Identifying Critical Areas in Your Watershed

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Critical Area: Where watershed efforts are most likely to result in the greatest impact on water quality.

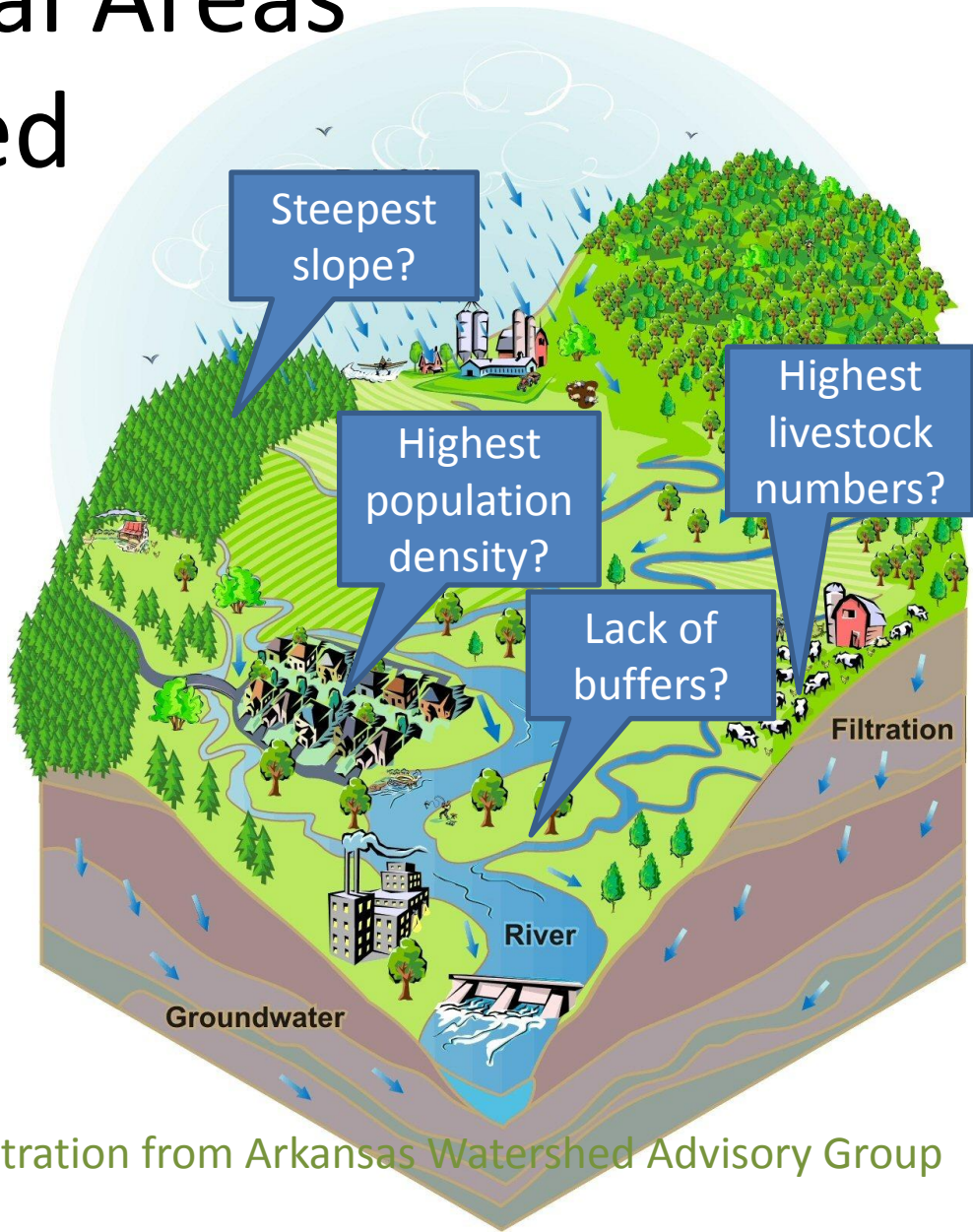
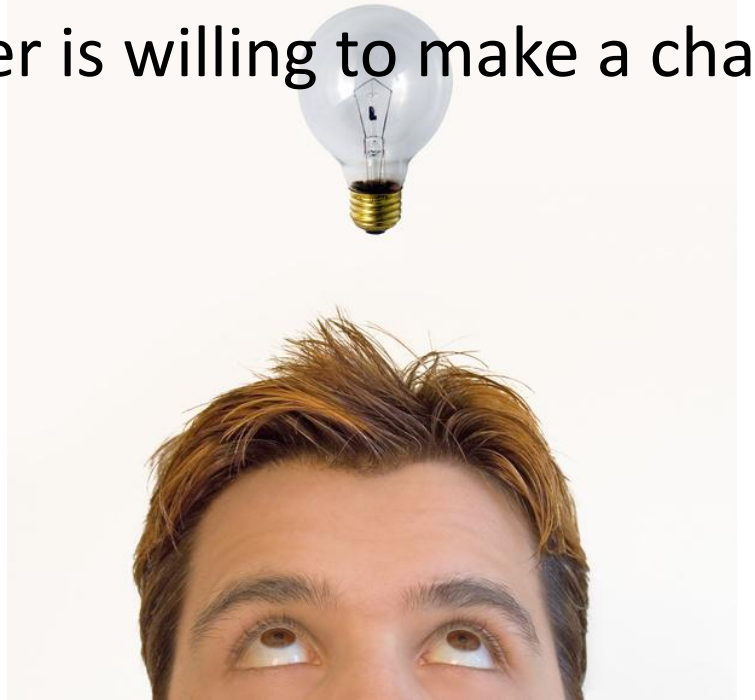


Illustration from Arkansas Watershed Advisory Group

What characteristics cause watershed efforts to have the greatest impact on water quality?

