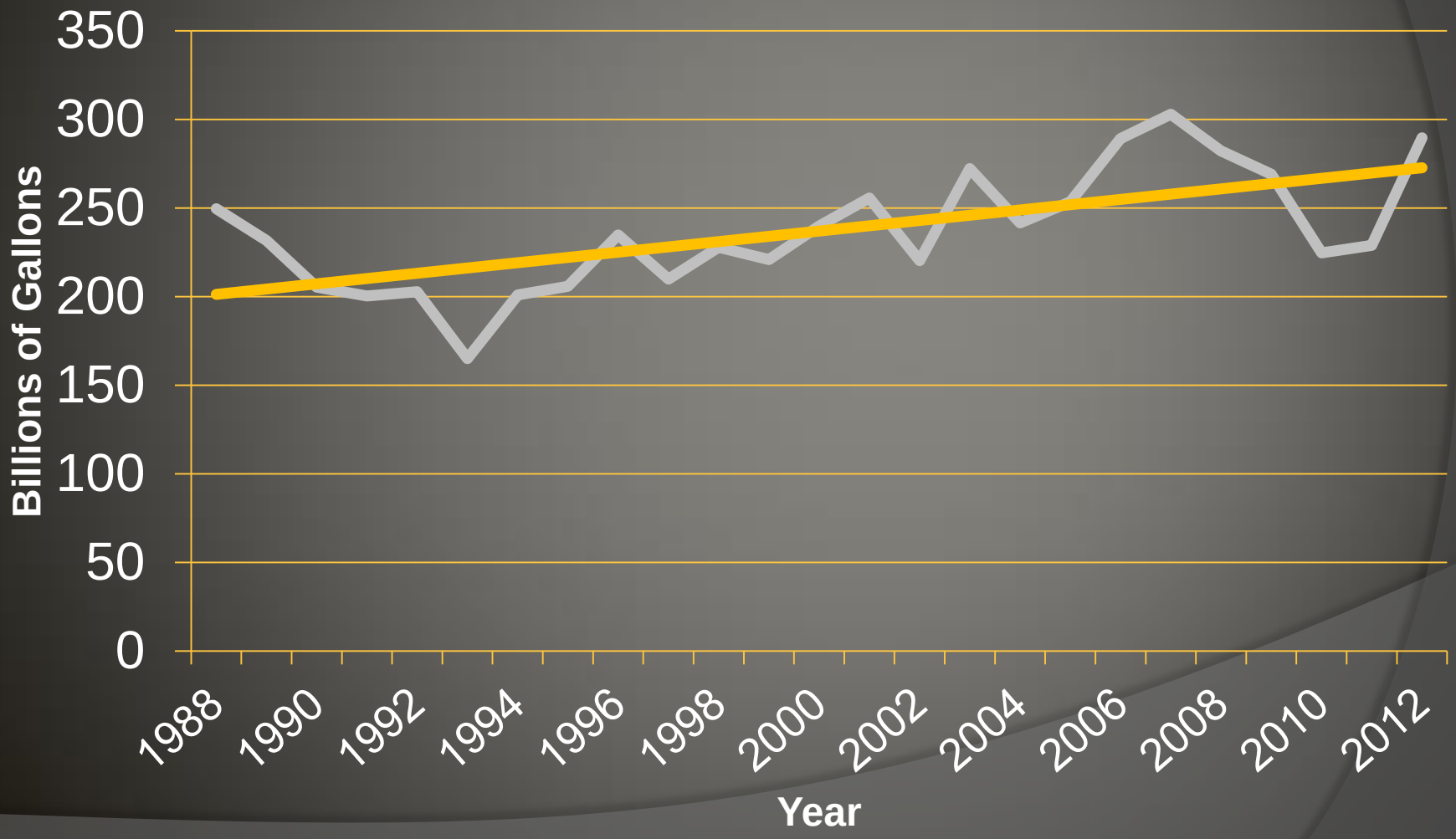
Groundwater Management

Jason Moeckel
Minnesota DNR
Division of Ecological and Water Resources

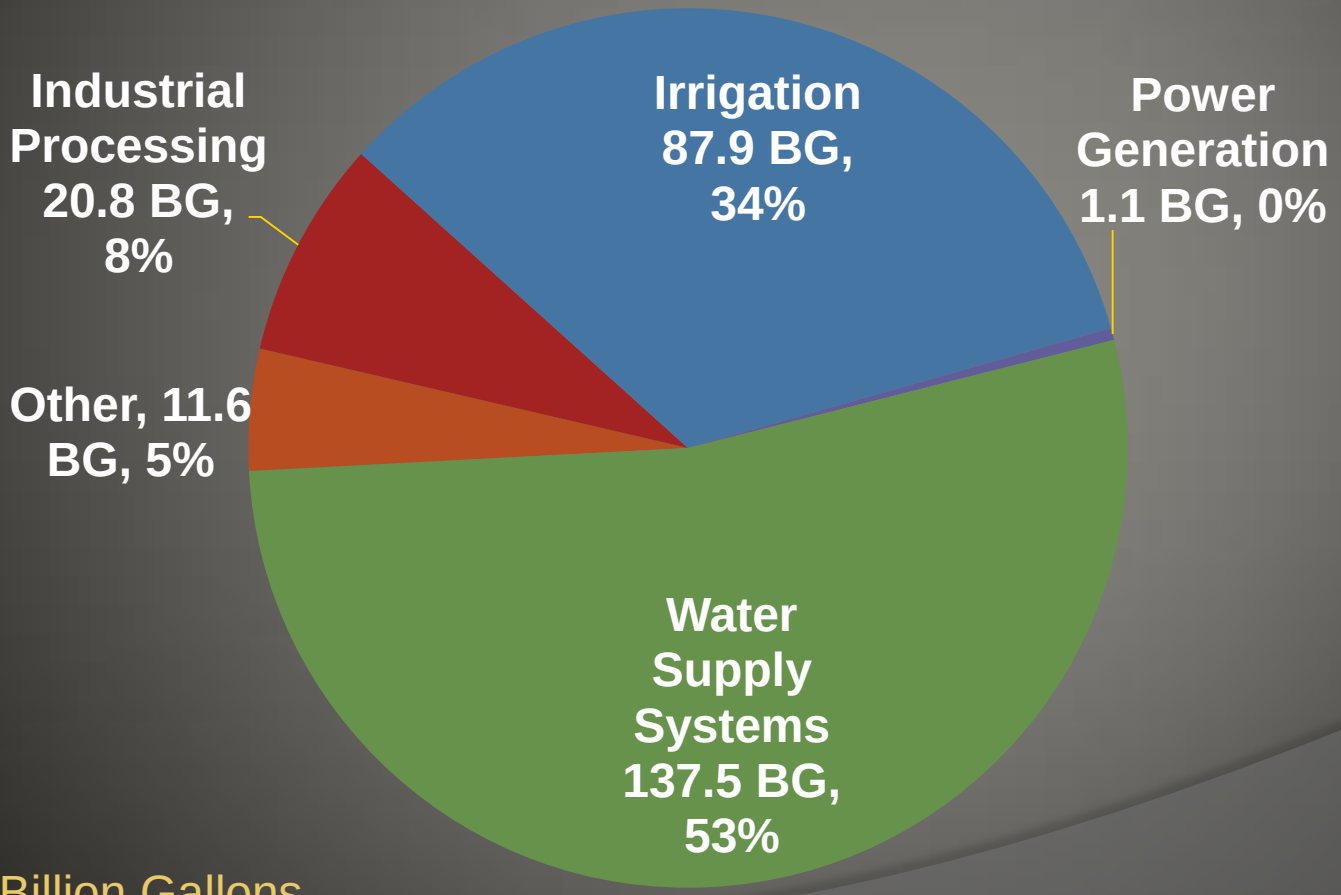
Understanding Groundwater at Risk of Overuse and Contamination

