

# Drinking Water



Toledo, OH



Des Moines, IA

## Raccoon River, Des Moines Water Works, 2008

### Critics ask why state failed to warn about toxic algae



Dennis Hill, a microbiologist with the Des Moines Water Works, displays some lengthy, stick-like cyanobacteria on the screen of a monitor looked up to his microscope. Waterworks officials have been monitoring the Raccoon River's atypically high blue-green algae levels.

The DNR says no one asked it to investigate the potential health threat, which the capital's waterworks and farm groups trace to a Sac County lake.

Natural Resources with monitoring water quality and persisting lowers from such outbreaks. Yet no one from the agency warned swimmers to stay out of the 525-acre Sac County lake, which has several beaches and campgrounds. DNR officials said that no one asked them

By PERRY BEEMAN  
Des Moines Register

The algae, or cyanobacteria, can cause rashes, intestinal illnesses, even death. Levels in the west-central Iowa lake near

An outbreak of toxic blue-green algae that

## Des Moines River, Des Moines Water Works, 2020

### Blue-green algae halts treatment of water from Des Moines River

107  
Shares



Updated: 6:25 PM CDT Aug 28, 2020

Infinite Scroll Enabled



**Marcus McIntosh** f ✉

KCCI Anchor, Reporter



## Big Creek Lake near Des Moines



## Macbride Lake State Park June, 2019



## Macbride Lake, 2019

### Harmful algae at Lake Macbride causes first-ever swim warning for toxins

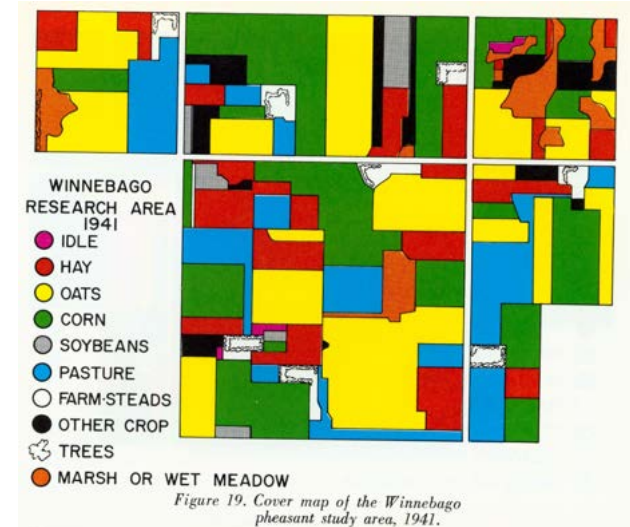
'Pea soup as far as the eye can see'



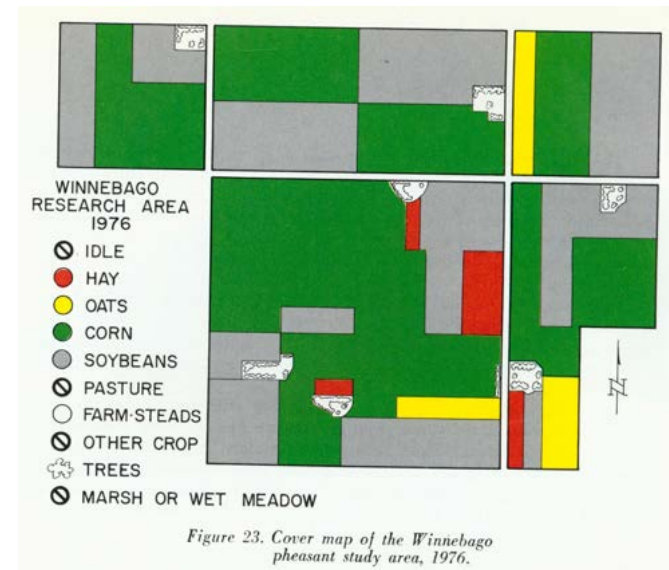
The Problem:

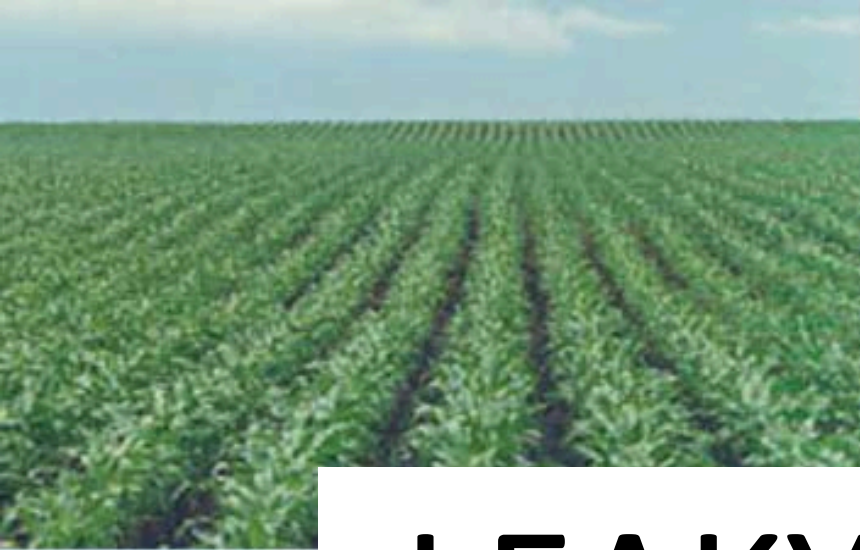
- 70% of land in corn-soy rotation
- 25 million hogs
- 4 million beef cattle
- 80 million laying chickens
- 5 million turkeys
- 4 million broiler chickens
- 220,000 dairy cows

