

# Metropolitan Council Water Supply Planning

**Environment Committee**

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# Minnesota Statutes, Section 473.1565

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- Directs the Metropolitan Council to “carry out planning activities addressing the water supply needs of the metropolitan area”, including the development of a master water supply plan for the metro area
- Establishes a Metropolitan Area Water Supply Advisory Committee to assist the Council



# Metropolitan Area Water Supply Advisory Committee

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- Chair – Metropolitan Council Chair or Chair's designee
- Commissioners of Health, PCA, DNR and Agriculture or their designees
- 2 Metro county officials
- 5 Local officials from the other 5 metro counties
- 1 official each from Chisago, Isanti, Sherburne, and Wright counties (to be appointed)



## Funding






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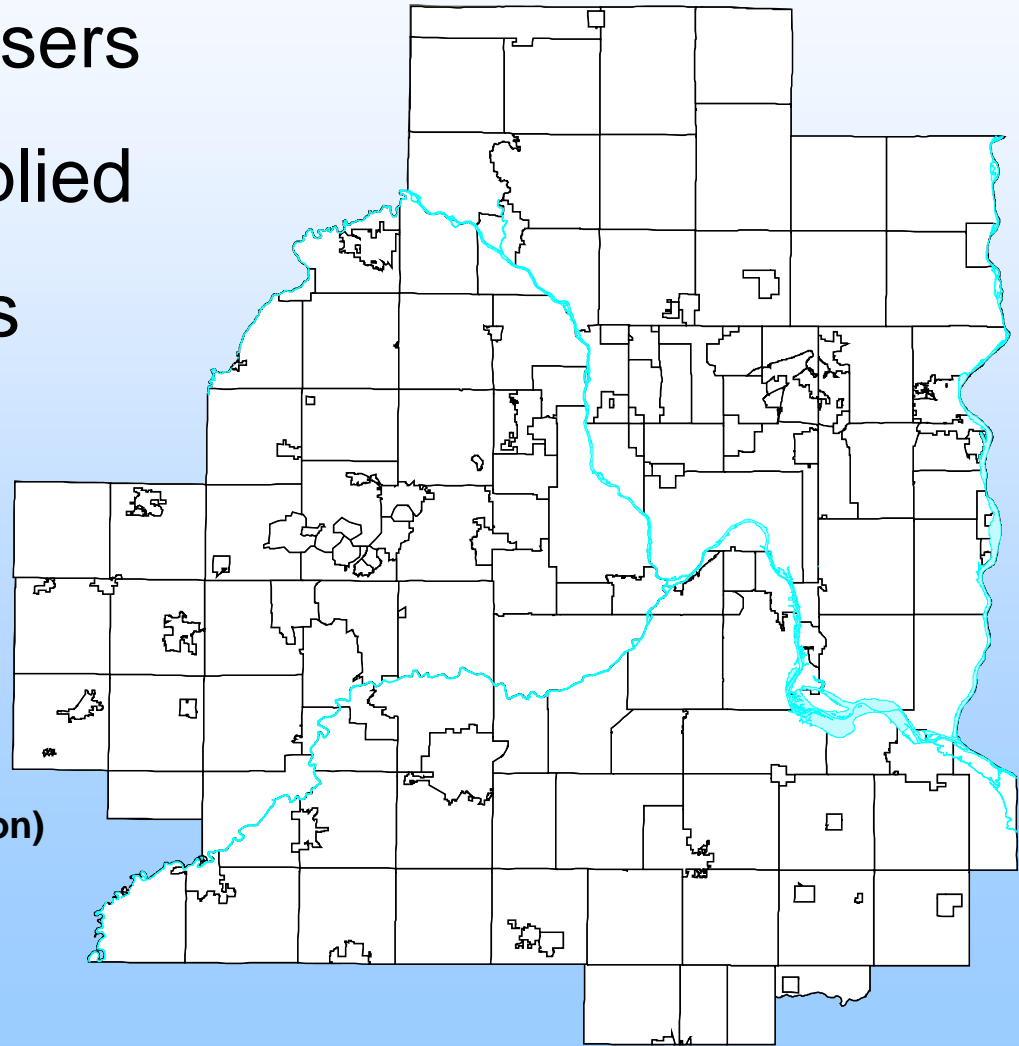
- Initial \$2 million from an unused solid waste planning bond
- Clean Water, Land, and Legacy Amendment Clean Water Fund appropriations:
  - \$800,000 in FY 10-11
  - \$1,000,000 in FY 12-13



# Metropolitan Area Water Supply Sources

- 2.8 million municipal users
- 300,000 privately supplied
- 110 municipal systems

-  Miss. River: Minneapolis (465,000)
-  River and wells: St. Paul (416,000)
-  River and wells: Bloomington (85,000)
-  Municipal wells: groundwater (1.5 million)
-  Private wells: groundwater (300,000)





# Effect of Independent Supply System Development

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- Low inter-dependence
- Increasing supply development issues as water demand increases
- Lack of coordinated assessment of water availability and management solutions



# Master Water Supply Plan

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**Goal: Ensure a sustainable water supply for current and future generations**

“...water use is sustainable when the use does not harm ecosystems, degrade water quality, or compromise the ability of future generations to meet their own needs.”  
(2009 Minnesota Legislature, Chapter 172)

The plan was completed in March 2010



# Planning Activities

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- Provide water demand and water resource information
- Analyze water availability and identify issues
- Develop tools, resources, and guidance to address issues





# Master Plan Conclusions

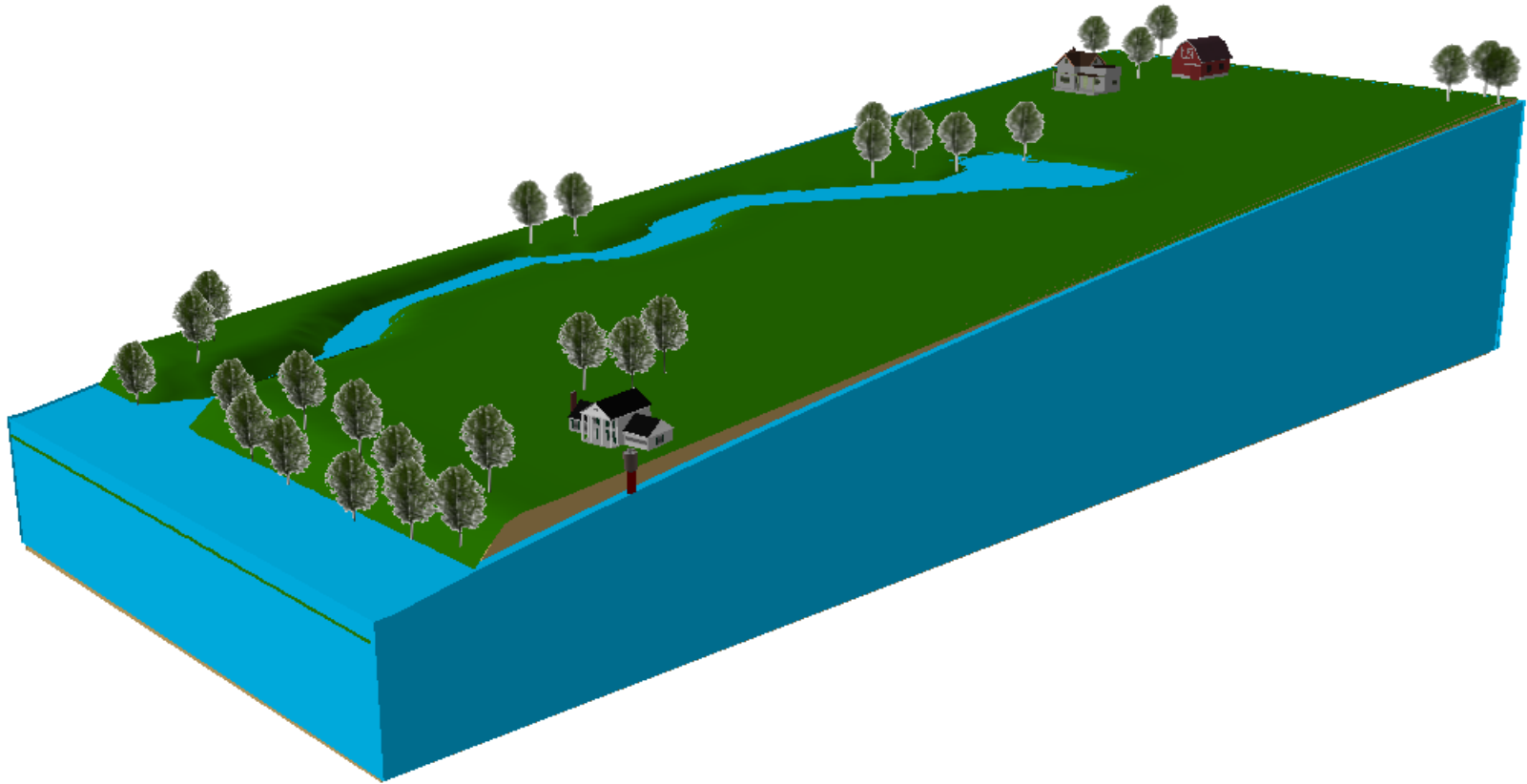
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- Overall, supplies are regionally adequate
- Some sub-regional water supply issues will occur using traditional sources
- Options are available to address potential issues
- Early identification of issues is critical
- Ongoing assessment is necessary to guide sustainable water use choices



