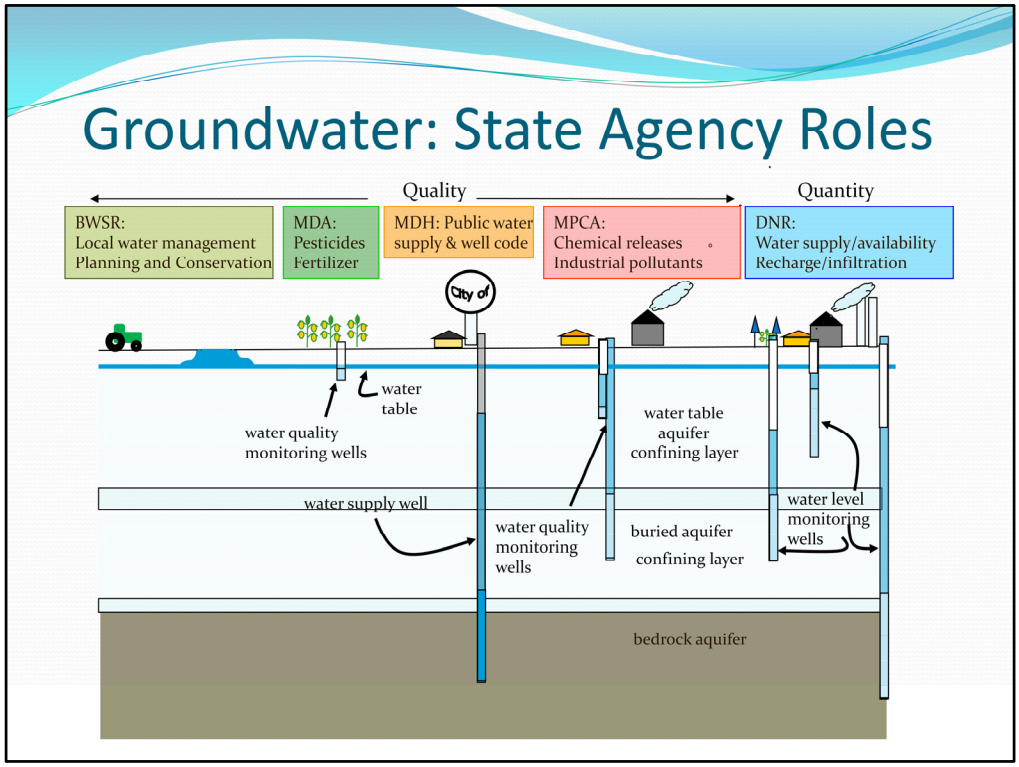
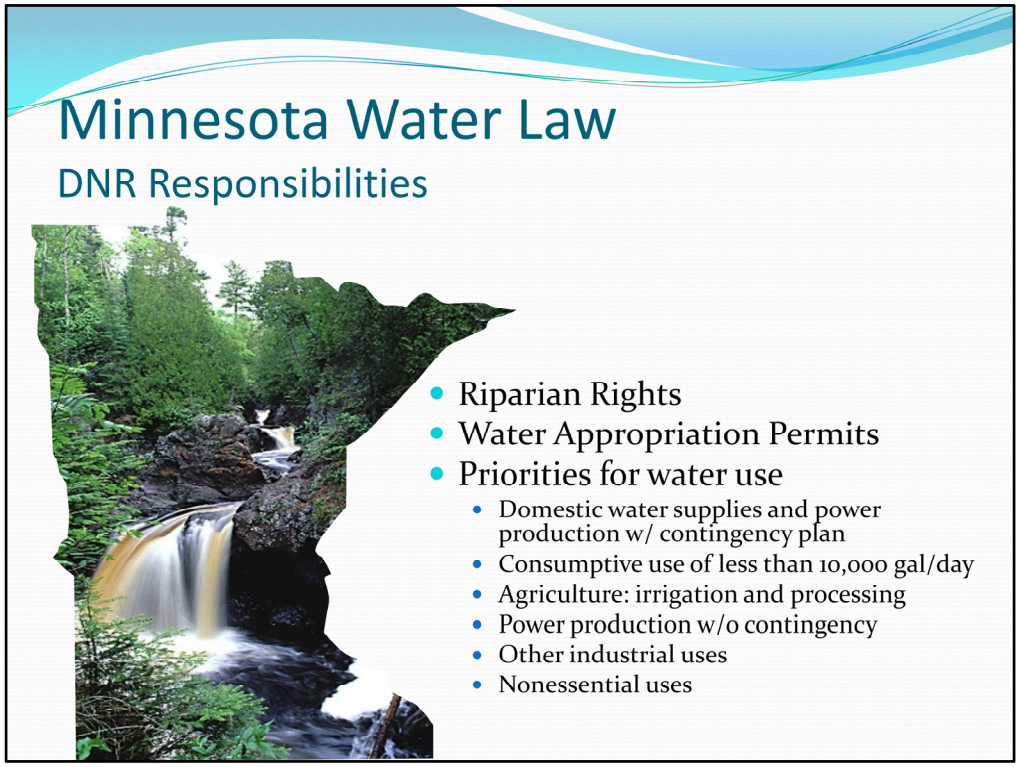
Hello my name is Joy Loughry and I am with the groundwater technical unit of the Minnesota department of natural resources. Today I am going to talk about how the state of Minnesota manages its Water resources and how we are moving forward with groundwater management areas.