1941



1976





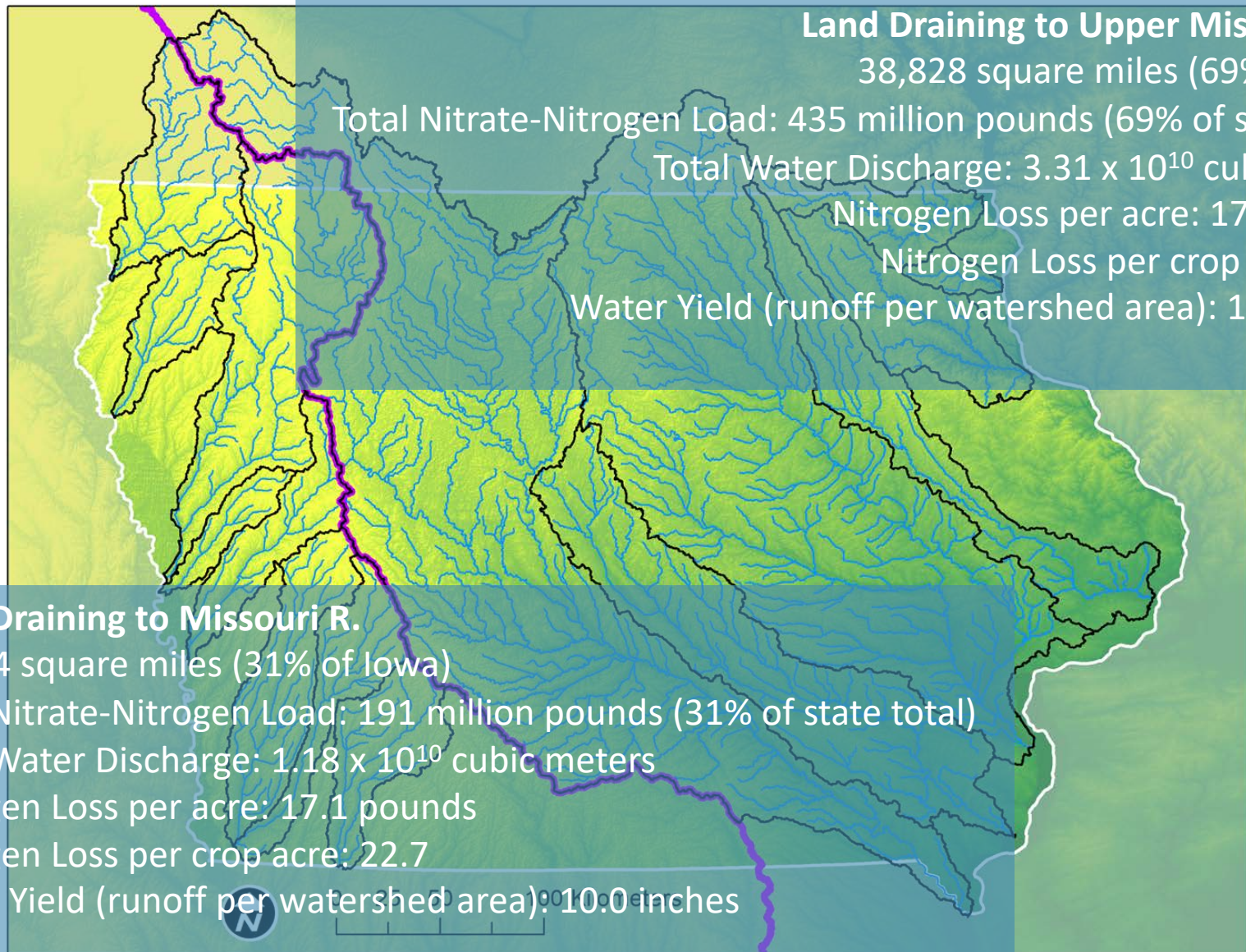
# LEAKY SYSTEM





## 2020 Stream Nitrate Data





**Land Draining to Upper Mississippi R.**

38,828 square miles (69% of Iowa)

Total Nitrate-Nitrogen Load: 435 million pounds (69% of state total)

Total Water Discharge:  $3.31 \times 10^{10}$  cubic meters

Nitrogen Loss per acre: 17.5 pounds

Nitrogen Loss per crop acre: 27.0

Water Yield (runoff per watershed area): 13.0 inches

**Land Draining to Missouri R.**

17,444 square miles (31% of Iowa)

