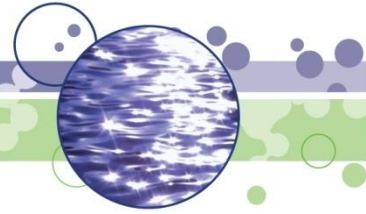




We Protect Hoosiers and Our Environment

Water



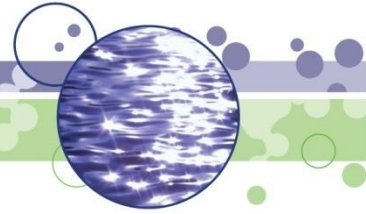
Wellhead/Source Water Protection and How it Interfaces with Watershed/Nonpoint Source Management Plans

Webinar for Purdue University by
Angie Brown and Connie Cousins-Leatherman
June 8, 2011



Overview

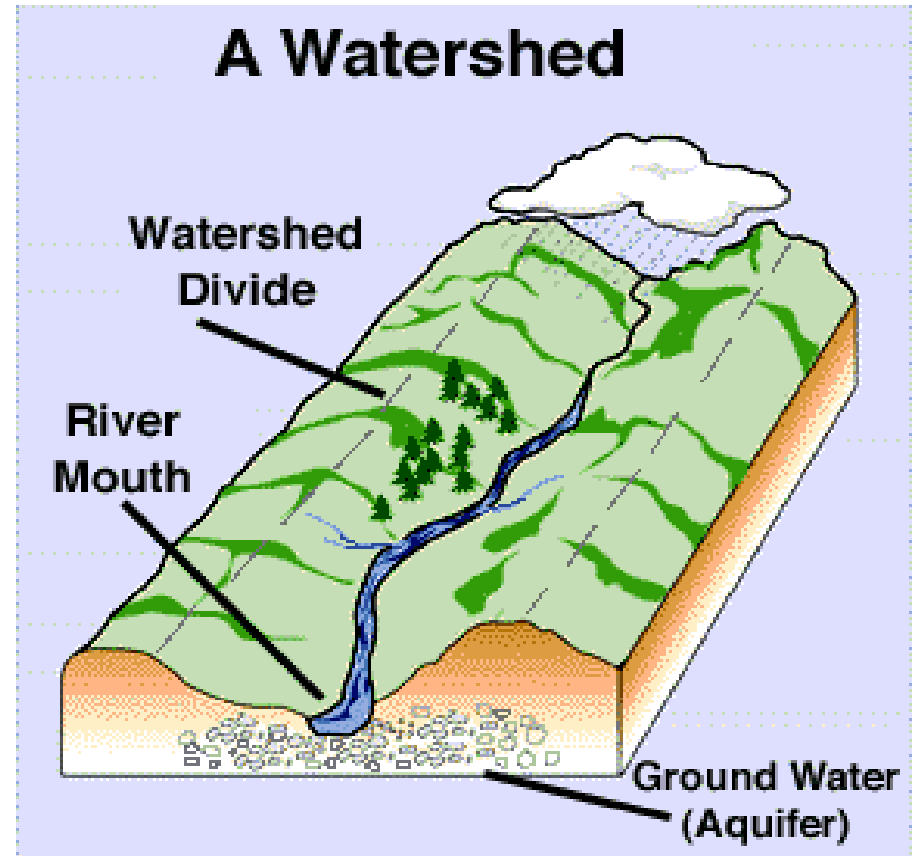
- Intro to Watershed Restoration
- Intro to Wellhead/Source Water Protection
- Comparison of the Programs
- Barriers to Integration
- Case Examples
- Recommendations

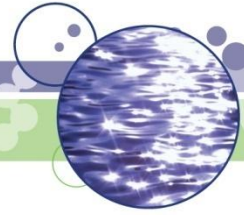


Watersheds

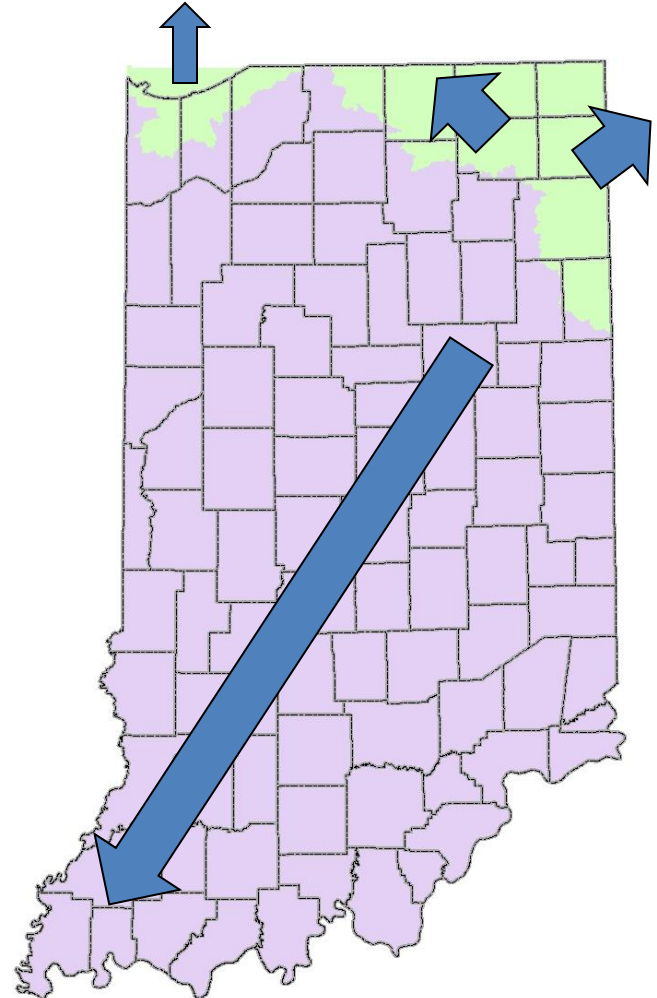
What is a watershed?

