A Strategic Look at Indiana's Water Monitoring Network

Jill Hoffmann
Executive Director
White River Alliance

Garth Lindner
DNR Division of Water

Indiana Water Summit
August 27, 2025

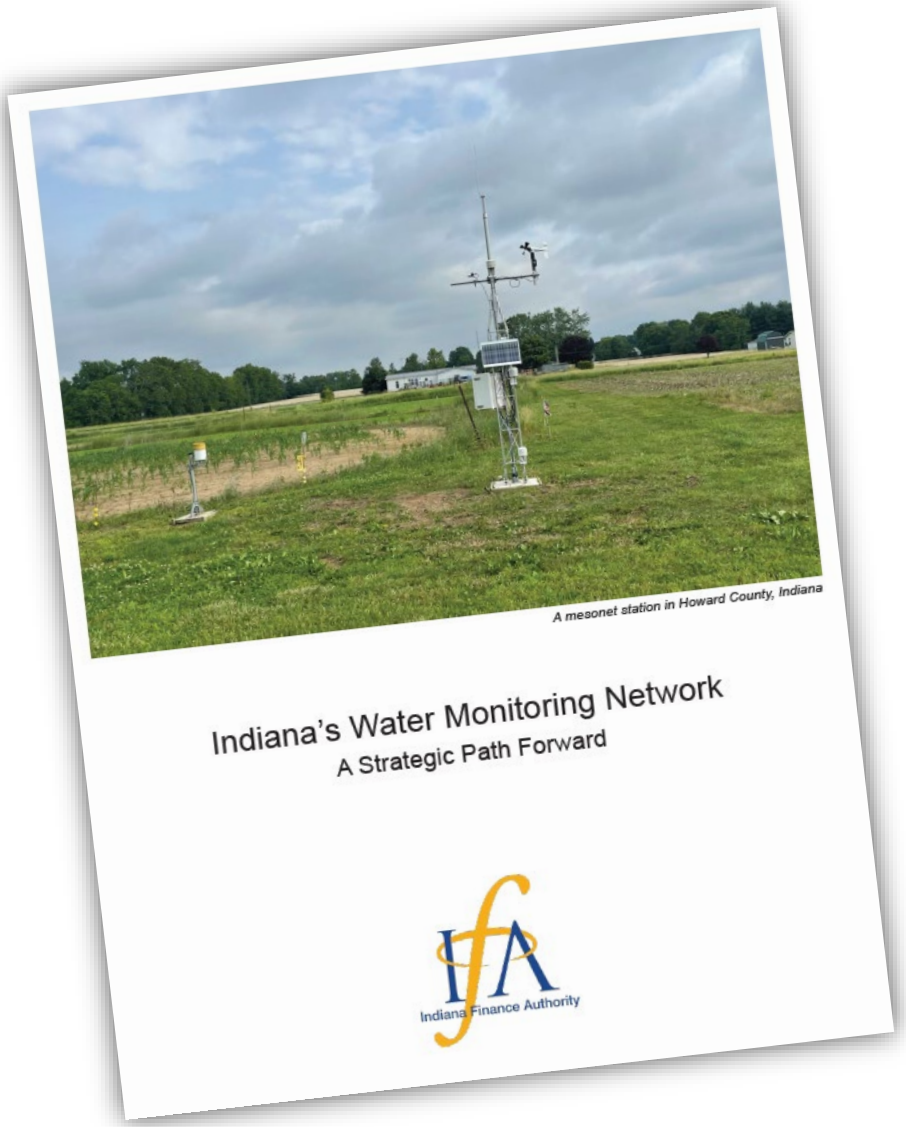
An Outcome of the Indiana Water Summit Working Group

These leaders from a wide variety of organizations meet bimonthly to help us plan and evaluate the Summit itself and to take a deeper dive into Summit topics.

Recent Working Group Topics:

- Nutrient reduction strategies
- Green infrastructure project funding and results
- Water/wastewater utility personnel needs
- Federal coal-ash and power-plant wastewater regulatory changes
- Septic failures and strategies for redressing them
- Incorporating climate resilience in local comprehensive plans