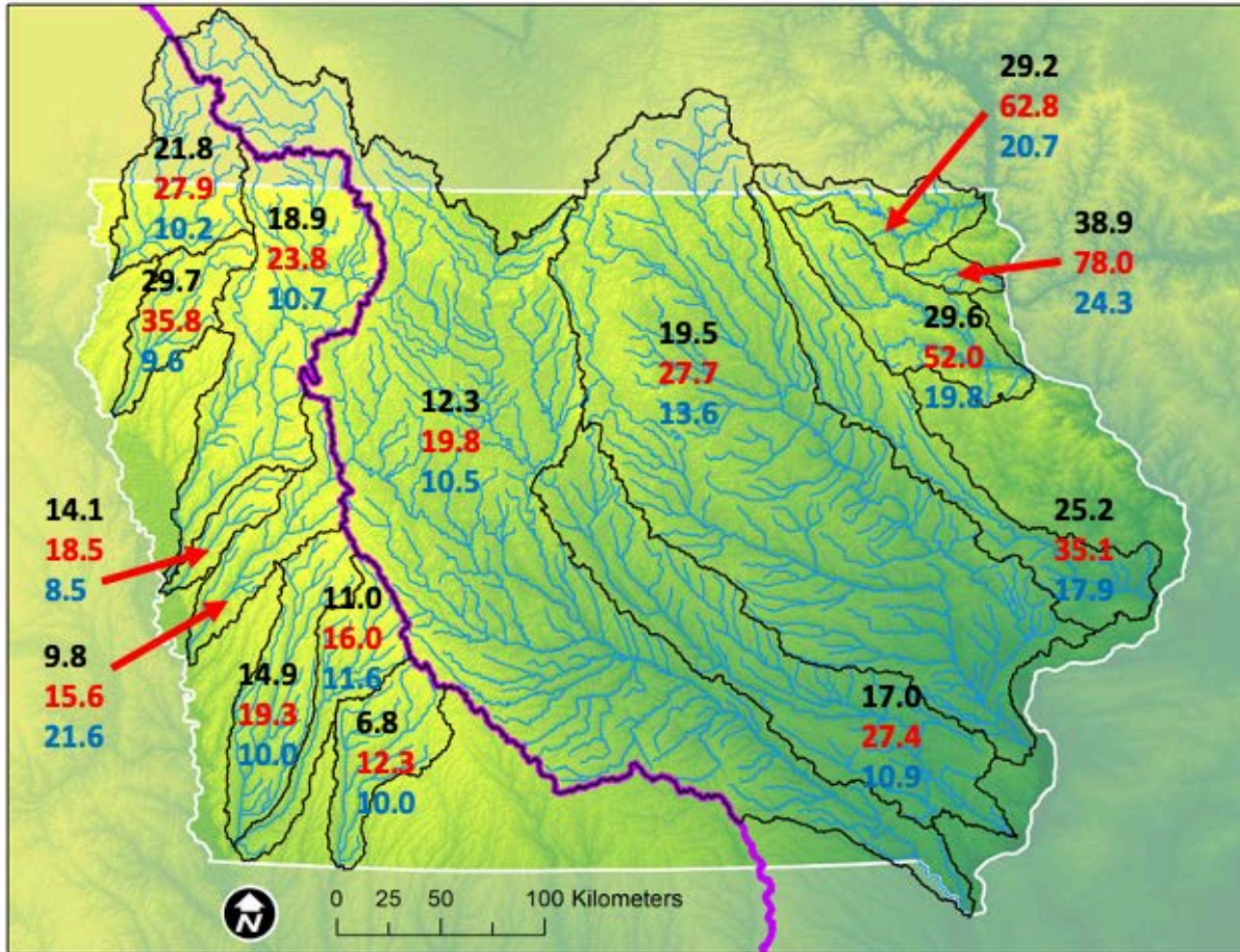
Total Nitrate-Nitrogen Load: 191 million pounds (31% of state total)

