agricultural Executives
Indiana Conservation Partnership
The Nature Conservancy

Lead

IANA

All ANT Agencies and Organizations are Partners

Primary Goals:

Nutrient Management & Soil Health for Better Water Quality

Reach Farmers Not Currently Engaged

Elevate

Agricultural Executives

Agribusiness Council of Indiana (ACI)
American Dairy Association of Indiana (ADAI)
Indiana Beef Cattle Association (IBCA)
Indiana Corn Growers Association (ICGA)
Indiana Corn Marketing Council (ICMC)
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)

Indiana Nutrient Management and Soil Health Strategy (NMSH)

*Agribusiness Council of Indiana (ACI)
Certified Crop Advisors (CCAs)
Indiana Beef Cattle Association (IBCA)
Indiana Corn Growers Association (ICGA)
*Indiana Corn Marketing Council (ICMC)
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)
*The Nature Conservancy
*USDA - Natural Resources Conservation Service (NRCS)

Leads/Authors

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
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 Farm Bureau (IFB)
*Indiana State Department of Agriculture Division of Soil Conservation (ISDA)
Purdue University Cooperative Extension Service (PU)
State Soil Conservation Board (SSCB)
The Nature Conservancy (TNC)
USDA - Farm Service Agency (FSA)
USDA - Natural Resources Conservation Service (NRCS)

Leads/Authors

Resources, Strategies, Initiatives and Other Organizations to Support Effort

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)

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)

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 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 State Strategies

