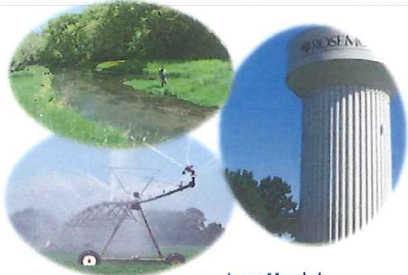




## Groundwater Thresholds Report: Sustaining Our Water Resources

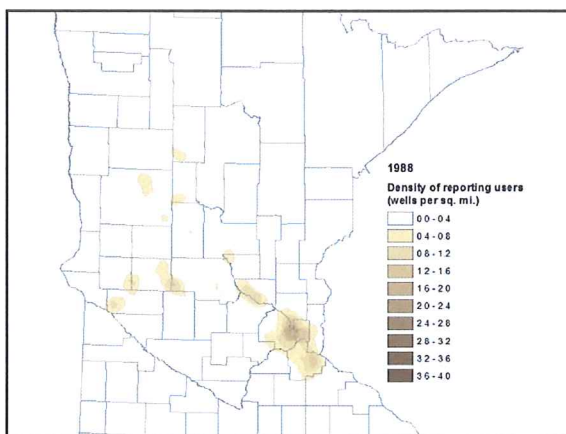
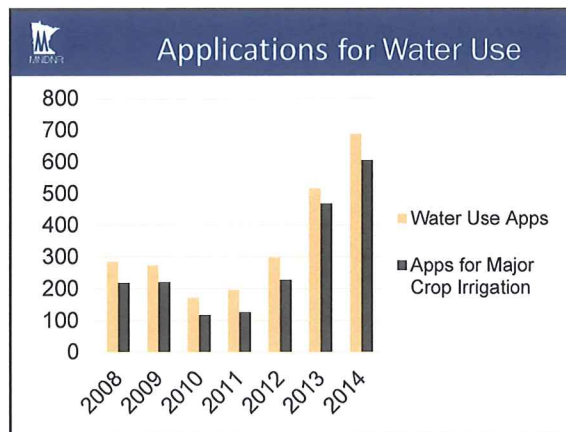
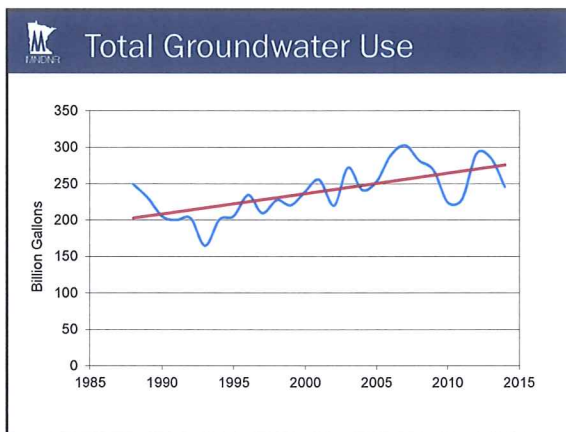


Jason Moeckel  
Minnesota DNR  
Division of Ecological and Water Resources

## Overview

- Our use of groundwater
- Stakeholder Input
- Statutory requirements
- Recommendations
  - Approach to thresholds
  - Definitions
  - Application to permitting




## Report to the Legislature

- Required by Legislation
- Technical Teams
- Consult with Stakeholders
  - 25 different organizations
  - Open to public
  - Five meetings over five months



**Public Engagement**



A summary of Meeting #4 of the stakeholder advisory group for the Thresholds project is attached. These notes are not formal minutes, but are simply highlights of the large- and small-group discussions.

A working draft of the first few sections of the report is posted on our [project web page](#) under Meeting 4. DNR staff are currently working to complete the draft; refining possible approaches, adding further details on calculation of thresholds and potential statutory and rule revisions, and incorporating feedback by the stakeholder group and other reviewers.

The fifth and final stakeholder meeting for this project will take place at the same location as Meeting #4: the City of Ramsey Municipal Center, 7550 Sunwood Drive NW, Ramsey, MN, on Thursday, December 10, 10:00 AM - 2:30 PM. The Municipal Center is close to Highway 10 just west of Ramsey Blvd. and a short walk from the Northstar commuter rail station. The DNR will provide coffee and lunch for members of the Stakeholder Advisory Group. Audience members are welcome to bring a lunch or pick something up at nearby stores.

