

Water Resources Management in Minnesota

or:

“Minnesota’s Water Bureaucracy”

MGWA 2009 Spring Conference



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Water resources protection & management

Physical factors

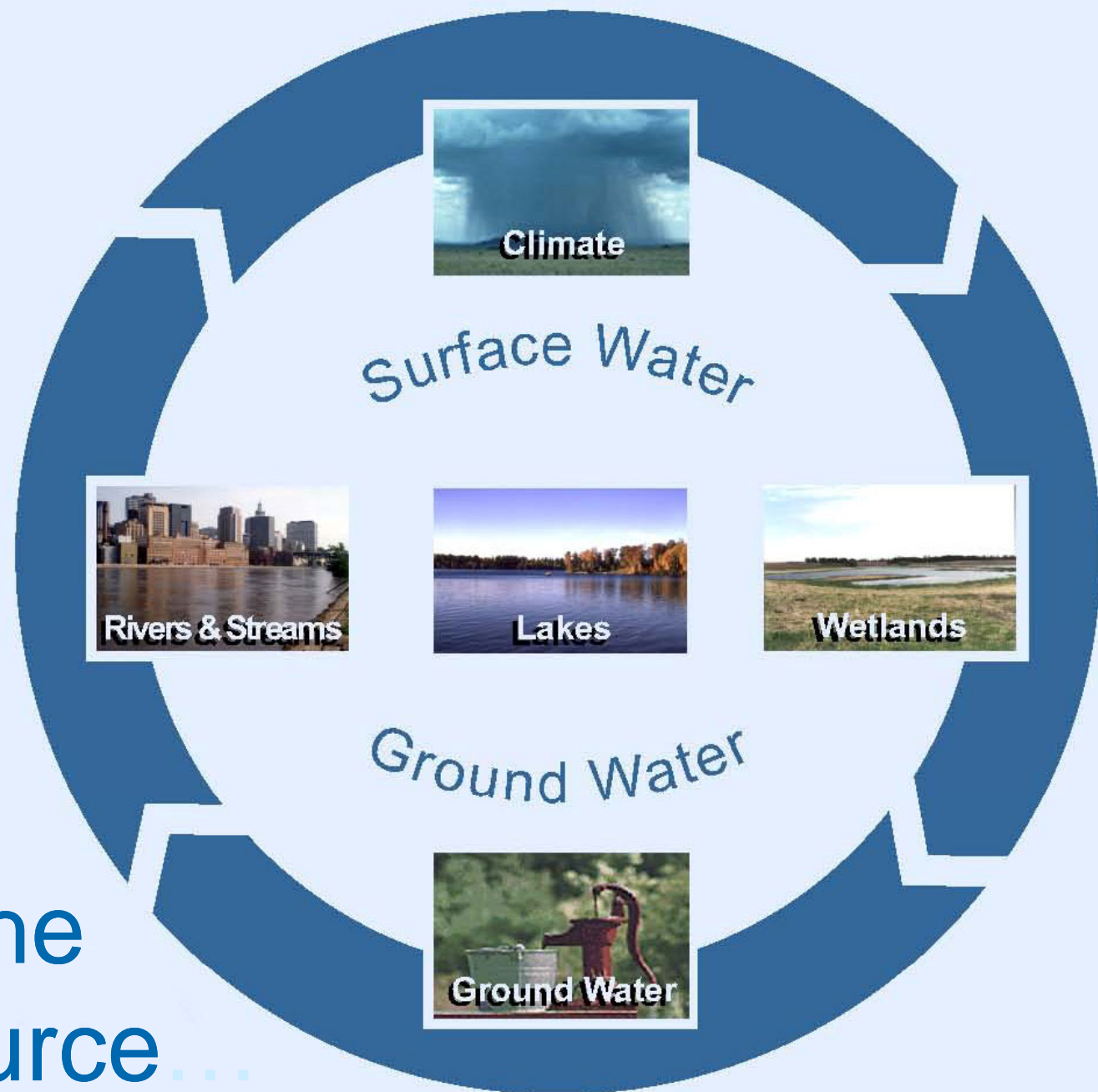
- geography / climate
- location / distribution
- “container”
- quantity / availability
- sustainable use
- quality / contamination



Societal factors

- history /culture
- disciplines
- legal
- levels of government
- population
- land use / human impacts
- economics
- policy / politics
- health protection
- value of environmental protection

The Resource...



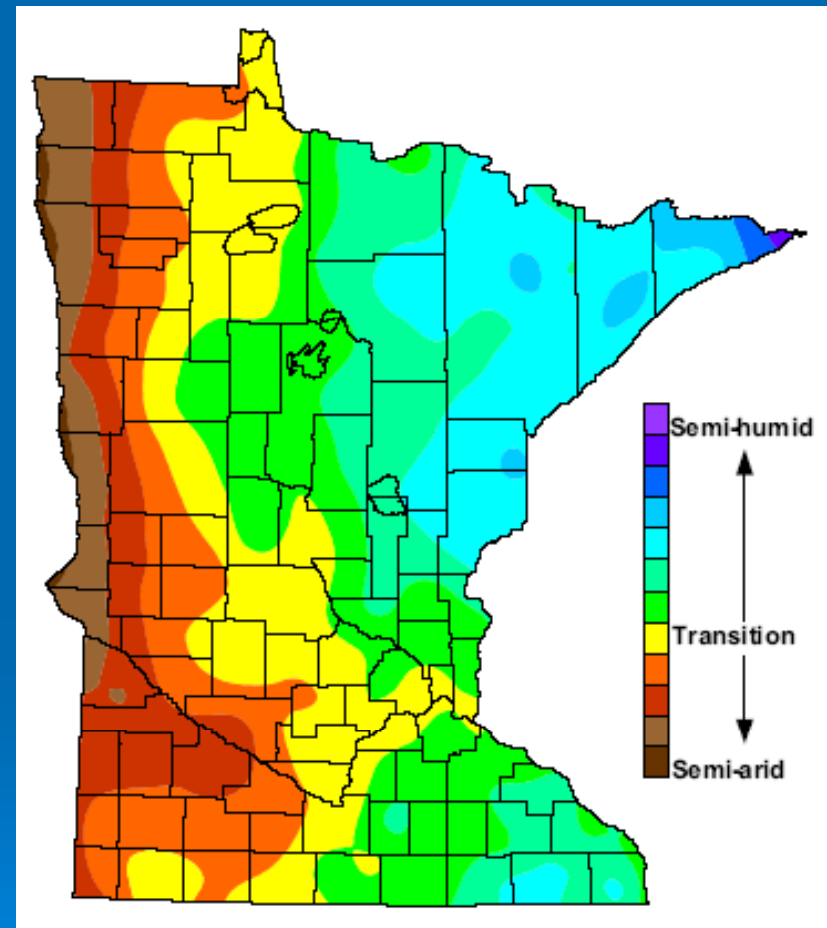
Minnesota...



- head of 4 continental watersheds
- is the headwaters of 3 of these watersheds
- receives very little surface water from outside its boundaries
- management practices affect the downstream user, both human and natural resources.

“...on the edge...”

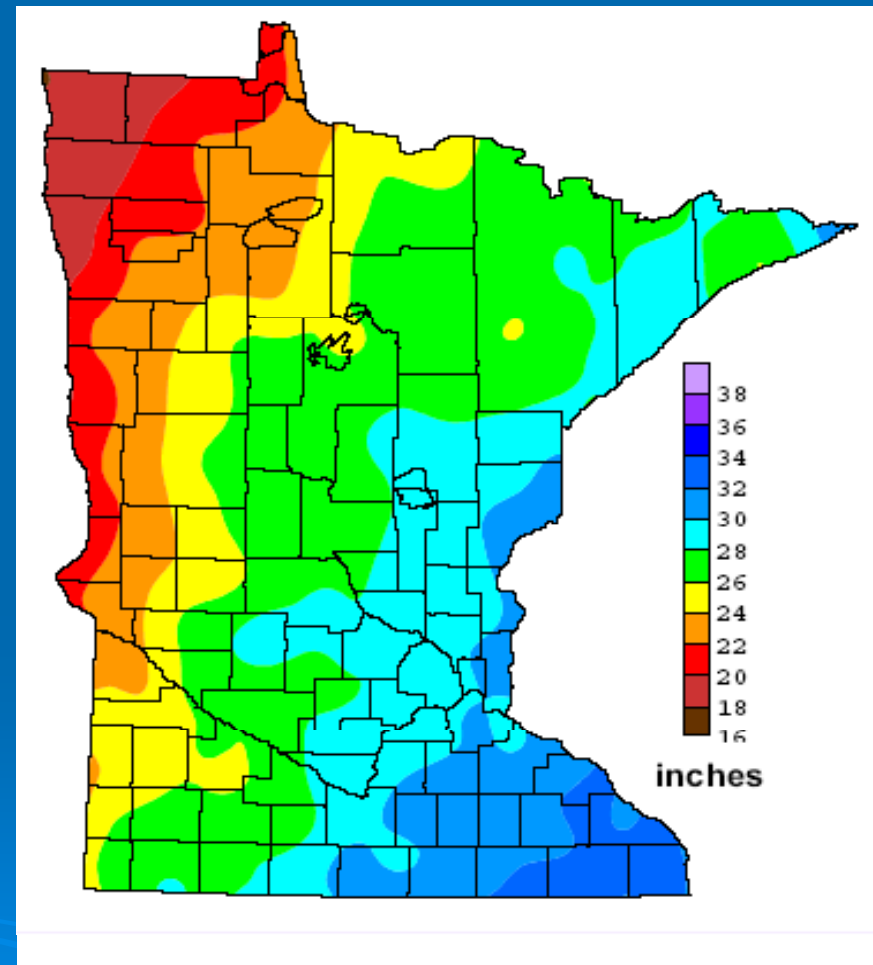
- climate highly variable from east to west and from north to south
- on the boundary between the semi-humid and semi-arid climate regimes
- wide ranges of climate are the norm



Precipitation - Evapotranspiration

What's “normal”?

- “Normal” is a midpoint about which climate fluctuates.
- “Normal” does not mean “common” or “the usual.”



Normal annual precipitation

Surface Water

- Minnesota has more than 20,000 protected water bodies and 870,000 wetlands;
- 63,000 miles of natural rivers and streams;
- 23,000 miles of drainage ditches channelized watercourses.
- 13.1 million acres in wetlands and lakes
 - 10.1 million acres are wetlands
 - 3 million acres are lakes.
- Public Waters and National Wetlands Inventories (PWI & NWI) :
 - 11,842 lakes greater than 10 acres in size
 - 10,029 wetlands

Lakes

- Intensifying pressures on Minnesota's lakes
- Growing population increasing the demand for lakeshore residences, lake-based recreation
- Lakeshore use and development directly influenced by fluctuations in lake water levels
- All lakes experience water level fluctuations
- land use changes can adversely affect water quality.



