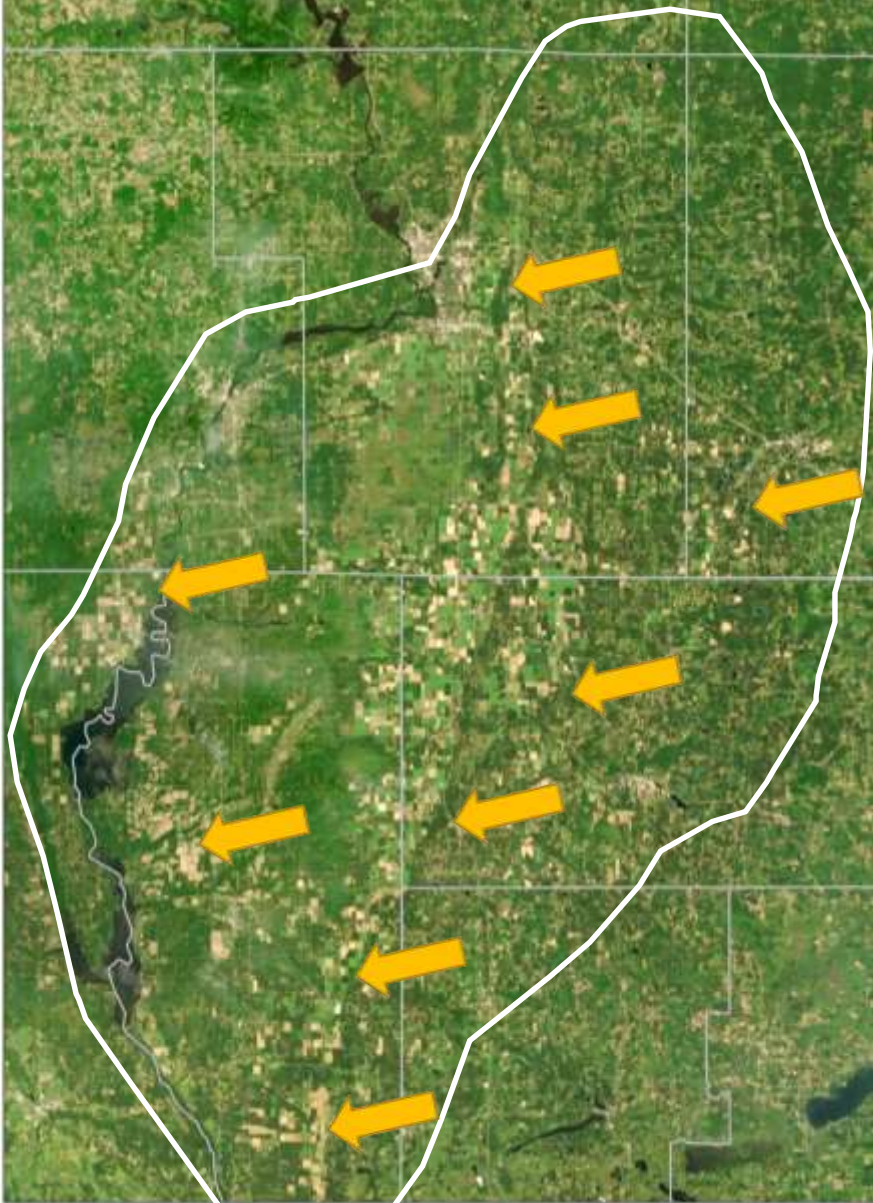