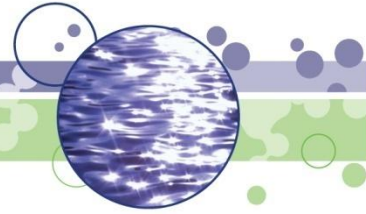
- *Land* area that drains to surface water
- Surface water - rivers, streams, lakes, ponds, ditches





Majority of the surface water in Indiana flows to the Mississippi River

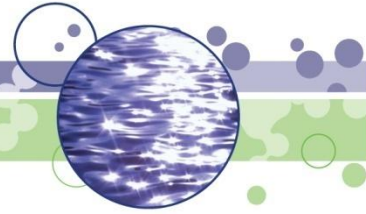




Surface Water: A Little History

- Clean Water Act (Federal Water Pollution Control Act - 1972; amended 1977) requires waters to be: swimmable, potable, and fishable
- 2 types of pollution addressed
 - Point source
 - Nonpoint source

Designated use → set standards → monitor
waters → save the good, treat the bad

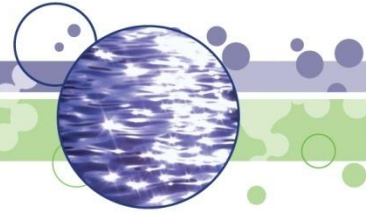


Fast Forward

- 6,970 discharge permits in the state
- 83% of Indiana's waters assessed; 52.8% impaired
- 12 streams have a "Do Not Eat" advisory
- 25% streams have full-body contact issues
- 43% population drinks from surface waters – treatment required

The Bottom Line

- System in place for point source control
- Still working on nonpoint sources programs

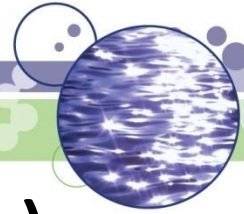


Mitigating Nonpoint Sources

Using the *Watershed Approach*

- Water quality problems generally do not begin in the stream or lake
- A problem-solving tool/decision-making model
 - Assessment
 - Identification
 - Stakeholder involvement
 - Implementation

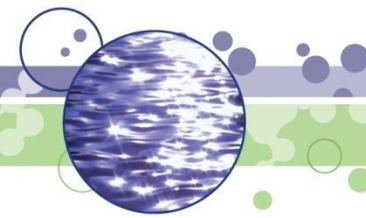




Current Status (Indiana)

- Not many regulatory controls on nonpoint sources
- Locally driven
- Federal grant dollars target impaired waterbodies
- ~ 100 Watershed Management Plans *
- +/- 100 active watershed efforts in Indiana
- 500 million lbs of sediment; 332,000 lbs of phosphorus; 546,000 lbs of nitrogen avoided/yr
- Several bi-state efforts for TMDL, watershed planning, and implementation of a WMP

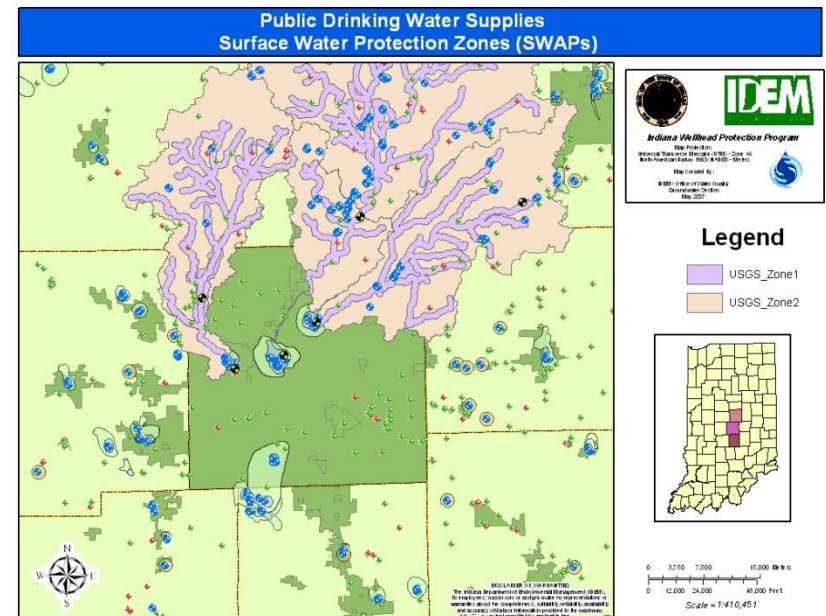
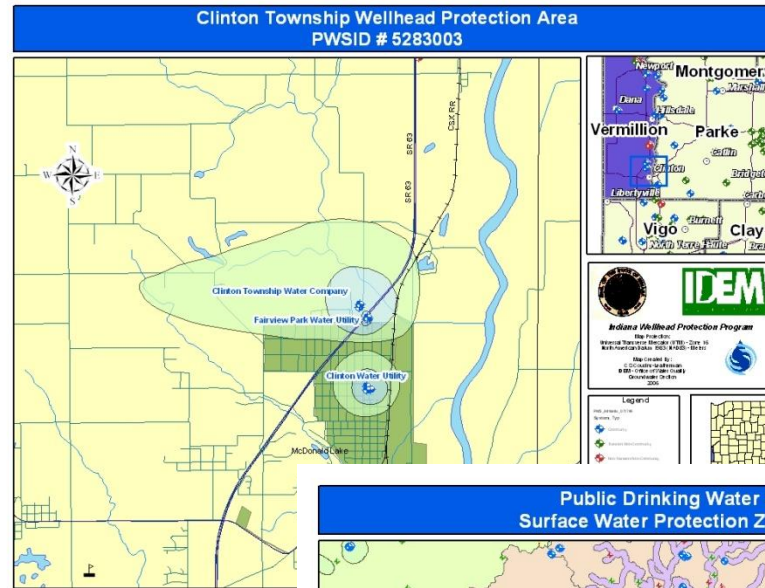
*<http://www.watersheds.IN.gov/3180.htm>



Protecting Water At the Tap

Safe Drinking Water Act
of 1974

Wellhead/Source Water
Protection Zones

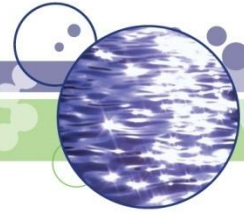




Multiple Barriers to Contamination Approach for Public Water Supplies



- Proper Siting of Wells/Intakes
- Design and Construction Stds
- Monitoring
- Maintenance/Operation
- Consumer Education



