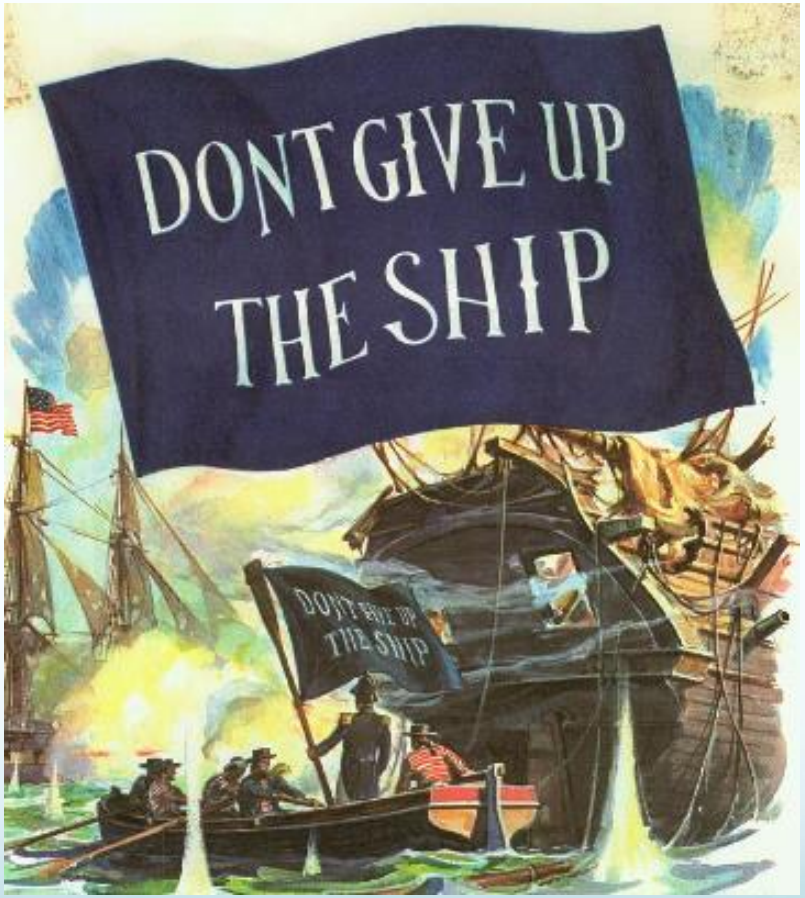
Presents

3rd

"The^Battle for Lake Erie"

First Battle for Lake Erie
September 10, 1813



Second Battle for Lake Erie

1950s-60s: Citizen outrage builds as sewage and industrial waste create massive "dead zones"

1969: Cuyahoga River catches fire again

1970-72: Landmark Legislation

EPA
Clean water starts with you

Clean Water Act

Phosphorus

Third Battle for Lake Erie

Photo: ECCSCM

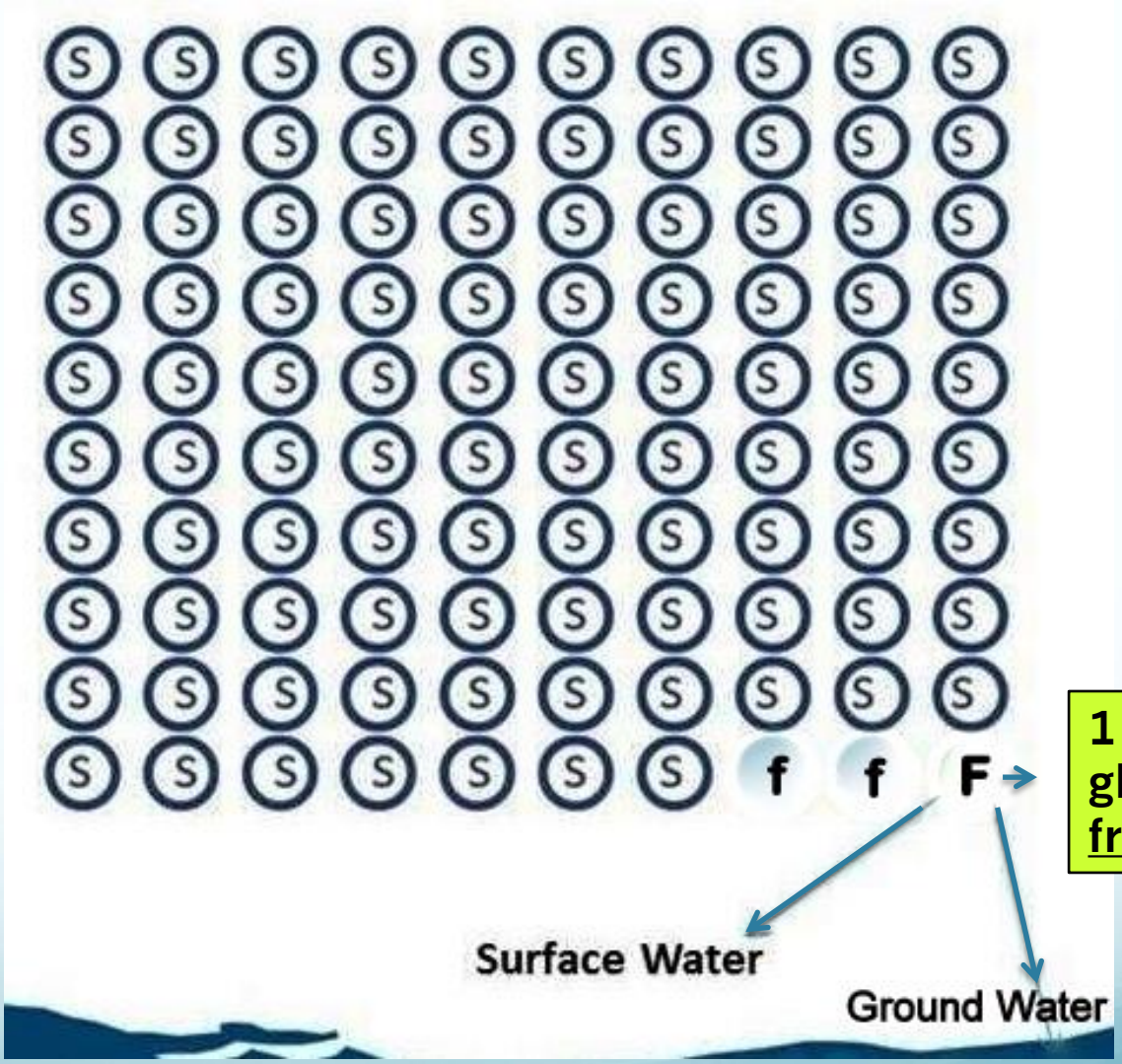
A catfish struggles for a breath in the algae-filled waters in Point Place in Toledo.

