

Tile Drainage and Nutrients in the Midwest

**Association of Clean Water Administrators
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**Iowa
Environmental
Council**



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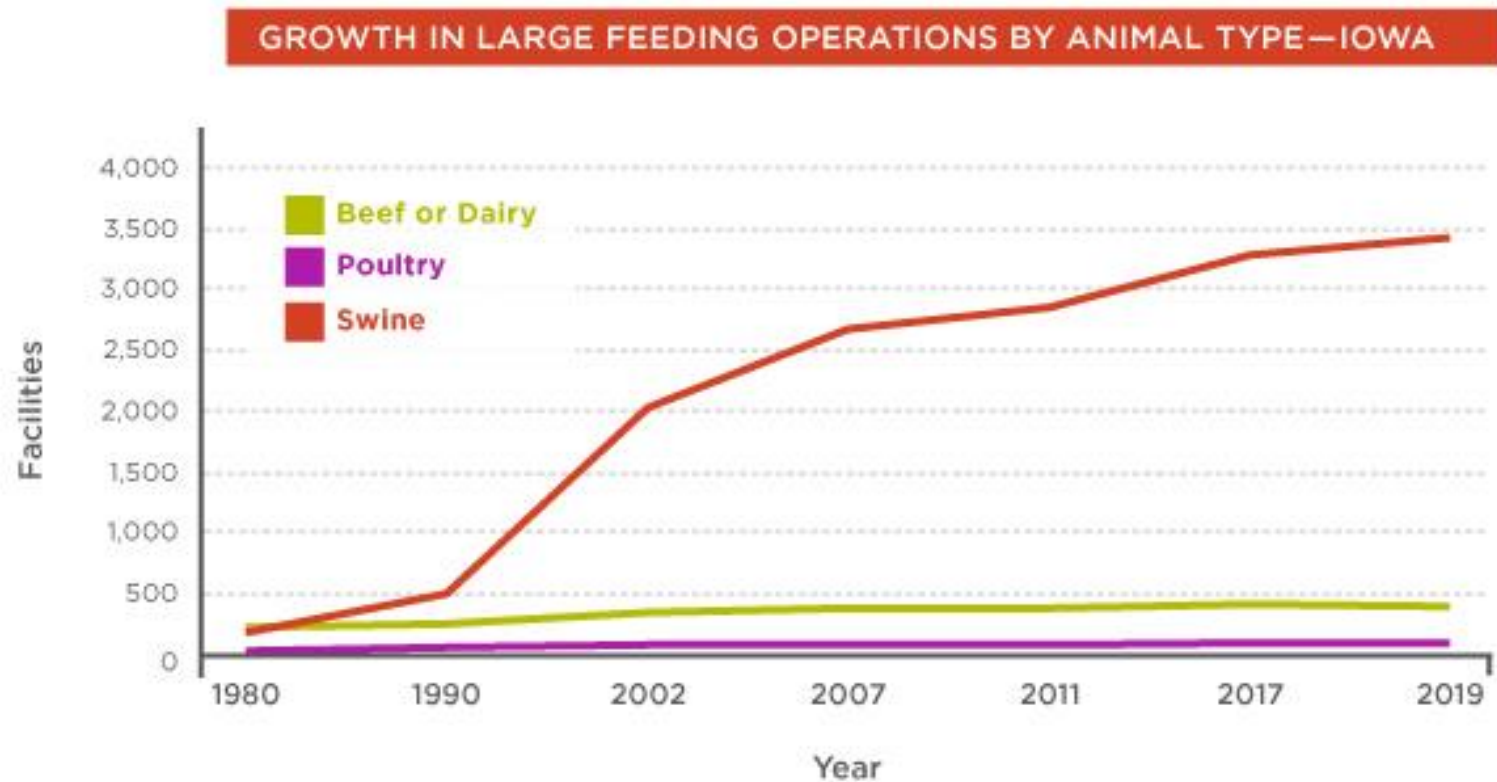
The Iowa Environmental Council educates, advocates, and builds coalitions to raise awareness, generate action, and impact policy to make Iowa a better place to live, work, and explore.