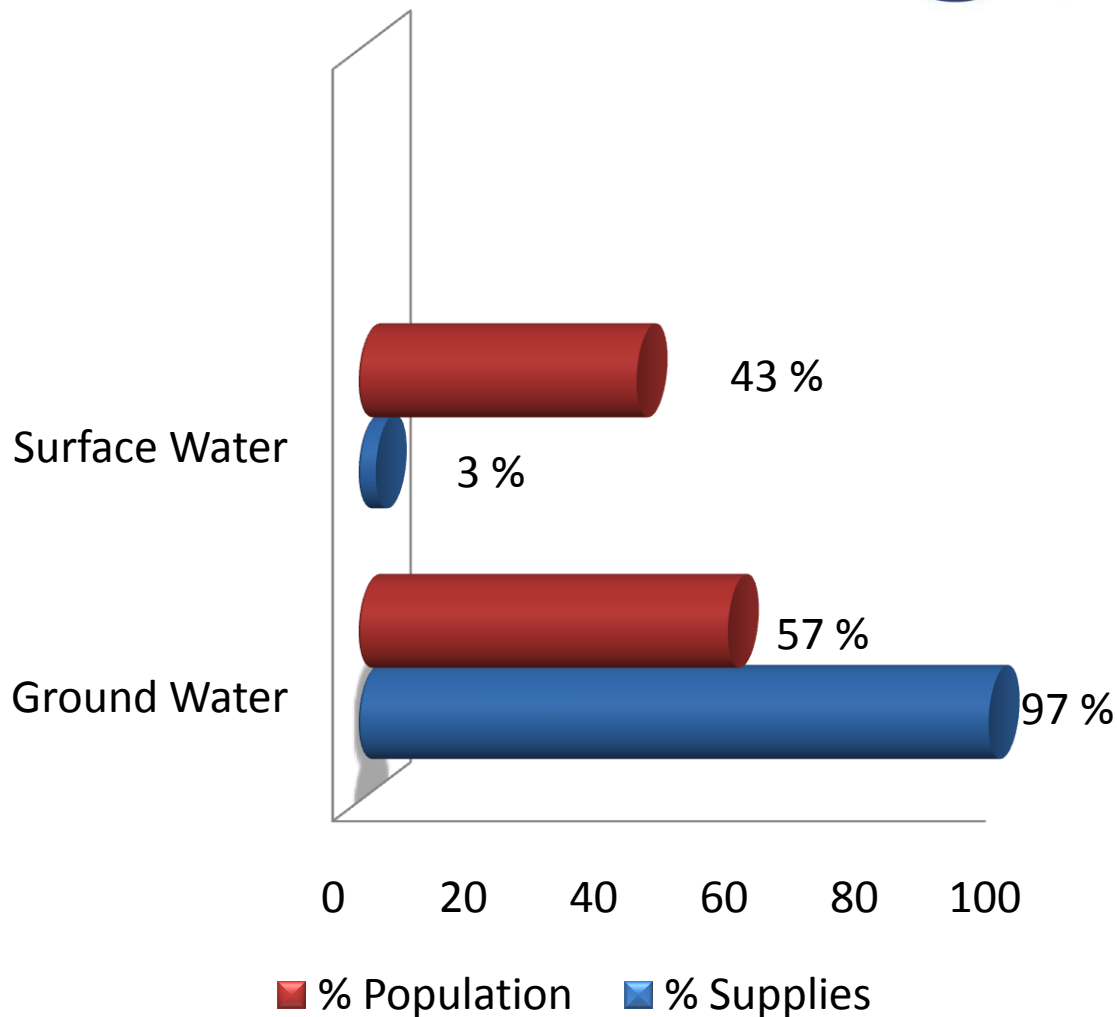
History of Wellhead/Source Water Protection in Indiana

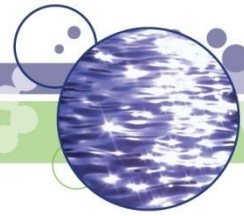
- 1986 Amendments to Safe Drinking Water Act
- 1996 Amendments to Safe Drinking Water Act
- 1997 State Rules Mandate Well Head Protection (WHP) for Community Water Supplies Utilizing Ground Water

(327 IAC 8-4.1)

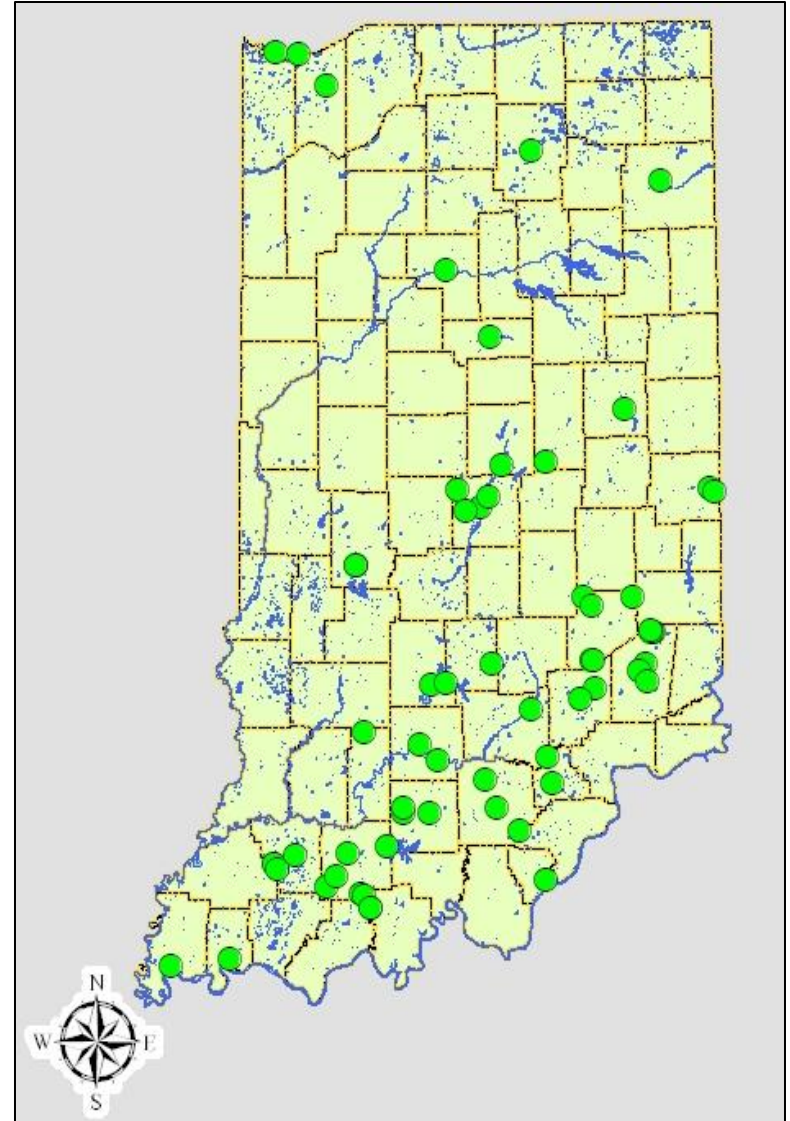


Sources of Drinking Water in Indiana





Public Drinking Water Supplies Utilizing Surface Waters in Indiana





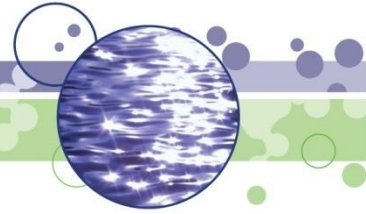
Current Status: Source Water Protection (Indiana)

I. State WHP Rules (327 IAC 8-4.1) :

- 630 approved Phase I plans*
- 90 approved Phase II plans*
- All Plans to be updated every 5 years thereafter

*IDEMTracking database available at :

<http://www.idem.IN.gov/4289.htm>



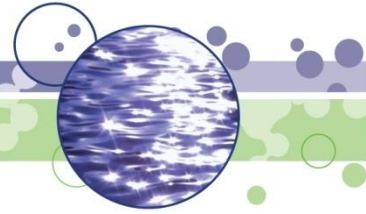
Current Status (cont'd)

2. Source Water Assessments (SWAPs)*

- Community & Noncommunity Public Water Supplies
- Surface Water & Ground Water
- Susceptibility Determinations**
 - Rated on a Scale from Low to High
 - All Surface Water Supplies determined to be Highly Susceptible

•Not available to the general Public.