Gratitude & Credit to Our Agency Partners

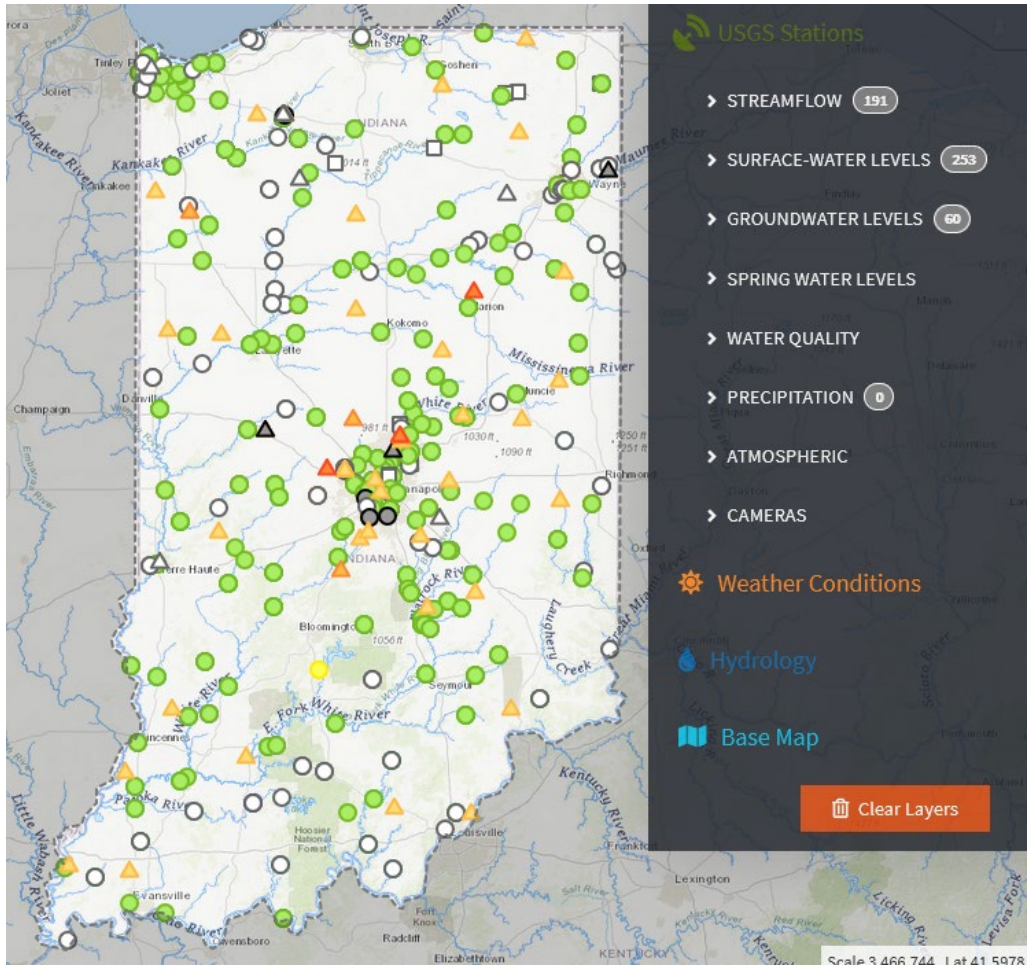


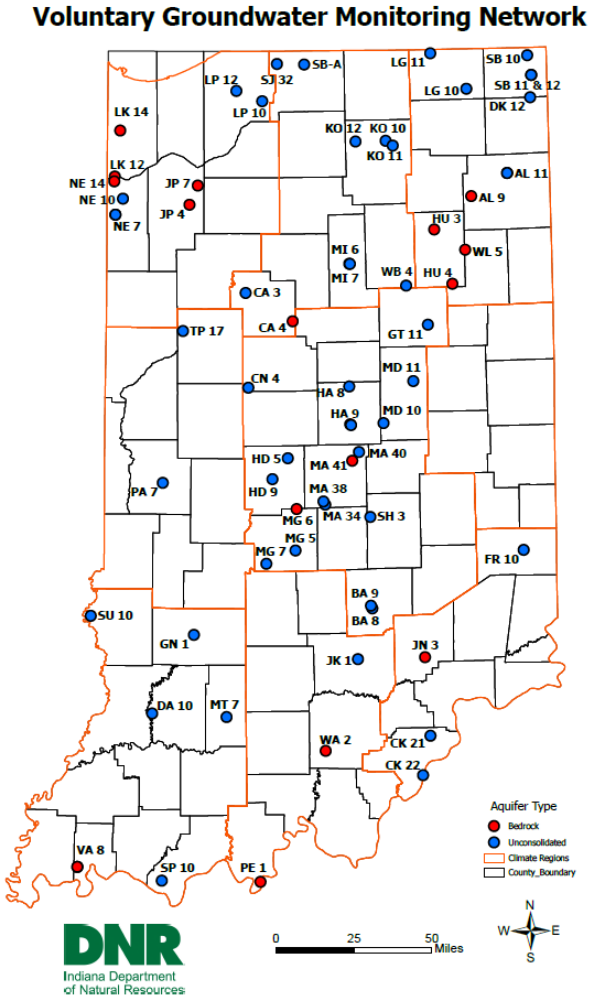
Mark Basch, Department of Natural Resources
Brandon Brummett, United States Army Corp of Engineers
Jerod Chew, Natural Resources Conservation Service
Kristiana Cox, Department of Natural Resources
Ginger Davis, Indiana Geological and Water Survey
Jeff Frey, United States Geological Survey
Glenn Grove, Department of Natural Resources
Beth Hall, State Climatologist
Sarah Hudson, Indiana Finance Authority
Jack Wittman, INTERA
Kevin Spindler, Department of Environmental Management
David Lampe, United States Geological Survey
Sally Letsinger, Indiana University
Garth Lindner, Department of Natural Resources
Randy Maier, Department of Natural Resources
Ali Meils, Department of Environmental Management
Alex Riddle, United States Geological Survey
Christina Spielbauer, Department of Natural Resources
Christian Walker, Department of Environmental Management
Jeremy Webber, United States Geological Survey
Jeffery Woods, United States Geological Survey
Shannon Zezula, Natural Resources Conservation Service

Monitoring Study Objectives

1) Identify spatial gaps in Indiana's water monitoring networks

2) Specify instrument needs at gap locations





Gaps in the network

Data are primarily focused on documenting existing conditions and changes in water resources over time.

Surface water level (stage) at select instrumented (gaged) locations

Groundwater levels at select locations and select depths for a portion of the state's aquifer systems

Climatic conditions and soil moisture data at select locations

Surface water flow volumes (discharge) at a portion of gaged locations

Surface and groundwater water quality at even fewer select locations with limited water quality parameters

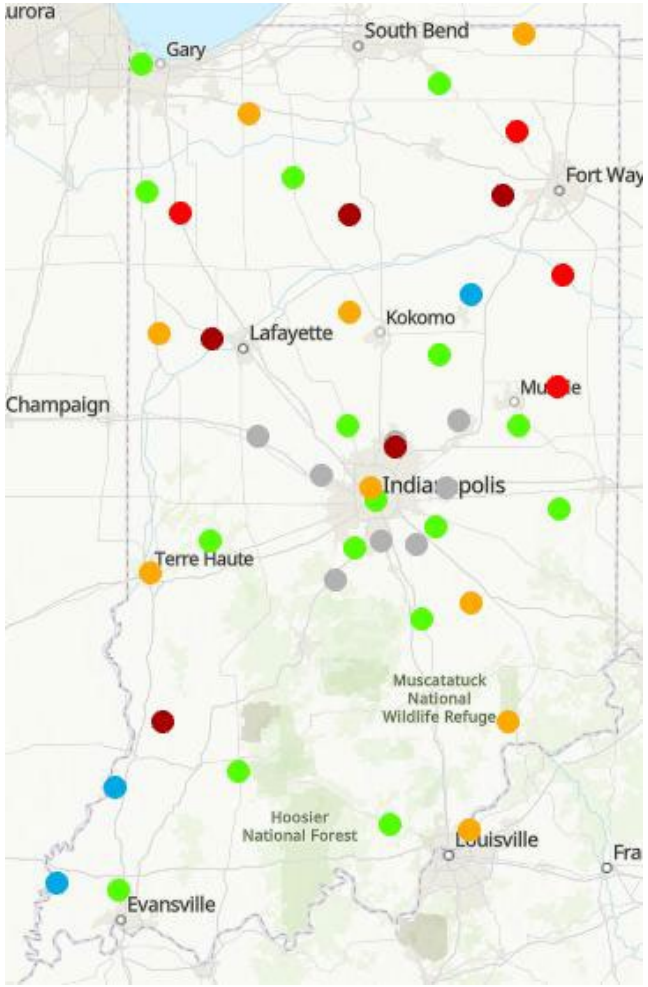
Benefits gained from an optimized network

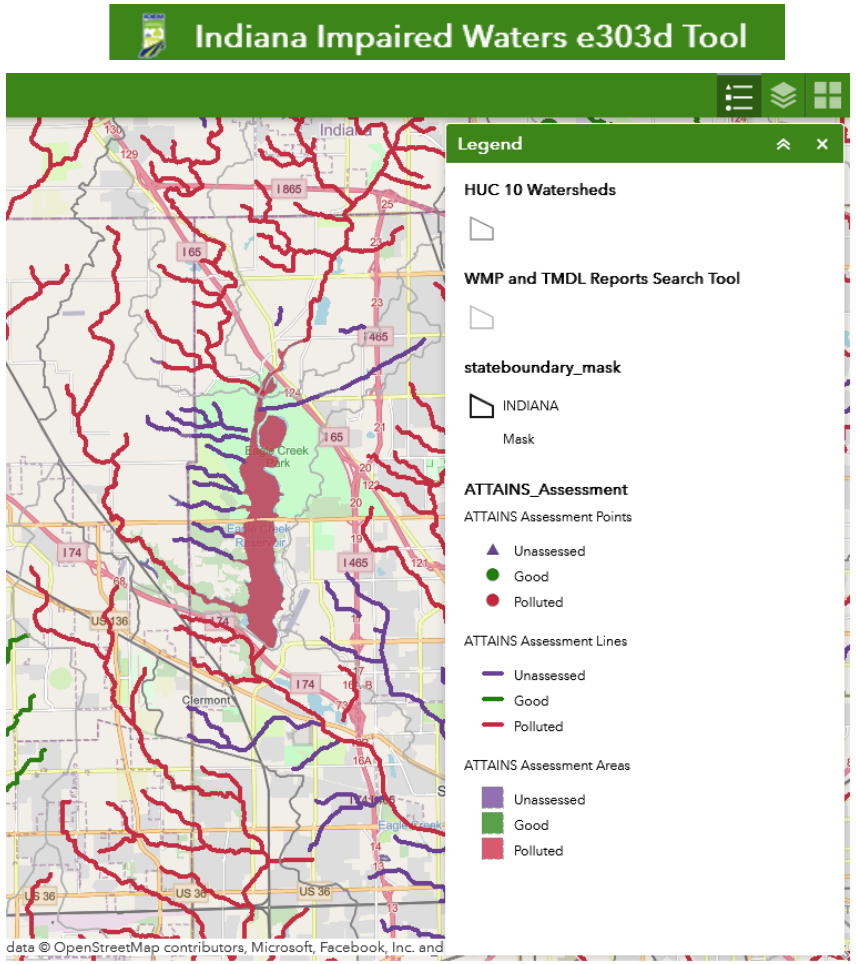
Water Availability and Assessments

- Seasonal water balance
- Groundwater-level trends
- Complex geological layers
- Recharge rates of shallow/deep aquifers
- Inform economic development efforts
- Effects of pumping
- Stormwater runoff volume/timing