Road Map for Today:

- The Iowa context
- Drainage laws
- State comparisons



Iowa Context: Proliferation of Concentrated Animal Feeding Operations (CAFOs)

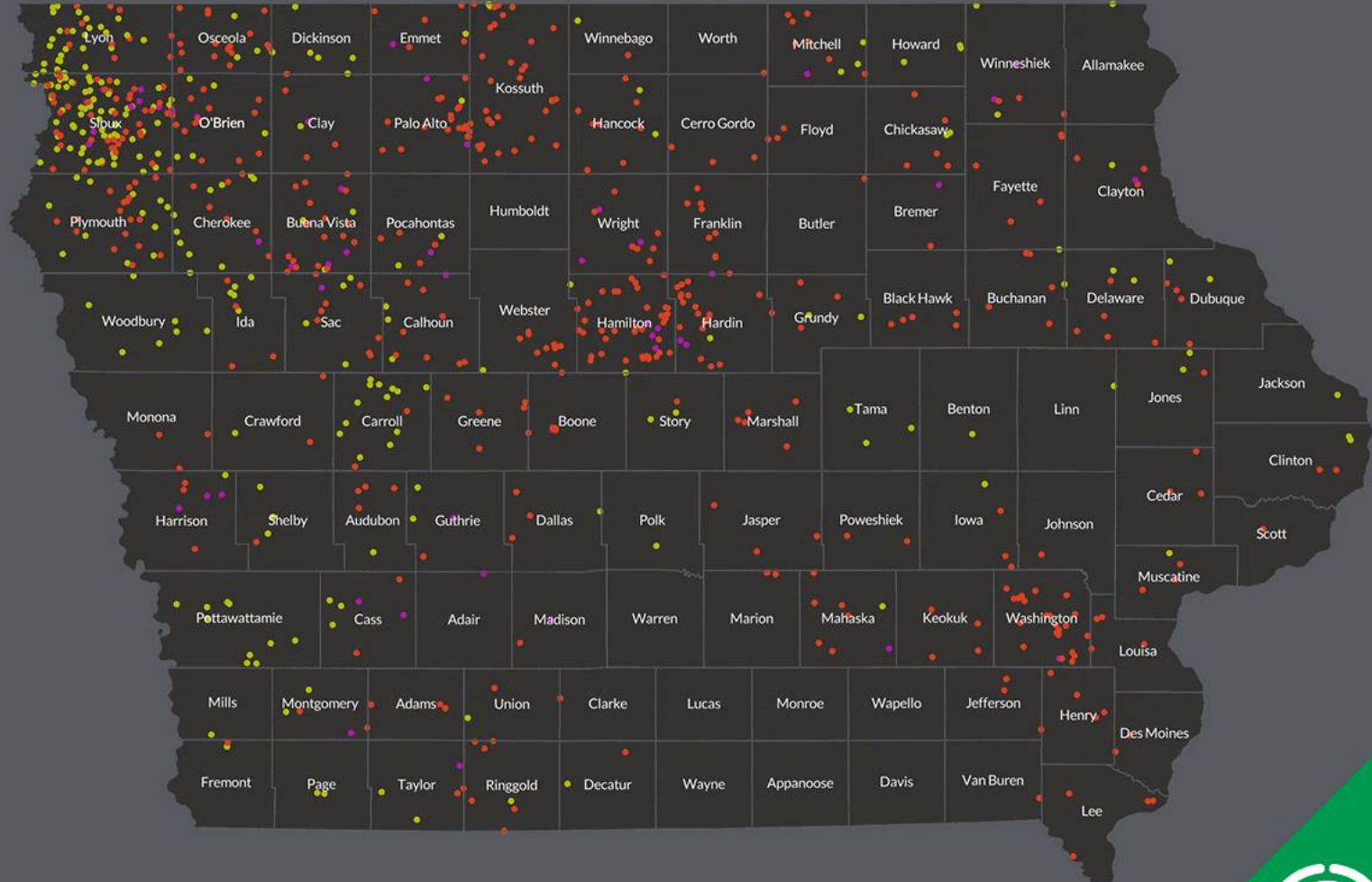


Source: EWG, from data from the Iowa Department of Natural Resources



Iowa Context: Proliferation of Concentrated Animal Feeding Operations (CAFOs)