- A source of pollution is causing a real problem
- We can identify the location it comes from
- A possible solution exists
- Land owner is willing to make a change



- This location or source is the **biggest** problem

So what are some options for identifying critical areas?

One source of ideas:

IDEM's 2009 Checklist

Critical Areas Identification - From IDEM 2009

"Within a WMP and following the above guidelines, critical areas should be identified as one or a combination of the following descriptions:

1. 12 digit HUCs or smaller geographic areas where a particular pollutant needs to be addressed to meet the water quality goals of the WMP.
2. Specific region within a 12 digit HUC or smaller geographic area where a particular source(s) is contributing a pollutant of concern and needs to be addressed to meet the water quality goals of the WMP.
3. Specific source(s), anywhere in the project area, that are contributing a pollutant of concern."

Critical Areas Identification Options From 2009 IDEM Checklist

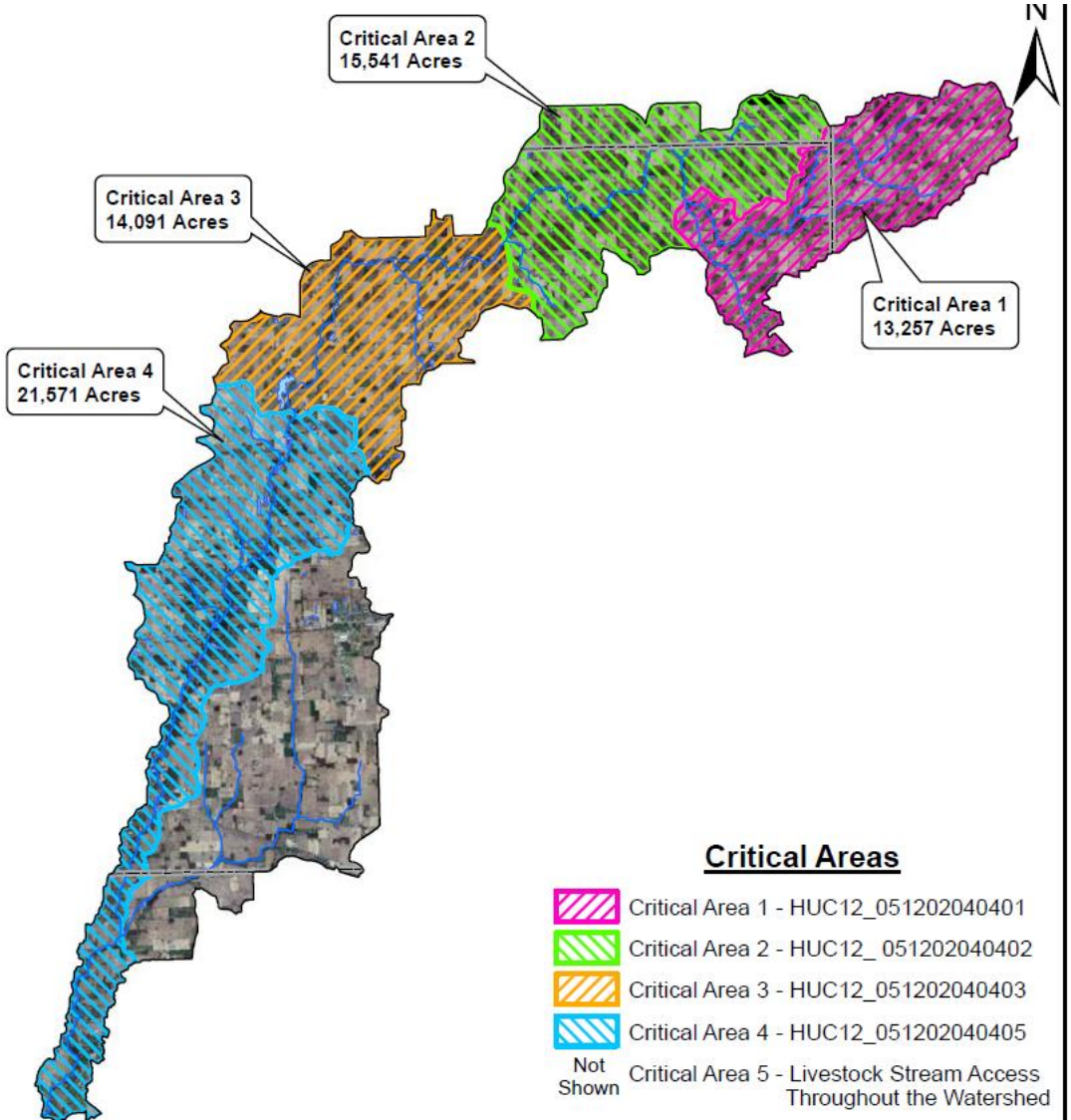
1	2	3
Defined by geographic area (usually HUCs or subwatersheds)	Combination	Defined by Source
Example: Mudbug Watershed	Example: Livestock access to streams in Mudbug Watershed	Example: Locations where livestock have access to streams

1. Defined by geographic area (usually HUCs or subwatersheds)

Example:

4 of the 5

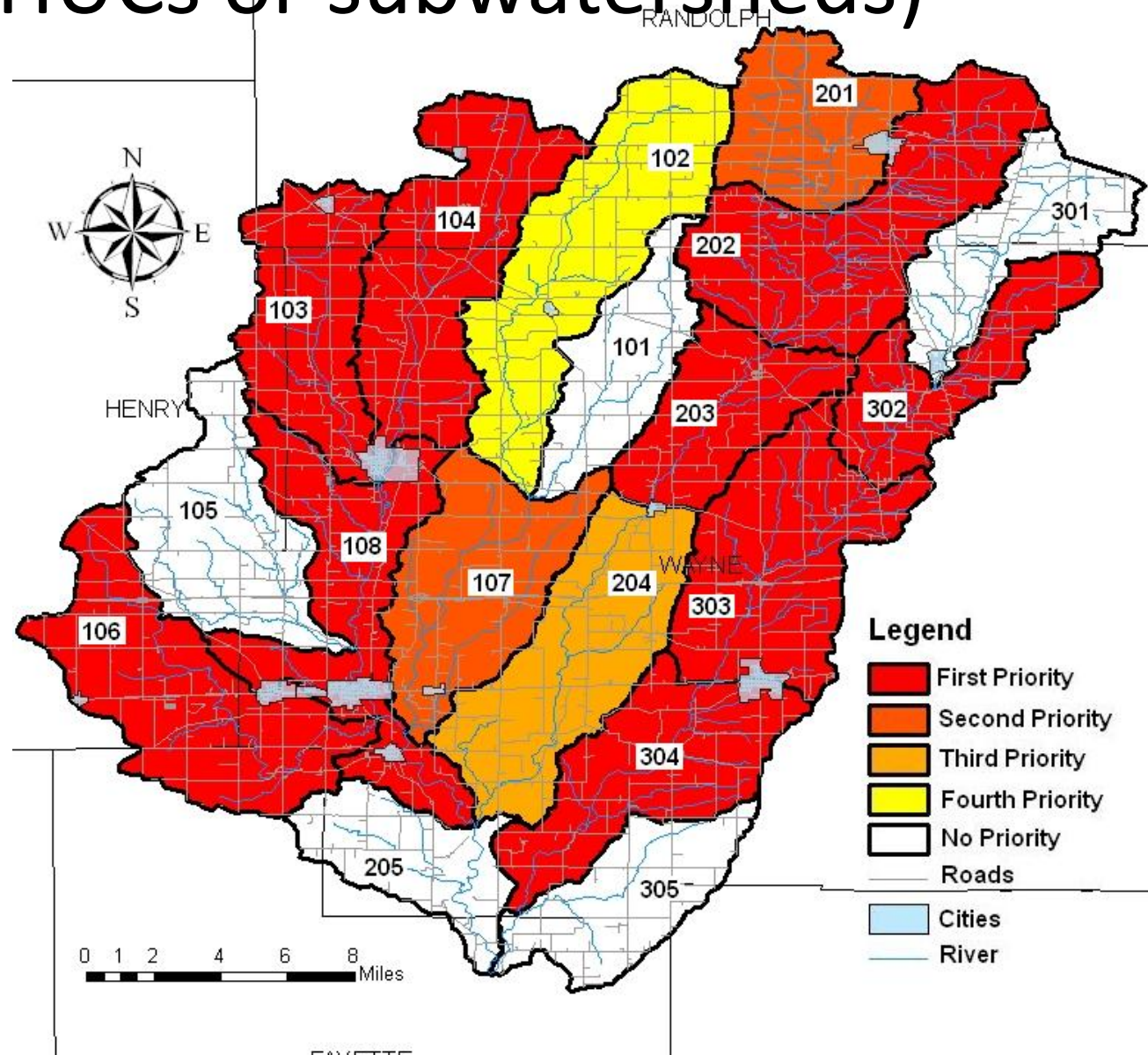
12-digit HUCs in the watershed



1. Defined by geographic area (usually HUCs or subwatersheds)

Example:

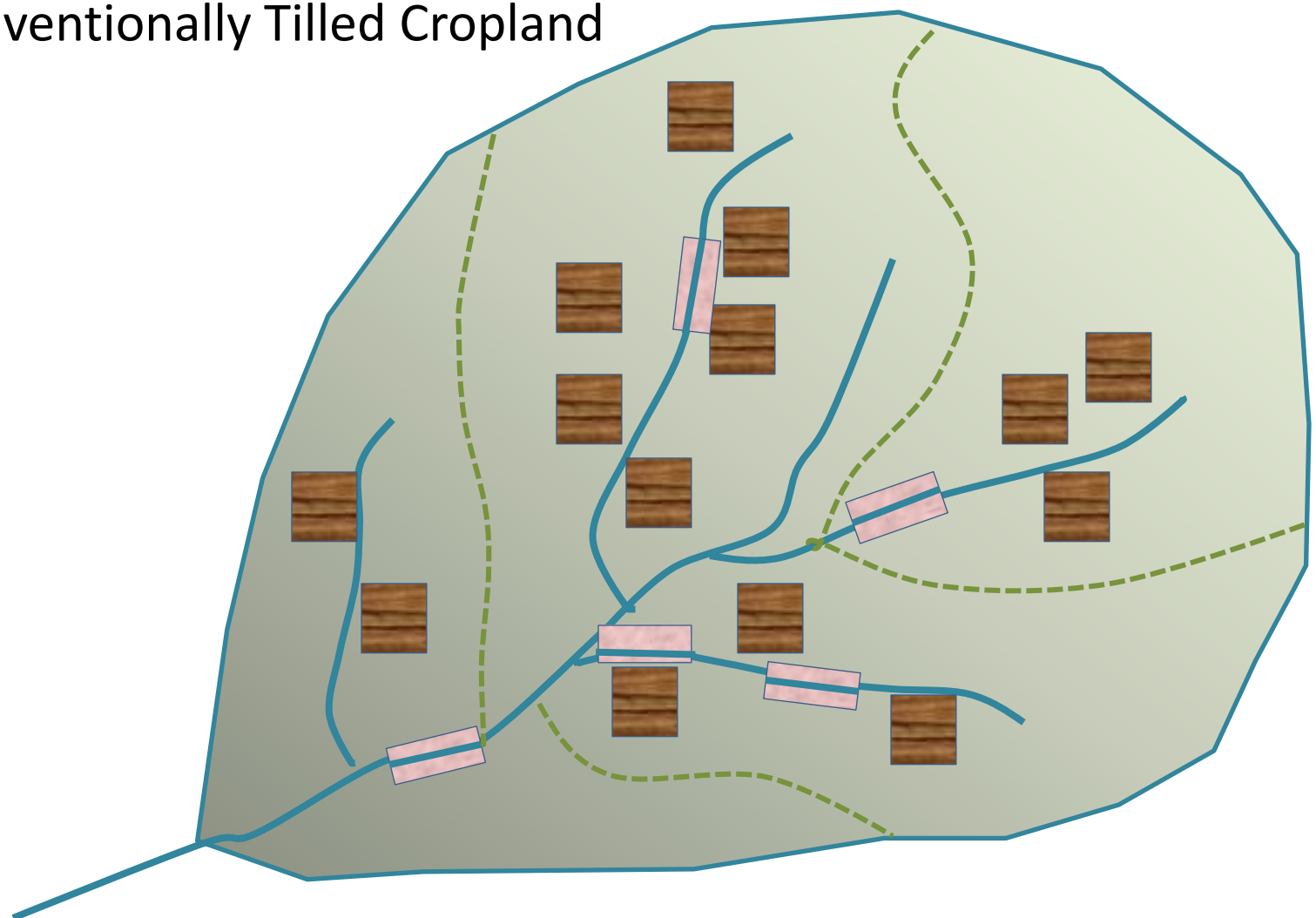
Five priority levels of HUCs defined in a large watershed