** <http://www.idem.IN.gov/4288.htm>



What's The Goal?

- Watershed – **Remediation/restoration and protection** of surface waters for multiple uses including recreation, wildlife habitat, and drinking water
- Source Water Protection/Wellhead – **Protection** of existing and new public drinking water supplies





We Protect Hoosiers and Our Environment

Water



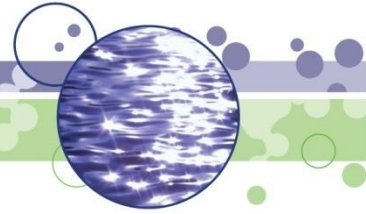
Questions?





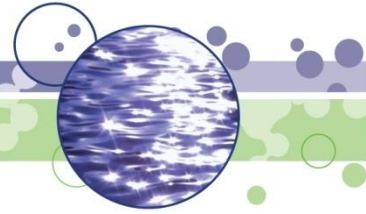
We Protect Hoosiers and Our Environment

Water



Comparing The Two Programs





Management Areas/Delineations

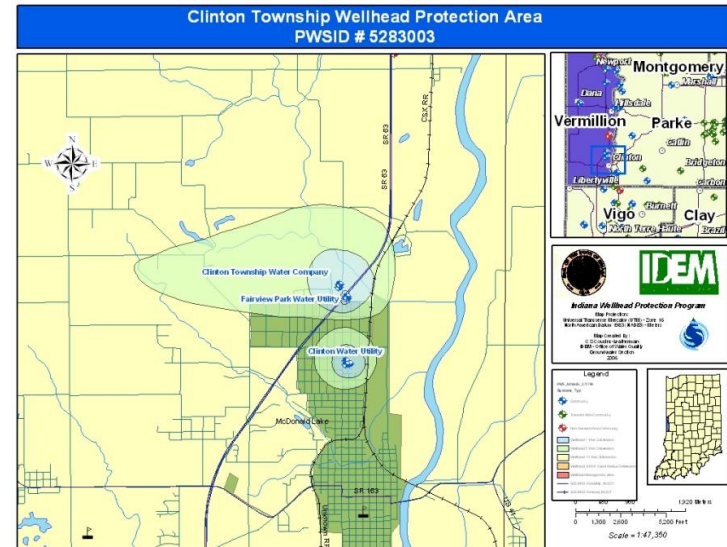
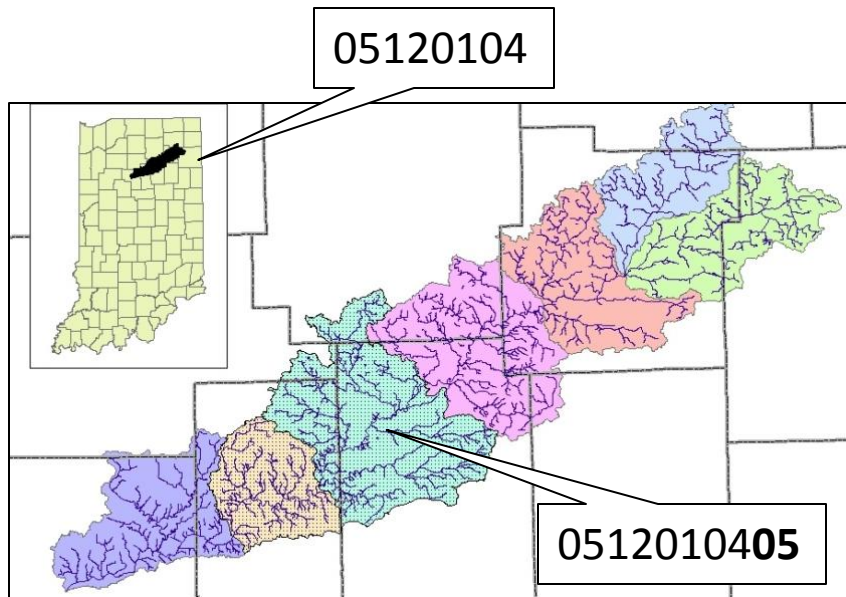
Watershed

vs

Wellhead

Based on the hydrologic unit code (HUC) system

WHPA 3,000 ft fixed radii or modeled 5-year time of travel





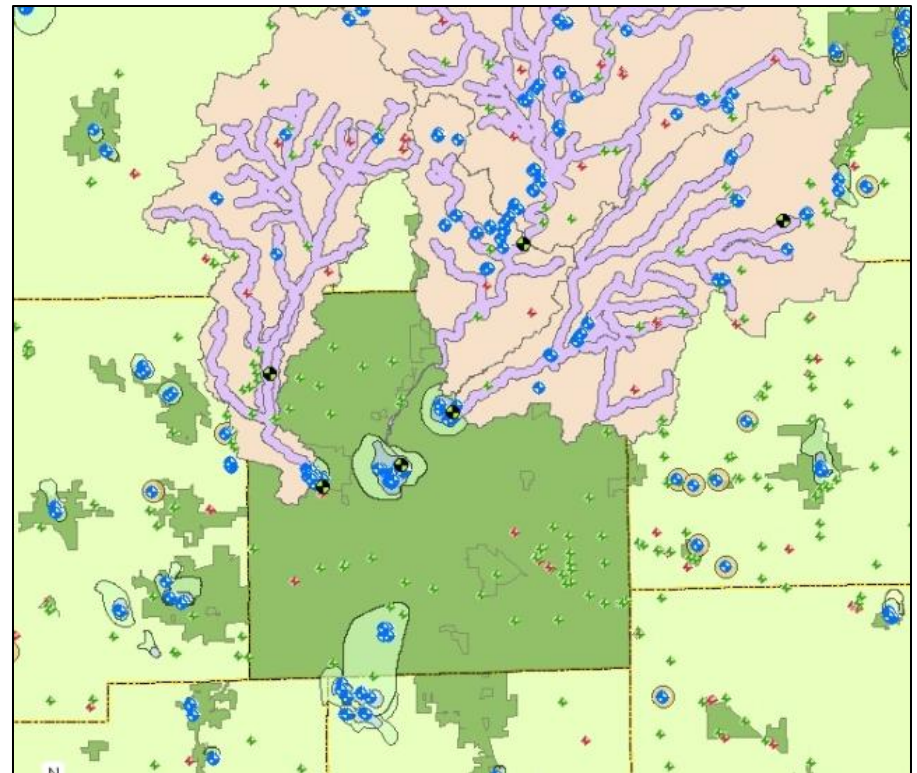
Source Water Assessments *

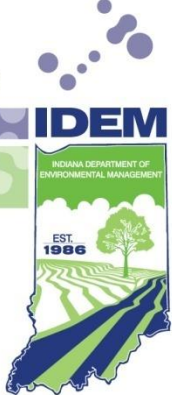
for Drinking Water Supplies Using Surface Water