Part I

Annual Reported Groundwater Use

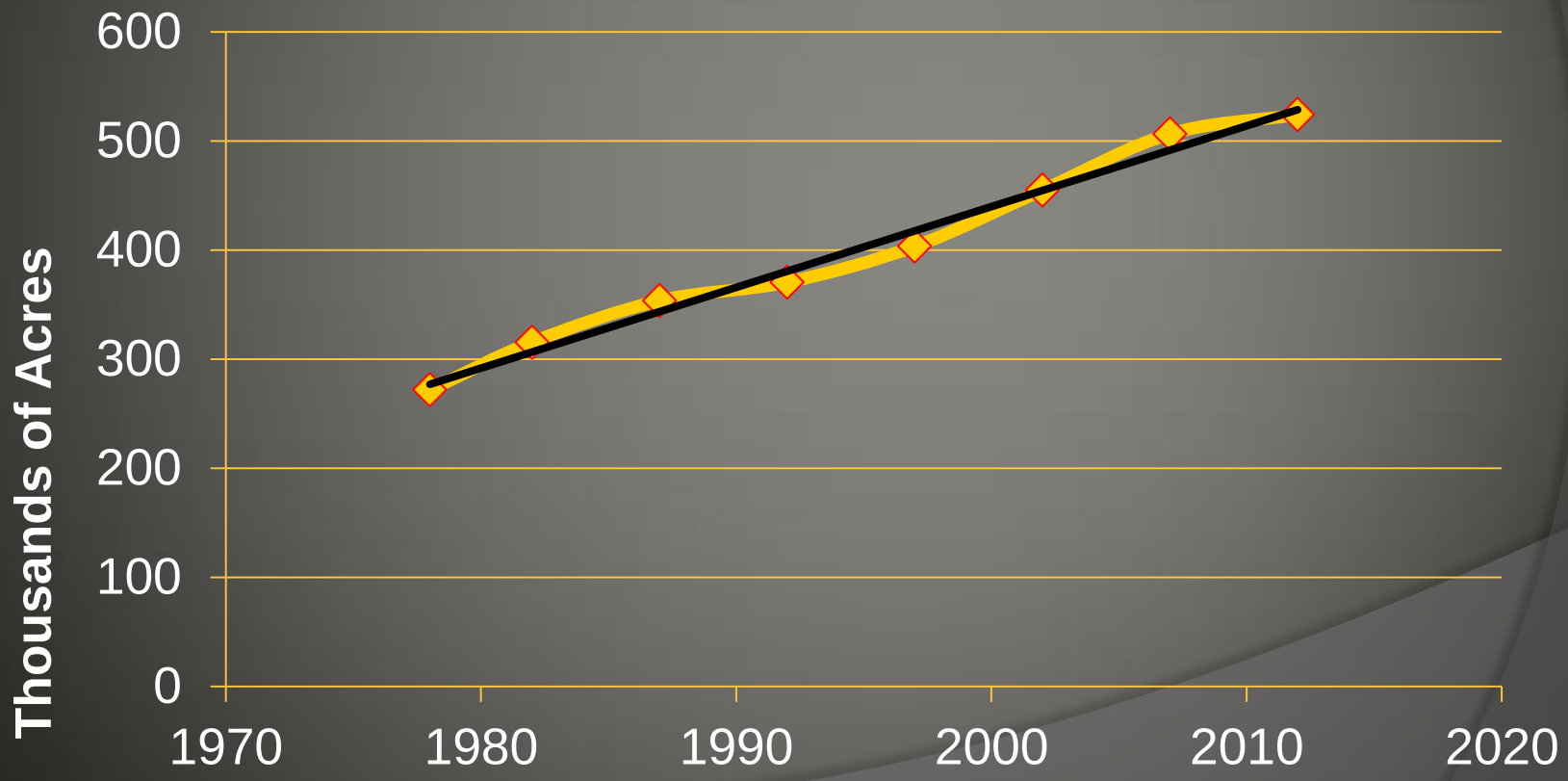


Groundwater Use Percentages By Major Category 5 Yr. Avg. from '08 - '12

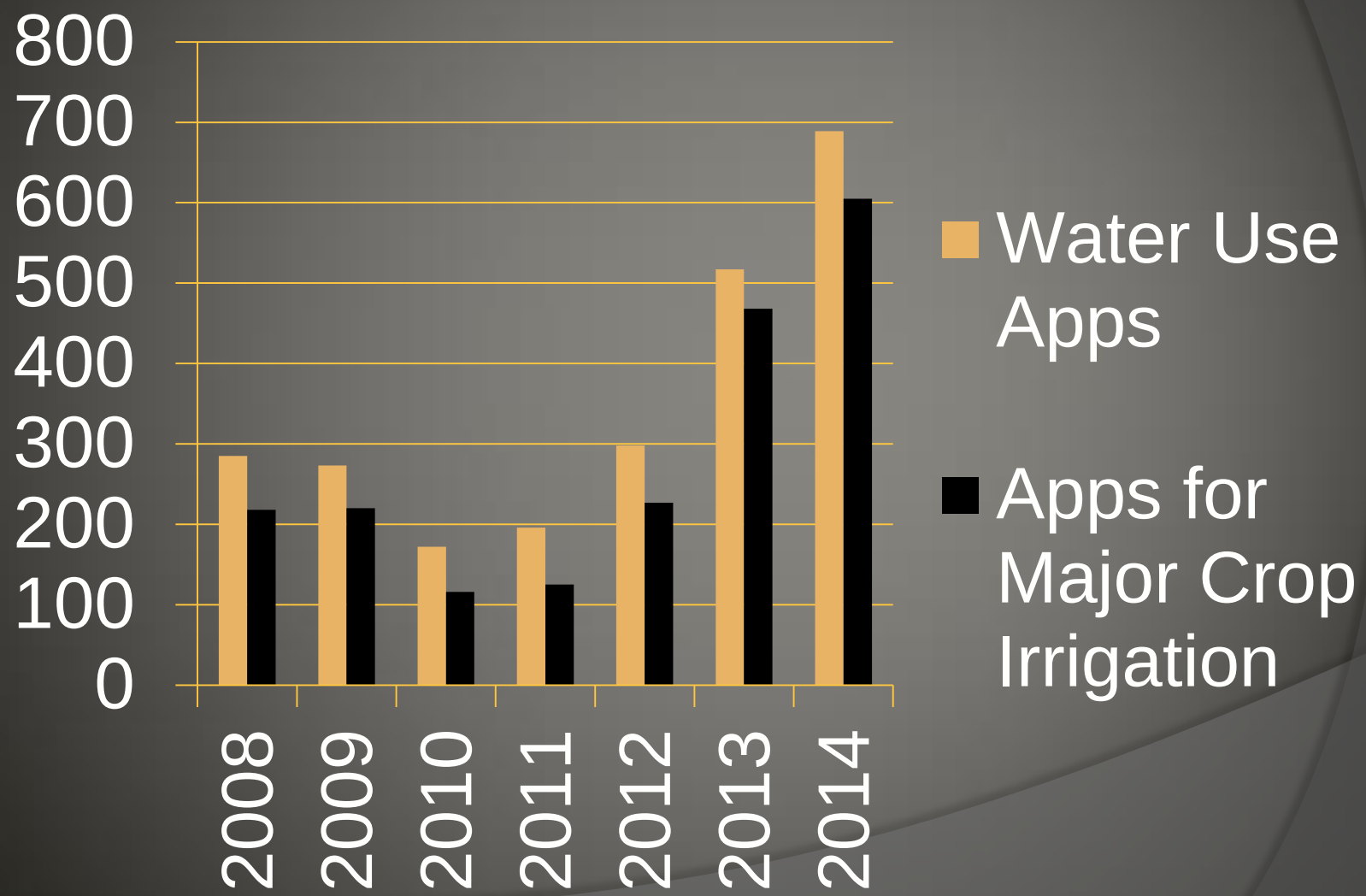


BG = Billion Gallons

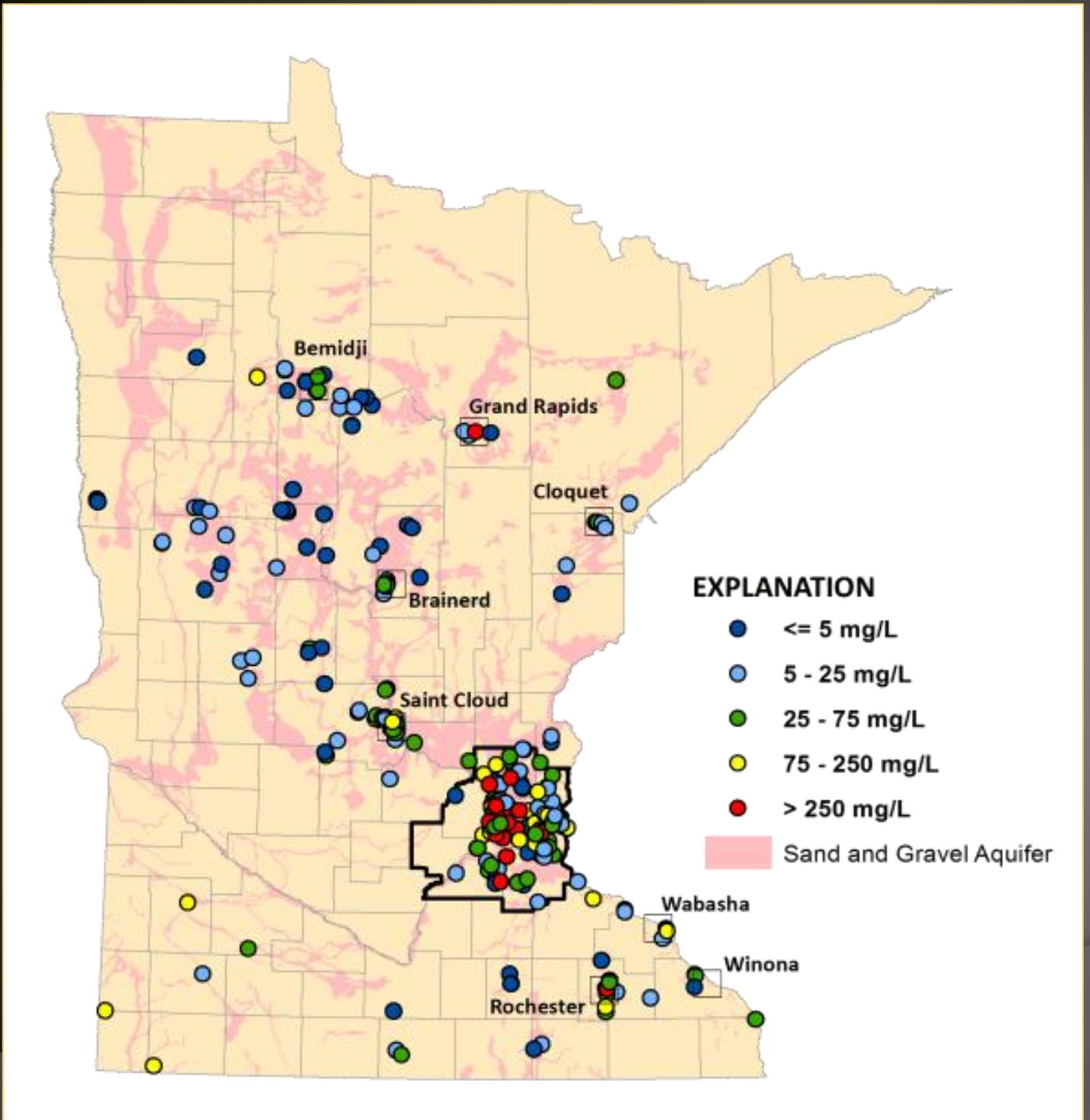
Minnesota Irrigated Cropland



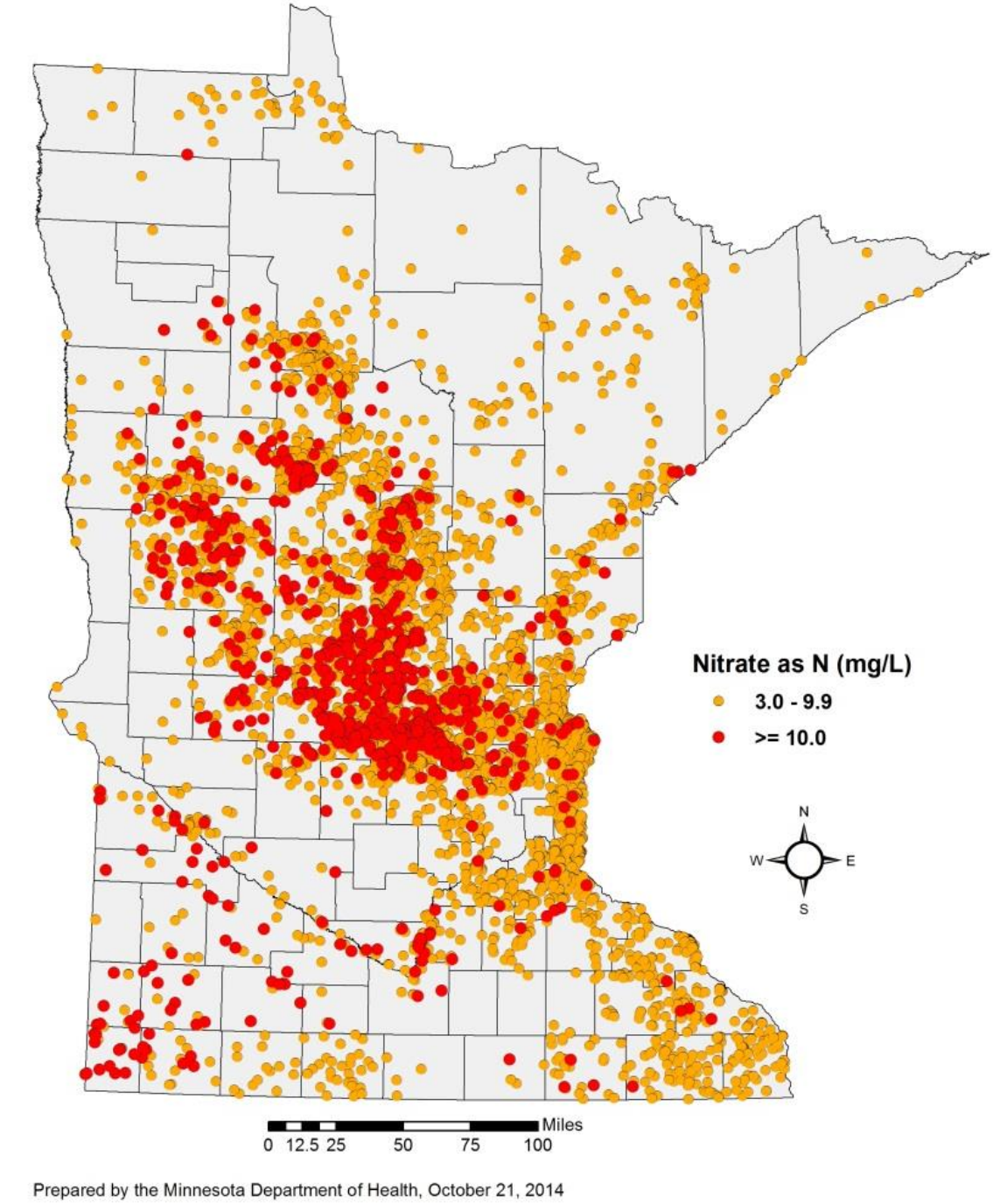
Applications for Water Use



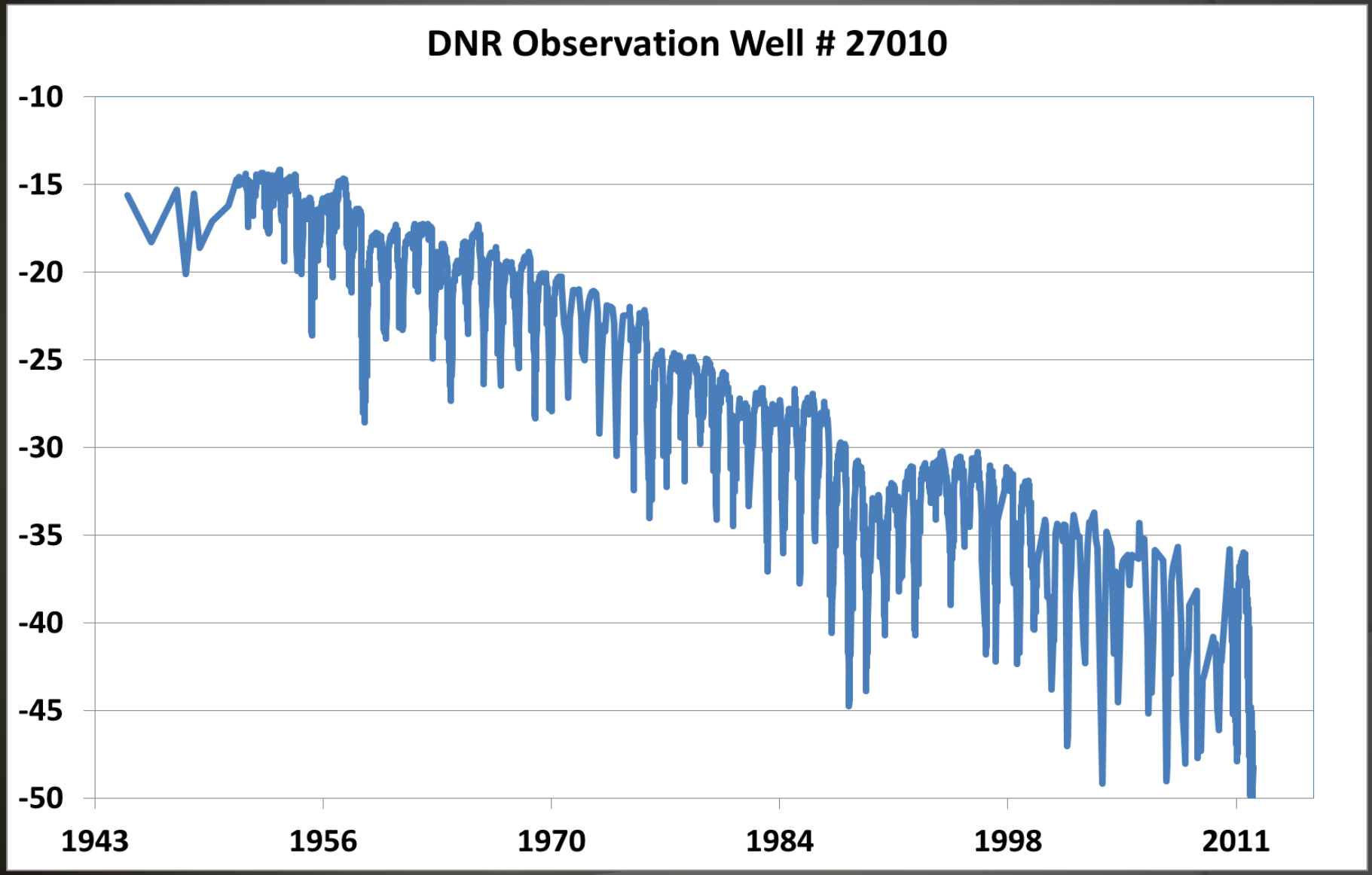
Chloride

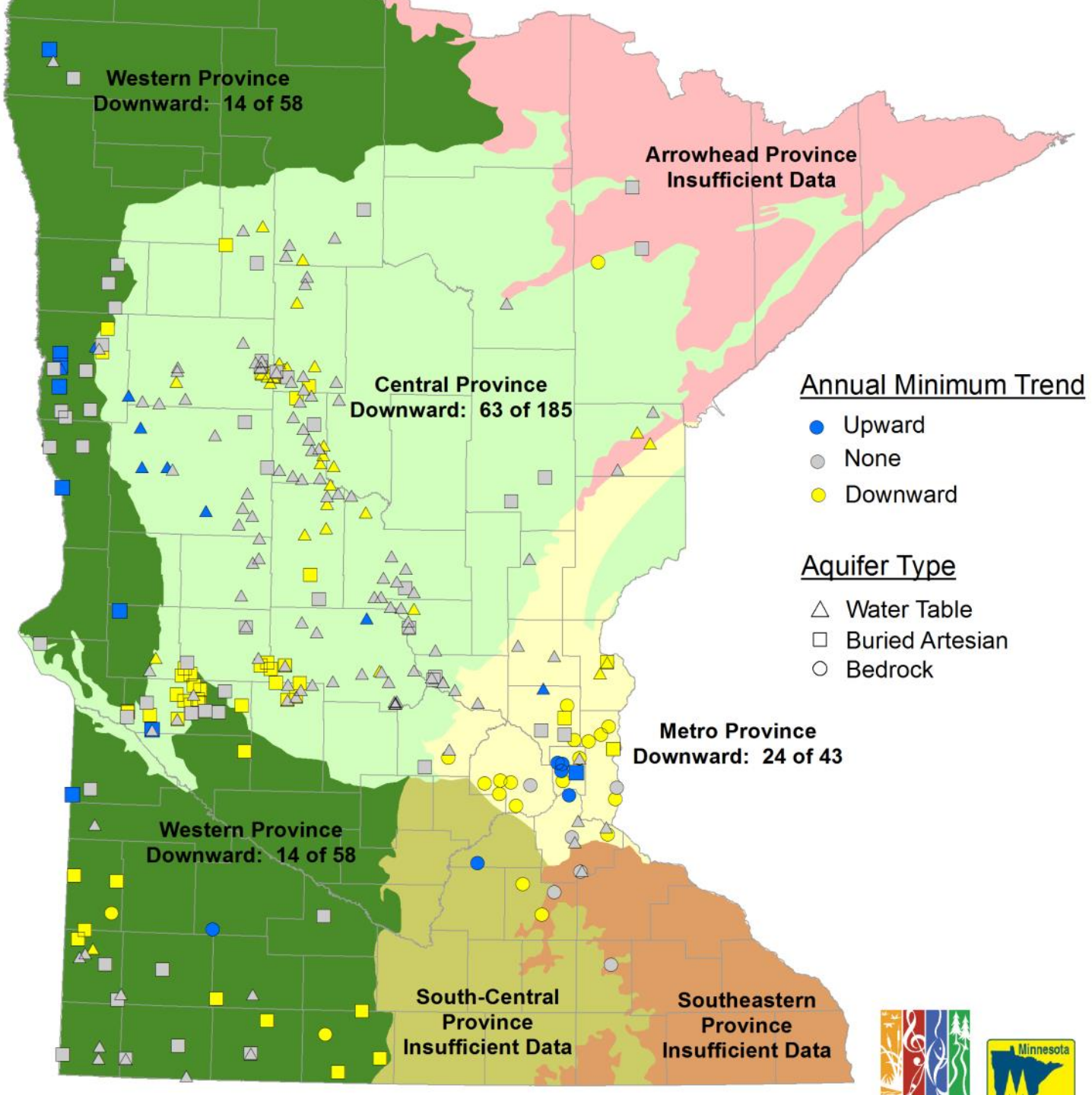

Bemidji
Grand Rapids
Cloquet
Brainerd
Saint Cloud
Wabasha
Winona