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

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

SHARED GOALS

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

- Aggressive
- Adaptive
- Measurable
- Viable

SHARED OPPORTUNITIES

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

SHARED INFORMATION

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

Common Practice Adoption Goals

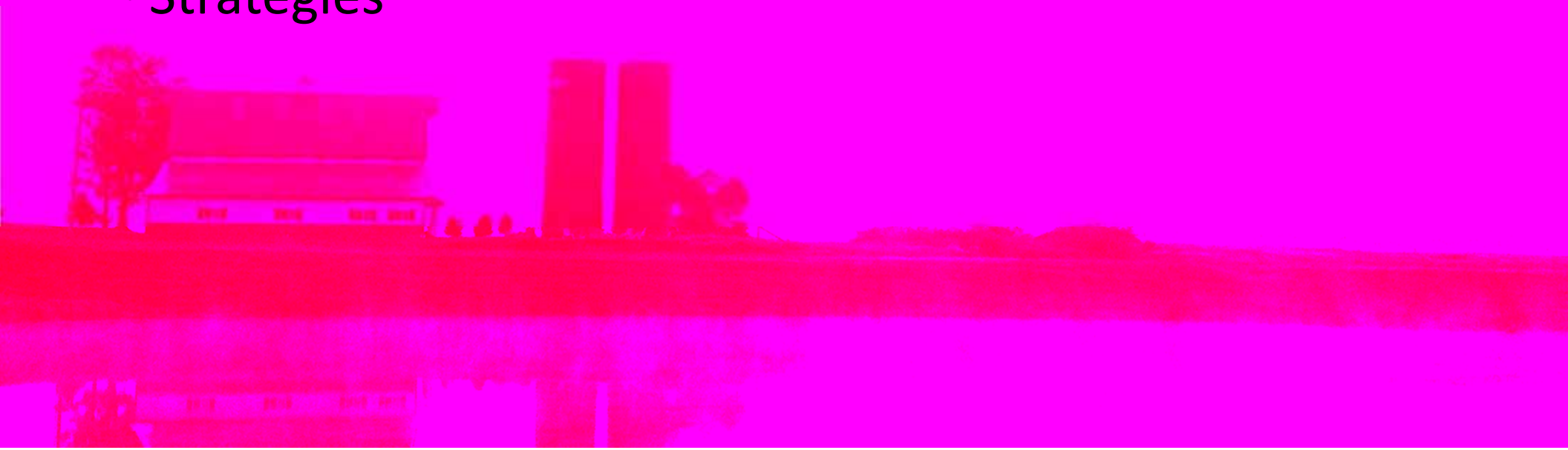
Healthy Soil, Clean Water, Viable Farms

	Action	2025*
	Utilization of 4R Principles for Nutrient Management:	Farmer %
Nutrient Management	**Farmers Regularly Performing Soil Sampling**	**100%**
	Farmers Planning for Nutrient Management	**100%**
Application Timing	Farmers Making Frozen or Snow Covered Ground Application of Nutrients Applied Only as Last Resort Option	100%
	Farmers Making Application of Nutrients to Crops at Planting or Post Emergence	75%
	Statewide Soil Health Practices:	Acre %
Soil Health	**30% Increase of Green Living Cover Crop Acres**	**40%**
	25% Increase of Minimum Tillage Acres	**75%**
	10% Increase of No-Till and Strip-Till Acres	**35%**
	***Base year 2014**	