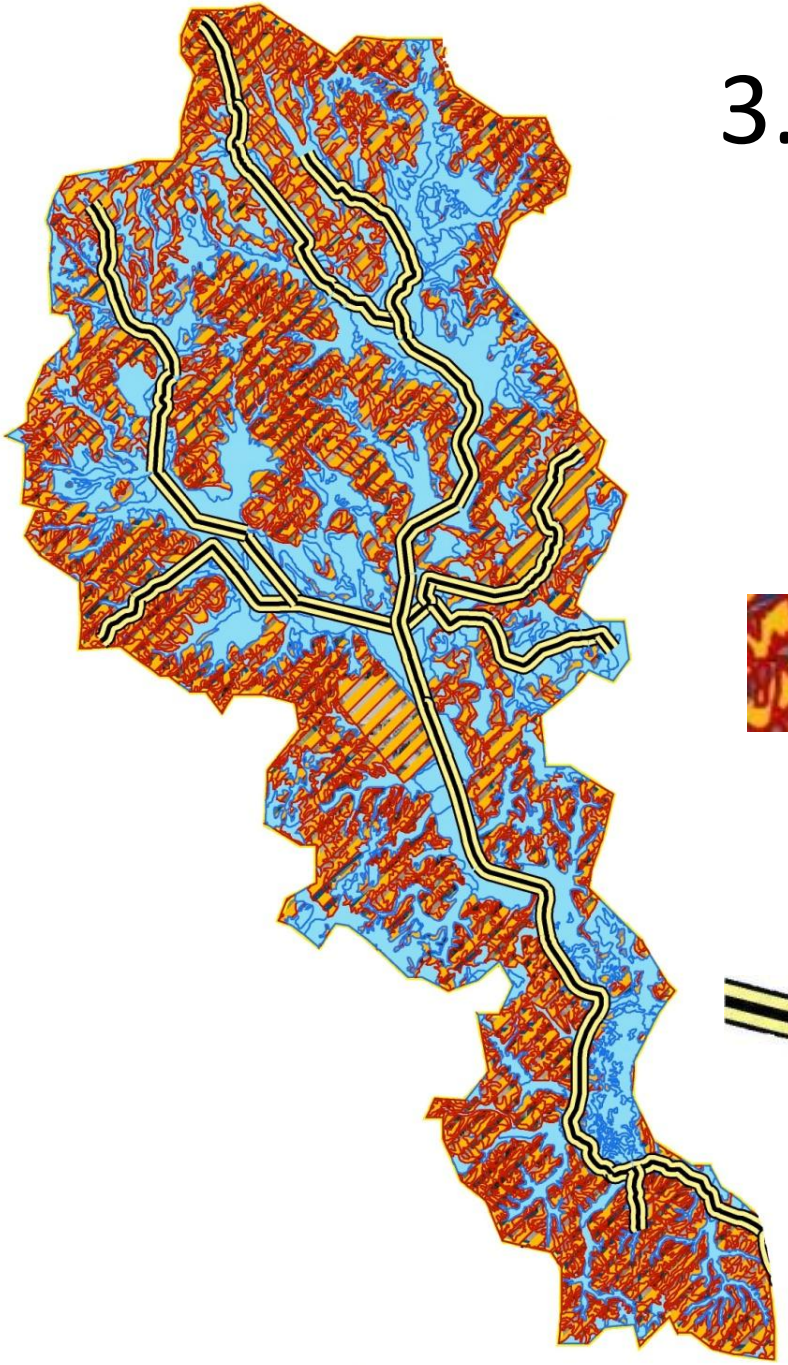


Where are the critical areas?

Unbuffered Streambank

Conventionally Tilled Cropland





3. Defined by source of pollution to address

Highly erodible areas contributing to the high levels of suspended sediment and nitrate found throughout the watershed.

Riparian areas in need of buffers and filter strips to provide wildlife habitat and water quality improvements.