The state of Minnesota has 5 state agencies that regulate our water resources.

The Minnesota board of water and soil resources, The Minnesota Department of Agriculture, the Minnesota department of Health and the Minnesota pollution control agency deal mostly with water quality issues like local planning, regulation of pesticides and fertilizer, well head protection, and industrial contamination.

The Minnesota Department of Natural Resources regulates water supply and availability.

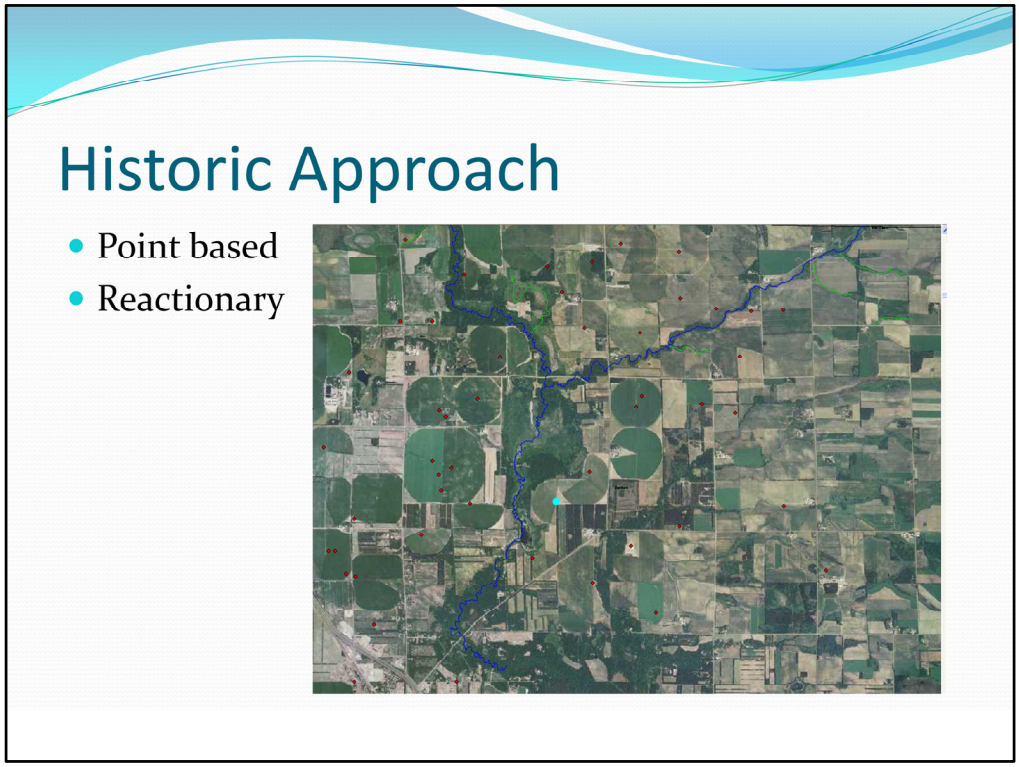


Minnesota is a riparian rights state. Minnesota's Water Law is based on the common law doctrine of riparian rights modified by the concept of reasonable use. If you own land abutting a surface water source or overlying a ground water source you have the reasonable right to use the resource subject to the rights of other riparian landowners This allows property owners to take water for domestic, agricultural, and industrial purposes from both surface and groundwater sources.