Total Water Discharge:  $1.18 \times 10^{10}$  cubic meters

Nitrogen Loss per acre: 17.1 pounds

Nitrogen Loss per crop acre: 22.7

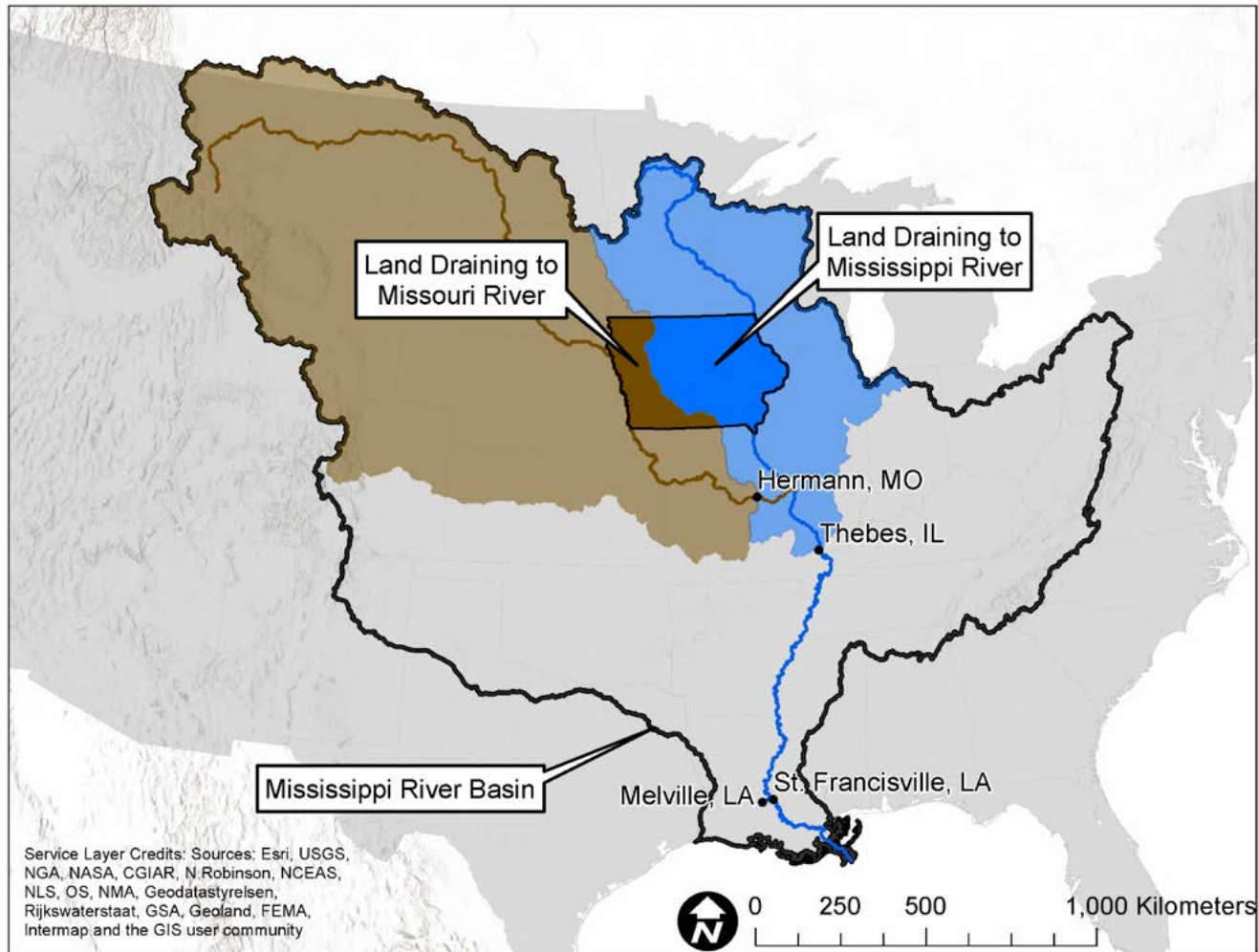
Water Yield (runoff per watershed area): 10.0 inches