1990

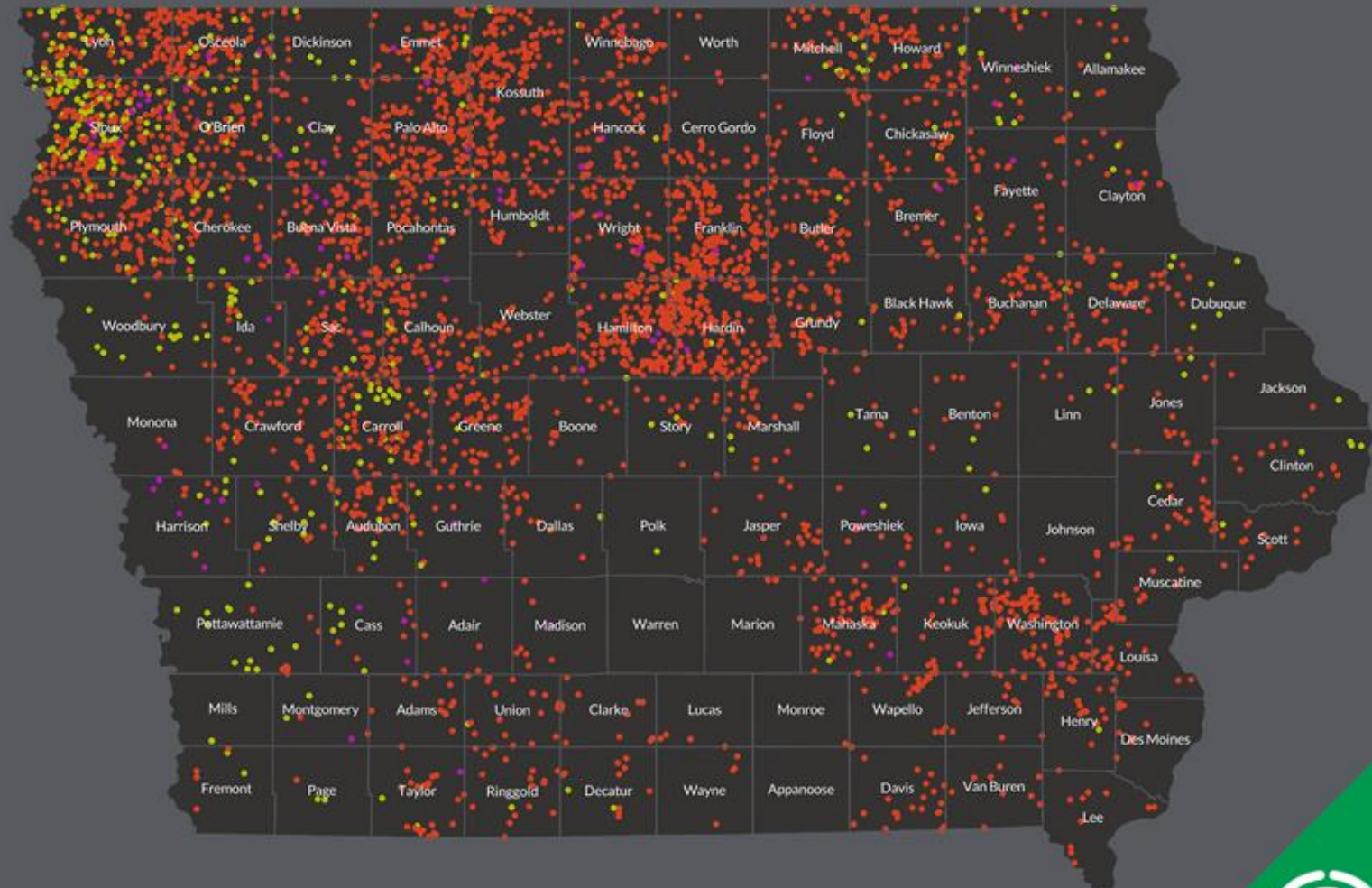


■ Beef-Dairy ■ Poultry ■ Swine



Iowa Context: Proliferation of Concentrated Animal Feeding Operations (CAFOs)