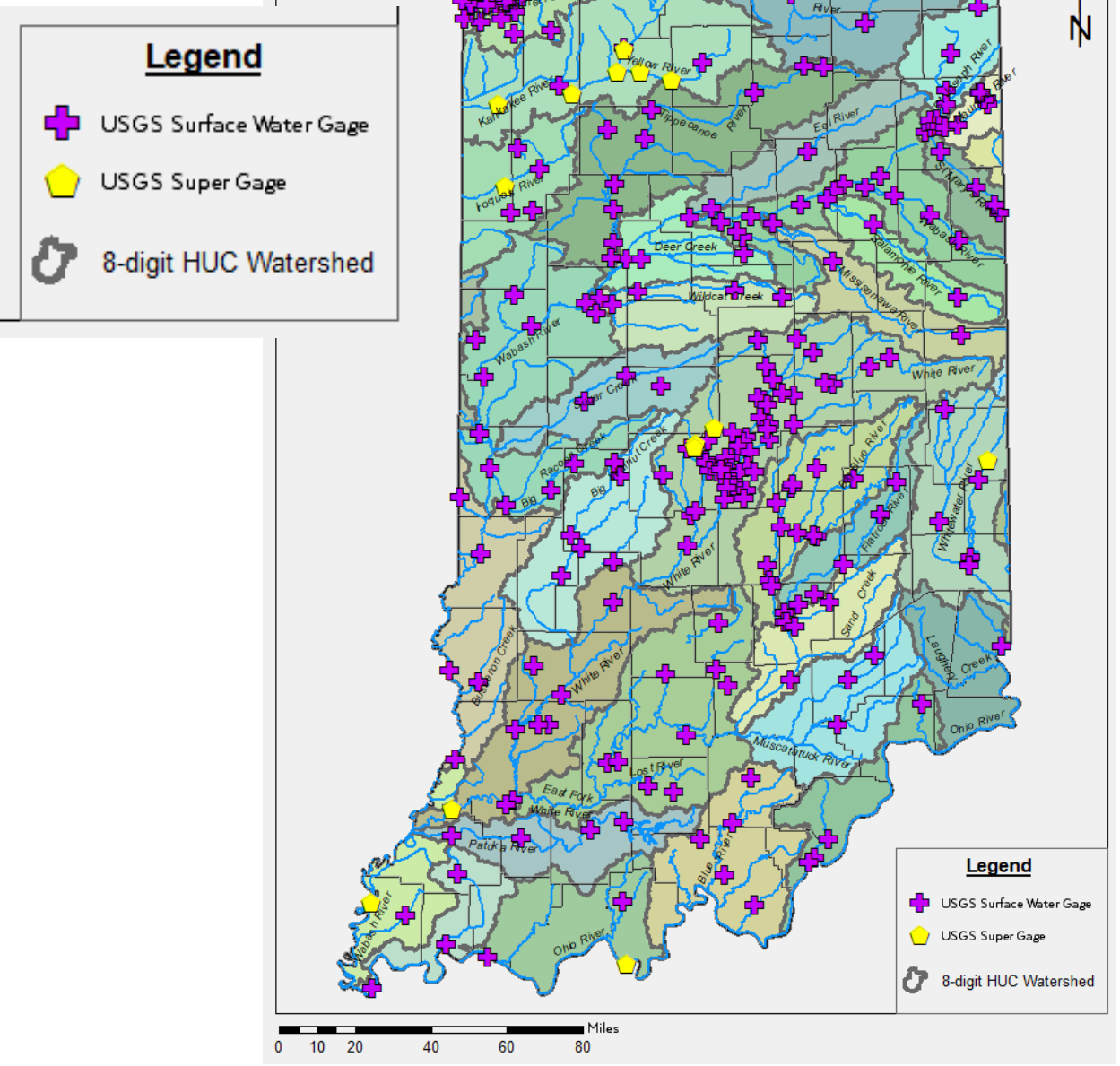
Water Quality

- Groundwater-quality trends
- Real-time surface water quality monitoring
- Water quality of bedrock aquifers