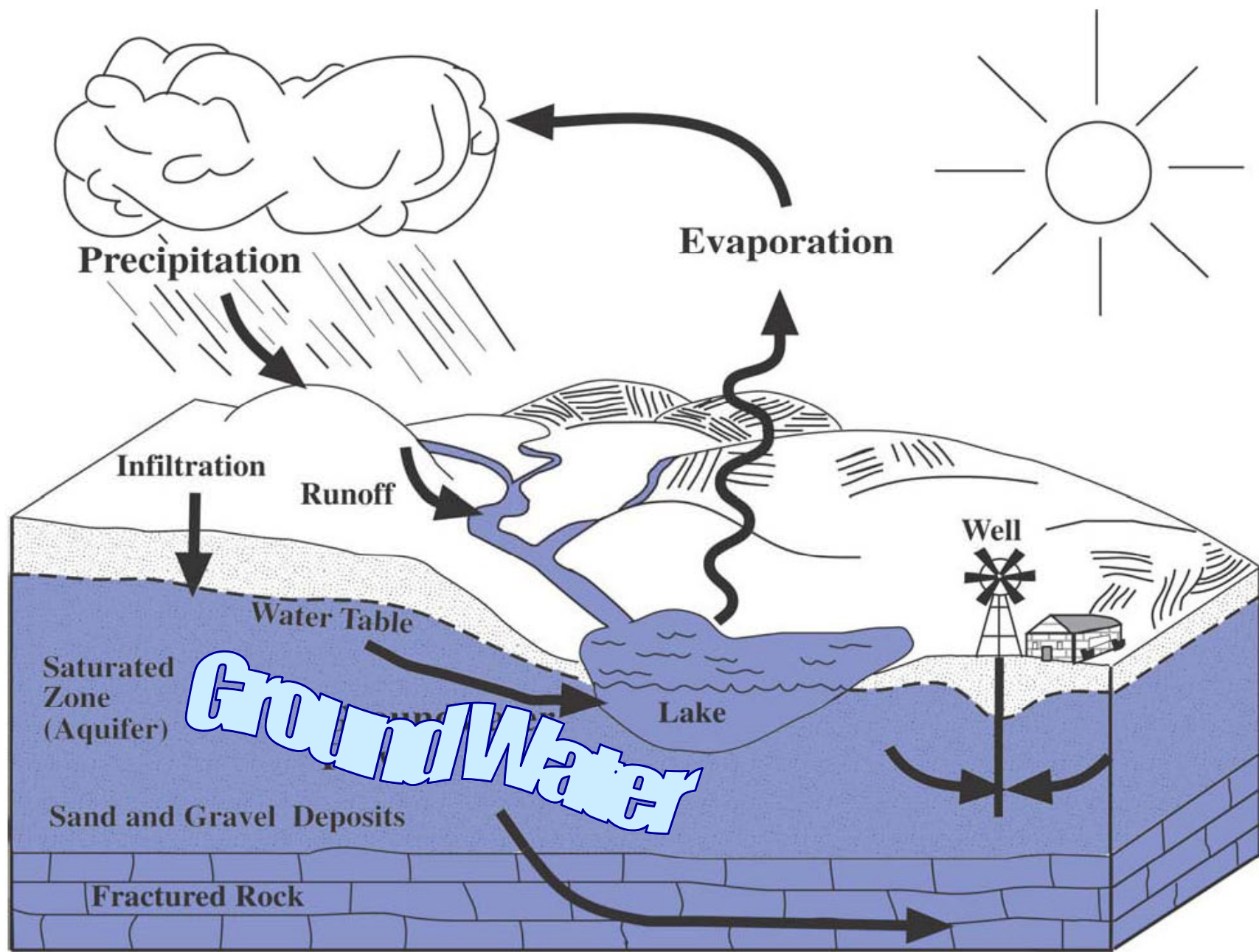
Wetlands

Functions & benefits

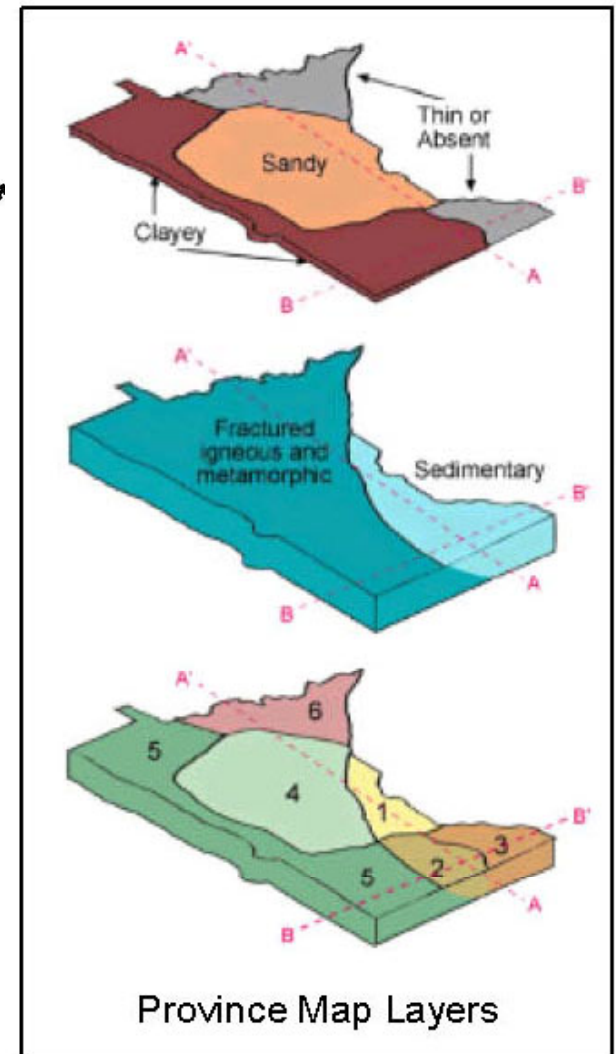
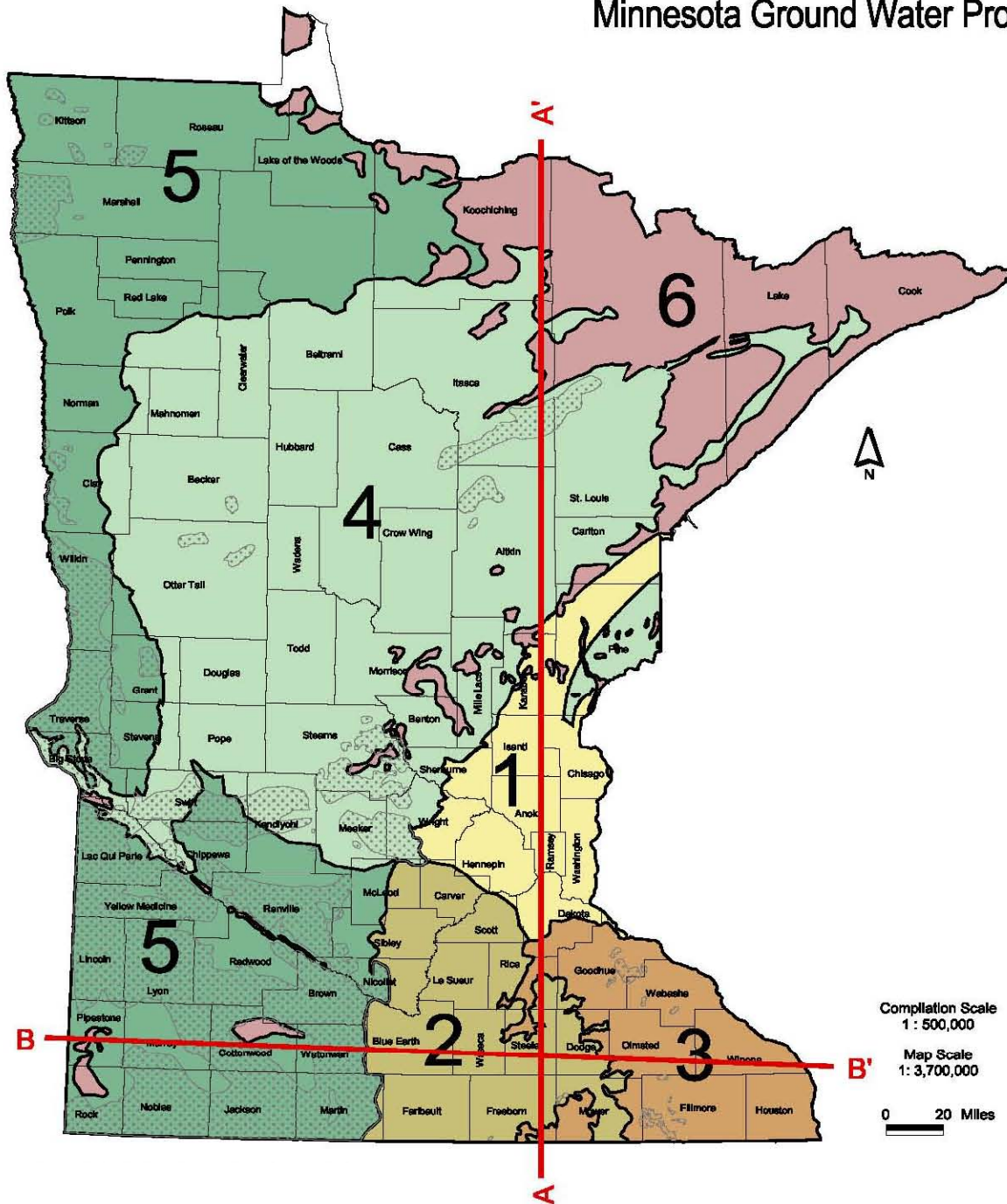
- floodwater storage and detention
- nutrient assimilation, sediment entrapment
- ground water recharge and discharge
- low-flow augmentation of streams
- aesthetics and recreation
- erosion control
- habitat

Issues

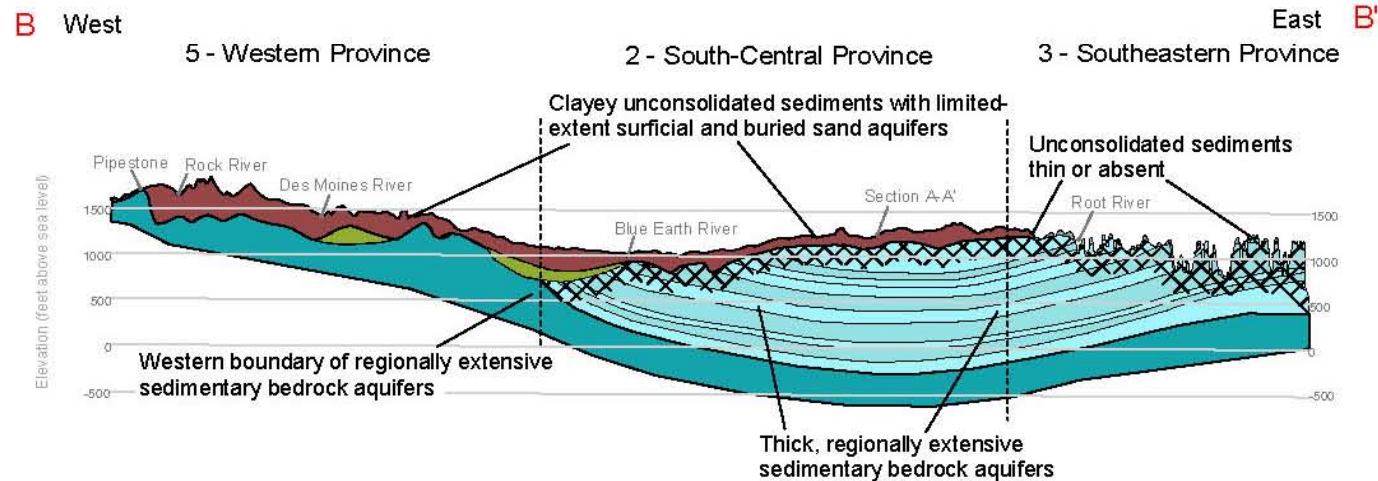
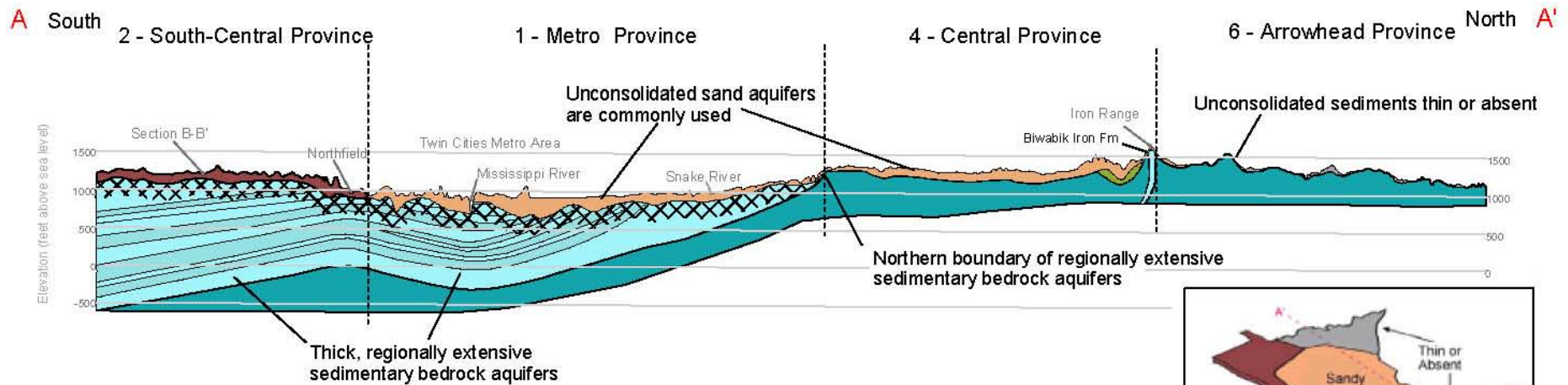
- once accounted for $\pm 1/3$ of MN's total acreage
- many wetlands drained for agricultural development in late 1800s and early 1900s
- $< 1/2$ of MN's original wetlands remain
- lost primarily to installation of drain tiles and ditches in the NW, W, and SW portions of the state
- current "no net loss" philosophy