Water appropriation permits are required by the DNR for any appropriation that exceeds 10,000 gpd or 1 mgy. Permit holders must annually report their use to the agency and pay a water use fee based on volume.

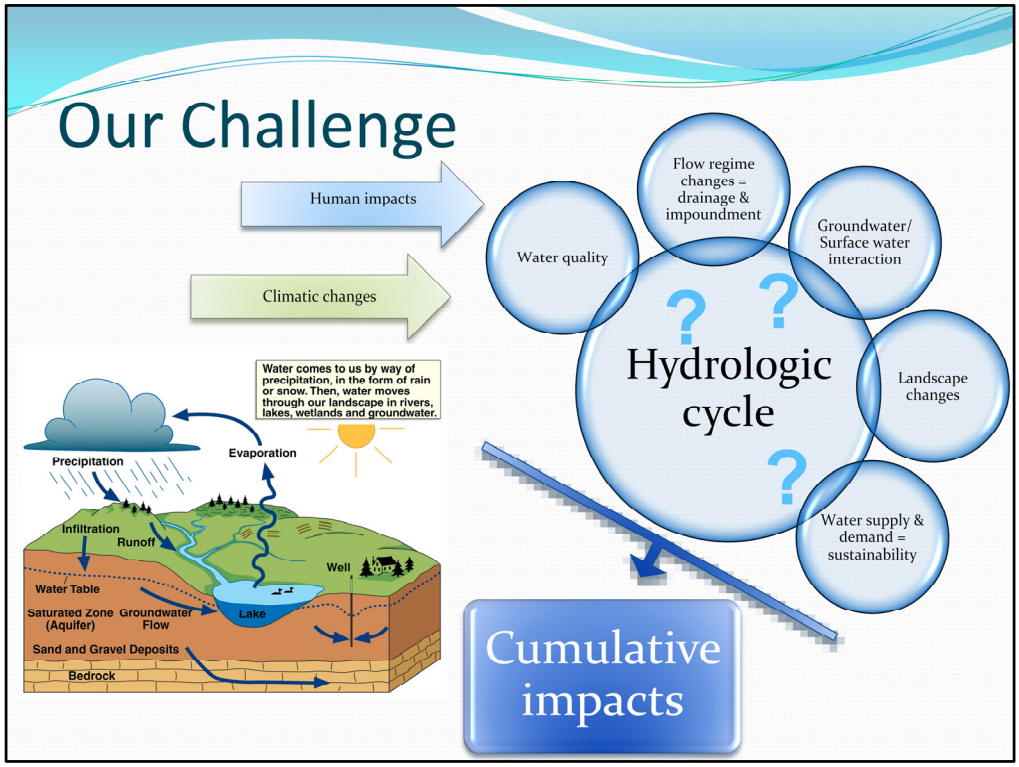
DNR has the authority to establish limits on volumes of water that are appropriated. Applications must show that the use will be sustainable now and into the future and that the proposed use will not harm ecosystems, degrade water quality, or reduce the water level below nearby public and private domestic wells.

When there are water conflicts Minnesota Law sets general priorities ranking types of water use.



Historically we have operated with the assumption that there is enough water for everyone here in the land of 10,000 lakes. An appropriator will ask for a volume and we will evaluate their request based on the local hydrogeology and if the well is located within a sensitive area with known water supply issues or environmentally sensitive areas like a calcareous fen or trout stream. For this highlighted irrigation well we would require a pumping test to ensure there is no impact on the nearby trout stream. We oftentimes deal with one permit application at a time and may not consider all of the other withdrawals in the area.