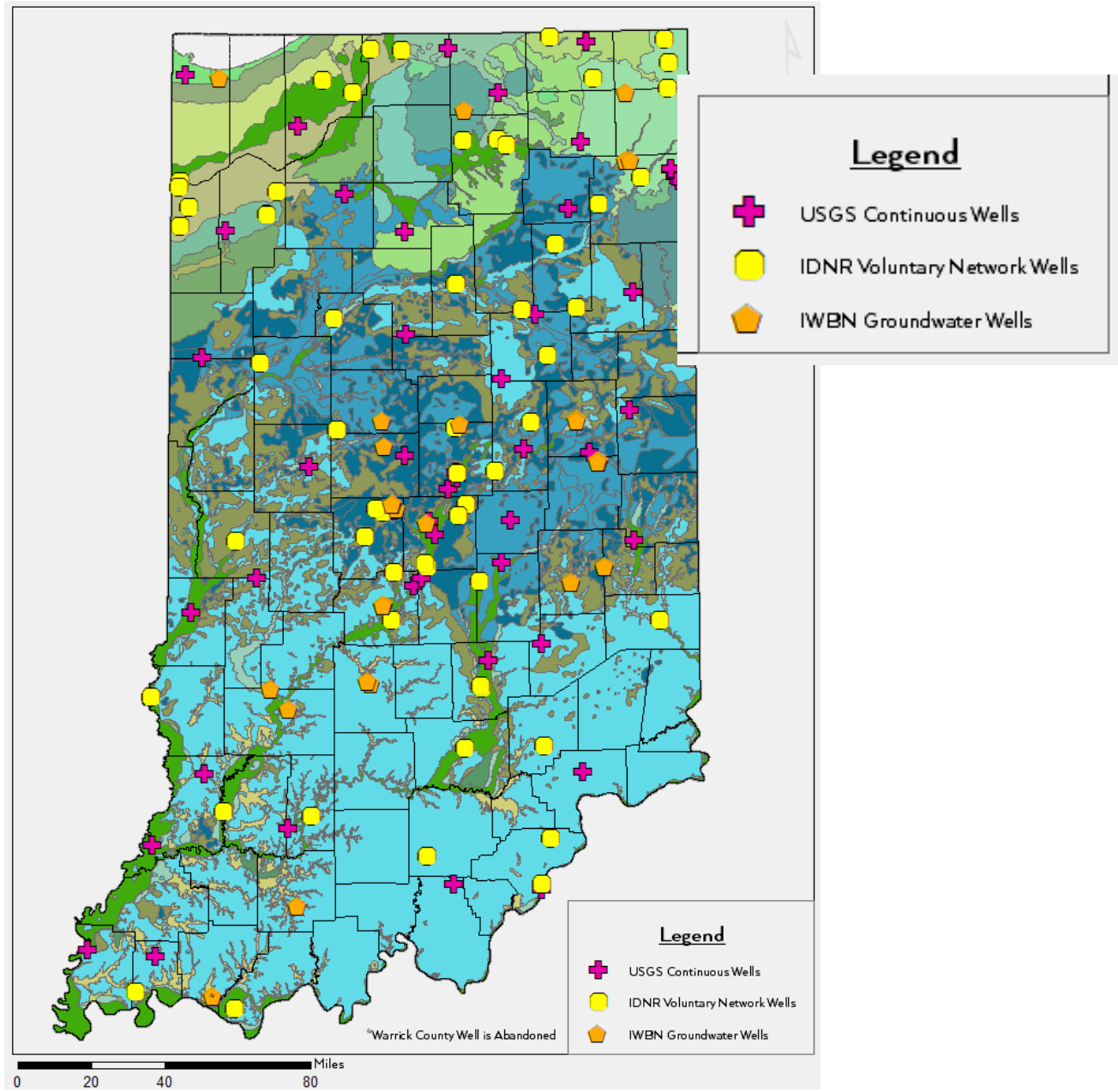




Surface Water Networks

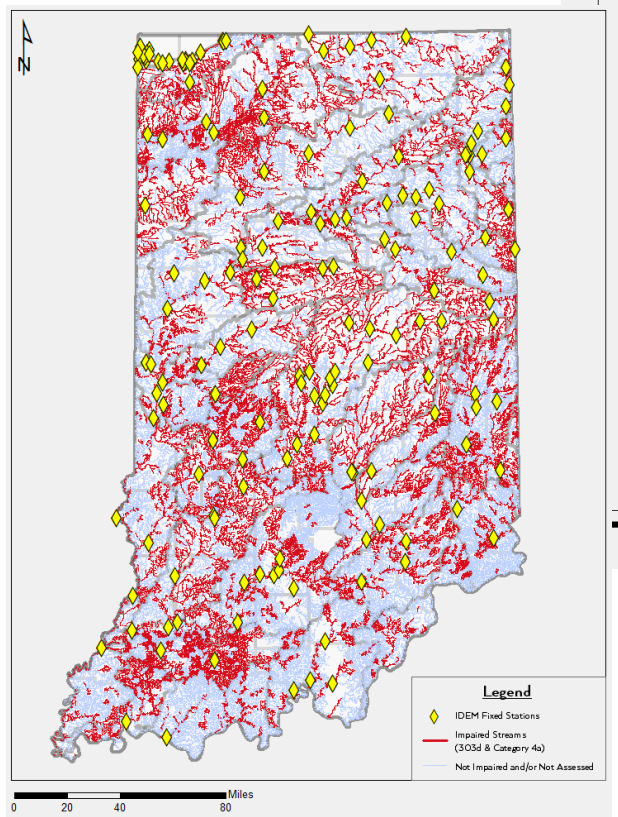


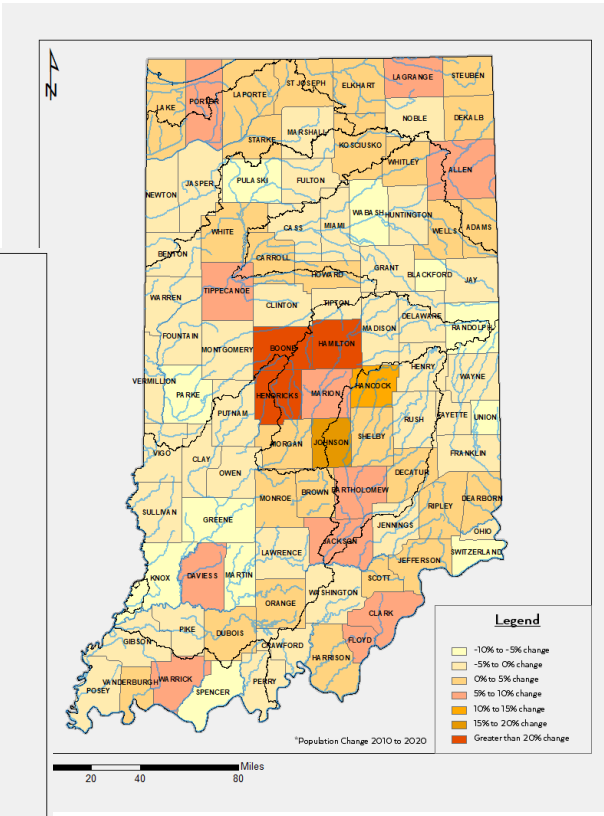
Groundwater Networks



Gap Analysis Considerations

- Watershed & Aquifer Systems
- Significant Water Users
- Population Change
- Impaired Waters (47% statewide)
- Mesonet Network