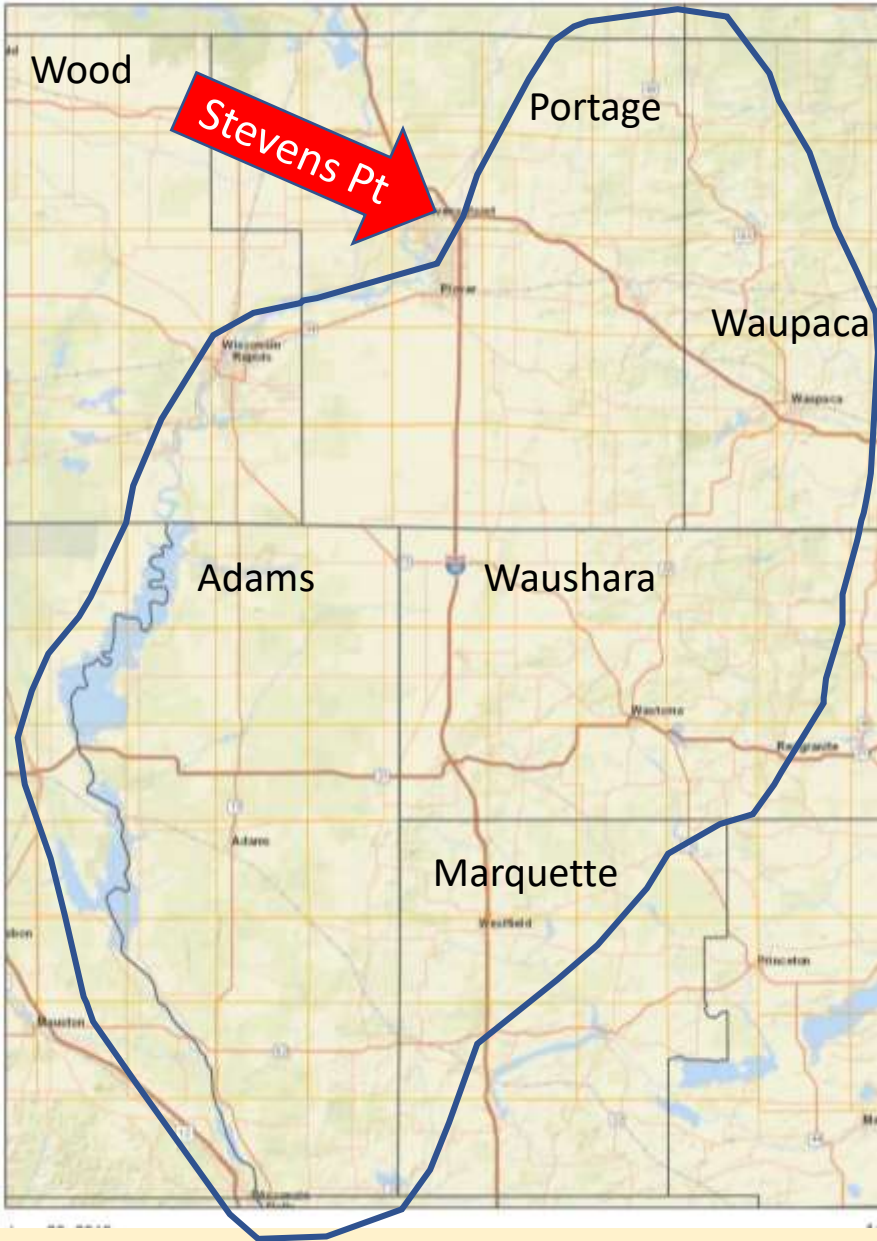


