Working Together for a Better Understanding of Water Quality in Indiana

Water Summit Kick-Off
August 14, 2019

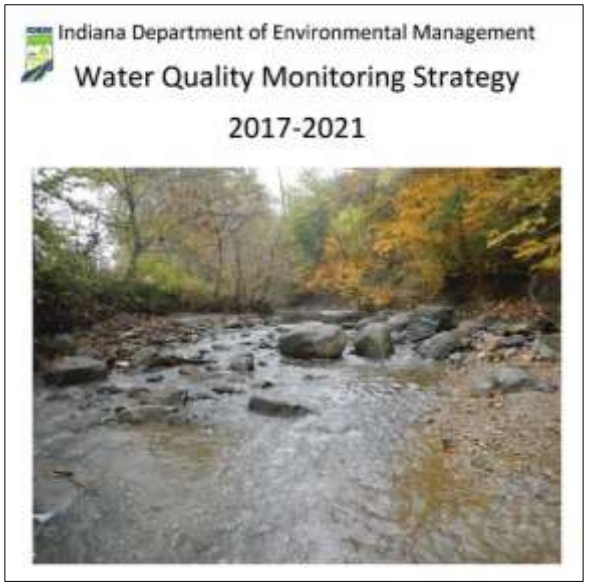
Jody Arthur, Integrated Report Coordinator
Indiana Department of Environmental Management
Office of Water Quality

Topics to be Covered

- IDEM's water quality monitoring programs and how data is used
- IDEM's Consolidated List and 303(d) List of Impaired Waters
- Opportunities to partner with IDEM through its Office of Water Quality (OWQ) External Data Framework (EDF)

Why IDEM Monitors Indiana Waters

- Clean Water Act (CWA) §305(b) requires IDEM to assess all waters of the state and to develop the CWA §303(d) List of Impaired Waters
- Support public health advisories and emerging water quality issues



- Support Office of Water Quality programs
- Support watershed planning and restoration activities
- Determine water quality trends and evaluate program performance

Monitoring Approaches

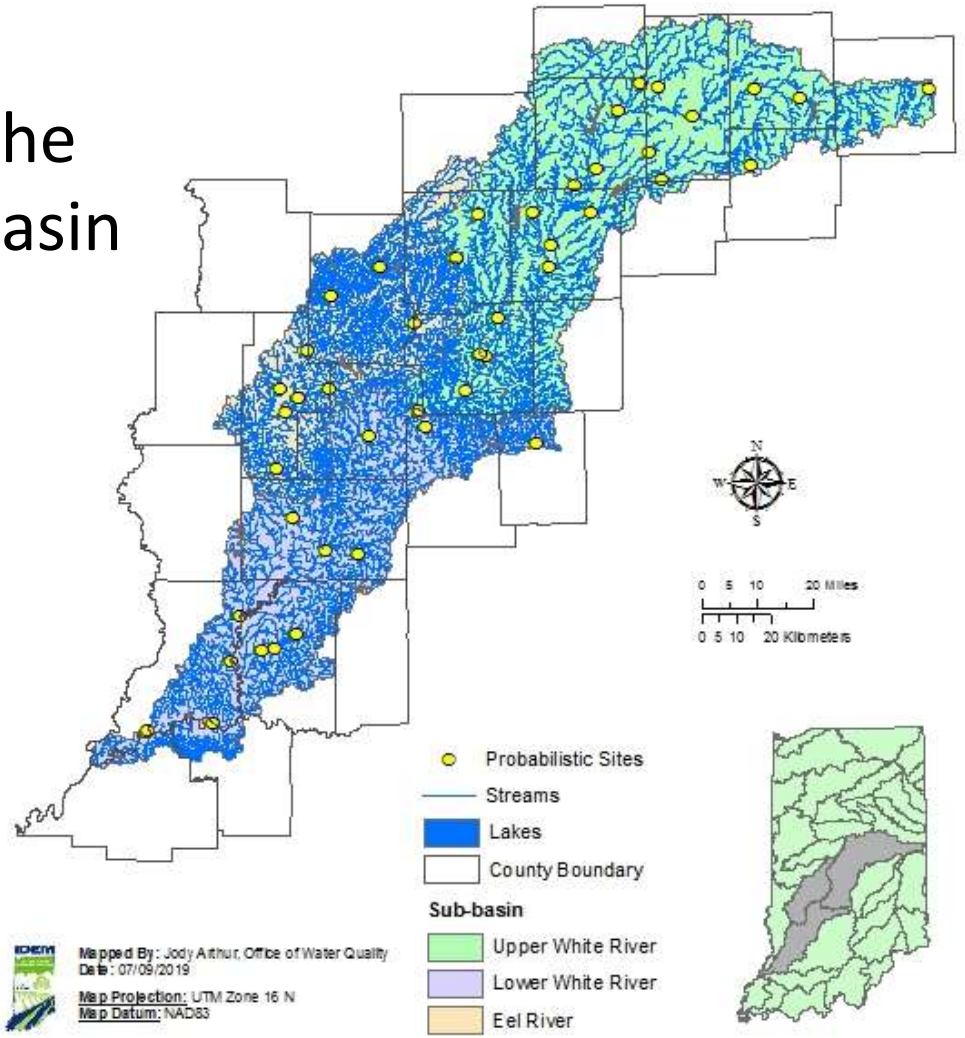
- Each of IDEM's water quality monitoring programs uses one of three general approaches based on what the agency needs to know:
  - **Probabilistic**: A stratified random approach to site selection
  - **Fixed**: Sites do not change from season to season
  - **Targeted**: Intentional selection of sampling sites based on specific monitoring objectives or decisions to be made