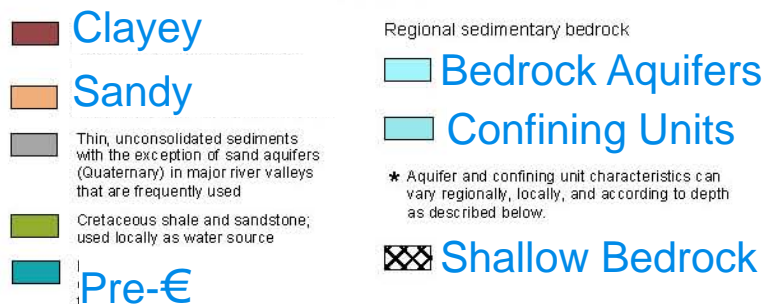
Minnesota Ground Water Provinces



Minnesota Ground Water Provinces - Generalized Cross Sections

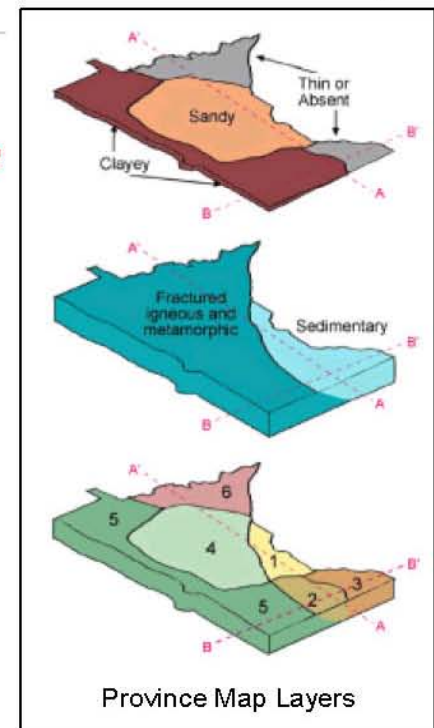


Explanation



Scale: 30 Miles

Approximate vertical exaggeration X 100



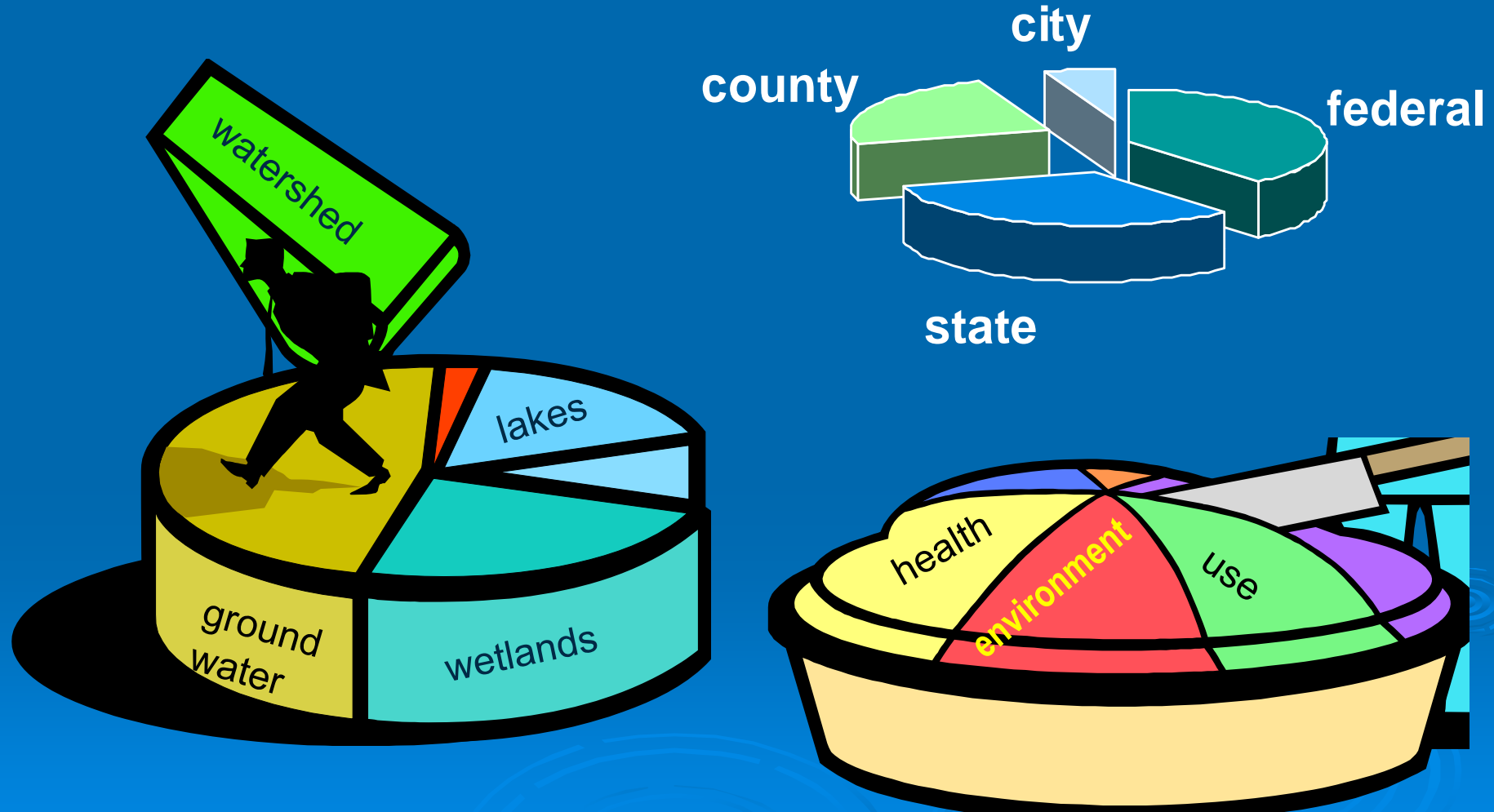
Modified from:

Issues

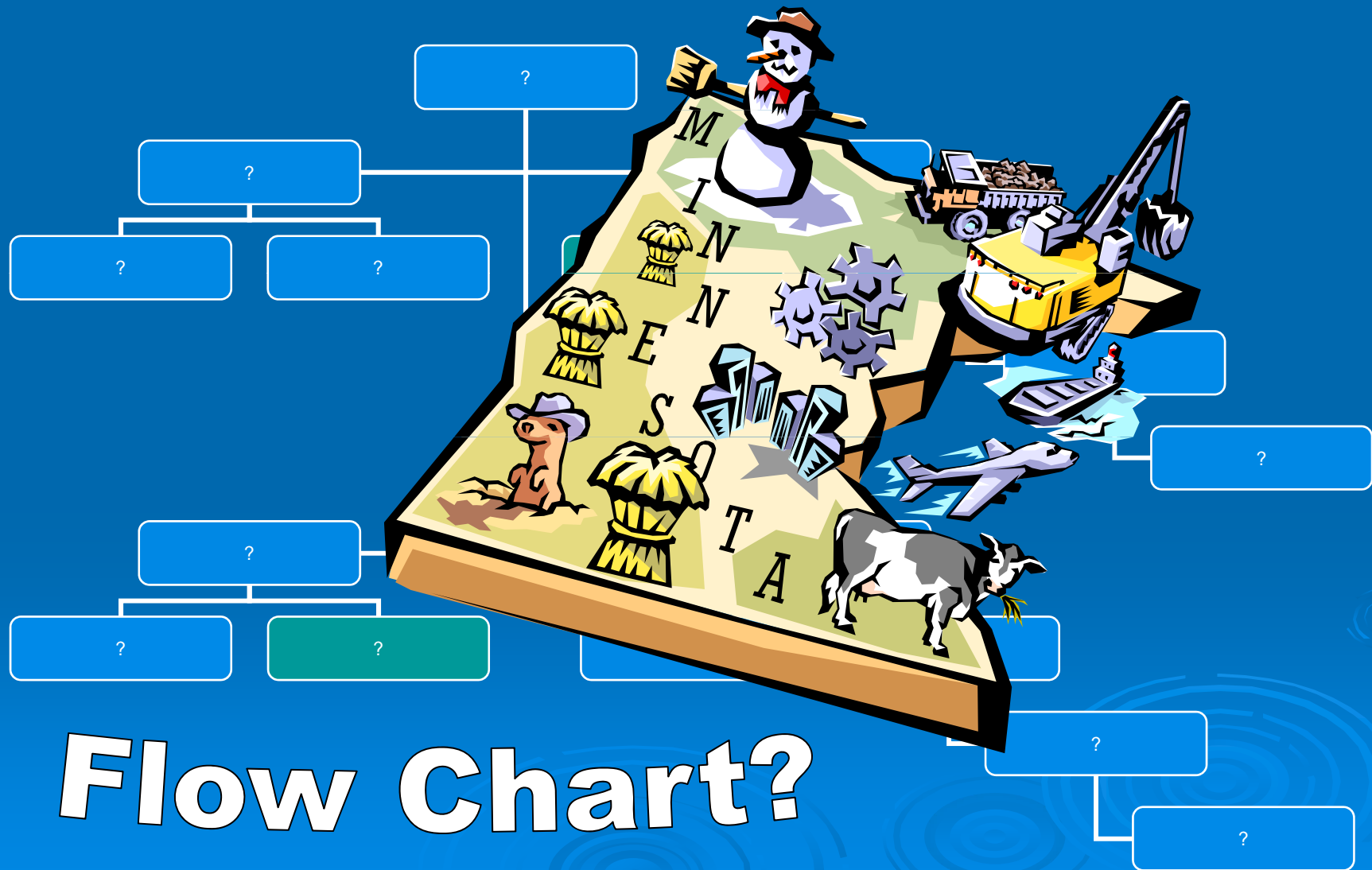
- Quality
- Quantity
- Use
- Conservation
- Human Impacts
- Human Health
- Environmental Health
- Information
- Education
- Economics
- Population Growth
- Politics



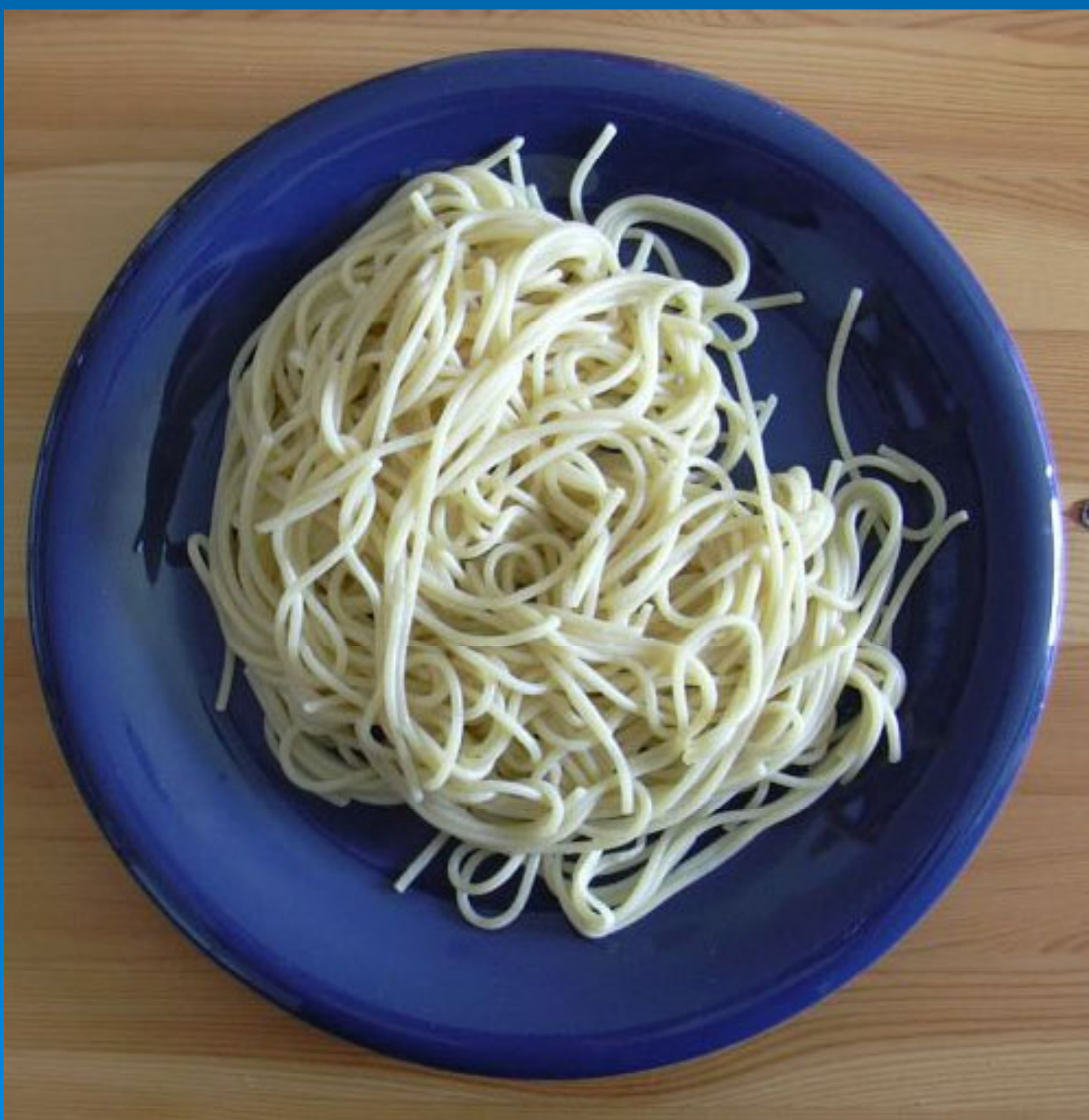
How to divvy up the water protection and management pie?

