

# Groundwater Management Challenges



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**Division of Ecological and Water Resources**



# Minnesota State Agency Roles in Groundwater

## Quality

## Quantity

### MDH

Public water supply  
Well construction  
Health risk assessment

### MPCA

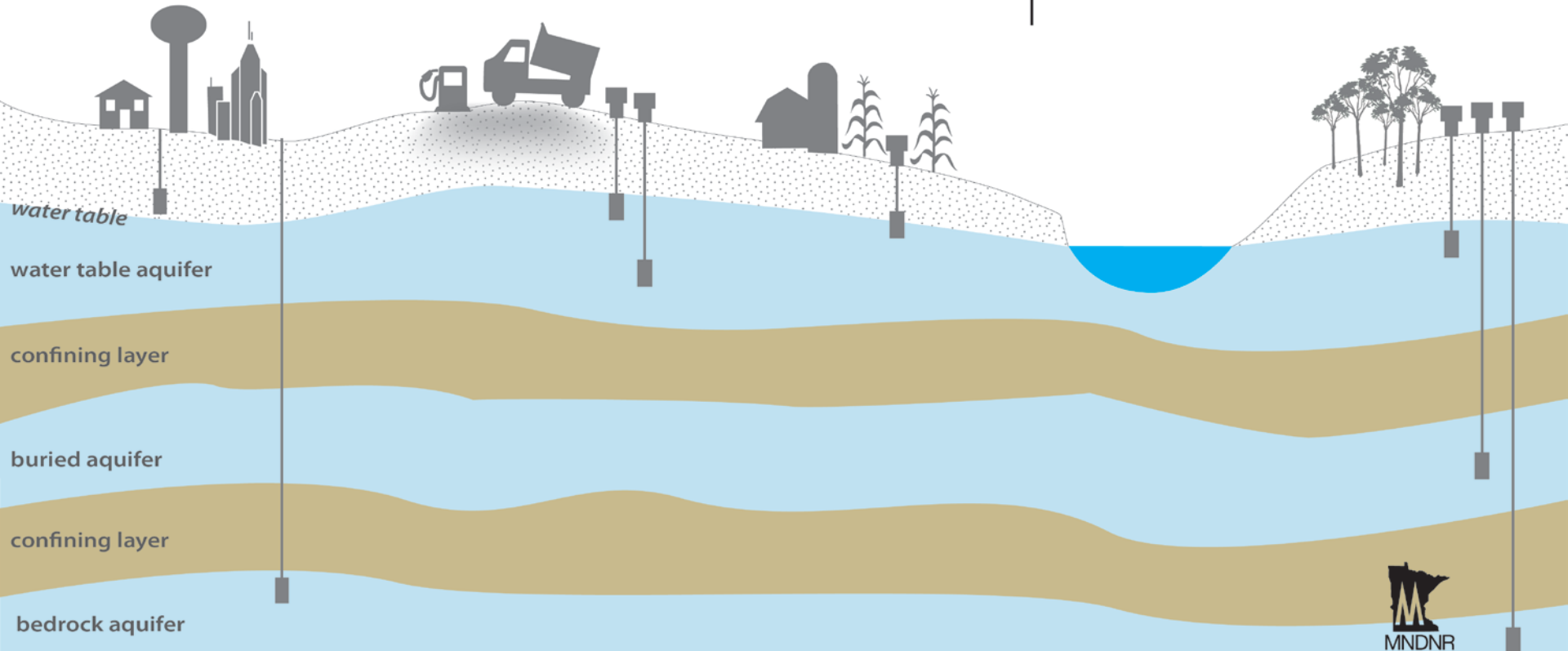
Chemical releases  
Industrial pollutants  
Chemicals from  
consumer products

### MDA

Pesticides  
Fertilizer

### DNR

Water supply/availability  
Natural resource/ecosystem functions





# DNR Strategies

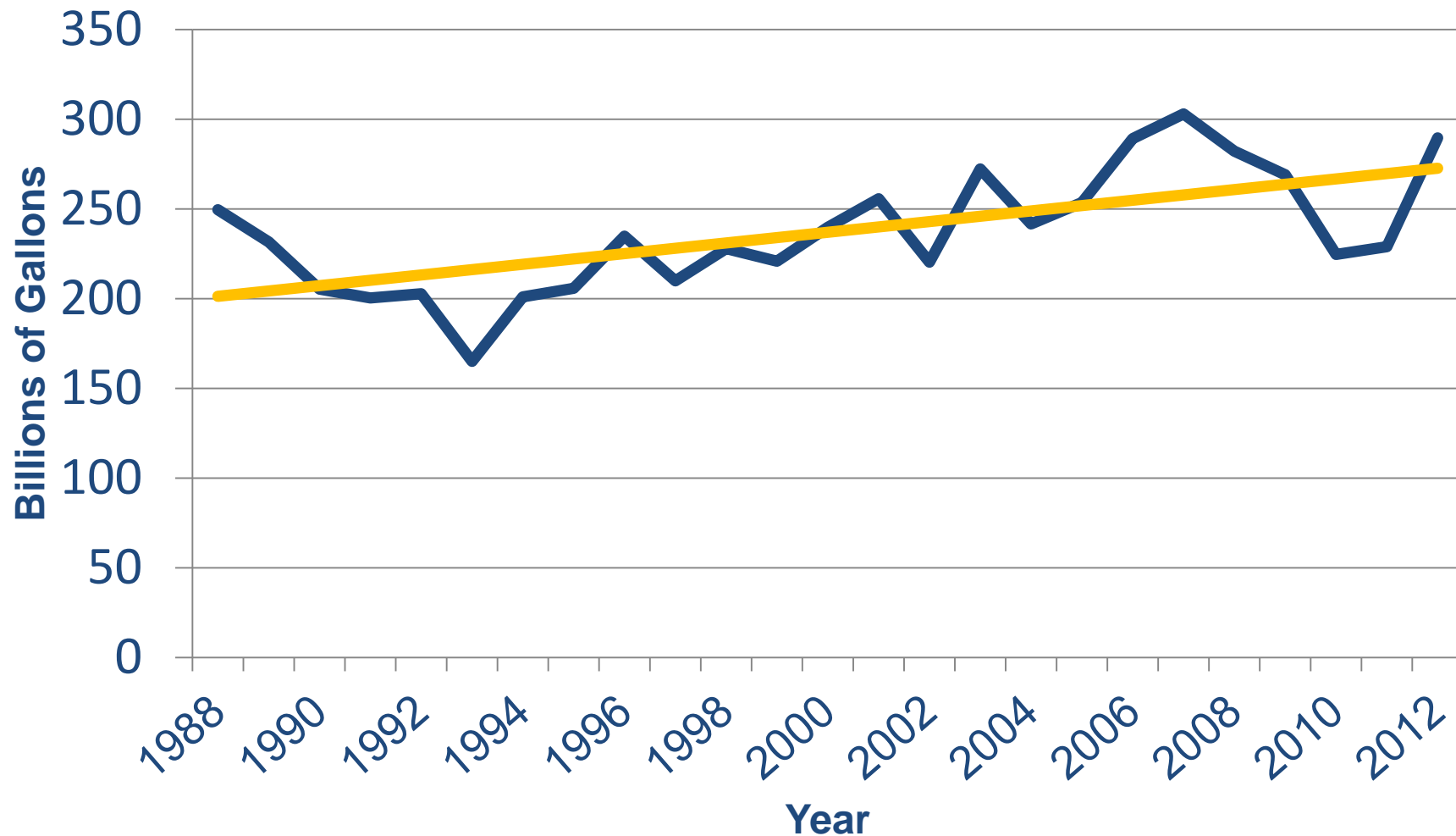
- 1. Heighten the priority given to groundwater**
- 2. Enhance the information available for decisions**
- 3. Improve management of appropriation permits**
- 4. Improve compliance with permits and regulations**
- 5. Improve communication and education**
- 6. Effectively address challenges in areas of high use**
- 7. Promote water conservation and wise use practices**