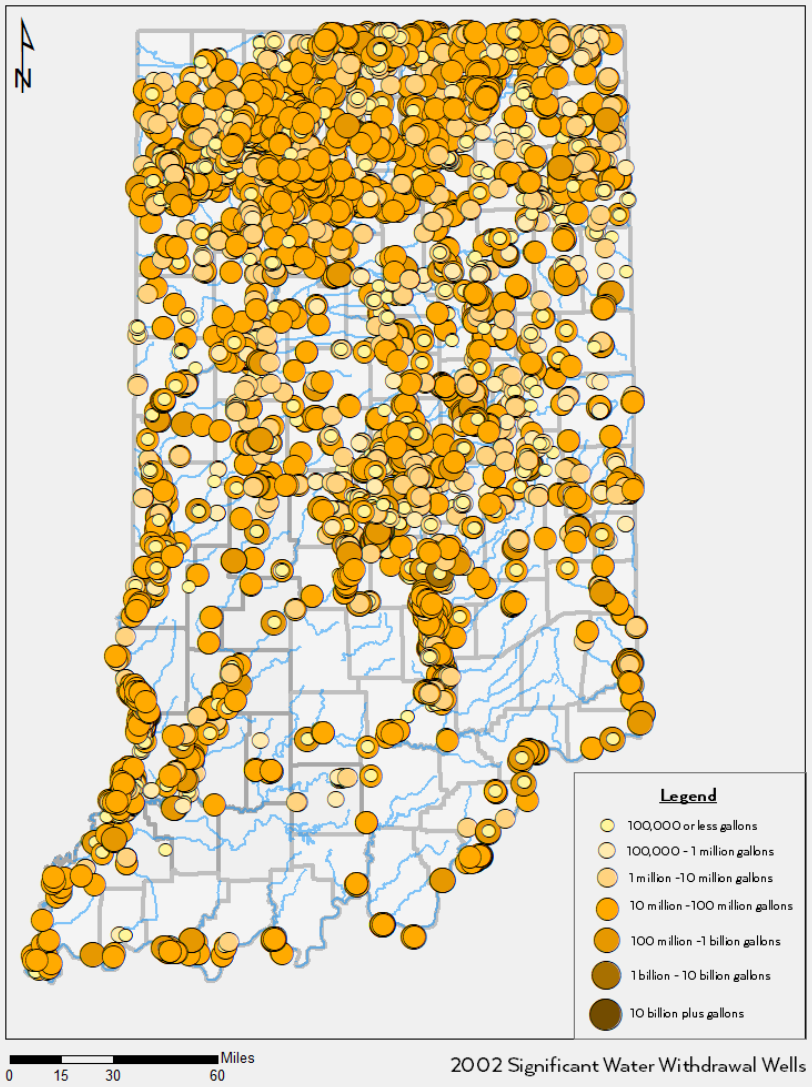


Indiana Finance Authority

WHITE RIVER ALLIANCE

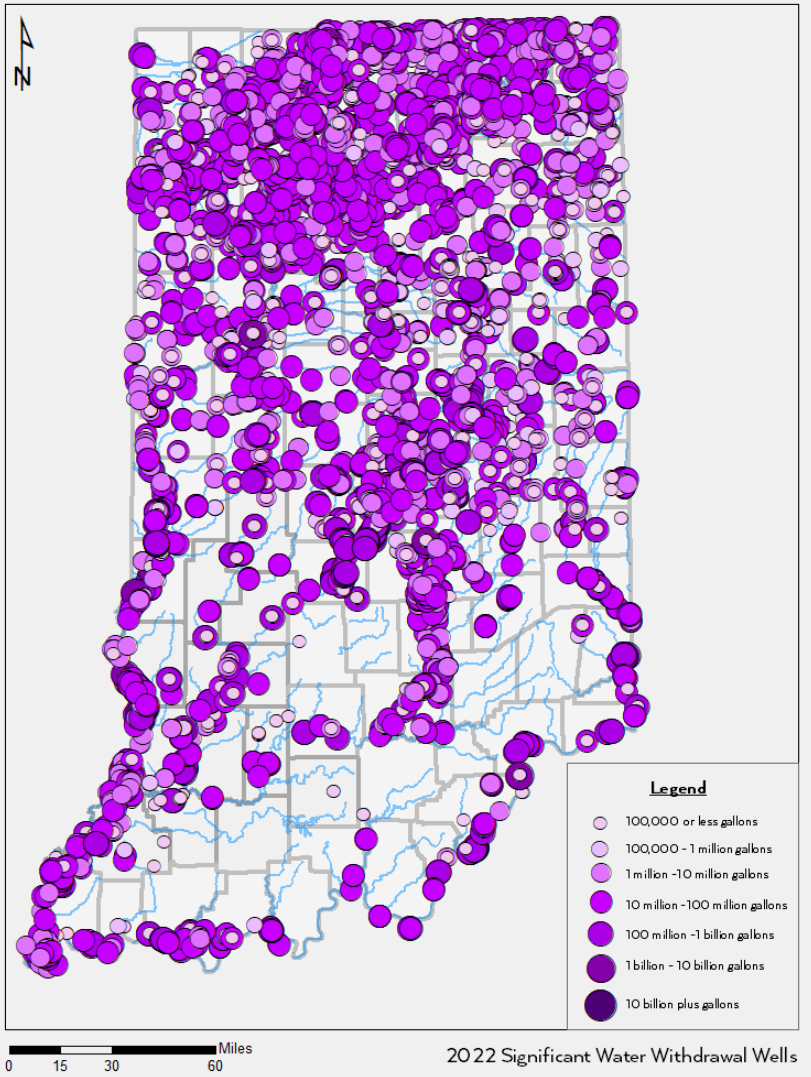
2002 Significant Water Withdrawal ALL Facilities

GROUNDWATER

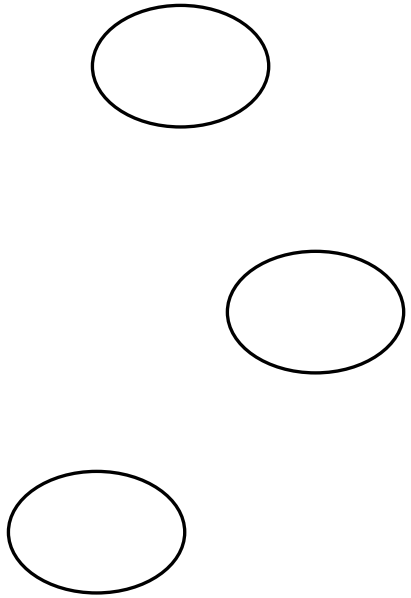


2022 Significant Water Withdrawal ALL Facilities

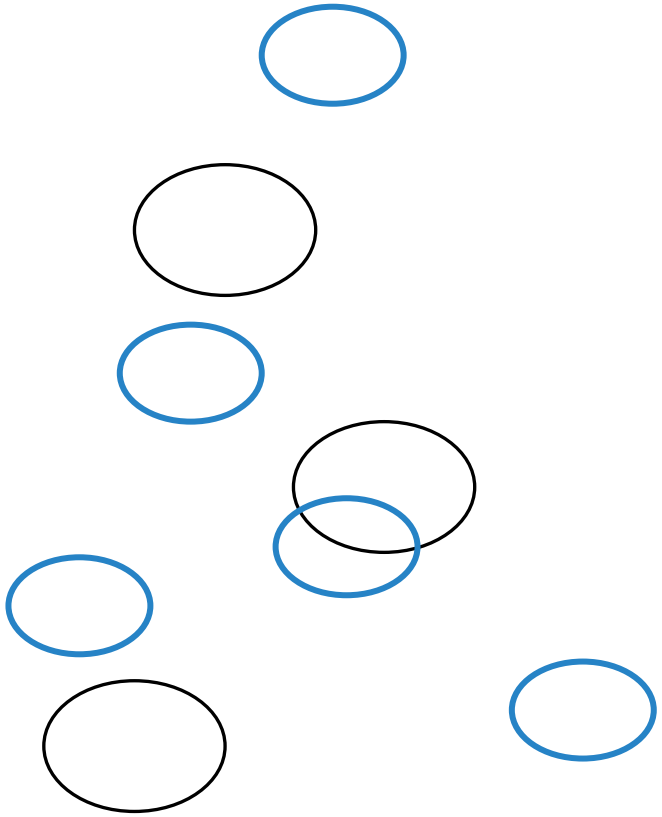
GROUNDWATER



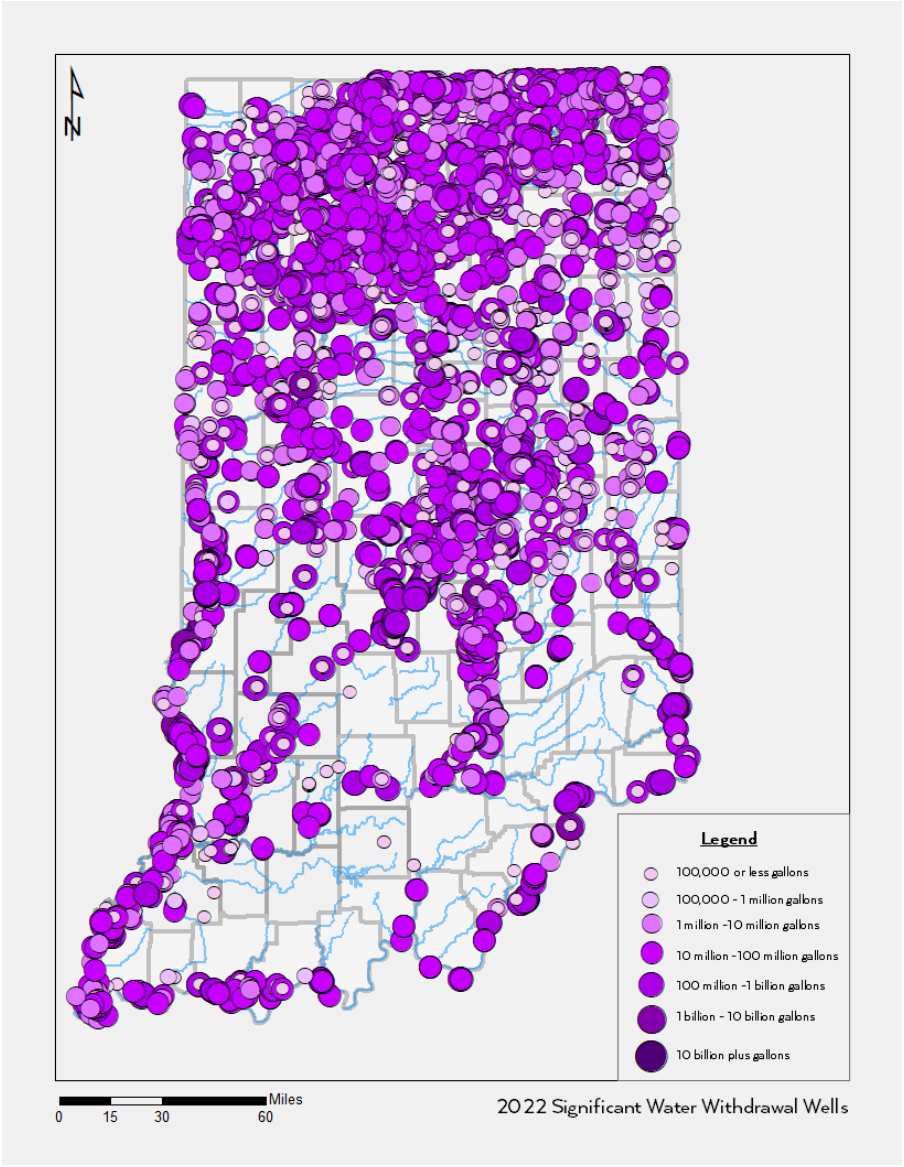
2002 Significant Water Withdrawal Facilities >100 MG/Yr
GROUNDWATER