If you are not attending the meeting and would like to share a question or comment on the working draft, please email [publicthresholds.dnr@mndnr.gov](mailto:publicthresholds.dnr@mndnr.gov). We will be posting a final draft of the report in early December, and will notify this list when it's available.

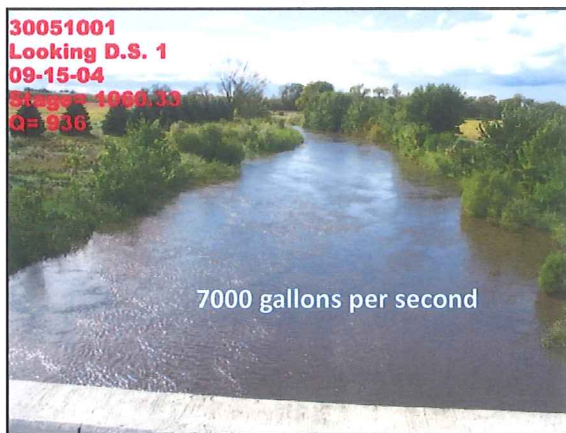
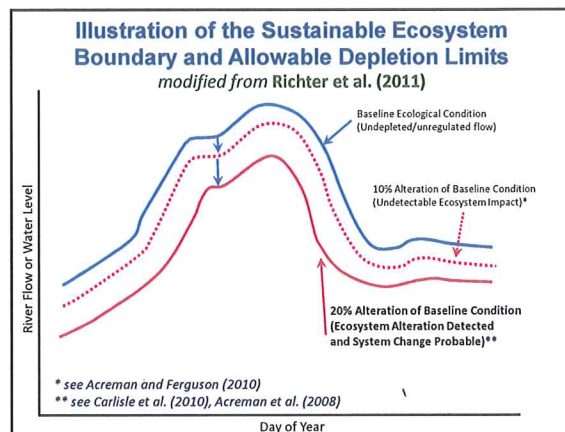
**DNR Responsibility... (Statute 103G.287)**

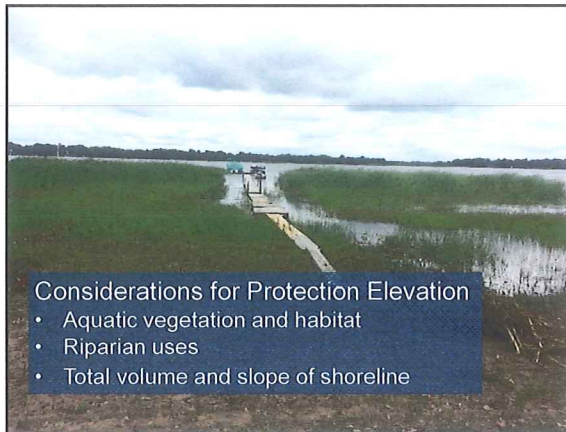
- When establishing limits DNR must consider the sustainability of the resource, including:
  - Current and projected water levels
  - Water quality
  - Protect ecosystems
  - Future generations to meet their needs