# **Groundwater: At Risk of Overuse and Contamination**

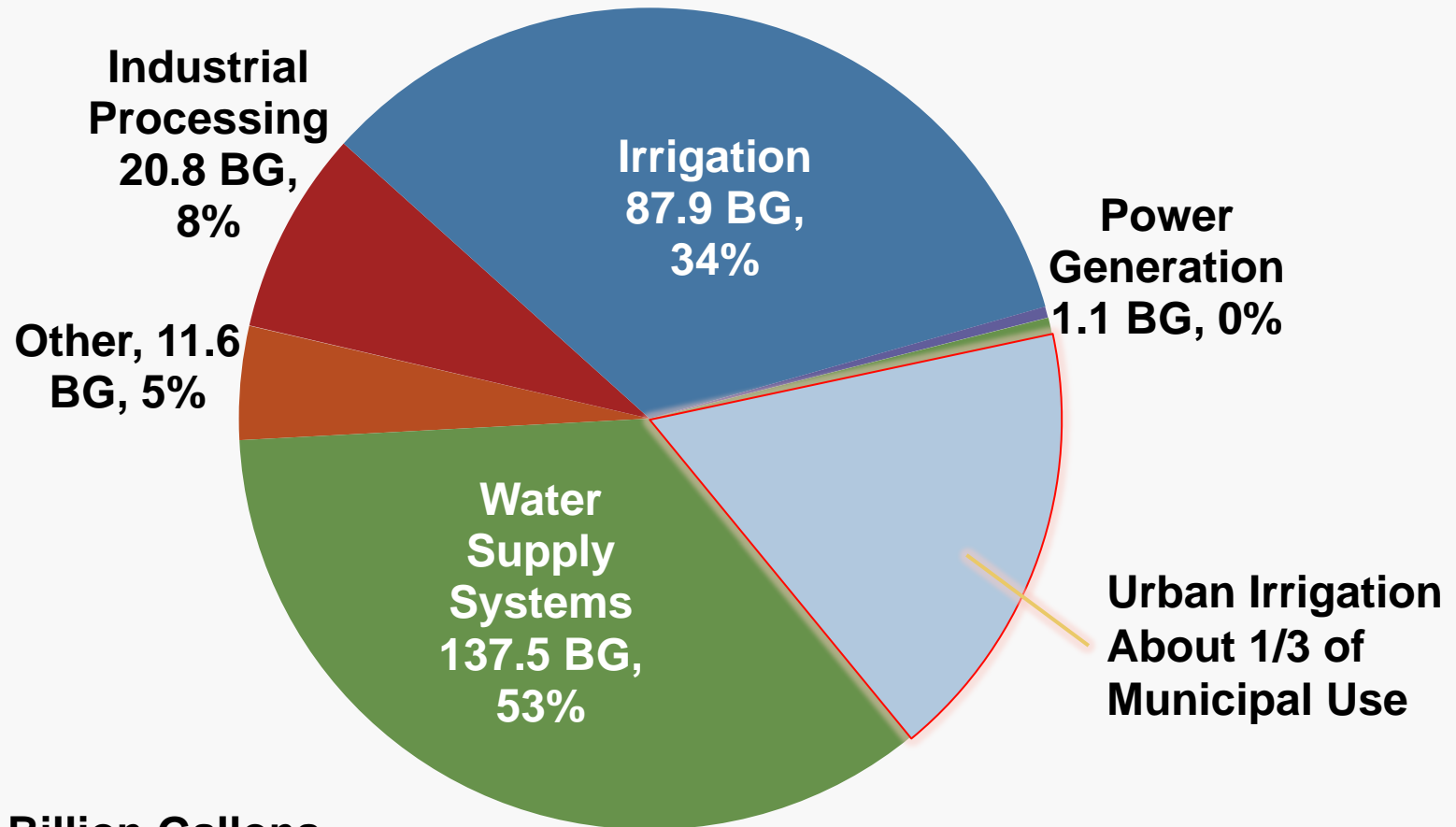


# Statewide Annual Reported Groundwater Use



# Groundwater Use Percentages By Major Category

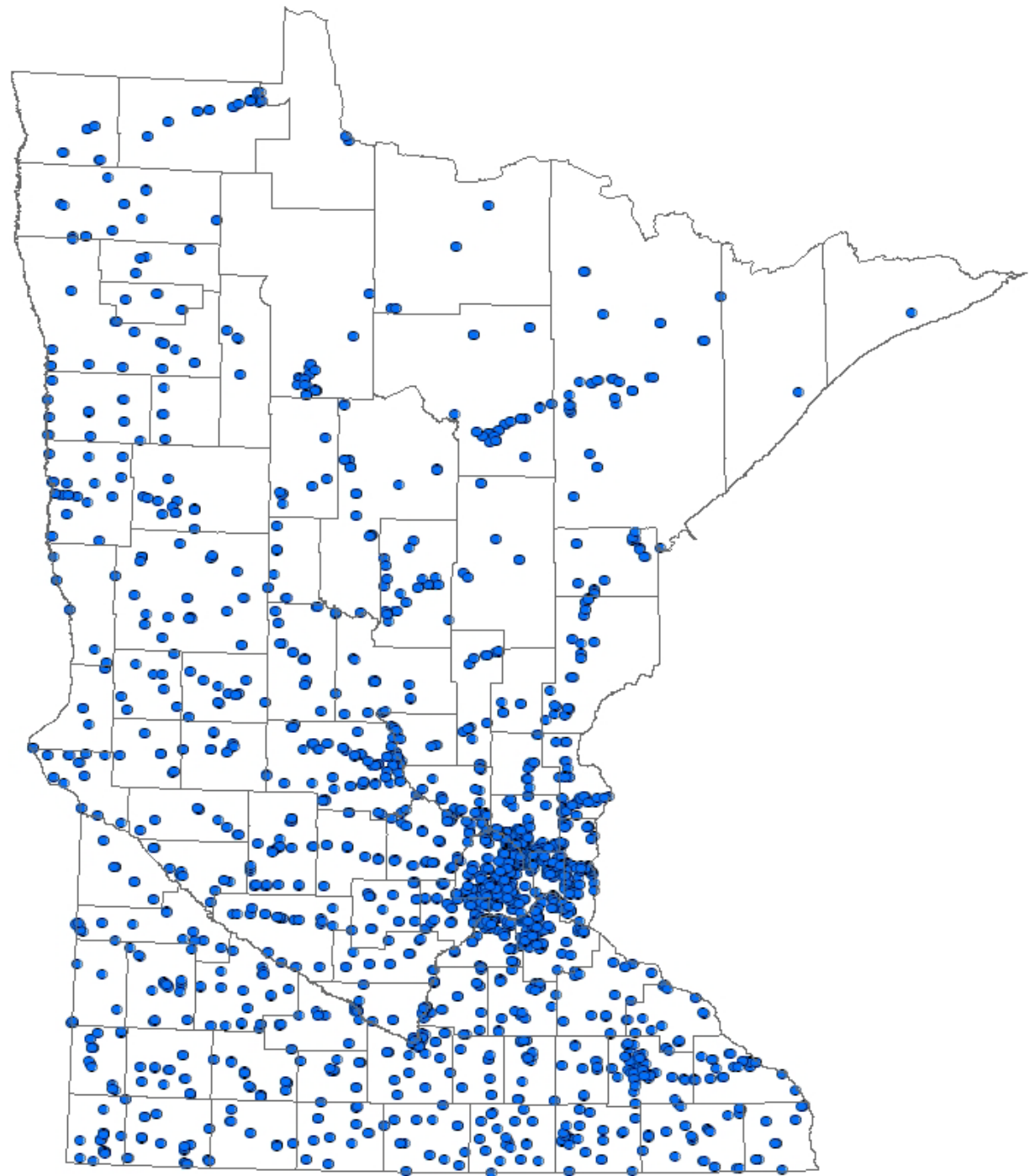
## 5 Year Average from 2008 - 2012



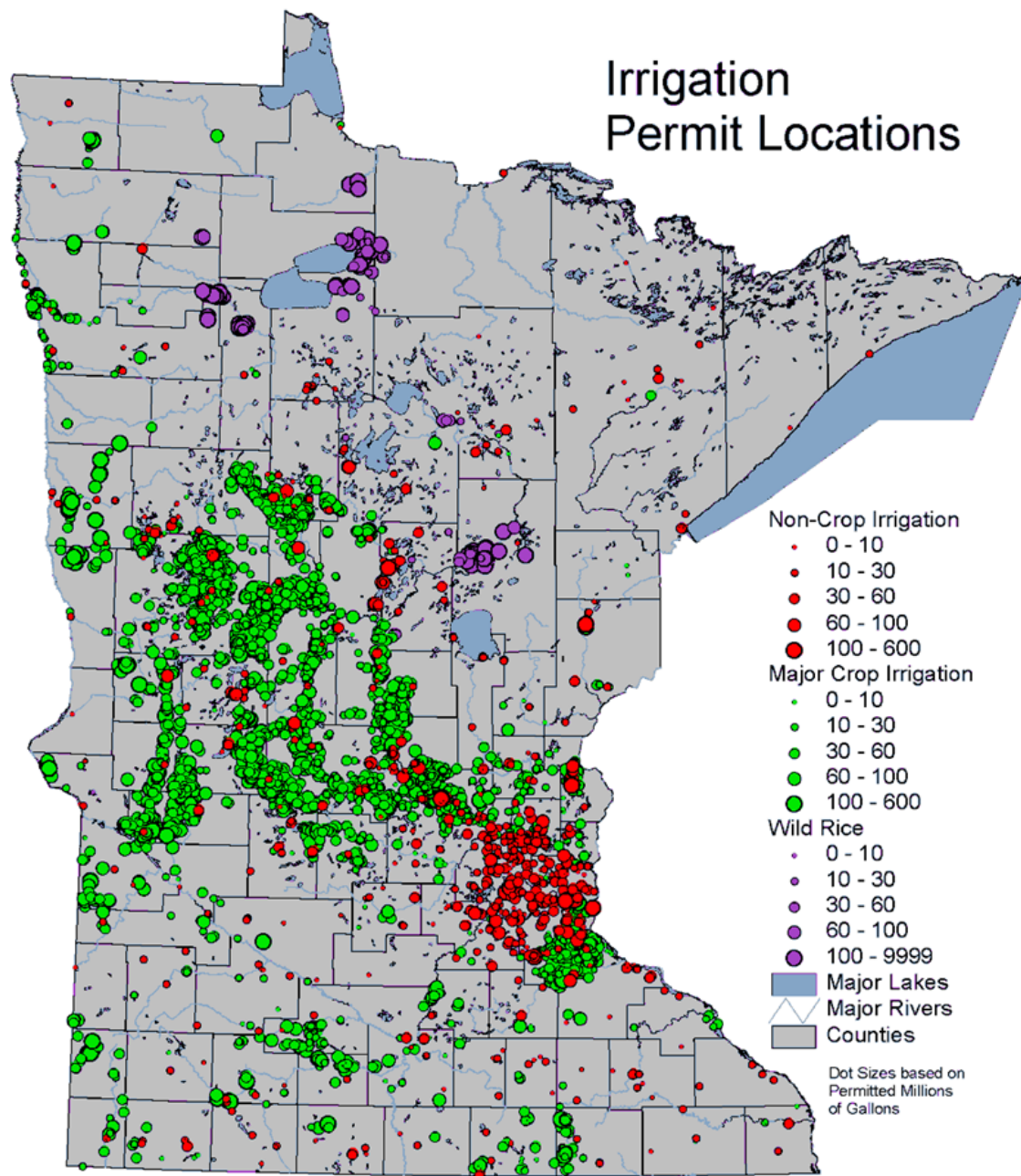