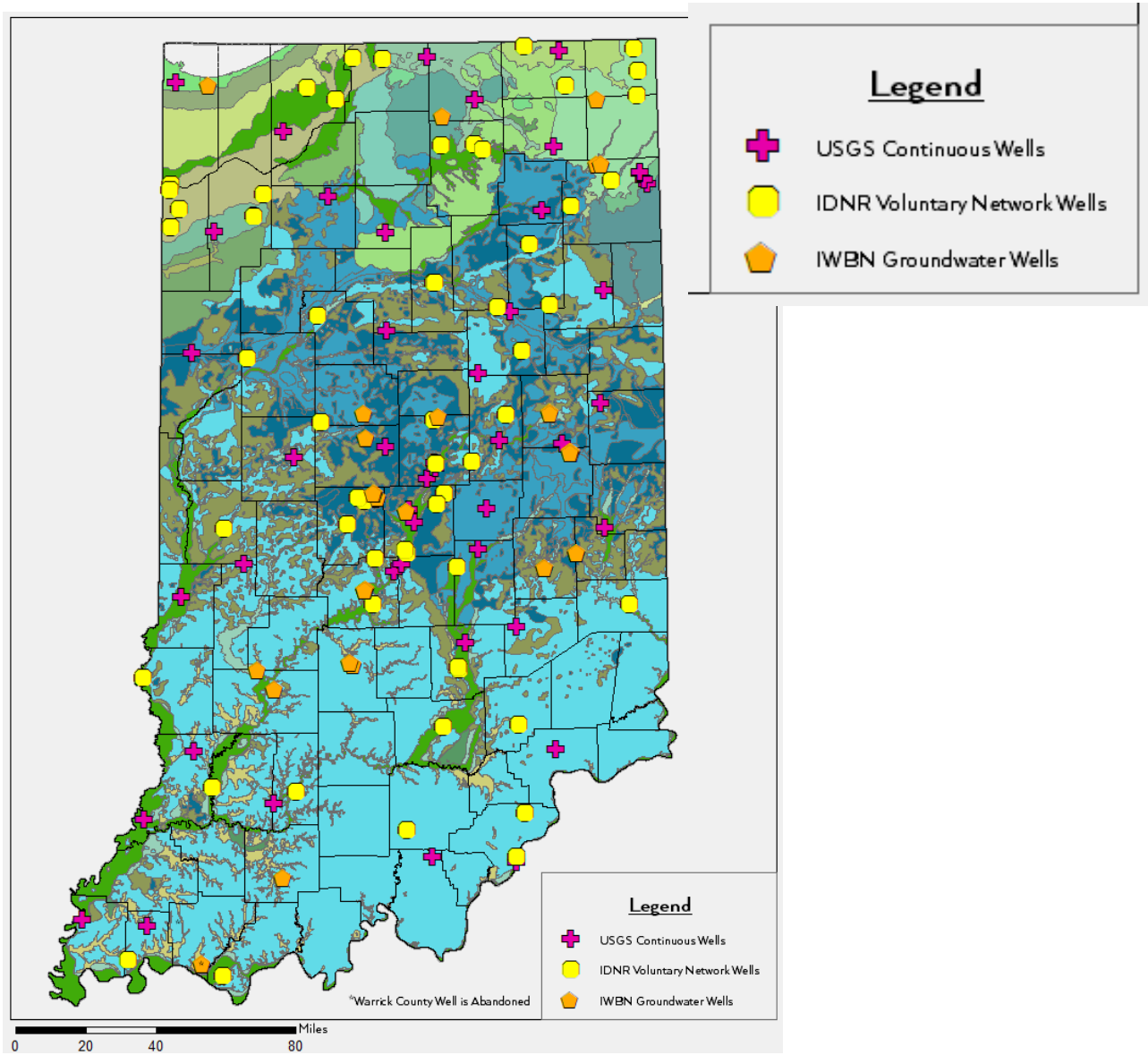
2022 Significant Water Withdrawal Facilities >100 MG/Yr
GROUNDWATER



2022 Significant Water Withdrawal ALL Facilities – **GROUNDWATER**



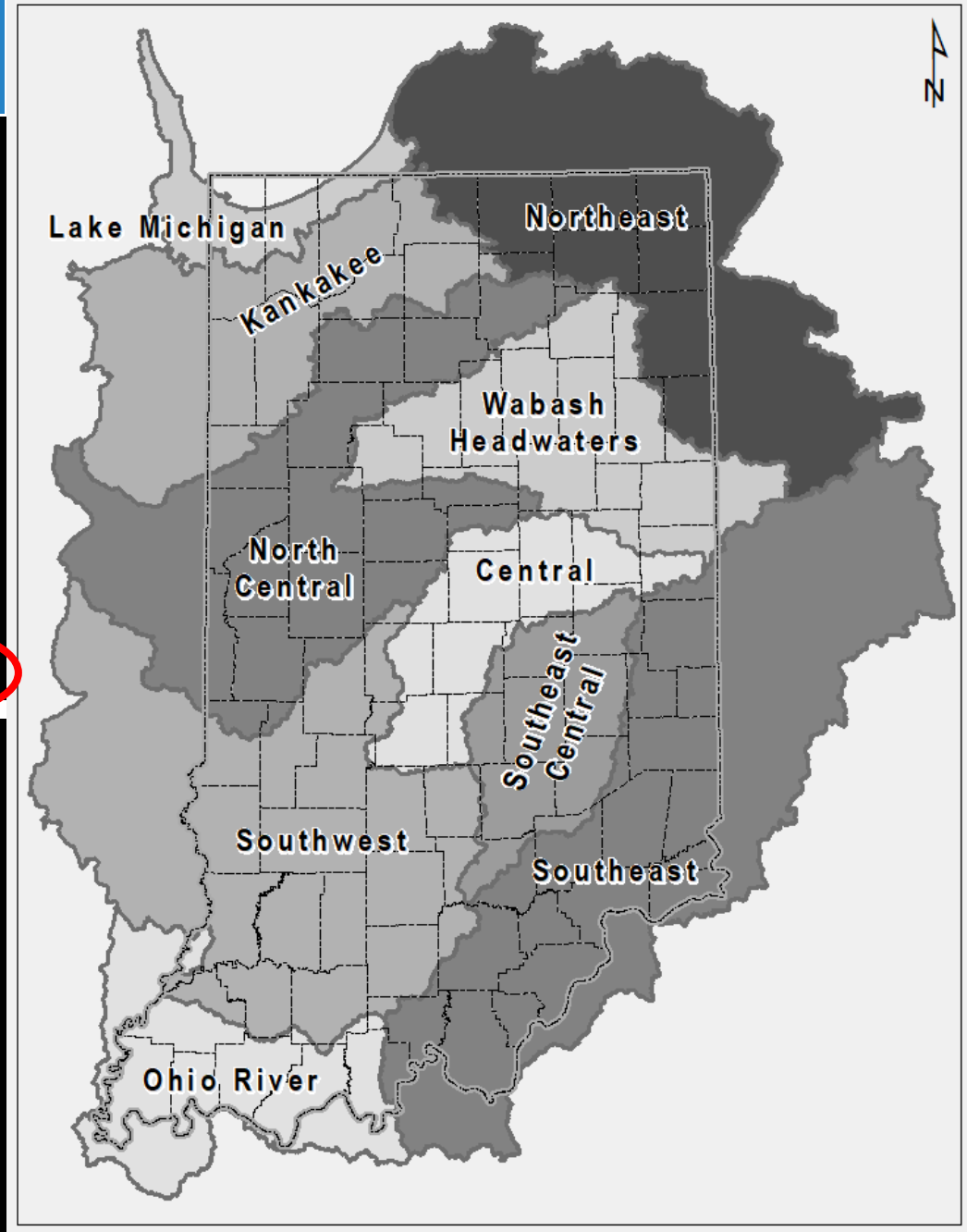
Existing Groundwater Networks



Use by Region

	GROUNDWATER WELLS Total 2022 Volume Withdrawn (gal)	SURFACE WATER INTAKES Total 2022 Volume Withdrawn (gal)
Central	47,245,553,000	101,138,768,000
Kankakee	27,161,781,000	23,922,593,000
Lake Michigan	1,137,295,000	22,537,159,000
North Central	39,952,612,000	233,151,251,000
Northeast	33,854,666,000	32,175,556,000
Ohio River	11,213,549,000	231,980,967,000
Southeast Central	3,493,764,000	3,493,764,000
Southeast	14,869,274,000	18,663,051,000
Southwest	21,143,589,000	237,942,883,000
Wabash Headwaters	14,268,262,000	8,683,171,000
TOTAL	214,332,345,000	913,609,163,000