THE BLADE/ANDY MORRISON

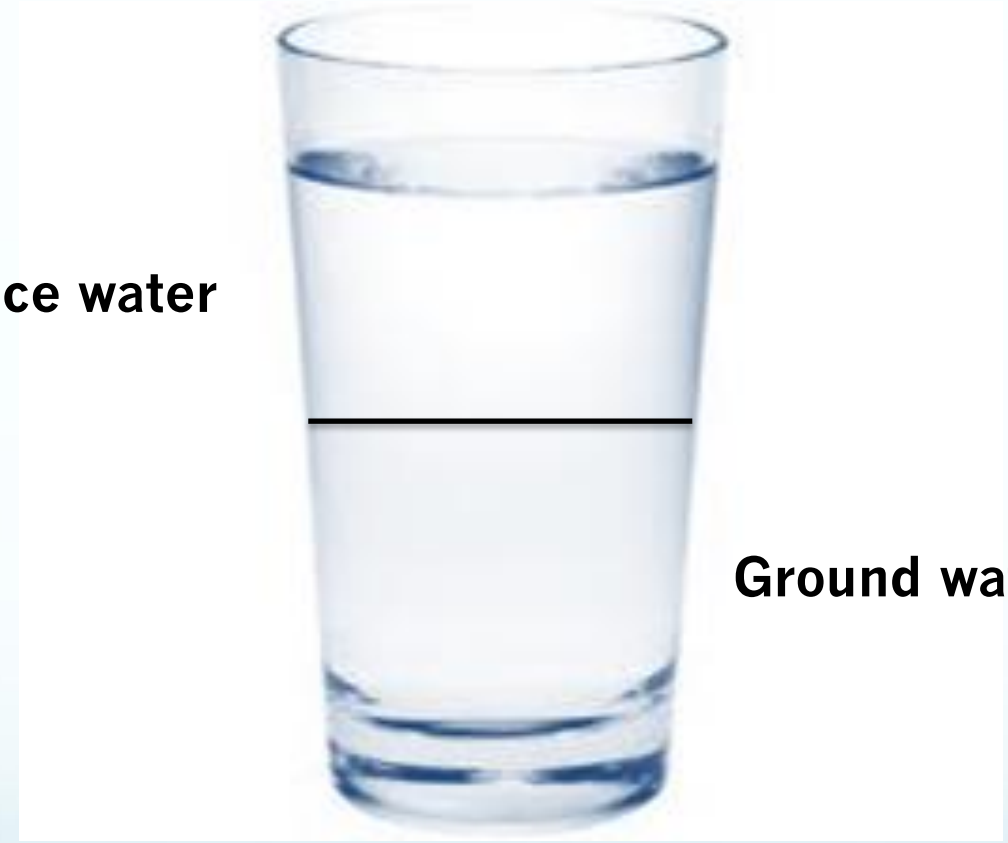
Clean Water is a Right

All Earth's Water in 100 Glasses

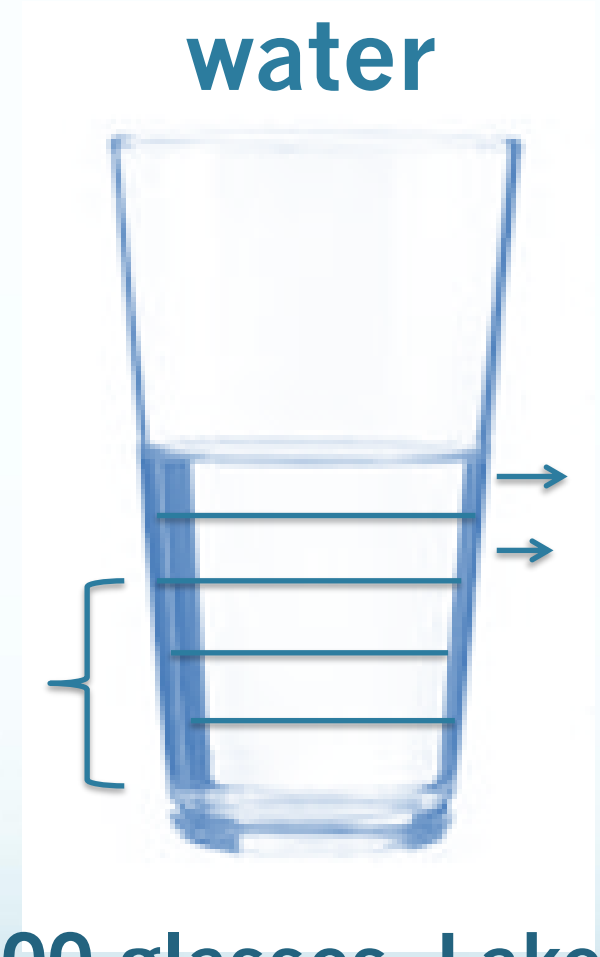
97 are saltwater



All Earth's usable, fresh water



All Earth's usable, fresh, surface water



and out of 100 glasses, Lake Erie's share of the earth's usable, fresh, surface water…

19 Precious Drops

…and here's what we're doing with it!

Lake Erie's 19 Precious Drops