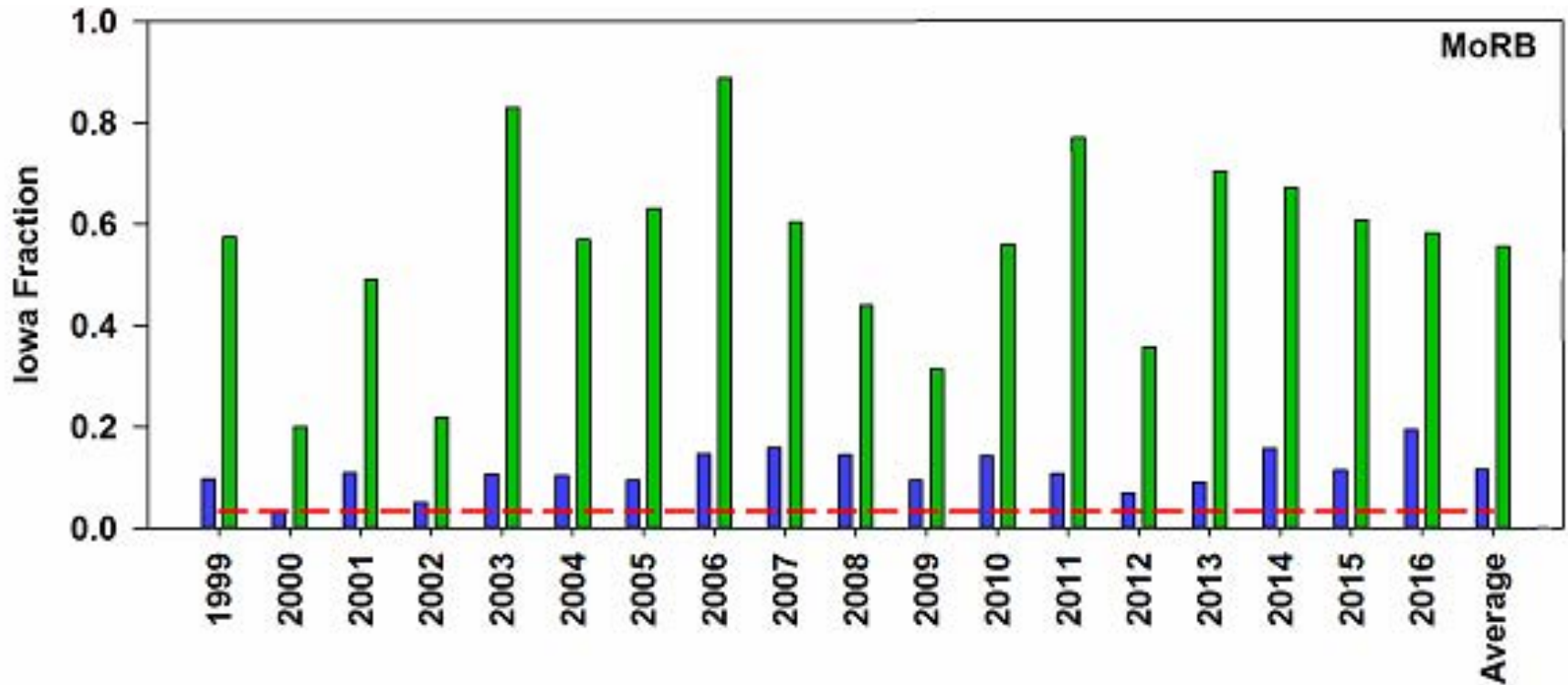
**Black: lbs/acre**

**Red: lbs/crop-acre**

**Blue: Runoff (inches)**

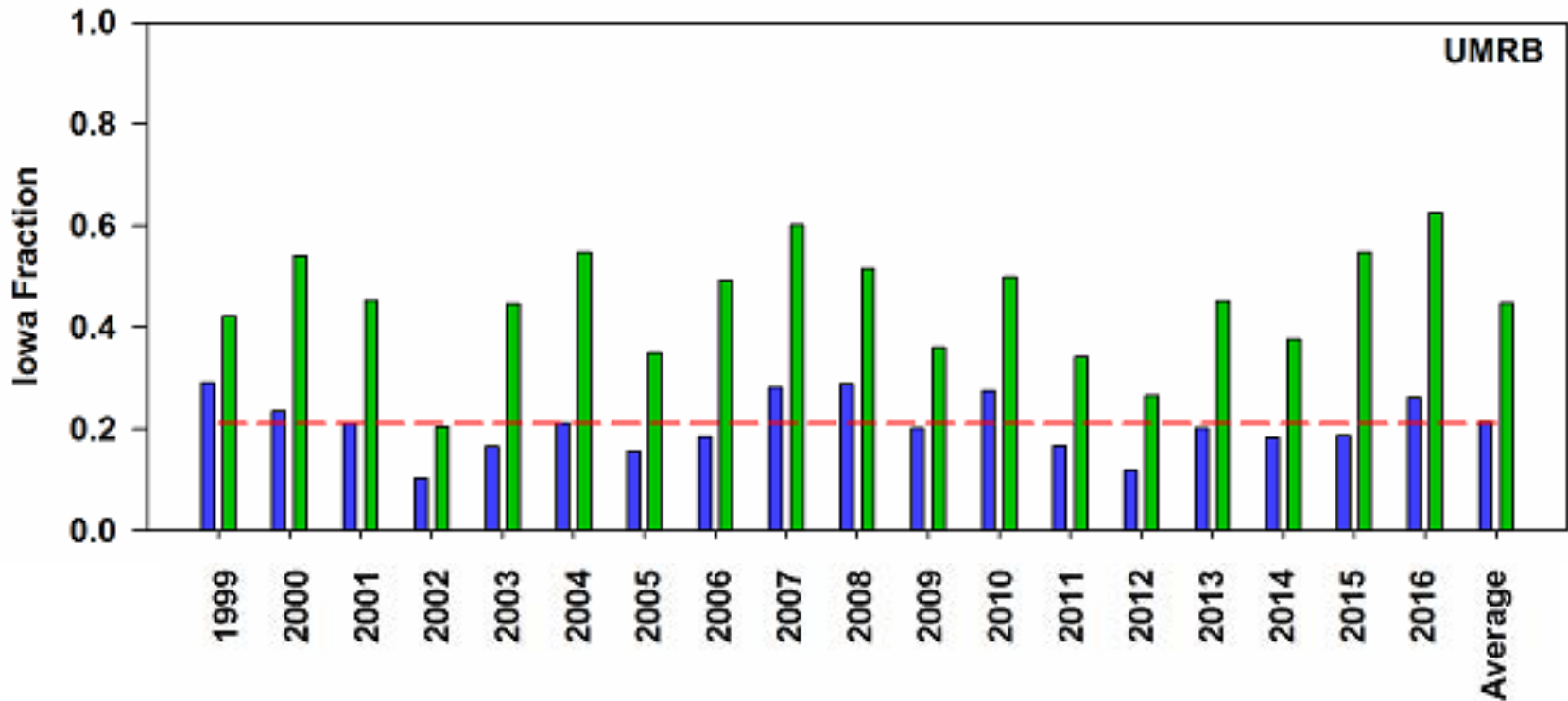