Probabilistic Monitoring

- Field and laboratory water chemistry, bacteria, and biological communities
- 38-45 sites randomly selected in one of nine major basins each year
- Randomness built into this sampling allows IDEM to use the data at two different scales

Probabilistic Sites: 2011

- Monitoring focused on the West Fork White River Basin
  - 45 sites in the basin as a whole
  - 23 sites in the Upper White River Watershed




Upper Illinois River
2017


Great Lakes
2018


Ohio River Tributaries
2019

2020


White River, West Fork
2020


Patoka River
2021


White River, East Fork
2022

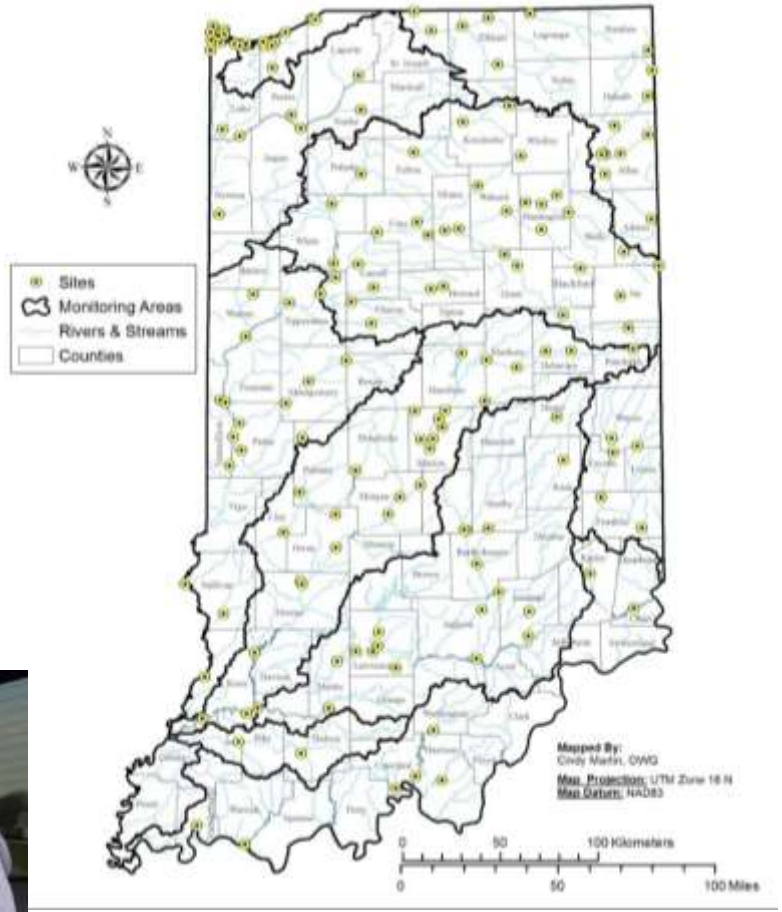

Whitewater River
2023


Upper Wabash River
2024


Lower Wabash River
2024

Fixed Stations

- Field and laboratory water chemistry, and bacteria monitored monthly on rivers and streams
- Established in 1957 with 49 sites located mainly at drinking water intakes and wastewater treatment plant outfalls
- Now 165 fixed locations



Targeted: Fish Tissue Contaminants

- Mercury and polychlorinated biphenyls (PCBs) in fish tissue at 35-45 sites each year on rivers, streams, lakes, and reservoirs
- Monitoring follows a five-year basin rotation and includes:
  - 23 “core” sites IDEM has been monitoring since the late 1970s
  - Lakes and streams commonly used for fishing
  - Sites that have known problems (“legacy issues”)

Targeted: Watershed Characterization

- Field and laboratory water chemistry and bacteria monitored monthly for one year; biological community monitored once in same year
- Modified geometric design based on drainage areas (12-digit watersheds) with sites located on bridge

CWA Sections 305(b) and 303(d)

- 305(b) requires states to:
  - Assess how well surface waters are supporting designated uses identified in the water quality standards (WQS)
  - Report IDEM's assessments to the U.S. Environmental Protection Agency (U.S. EPA)
- 303(d) requires states to submit a list of impaired waters to U.S. EPA
- Both are combined into the Integrated Report (IR) submitted every two years

IDEM's Water Quality Assessments

- Based on narrative and numeric criteria expressed in Indiana's water quality standards