- Home to more than 1,500 species of plants and animals
- Prime migratory bird route

- Drinking water for over 13 million people
- Economic resource for multiple states and Ontario

Source: Ohio Environmental Council

7 Years After Toledo's Water Crisis some are still trying to locate the problem!

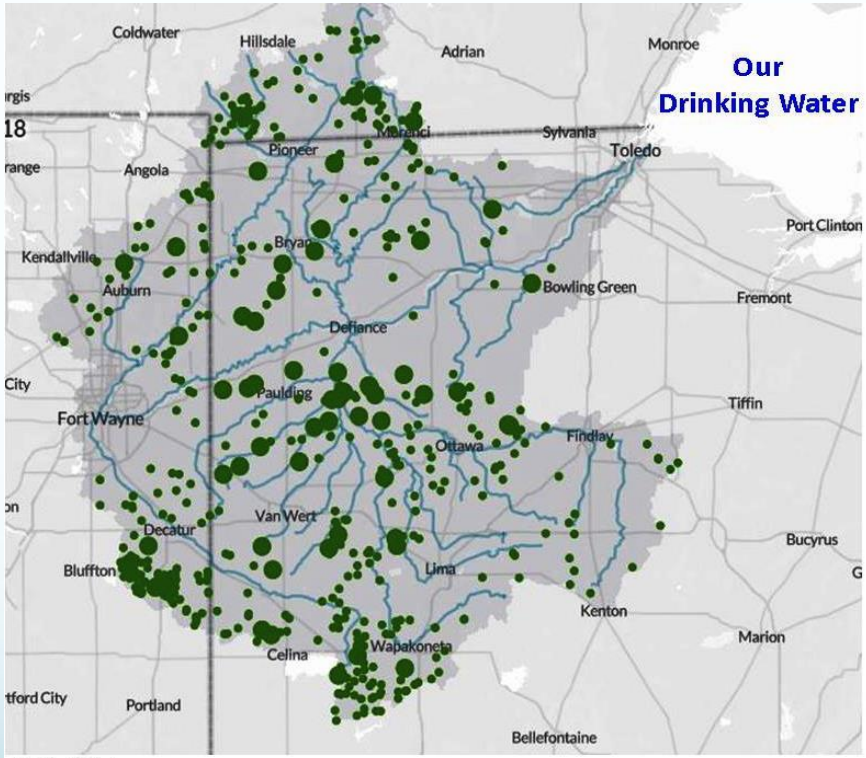
800 Factory "Farms" Western Lake Erie Watershed

Emit Phosphorus (P) = sewage from all the people in Ohio, Indiana, Chicago and Atlanta

