Water Supply Planning in Illinois:
The Continuing Need for Data Support

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Just a word about the Surveys

- Collectively, the five State Surveys bring a high degree of unbiased, scientific knowledge and data, from multiple disciplines, to bear on natural resource issues of significance to Illinois
- *Illinois State Water Survey* (est. 1895) is one of three "original" State Scientific Surveys in Illinois, along with the *State Natural History Survey* (est. 1858) and the *State Geological Survey* (est. 1905)
- In 1984, the *Hazardous Waste Research & Information Center* was created. Its name was changed to the *Waste Management & Research Center* (WMRC) in 1989 when it became the fourth "Survey".
- In 2008, the four Surveys became a part of the University of Illinois within a newly formed *Institute of Natural Resource Sustainability*, at which time WMRC changed its name to the *Illinois Sustainable Technology Center*
- In 2010, the *Illinois State Archaeological Survey* is established at the fifth Survey, formerly the UI's transportation archaeology program

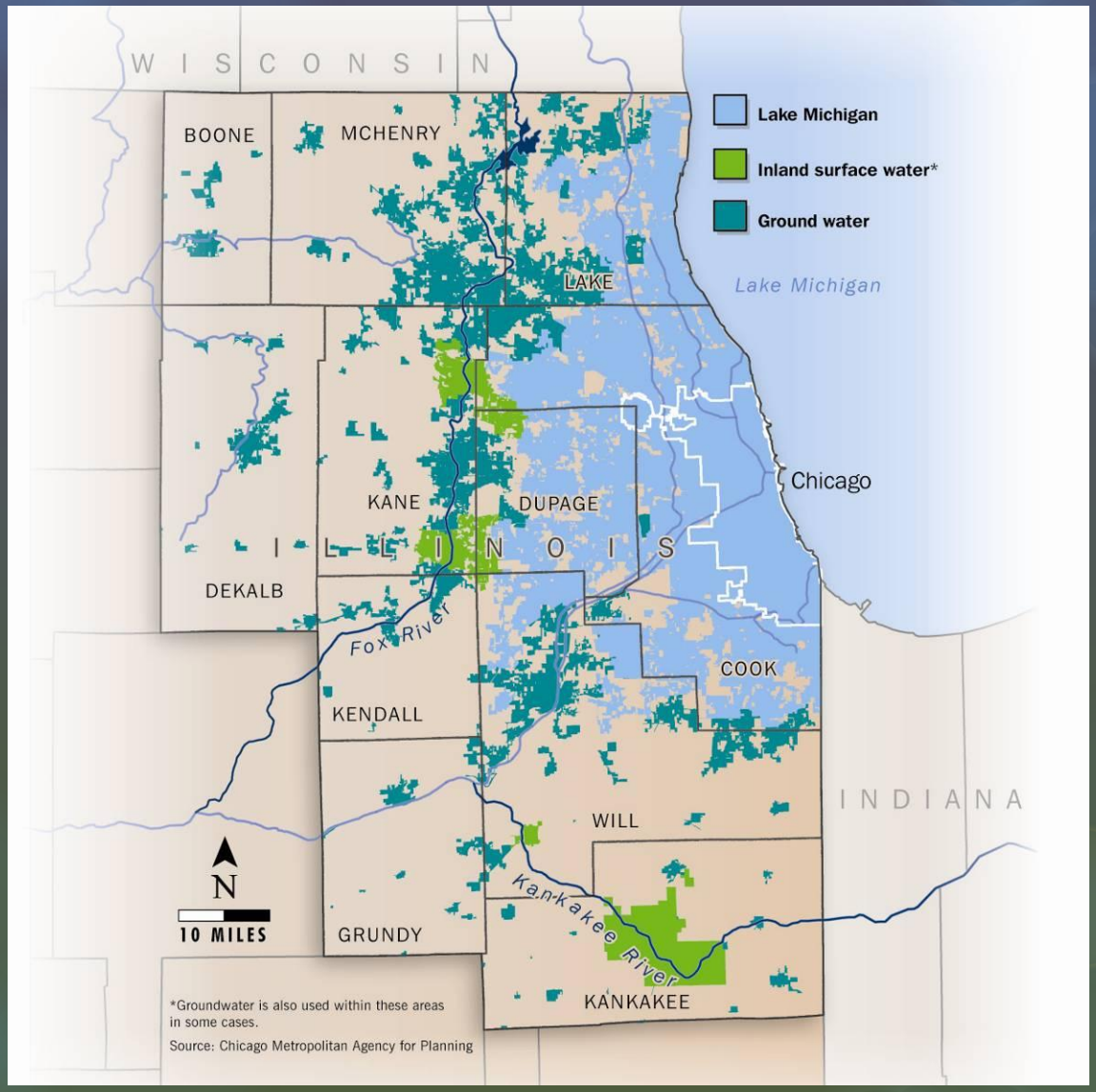
ISWS Mission Statement

The Illinois State Water Survey is the primary agency in Illinois for research and information on *surface water*, *groundwater*, and the *atmosphere*. Its mission is to characterize and evaluate the quality, quantity, and use of these resources. The mission is achieved through basic and applied research; by collecting, analyzing, archiving, and disseminating objective scientific and engineering data and information; and through service, education, and outreach programs. This information provides a sound technical basis for the citizens and policymakers of Illinois and the nation to make wise social, economic, and environmental decisions.

Presentation Outline

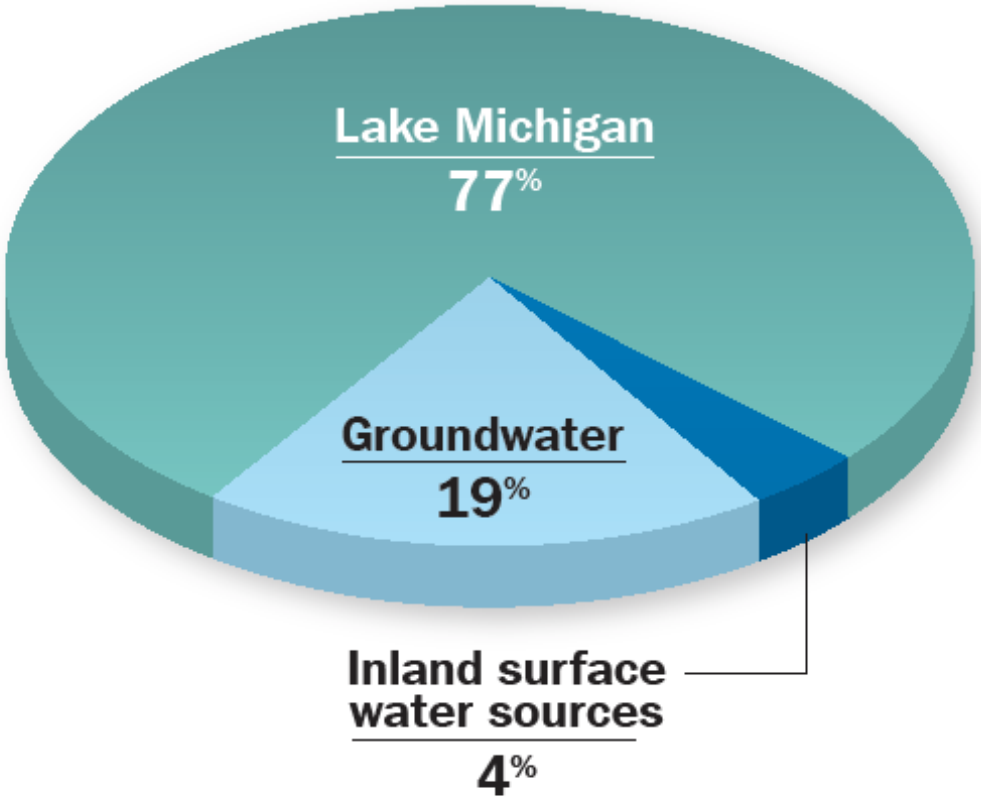
- Water Supply Planning Process/Status
- Scientific Data Used in Water Supply Planning/Results
- Continuing Needs/Challenges

Water Supply Planning for Northeast Illinois



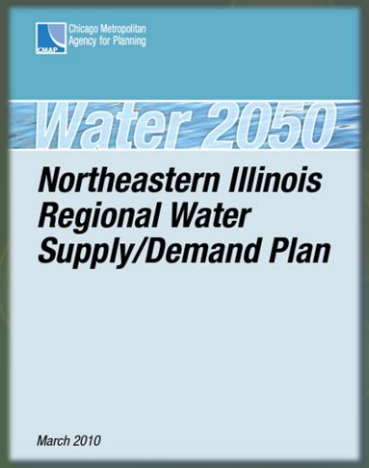
Sources of Drinking Water for Northeastern Illinois