Rochester
EXPLANATION
<= 5 mg/L
5 - 25 mg/L
25 - 75 mg/L
75 - 250 mg/L
> 250 mg/L
Sand and Gravel Aquifer

Nitrates in Private Drinking Wells



West TC Metro (‘45 – ‘12)




Western Province
Downward: 14 of 58
Arrowhead Province
Insufficient Data
Central Province
Downward: 63 of 185
Annual Minimum Trend
Upward
None
Downward
Aquifer Type
Water Table
Buried Artesian
Bedrock
Metro Province
Downward: 24 of 43
Western Province
Downward: 14 of 58
South-Central
Province
Insufficient Data
Southeastern
Province
Insufficient Data
Minnesota

Water Rights and Water Responsibilities in Minnesota

Part II

Water Rights

- Water is a public resource, no one "owns" it
- Riparian system of water rights – access and reasonable use
- State's grant the right to water beyond personal use
  - In Minnesota, 10,000 gpd or 1,000,000 gpy.
  - Based on available, sustainable and priority

Permit Thresholds

- Less than 1 million gallons per year or 10,000 gallons per day – No permit required (majority of private wells)
- More than 1 million gallons per year – authorization by permit from the DNR
  - Municipal water suppliers
  - Agricultural Irrigation
  - Golf Course / Landscape / Ball fields
  - Industrial / Ethanol / Mining / Pulp Processing
  - Power generation (primarily surface water)

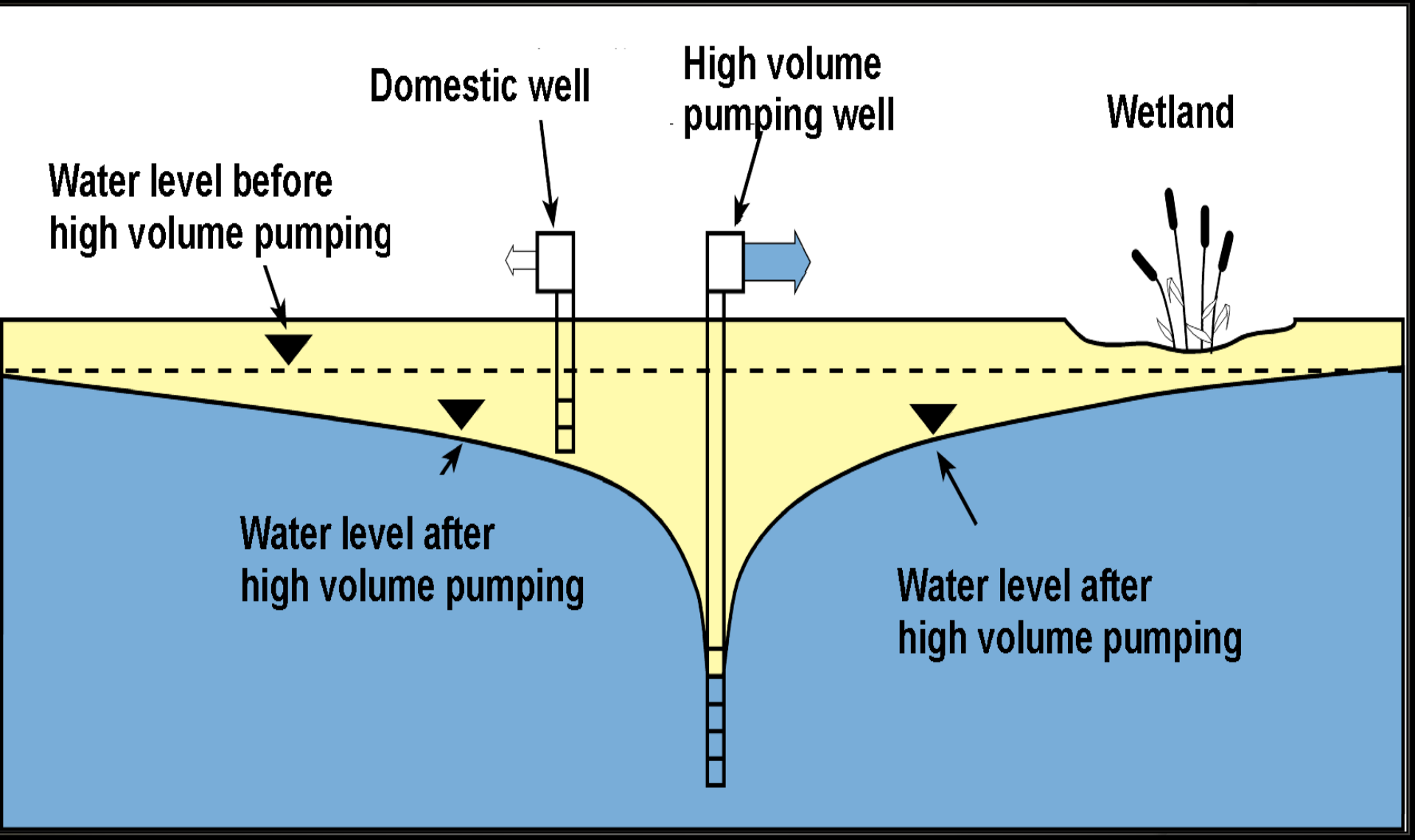
DNR Responsibility... (Statute 103G.287)

- When establishing limits DNR must consider the sustainability of the resource, including:
  - Current and projected water levels
  - Water quality
  - Protect ecosystems
  - Future generations to meet their needs