We also manage instances of well interference. If a well owner's pump goes dry they can file a well interference complaint and we will investigate to determine if the cause is another appropriation in the area. If the complaint is valid and we find for instance that an irrigation well is dewatering a domestic well or say a mine dewatering operation is impacting a municipal supply well we will work to mediate a solution where the higher priority well is deepened or redrilled in another area. This is a reactionary approach to management.

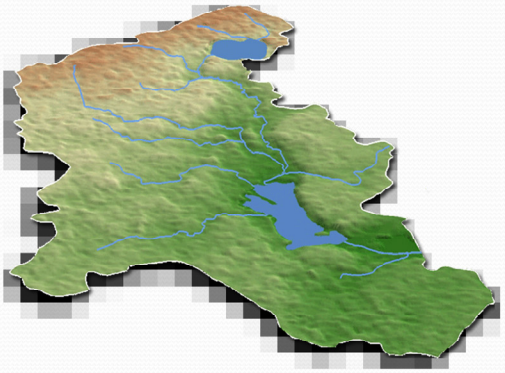


There are many components to the hydrologic cycle, these components are impacted by both human activities and climactic change. We have been managing all of these components as parts, water quality, land use planning, water supply and demand.

All of these uses and components of management affect the hydrologic cycle and may not individually create a known measurable impact but together they create cumulative impacts that can be very damaging to the system as a whole.