- Answering the question, "How well do our waters support their designated uses?"

IDEM's Consolidated List and 303(d) List

- The Consolidated List
  - A summary of everything IDEM staff know about how well each waterbody assessment unit is supporting its designated uses
- The 303(d) list
  - A *subset* of the Consolidated List – those waters not supporting one or more uses
  - Waters that require a total maximum daily load (TMDL)
- Both lists are needed to see the big picture

Data is Key to Understanding Indiana Waters

- Indiana, like many states, is facing increasingly limited monitoring resources coupled with ever increasing need for monitoring data

- Effective water resource management across the board requires data of known quality, and LOTS of it

IDEM's External Data Framework

- A process to help organizations and individuals share their water quality data with IDEM for potential use in assessments and other decision-making
- Technical assistance available to help you develop and document your monitoring plan and to share your data with IDEM
- Participation is completely voluntary

Tier 1 Uses

- Education and building awareness of water resources and the issues affecting them
- Supplementary information for total maximum daily load (TMDL) development
- Supplementary information for OWQ's Integrated Report

Tier 2 Uses

- Supplementary information for use in planning or prioritizing OWQ's monitoring and TMDL development
- Demonstrating success of water quality restoration or protection measures
- Watershed management planning
- Determining water quality trends
- Screening data

Tier 3 Uses

- CWA 305(b) water quality assessment and 303(d) listing decisions
- Total maximum daily load modeling
- Determining representative background conditions for National Pollutant Discharge Elimination System permits
- Determining/changing the antidegradation classification of a waterbody

Increasing Level of Scientific Rigor

How Might Your Data Fit?

- Can accept data collected at any geographic scale, anywhere in the state
- Lakes, rivers and streams
- Inclusive by design
  - Based on the premise that all data have value
- The original purpose for collecting the data doesn't matter