**BG = Billion Gallons**



# Community Water Supply Wells



# Irrigation Permits



50 0 50 100 Miles

Minnesota DNR Waters  
Water Appropriation Permit Program

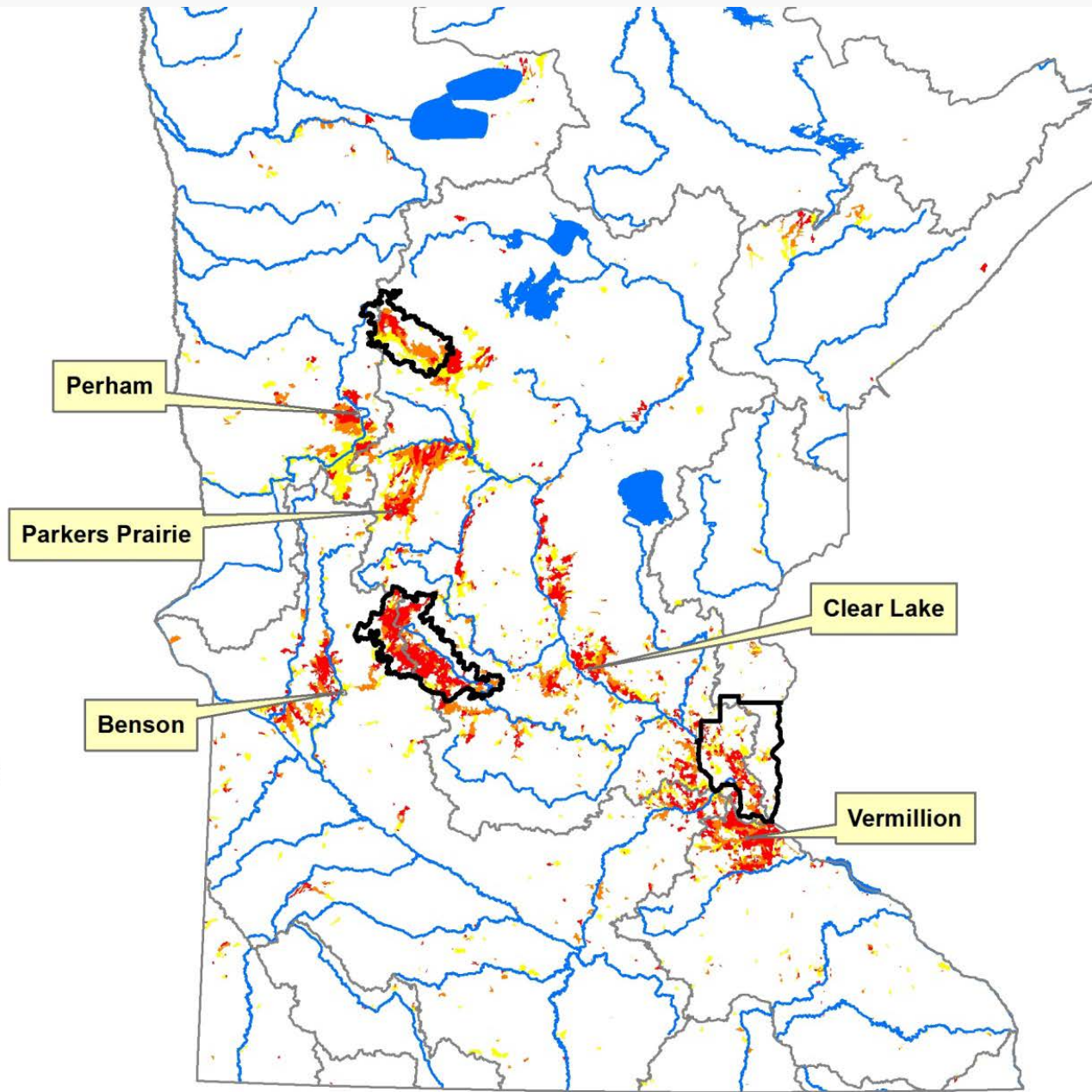
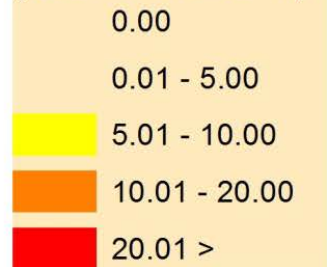