Three Zones of Protection:

- Emergency Mgt Zone
- ¼ mile buffer 25 miles **upstream of intake** (~5 hr time of travel)
- The entire HUC 8 watershed

* Per 1996 Amendments to the Safe Drinking Water Act

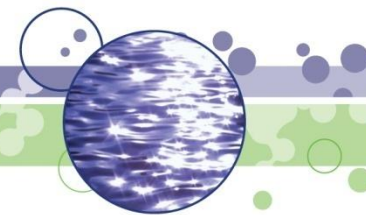




IDEM

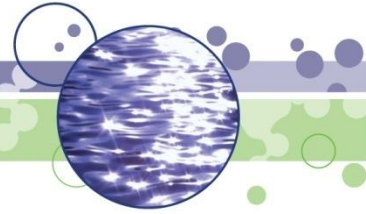
We Protect Hoosiers and Our Environment

Water



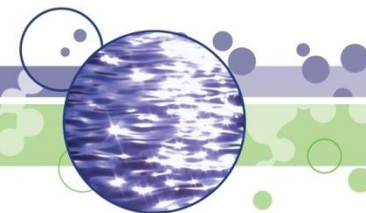
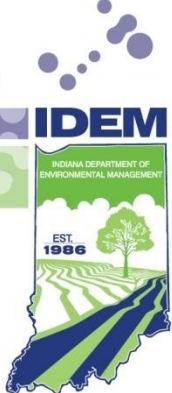
Contaminants of Concern

| Watershed | vs | Wellhead |
|--|----|---|
| <ul style="list-style-type: none">• Sediment• Nitrogen• Phosphorus• Fecal contamination• Pesticides• Oils and grease | | <ul style="list-style-type: none">• Nitrates• Bacteria & viruses• Pesticides• Heavy metals• Volatile organics• Synthetic organics• Taste & odors |



Contamination Pathways

| Watershed | vs Wellhead |
|--|---|
| <ul style="list-style-type: none"> • Storm water run-off • Snow melt /infiltration • Atmospheric deposition • Bank erosion | <ul style="list-style-type: none"> • Subsurface Releases • Uncapped wells • Percolation • Gravel pits/Storm water run-off |



Management Plan Components

Watershed

vs

Wellhead

U.S. EPA's 9 Elements

- ID causes & sources
- Estimate load reductions
- Solutions & locations
- Assistance needed
- Information/education
- Schedule
- Interim milestones
- Indicators of success
- Effectiveness monitoring

Indiana's 4 Elements of a Phase II WHPP

- Protection zone delineation
- Inventory of potential
contaminant sources
- Strategies to manage
potential sources
- Contingency plan

IDEM checklist* <http://www.watersheds.IN.gov/3429.htm>



Regulatory Approaches

Watershed

vs

Wellhead

- State: CFO/CAFO and storm water requirements
- Local: some ordinances in municipalities
 - Pet waste
 - Development standards
 - Construction inspections

- Mandatory WHP Plan
- *Several Provisions in other State Rules:*
 - Siting of Landfills
 - Spill reporting
 - Secondary Containment
 - USTS
 - Infiltration basins



Non-Regulatory Approaches

Watershed

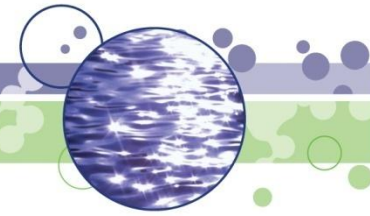
vs

Wellhead

- Watershed planning
 - Locally-led
 - 319, U.S.EPA targeted funds
- Cost-share
 - 319 grants/state funding
 - USDA Farm Bill
- Education
 - Printed materials
 - PSAs
 - Workshops, field days, etc

- Education
 - Consumer Confidence Reports
 - Road signs
 - Plant tours
 - Fairs and Ag Days
- CRP for croplands
- Hoosier Water & Groundwater Guardian Awards





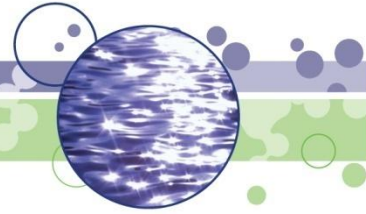
Timeframes

| Watershed | vs | Wellhead |
|--|----|---|
| <ul style="list-style-type: none">• Plans written for 5-20 years• Expectation is that nonpoint source remediated in an “expeditious” timeframe• Living documents | | <ul style="list-style-type: none">• Phase I due in 3,4, or 5 years after effective date of rules• Phase II Update due 5, 7, or 10 years after Phase I Approval• Ongoing process• Update every 5 years |



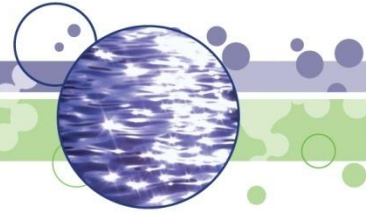
Partnerships

| Watershed | vs | Wellhead |
|---|--|----------|
| <ul style="list-style-type: none"> • Watershed groups • USDA-NRCS & FSA • SWCD • Health Departments • DNR • MS4s | <ul style="list-style-type: none"> • USDA-FSA • SWCD • Health Departments • DNR • MS4s <p>Alliance for Indiana Rural Water</p> | |
| <p>IDEM Spill Line: (888) 233-7745</p> | | |



Barriers to Integration

- Isolation of programs
 - Lack of integration of rules and regulations at both Federal and State levels
- Overall goals = clean water, but...
 - definition of “clean” is different for each
 - remediation may trump protection goals
 - strategies may contradict each other (i.e., discharge to ground or surface water?)