# Invited Testimony of George J Kraft

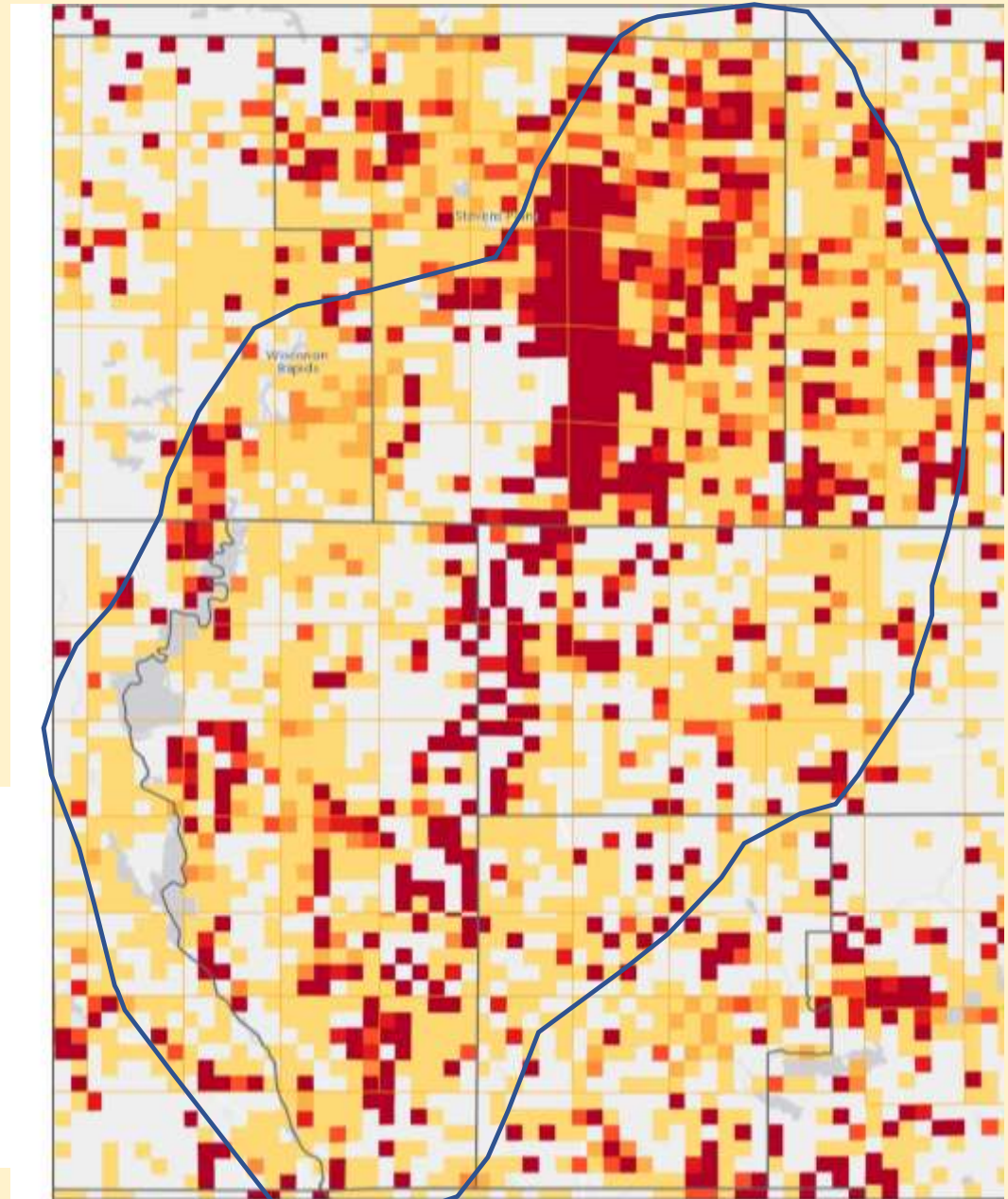
Professor Emeritus of Water Resources  
University of Wisconsin – Stevens Point and Extension