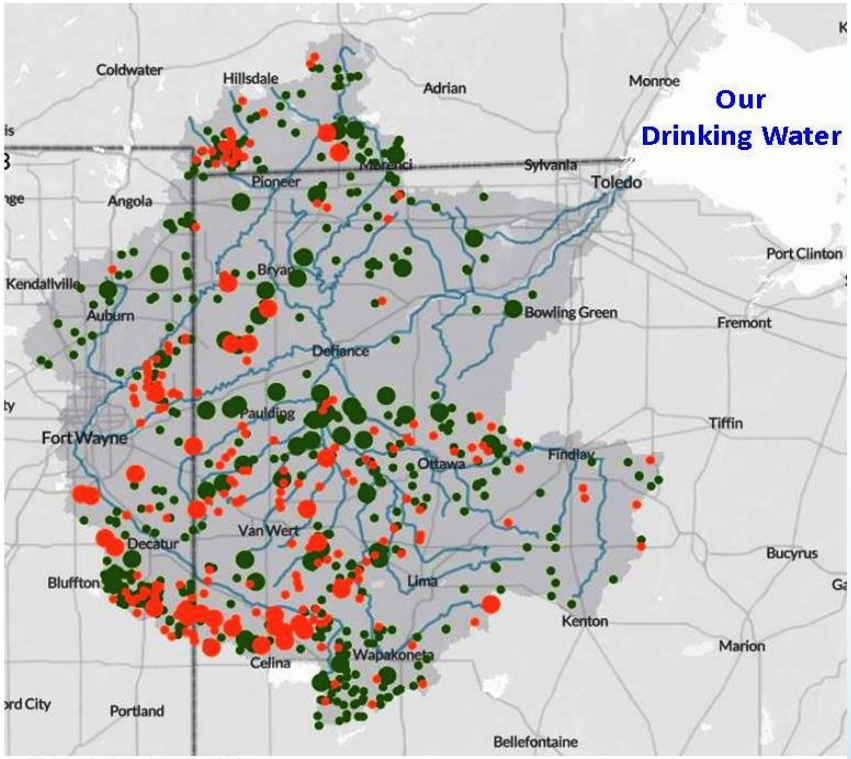
Photo: courtesy of ECCSCM

Factory "farm" numbers exploding.

- Animals increased from 9 to 20 million.
- Responsible for 69% of Phosphorus into Western Lake Erie.
- Phosphorus from commercial fertilizer use went down.



2005



2005-2018

Maumee River watershed

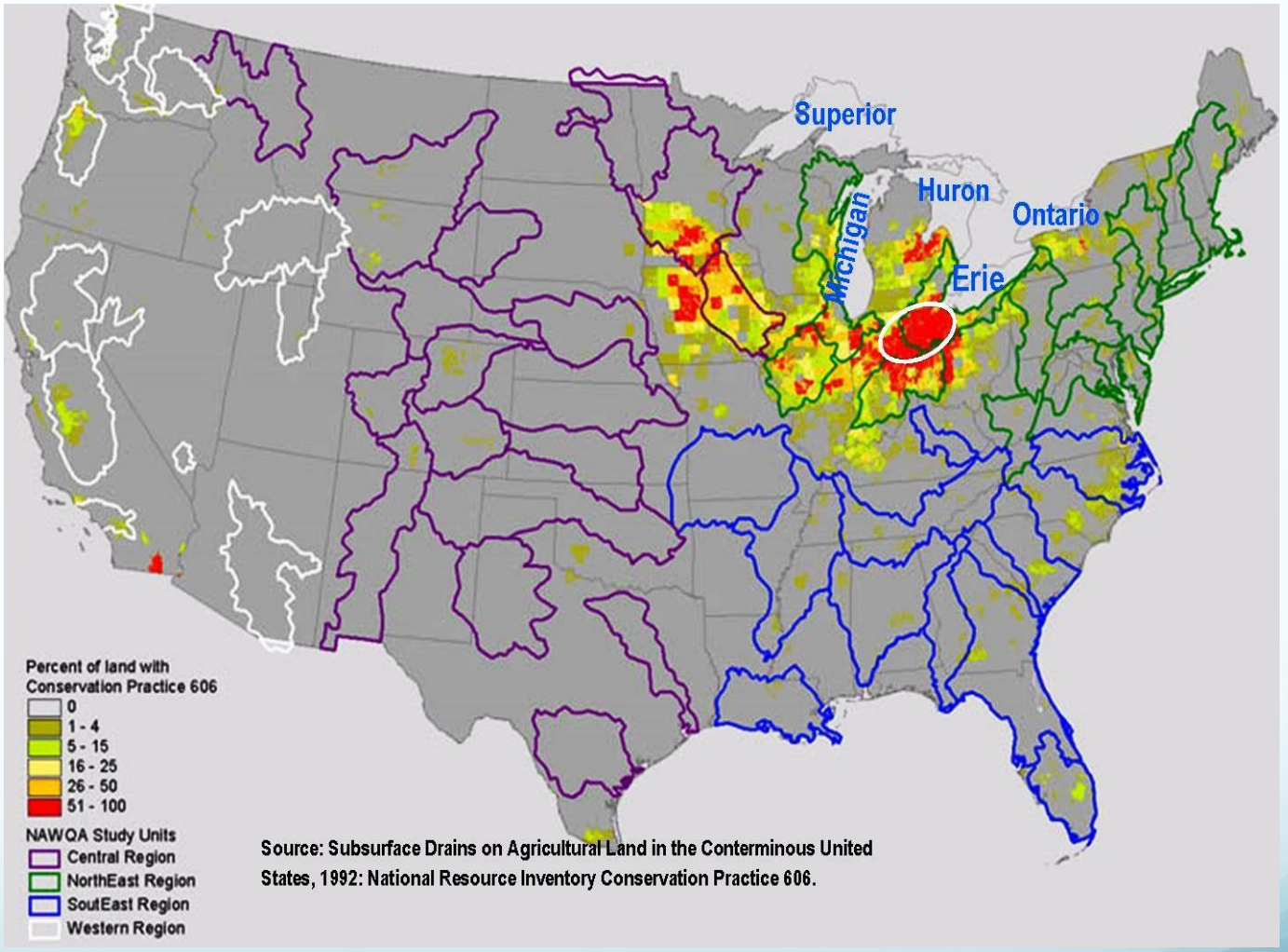
ewg

ENVIRONMENTAL LAW & POLICY CENTER

Subsurface Drainage

Of all the Great Lakes Erie is:

- **Shallowest**
- **Most southerly**
- **Warmest**
- **Highest concentration of drain tiles**
- **Perfect Storm for H.A.B.s (harmful algal blooms)**
- **Nation's 2nd largest, free public toilet for factory "farms"**



The Lake Belongs to Everyone…

- **No Person or Corporation has the right** to impair our water
- **But factory ‘‘farm’’ corporations do AND *shift costs onto the public:***
  - **Toledo Water Customers pay $6 million+/year** more to treat drinking water since the 2014 water emergency **$50 million for ozonation**
  - **How much higher are water/sewer bills since 2014?**
  - **Can Toledo still advertise low water bills?**

…But It's Not Healthy

- **Water Crisis of 2014** left 400,000+ citizens without drinking water for 2.5 days
- **Harmful "Algal" Blooms (actually cyanobacteria)** elevate toxins in drinking water

And Green is not good in this case

- **Overabundance of nutrients,** primarily **Dissolved/Reactive Phosphorus (P),** feed the microcystis bacteria, creating microcystin toxins
- **88% of excess nutrients in W. Lake Erie Basin from agriculture,* about 50% of that via subsurface drainage.****

* OEPA: *Nutrient Mass Balance Study for Ohio's Major Rivers*

** USDA and Royal Swedish Academy of Sciences: *Phosphorus losses from monitored fields with conservation practices in the Lake Erie Basin*

Factory "Farms" Put Our Health At Risk

- **Water and air contaminants:** Feces, urine, viruses, antibiotic-resistant E. coli and salmonella, methane, ammonia, hydrogen sulfide,
- **More Manure = More P = More Microcystis = More Microcystin + BMAA** beta-methyl-amino-L-alanine linked to ALS and Parkinson's
- **Microcystin is a liver toxin.** Exposure causes nausea, vomiting, diarrhea, fever and even death in high enough doses

How Toxic is Microcystin?

Toxin	Dosage Required to Kill 50% of Lab Rats
Dioxin	0.000001 mg/kg/d
Microcystin LR	**0.000003 mg/kg/d (3 millionth mg)**
PCBs	0.00002 mg/kg/d
Methylmercury	0.0001 mg/kg/d
DDT	0.0005 mg/kg/d
Cyanide	0.02 mg/kg/d
Chlorine	0.1 mg/kg/d

Source: OSU Stone Laboratory

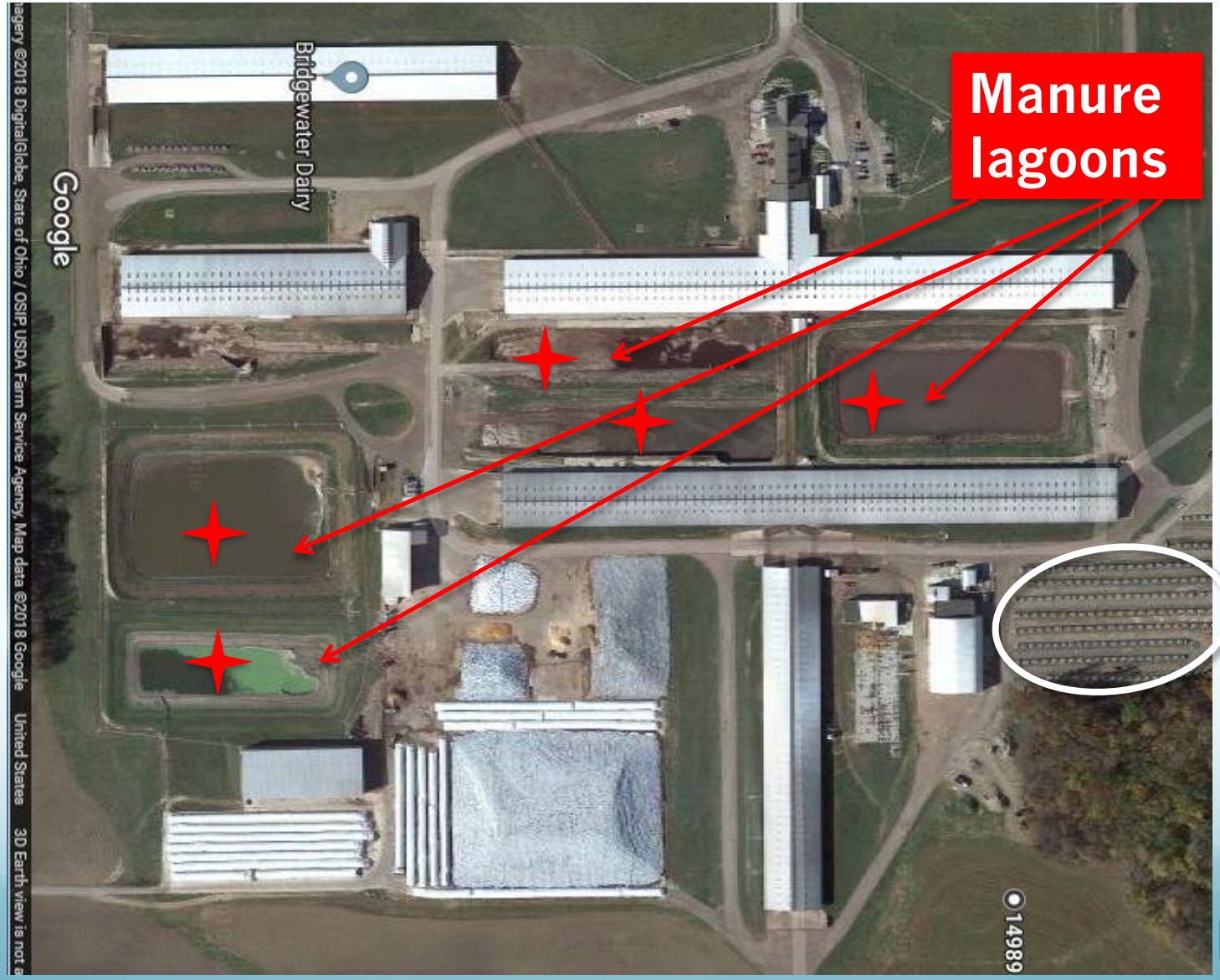
Treating the Water Makes It Drinkable, But…