**103G.287. Subd. 2.**

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

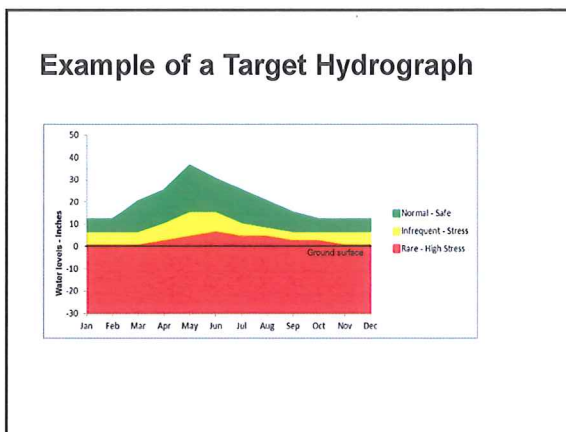
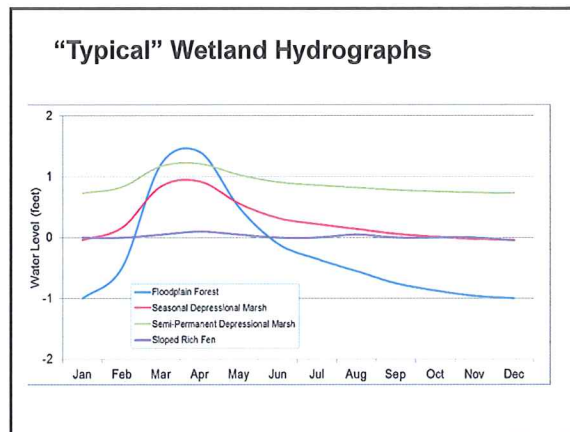
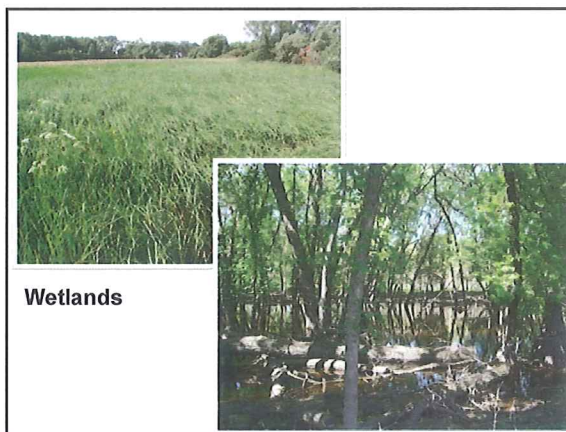
- Protect instream flows and uses
- Only temporary appropriations from trout streams
- Only 6 inches from basins
  - Set protection elevation





**Lake level patterns in MN**  
which lake types are most vulnerable?

	Shallow Lakes	Deep Lakes
Frequent Surface Outflow	Moderate	Lowest
Infrequent Surface Outflow	Highest	High



**Challenge**

Translate sustainability thresholds

- Streams
- Lakes
- Wetlands


➔

Volume allowed for withdrawal

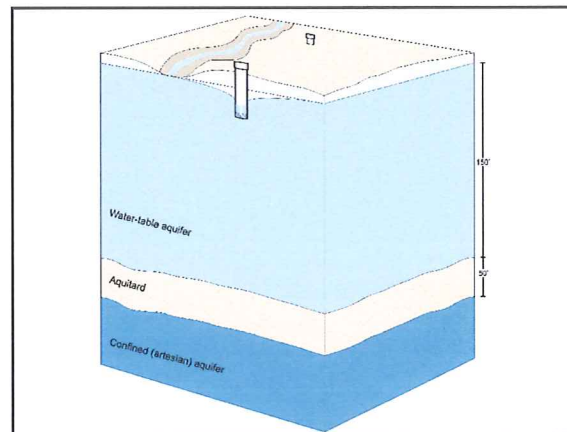
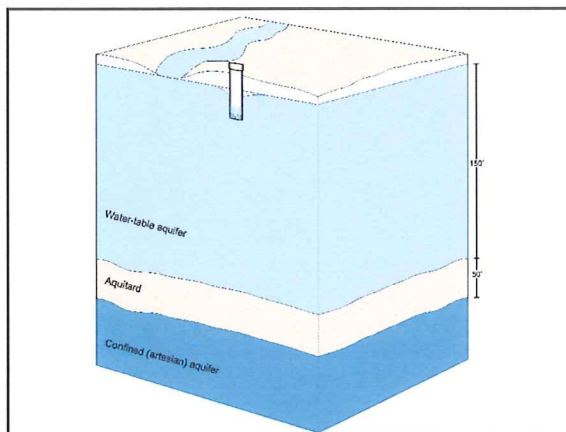
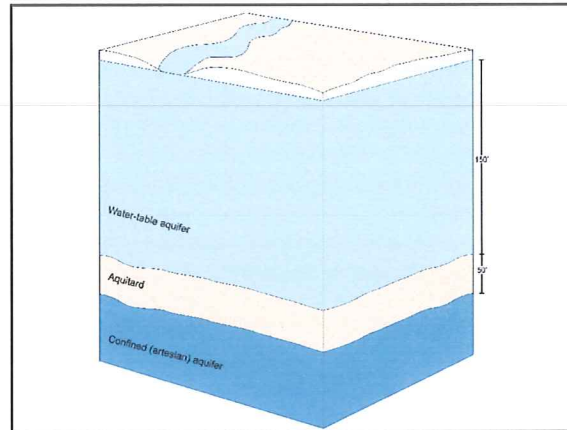
- Individually
- Cumulatively


=

“sustainable diversion limit”