Barriers to Integration (cont'd)

- Restrictions on Money
 - 319 Grant \$\$ must be spent in the watershed the grant is for
 - WHPP (delineation) generally paid for by utility,
- Delineations – areas of protection differ considerably, even for surface water supplies
- Confidentiality Restrictions due to Homeland Security Act

IDEM

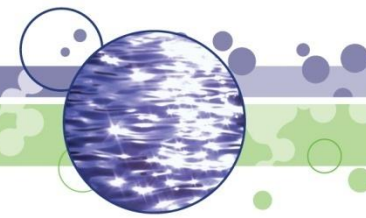
INDIANA DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT

EST.
1986



We Protect Hoosiers and Our Environment

Water



Questions?





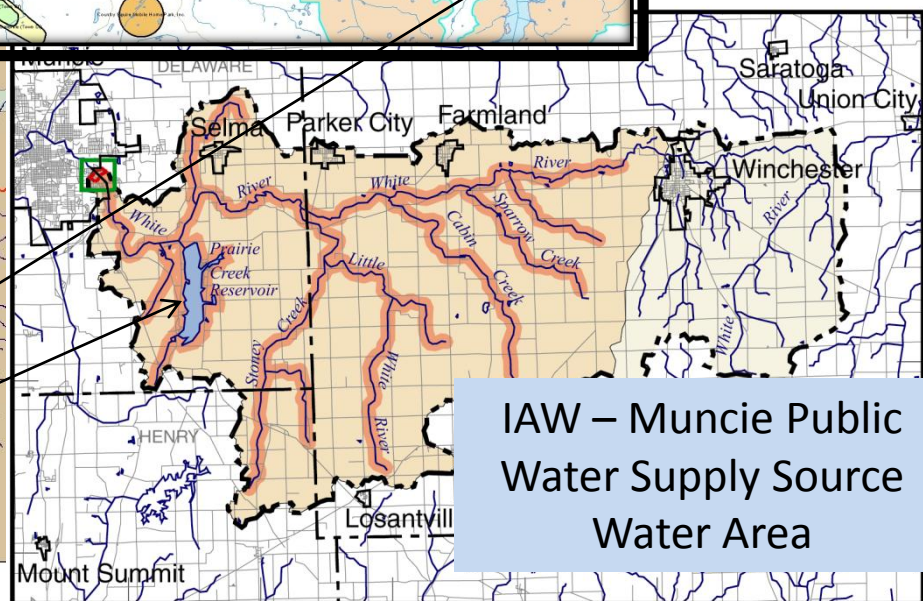
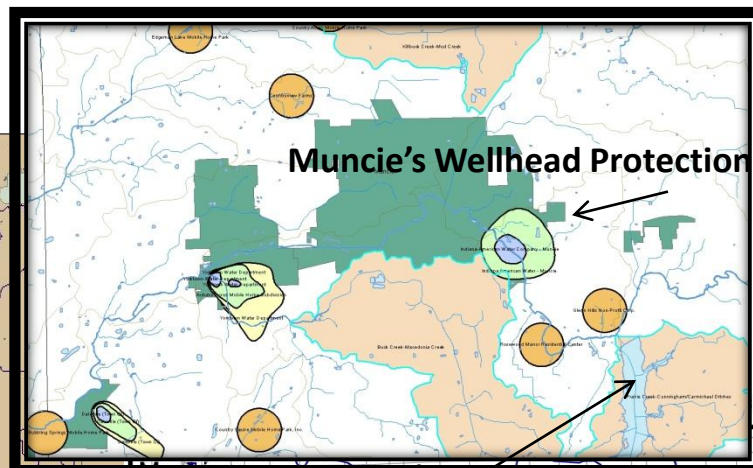
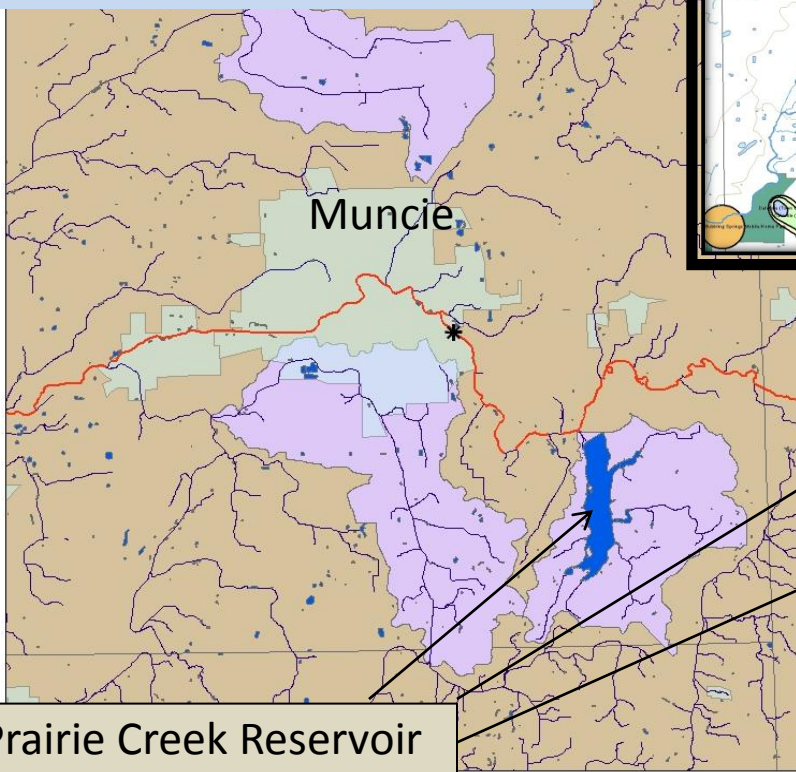
Case Examples

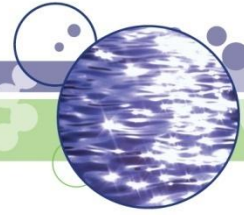
Where Watershed Management and Drinking Water/ Source Water
Protection overlap...



Case Example #1 – Delaware Co.