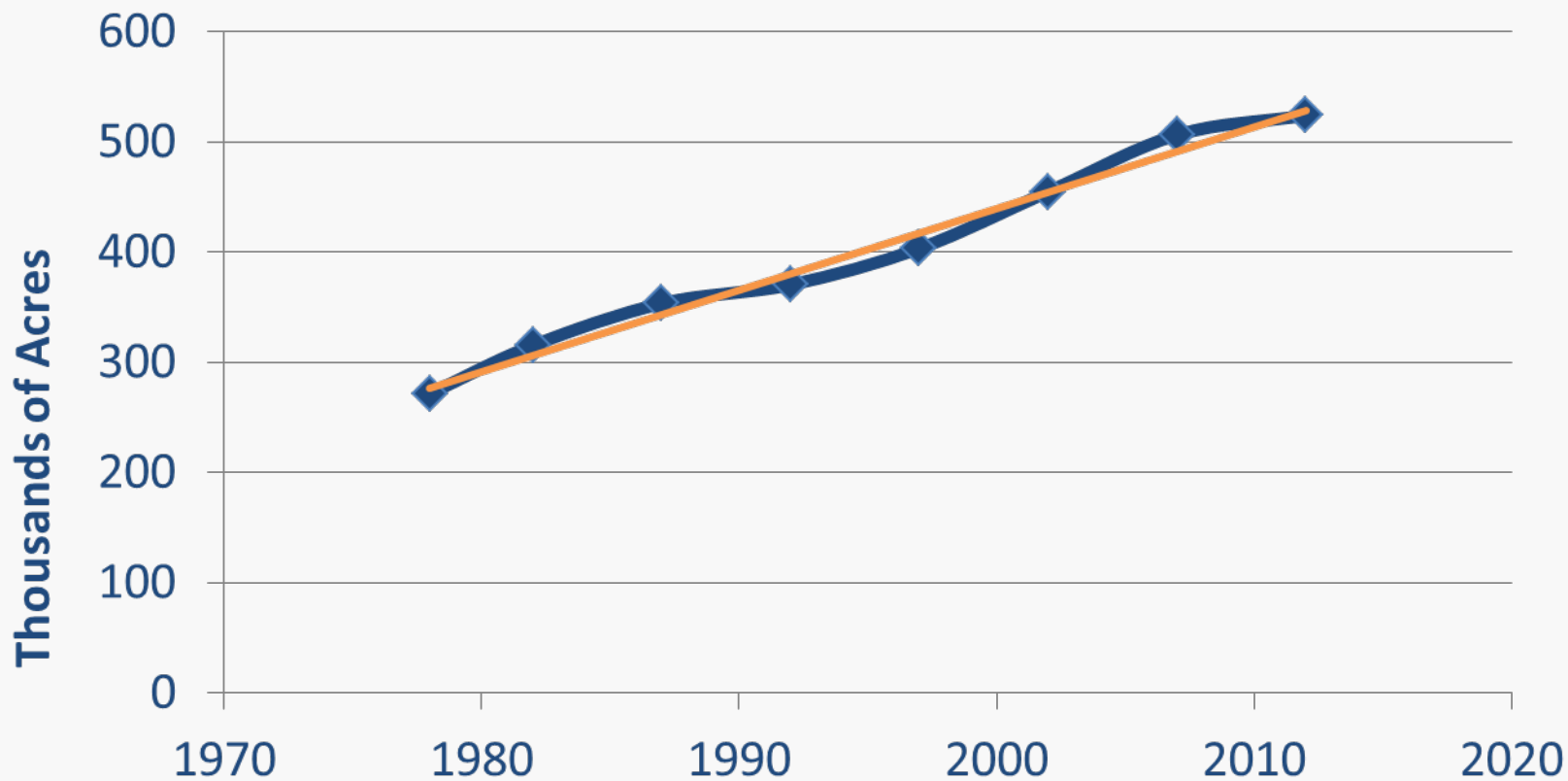
### DNR Level 09 Catchments

Water Use Index  
(use/available %)