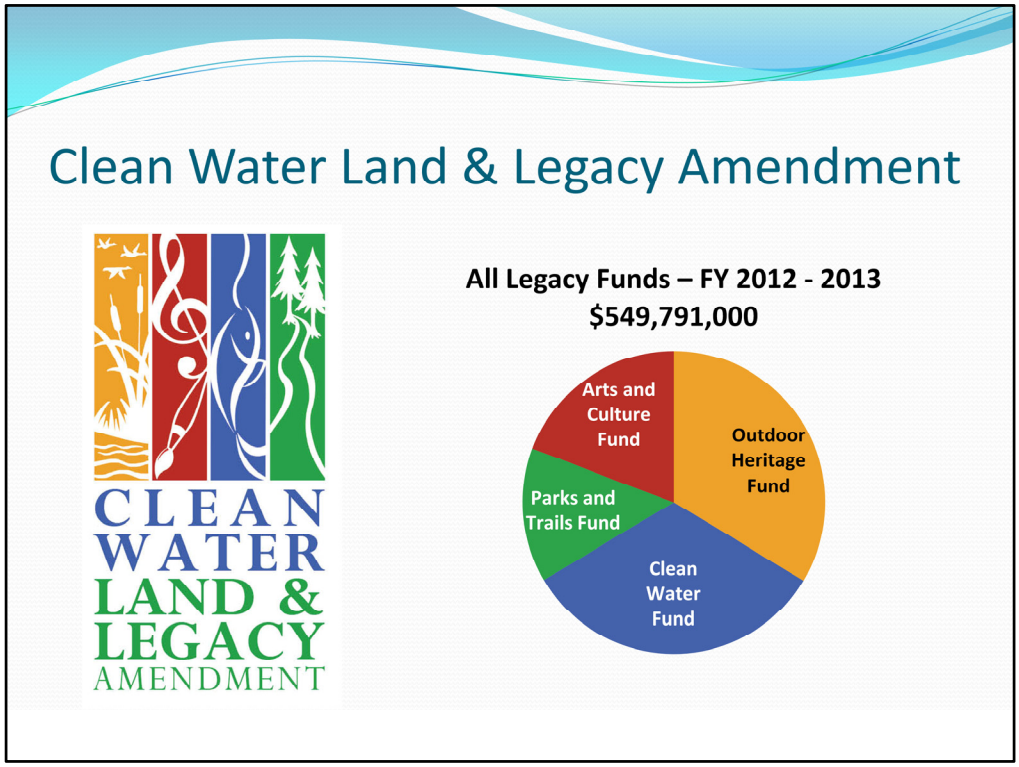
Watershed Approach

- Holistic approach to management
- Account for all uses



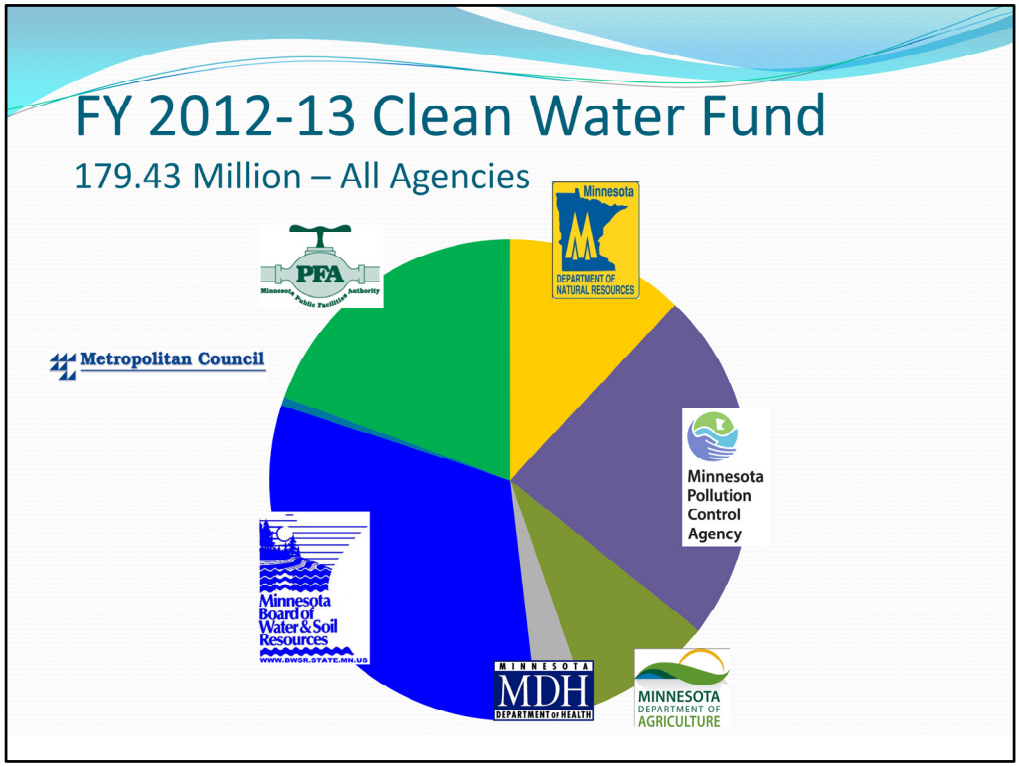
We have realized the need to manage the entire system holistically. We need to treat the system as one water because of surface and groundwater interactions. We have moved to management based on the watershed approach understanding that surface watershed and groundwater shed boundaries do not always match up. As we begin to manage these areas in this holistic approach, the boundaries will be better defined based on the components of the system.

We need to consider all users in the system both human and ecological realizing that ecosystem functions are required for human health. We also need to balance the social, economic, and political needs and requirements.



The citizens of the state of Minnesota realize the importance of protecting our natural resources and thus
On November 4, 2008, Minnesota voters approved the Clean Water, Land, and Legacy Amendment to the constitution to *protect drinking water sources; to protect, enhance, and restore wetlands, prairies, forests, and fish, game, and wildlife habitat; to preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater.*