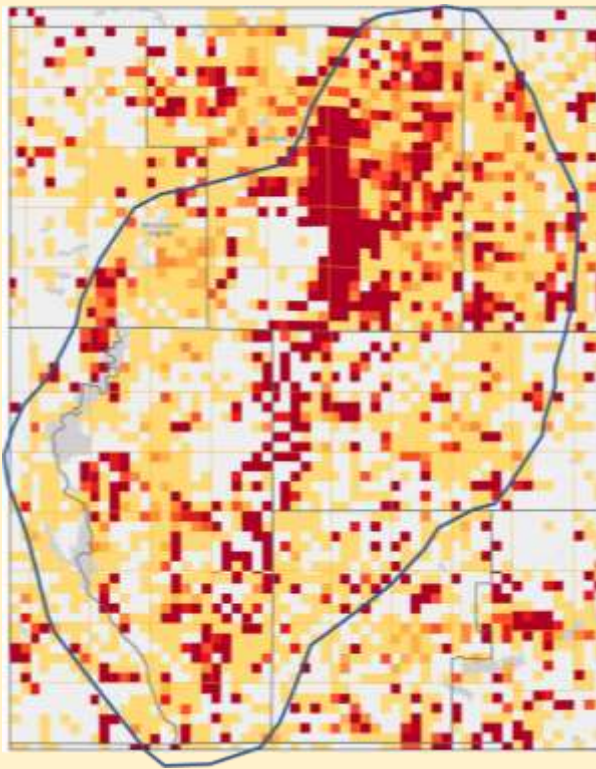
Licensed Professional Hydrologist

# Nitrate

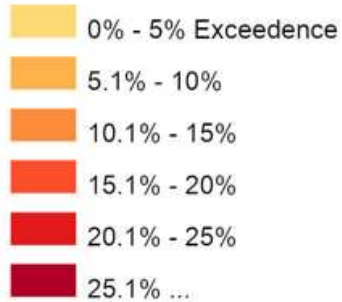


# Nitrate Exceedence Rate - % of Samples



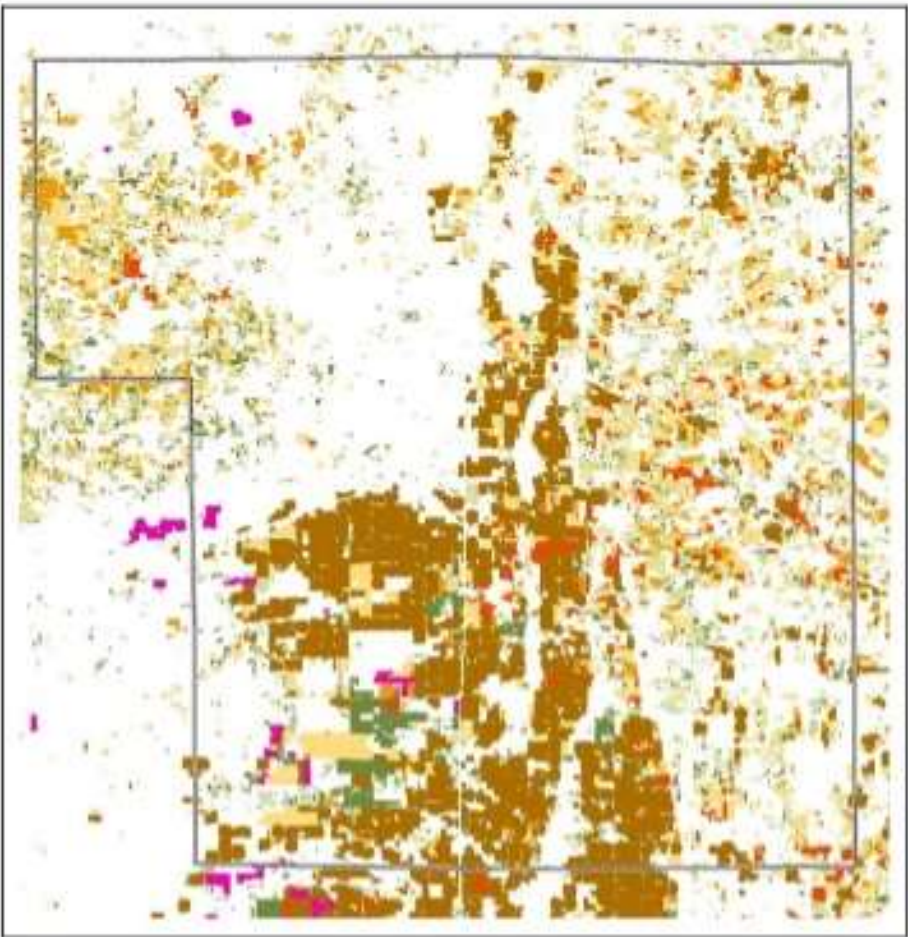


Nitrate - Percent - Exceedence by Section



*% of samples exceeding nitrate standards in some central Wisconsin Towns*

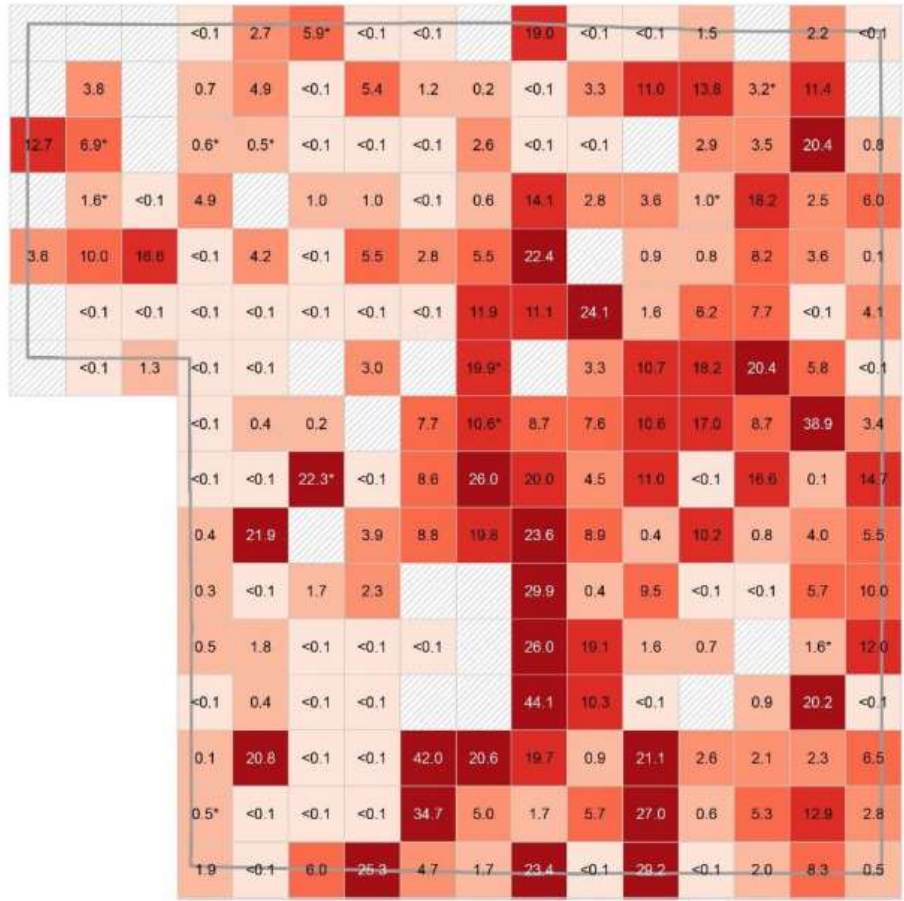
<b>County</b>	<b>Town</b>	<b>% Exceedence rate</b>
Adams	Leola	<b>37.0</b>
Adams	Lincoln	<b>36.2</b>
Adams	Strong's Prairie	<b>35.5</b>
Portage	Pine Grove	<b>45.9</b>
Portage	Buena Vista	<b>41.6</b>
Portage	Almond	<b>32.0</b>
Waupaca	Dupont	<b>22.4</b>
Waushara	Oasis	<b>43.7</b>
Waushara	Plainfield	<b>41.1</b>
Waushara	Hancock	<b>35.4</b>
Waushara	Deerfield	<b>25.6</b>
Waushara	Coloma	<b>22.0</b>



Source: Wisland 2.0

### Agricultural Landcover Classification

- Cash Grain
- Continuous Corn
- Dairy Rotation
- Potato/Vegetable
- Cranberries
- Hay
- Pasture



### Nitrate (mg/l as N)

- Not Sampled
- Not Detected
- ... 2.0
- 2.1 - 5.0
- 5.1 - 10.0
- 10.1 - 20.0
- 20.1 ...

# Nitrate Pollution Facts and Why's

- Nitrate has been increasing since the 1950s with the increasing use of fertilizers
- Nitrate exceedences were rare in Wisconsin 40 years ago, now ~10% Wisconsin wells exceed standard
- Why? Fertilizer N is applied at economic optimum rates, where plant uptake is inefficient and much ends up in groundwater
- Why? Nitrate pollution costs are externalized - little economic motivation to apply at protective rates
- Applying fertilizer at half the economic optimum might produce ~90% of the optimum economic yield while greatly reducing nitrate pollution