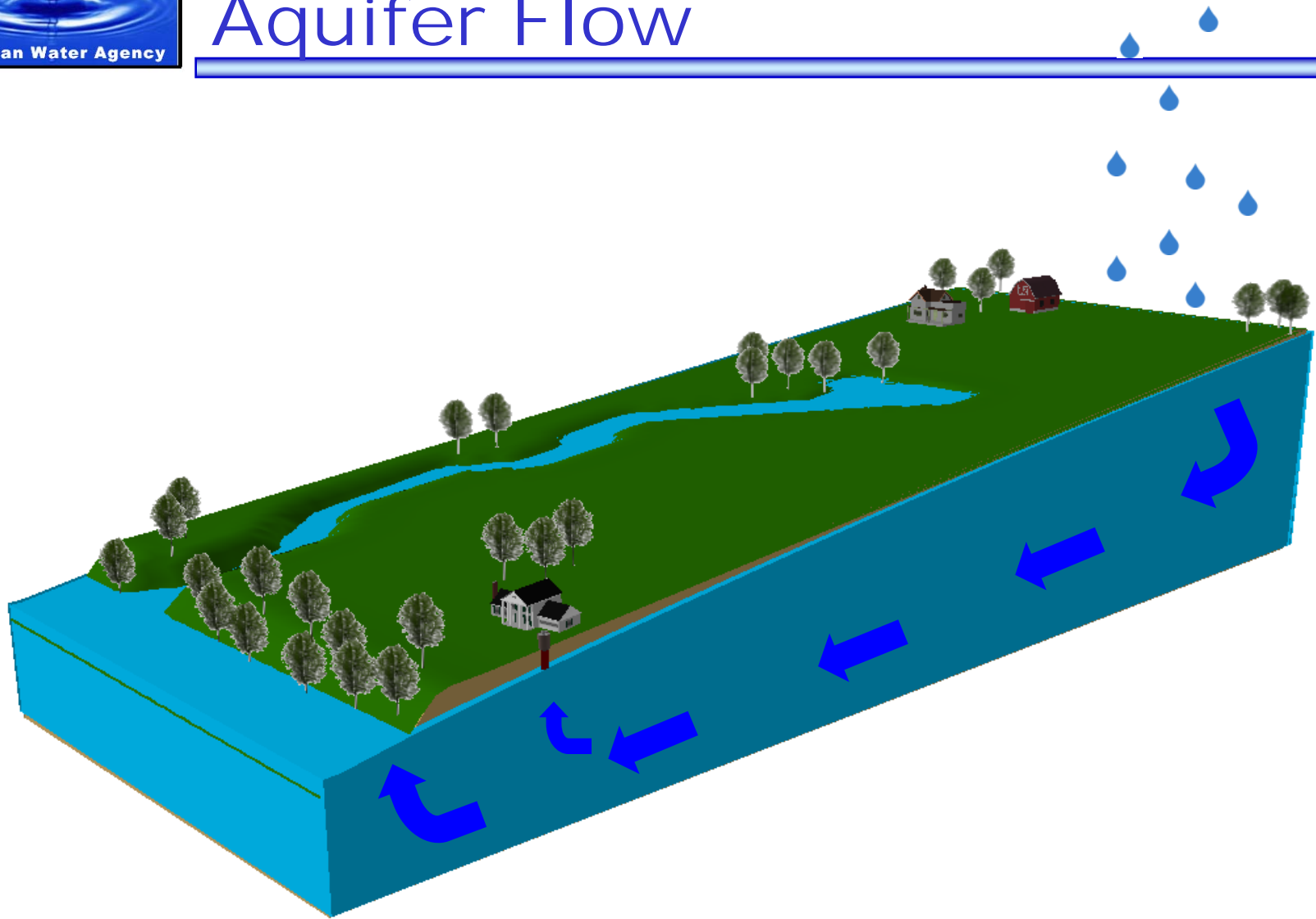
# Urban Development Changes 10 Aquifer Flow

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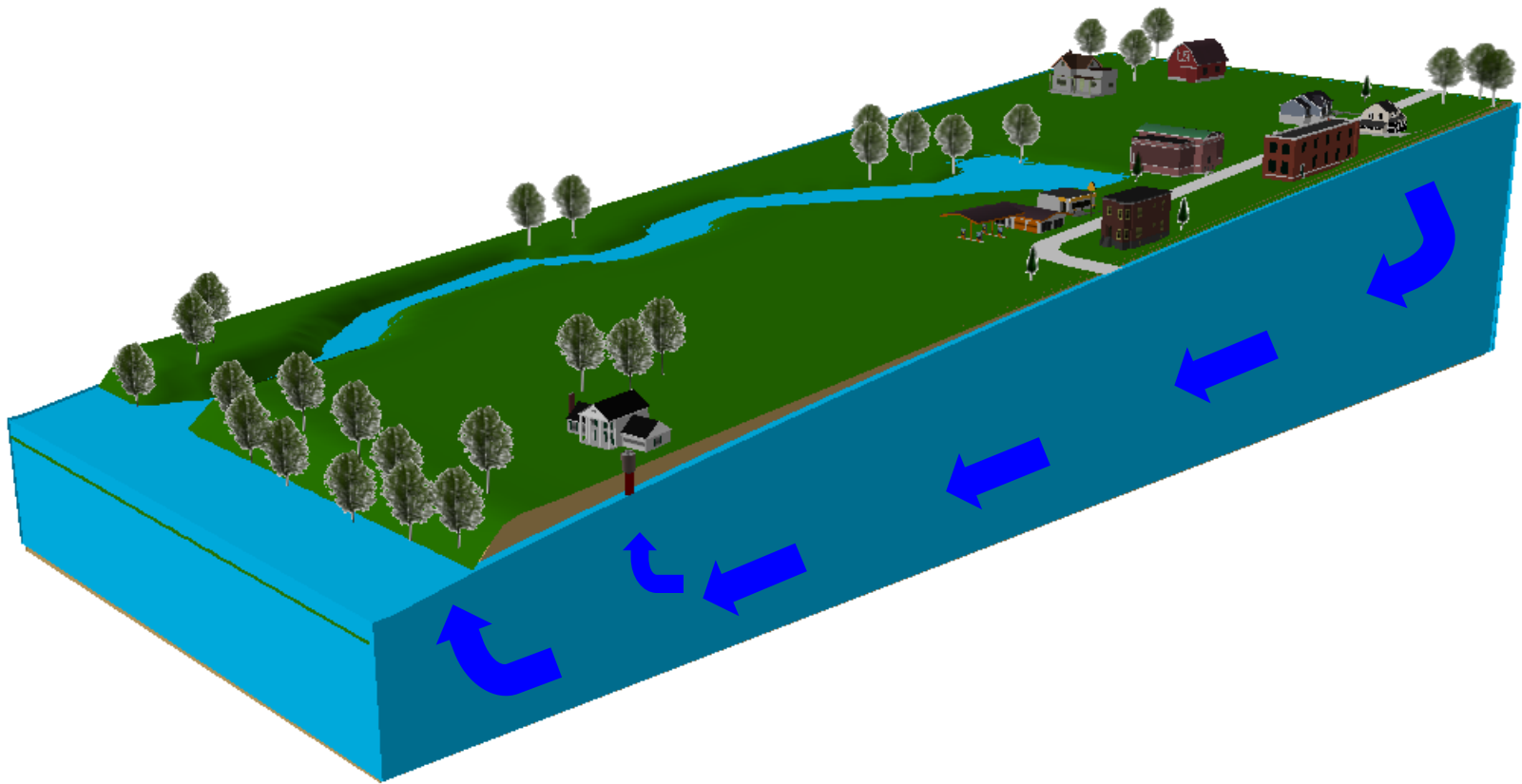