2019



Beef-Dairy



Poultry



Swine



Iowa Context: Toxic Algae Blooms

Lake MacBride, 2019



Saylorville Lake, 2020



Iowa Context: Drainage Litigation

Des Moines Register

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MONEY

With Water Works' lawsuit dismissed, water quality is the legislature's problem

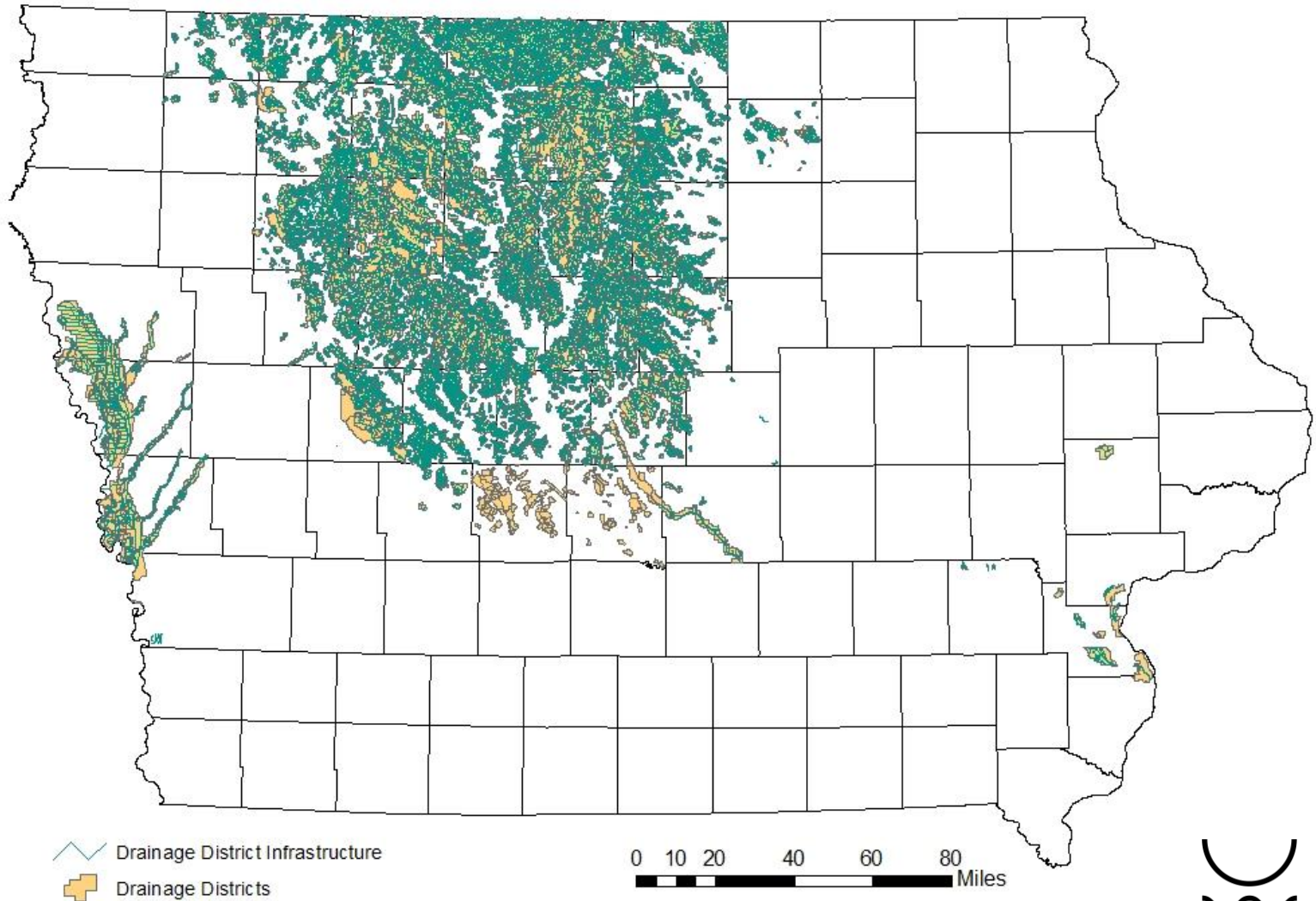