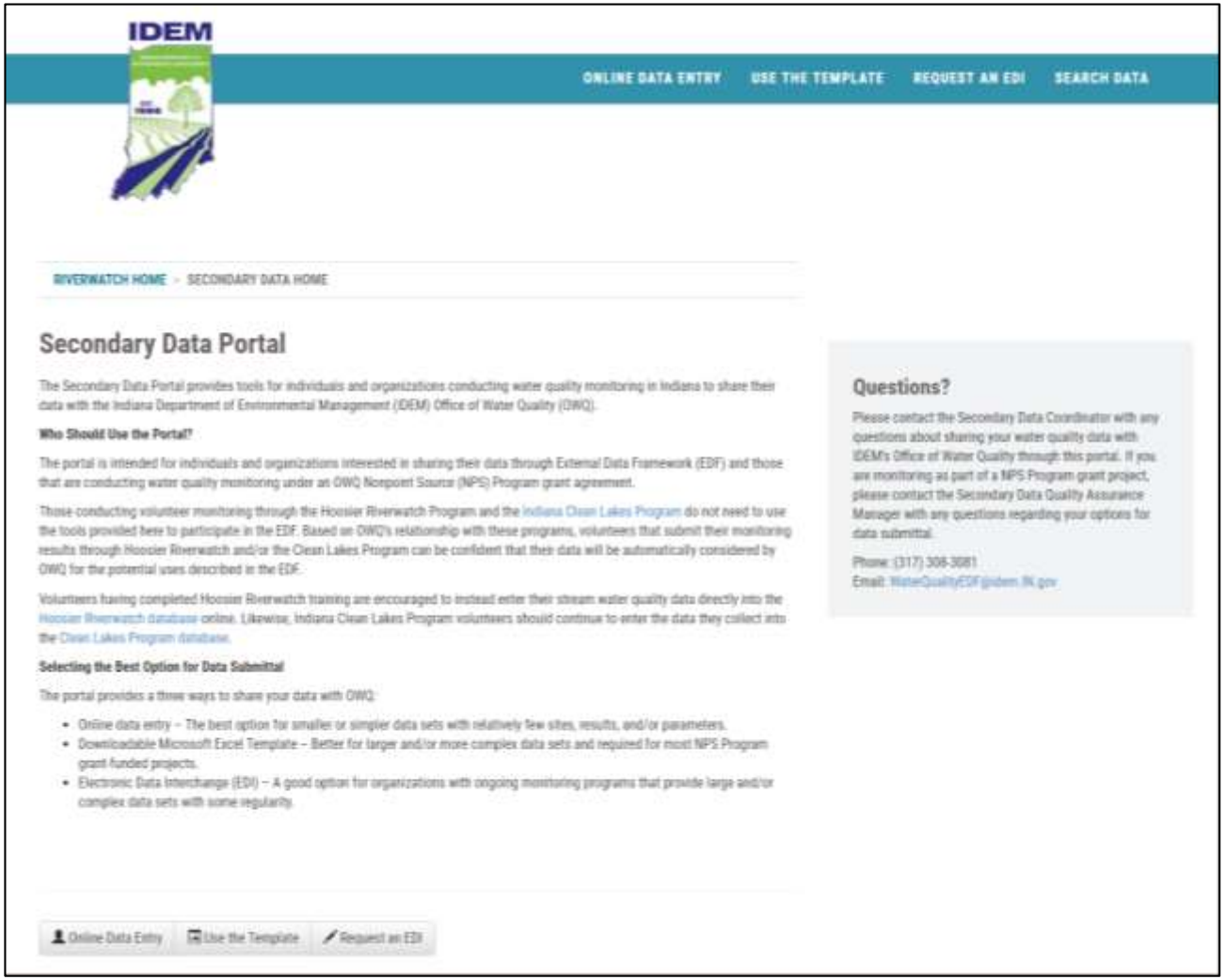
Types of Data IDEM Can Accept

- Field measurements and flow data
- Chemistry and bacteria results from ambient water samples
- Fish tissue data
- Biological community data and habitat evaluations
- Algal biomass data

What IDEM Does with Your Data

- IDEM reviews the data set and any documentation provided with it to determine its level of data quality
- The data set is then assigned an EDF Tier, qualifying it for any of the uses in that tier.
- If the data is the right type for a given use, IDEM then checks any other use-specific requirements to determine whether the data can be used for that purpose.

EDF Tools & Support



IDEM Invites You to Participate!

External Data Framework

idem.IN.gov/cleanwater/2485.htm

Contact

Jody Arthur, 317-308-3179

jarthur@idem.IN.gov