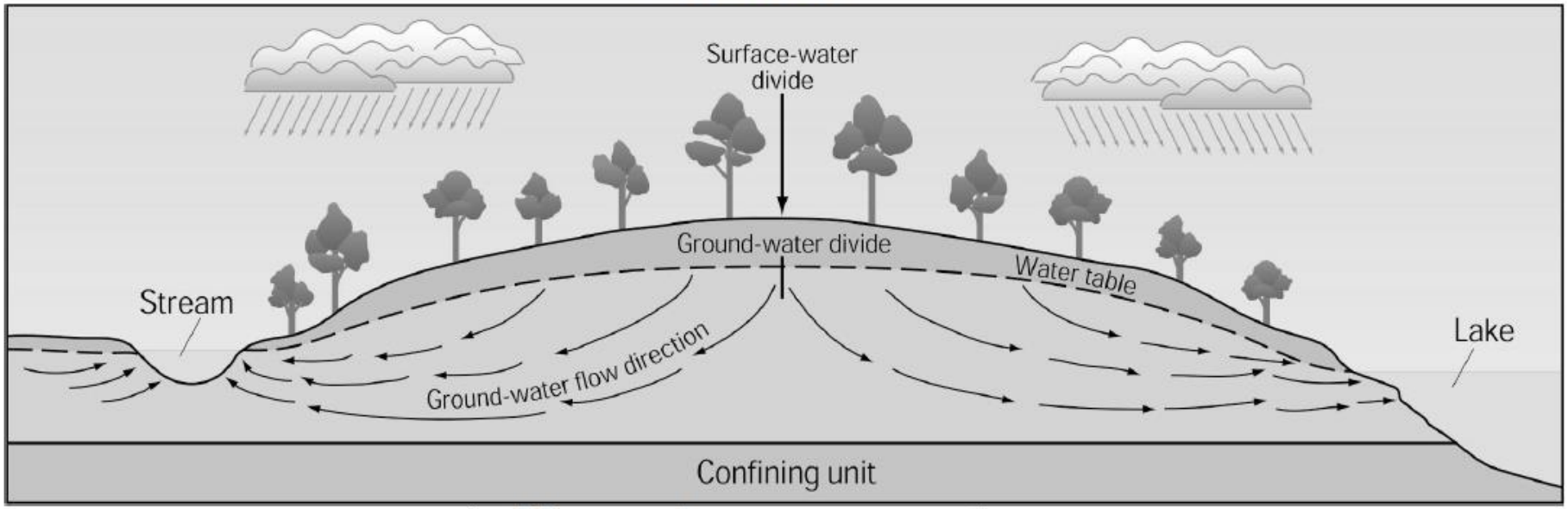
Preliminary Well Construction

- New Law – effective July 1, 2013
- DNR must review and provide and assessment to a prospective well owner
- *and determine whether the anticipated appropriation request is likely to meet the applicable requirements*
- *Currently reviewing our process*