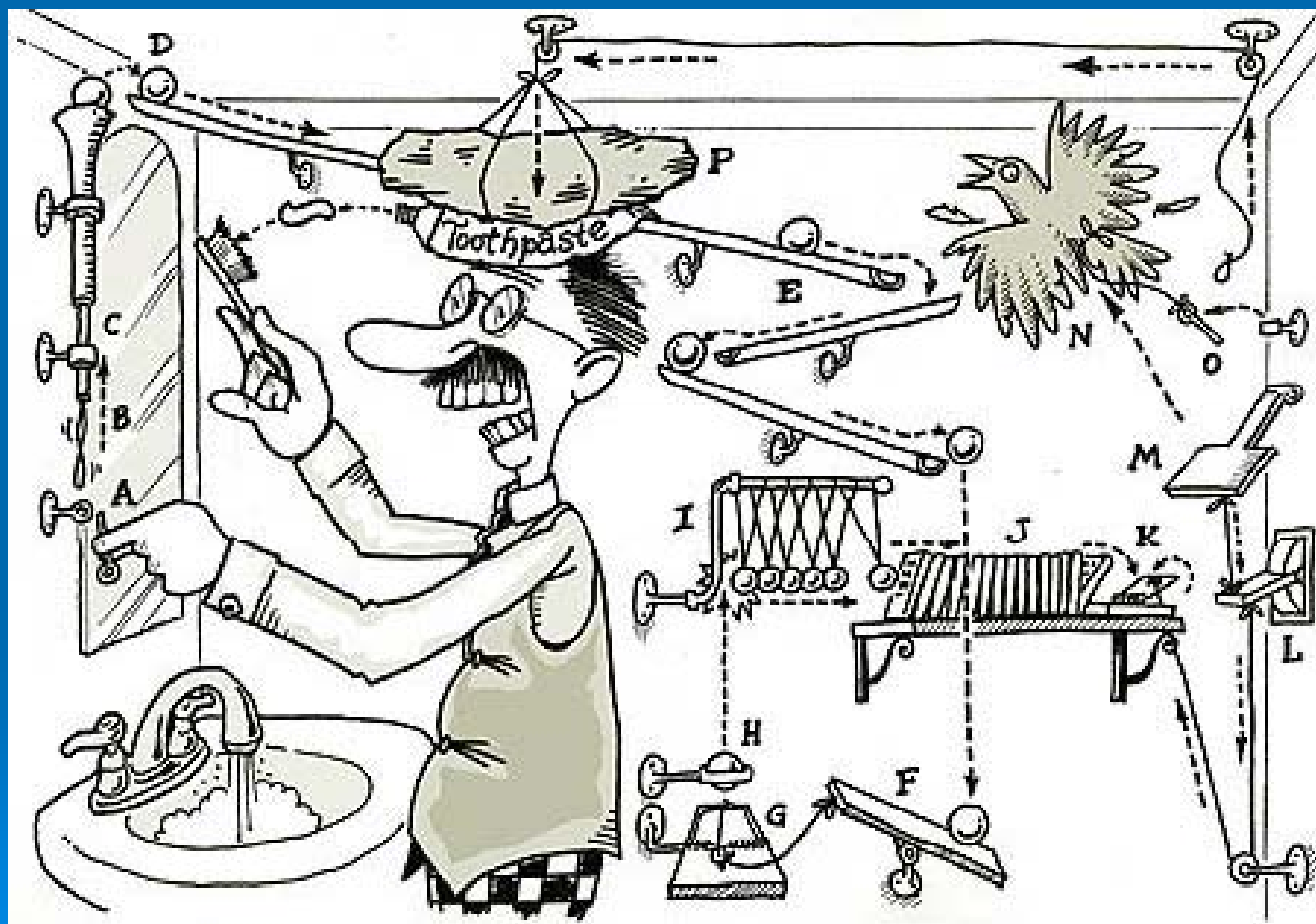


Water Management in MN

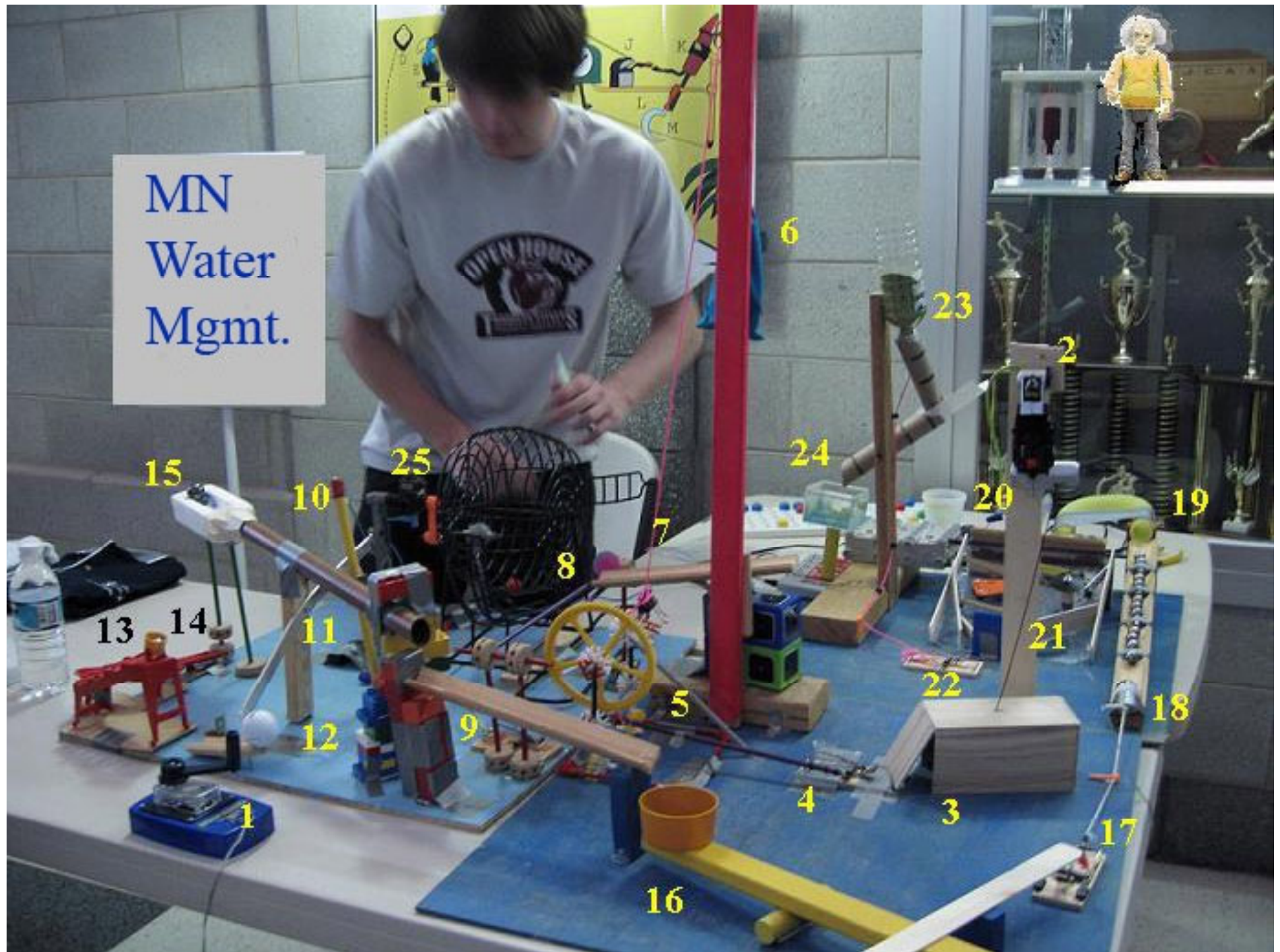


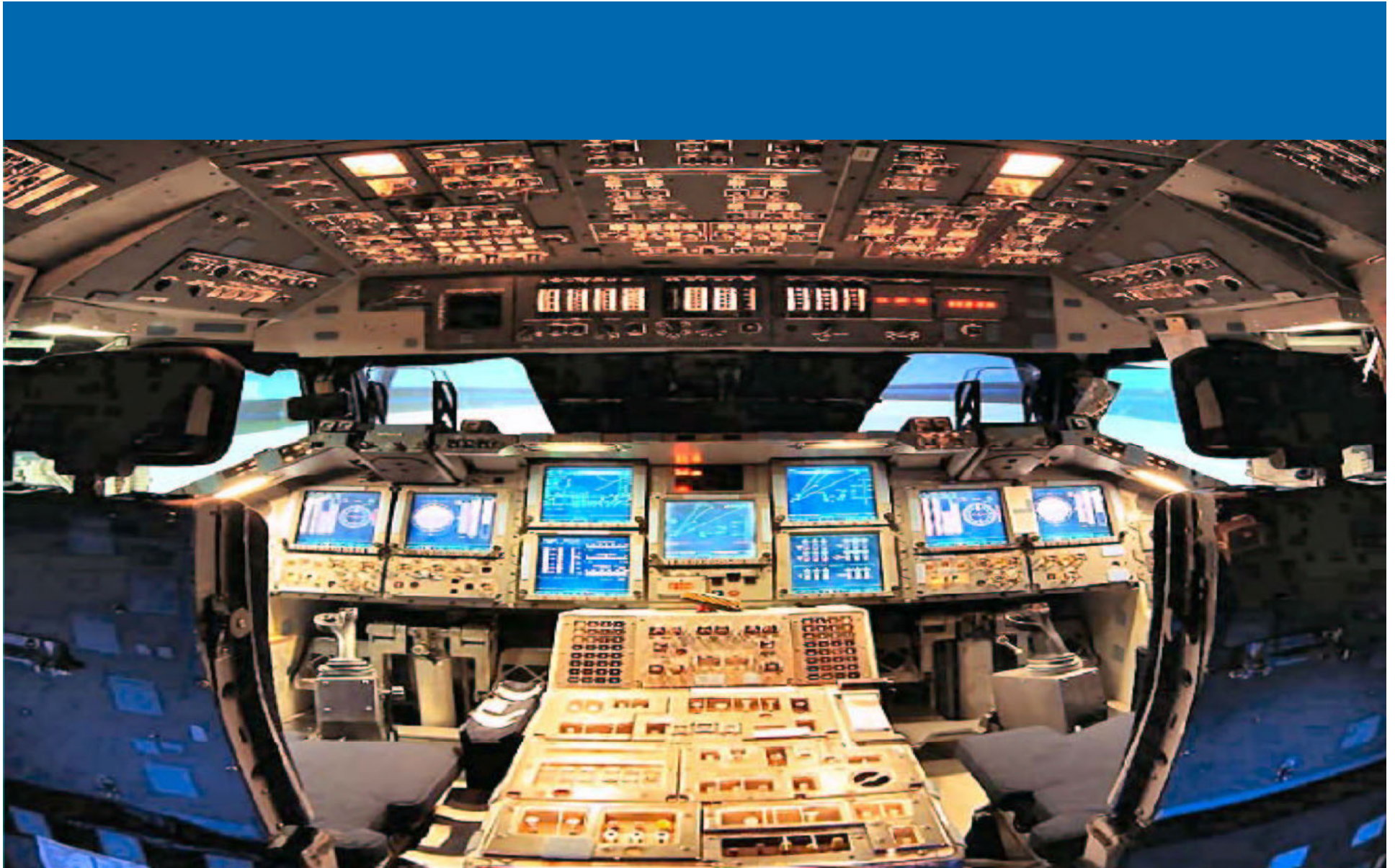
Flow Chart?





MN
Water
Mgmt.







Water Resource Management & Protection

Federal

- Interior
- USDA
- EPA
- USACE



State

- DNR
- MPCA
- MDH
- MDA
- BWSR



Local

- Regional
- County
- SWCD
- WD
- WMO

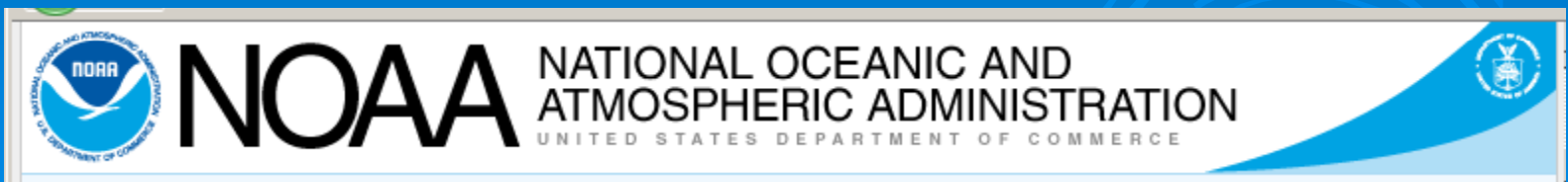
Federal



**US Army Corps
of Engineers**



United States Department of Agriculture



US EPA



- Clean Water Act (CWA) and other water laws.
Traditional focus: protect surface waters from point source pollution.
- Sets wastewater treatment technology standards
- requires industrial facilities to prevent chemical and oil spills from reaching surface waters, and to have plans to respond to spills .
- Investigates pollution of surface and groundwater.
Can require cleanup
- Delegates much of this authority to state governments

➤ CWA also directed at both point and non-point pollution thru legal directive that water quality in all surface waters be protected or restored to fishable and swimmable standards.

➤ States:

- set standards for pollutants
- determine how much pollution must be abated to meet those standards
- craft plans to allocate pollutant reductions among all of the point and non-point sources
- This is the **Total Maximum Daily Load (TMDL)** program



- In recent years, EPA has stepped up its CWA program regulating non-point-source pollution:
- permits for runoff from industrial facilities and construction sites
- Increased regulation of stormwater systems within urban or urbanizing areas
- state government carries out these programs under federal authority delegated from the EPA.





- §404 of the Clean Water Act
- Regulates draining & filling in “Waters of the US”:
- lakes, streams and wetlands, plus ditches & drainage pipes that connect to them
- This is the primary federal wetland protection law.
- Unlike EPA, Army Corps delegates very little of its authority down to state government



United States Department of Agriculture



NRCS Natural Resources
Conservation Service

- conservation easement programs
- “swampbuster” wetland protection provisions
- voluntary & incentive-based solutions to natural resource and environmental concerns on private lands
- technical assistance

- ...a further vast array of federal laws and programs that bear on water resource management...
- regulation, data collection, land management, technical assistance, funding.



State



Minnesota Pollution Control Agency



Minnesota Department of Health

Protecting, maintaining and improving the health of all Minnesotans



Minnesota

Department of Natural Resources

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MPCA

- carry out delegated federal responsibilities
- issuing technology-based permits to industrial dischargers
- TMDL program
- setting water quality standards for pollutants
- sampling and assessing surface & ground waters throughout the state
- allocating pollutant load reductions among sources



MPCA

Responsibilities

- water-quality monitoring and reporting
- development of best management practices
- regulations to protect water from chemical contaminants
- pollution-prevention grants
- technical assistance
- environmental education resources
- many responsibilities passed on to local government



MPCA

Key Programs & Activities

- Nonpoint sources of pollution
- Financial assistance to local government for investigation of pollution sources in local surface and ground water
- Feedlots and manure management
- Individual sewage treatment systems (septic systems) help for local governments
- Municipal and industrial wastewater treatment permitting
- Land application of biosolids (sludge)
- Hazardous waste from businesses
- Solid waste facility permitting
- Underground and above-ground storage tank registration
- Storm water



Minnesota

Department of Natural Resources

DNR

- Water **quantity** issues. Regulates higher-volume appropriations of surface and groundwater
- Regulates work in lakes, streams and wetlands that meet the definition of a “public water”
- Regulation covers filling, dredging, dams, culverts, docking structures, aquatic vegetation harvesting, and mineral extraction from lakebeds.
- DNR acquires conservation easements to protect riparian areas and manages aquatic and riparian habitat for both game and non-game wildlife.