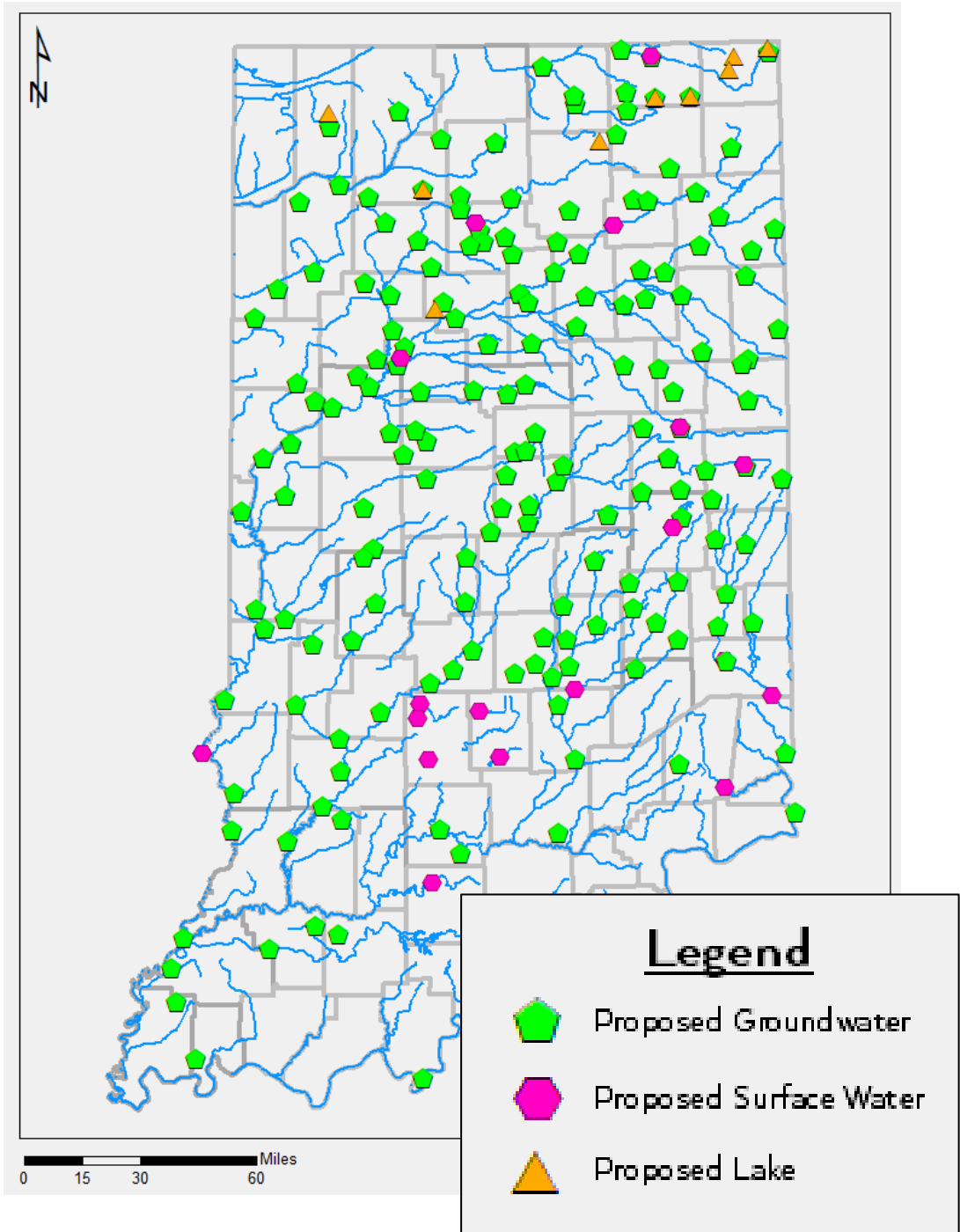
	GROUNDWATER WELLS Number of Facilities	SURFACE WATER INTAKES Number of Facilities
Central	675	136
Kankakee	1,451	282
Lake Michigan	69	36
North Central	1,196	118
Northeast	1,336	163
Ohio River	313	56
Southeast Central	51	51
Southeast	236	90
Southwest	388	101
Wabash Headwaters	462	79
TOTAL	6,177	1,112



RECOMMENDATION #1 – Invest in the Network & Data Analysis

Table 2: Proposed monitoring network expansion by water study region

Region	Proposed Groundwater Wells	Proposed Surface Water Gages	Proposed Lake/Reservoir Gages
Central	25	1	0
Kankakee	10	0	2
Lake Michigan	1	0	0
North Central	39	1	0
Northeast	17	1	6
Ohio River	4	0	0
Southeast Central	22	2	0
Southeast	14	3	0
Southwest	19	7	0
Wabash Headwaters	33	3	1
Total	**184**	**18**	**9**