# Urban Development Changes Aquifer Flow



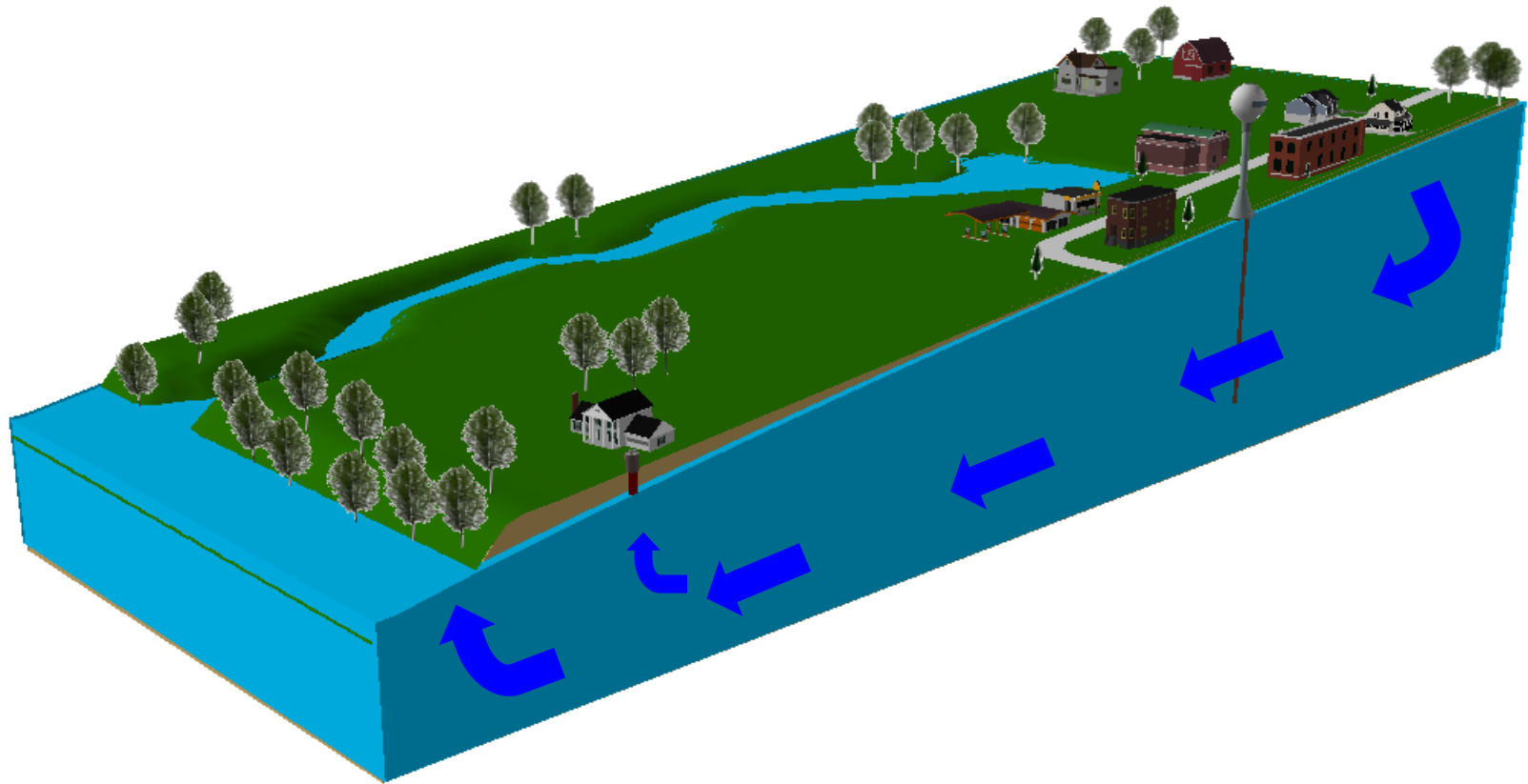


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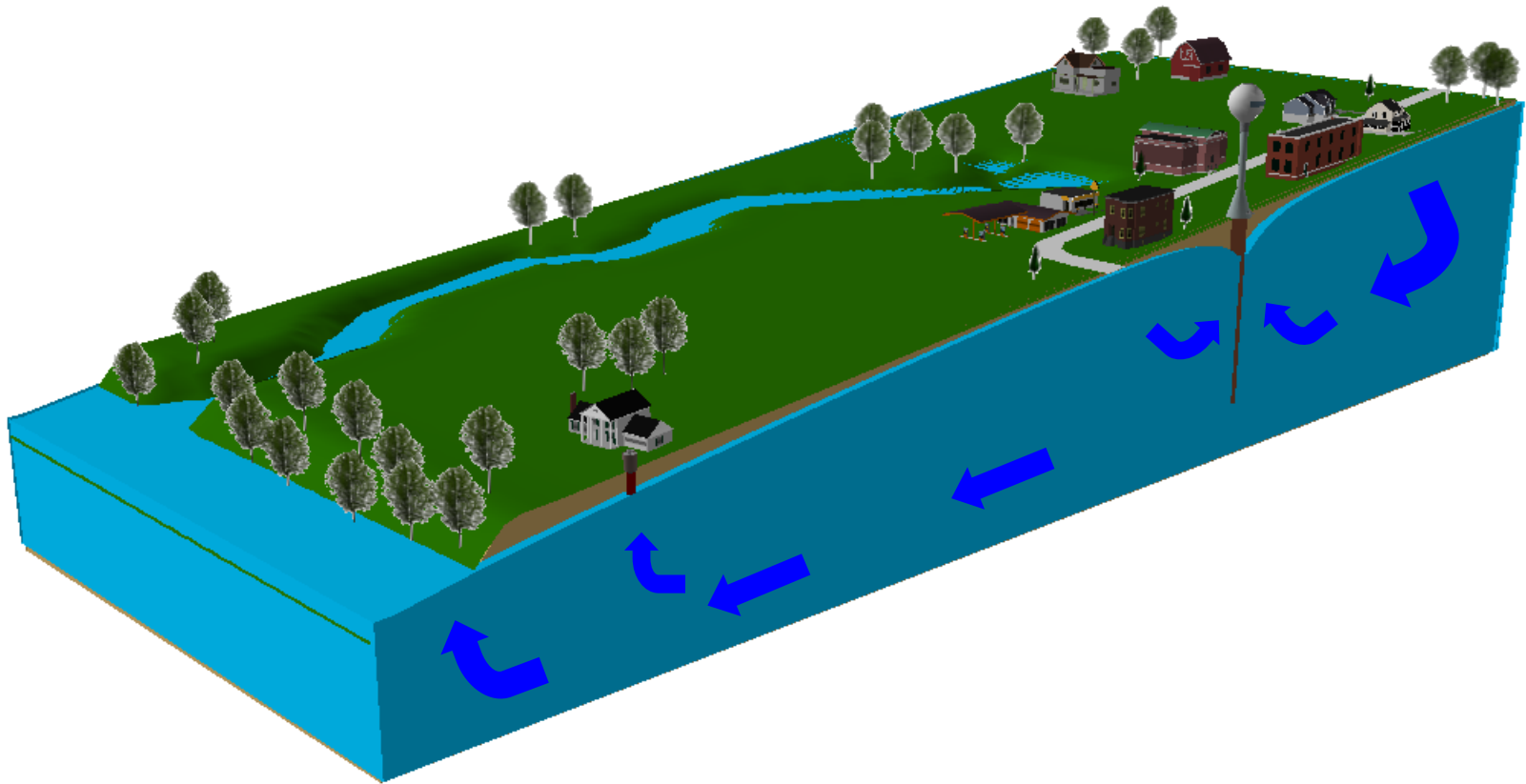