- Chlorination produces carcinogens like **Trihalomethanes.** Reducing THMs adds to water treatment costs -- $50M for ozonation at Toledo Water Treatment Plant

Source: Water Research Center

Now let's follow the manure…

3,900 cows at Bridgewater Dairy in Williams County, generate more P in their waste every year than Perrysburg, Sylvania, Maumee, Defiance and Fremont, combined.



From manure lagoon to field with no treatment…

Photo: courtesy of ECCSCM

…through the soil to underground drainage or surface runoff…

Photo: courtesy of ECCSCM

…into streams that feed Lake Erie…

Photo courtesy ECCSCM

… poisoning a Great Lake.

Satellite view of Lake Erie 2015

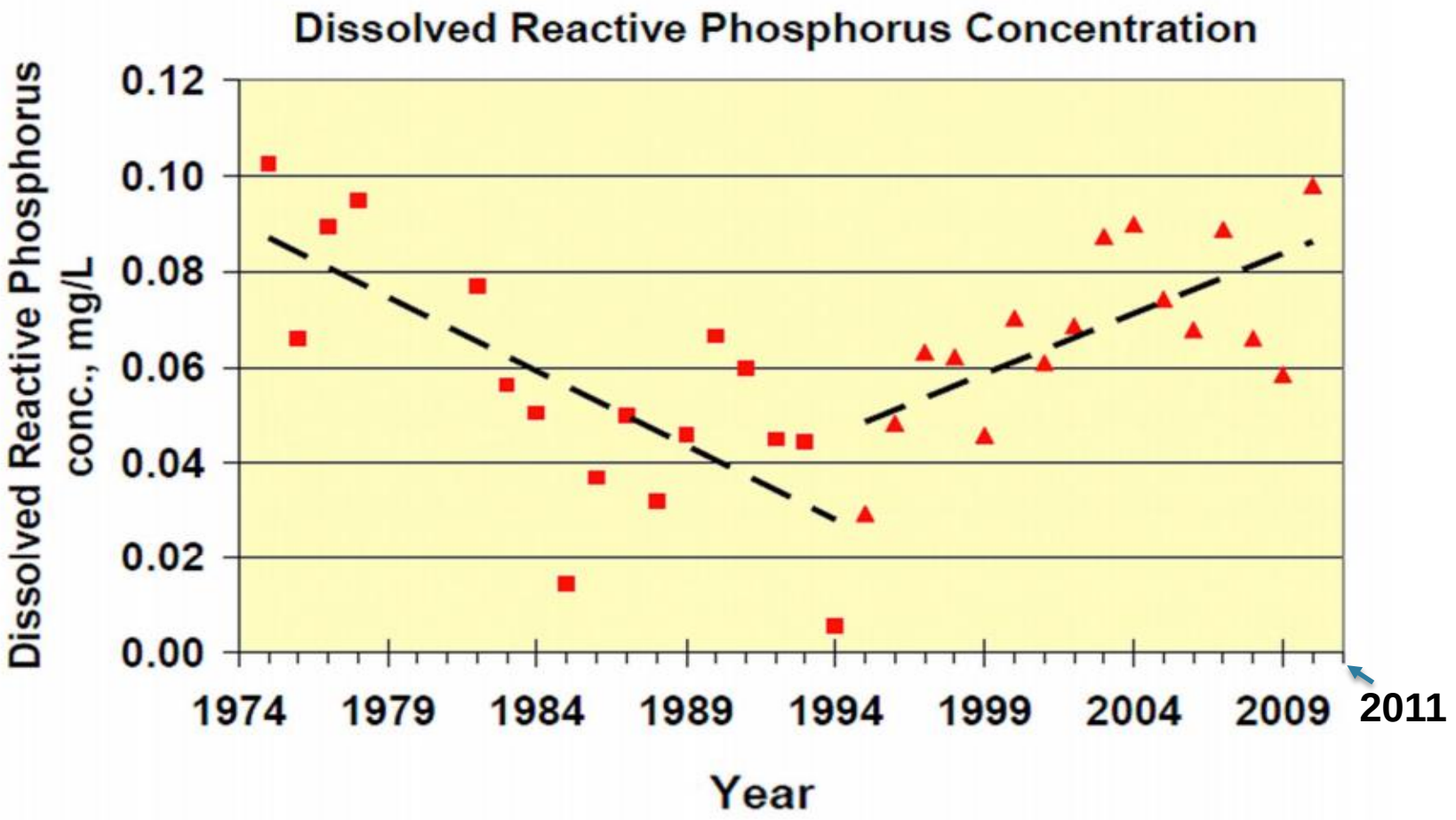
What We're Doing Doesn't Work

- **H2Ohio voluntary "Best Management Practices" help control sediment, nitrates and TP (total phosphorus)**
  - Examples: Buffer strips, grassed waterways, cover crops, no-till
- **<u>Do not control Dissolved Phosphorus</u> and can make it worse**
- **Liquid manure + subsurface drainage systems increase DP flow to the lake**