# Missouri



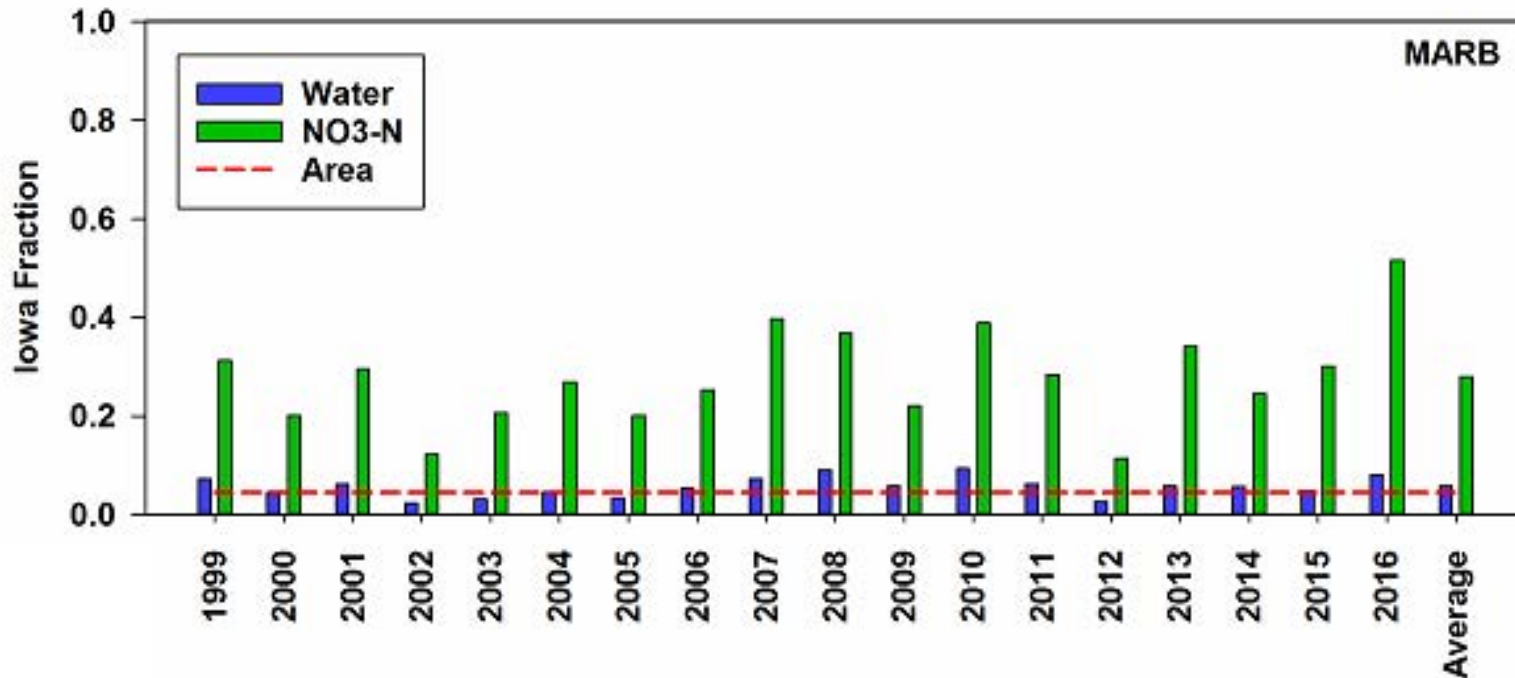
**3.3% of the land**  
**12% of the water**  
**55% of the nitrate**