# Urban Development Changes Aquifer Flow



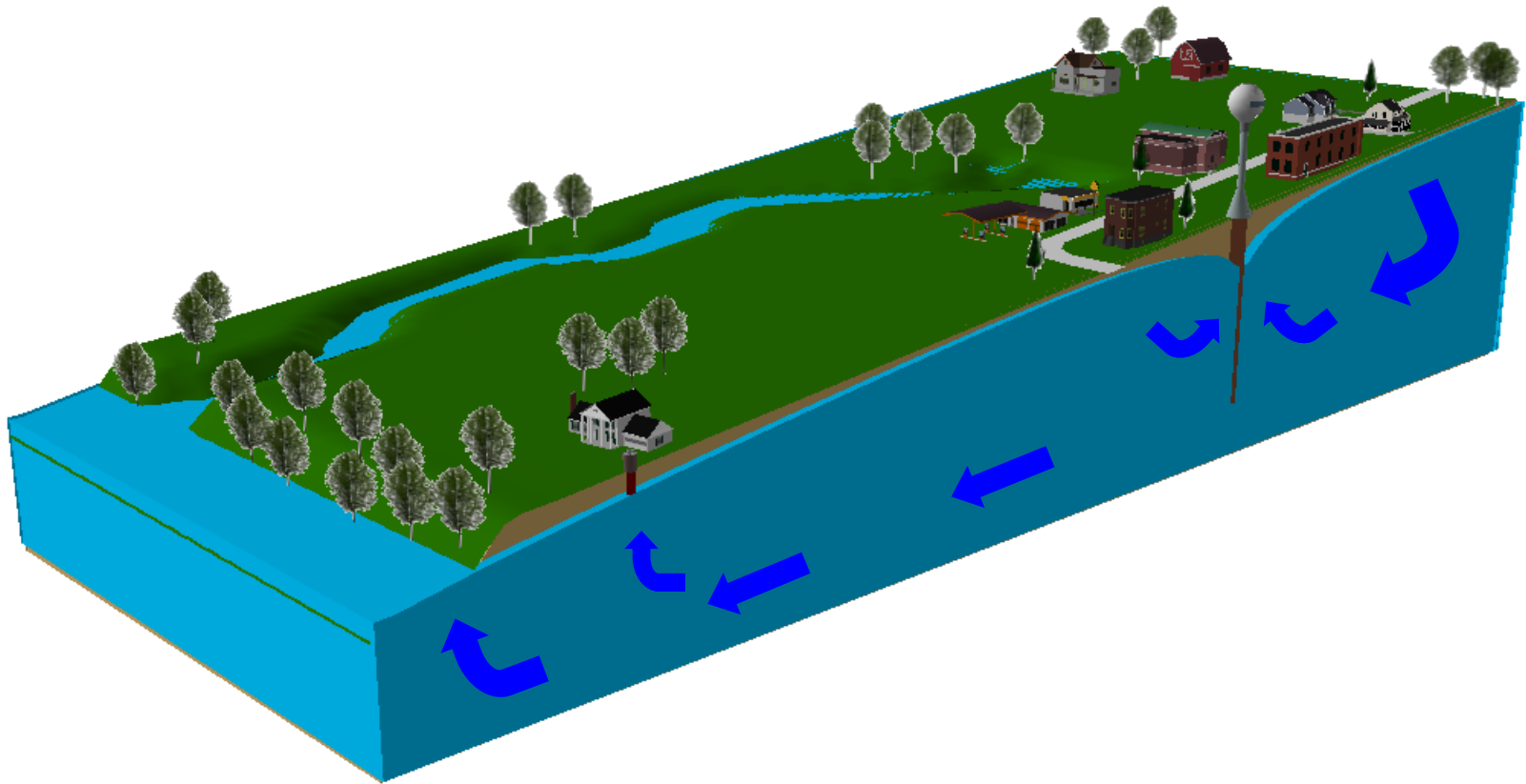


# Urban Development Changes Aquifer Flow



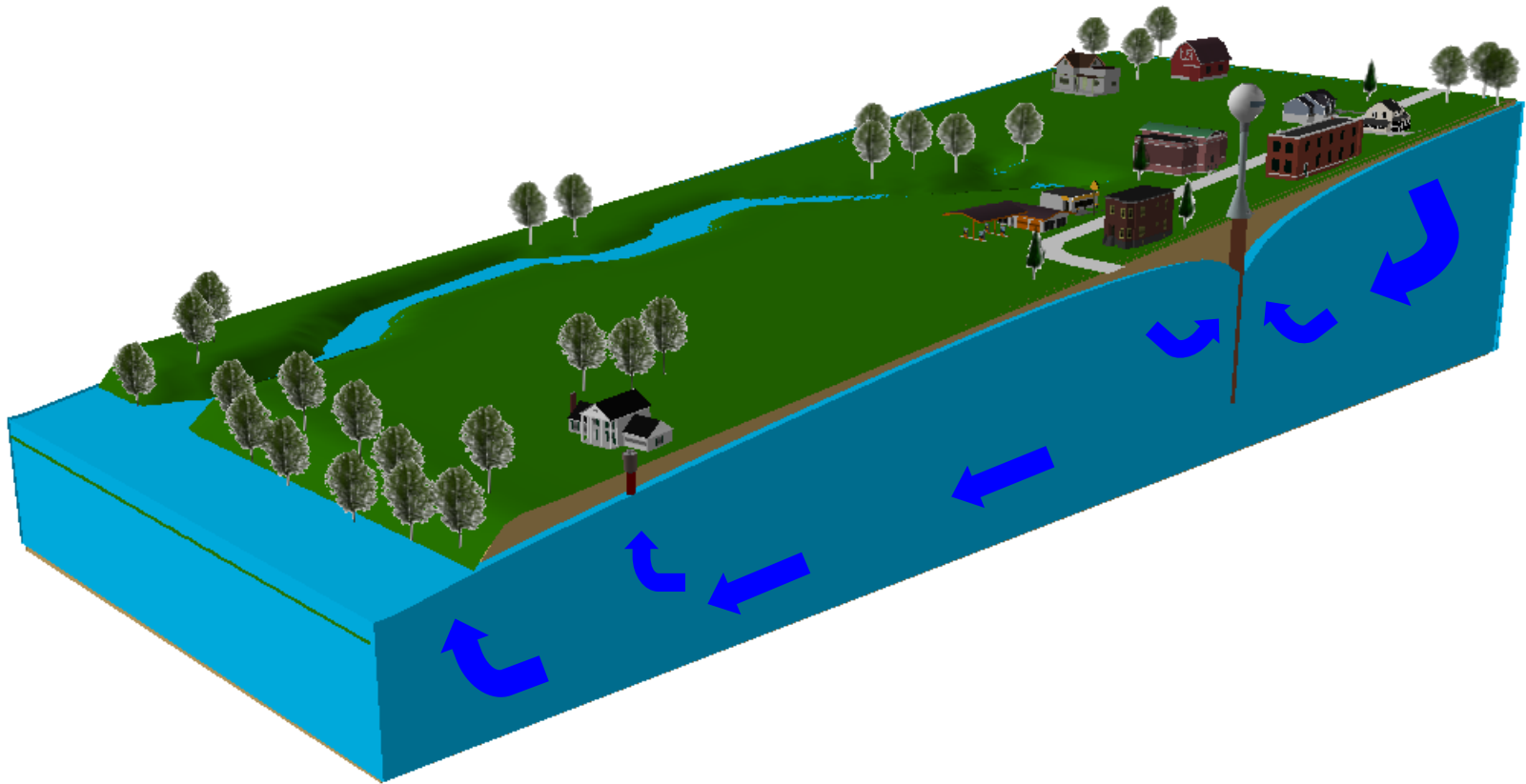


# Urban Development Changes Aquifer Flow





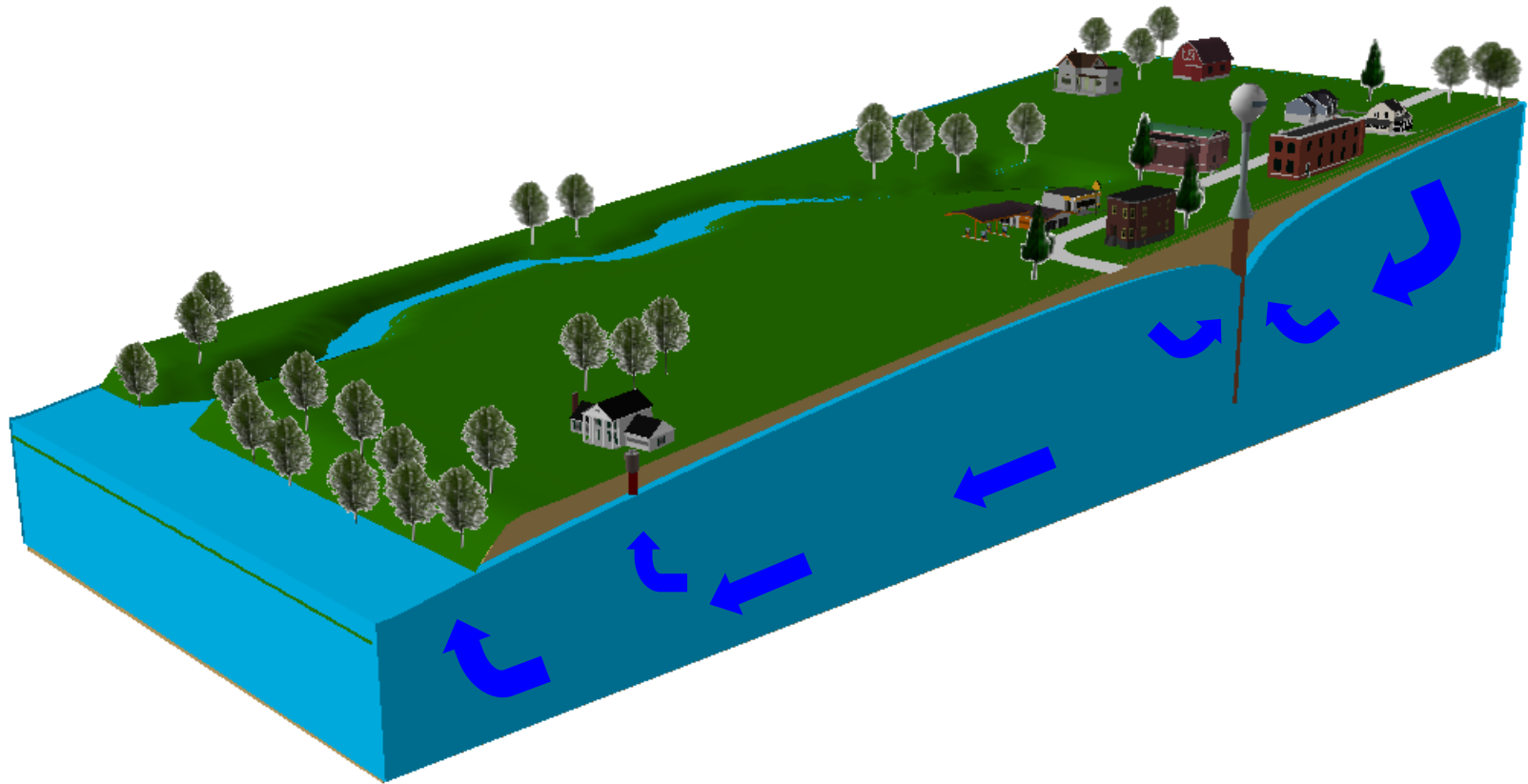
# Urban Development Changes Aquifer Flow