 **Methodology**

- Quantifiable
- Reasonably quick
- Technically and scientifically sound
- Accounts for cumulative GW use
- Predictive
- Adaptive



 **Recommendations**

**Definitions**  
**Negative Impacts to Surface Waters**  
 – in relation to water appropriations, a change in hydrology sufficient to cause ecosystem harm or alter riparian uses long-term

 **Recommendations**

**Definitions**  
**Ecosystem harm** – in relation to water appropriations, to change the biological community and ecology in a manner that results in a less desirable and degraded condition

**Recommendations**

**Definitions**

**Sustainable diversion limit** – a maximum amount of water that can be removed directly or indirectly from a surface water body in a defined geographic area on an annual basis without causing a negative impact to the surface water body.

**Recommendations**

**Statutes**

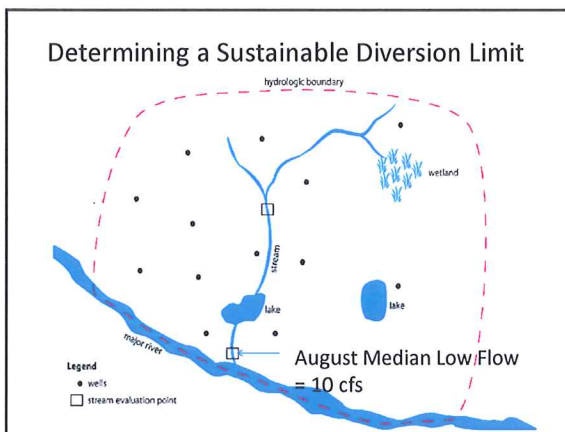
Combine surface water appropriations (103G.285) and groundwater appropriations (103G.287) into a new **“Water Appropriations”** section

**Setting Thresholds**

- Threshold = the point at which negative impacts occur
- Not a single number
- Goals:
  - Maintain the variability of the natural, seasonal hydrograph
  - Protect against regular, periodically occurring, severe drought

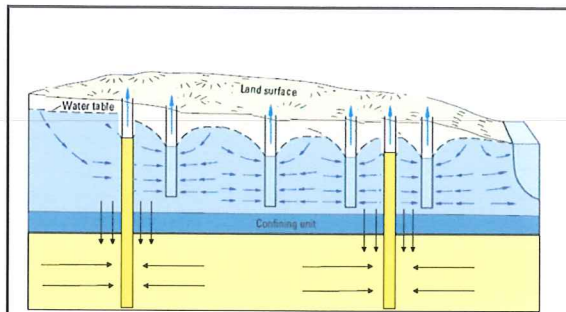
**Application in Permitting**

- Focus on areas of intense use or limited aquifers
- Establish protected flows / protection elevations, if needed
- Determine “sustainable diversion limit”
- Review and revise permits to stay within limits, if needed
- Allocate according to statutory priority

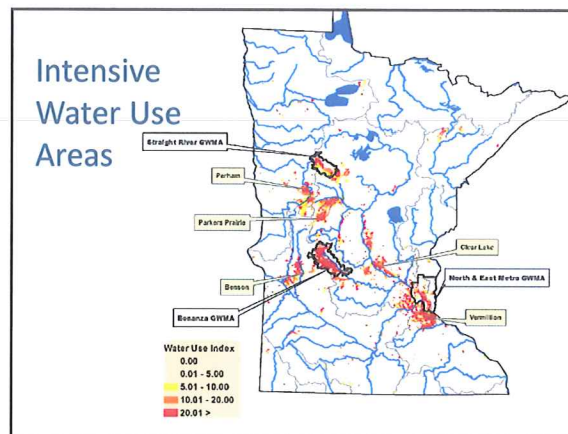


**Example**

- August Median Low Flow = 10 cfs
- Normal Range for August is 5 to 15 cfs
- Sustainable Diversion Limit (10%) = 1 cfs
  - 1 cfs ~450 gallons per minute
- Use a Groundwater Model of appropriations to determine pumping equivalent to 450 gallons at the stream
- New Normal Range for August is 4 to 14 cfs



A groundwater model is the best way to account for each appropriation's affect on streamflow. It accounts for different aquifers, pumping rates and timing, and distance.



## Conclusions

1. "Urgency room"
2. Water management policies conceptually sound
3. Statutes could be improved
4. Strong scientific basis for setting protected flows and protection elevations
5. DNR will focus on areas of intense use