INDIANA AGRICULTURE NUTRIENT ALLIANCE

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

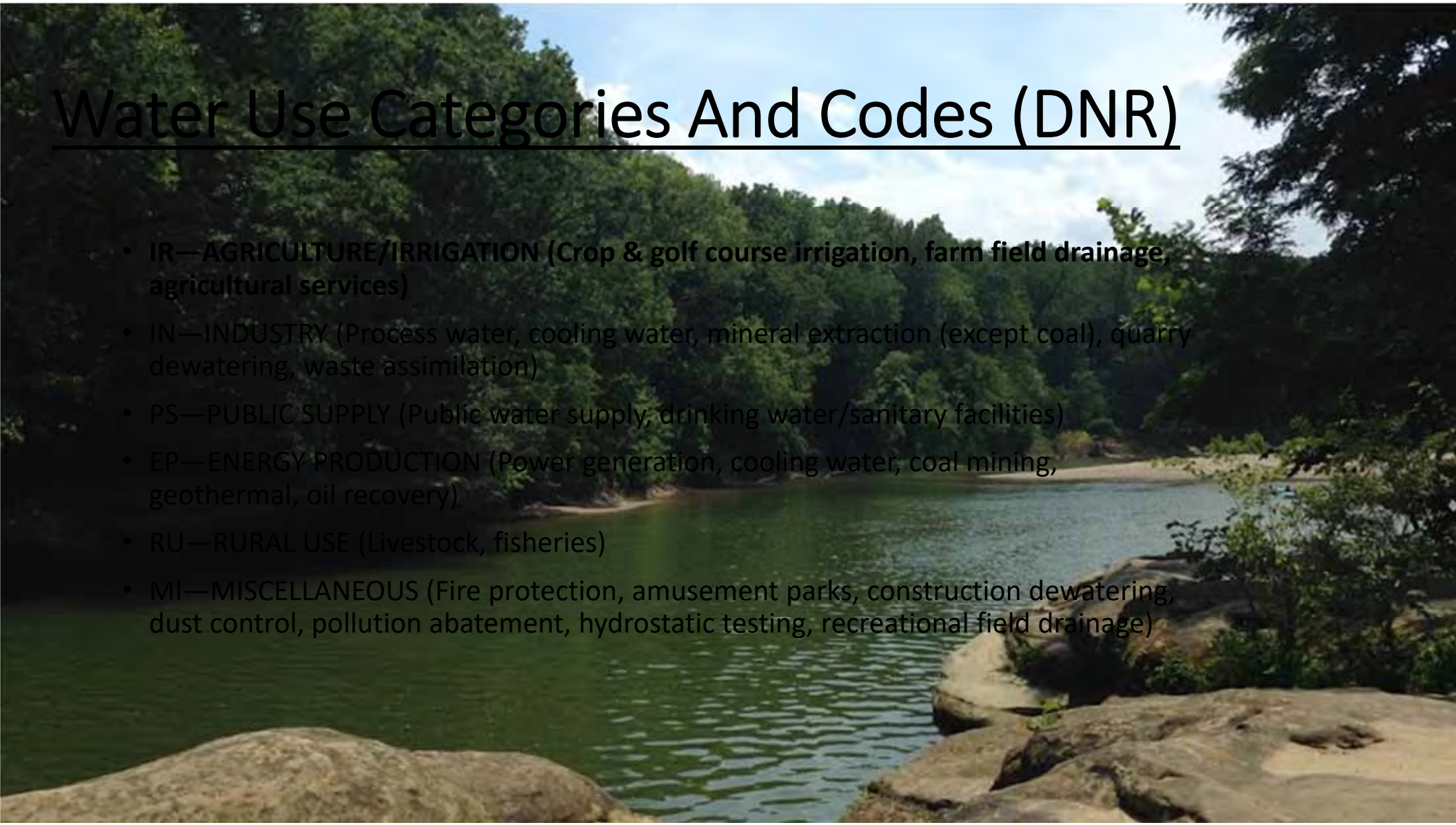
Ag Sector - Water Quantity

- Challenges
- Needs
- Strategies

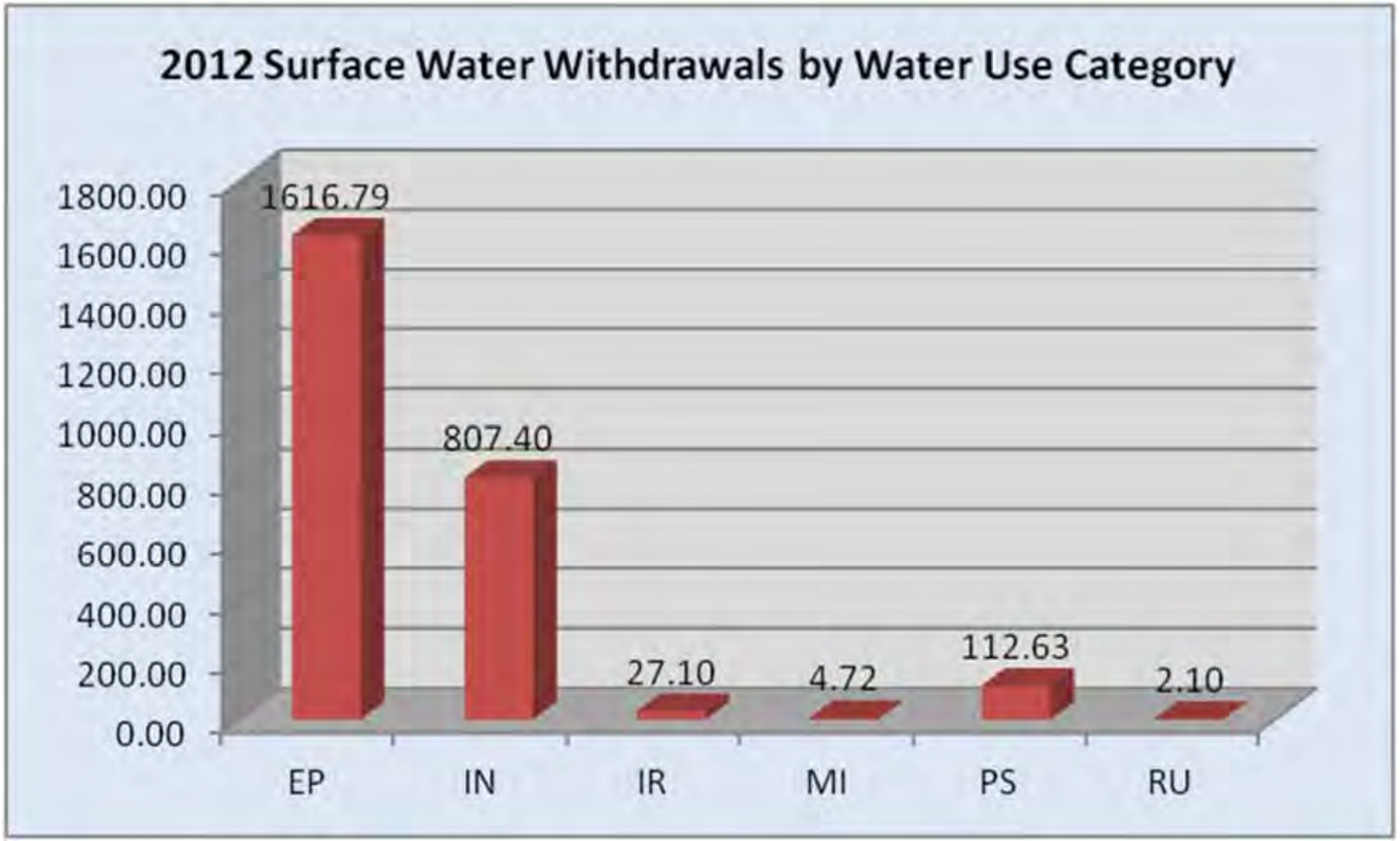
Ag Sector - Water Quantity Challenges

- 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)