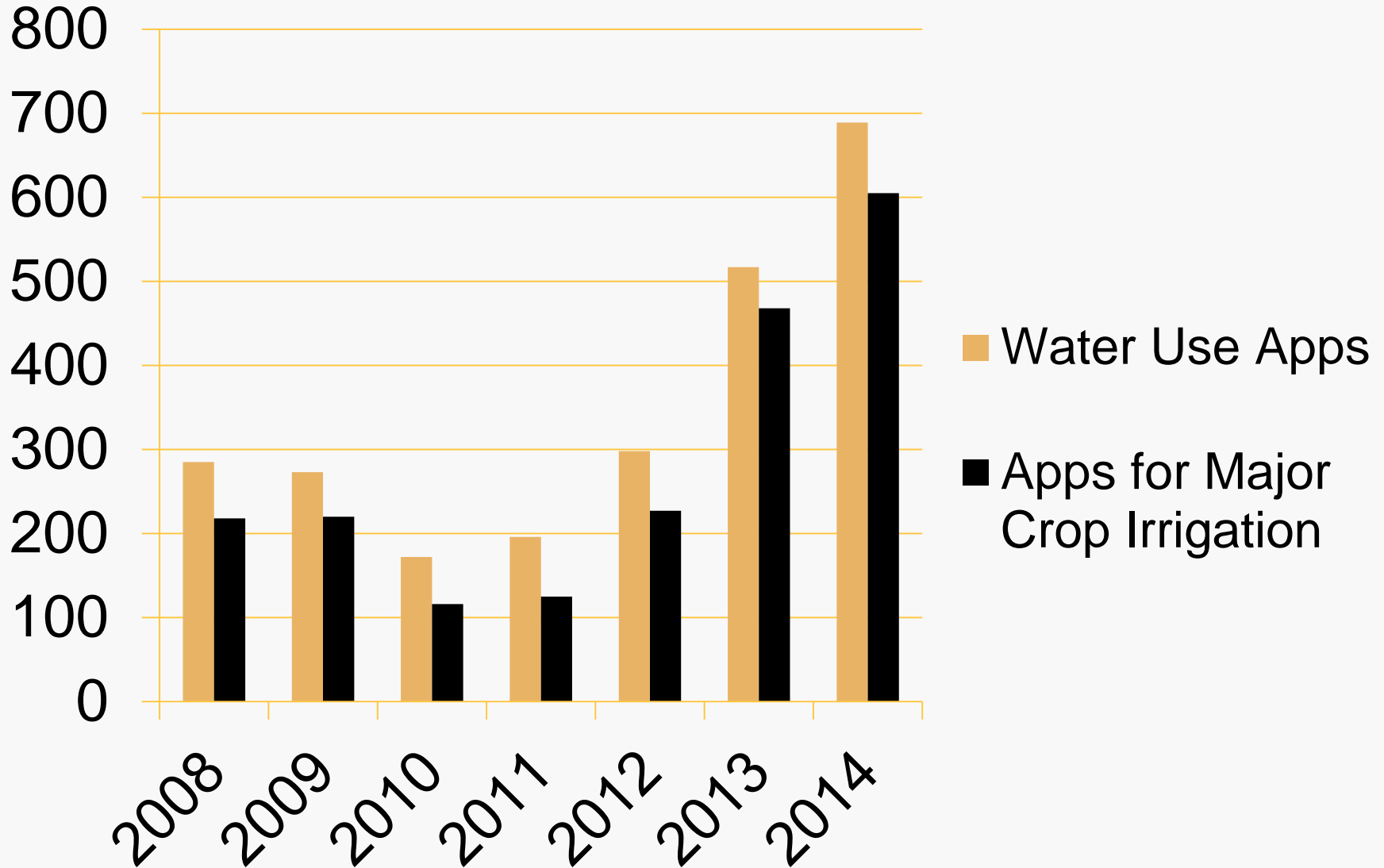


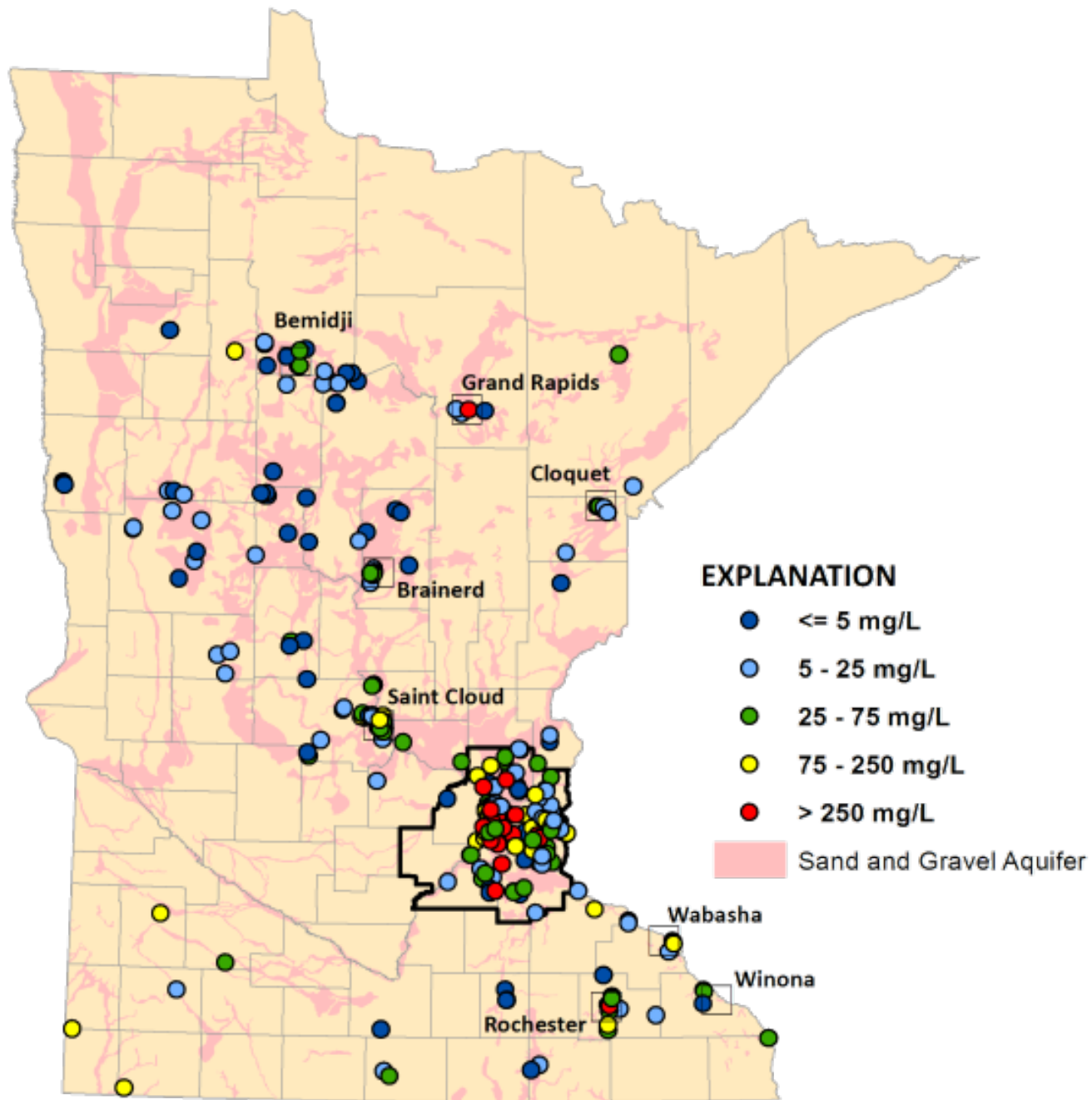
# Minnesota Irrigated Cropland



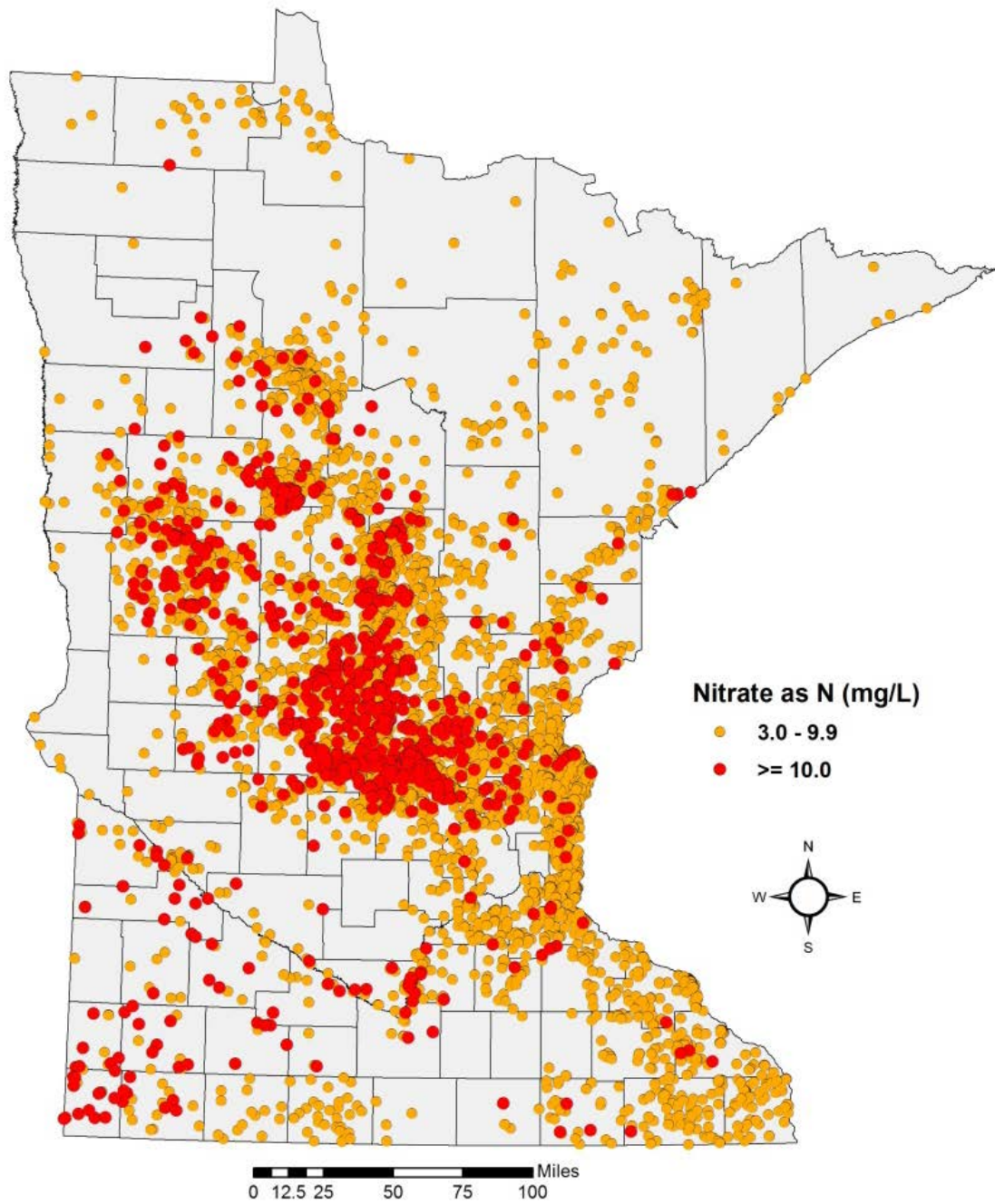


# Applications for Water Use





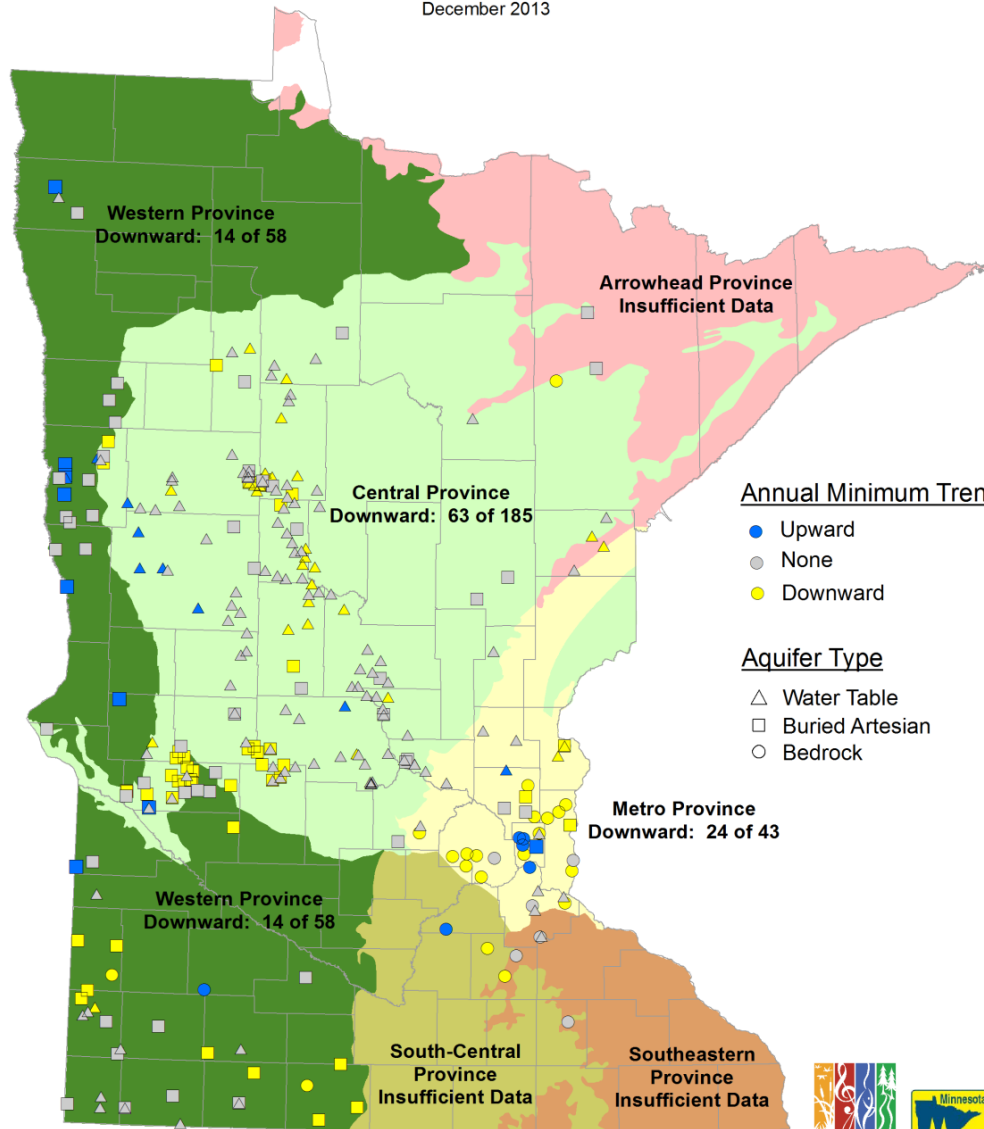
# Chloride



# Nitrates in Private Drinking Wells

# Annual Minimum Water-Level Trends in Observation Wells By Groundwater Province, 1993 - 2012

December 2013





**Water Rights and  
Water Responsibilities:  
An orientation to MN  
Statutes and Rules**



# Minnesota Water Rights

- Water is a public resource, no one “owns” it
- Riparian system of water rights – access and reasonable use
  - The state grants the right to water beyond personal use
  - In Minnesota, 10,000 gallons per day or 1,000,000 gallons per year
  - Based on available, sustainable and priority





## 103G.287. Subd. 3. Protection of groundwater supplies.

When establishing water appropriation limits to protect groundwater resources, the commissioner must consider the sustainability of the groundwater resource, including the current and projected water levels, water quality, whether the use protects ecosystems, and the ability of future generations to meet their own needs.