Minnesota

Department of Natural Resources

DNR

Responsibilities

- Managing water as a natural resource
- Water use, availability and sustainability planning and study
- Water use management and regulation
- Resolve water use conflicts and interference
- Water-quantity monitoring
- Hydrogeologic mapping
- Environmental review related to water use and public waters



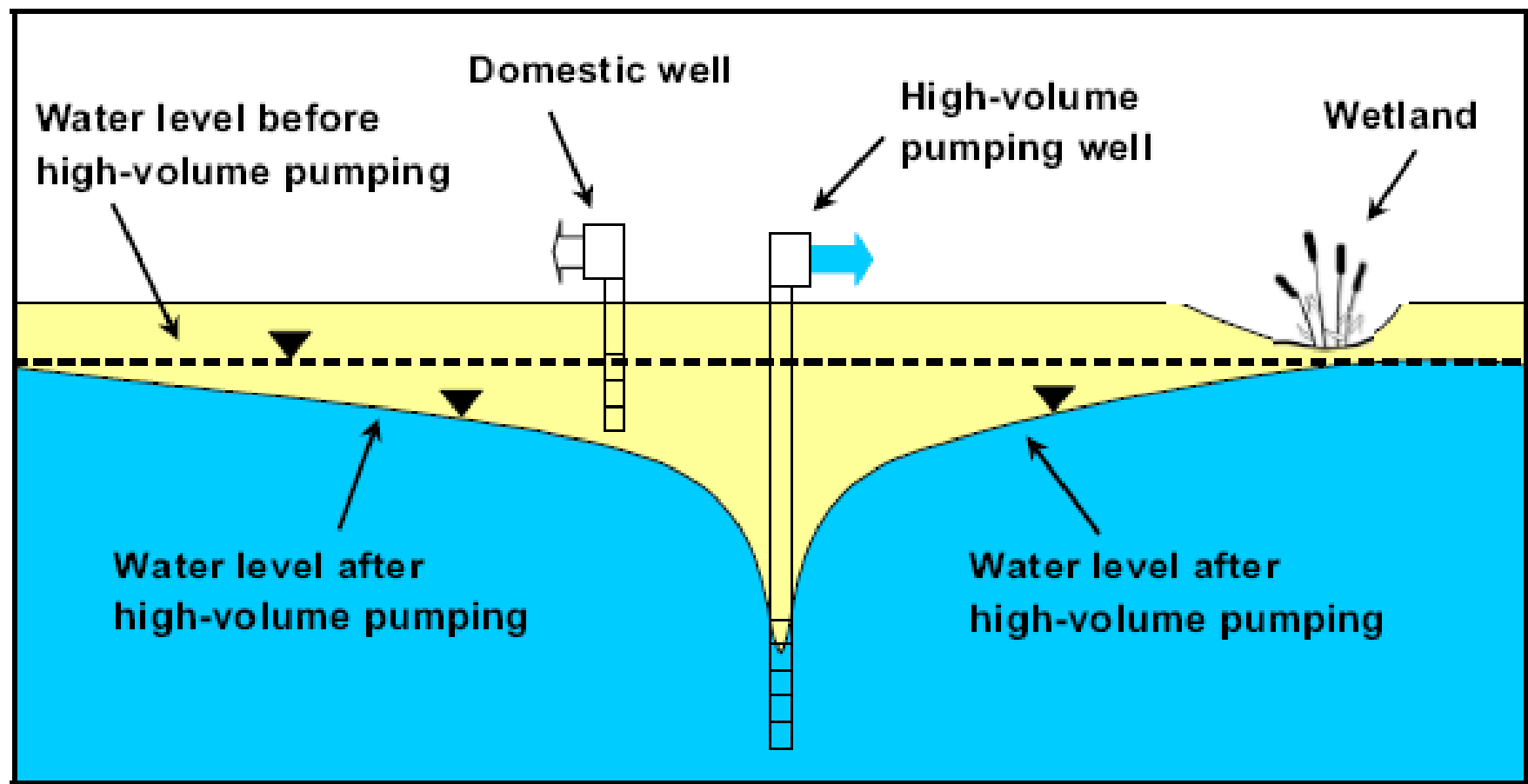
Minnesota

Department of Natural Resources

DNR

Key Programs & Activities

- Water appropriation permitting
- Public water supply plan approval
- Water use data collection and analysis
- Ground water level monitoring
- Lake level monitoring
- Stream flow monitoring
- Climate monitoring
- Hydrology components of geologic atlases and hydrogeologic assessments
- Hydrogeologic sensitivity mapping
- Environmental review of high volume water uses and projects impacting public waters



Minnesota Department of Health

Protecting, maintaining and improving the health of all Minnesotans

Responsibilities

- Regulation of wells and borings
- Wellhead and source water protection measures for public water supplies
- Ensuring the safety of public drinking water supplies
- Development of health risk limits.

Minnesota Department of Health

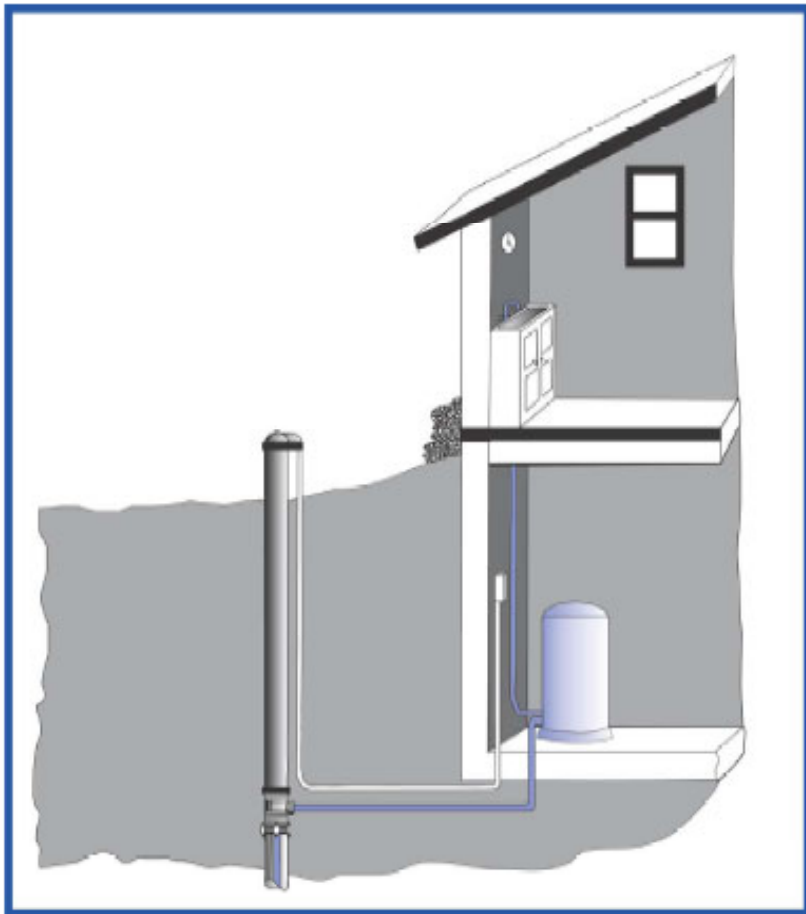
Protecting, maintaining and improving the health of all Minnesotans

Key activities and programs:

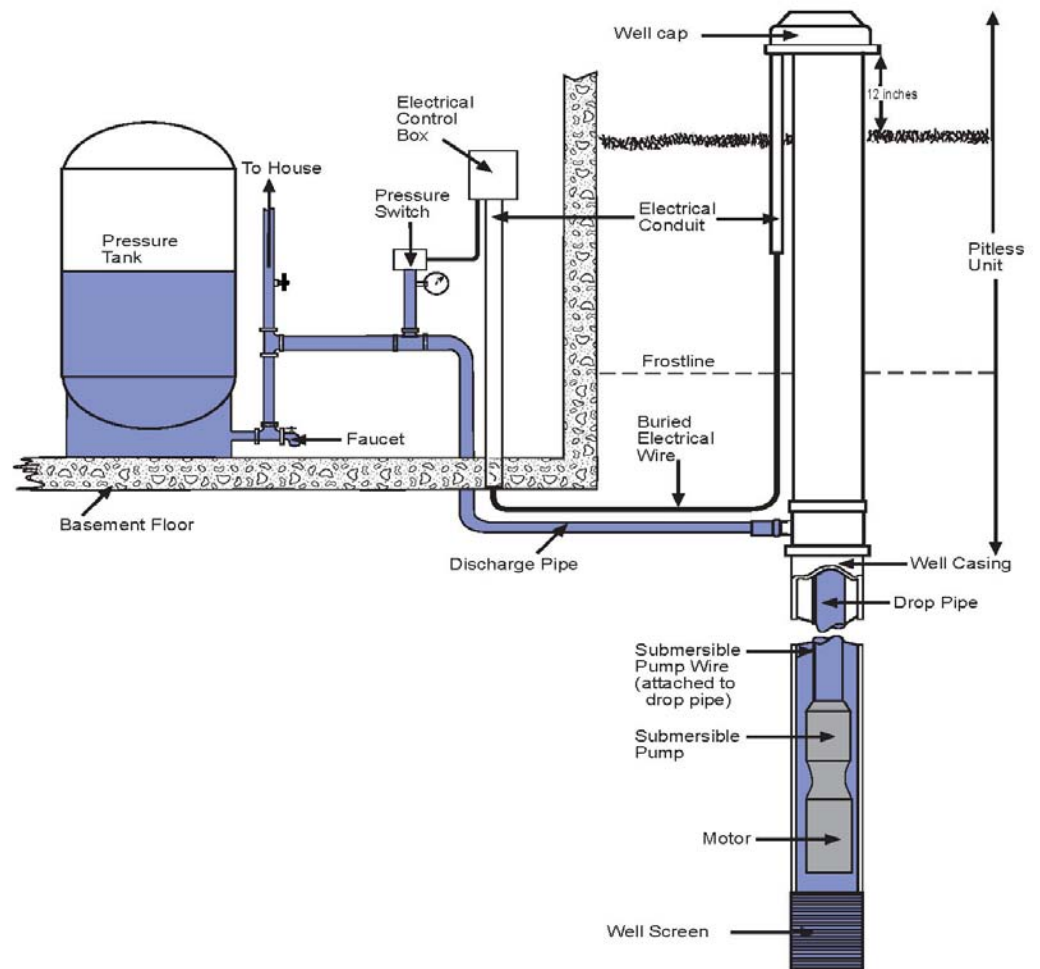
- Wellhead (source water) protection program
- Well management program - regulates of well installation, and sealing
- Public drinking water supply program
- Development of health risk limits

Well Owner's Handbook

A Consumer's Guide to Water Wells



Well Management Section
Environmental Health Division
Minnesota Department of Health



Retrieve by number ?

4725

Rules

Retrieve

Keyword Search

Statutes

Laws

Rules

About Minnesota Rules

Agency List

Table of Chapters

Minnesota Administrative Rules

Chapter Text Pdf

CHAPTER 4725. WELLS AND BORINGS

DEPARTMENT OF HEALTH

Part	Title
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[4725.0050](#)

GENERAL.

[4725.0100](#)

DEFINITIONS.

[4725.0150](#)

INCORPORATIONS BY REFERENCE AND ABBREVIATIONS.

[4725.0200](#)

APPLICATION TO ALL WELLS AND BORINGS.

[4725.0250](#)

ENFORCEMENT.

[4725.0300](#)

[REPEALED, 17 SR 2773]

[4725.0350](#)

FEES APPLICABLE TO THIS CHAPTER.

[4725.0400](#)

[REPEALED, 15 SR 1597]

[4725.0410](#)

VARIANCE.

[4725.0450](#)

[REPEALED, 17 SR 2773]

LICENSING AND REGISTRATION

[4725.0475](#)

ACTIVITIES REQUIRING LICENSURE OR REGISTRATION.

[4725.0500](#)

[REPEALED, 17 SR 2773]

[4725.0550](#)

CERTIFIED REPRESENTATIVE OR INDIVIDUAL WELL CONTRACTOR.

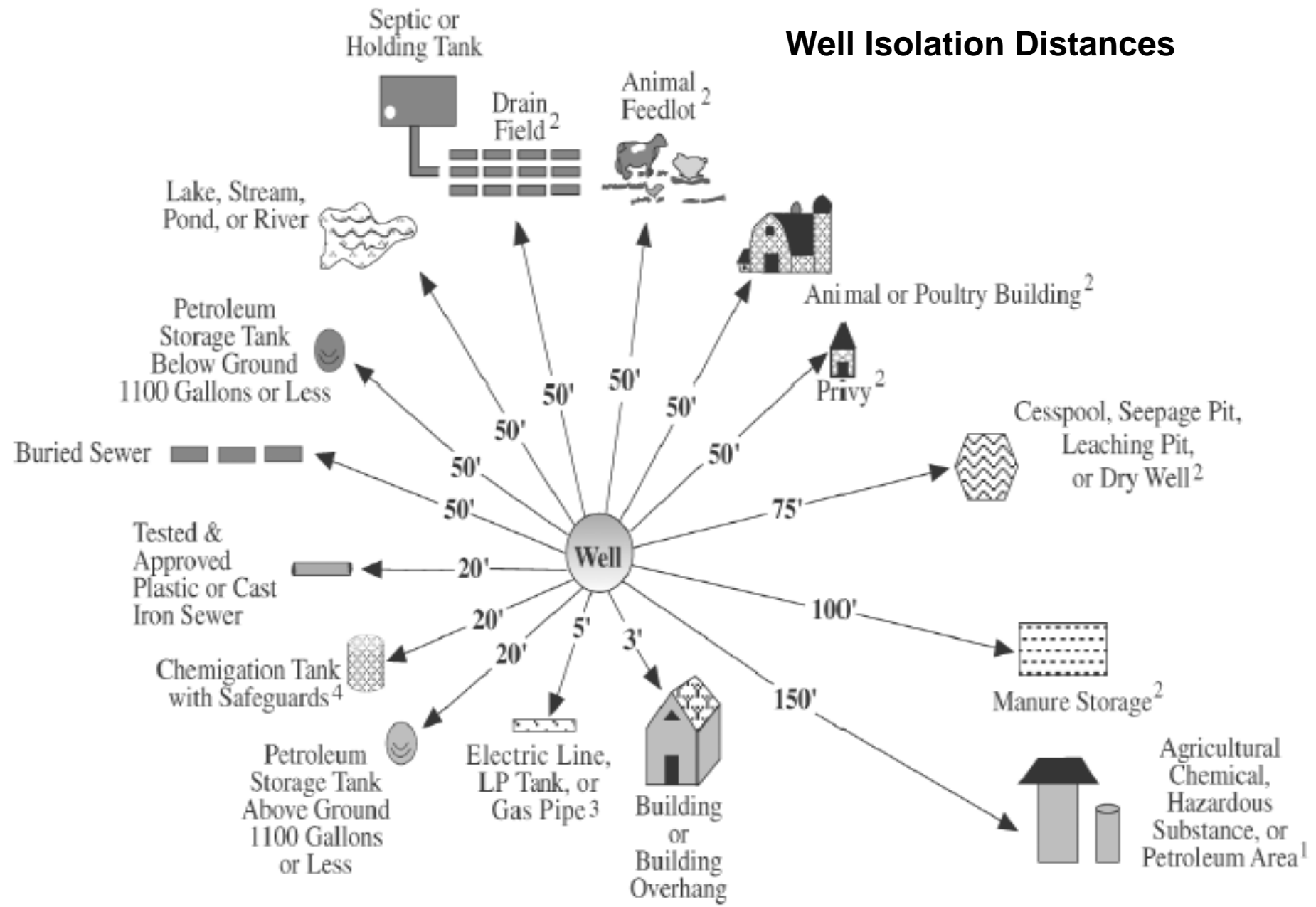
[4725.0600](#)

[REPEALED, 15 SR 78]

[4725.0650](#)

EXPERIENCE REQUIREMENTS; CERTIFIED REPRESENTATIVE AND INDIVIDUAL WELL CONTRACTOR.