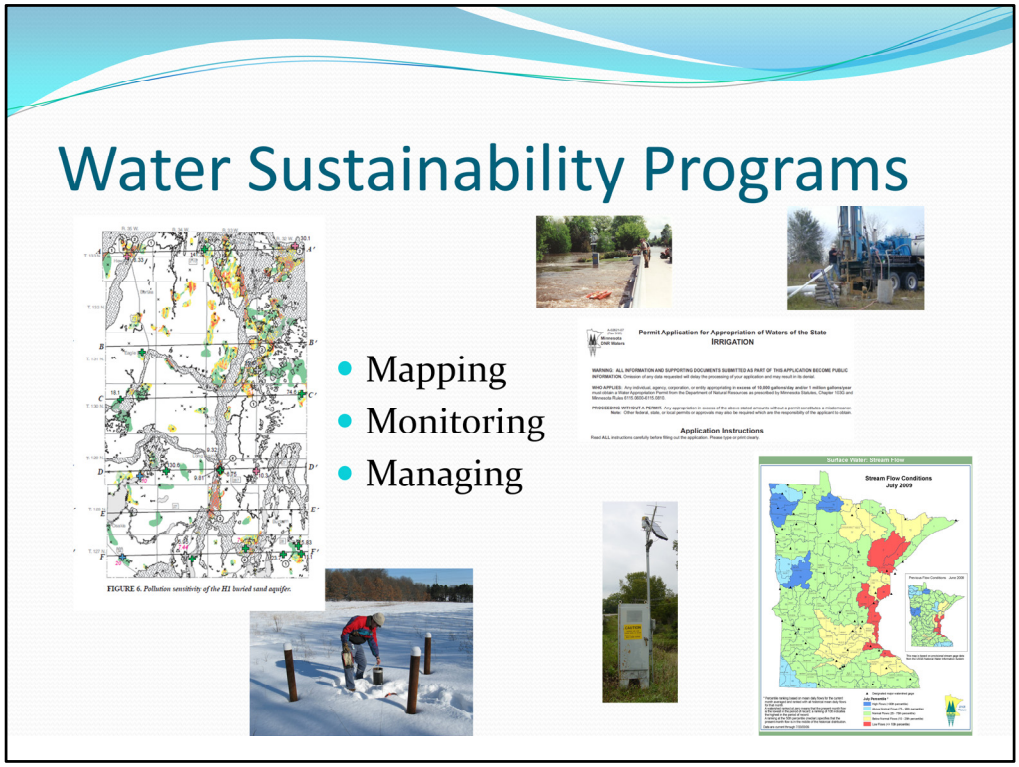
This amendment created a 3/8's percent sales tax through the year 2034. Approximately one third of these funds are dedicated to the clean water fund which supports many programs aimed at protecting the waters of this state. This amendment shows how much Minnesotan's value the resources of this state and how much we value clean plentiful water.



The clean water fund is divided amongst 7 agencies to pay for programs to protect, enhance, and restore water quality in lakes, rivers, streams, and groundwater, with at least five percent of the fund targeted to protect drinking water sources

5 of these agencies were mentioned previously and the other two are the Metropolitan Council which is the regional planning agency throughout the twin cities metro area and the Minnesota Public Facilities Authority provides municipal financing programs and expertise to help communities build public infrastructure that preserves the environment, protects public health, and promotes economic growth.

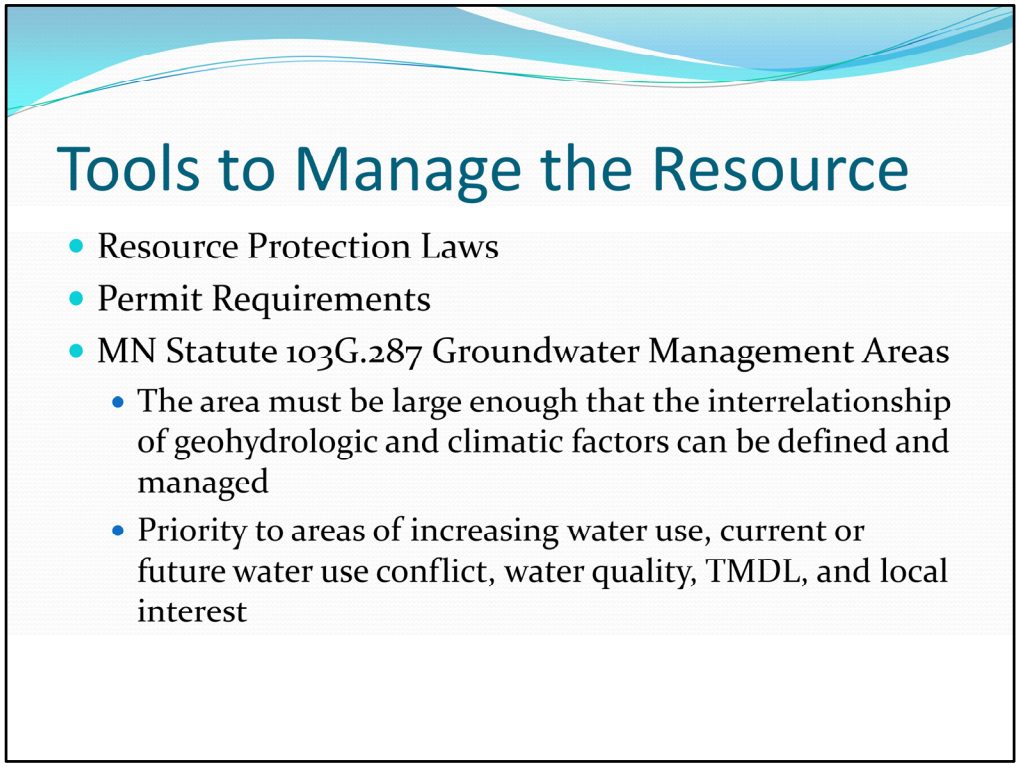
Of course The Clean Water fund is not our only source of funding for DNR programs, many of our programs are funded through the Environmental and Natural Resources Trust Fund, and partners like the USGS, local in kind spending, and also general fund.