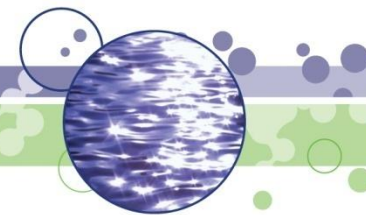
White River Watershed Delaware County



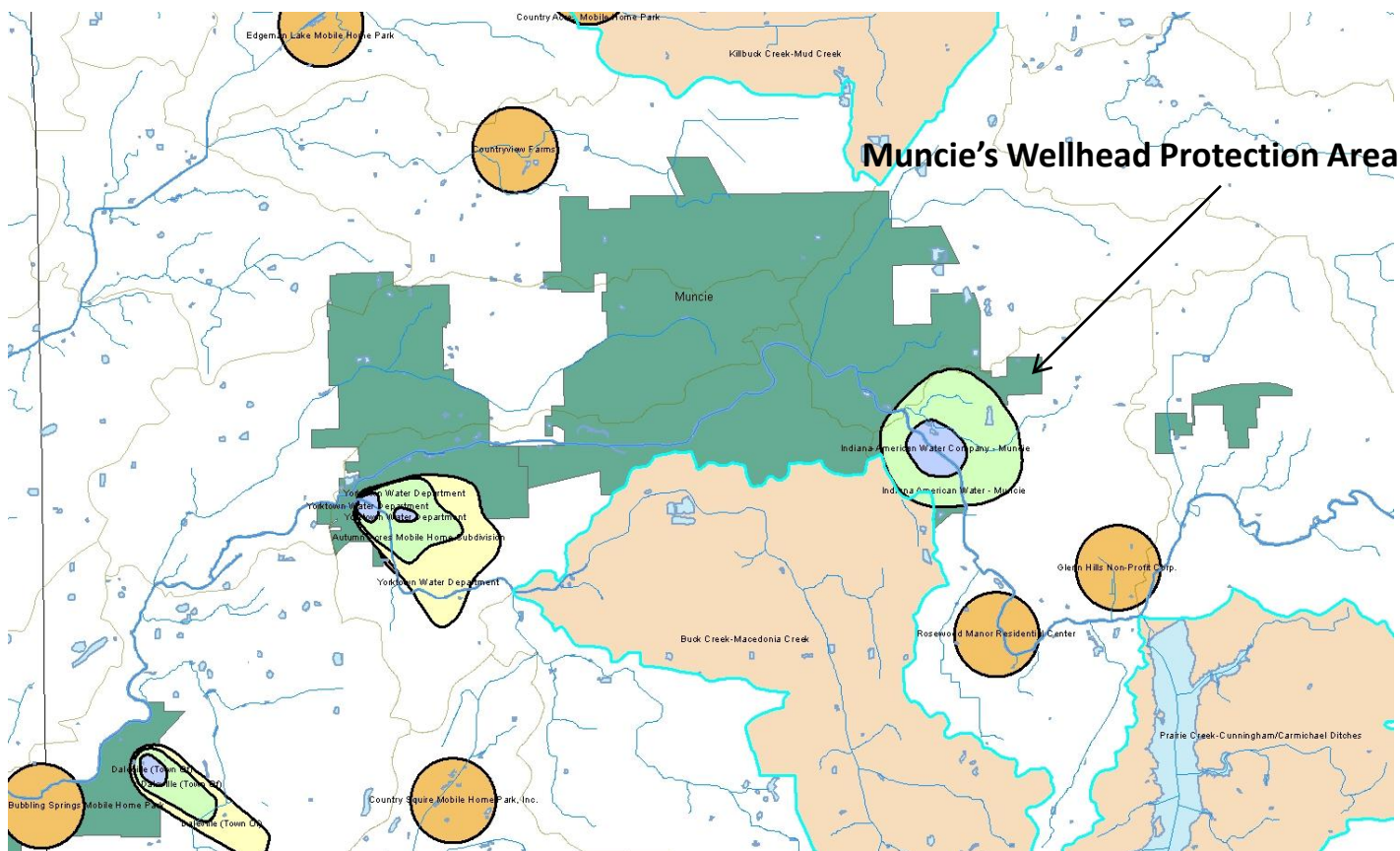


Case Example #1 – Delaware Co. (Cont'd)

- Planning Teams – Very similar
- Drinking water one of top 5 concerns
- Totally different delineations
- All Focus on voluntary land use changes

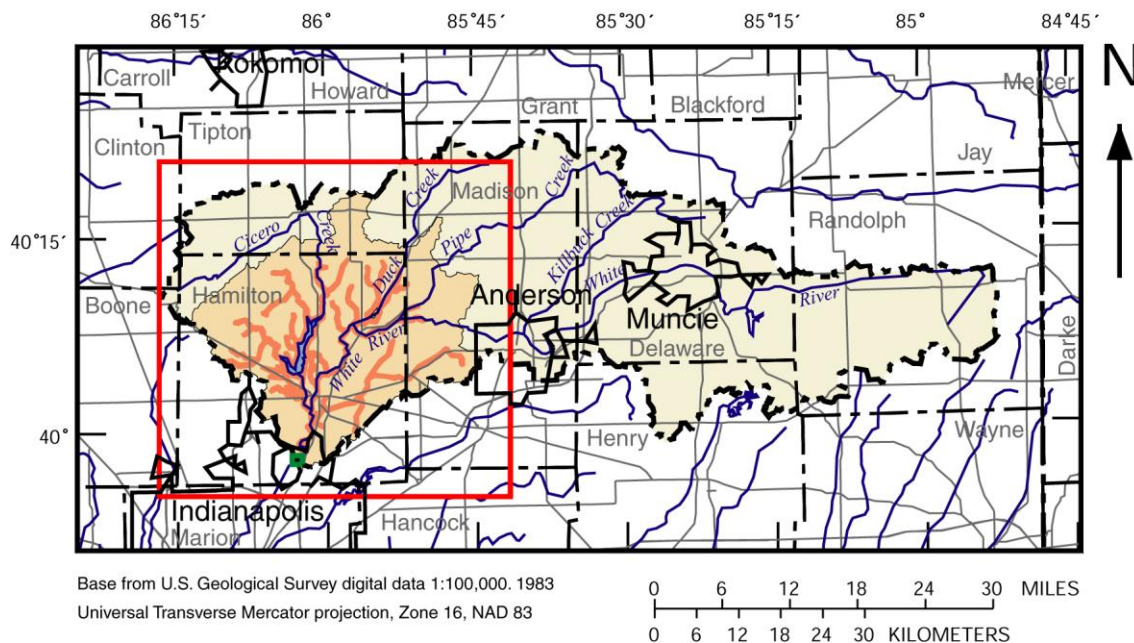


Case Example #1 – Delaware Co (Cont'd)