Deciding on a process in your watershed

Critical Areas Identification Options

1

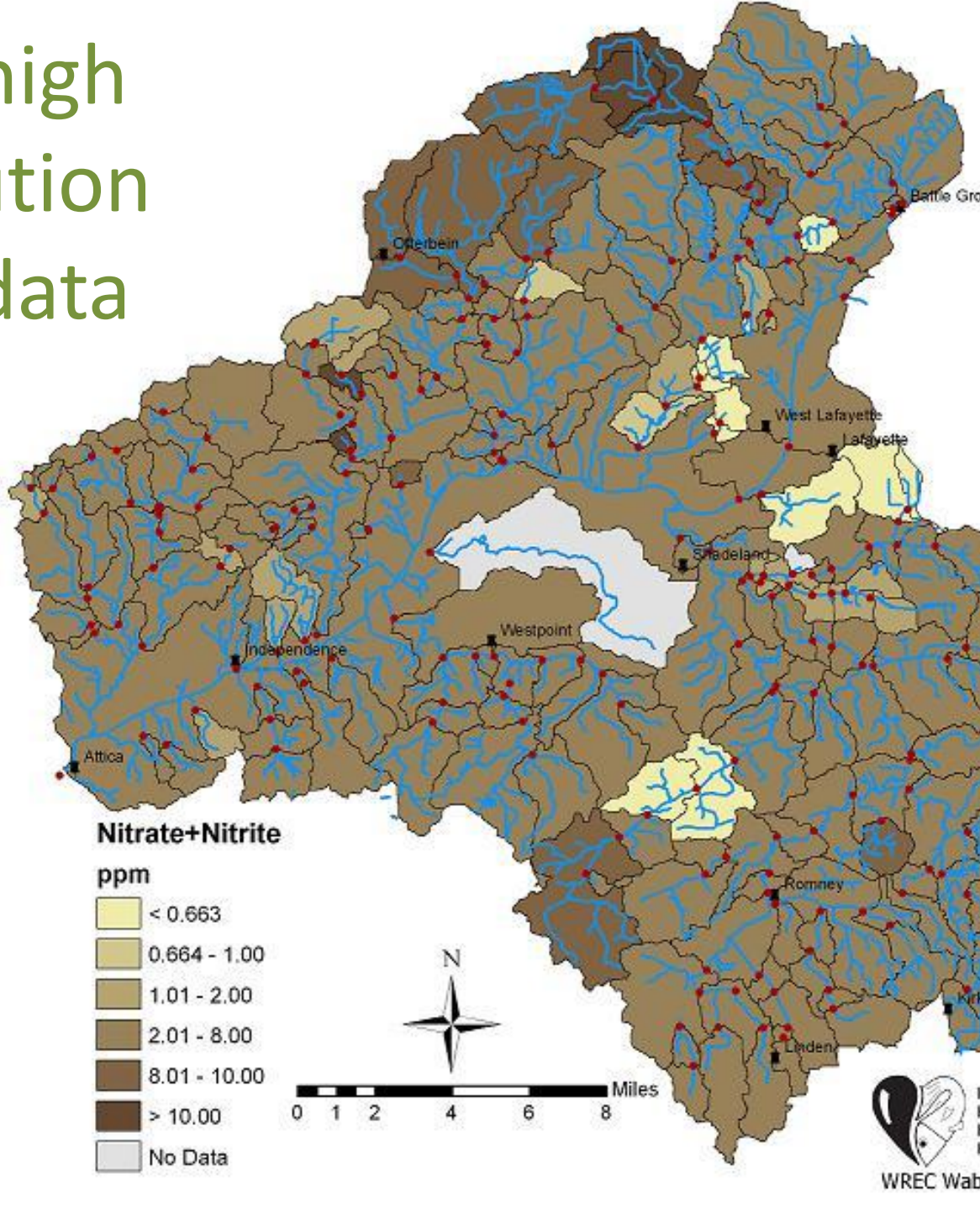
Defined by geographic area (usually HUC or subwatershed)

Makes sense if you

- Have monitoring data that differentiates locations
  - high spatial resolution
  - shows one watershed with higher yields (concentration or load/area)
- Have a very homogenous land use

Example of high spatial resolution monitoring data

- Define geographic areas if you have monitoring data that can differentiate locations



Critical Areas Identification Options

Makes sense if

- you know that there are particular behaviors that people are willing to change
- "the time is right" for grants to fund a particular solution to a source
- your monitoring data is sparse or concentrations in all areas are similar

3

Defined by source of pollution to address

Examples:

Cropped fields without cover crops

Lawns that receive P fertilizer

One idea for selecting sources

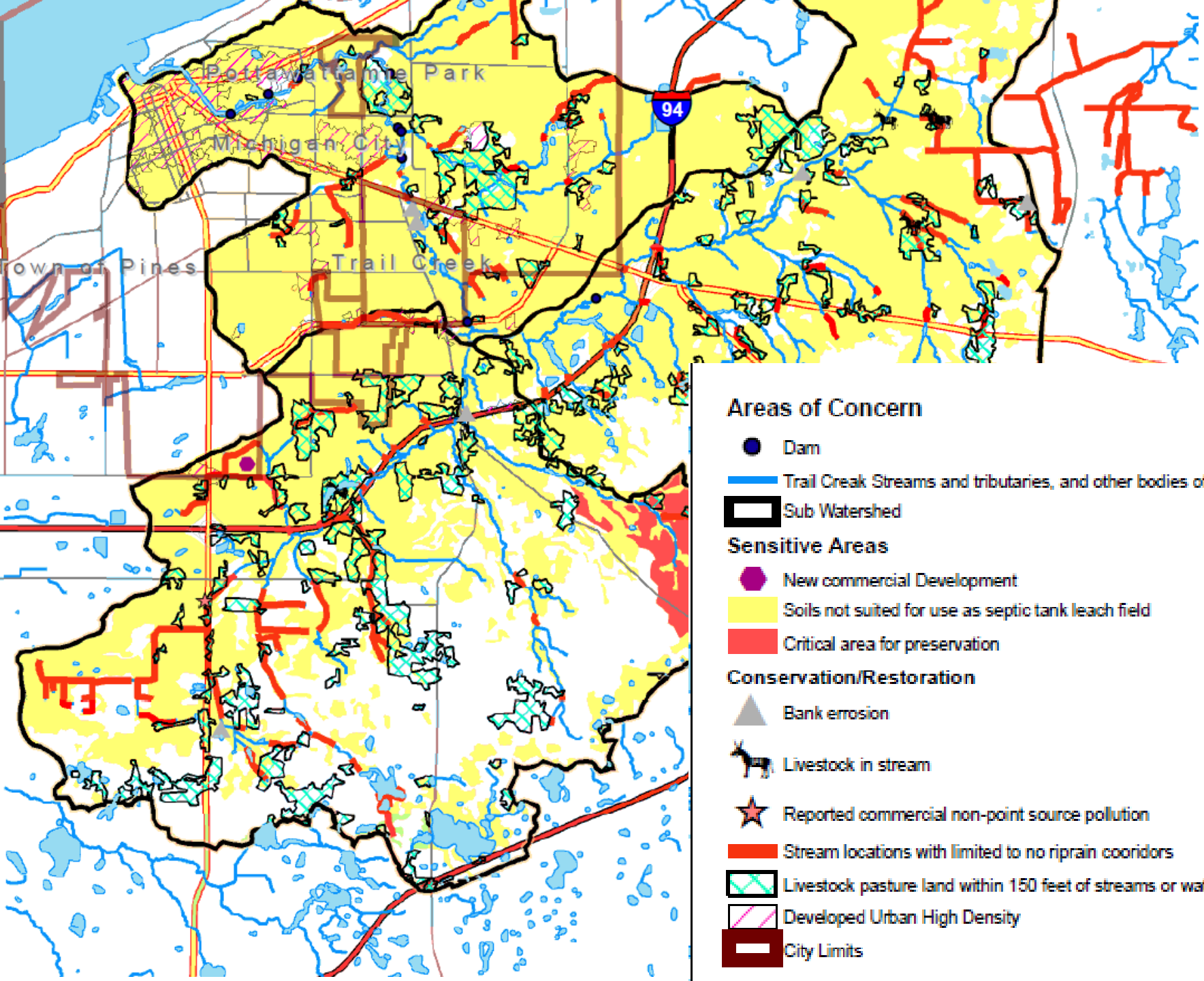
Nitrogen – Sources	Real prob-lem?	Can we identify locations?	Can we address source?	Land owner willing?
Drained cropland	Y	maybe	Y	
Manure land application areas	Y	No	Y	
Wastewater treatment plants	maybe	Y	No	
Failing septic systems	maybe	No	No	
Pet waste	maybe	Y	Y	

The same process can be used for all pollutants of concern

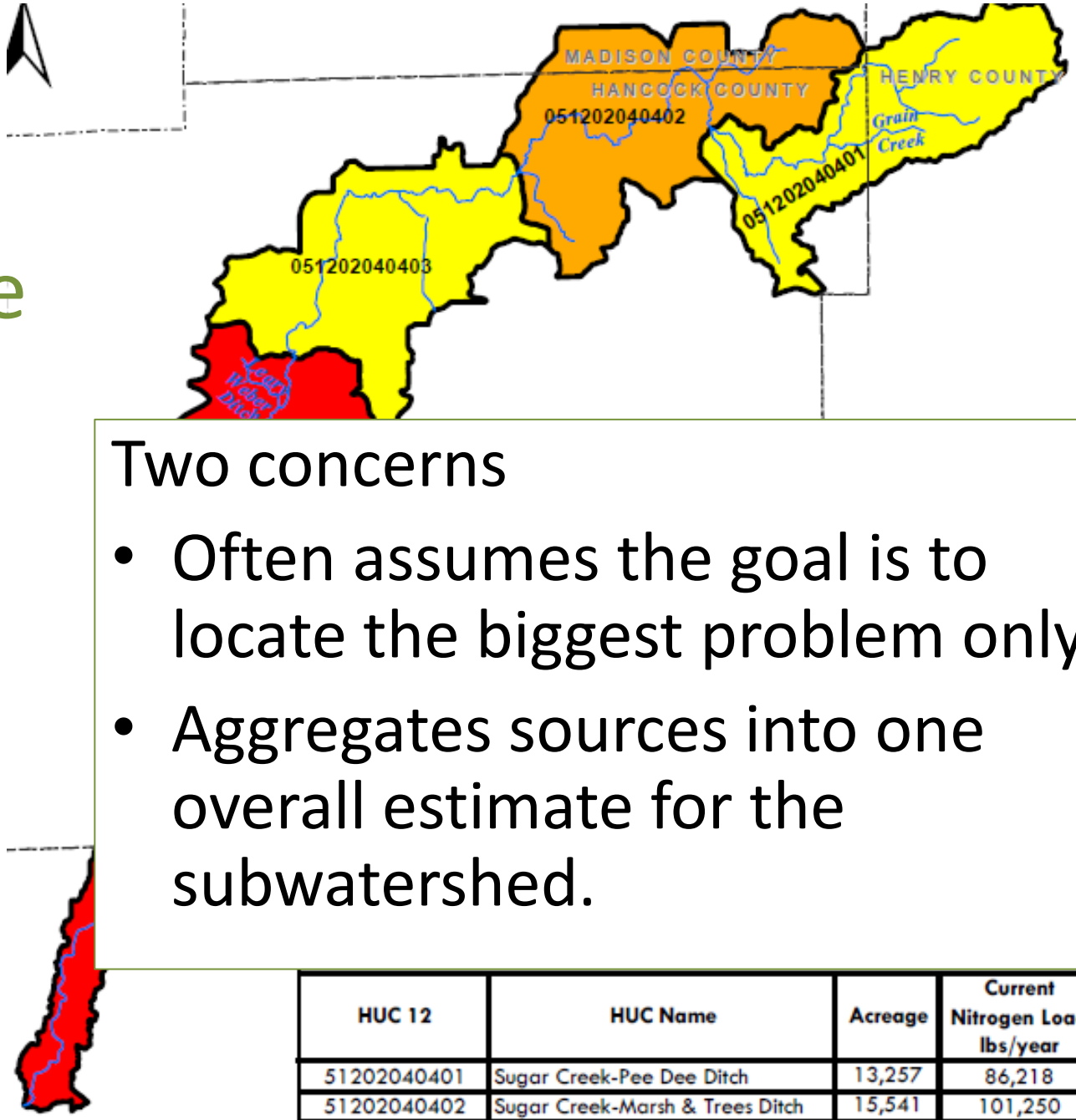
E. coli – Sources	Real prob-lem?	Can we identify locations?	Can we address source?	Land owner willing?
Livestock access to stream	Y	Y	Y	
Manure land application areas	Y	No	Y	
Manure storage (leaks, spills)	maybe	No	No	
Failing septic systems	maybe	maybe	maybe	
Dense wildlife areas	maybe	Y	maybe	