# 103G.287. Subd. 5. Sustainability standard.

The commissioner may issue water use permits for appropriation from groundwater only if the commissioner determines that the groundwater use is sustainable to supply the needs of future generations and the proposed use will not harm ecosystems, degrade water, or reduce water levels beyond the reach of public water supply and private domestic wells constructed according to Minnesota Rules, chapter 4725.



# 103G.287. Subd. 2. Relationship to surface water resources.

Groundwater appropriations that will have negative impacts to surface waters are subject to applicable provisions in section 103G.285.



## 103G.285. Subd. 2. Natural and altered natural watercourses.

If data are available, permits to appropriate water from natural and altered natural watercourses must be limited so that consumptive appropriations are not made from the watercourses during periods of specified low flows. The purpose of the limit is to safeguard water availability for in-stream uses and for downstream higher priority users located reasonably near the site of appropriation.



## 103G.285. Subd. 3. Water basins.

(a) Permits to appropriate water from water basins must be limited so that the collective annual withdrawals do not exceed a total volume of water amounting to one-half acre-foot per acre of water basin based on Minnesota Department of Conservation Bulletin No. 25, "An Inventory of Minnesota Lakes," published in 1968.



## 103G.285. Subd. 3 Water basins.

(b) As a condition to a surface water appropriation permit, the commissioner shall set a protective elevation for the water basin, below which an appropriation is not allowed. During the determination of the protective elevation, the commissioner shall consider:

- (1) the elevation of important aquatic vegetation characteristics related to fish and wildlife habitat;
- (2) existing uses of the water basin by the public and riparian landowners; and
- (3) the total volume within the water basin and the slope of the littoral zone.



# 103G.285. Subd. 4. Water basins less than 500 acres.

As part of an application for appropriation of water from a water basin less than 500 acres in surface area, the applicant shall obtain a statement of support with as many signatures as the applicant can obtain from property owners with property riparian to the water basin. The statement of support must:

- (1) state support for the proposed appropriation;  
and
- (2) show the number of property owners whose signatures the applicant could not obtain.



## 103G285. Subd. 5. Trout streams.

Permits issued after June 3, 1977, to appropriate water from streams designated trout streams by the commissioner's orders under section 97C.005 must be limited to temporary appropriations.





# Wetland Conservation Act (WCA)

## 103G.222 REPLACEMENT OF WETLANDS.

Subdivision 1. Requirements. (a) Wetlands must not be drained or filled, wholly or partially, unless replaced by restoring or creating wetland areas of at least equal public value

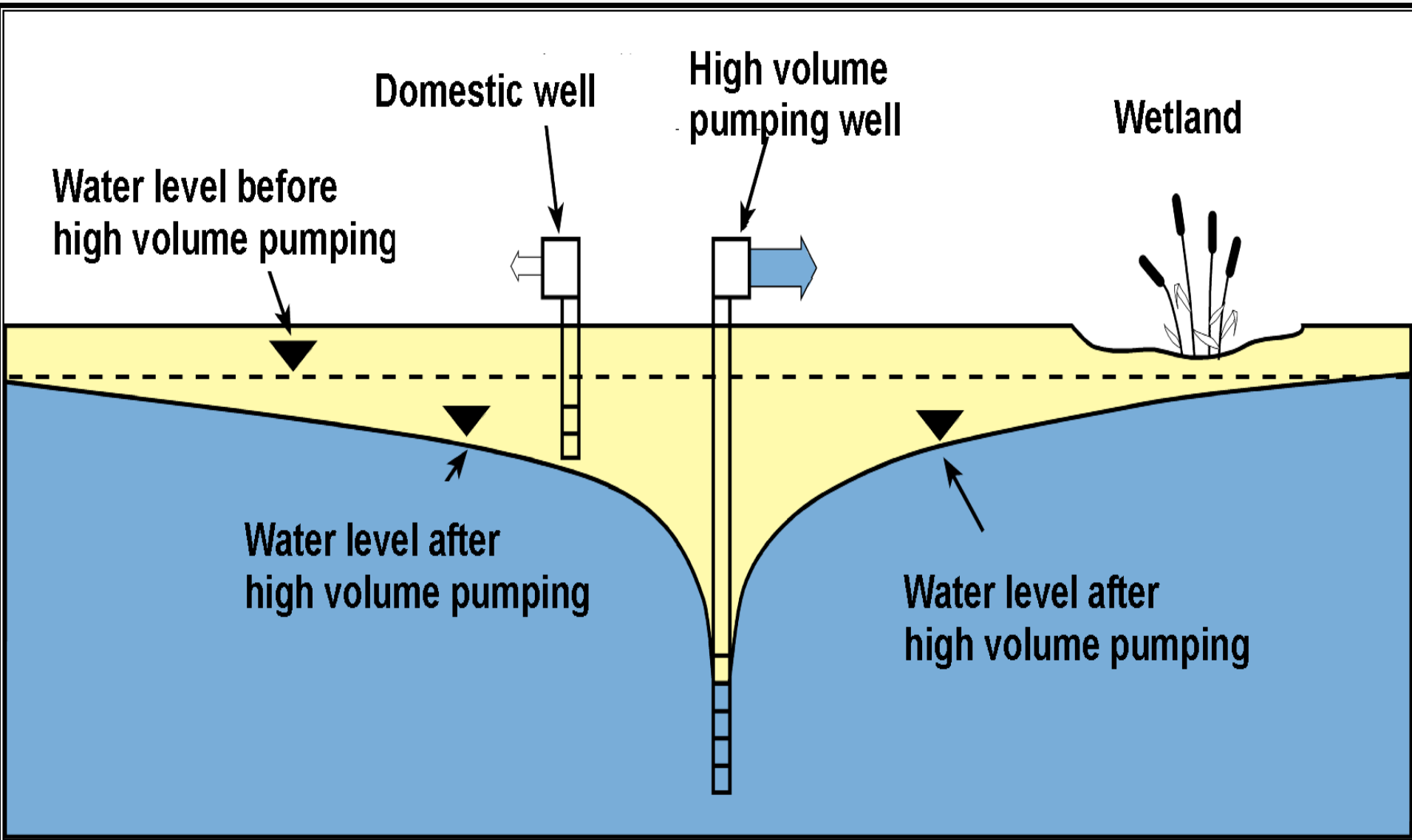
*Drain or drainage. "Drain" or "drainage" means any method for removing or diverting waters from wetlands. Methods include, but are not limited to, excavation of an open ditch, installation of subsurface drainage tile, filling, diking, or pumping.*