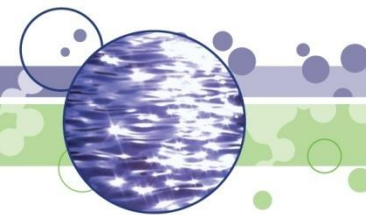


White River – Looking Downstream

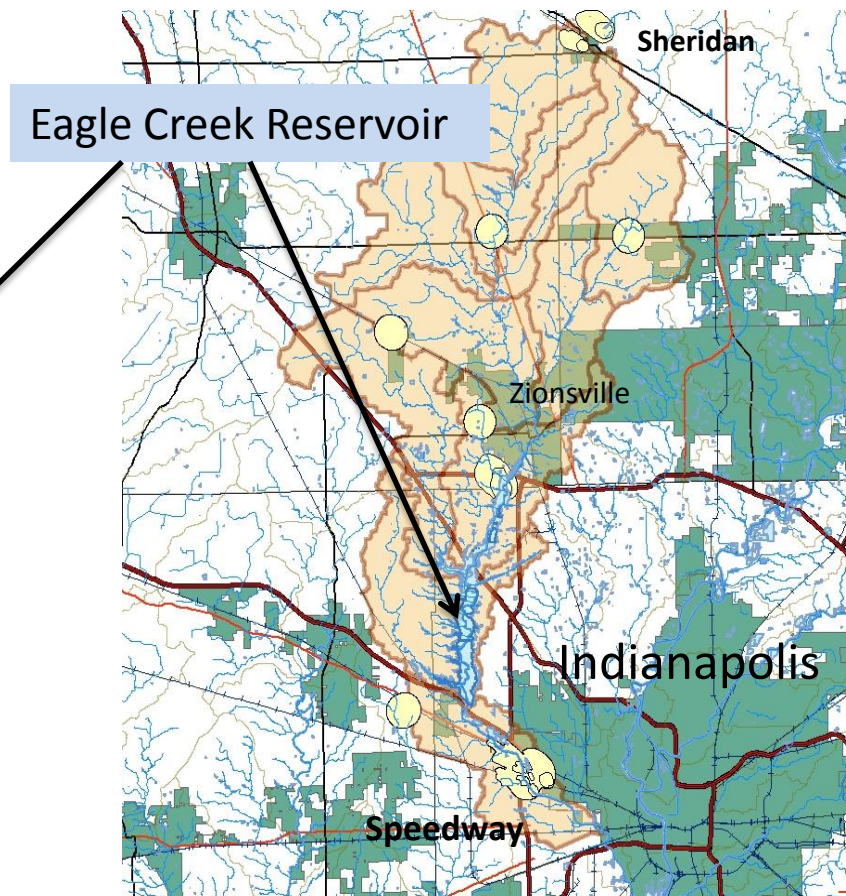
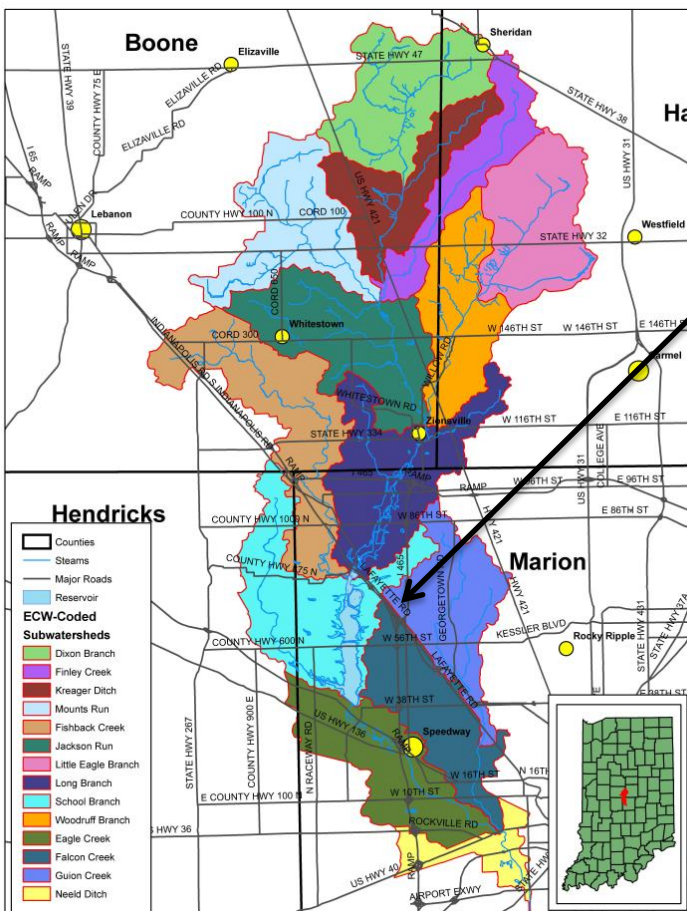


EXPLANATION

- Zone 1
- Zone 2, excluding Zone 1
- Zone 3, excluding Zones 1 and 2
- Open water
- Boundary for figures 2, and 4 through 7
- Boundary for detailed map of Emergency Management Zone shown in figure 3
- Boundary of source area



Case Example #2 Eagle Creek Watershed



IDEM

We Protect Hoosiers and Our Environment

Water



Eagle Creek Watershed - Where nature
and the city meet.



VEOLIA
WATER



DNR





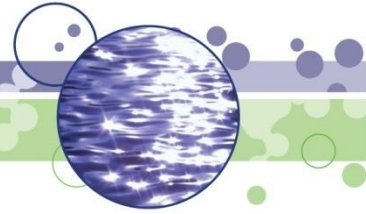
We Protect Hoosiers and Our Environment

Water

Education and Outreach

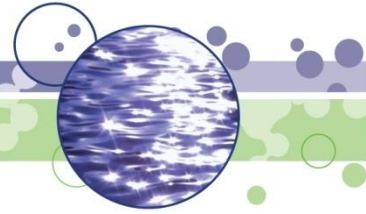


<http://www.eaglecreekwatershed.org/index.html>



General Recommendations for Future Joint Ventures

- **Partner** with other Watersheds and Public Water Supplies
 - Integrate information from **all** plans – water quality data, intakes, local issues, investigations
 - **Map all** the areas of concerns
 - **Coordinate** with partners on education efforts
- Leverage monies from related programs to make it an **ongoing process**
- Think upstream, **downstream** and **underneath!**



Specific Recommendations for Watershed Groups

- Ask for and share “raw”
water monitoring data w/ PWS
- Ask for and include PWS
treatment methods and costs
- Expand monitoring to include nitrate nitrogen
- Ask for and contribute to PWS Consumer’s
Confidence Report

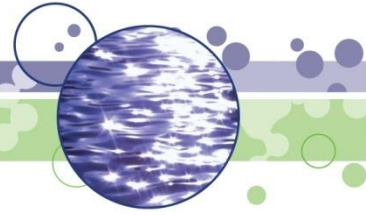




Specific Recommendations for Public Water Supplies

- Review and comment on all nearby Watershed Plans
- Be involved, Be public friendly
- Volunteer to educate on drinking water
- Leverage monies, such as State Revolving Fund for Source Water Protection





“Humans are part of the environment. Our society is not, and cannot, be isolated from the environment in which we live.”

Canada Ministry on the Environment Report on Integrated Watershed Management

Questions?