## Upper Mississippi



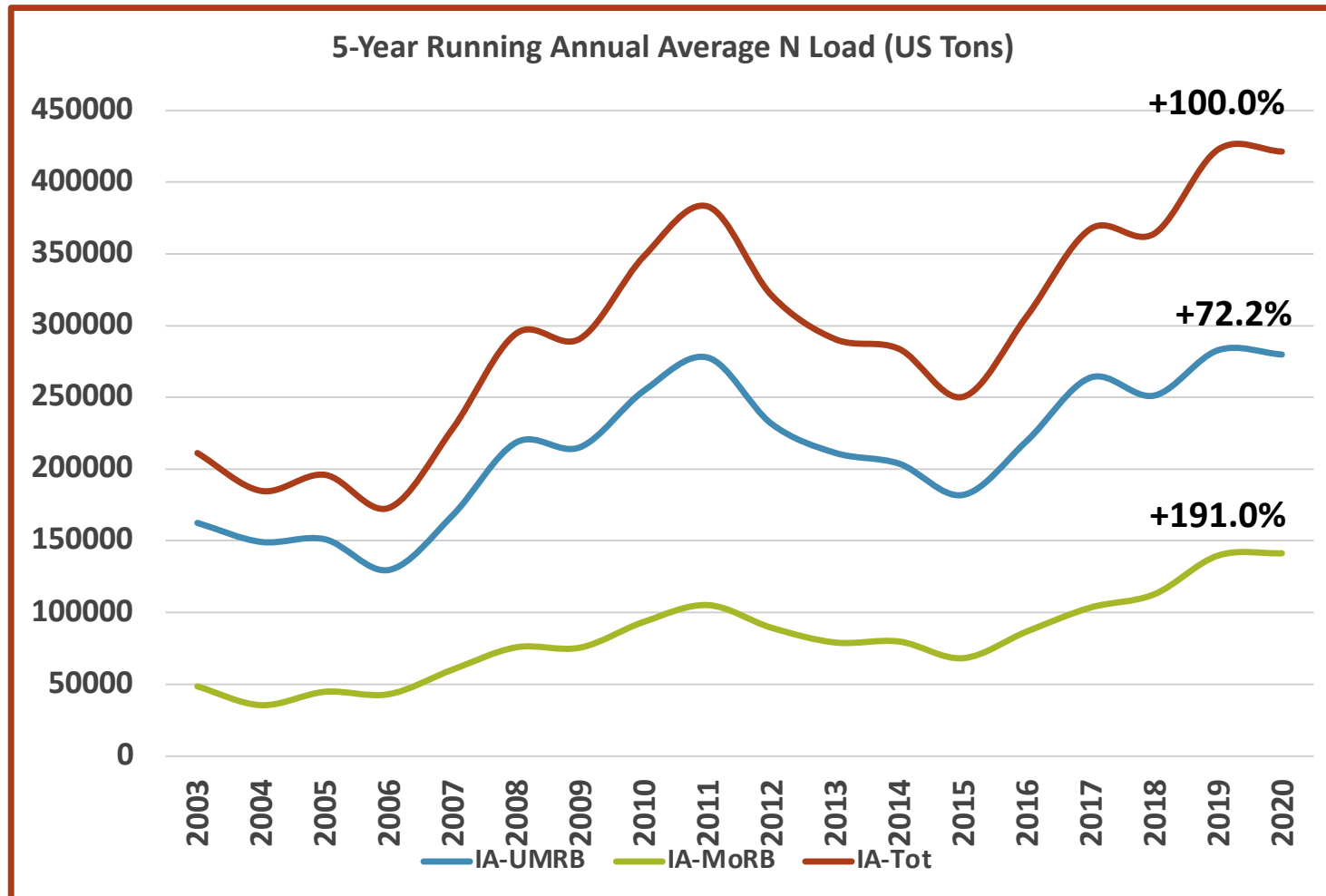
**21% of the land**  
**21% of the water**  
**45% of the nitrate**

## Mississippi-Atchafalaya-Gulf of Mexico



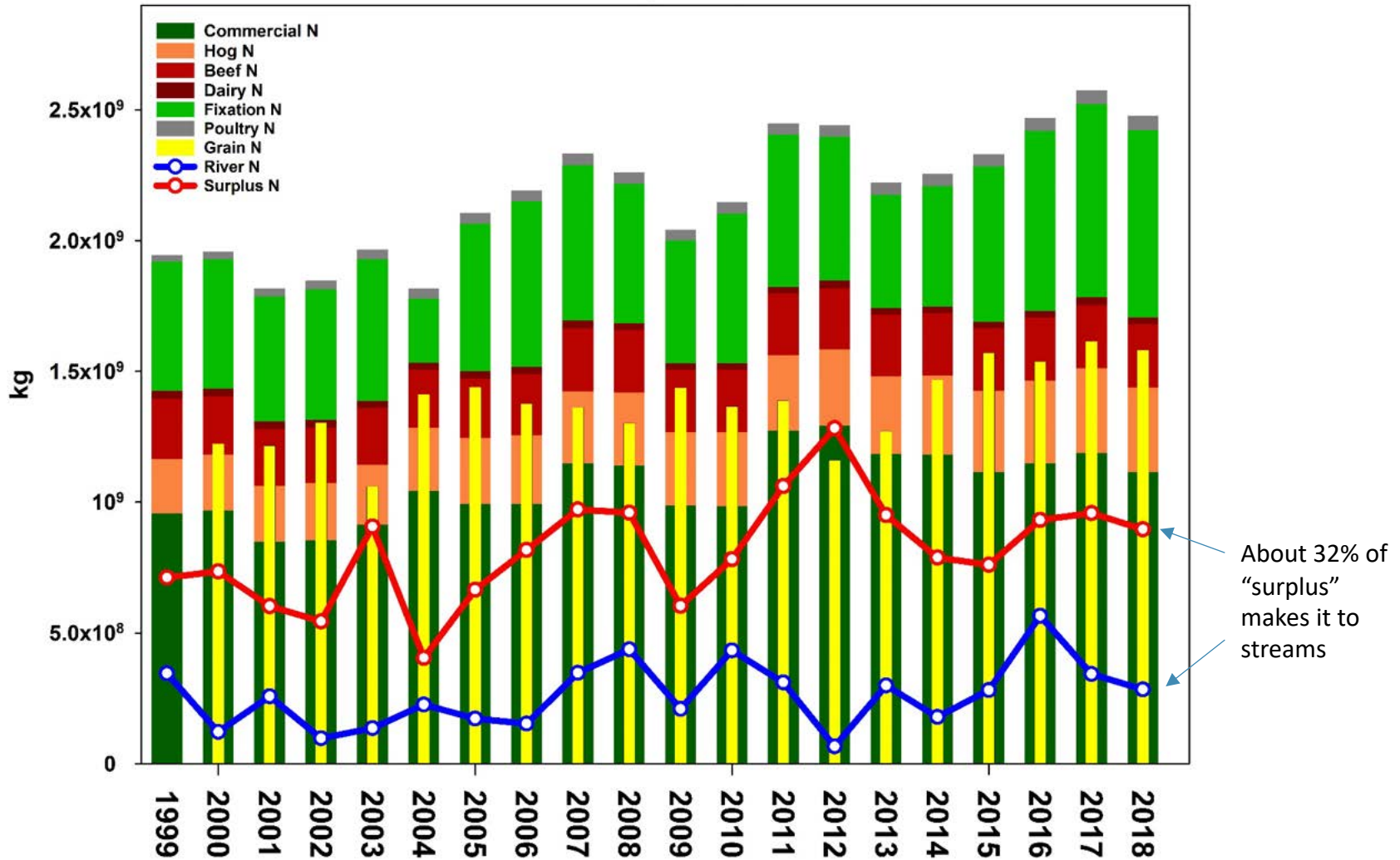
4.5% of the land  
5.9% of the water  
29% of the nitrate

