


2020 Indiana Water Summit

What's Polluting Our Waters & How are We Managing?

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Fresh water is scarce

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Global Water Supply

3% fresh water

97% salt water

source: UNESCO

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How Rare is Fresh Surface Water?

- If you can imagine that all of the water on earth was **50 gallons**,



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You could dip all of the fresh lake water in the barrel out with **one tablespoon**



- And all of the fresh *river* water could
- found in **a drop** on the handle of that
- tablespoon!

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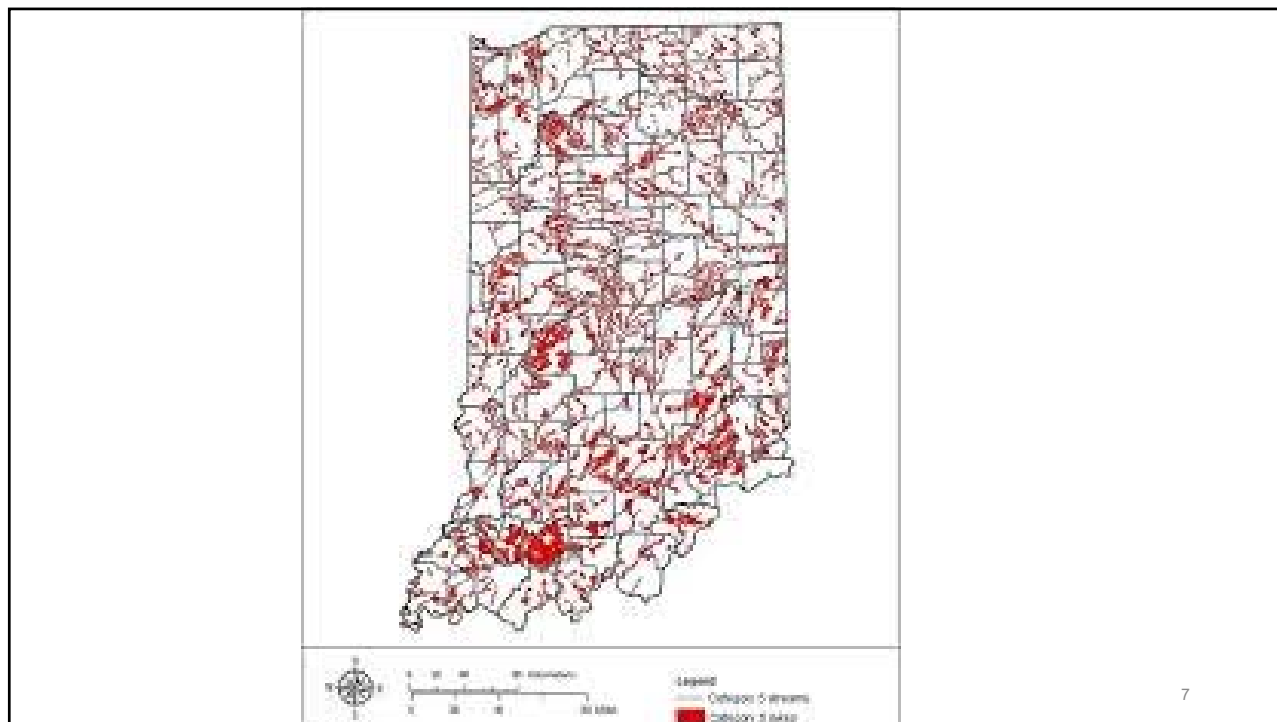
Indiana Fresh Water is an Exceptional Resource

- Temperate, well distributed river and stream resources with 40+ inches of rain per year offers an unusually attractive resource for business and –we often forget-- holds extraordinary potential for quality of life and the recreational opportunities that keep talent in Indiana and bring talent here.
- BUT...

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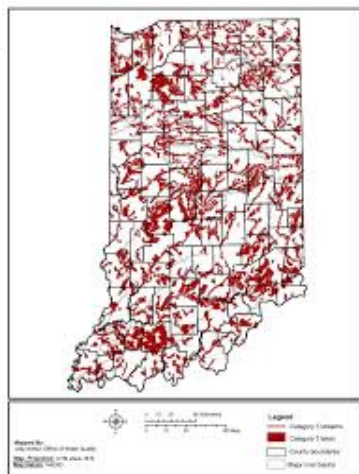
Most Indiana River and Stream Miles are Impaired. That means they don't meet the quality standards Indiana has set for them. They are polluted.