The same process can be used for all pollutants of concern

Sediment– Sources	Real prob-lem?	Can we identify locations?	Can we address source?	Land owner willing?
Riparian areas lacking buffers				
Erosion in cropped fields (conventional tillage)				
Streambank and bed erosion				
Livestock access to streams				
Altered hydrology (ditching and draining)				


Pottawattamie Park
Michigan City
Trail Creek
Town of Pines
94
Areas of Concern
Dam
Trail Creak Streams and tributaries, and other bodies of water
Sub Watershed
Sensitive Areas
New commercial Development
Soils not suited for use as septic tank leach field
Critical area for preservation
Conservation/Restoration
Bank errosion
Livestock in stream
Reported commercial non-point source pollution
Stream locations with limited to no riprain cooridors
Livestock pasture land within 150 feet of streams or waterbodies
Developed Urban High Density
City Limits

Does modeling help define critical areas?



Two concerns

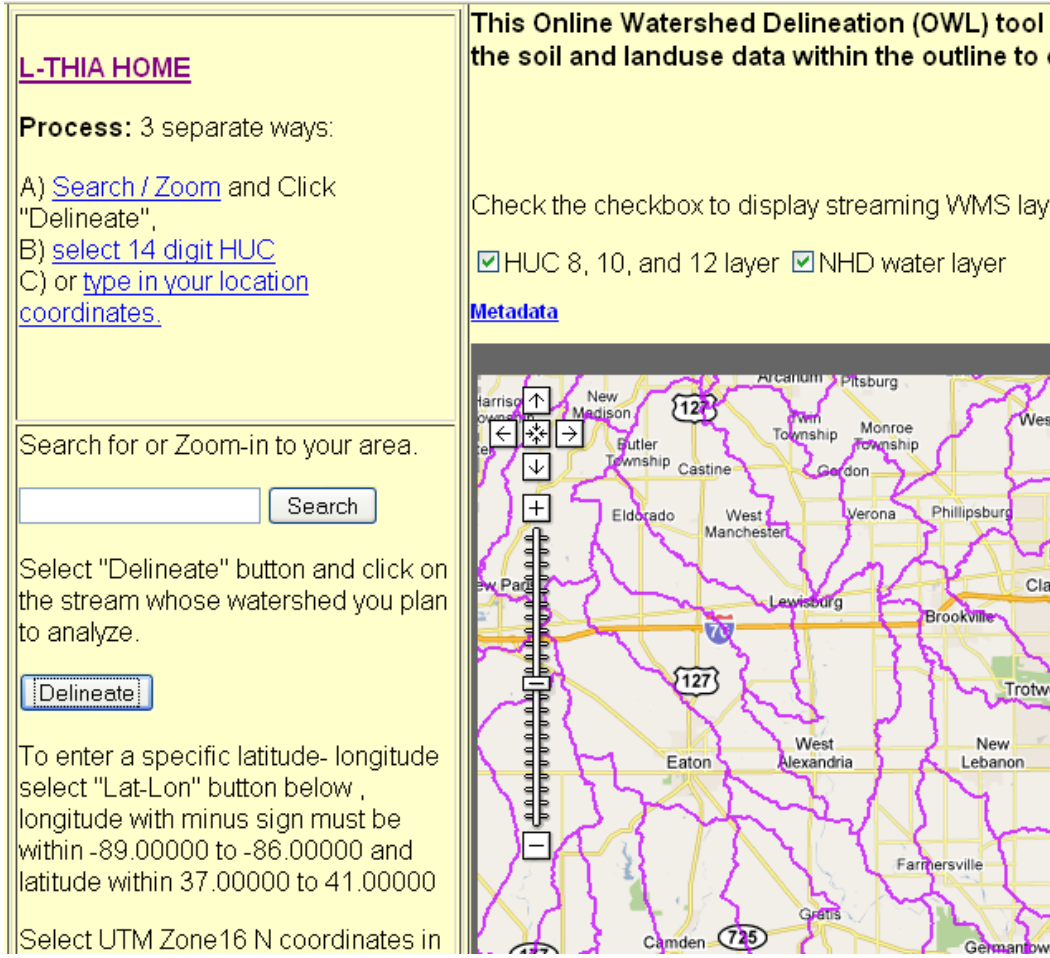
- Often assumes the goal is to locate the biggest problem only
- Aggregates sources into one overall estimate for the subwatershed.