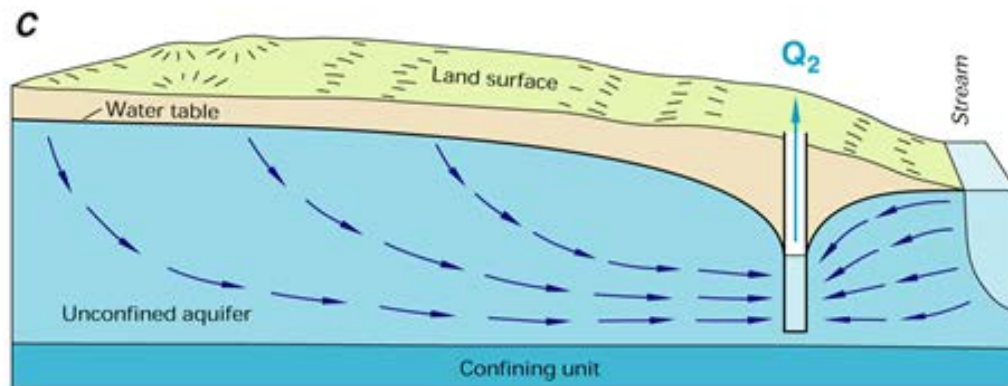
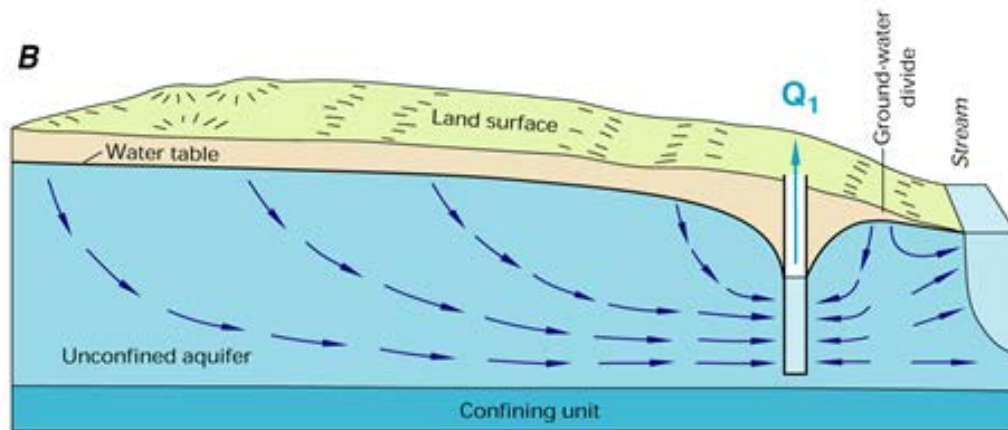
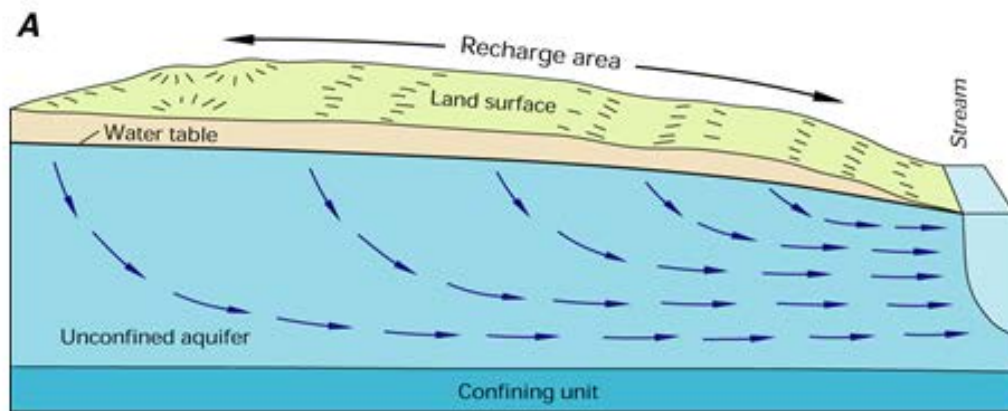


## 103G.223 Calcareous Fens

Calcareous fens, as identified by the commissioner by written order published in the State Register, may not be filled, drained, or otherwise degraded, wholly or partially, by any activity, unless the commissioner, under an approved management plan, decides some alteration is necessary.

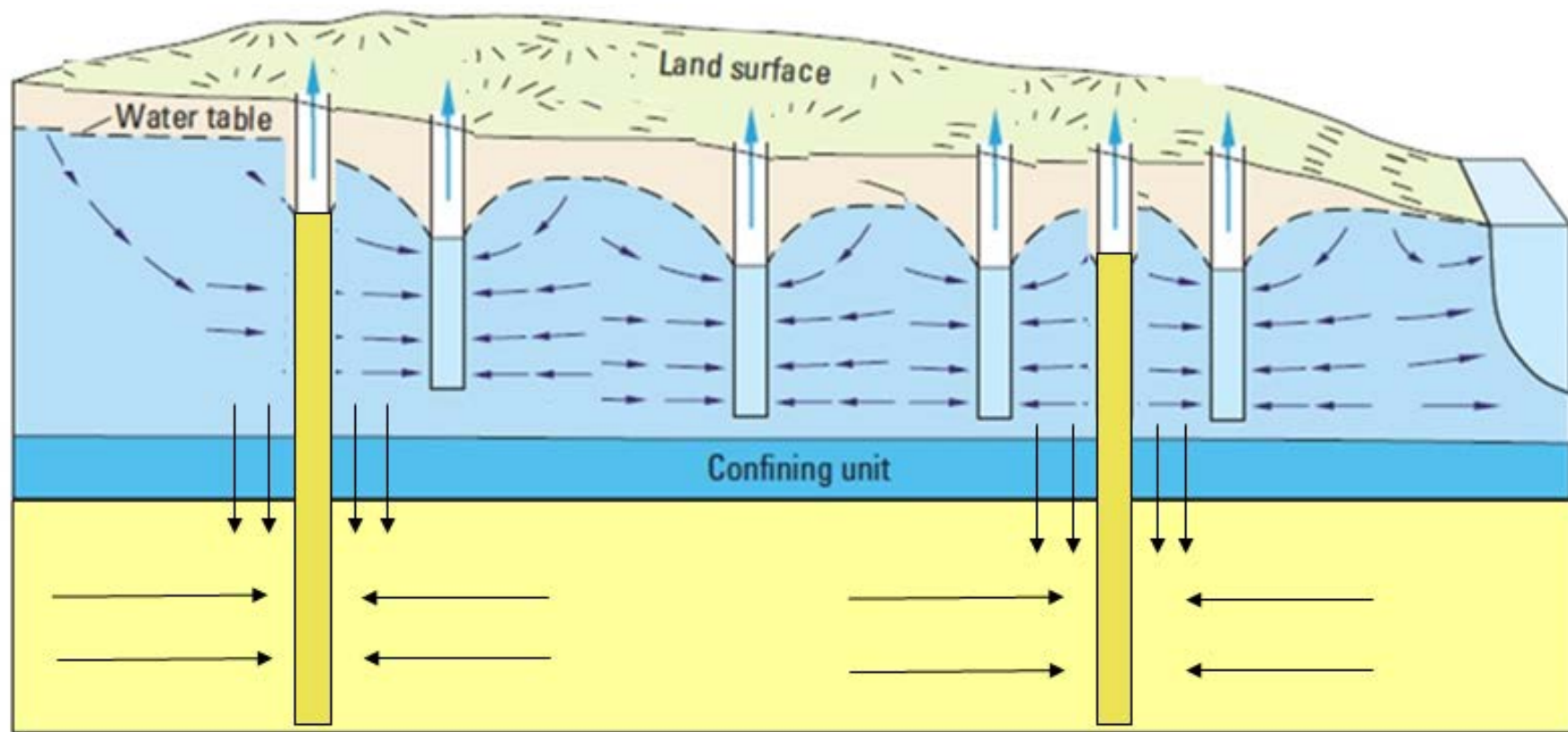
# Illustrated Cone of Depression





# Cumulative 'Cones'









# Report to the Legislature

...recommendations for statutory or rule definitions and thresholds for negative impacts to surface waters as described in

....



# Questions?



**About groundwater issues and DNR's groundwater responsibilities?  
What information will help you better understand the issues, this  
project, and DNR's actions?  
Other thoughts?**