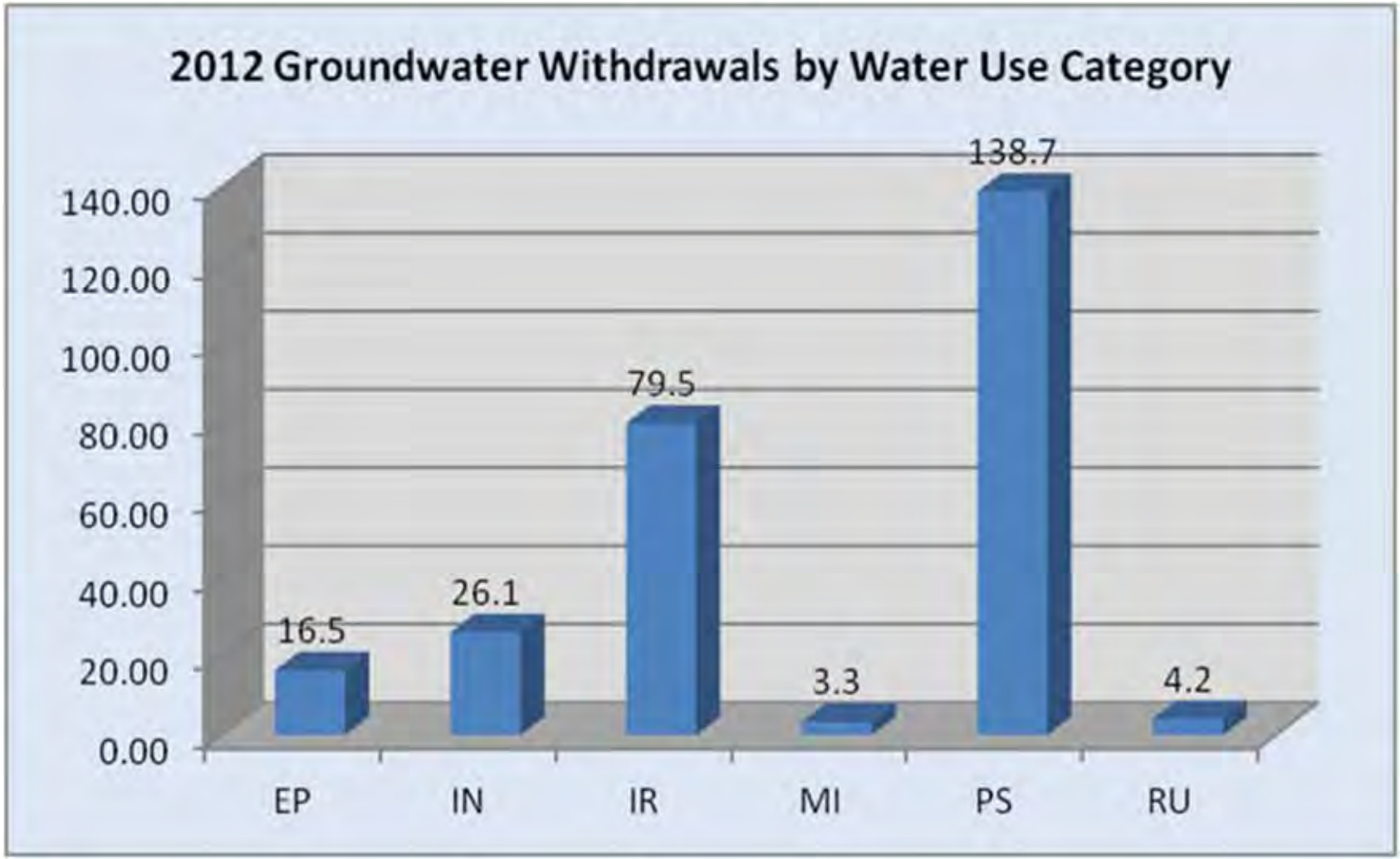


- **IR—AGRICULTURE/IRRIGATION (Crop & golf course irrigation, farm field drainage, agricultural services)**
- IN—INDUSTRY (Process water, cooling water, mineral extraction (except coal), quarry dewatering, waste assimilation)