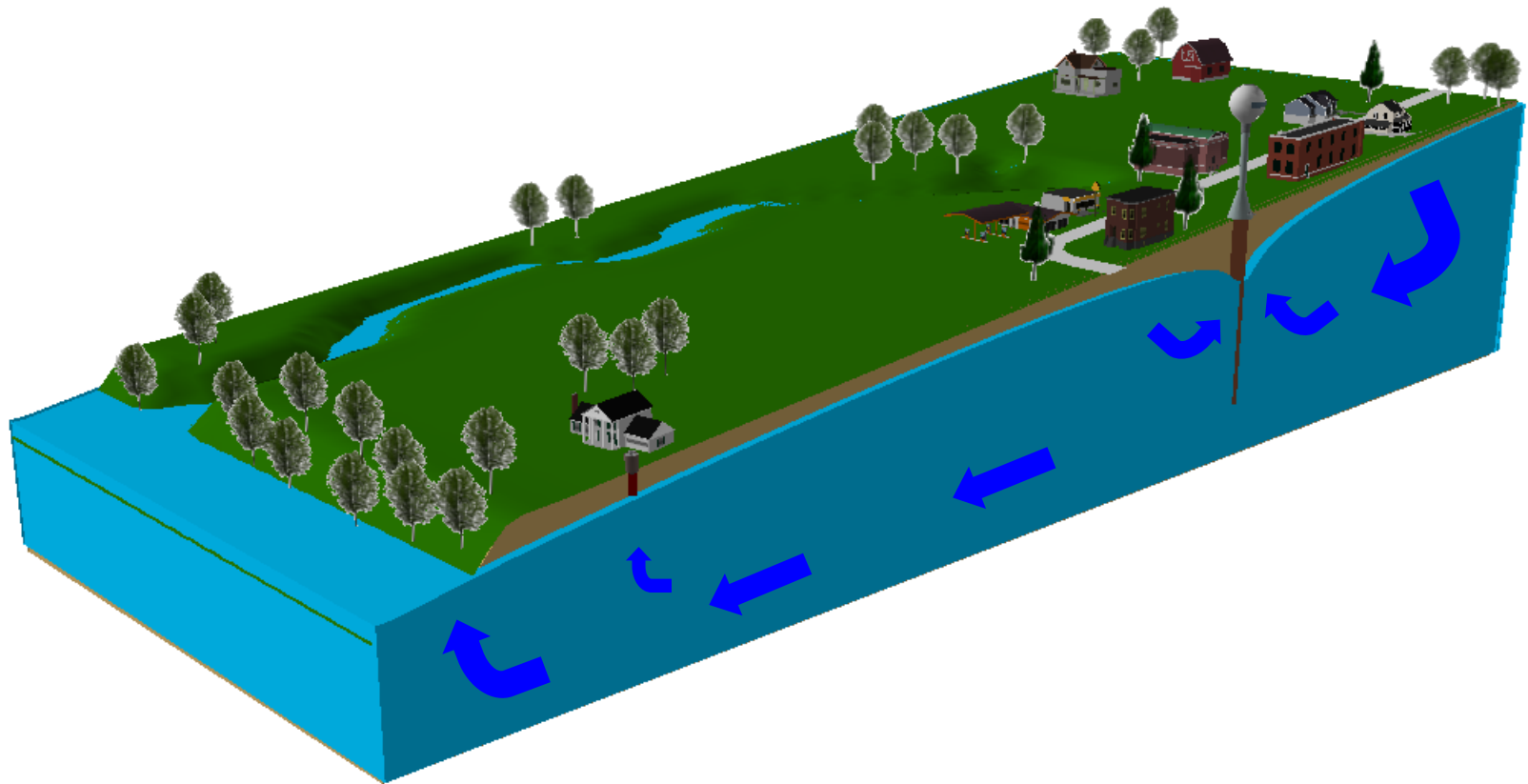


# Urban Development Changes Aquifer Flow



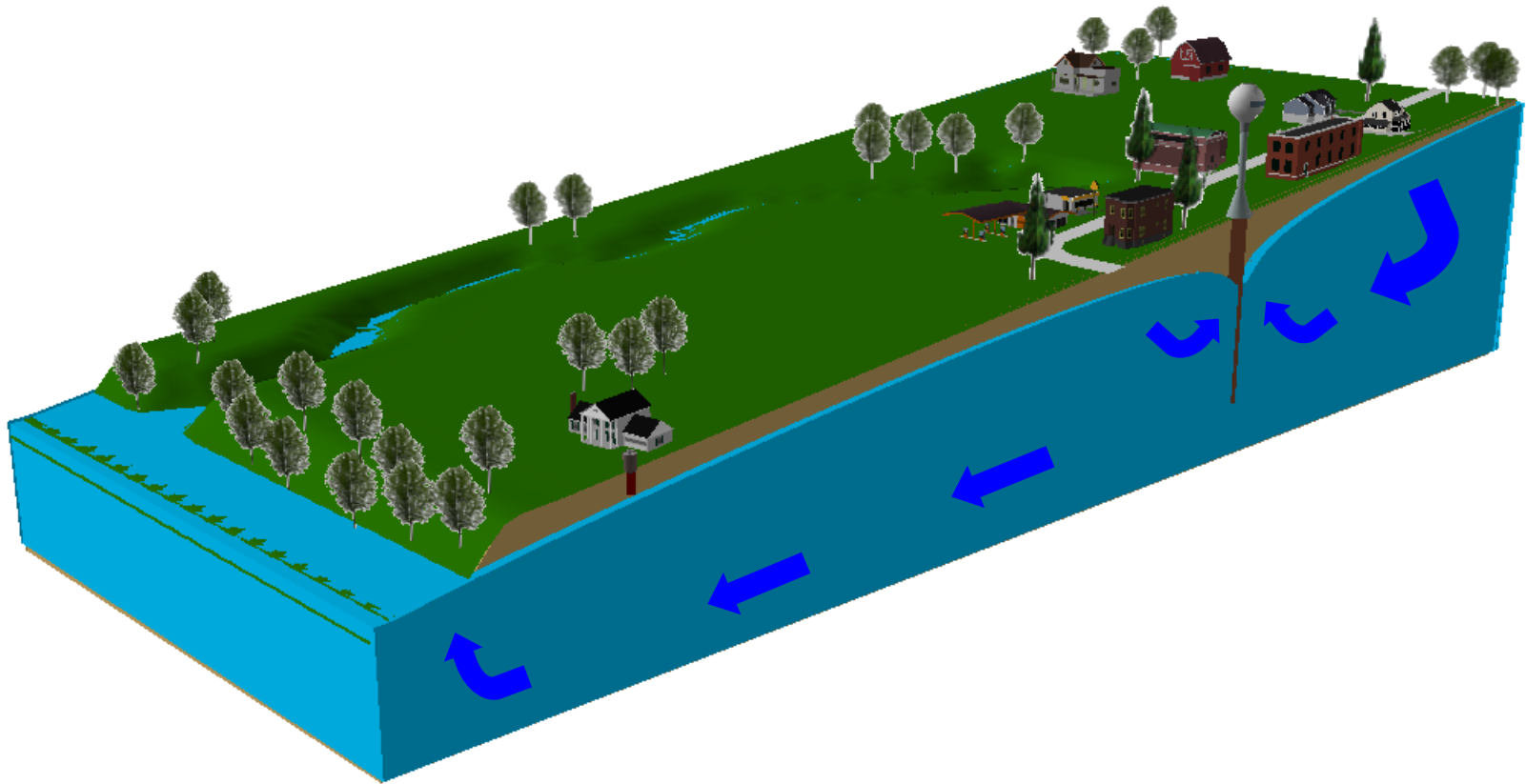


# Urban Development Changes Aquifer Flow



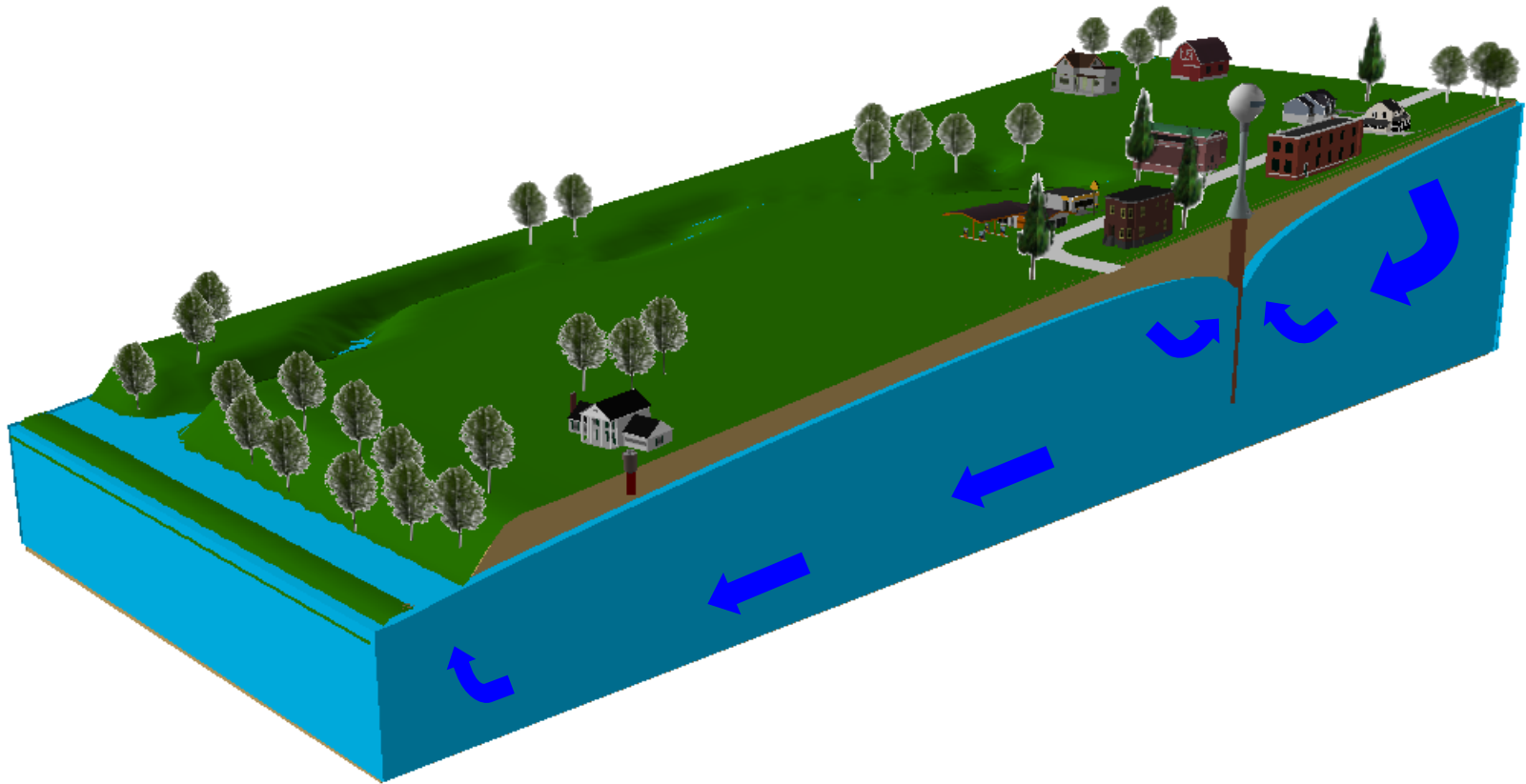


# Urban Development Changes Aquifer Flow





# Urban Development Changes Aquifer Flow





# Community Water Supply Profiles

Water use & current sources

All available sources

Potential issues

**Bloomington**

Water Demand Projections <sup>(1, 2, A)</sup>	2010	2020	2030	2040	2050
Population Served	87632	90503	93000	94827	98205
Annual Total (Million Gal./Yr)	4964.00	5073.50	5219.50	5322.06	5511.62
Average Day (Million Gal./Day)	13.60	13.90	14.30	14.58	15.10
Maximum Day (Million Gal./Day)	36.80	37.60	38.60	39.36	40.76
Maximum Day, Conserving 10%	33.12	33.84	34.74	35.42	36.68
Estimated Additional Wells, (if groundwater sources were pumped at metro average rates to meet demand above permit)	7	0	0	0	1

**Current Water Supply<sup>(C)</sup>**

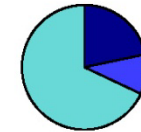
The community owns and operates their own water supply system.

**Current Permitted Appropriation: 4015 million gallons per year**

**Active 2008 Water Source(s) # Wells 2008 Municipal Water Use**

Served by Minneapolis (wholesale)

Prairie du Chien-Jordan	5
Multi-Aquifer	1



- Minneapolis
- Multi-Aquifer
- Prairie du Chien-Jordan

**Available Future Water Supply Source(s)<sup>(D)</sup>**

The community is anticipated to rely on Minneapolis, assuming contractual agreements continue, for demand through 2050. If a new water source is planned, aquifer capacity and withdrawal impacts should be assessed.

- **Prairie du Chien-Jordan aquifer**
- **Franconia-Ironton-Galesville aquifer**
- **Interjurisdictional cooperation:** Minneapolis Water Works

**The following will need to be addressed should water supplies be developed using the sources or in the areas noted (Appendix 3 provides guidance):<sup>(D, A, B, C, D, E)</sup>**

**Potential for well interference**

- Due to the pervasiveness of private wells in the metro area, suppliers requesting water appropriations should evaluate the need to address potential well interference

**Potential for impacts of groundwater pumping on surface water features**

- Predicted decline greater than one meter in water table elevation in the eastern portion of the community within the Minnesota River valley under projected 2030 demand conditions

**Potential for impacts to state protected trout habitat or calcareous fen**

- Unnamed Stream, trout habitat, located within one mile of the community

**Significant vulnerability to contamination**

- Minnesota Department of Health designates all or part of the community as a drinking water supply management area with high or very high vulnerability to potential sources of contamination

**Minnesota Department of Natural Resources and Department of Health conditions**

- Conditions identified on existing and future water appropriation permits issued by the

Notes and references can be found on the Appendix 2 cover page.



# Appropriation Permit Guidance

Use other sources, or:

Verify the issue →

Management plan →

Monitor for impact →

Act when needed →

**Water Supply Issue:** Potential for significant decline in aquifer water levels

A basic evaluation of the likelihood for unacceptable drawdowns should be conducted for all communities where the potential for significant decline in water levels was identified in Appendix 2. This evaluation should include:

- Analysis of existing and projected water level/water withdrawal data to assess the likelihood of a significant decline in water levels (i.e. exceeding >50% drawdown in available head in confined aquifers or continued decline in unconfined aquifers). The analysis can vary from a graphical comparison of water levels, to basic distance drawdown calculations, to a groundwater flow modeling and should be determined in consultation with the DNR.

For those areas where the above analysis suggests future drawdowns are likely to be unacceptable, the following should be included in a management plan<sup>5</sup>:

- Schedule measurement<sup>3</sup> of water levels and/or pumping rates in existing production wells<sup>1</sup>.
- Schedule for measurement<sup>3</sup> of water levels in at least one observation well<sup>2</sup> (sentinel well) in the pumped aquifer near the well field.
- Schedule for periodic and timely analyses of water level data and other information to identify the need for action to mitigate impacts on aquifer water levels
- Schedule for periodic and timely submittal of water level data and other information to the DNR. In most cases quarterly submittal of water level data and annual submittal of an analysis of the available information is appropriate.

The management plan should also identify triggers and associated actions to protect aquifer water levels