HUC 12	HUC Name	Acreage	Current Nitrogen Load lbs/year
51202040401	Sugar Creek-Pee Dee Ditch	13,257	86,218
51202040402	Sugar Creek-Marsh & Trees Ditch	15,541	101,250
51202040403	Sugar Creek-Barrett Ditch	14,091	86,718

Models are useful, but perhaps not for critical area definition

Useful for

- Load estimation
- Load reduction estimation
- If we are confident in load reduction, can use models to see where load **reduction** is greatest



Identifying Critical Areas in Your Watershed

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- **Jane Frankenberger** – Overview of options
- **Kris Vance** – Experiences in several watersheds, Options and reflections
- **Rob Miller** – One specific experience in Central Muscatatuck Watershed

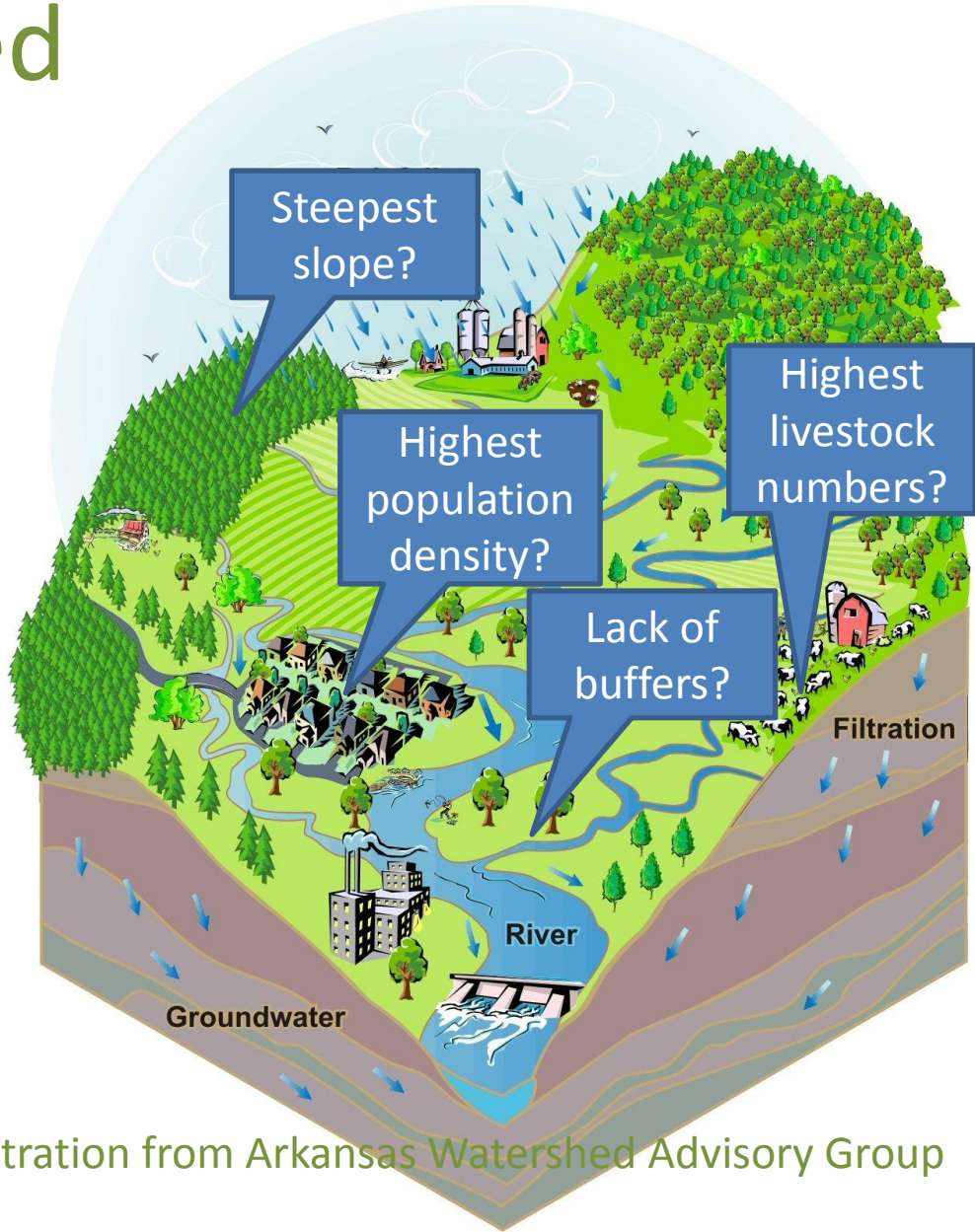
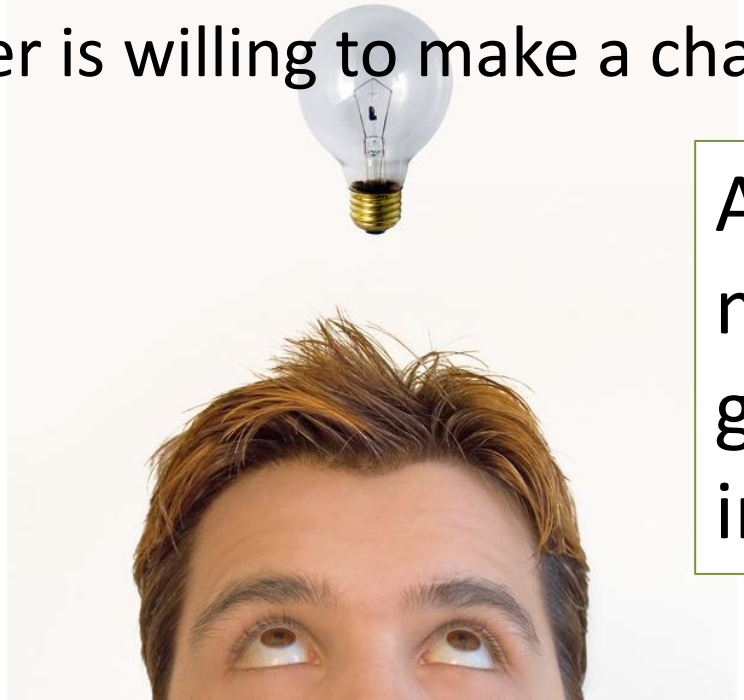


Illustration from Arkansas Watershed Advisory Group

Summary: Let's think about characteristics of critical areas

- A source of pollution is causing a real problem
- We can identify the location it comes from
- A possible solution exists
- Land owner is willing to make a change



Always keep in mind that the goal is to improve implementation