11-county region population, 2000

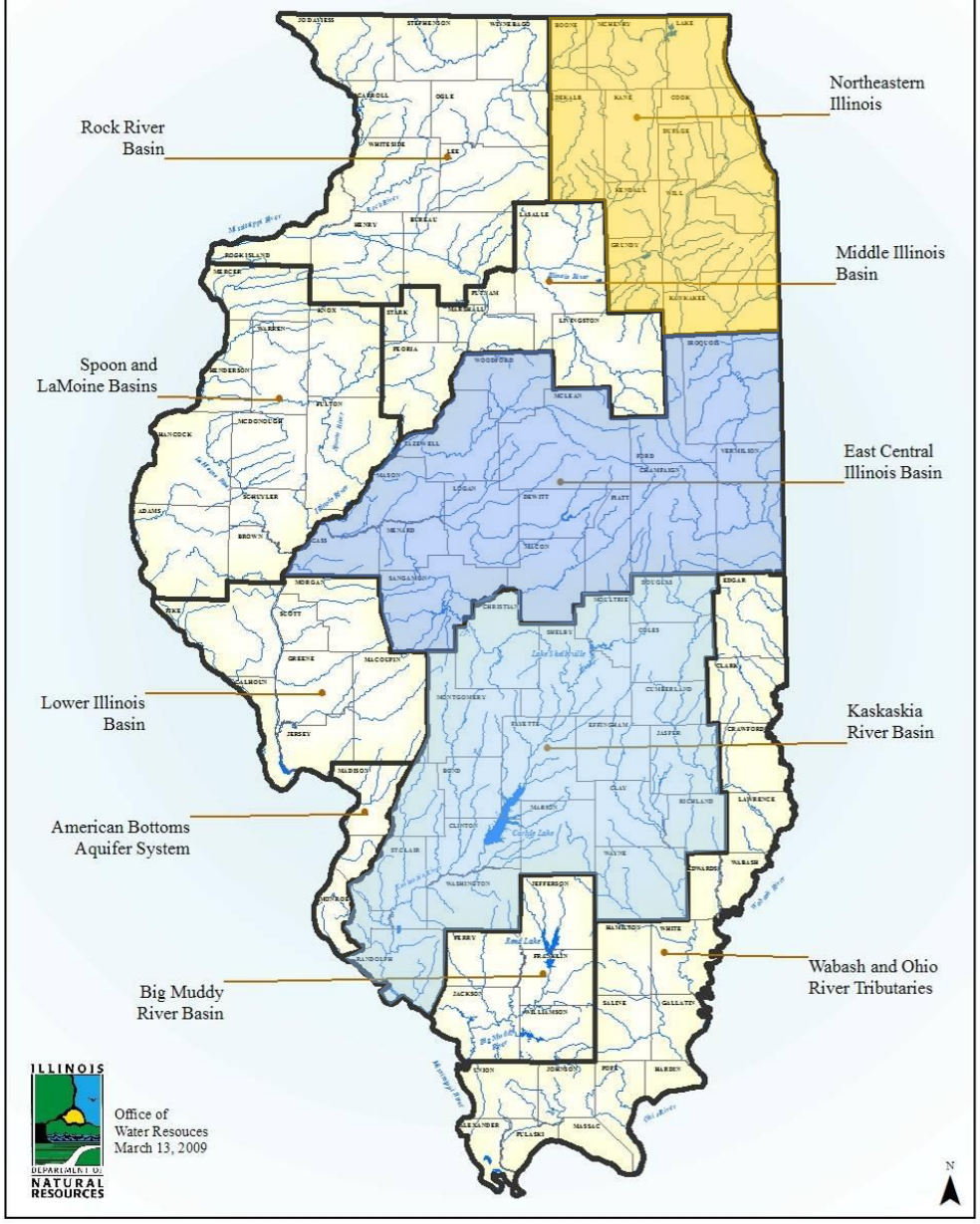


Water Supply Planning Status

- 2006: Two regional planning areas selected (11-county northeast IL, 15-county east-central IL)
- 2007-08: Each region created a stakeholder planning committee and monthly meetings were held
- 2008: Future water demand scenarios (to 2050) developed - IWIP data!
- 2008: State funding cut; Surveys re-direct internal funds to continue; CMAP administers $100,000 contract with Surveys
- 2009-10: Stakeholder plans completed (CMAP Water 2050)
- 2010-11: ISWS continues to complete technical reports
- 2010: 3rd planning region started, Kaskaskia Basin of SW IL
- 2011 and beyond: Plan implementation/Plan update?