Well Isolation Distances



BWSR



Responsibilities:

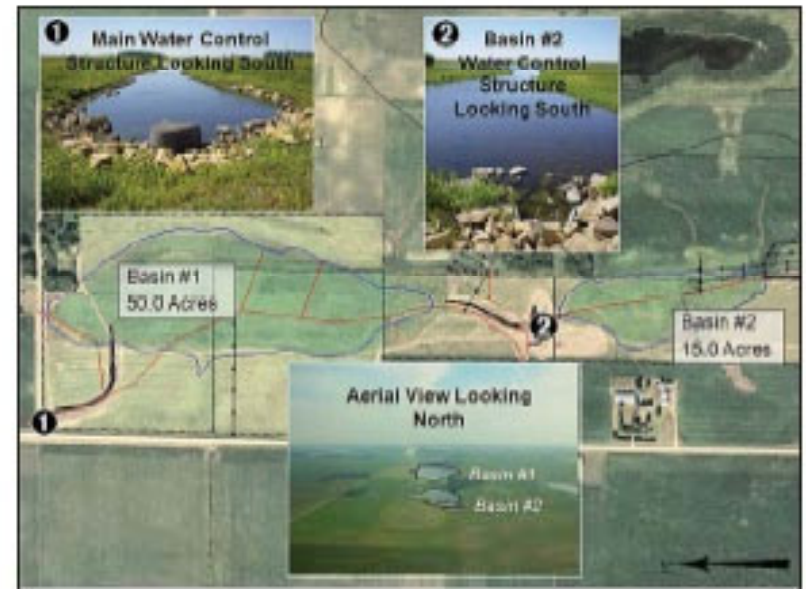
- technical assistance to local governments on natural resource management issues
- comprehensive local water management
- grants to local government units to direct private land soil and water conservation programs through the action of SWCDs, counties, cities, townships, watershed districts, and water management organizations
- wetland protection
- state soil conservation agency
- resolution of water policy conflicts and issues
- forum to incorporate local issues, priorities, and opportunities into state public policy

BWSR



Key activities and programs:

- state cost-share program
- clean water legacy grant program
- Natural Resources Block Grant
- Reinvest in Minnesota (RIM) reserve, and Conservation Reserve Enhancement Program (CREP)
- Comprehensive local water management
- Wetland Conservation Act (WCA)



Judicial Ditch 10 wetland restoration



Responsibilities:

- Sustainable agriculture and integrated pest management
- water-quality monitoring
- development of best management practices
- regulations to protect ground water from agricultural chemical contaminants.

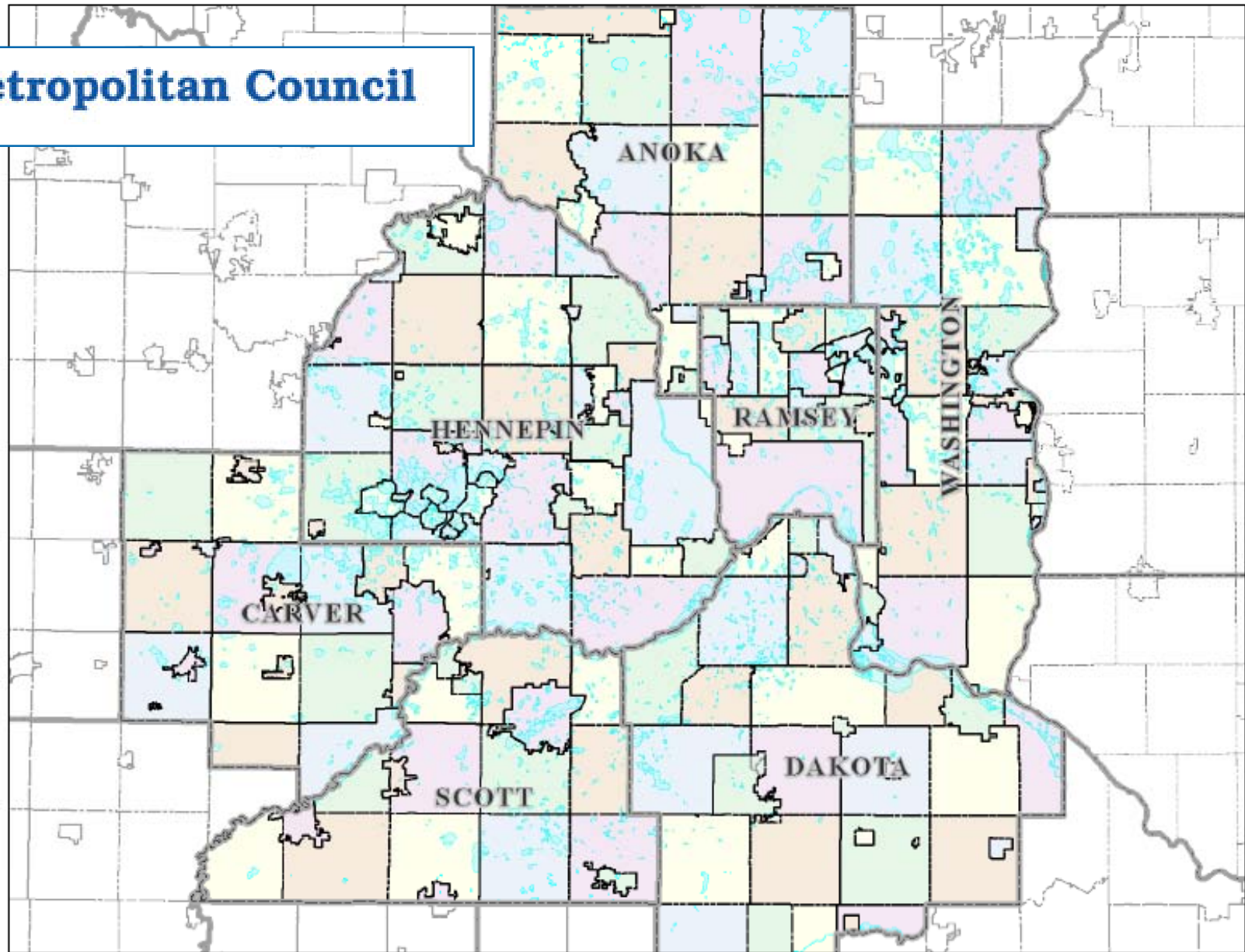


Key activities and programs:

- Bulk pesticide and fertilizer storage permits
- Pesticide applicator licensing
- Waste pesticide and pesticide container collection
- Sustainable agriculture
- Statewide pesticide management plan
- Nitrogen fertilizer management
- Agricultural best management practices local program

7-County Twin Cities Metro Area

 **Metropolitan Council**



0 6 12 18 mi.

1:670,279





Metropolitan Council

- regional planning agency serving the Twin Cities seven-county metropolitan area.
- operates the region's largest bus system
- collects and treats wastewater
- engages communities and the public in planning for future growth
- provides forecasts of the region's population and household growth
- provides affordable housing opportunities for low- and moderate-income individuals and families
- provides planning, acquisitions and funding for a regional system of parks and trails
- provides a framework for decisions and implementation for regional systems including aviation, transportation, parks and open space, water quality and water management.

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- Education
 - Research
 - Training
 - Technology transfer
-

- Food, Agricultural & Natural Resource Sciences
 - Engineering departments
 - Geology/ geophysics, MGS, LRC
 - Water Resources Center
 - ...& more...
- 

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Minnesota Geological Survey



Responsibilities:

- Serve as the state's primary resource for geologic information. (Geology is the “container” for the state's water resources.)
- Geologic mapping and interpretation
- Provide the basic geologic information key to understanding water availability and quality

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Minnesota Geological Survey

Key activities and programs:

- Geologic Atlas and Regional Hydrogeologic Assessments (in conjunction with DNR)
- Conduct studies to understand the state's hydrogeologic framework, ground-water resources and ground-water conditions;
- Provide data, reports, and maps to communicate findings and provide essential support to other organizations involved in water resource management.
- Characterize aquifer systems

Coordination???



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Department of Natural Resources**

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MINNESOTA DEPARTMENT OF
AGRICULTURE
FROM THE FARM TO YOUR FAMILY



The Environmental Quality Board (EQB)

- 5 Citizen Members
- Natural Resources
- Agriculture
- Health
- Transportation
- BWSR
- Pollution Control Agency
- Commerce
- DTED
- Minnesota Planning
- OEA



Governor's Water Unification Initiative

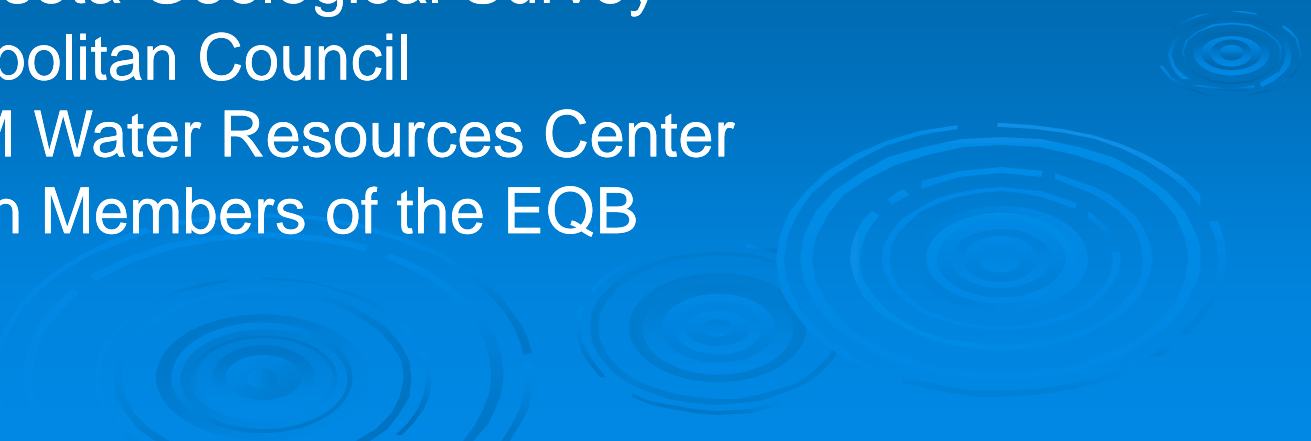
Environmental Quality Board (EQB)

Water Resources Committee

Water program directors from:

- Department of Natural Resources
- Department of Agriculture
- Department of Health
- Pollution Control Agency
- Board of Water and Soil Resources

As well as:

- Minnesota Geological Survey
 - Metropolitan Council
 - U of M Water Resources Center
 - Citizen Members of the EQB
- 



Minnesota Environmental Quality Board

Coordinating Policies and Plans for Minnesota's Environment

EQB Water Resources Committee

Brings Plans and Programs Together



Local Plans

Metro Ground Water Plans
Metro Surface Water Plans
Metropolitan Council Blueprint



County Local Water Plans
Watershed Plans
SWCD Plans



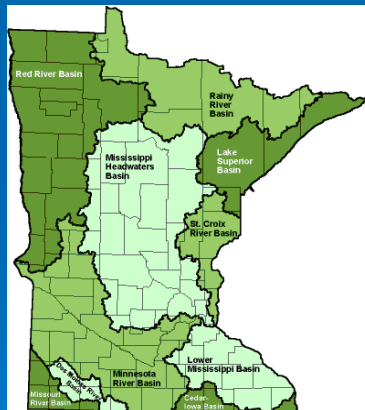
Citizen Group Initiatives



Minnesota Pollution Control Agency



Resource-Based Basin Plans



Overall State Priorities and Plans Developed Through EQB



Biennial Priorities for Clean, Plentiful Water to Governor and Legislature



Specific State Plans and Assessments, such as:

DNR Directions Strategic Plan
PCA Nonpoint Source Management Plan
Animal Agriculture Generic Environmental Impact Statement
Recommendations of MDH Ad Hoc Source Water Task Force
Water Assessments



Minnesota Watermarks

Gauging the flow of progress 2000-2010

MINNESOTA

w a t e r m a r k s

gauging the flow of progress 2000 - 2010

Not to mention...