Buffer Strip **Photo: Mankato Free Press**

Grassed Waterway **Photo: Evrardo**

And Here's the Proof:



Ohio Sea Grant and Stone Laboratory

Bay View Wastewater Treatment Plant

Phosphorous: average raw and final effluent mg./liter 2006 - 2018

Lake Erie Advocates Recommends:

- ✓ **Recognize that nature has rights**
- ✓ **Declare Western Lake Erie Basin impaired**
  Supposed to begin a process under the Clean Water Act
  - **Determine sources and amounts = massive stream sampling**
  - **Enforceable action plan** based on Total Maximum Daily Loads (TMDLs)
  - ***Mandatory* goals** with report cards and enforceable deadlines
  - **Accountability** for meeting goals
- **Redirect H2Ohio $ to Impaired process**
- **Ban factory "farms"**

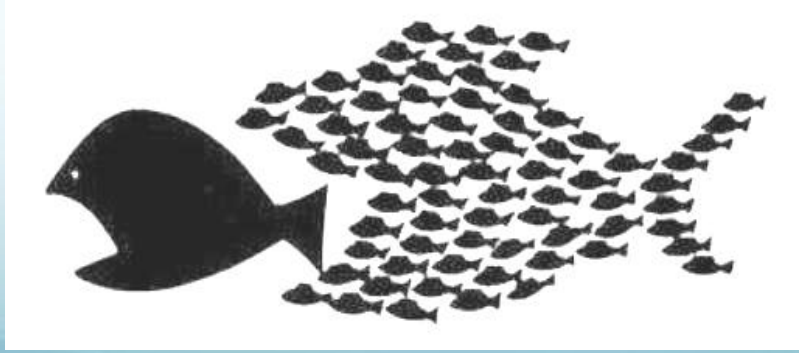
This is a Political Fight

- Recently retired OEPA Deputy Chief worked 19 years as Ohio Farm Bureau lobbyist: "TMDLs aren't needed," keep voluntary measures.*
- H2Ohio Best Mgt. Practices = Good money after bad
- WLEB CAFOs given $17 million in public support just between 2008-2015
- $$ needed to support sustainable farming
- Big political decision: <u>who will pay to clean up Lake Erie?</u>
  - Farmers who've reduced their commercial fertilizer usage?
  - Water and sewer ratepayers?
  - Factory "farm" corporations?

* Karl Gebhardt quoted in Toledo Blade 4/18/2018

We Can Win
We've Done it Before!

- In the 1960's Lake Erie was considered a dead lake
- Concerned citizens rolled up their sleeves and went to work
  - Phosphorus was banned in laundry detergent
  - Sewage treatment plants were upgraded
- Lake Erie was brought back to health!
- This time the problem is manure
- **The power of democracy can save Lake Erie again!**



What You Can Do

- **Spread the word** to friends, relatives, neighborhood groups, churches, unions
- **Get local governments** involved.
- **Get active with LEA!** Join a committee. Donate.
- ***We are not going away until Lake Erie is healthy!***

“Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.” ***- Margaret Mead***

Thank You!

Lake Erie Advocates

The following slides are for background and discussion

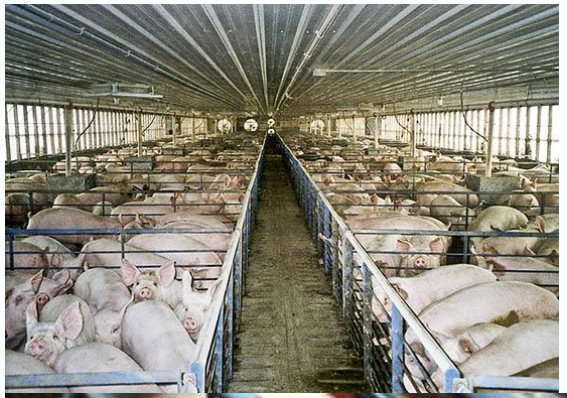
When you're not born a cow at a factory "farm," what happens?

A) go to an all-male veal factory like this one

B) get fattened up for meat, belts and shoes

C) get a bullet in the head and dumped in the "animal mortality" compost pile.

Cows get milked to death in 2-3 years. Our taxes subsidize the whole business. Bon apetit!