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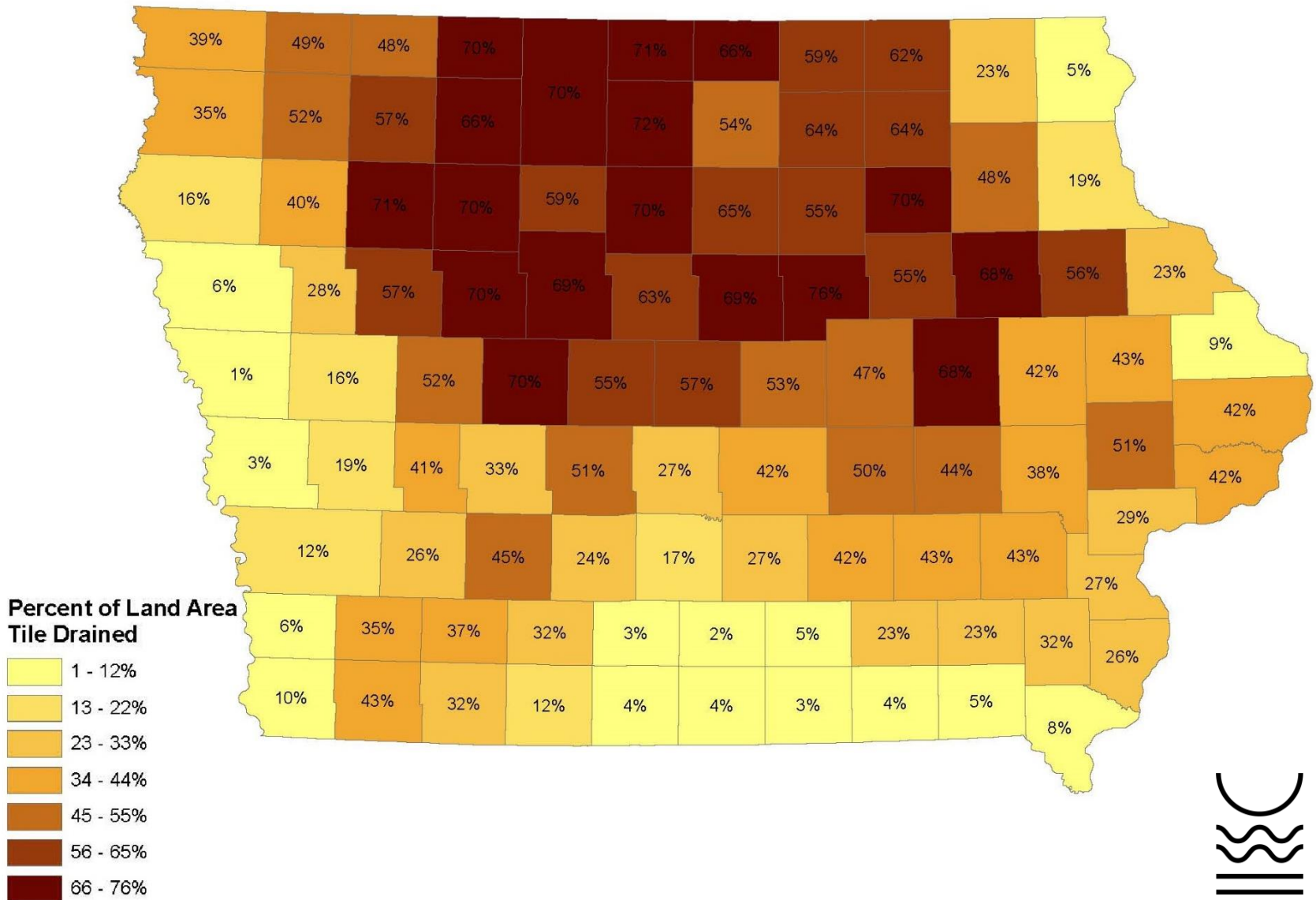
A federal judge has dismissed Des Moines Water Works' lawsuit against drainage districts in three northern Iowa counties the utility claimed are funneling high levels of nitrates into the Raccoon River, a source of drinking water for 500,000 central Iowa residents.