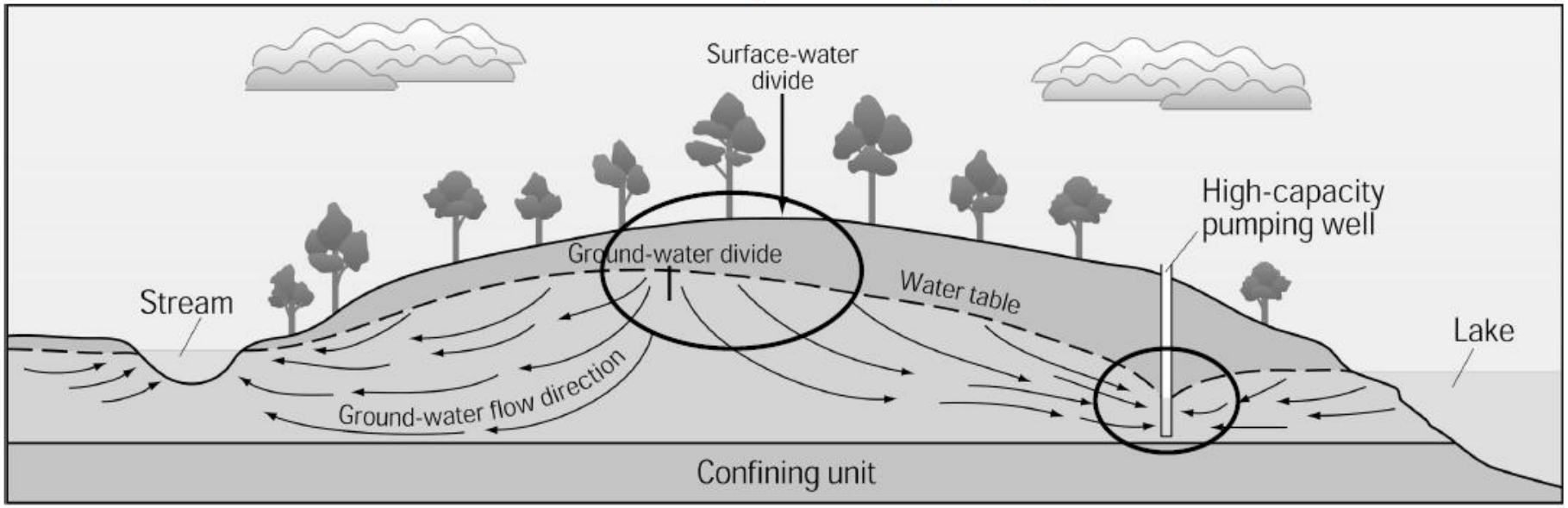
Illustrated Cone of Depression



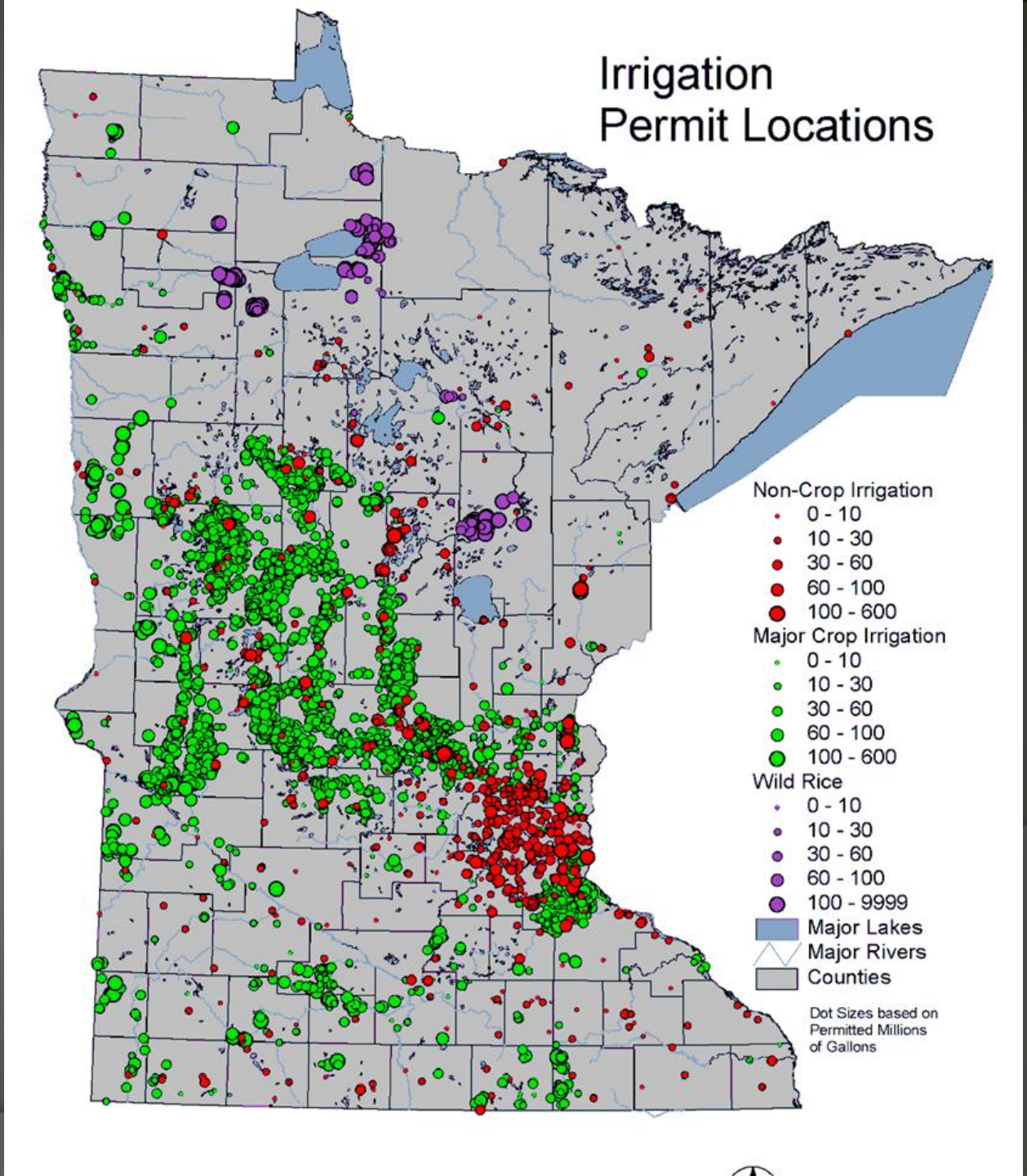
Natural



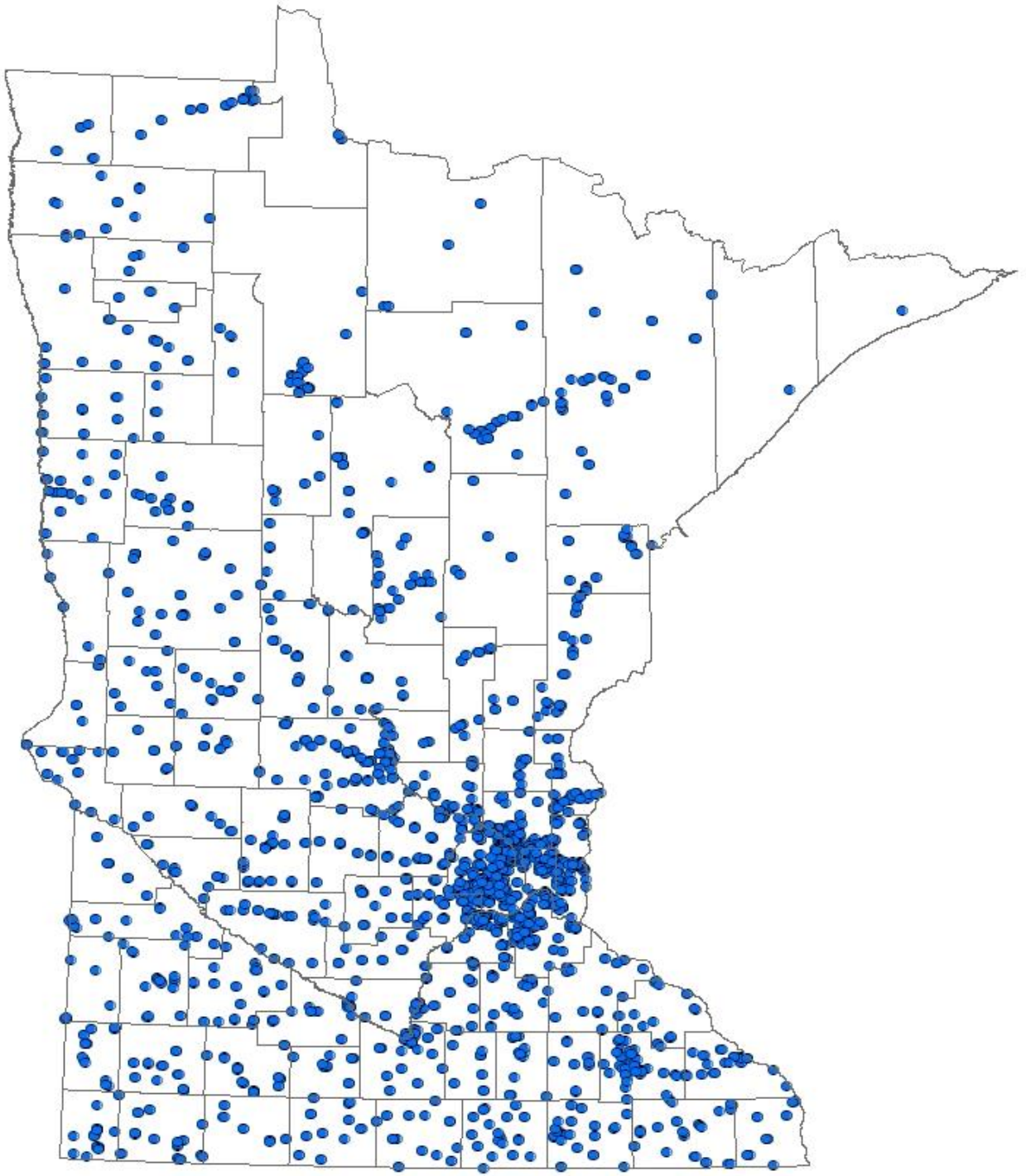
Affected By Pumping



Irrigation Permits



Community Water Supply Wells



Efforts and Updates Since January 2014

Part III

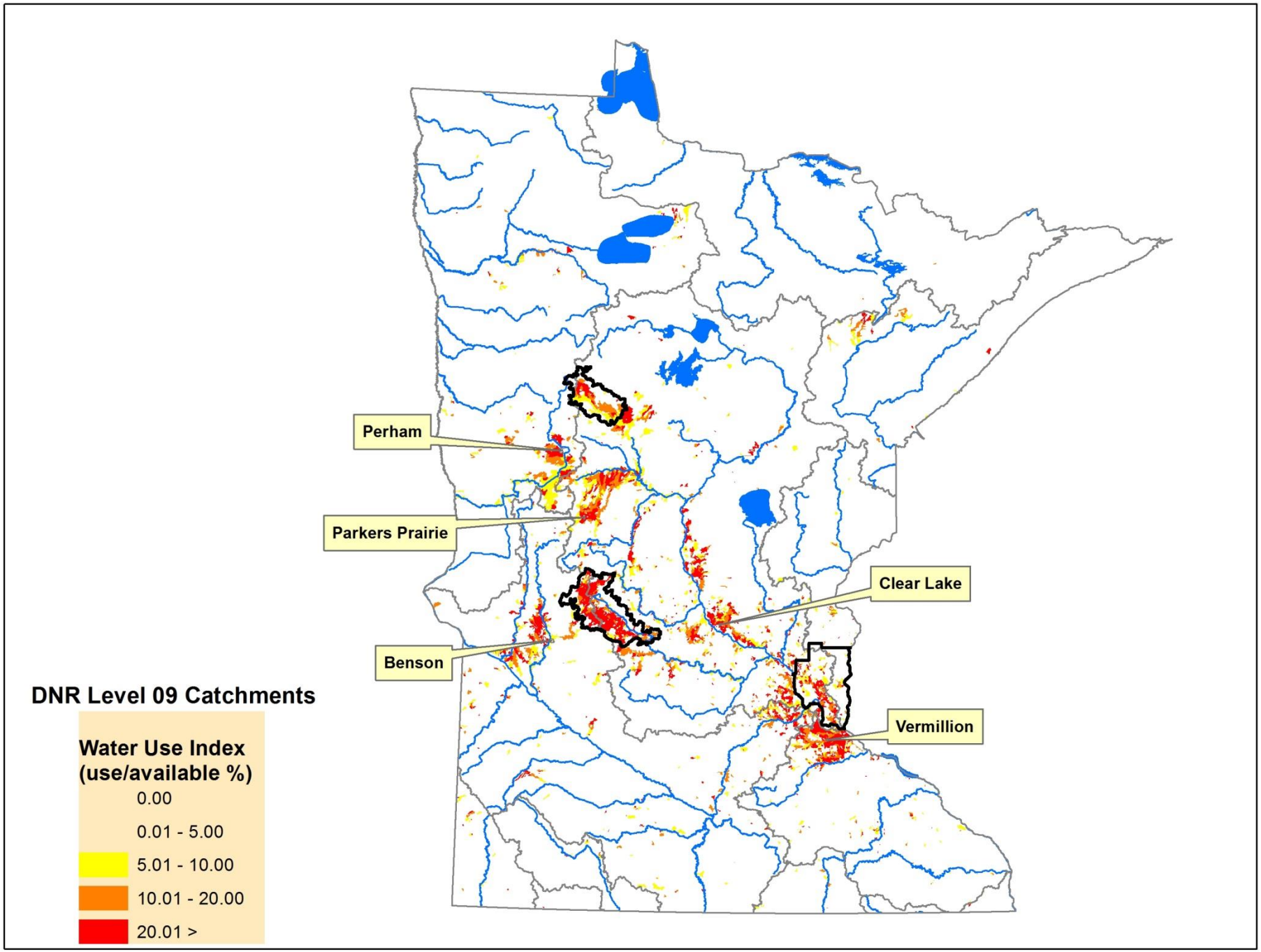
Draft Strategic Plan

Seven Core Strategies

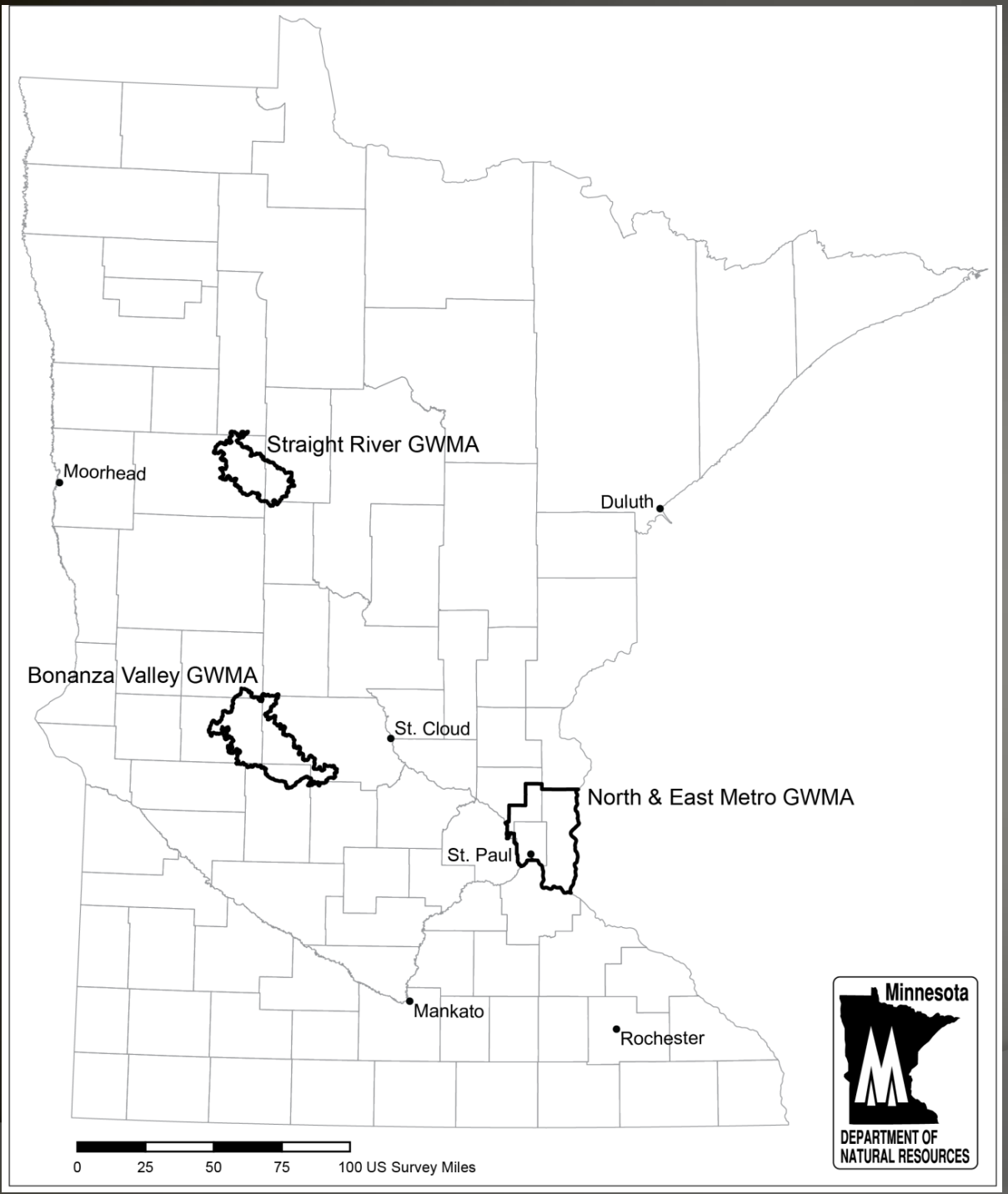
1. Heighten the priority given to groundwater
2. Enhance the information available for decisions
3. Improve management of appropriation permits
4. Improve compliance with permits and regulations
5. Improve communication and education
6. Effectively address challenges in areas of high use
7. Promote water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

Monitoring

Analysis


Perham
Parkers Prairie
Clear Lake
Benson
Vermillion
DNR Level 09 Catchments
Water Use Index
(use/available %)
0.00
0.01 - 5.00
5.01 - 10.00
10.01 - 20.00
20.01 >

Groundwater Management Areas



Groundwater Management Areas

- Planning for change
- Formed Project Advisory Teams (PAT)
- Meeting monthly since January 2014
- Reviewed and discussed data and information
  - Water levels
  - Water Use
  - Natural features
- Reviewed and discussed goals and objectives as reflected in statutes

Groundwater Management Areas

- Developed draft plan
- Reviewed and discussed draft plan
- Plan Highlights
  - Improve information
  - Review all permits within 5 years, and amend if necessary
  - Support conservation efforts
  - Improve communication
  - Coordinate with other units of Government

Groundwater Management Areas

- Public Review and Input
  - February – April
  - Public meetings
  - Open house forums
- April – May: Plan Revisions
- Commissioner Approval

Stimulate Innovation

Demand

- Wise use and Conservation
  - Lawns, toilets etc..
  - Industrial processing
- Leak detection
- Irrigation scheduling
- Crop selection and rotation

Supply

- Diversify sources – seasonal patterns
- Shared systems
- Stormwater management and recharge
- Re-use of treated water (gray water)