# Pesticide Residues

## % of Wisconsin Wells containing:

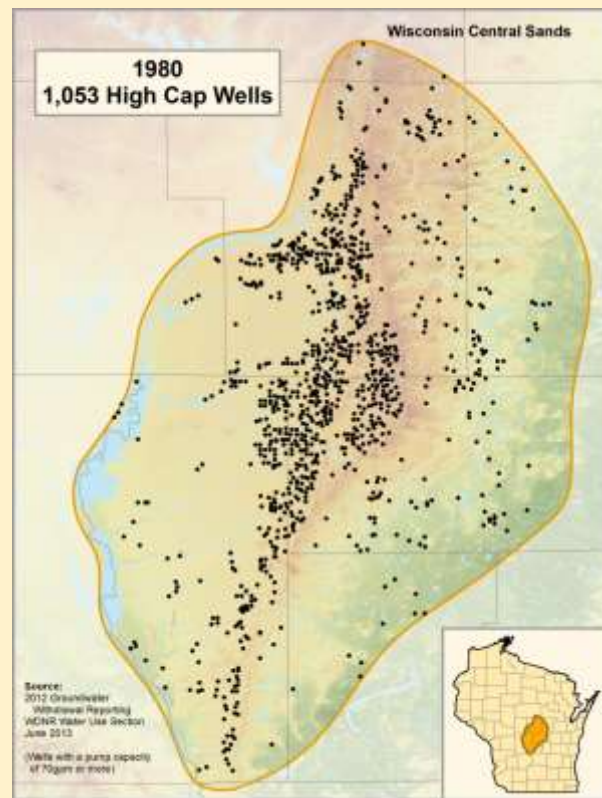
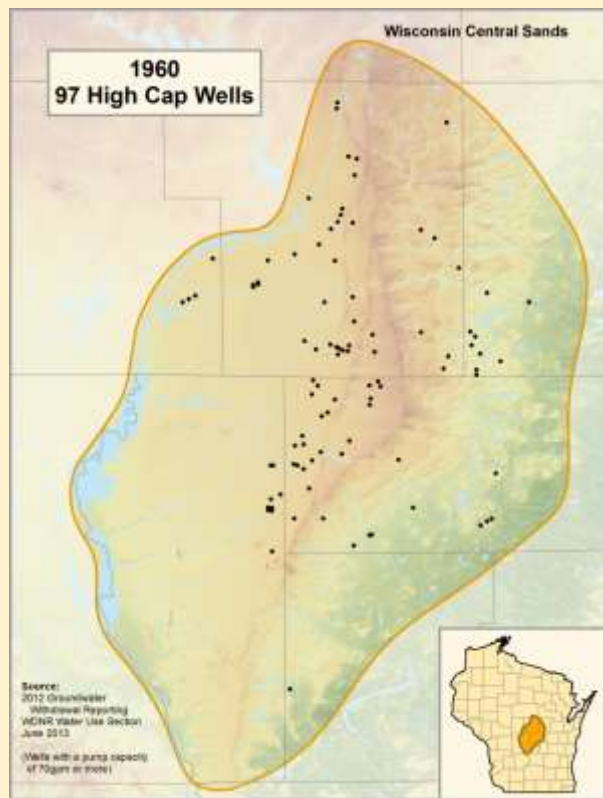
At least 1 pesticide, usually not exceeding standards:	42%
Metolachlor ESA:	32%
Alachlor ESA:	22%
Atrazine residues:	23%