The MN DNR has water sustainability programs including mapping, monitoring, and managing.

Mapping includes understanding the distribution of surface and groundwater resources, in reality we still do not know a lot about our aquifers. Our County Atlas Part B program, depicts the characteristics and pollution sensitivity of Minnesota's groundwater resources.

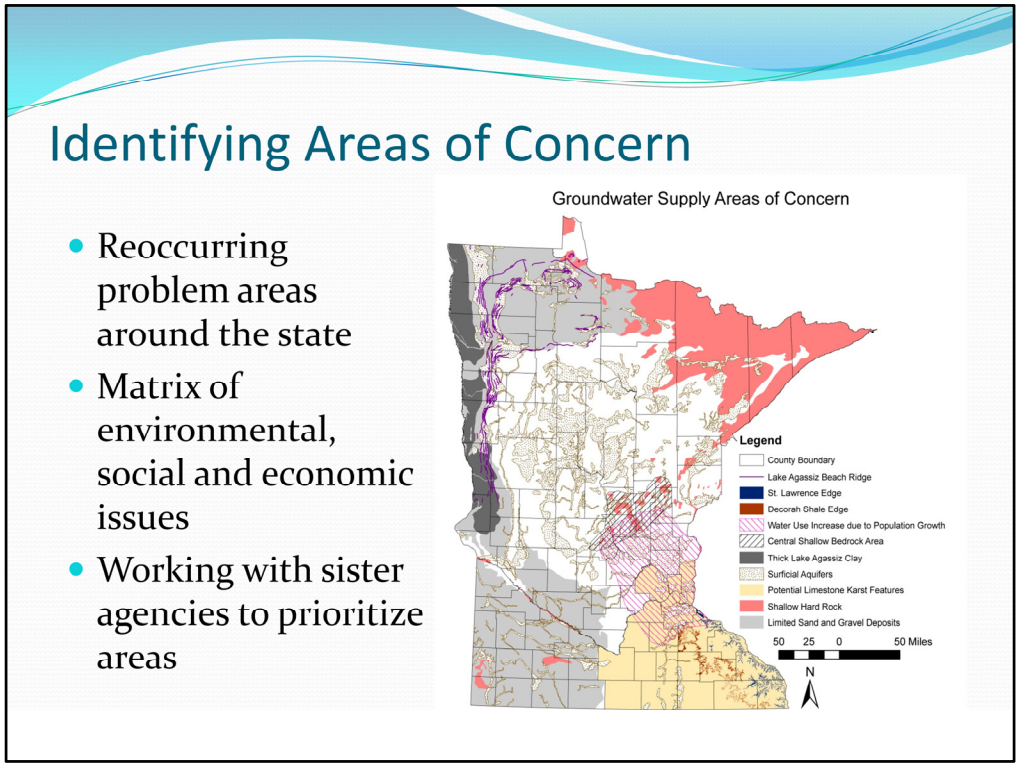
Monitoring measuring changes in water supplies over time and evaluates impacts from withdrawals. We monitor climate with weather stations, surface water through stream and lake gaging, and groundwater levels with our statewide observation well network.