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Sources of Stream Impairment



Source	Stream or river miles
Non-point animal feeding operations	9,746
Direct Piped Sewage discharge	6,976
Livestock grazing/feeding operations	6,207
Municipal Treatment plants	3,139
Permitted Small discharge/package plants	2,858
Crop Production- sub-surface drainage	2,702
Animal Agriculture-unspecified	2,049
Concentrated Animal Feeding Operations	1,942
Combined Sewer Overflows	1,570
Loss of Riparian habitat	1,368
Failing septic systems	1,228
Unspecified Urban Stormwater	1,053

*Note: Waterfowl (3,836 miles) and other wildlife (3,815 miles) are also cited. There are management strategies that might help for sources such as resident Canada geese, but in this report, because detailed information about wildlife as a source of water pollution is unavailable, wildlife sources are treated as unmanageable.

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What do the figures mean?

- To put figures in context, think of the **30,000+ stream miles** Indiana reported until 2012. Thus, 7000+ miles of streams and rivers **impaired by direct piping of sewage is about 20%** on Indiana stream miles.
- *Since 2012, better resolution in data sources has resulted in IDEM reporting that Indiana features **60,000+ stream miles**. Most or all of the additions are smaller streams than were previously known. Our best guess is that the percentage of impaired stream miles will not drastically change; the newly recognized stream miles are likely to be affected by most of the sources of pollution that affect larger streams, especially those cited in the previous slide.

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THUS...much of our flowing water and lake water is polluted, diminishing its value as an attraction for people and businesses, and threatening public health.

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IN fact, more than 60% of Indiana's assessed stream miles still classified as impaired and "unfit for human health and wildlife."

Largest known manageable sources of stream impairment:

Non-point Livestock feeding– not including CAFOs – 10,000 stream miles

Direct piping of untreated sewage (not CSO's or failed septic) 7,000 miles

Municipal treatment plants – 3000 miles

Permitted small discharge plants– 3000 miles

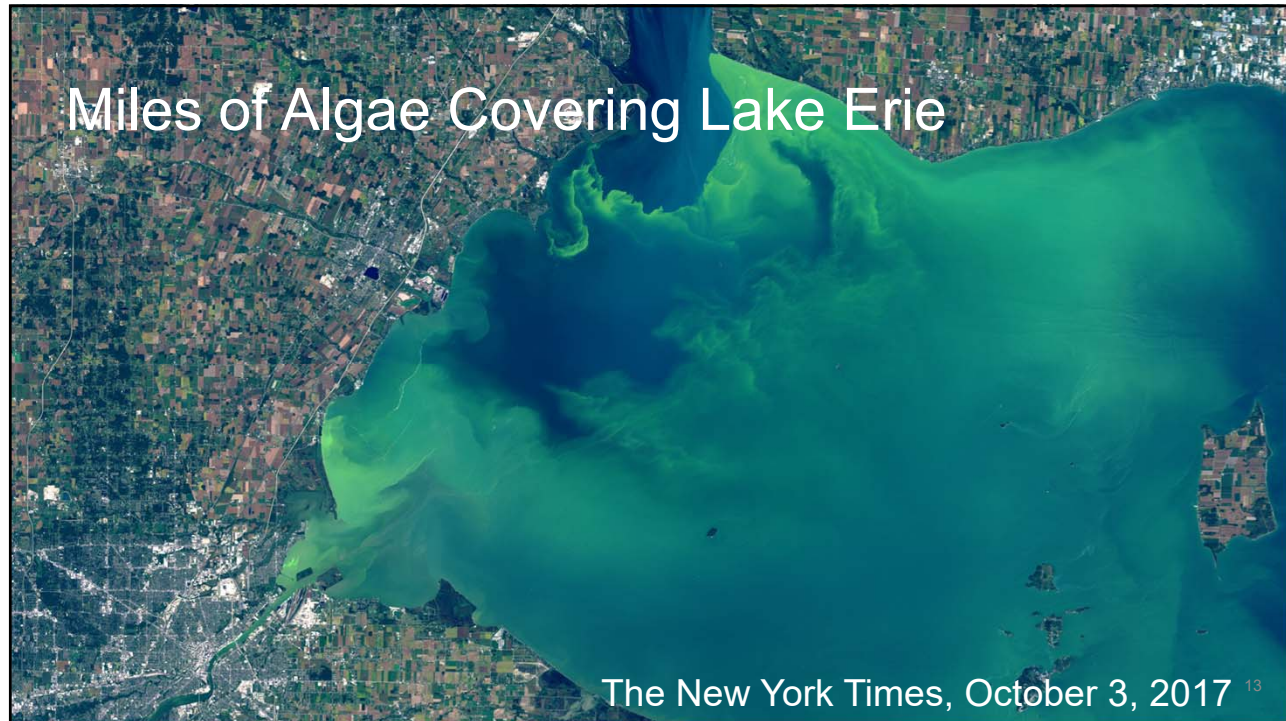
Agricultural drainage –tiling/ditches– 3000 miles