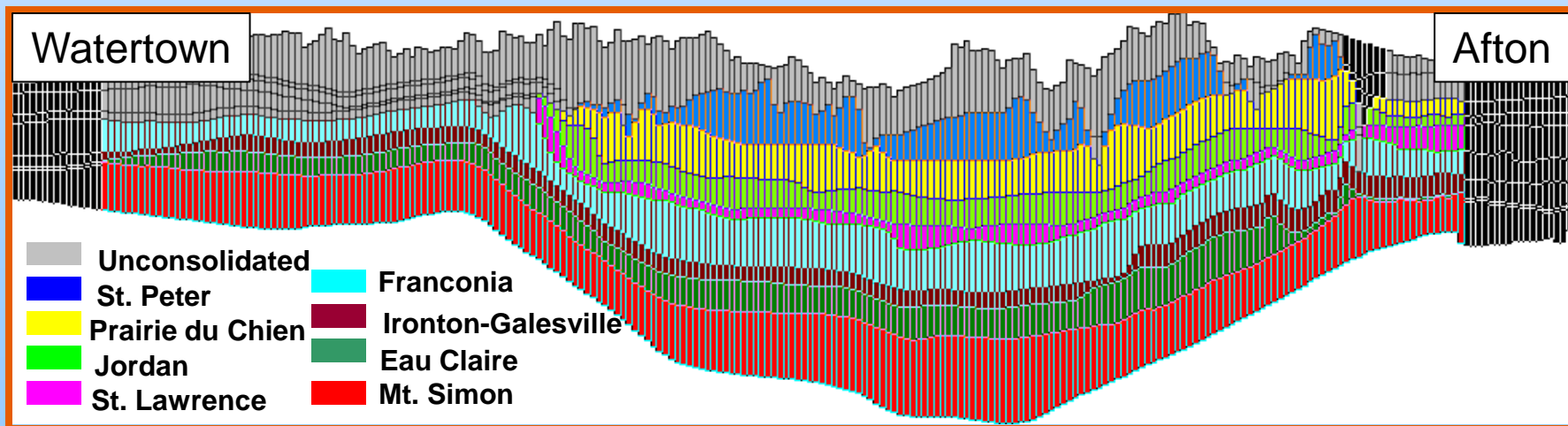
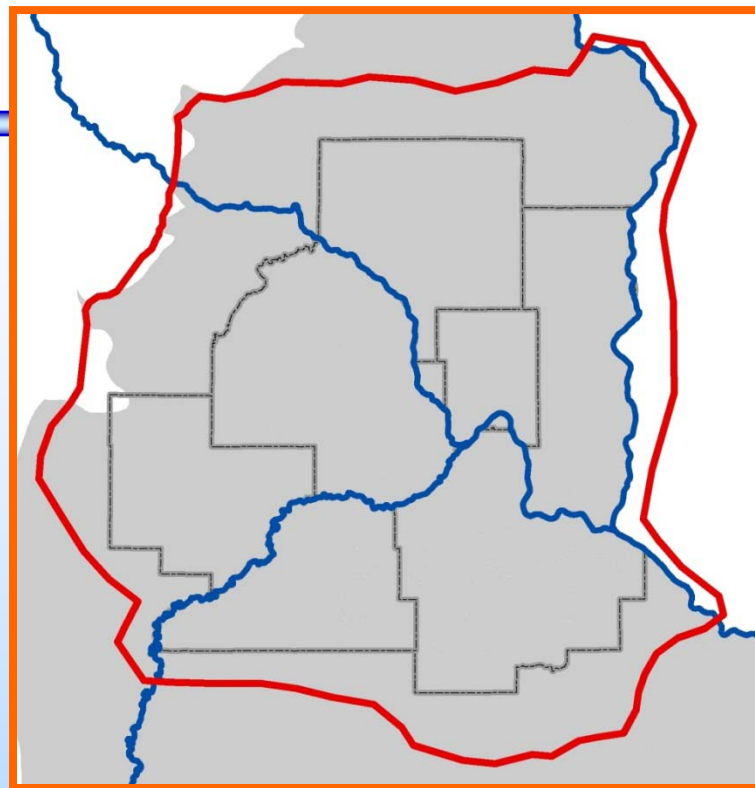
Sample triggers

- Measured > 50% decline in confined aquifer available head at sentinel well(s)
- Measured or projected significant seasonal declines
- Measured continuing decline in unconfined or confined aquifer head at appropriate sentinel well(s)
- Other triggers developed in cooperation with the DNR

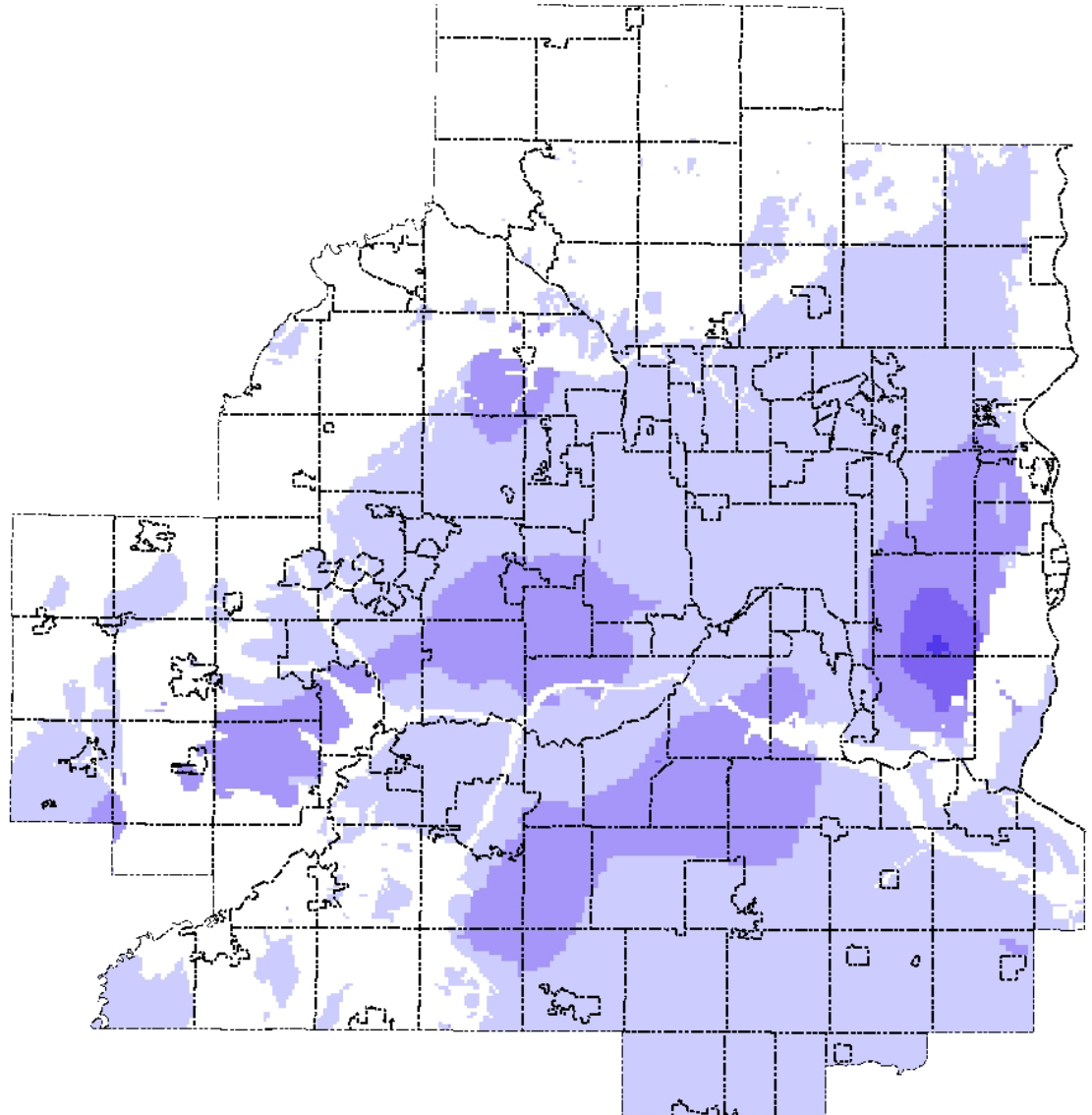
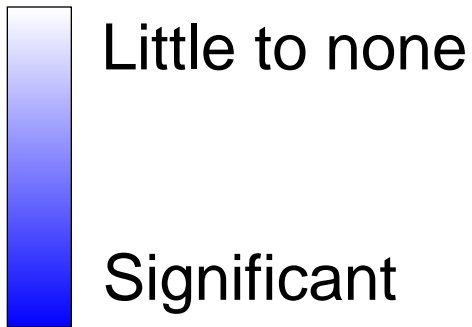


# Metro Model 2

- 5,000 miles<sup>2</sup>
- Entire metro
- 9 layers

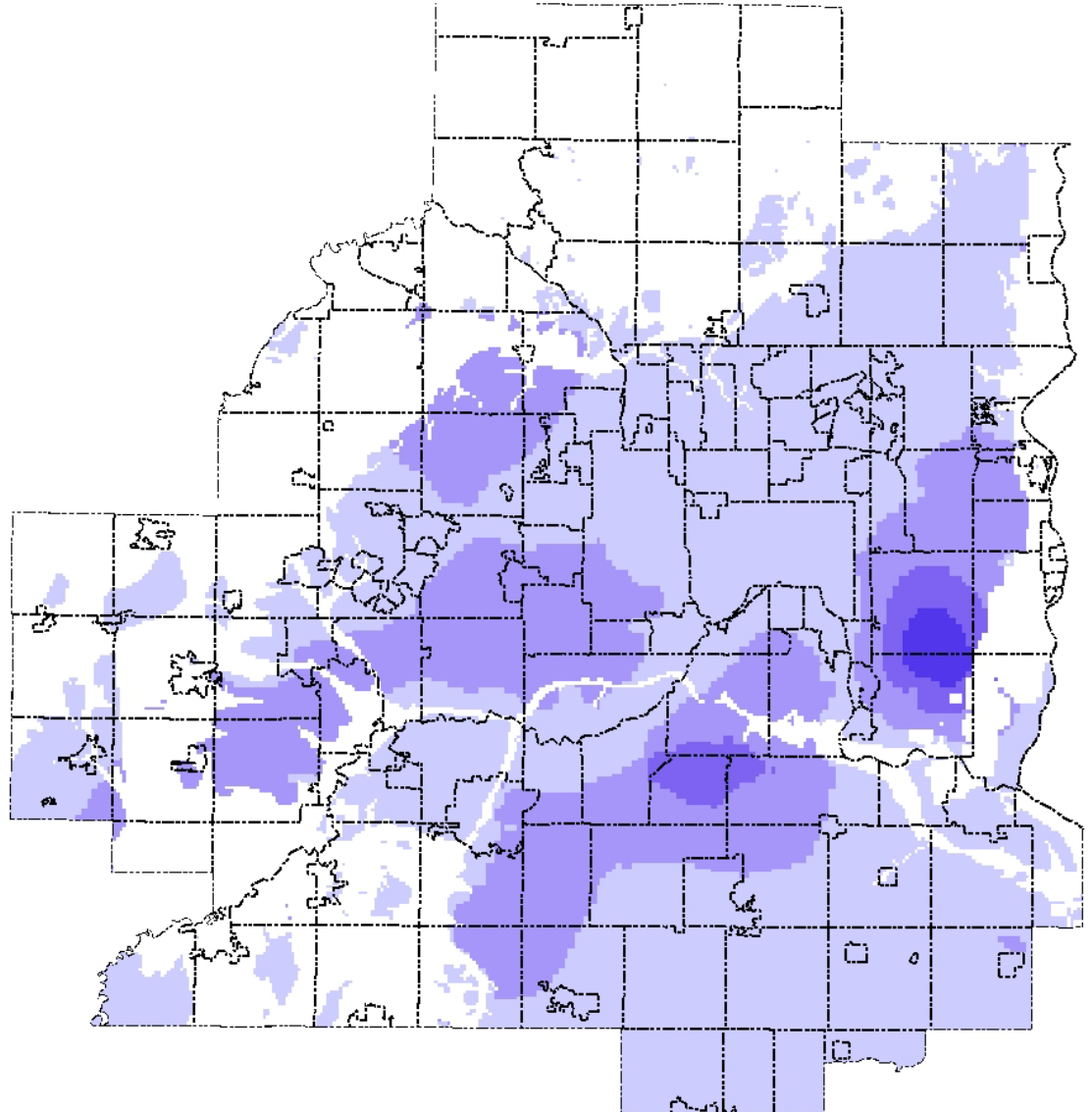
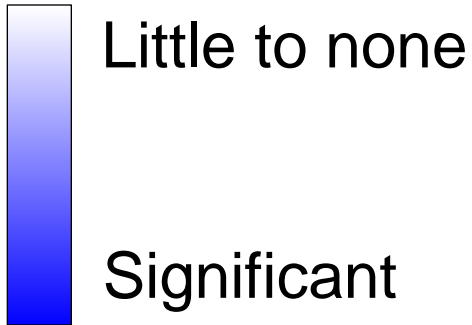