- PS—PUBLIC SUPPLY (Public water supply, drinking water/sanitary facilities)
- 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)



Unit = Million gallons per year

Source:DNR



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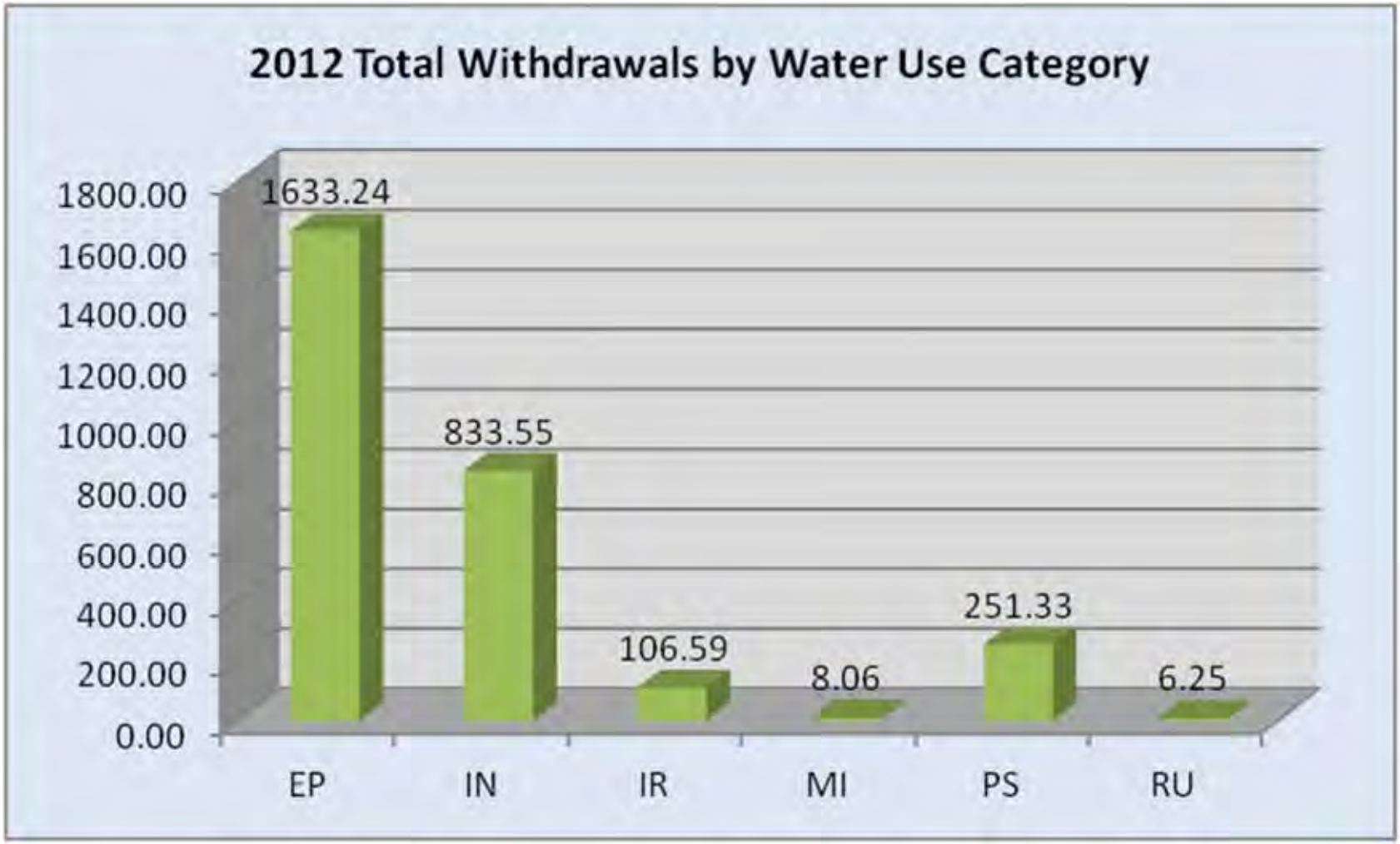
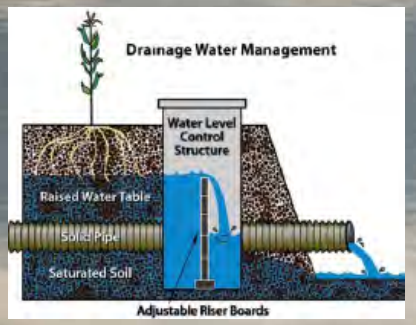