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Many Indiana Lakes Are Impaired

- Including Lake Michigan Shore for *E. Coli*, and –maybe not as often cited as should be– for industrial pollution
- Other Lakes for Toxic and potentially Toxic algal bloom by-products
- Recent estimate is the **95% of Indiana lake acreage** is impaired: mercury, PCBs, excess nutrients

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A LITTLE MORE ABOUT ON-SITE WASTEWATER TREATMENT

- Some facts and figures:

- *Around one-third of Indiana's population utilize on-site systems for their waste disposal.

- *Studies estimate that upwards of one-half of existing soil absorption systems in the United States did not function adequately. (EPA, The Water Monitor, 1996). Jacquez et al. (1991)

- *Indiana County environmental sanitarians asked about on-site system failure rate gave a wide variety of answers, with some estimates reaching **70%**.

- *Components of potential public health concern in wastewater are biodegradable organic carbon, total suspended solids, nitrogen as ammonia (NH₃) and nitrate (NO₃), phosphate (PO₄) or phosphorus (P) concentrations, fecal coliforms, and viruses.

An Evaluation of On-Site Technology in Indiana

Purdue University, 1997

Catherine Taylor, Joseph Yahner, and Don Jones

- Failed Septic systems IMPAIR more than 1,200 miles of streams and rivers.

Source: IDEM 2016

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Waste Water Treatment Needs

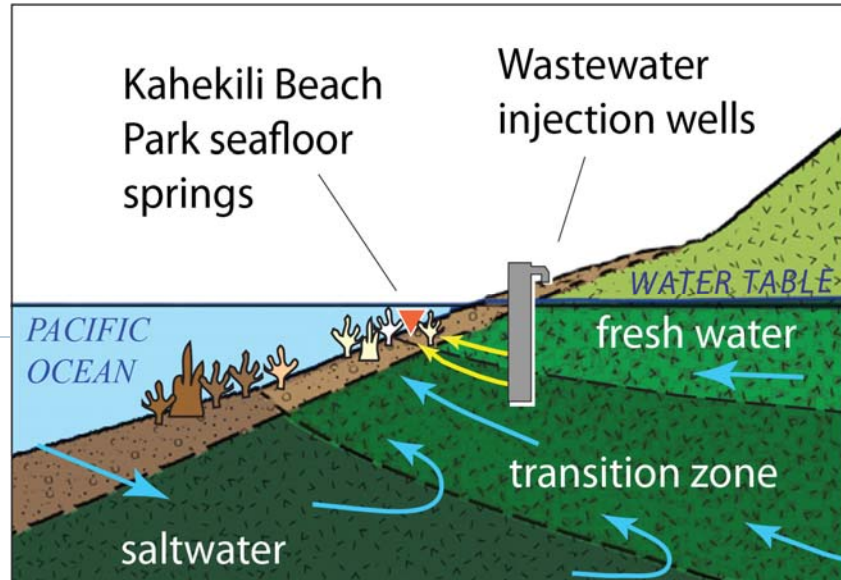
- In 2001 there were about **200,000** Indiana residences or businesses without adequate means of wastewater treatment

- Purdue University Ext., Small Community Wastewater Systems, Jones, et al. 2001

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County of Maui

CWA "The Functional Equivalent of a Direct Discharge"



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County of Maui

- **Some Indiana septic failures may be CWA violations** under the "functional equivalent of a direct discharge" test.

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And there are pollutants that we aren't even regulating yet....

- We haven't even gone through the contentious process of establishing limits for many pharmaceuticals and their metabolites, for many hormone mimics--which can have biological effect at incredibly low concentrations--and other chemicals now in the news, such as PFAS.

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We have a long way to go.....and it has been this way for a while. Shall we keep trying?

- A description of the United States: “growing inequalities of wealth and a cornucopia of consumer goods...money-making activities...saturate the political system with corruption. Businesses bargain for tax breaks, government contracts, land grants, and other favors, undermining democratic institutions that find it hard to withstand this assault.”

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IN 1870



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“...the more clearly, absolutely, irrevocably, unchangeably clear it is that it is impossible for you to make a difference and make the world better, the more you must.”

Robert Sapolsky

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