Management includes planning and permitting to assure sustainable water resources. The tools that we have include resource protection laws such as protected flows and elevations of surface waters, safe yield for groundwater, and then special requirements for trout streams, calcareous fens, and endangered species.

The DNR can place special requirements on appropriation permits requiring monitoring or can place thresholds on groundwater levels that can cause restrictions on pumping.

MN Statute 103g.287
The commissioner may designate groundwater management areas and limit total annual water appropriations and uses within a designated area to ensure sustainable use of groundwater that protects ecosystems, water quality, and the ability of future generations to meet their own needs. Water appropriations and uses within a designated management area must be consistent with a plan approved by the commissioner that addresses water conservation requirements and water allocation priorities



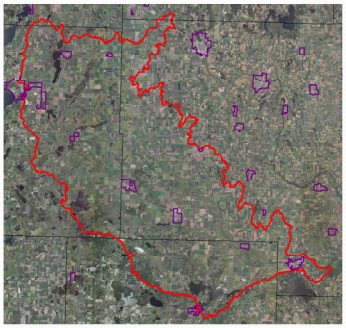
The process of prioritizing areas that could be managed using a groundwater management area has been ongoing for decades through experiences that all of the agencies have had. There are areas in the state with reoccurring problems due to lack of water supply or water quality.
We identified many different GIS based coverages showing priority areas for different criteria. My example is a map showing the groundwater supply areas of concern depicting areas where groundwater may be limited or easily contaminated aquifers, areas of karst land, areas of shallow depth to bedrock.
Other layers included things like anticipated growth of population and industry, a coverage of the MNPCA designated impaired surface waters, biodiversity areas of significance, nitrogen probability maps and many others.

A list of these areas were compiled into a matrix and were ranked based on the number of environmental, social, and economic issues. We worked with other agencies to determine their priority areas and to find areas where we could work together to manage.

Of course each of these areas will have different priorities and will be set in different hydrogeologic settings around the state, so they will each have specific sets of challenges as we move forward. The most important criteria for a successful gwma will be local interest and buy in.

Groundwater Management Area Scoping

- Clear definition of issues
- Engage local partners
- Compile existing data
- Upgrade gw/sw monitoring network in area
- Model aquifer characteristics
- Determine local management goals
- Outline deliverable products



As we begin to work through the scoping process for priority gwmas we have a set of things that are essential. We must first clearly identify the issues of the area, this could be concerns of over allocation of appropriations that are impacting surface water features, or possibly contamination of the water supply from industrial or agricultural impacts.

We need to engage local partners, as you can see on the map, this area does not align with political boundaries, it includes many different municipalities, three separate counties, three major watersheds, and for our own internal difficulty three separate DNR management regions. Local partners would include groups such as the local representation of the state agencies, regional planning commission, the county commissions, municipalities, Soil and Water conservation districts, local irrigators, native American tribes, rural water authorities, the public.

We need to compile the existing data and conduct a data gap analysis to determine where we need additional data.

We need to upgrade and improve our monitoring in the area, gw/sw/climate, enhance data collection and sharing while simplifying access for all.

We may need to update existing models or create new models to help understand the system.
We need to clearly determine what the local management goals are and outline what deliverable products will be handed over to the local unit of government.

The groundwater management area goals are to encourage and influence local water use management with agency oversight.

We will comprehensively characterize the hydrogeologic system so that we have an understanding of the system to be managed.

We will provide the data, technical information, up to date technical tools and BMPs to the local management agencies to help guide them to make sustainable management decisions on land use, planning, and to aid them in conflict resolution.

It is also necessary that the state agencies work collaboratively within these areas to support the local agencies. All of our programs such as WHPP, TMDL, agriculture BMPs, and water appropriation must fit together for this to be successful.


Minnesota
DEPARTMENT OF
NATURAL RESOURCES
Thank you