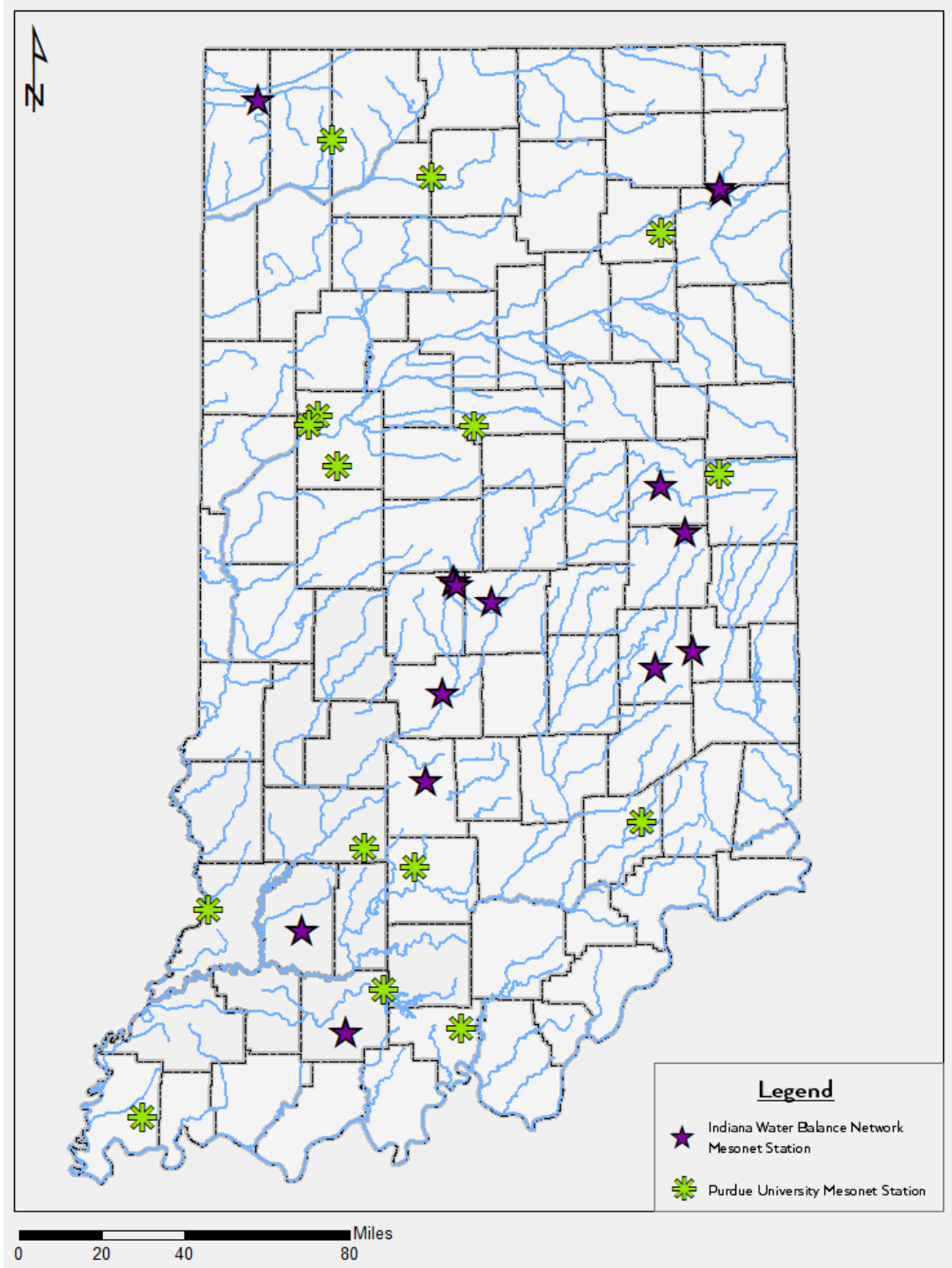


RECOMMENDATION #1 – Invest in the Network & Data Analysis

Invest in **at least one complete Mesonet station in each county** to better understand climate conditions and related water cycle elements such as evapotranspiration, infiltration, soil moisture, etc.

Indiana Water Balance Network Mesonet Station

Purdue University Mesonet Station



EO 25-63: Directives

1. Inventory current usage, availability of surface and groundwater resources and forecasting of future demand.
2. Develop a statewide water planning framework at a regional scale.
3. Develop recommendations for enhancement and optimization of Indiana's water resource monitoring networks.
4. Create a centralized, publicly accessible, on-line water data platform.

The inventory shall be completed by Oct. 31, 2026 with a report provided to the Governor and Legislative Council by Dec. 31, 2026.

RECOMMENDATION #1

- Invest in Network Expansion & Maintenance
- Sustain Existing Network

RECOMMENDATION #2

- Prioritize and Align Funding

RECOMMENDATION #3

- Establish Clear Leadership

RECOMMENDATION #4

- Engage Academic Institutions

RECOMMENDATION #5

- Facilitate Data Sharing

RECOMMENDATION #6

- Expand Staffing for Water Resource Analysis & Management

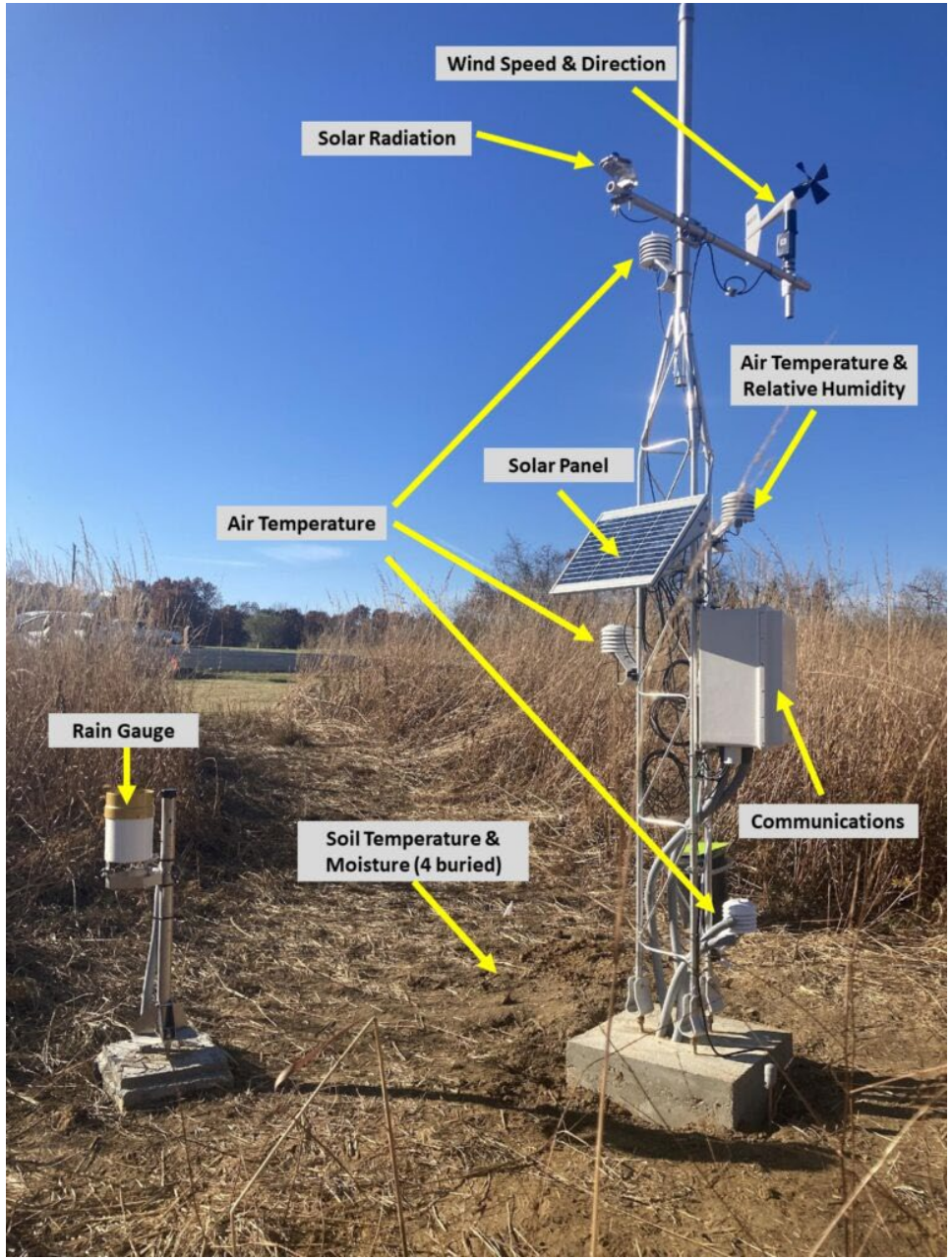
Summary Findings

Indiana's hydrologic monitoring network has numerous gaps that when filled with targeted instrumentation can better answer critical questions related to water resource availability and management.

Reduced investment in the network over the past 25 years has limited data needed for:

- ✓ proactive economic planning,
- ✓ preventive drought and flood response,
- ✓ comprehensive health and safety assurances,
- ✓ environmental protection, and
- ✓ new permit review procedures on large transfer will require an advanced understanding of the resource

Addressing these deficiencies through *hydrologic monitoring network enhancement* is crucial to ensuring a sustainable and resilient water management system for Indiana's future.



QUESTIONS / DISCUSSION

Jill Hoffmann jill@thewhiteriveralliance.org
Garth Lindner glindner@dnr.IN.gov

DNR
Indiana Department of Natural Resources

IFA
Indiana Finance Authority

WHITE RIVER ALLIANCE