Unit = Million gallons per year

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.

DNR Monitoring Well

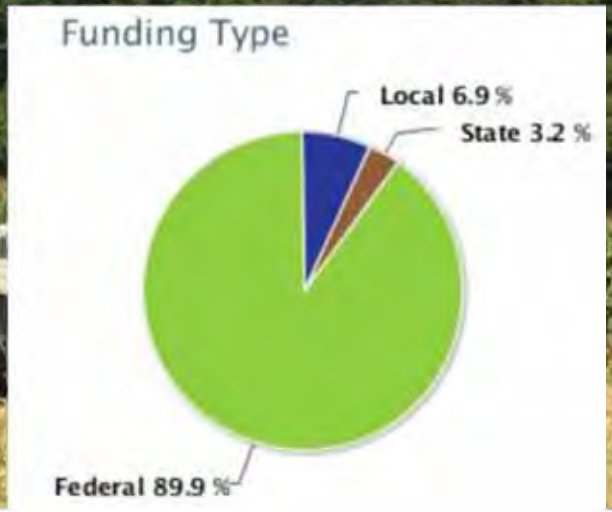
Ag Sector - Investment

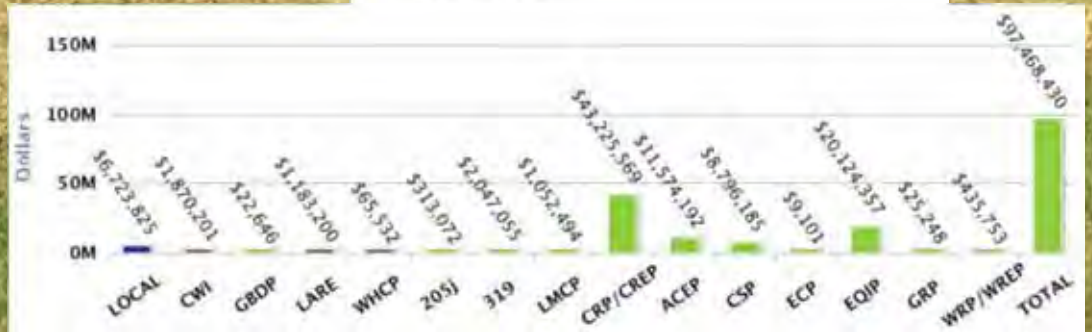
- Challenges
- Needs
- Strategies

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

Indiana 2017 Conservation Funding





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

Indiana 2017 Conservation Funding

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