\*\*\*\*\*

**Neonicotinoids:** Found in groundwater, well water, and streams at environmentally significant concentrations.

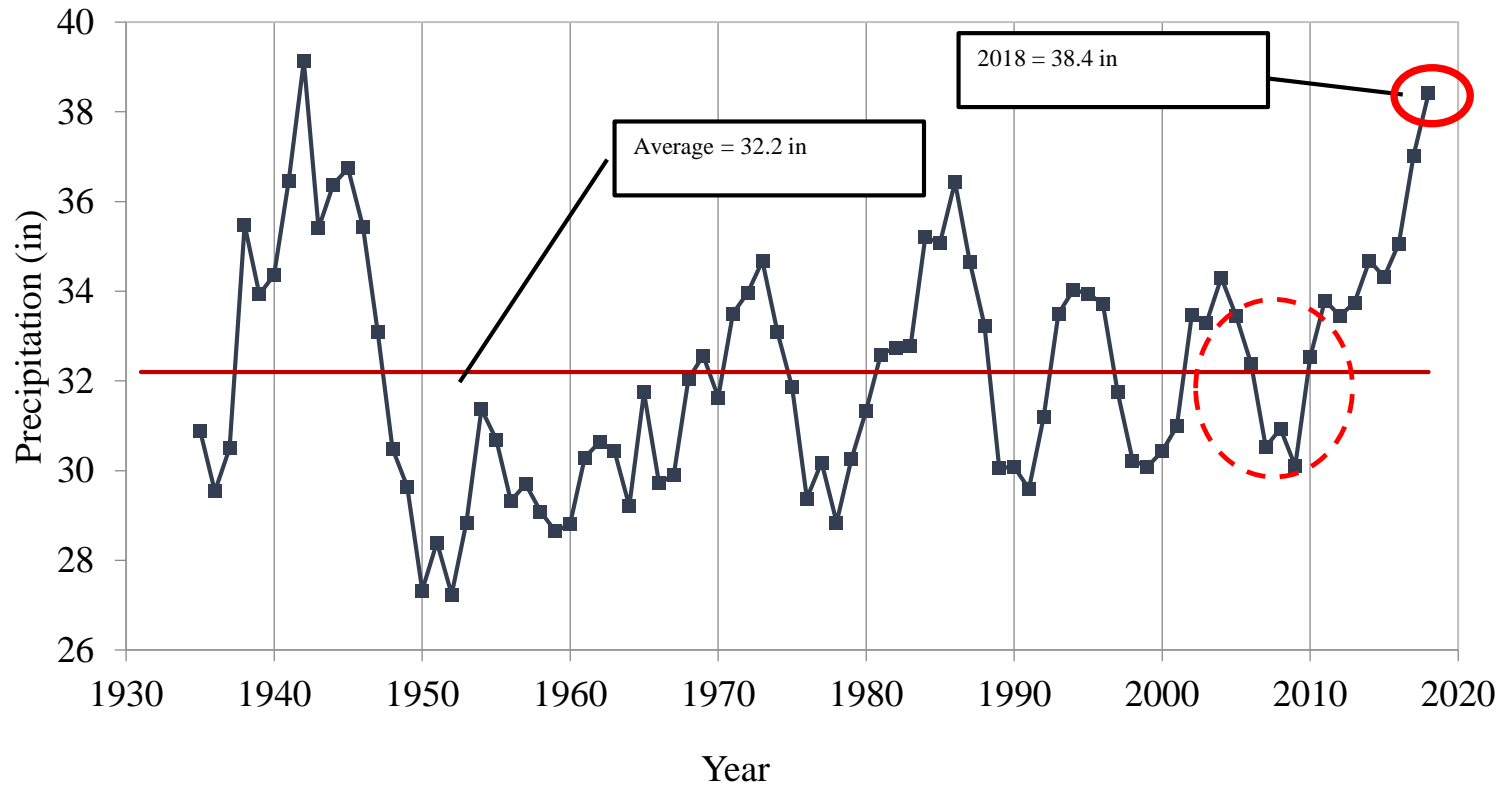
**WE NEED A GROUNDWATER STANDARD**

# Groundwater pumping – High Cap Wells



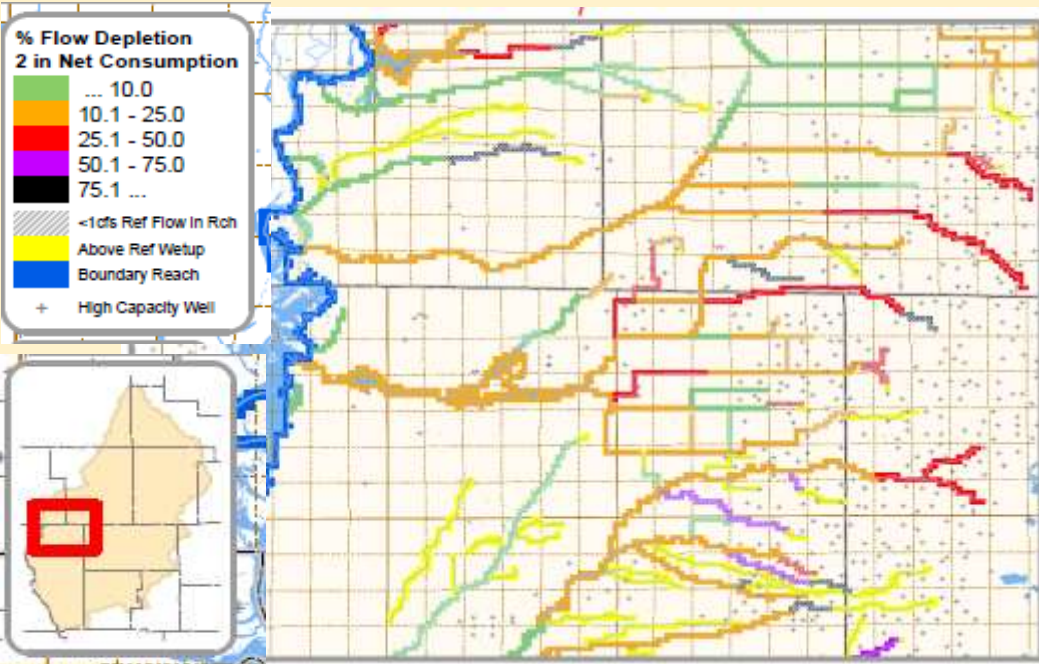


### Stevens Point Five Year Average Annual Precipitation 1931-2018

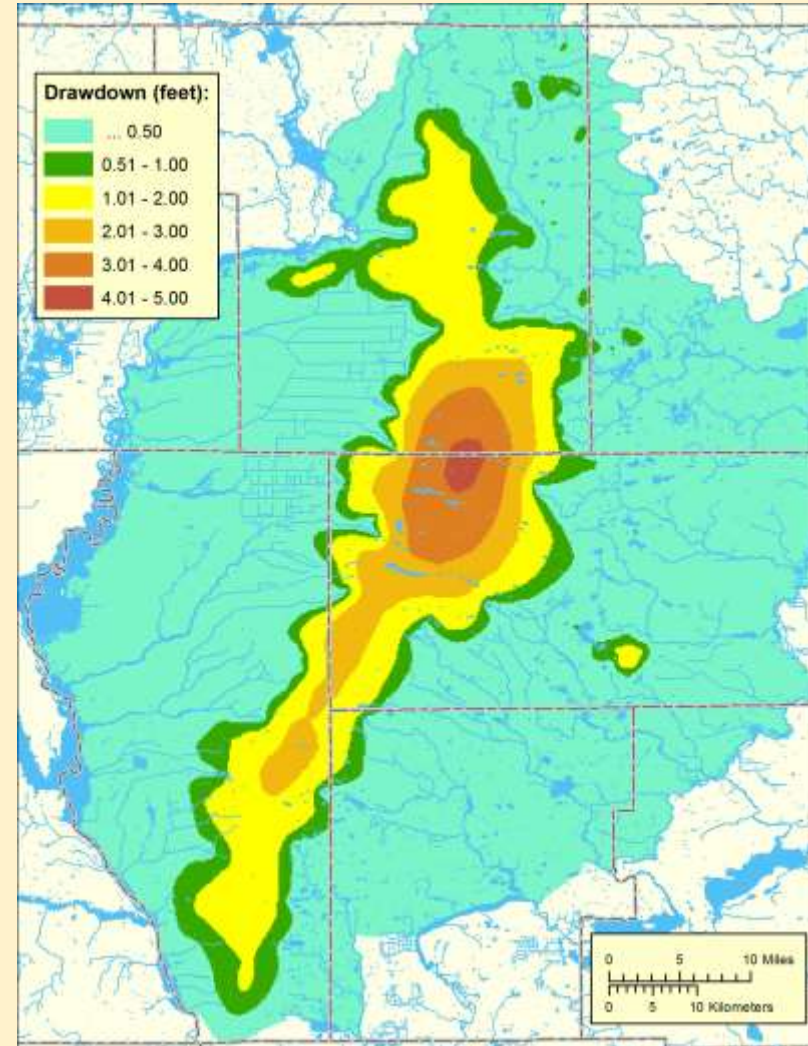




# Stream flow depletion



# Drawdown



## Considerations:

Traditional techno fix-its have not improved water

- Nutrient management plans
- Fertilizer “spoon feeding”
- University recommendations, BMPs, etc
- Low pressure nozzles, irrigation scheduling
- “We spend lots of money on research”
- Voluntary approaches without an imposed goal

## Considerations:

Traditional projects and social processes have not improved water

- USDA Stevens Point – Whiting – Plover Wellhead Protection Project
- Wisconsin Port Edwards Priority Watershed Project
- Tomorrow River Priority Watershed Project
- 13 years of Little Plover Workgroup
- UW-Madison WISA water management project
- Food, Land, and Water Project (by Wisconsin Land and Water)

# Some Specific Action Ideas

## Get good information

- Use vetted science and evidence-based information
- Use the science talent you have available to you  
(Deans C. Thomas and K. VandenBosch as Co-Chairs?)

# Some Specific Action Ideas (cont'd)

## Public Health Protection

- Approve groundwater standards for neonics, PFAS, others
- Subsidize private well testing and safe water sources

## Central Sands Groundwater Study from 2017 Act 10

- Fund to completion
- Ask DNR to apply study to all impaired waters in study area

# Some Specific Action Ideas (Cont'd)

## High Capacity Wells

- DNR reviews protecting lakes and streams were halted by Speaker Vos. 700 new wells have gone in since without review. The legislature can fix this immediately.
- Comprehensive groundwater pumping management needed

## If You Really Want to See Improvements...

- Set goals and work backward to see what practices will get us there
- Nonvoluntary approaches may be required