- Legislative-citizen Commission on Minnesota Resources (LCCMR)
- Clean Water Legacy, Council, Cabinet
- Lessard Outdoor Heritage Council
- MN Conservation and Preservation Plan

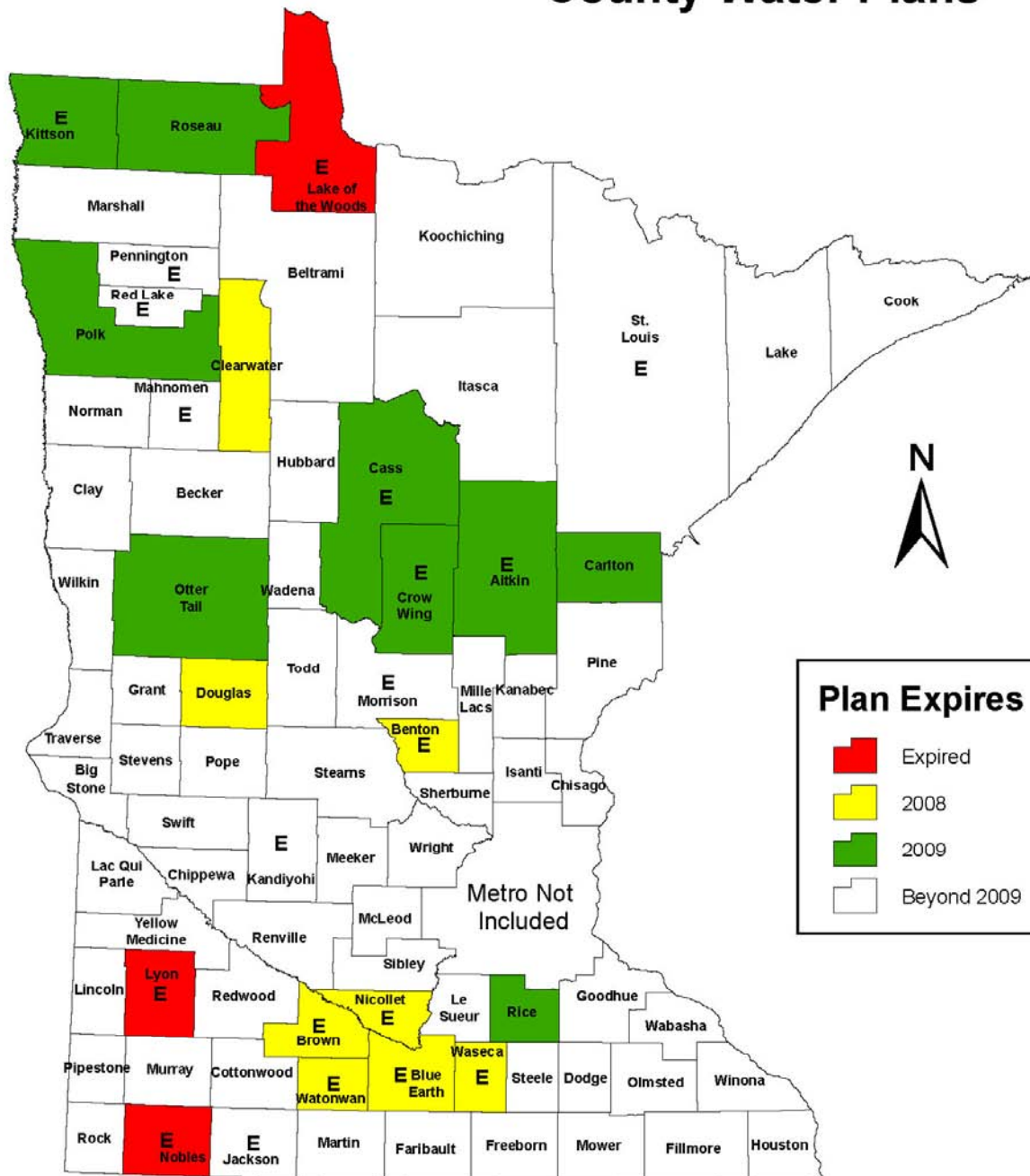


Local

- Counties
- Soil and Water Conservation Districts (SWCD)
- Watershed Districts
- Watershed Management Organizations