## 2020 Drawdown

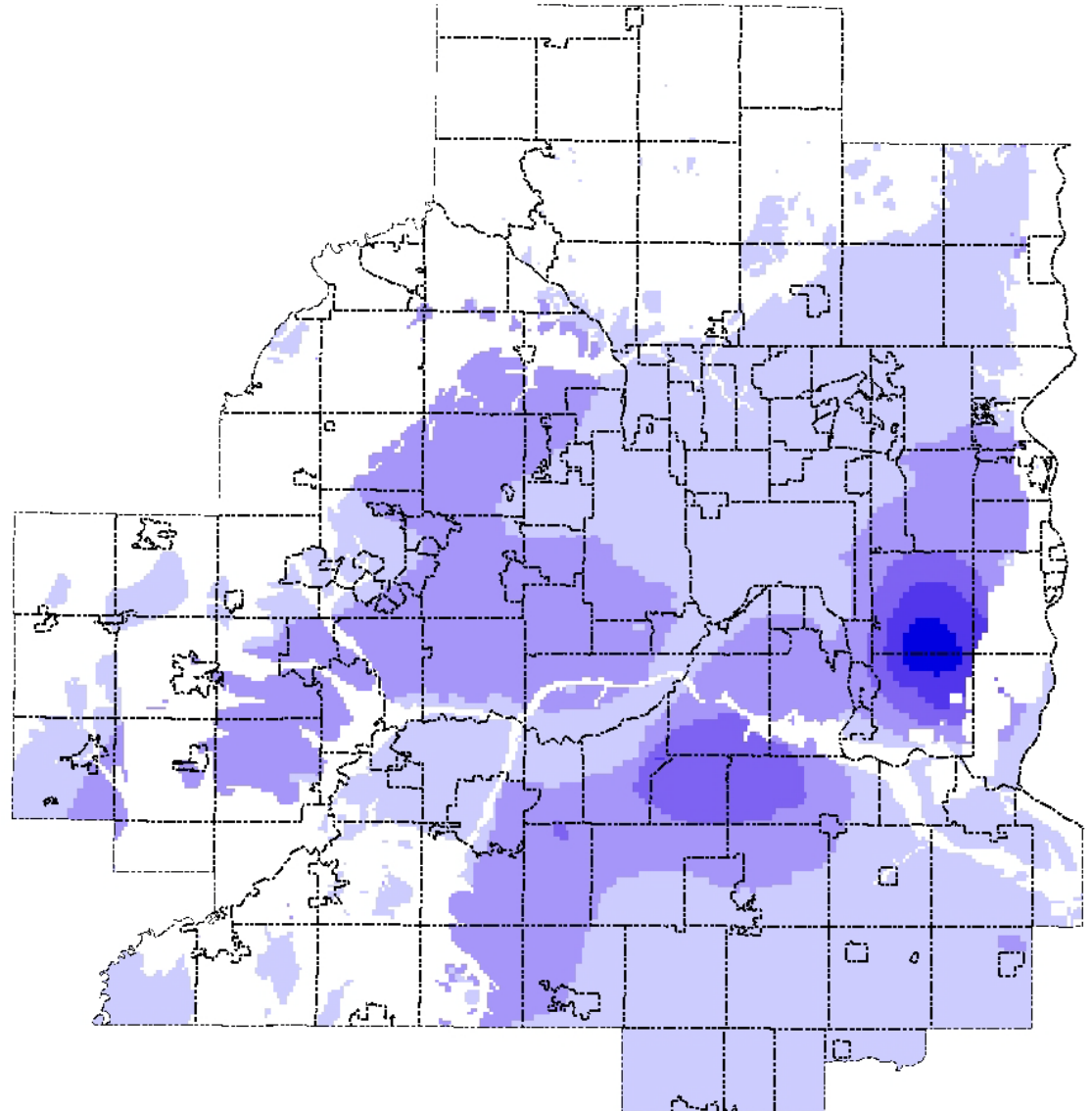
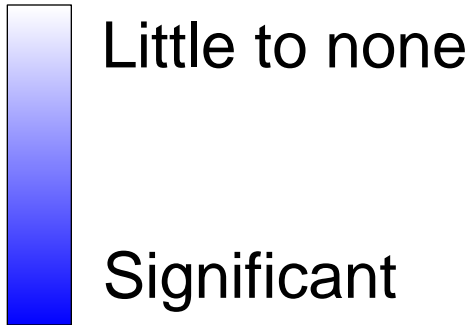




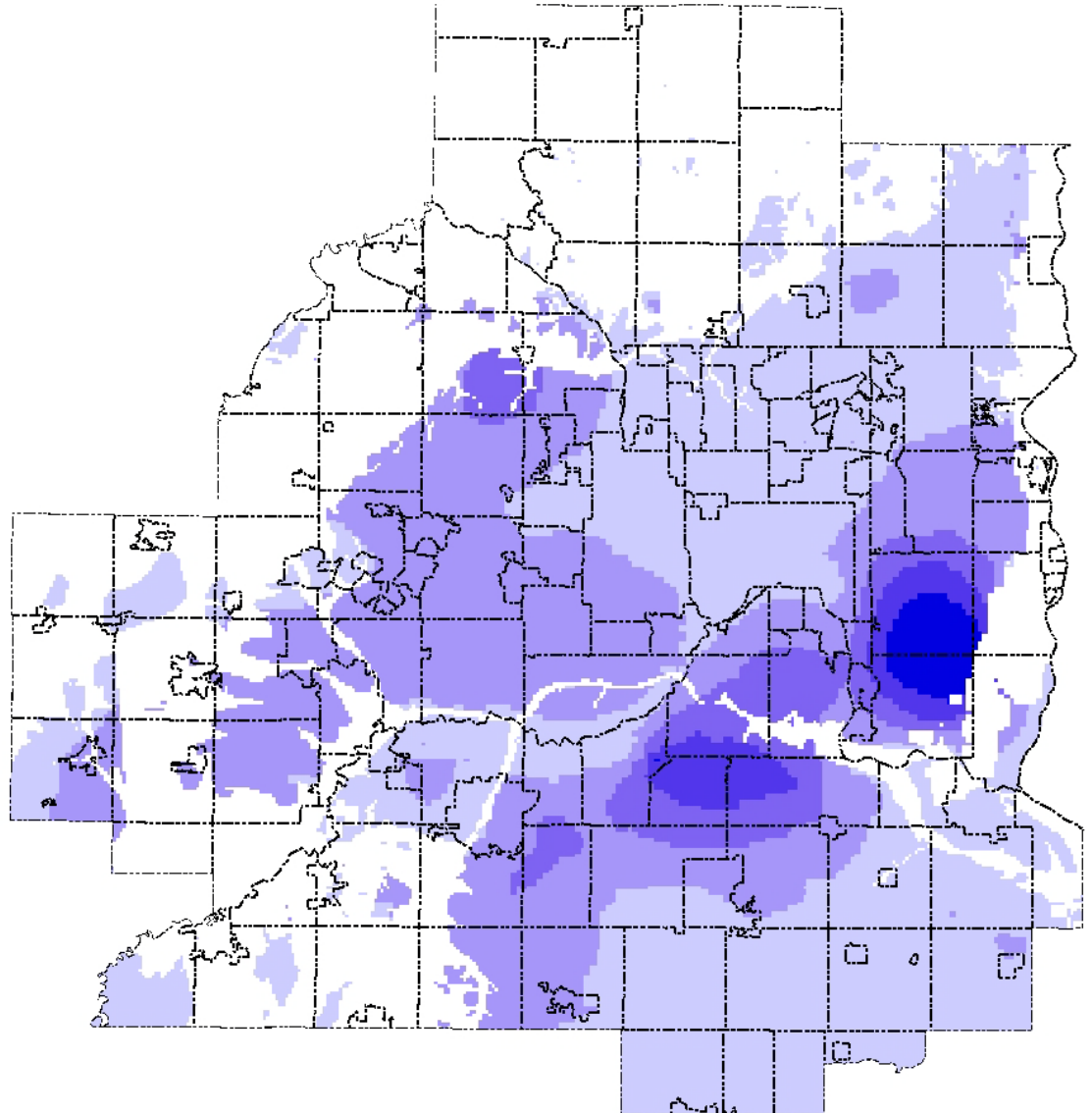
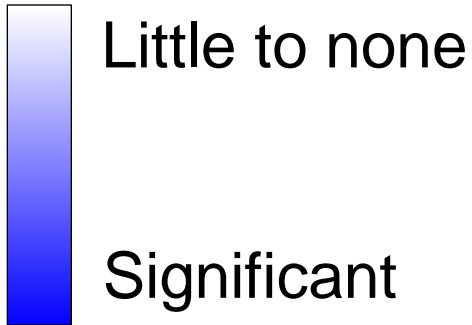
## 2030 Drawdown