Federal Judge Leonard Strand dismissed all of Water Works' claims against drainage districts in Sac, Buena Vista and Calhoun counties, determining that

Drainage Districts in Iowa



Tile Drainage in Iowa



IEC/Data from USDA NASS Ag Census (2017)



Tile Drainage by State

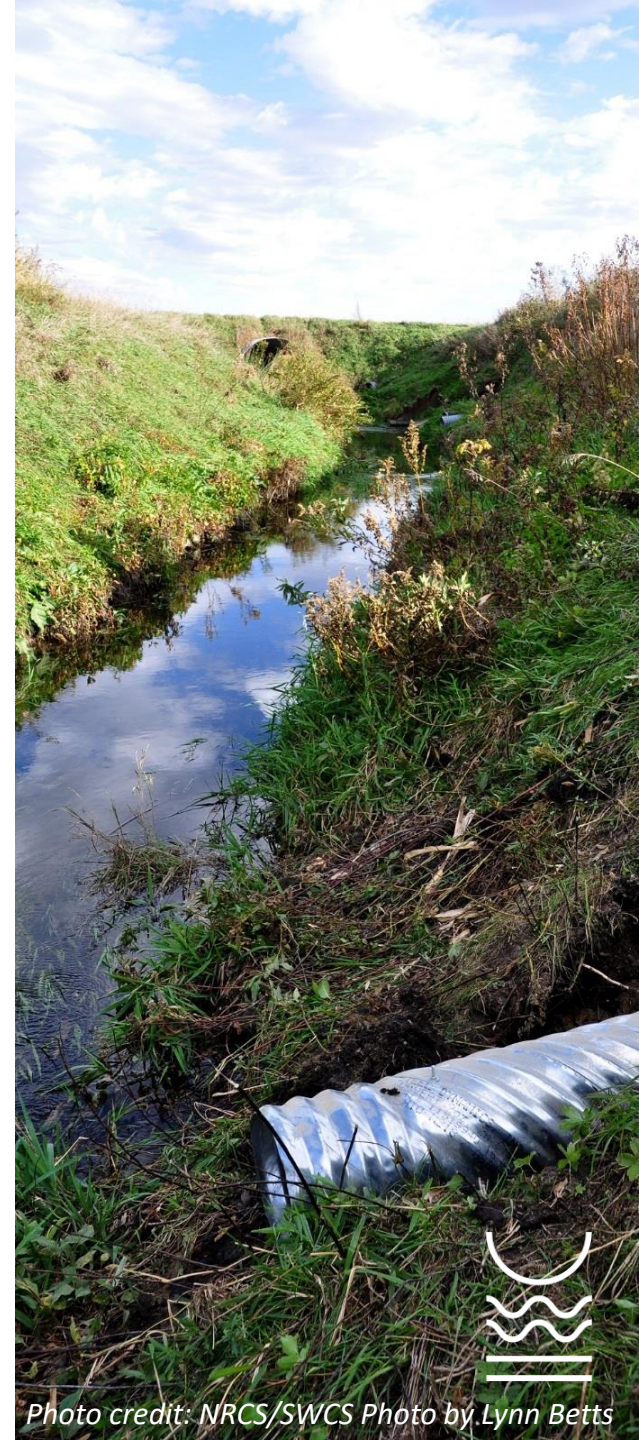
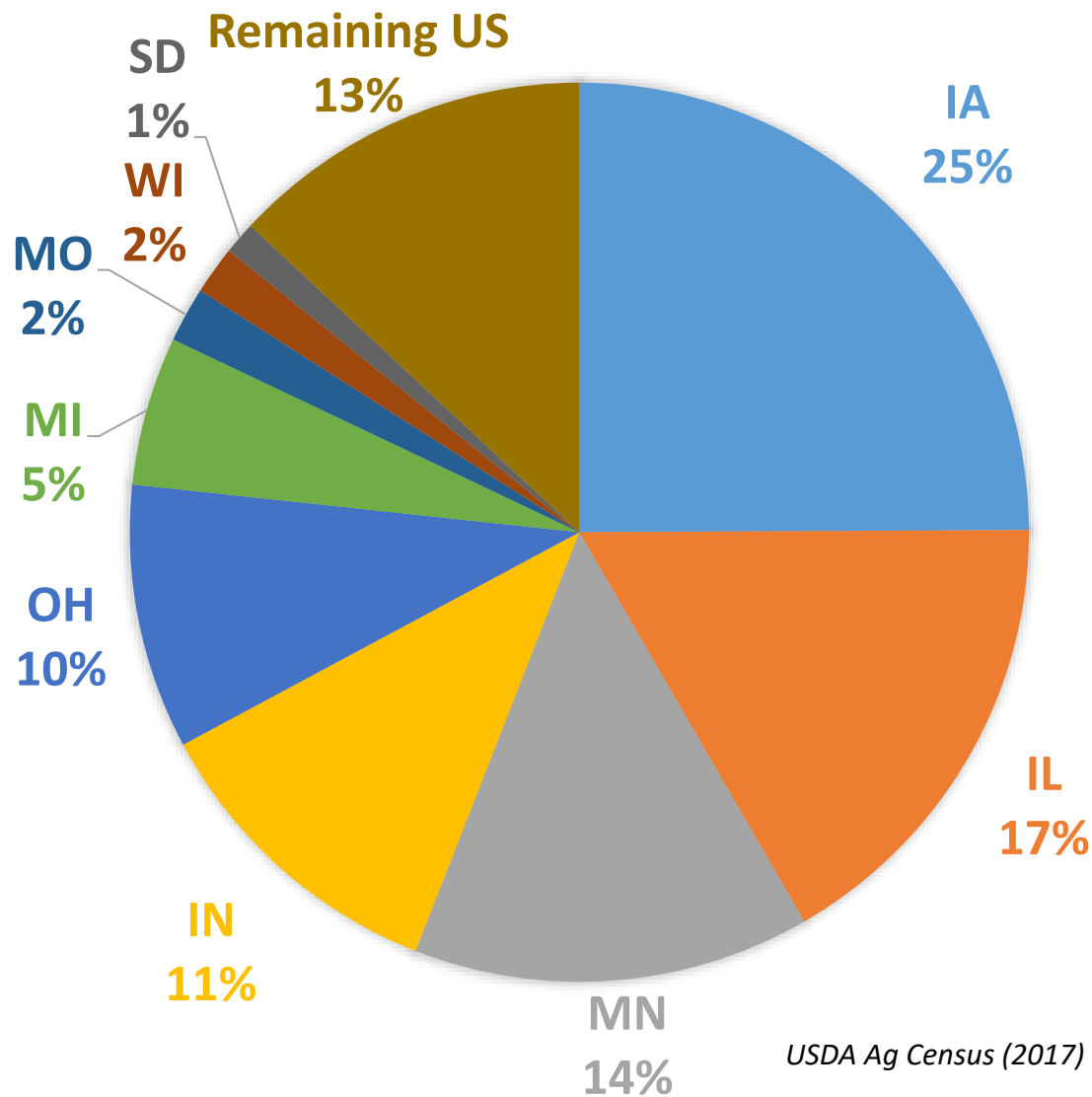