# How Much Nitrogen Leaves Iowa?

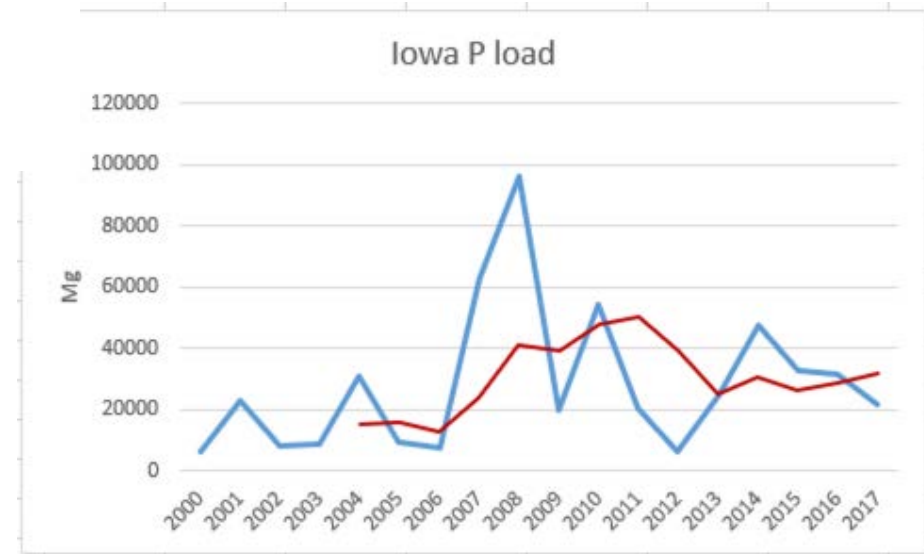
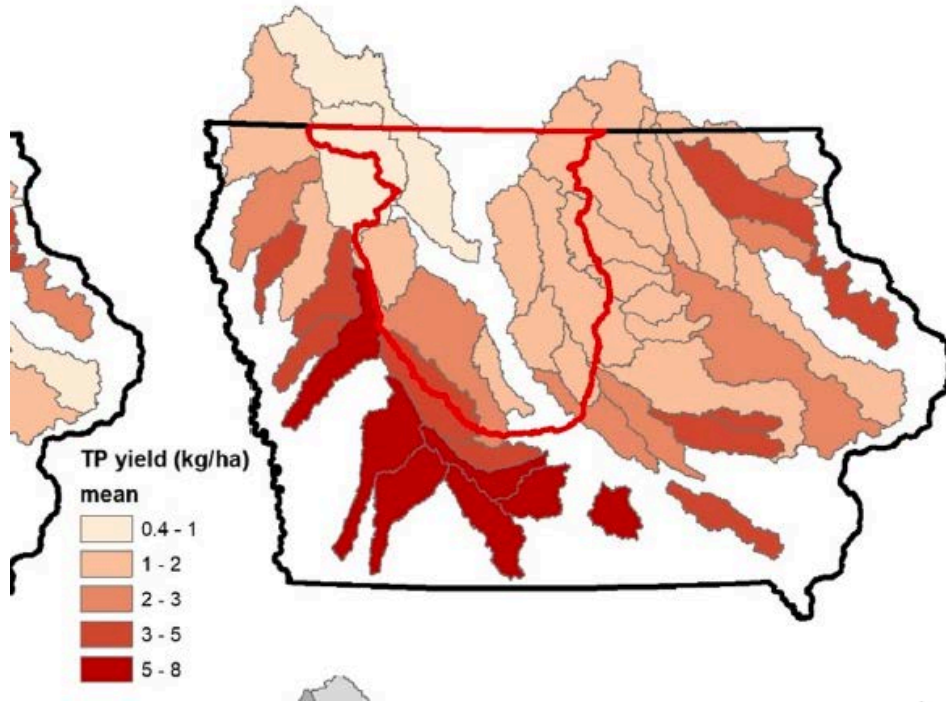




Iowa Statewide Nitrogen Inputs and Outputs



# Phosphorus



Can we “soil  
health” our way  
out of this?

## Nitrogen Change (%) Since 1999

N Category	% change
River	83
Chicken	76
Turkey	59
Hogs	59
Surplus	51
Fixation	41
total inputs	36
Commercial	34
Grain N	27
Beef	10
Dairy	-11