Comprehensive Local Water Management

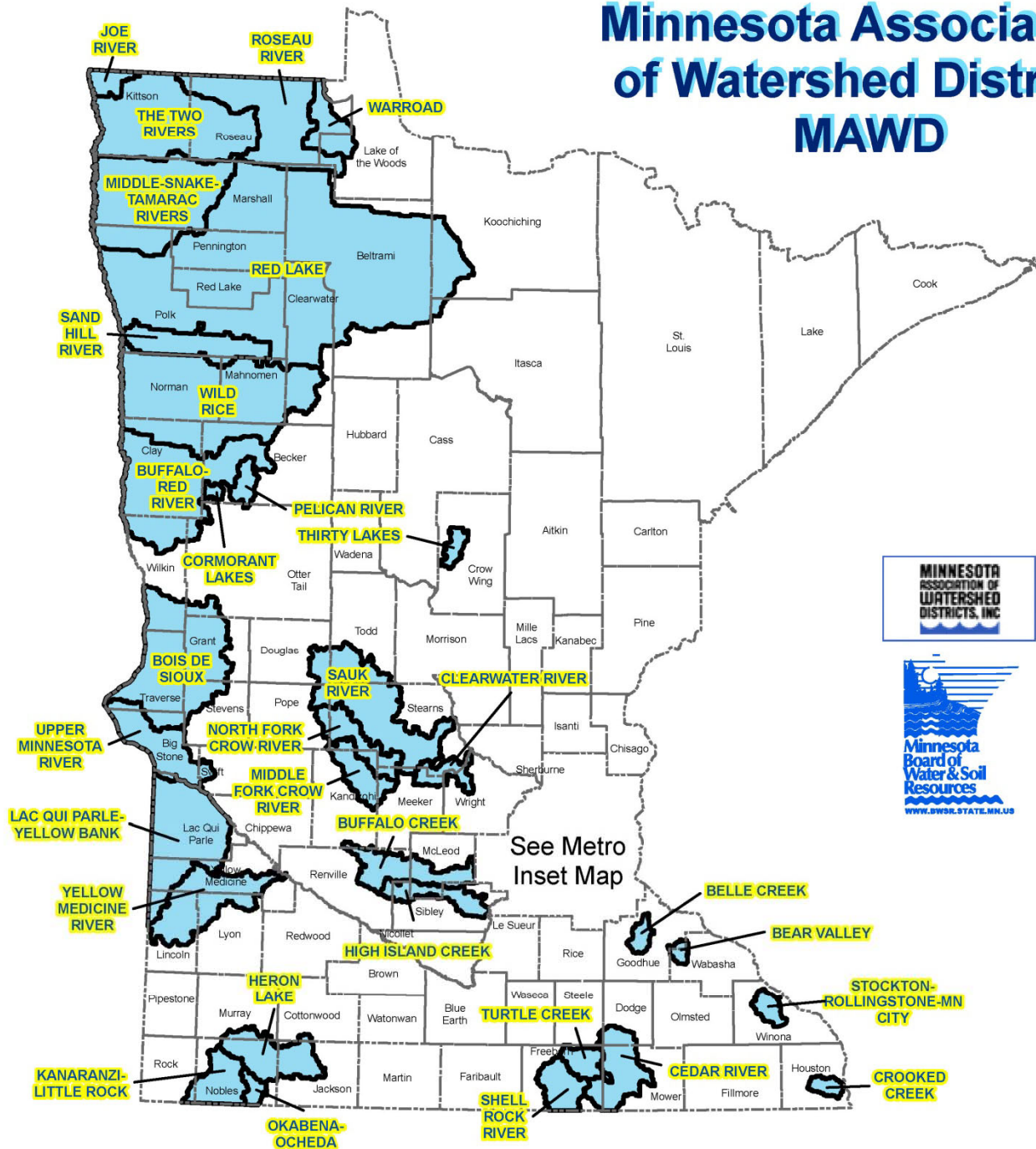


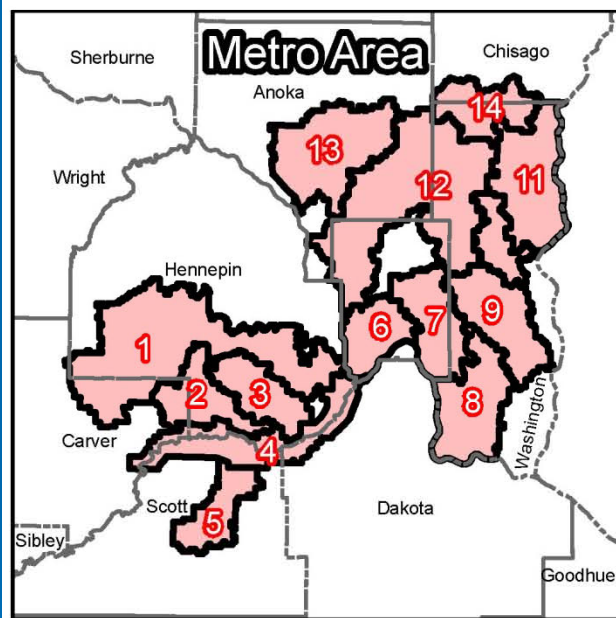


Minnesota Soil & Water Conservation Districts



Minnesota Association of Watershed Districts MAWD





Metro Watershed Districts



1, MINNEHAHA CREEK



2, RILEY-PURGATORY-BLUFF CREEK



3, NINE MILE CREEK



4, LOWER MINNESOTA RIVER



5, PRIOR LAKE-SPRING LAKE



6, CAPITOL REGION



7, RAMSEY-WASHINGTON-METRO



8, SOUTH WASHINGTON



9, VALLEY BRANCH



10, BROWNS CREEK



11, CARNELIAN-MARINE-ST. CROIX



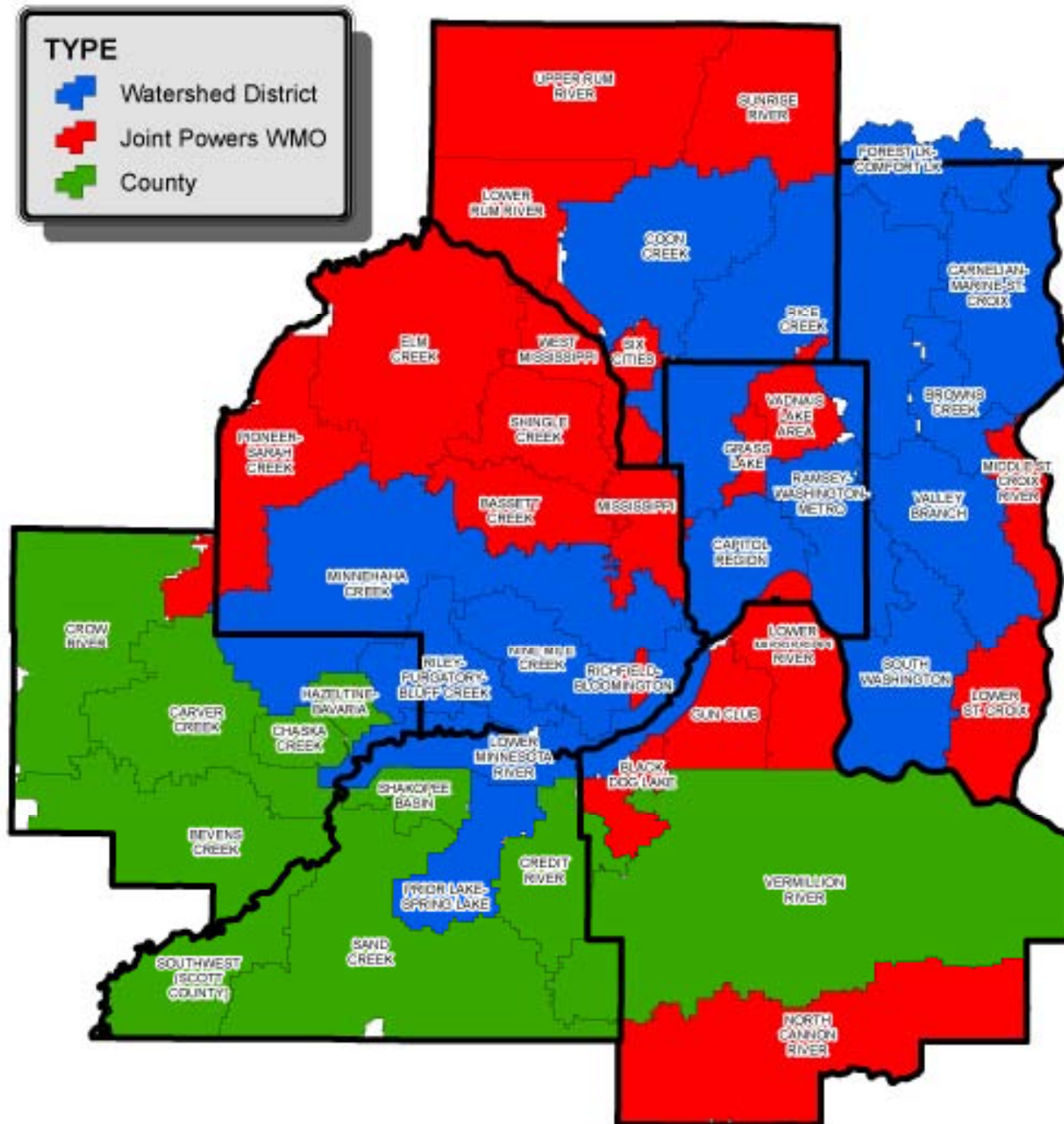
12, RICE CREEK



13, COON CREEK

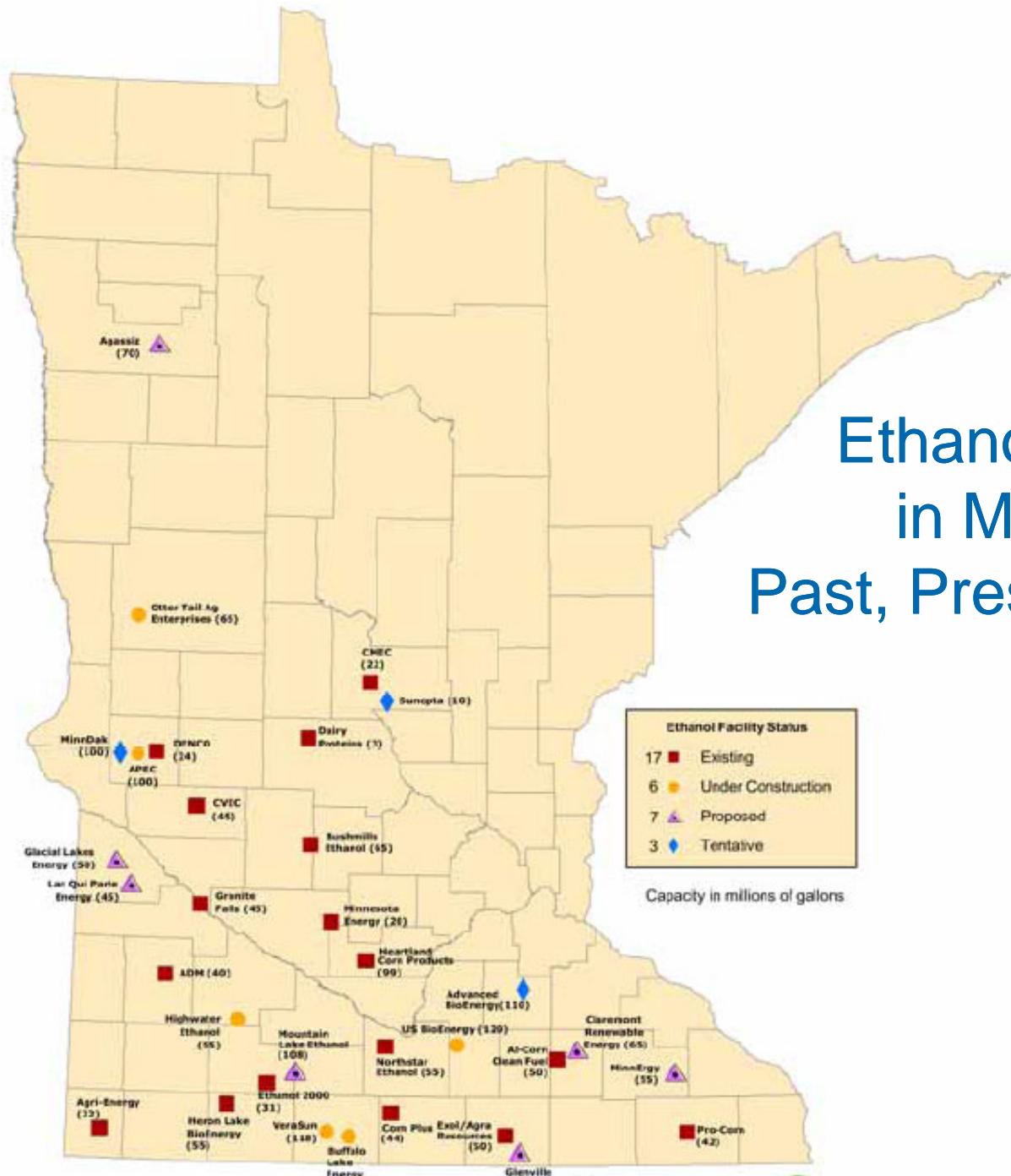


14, FOREST LK-COMFORT LK



Watershed Management Organizations

Ethanol Facilities in Minnesota Past, Present, & Future



Planning and Constructing an Ethanol Plant in Minnesota: A Guidance Document



**May 2008
(revised)**



A publication made in cooperation with:
Minnesota Pollution Control Agency
Minnesota Department of Natural Resources
Minnesota Department of Agriculture
Minnesota Department of Employment and Economic Development
Minnesota Department of Transportation
Minnesota Department of Commerce
Minnesota Department of Health

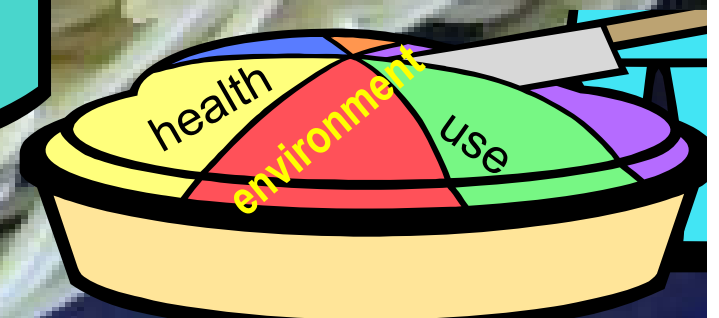
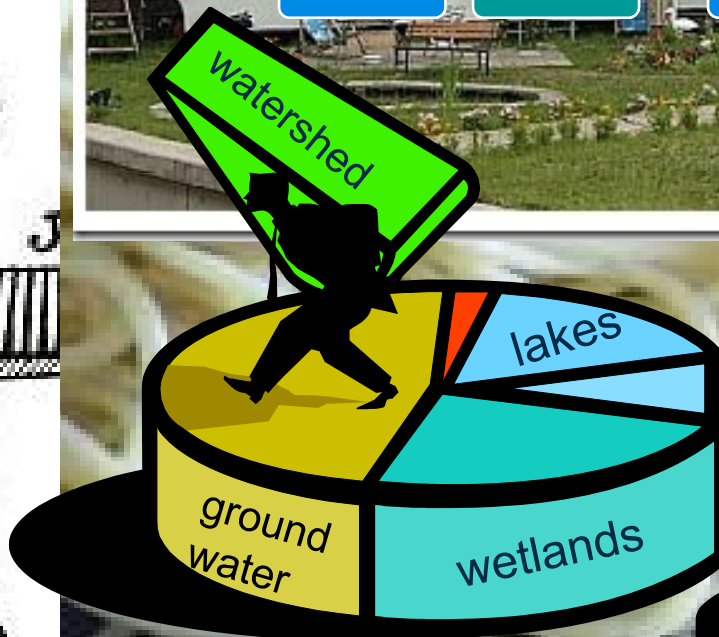
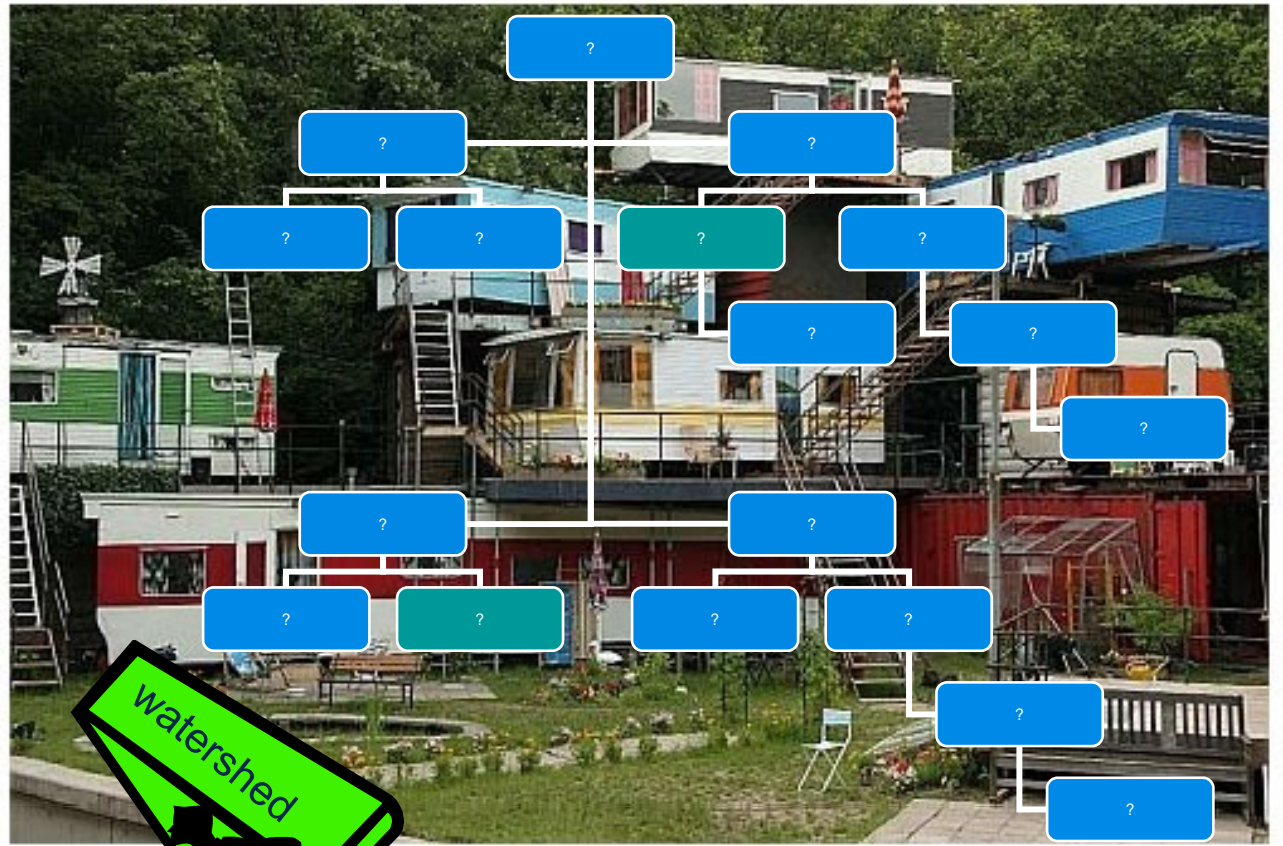
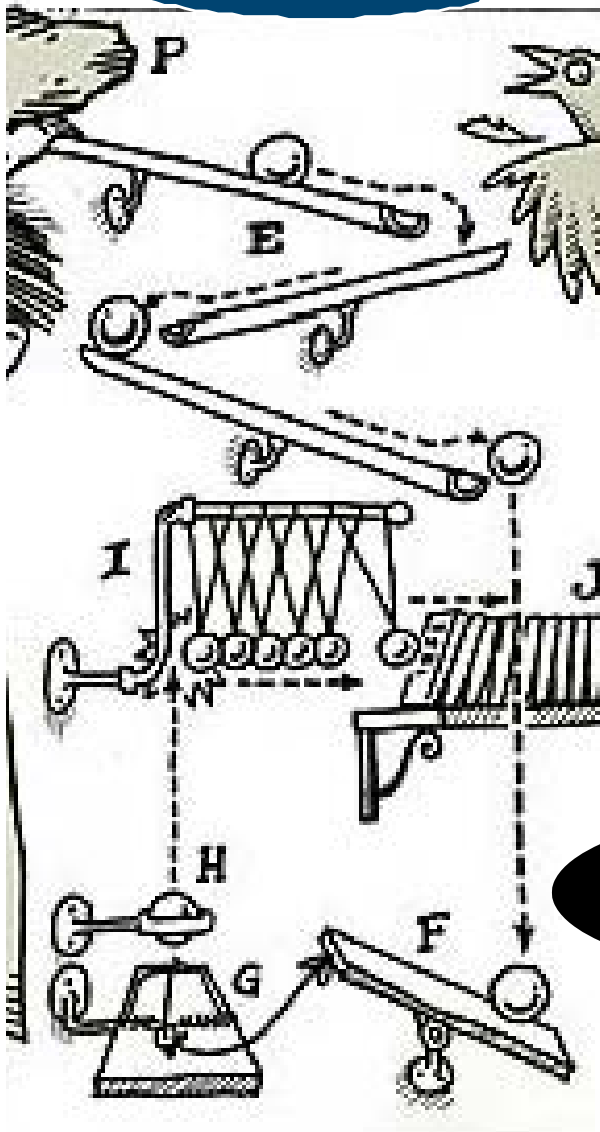
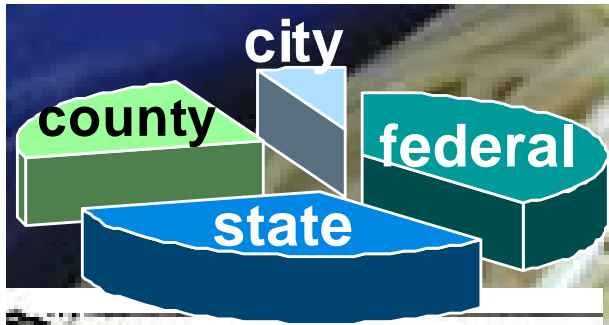
Ethanol Plant

Water Resources Considerations

- Water Supply
- Natural Resource Features
- Water Appropriation Permits
- Well Interference
- Wetland Impacts
- Public Water Permits
- Wastewater Disposal
- Water Quality Standards
- Public Water Supply Wells
- Transportation

Environmental Planning/ Permits

- Environmental Review: EAW or EIS
- Water Appropriations (DNR)
- Public Water Supply Wells (MDH)
- Air Permit
- Air Dispersion Modeling
- Air Emission Risk Assessment (AERA)
- Wastewater Permits (NPDES/SDS): Stormwater (construction and industrial), Process Wastewater/ Non-Process Water/ Sanitary Sewer Extension
- Storage Tanks: Aboveground or Underground
- Hazardous Waste
- Natural Heritage Information Request
- Wetlands – Combined Joint Notification





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“... democracy is the worst form of government except all those other forms that have been tried from time to time..”

- Winston Churchill

...democracy is not neat, orderly, or quiet. It requires a certain relish for confusion. ”

- Molly Ivins

There are no magic answers, no miraculous methods to overcome the problems we face, just the familiar ones: honest search for understanding, education, organization, action...

- Noam Chomsky

“More so than any other state, the quality and quantity of water in Minnesota is central to our way of life. It helps define who we are and what we value.”

- Governor Tim Pawlenty



***“I might get frustrated
once in awhile –
but I’m never bored.”***



End