Photo credit: NRCS/SWCS Photo by Lynn Betts

A Clean Water Act point source and nonpoint source



Archaic State Laws

- Drainage districts in Iowa exist to move water off the land and out of soil
- Basic assumptions unchanged for over a century
- Agricultural practices have changed significantly



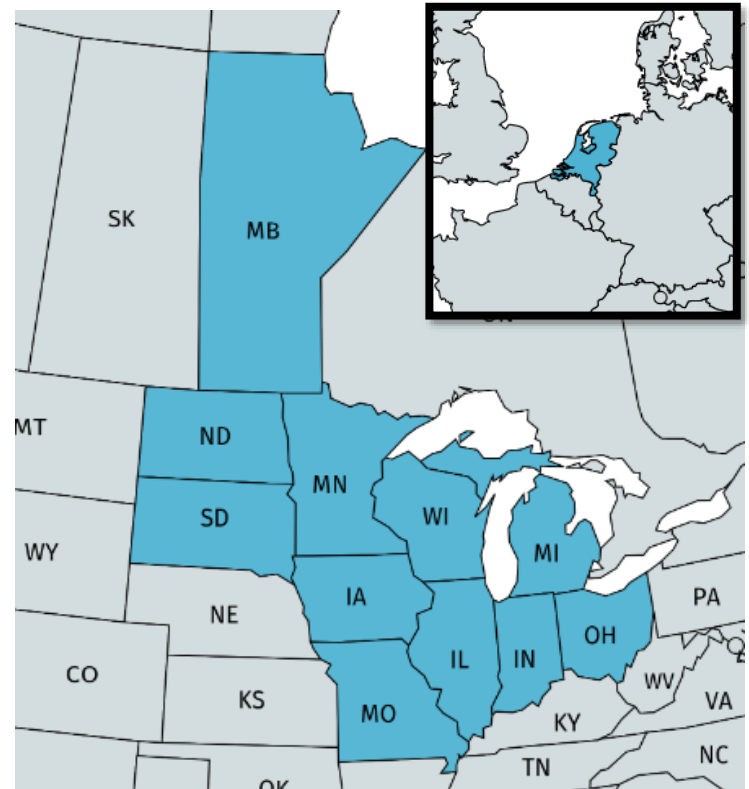
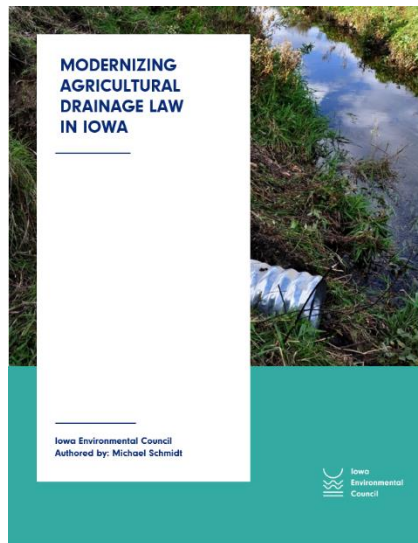
Nutrient Loading from Tile Drainage

- Iowa Nutrient Reduction Strategy: 7 of 8 possible scenarios specifically call for BMPs to treat tile drainage
- Illinois Nutrient Loss Reduction Strategy: “the greatest yields were found in the tile-drained northern two-thirds of Illinois...”
- Minnesota: 37% of stream nitrate via tile drainage



Regional Comparison of Drainage Laws

- Midwestern states have most tile-drained acres
- Requirements vary significantly
- Considered international examples for comparative analysis



www.iaenvironment.org/moderndrainage



Drainage oversight

- Number of drainage districts per state ranges from one per county to ~3000 (Iowa)
- Drainage district board generally overlaps with county board members; court-appointed in some states
- Generally, counties retain records



Drainage laws: WQ considerations at installation

Iowa	Illinois	Indiana	Minnesota	North Dakota	Ohio
None	Trees, fish, wildlife habitat, erosion, pollution	A private drain connection is not allowed if it would pollute.	Alternatives to promote other beneficial uses, reduce erosion, or improve water quality; effects on fish, wildlife, water quality, groundwater, overall environmental impact	Erosion, impact on waters with fish/wildlife value	Protection of environmentally significant areas and alternative plans to protect those areas; engineer must submit plans to conservancy district for comment