Heidelberg Univ. Sampling Sites

Can show gross amounts but no accountability for sources

20016 USDA Environmental Quality Incentives Program (EQIP) Payment Schedule

Practice_ Code	Cost_Share_ Program	Practice_Name	Component	Unit_Type	Unit_Cost	Cost_Type	Share_Rate
128	EQIP	Agricultural Energy Management Plan - Written	AgEMP Small, One Enterprise	Number	1601.98	PR	100
128	EQIP	Agricultural Energy Management Plan - Written	HU-AgEMP Small, One Enterprise	Number	1922.37	PR	100
316	EQIP	Animal Mortality Facility	HU-Composter with Storage, Turkey	Lb/Day	207.57	PR	100
316	EQIP	Animal Mortality Facility	Small Rotary Drum 270lbs. to 523lbs. of Daily Mortality with composter	Each	30090.98	PR	100
102	EQIP	Comprehensive Nutrient Management Plan - Written	HU-Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application	Number	10929.46	PR	100
102	EQIP	Comprehensive Nutrient Management Plan - Written	Dairy Operation Greater Than or Equal to 700 AU with Land Application	Number	10127.28	PR	100
412	EQIP	Grassed Waterway	HU-GWW > 1,000ft long	Acre	1668.51	PR	100
412	EQIP	Grassed Waterway	GWW with geotextile or stone checks	Acre	2085.57	PR	100
327	EQIP	Conservation Cover	HU-Introduced Species	Acre	164.82	PR	100
327	EQIP	Conservation Cover	Native Species	Acre	231.28	PR	100
647	EQIP	Early Successional Habitat Development/Management	Habitat Selective Herbicide	Acre	35.27	PR	100
595	EQIP	Integrated Pest Management (IPM)	HU-Advanced IPM Orchard All RCs	Acre	238.4	PR	100
595	EQIP	Integrated Pest Management (IPM)	Advanced IPM S-Farm All RCs	Each	782.39	PR	100
670	EQIP	Lighting System Improvement	HU-Lighting LED dusk to dawn lighting fixture	Each	974.35	PR	100
670	EQIP	Lighting System Improvement	Lighting - LED high bay lighting fixtures	Each	1380.6	PR	100
606	EQIP	Subsurface Drain	HU-Corrugated Plastic Pipe (CPP), Single-Wall, = 8 Inches	Foot	5.79	PR	100
606	EQIP	Subsurface Drain	Corrugated Plastic Pipe (CPP), Twin-Wall, = 8 Inches	Foot	10.08	PR	100
313	EQIP	Waste Storage Facility	Earthen Storage Facility greater than 50K ft3 Storage $38,000	CuFt	0.21	PR	100
313	EQIP	Waste Storage Facility	Earthen Storage Facility High Water Table $168,000	CuFt	0.99	PR	100
642	EQIP	Water Well	HU-Plastic Casing for unconsolidated geologic sites with unstable rock formations	Foot	28.42	PR	100
642	EQIP	Water Well	Steel casing for consolidated geologic sites with stable rock formations	Foot	18.89	PR	100

The Chesapeake Bay Story
1983-2016

- **1983-2010:** Three unsuccessful voluntary agreements over 27 years
- **2010:** EPA implements Total Maximum Daily Loads (TMDLs)
- **2011:** American Farm Bureau, Pork Producers Council, National Chicken Council, National Builders Assn. sue EPA over TMDL Plan
- **2016:** Supreme Court rejects Farm Bureau challenge to TMDL

Chesapeake Bay

- Over 400 acres of oyster reefs restored in six rivers
- Over $2 billion in federal restoration funds 2015-16
- Nutrient load estimate for 2017: down 60% from 2009

The Washington Post

Scientists: Chesapeake Bay hasn't been this healthy in 33 years

June 15, 2018

Your Tax Dollars At Work

Grand Lake St. Mary's

Celina Daily Standard 4-27-2018

OEPA/ODNR "proof" that distressed works

US National Library of Medicine National Institutes of Health

https://www.ncbi.nlm.nih.gov/pubmed/29415096

J Environ Qual. 2018 Jan;47(1):113-120. doi: 10.2134/jeq2017.08.0338.

Changes in Water Quality of Grand Lake St. Marys Watershed Following Implementation of a Distressed Watershed Rules Package.

Jacquemin SJ, Johnson LT, Dirksen TA, McGlinch G.

Abstract

Grand Lake St. Marys watershed has drawn attention over the past decade as water quality issues resulting from nutrient loading have come to the forefront of public opinion, political concern, and scientific study. The objective of this study was to assess long-term changes in water quality (nutrient and sediment concentrations) following the distressed watershed rules package instituted in 2011. Since that time, a variety of rules (e.g., winter manure ban) and best management practices (cover crops, manure storage or transfers, buffers, etc.) have been implemented. We used a general linear model to assess variation in total suspended solids, particulate phosphorus, soluble reactive phosphorus (SRP), nitrate N, and total Kjeldahl nitrogen concentrations from daily Chickasaw Creek (drains ~25% of watershed) samples spanning 2008 to 2016.

Parameters were related to flow (higher values during high flows), timing (lower values during winter months), and the implementation of the distressed watershed rules package (lower values following implementation). Overall, reductions following the distressed designation for all parameters ranged from 5 to 35% during medium and high flow periods **(with exception of SRP).**

Reductions were even more pronounced during winter months covered by the manure ban, where all parameters (including SRP) exhibited decreases at medium and high flows between 20 and 60%. While the reductions seen in this study are significant, concentrations are still highly elevated and continue to be a problem. We are optimistic that this study will serve to inform future management in the region and elsewhere.