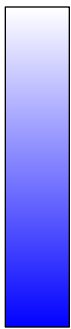
## 2040 Drawdown



## 2050 Drawdown



## 2050 Drawdown

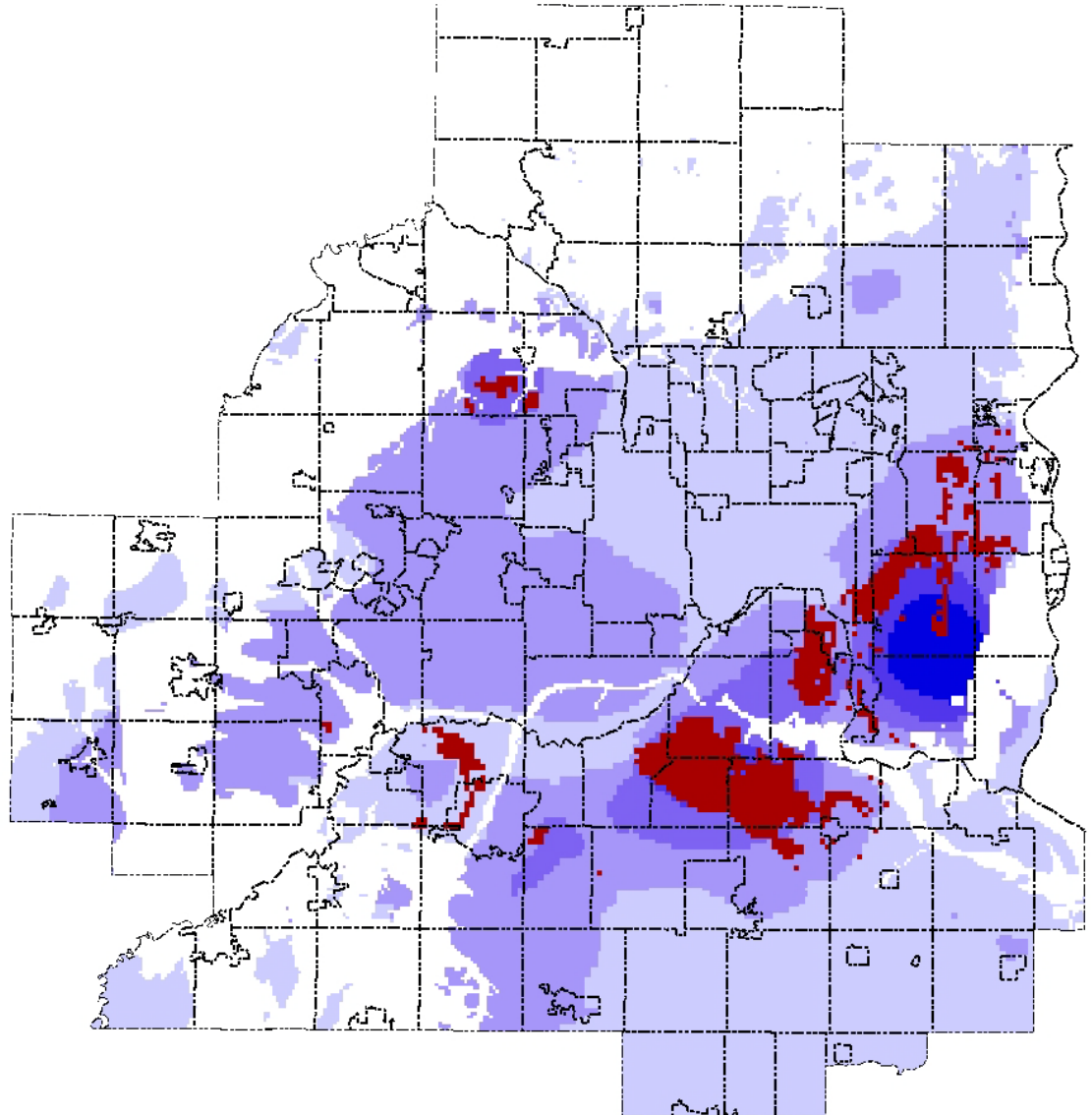


Little to none

Significant

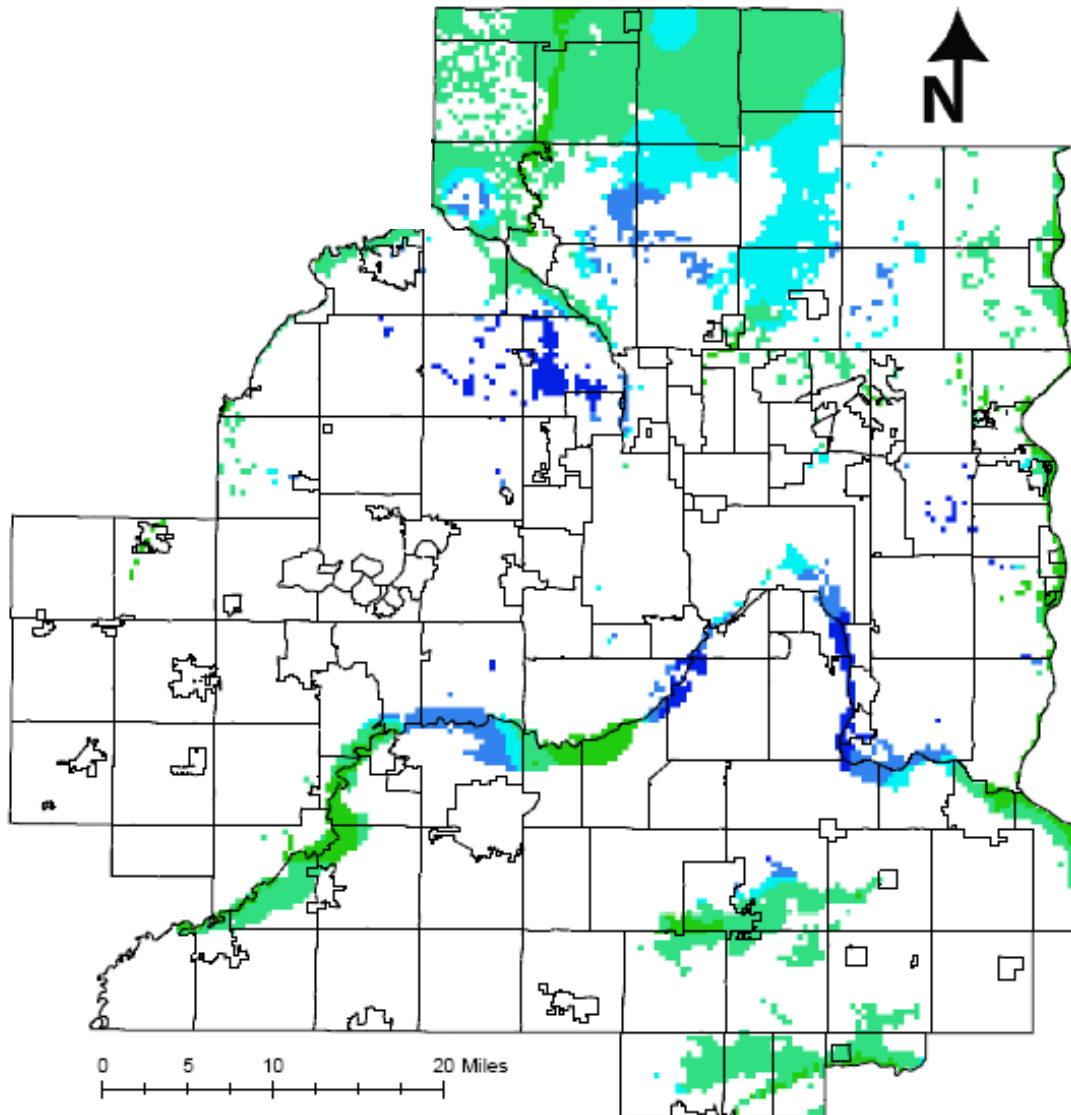


Drawdown  
exceeds 50%  
available  
head



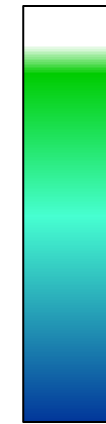


# Model-projected Drawdown in Water Table Aquifers where Pumping is Likely to Impact Surface Waters



2050 Drawdown

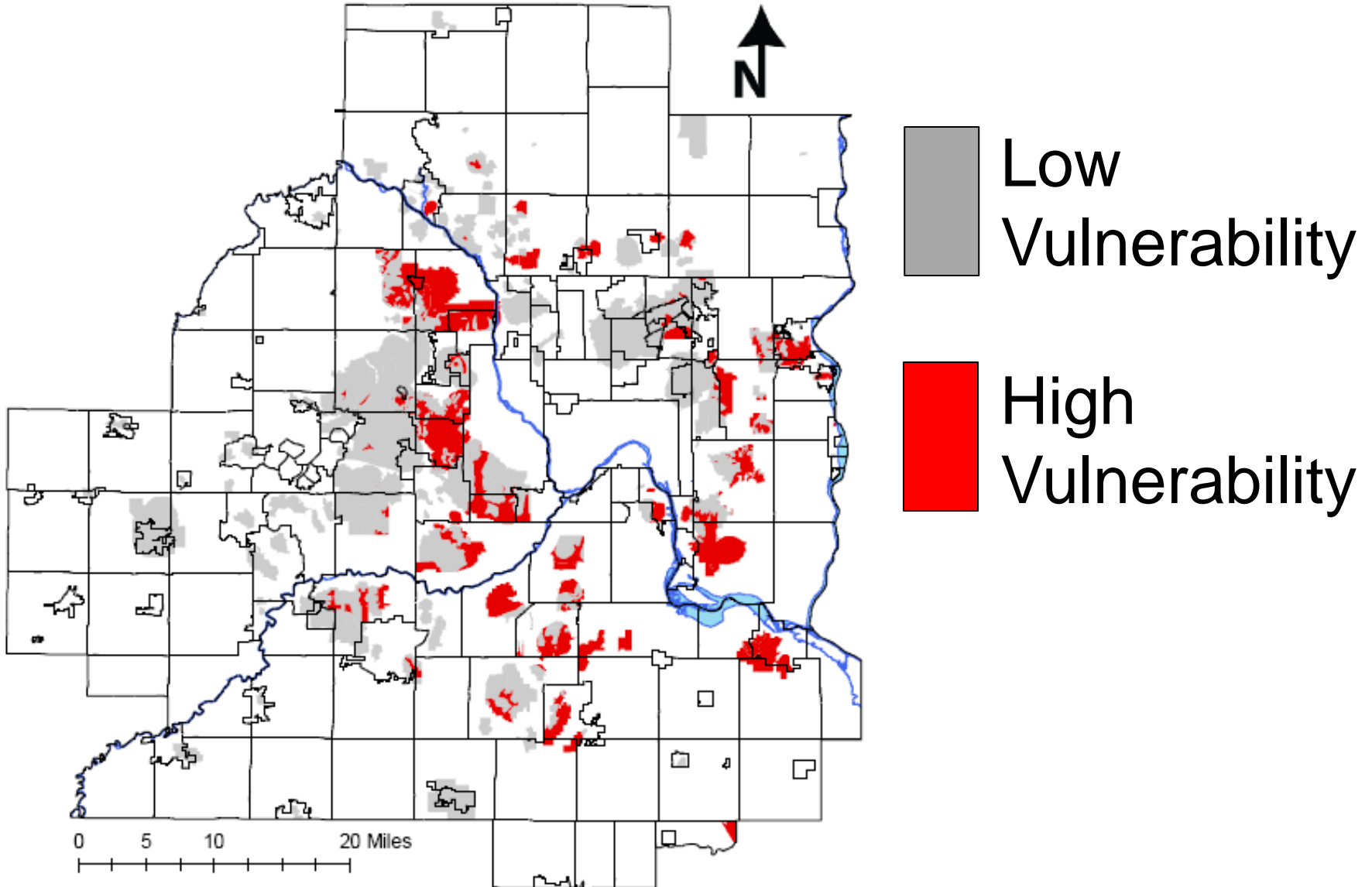
Little to none



Significant



# MDH Drinking Water Supply Management Areas





# Continuing Efforts

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- Gathering information
- Analyzing water availability and issues
- Developing tools and guidance
- Informing regional planning
  - Regional Development Framework
  - Water Resources Management Policy Plan