Drainage laws: Oversight and permitting

Iowa	Minnesota	North Dakota	South Dakota	Manitoba	Netherlands
None	Permits required by many watershed districts	Permit required to drain 80+ ac watershed	Board or commission may require permits; violation is misdemeanor	Licenses (for drainage) only issued if no harm to the aquatic ecosystem	Permits for essentially all water control structures

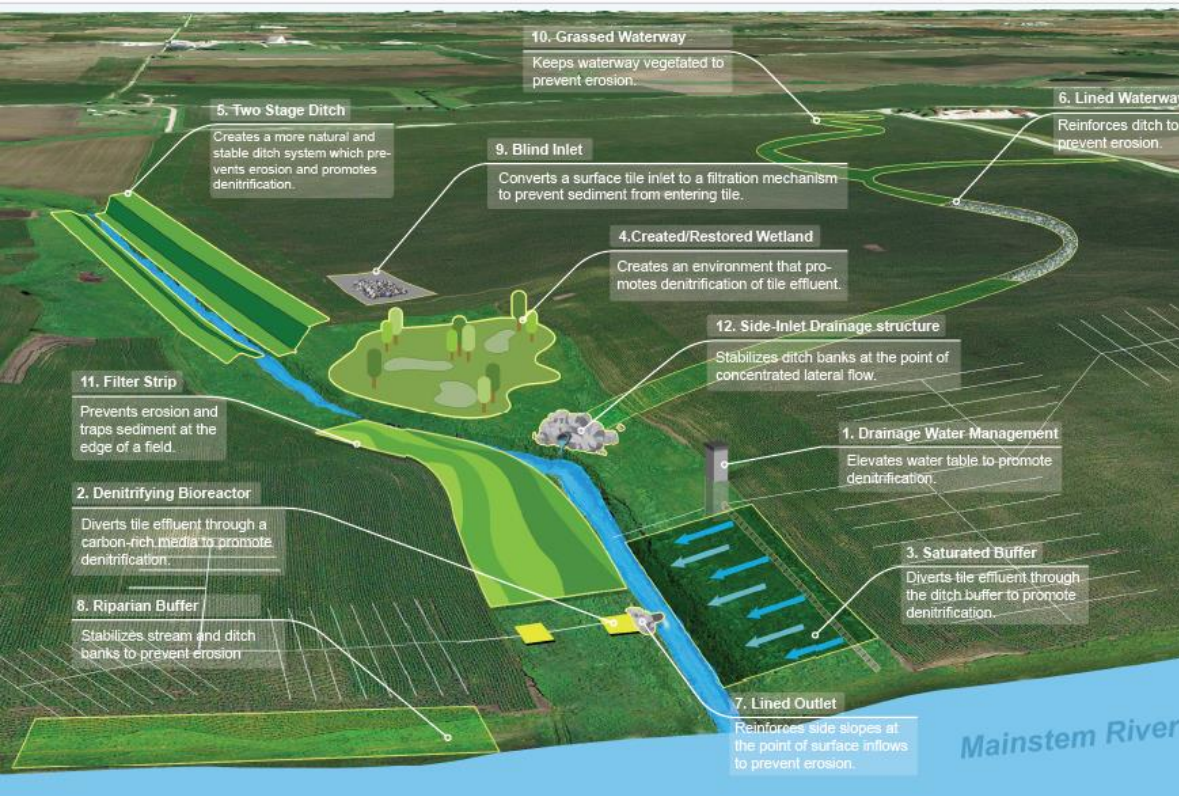




Drainage laws: Expectations for landowners

Iowa	Minnesota	North Dakota	Ohio	South Dakota	Wisconsin
None	Riparian buffers with perennial vegetation	Permit required to drain 80+ acre watershed	Comply with prohibition against nuisance conditions	Board or commission may require permits; violation is misdemeanor with penalty of \$1000	Maintain vegetative buffer of 20 ft (wider if necessary), minimize erosion through control practices; implement Board-mandated NRCS practices (or disconnect tile); notify Board of any action that increases erosion

Nutrient Management



Many options exist

- NRCS practices
- State programs and plans
- Research and demonstration projects





Nutrient Management

We're not "just getting started":

- 1935: Soil Conservation Act
- 1953: University recommendations on N usage
- 1960s: Recommendations based on yield goals
- 1981: ISU paper on nitrate effects of fertilizer
- 1980s: DMWW notices increasing nitrate trend in surface water
- 1990: ISU researchers call for better nutrient management



Thank you!

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