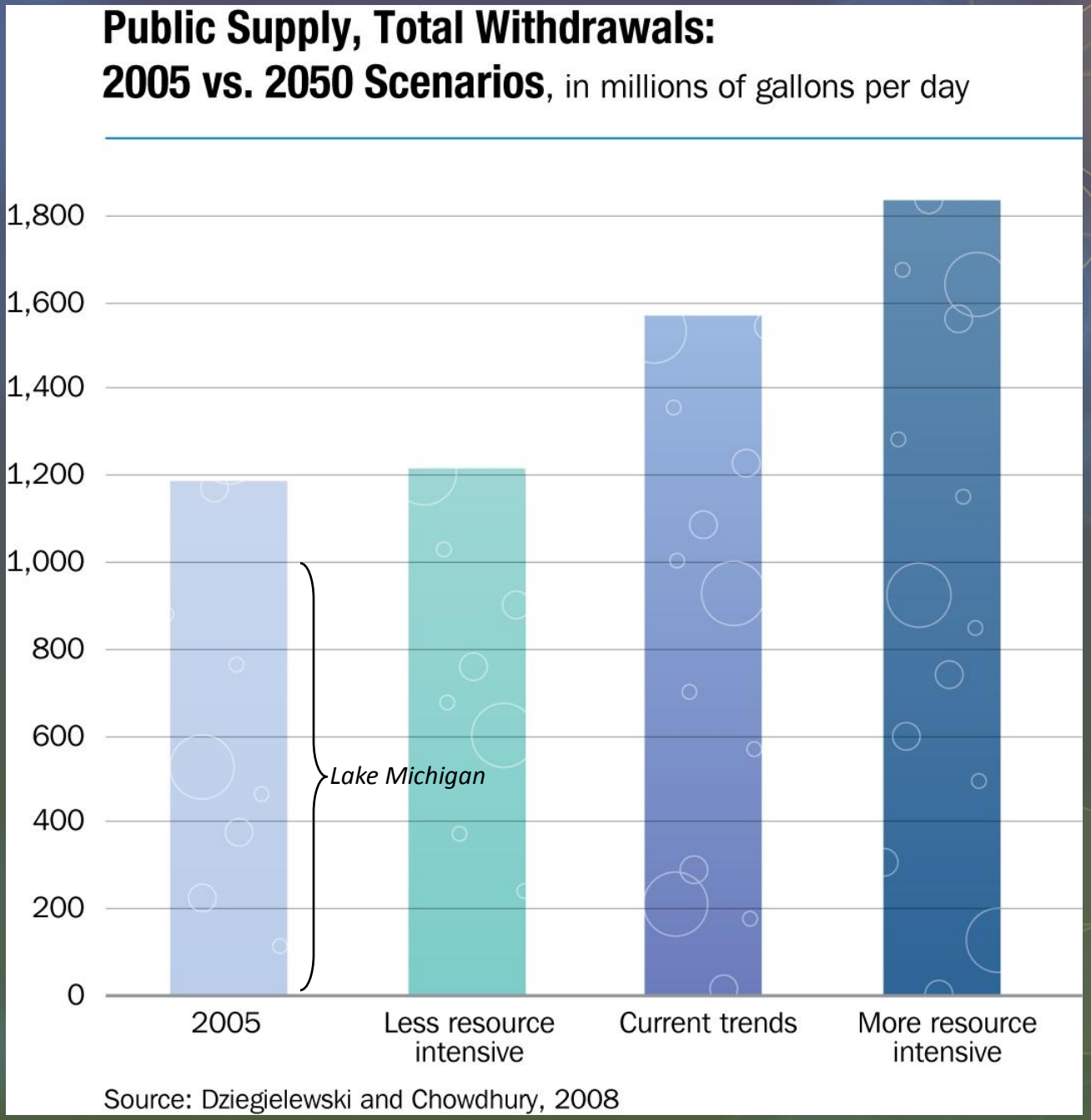


PRIORITY WATER SUPPLY PLANNING AREAS



Data Used in Water Supply Planning

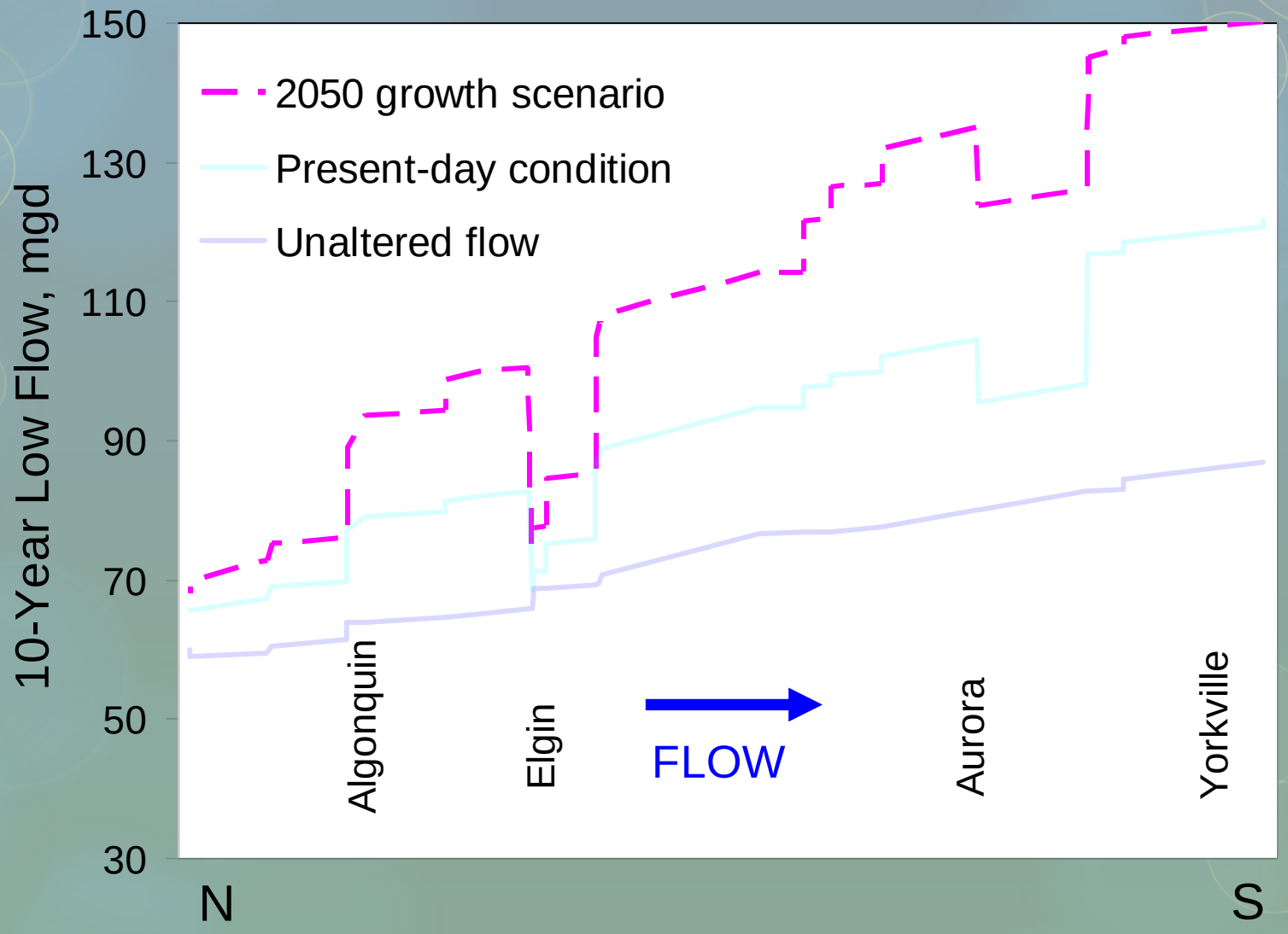
- Water withdrawals for:
  - Public water supply
  - Self-supplied industry/commerce
  - Power generation
  - Rural domestic
  - Agriculture & environment
- Streamflows and treated effluent discharges
- Groundwater data:
  - Geology
  - Wells – locations, aquifers used, pumping rates
  - Aquifer hydraulic properties (ability to transmit water)
  - Groundwater levels


Public Supply, Total Withdrawals:
2005 vs. 2050 Scenarios, in millions of gallons per day
Million gallons per day
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Lake Michigan
2005
Less resource intensive
Current trends
More resource intensive
Source: Dziegielewski and Chowdhury, 2008

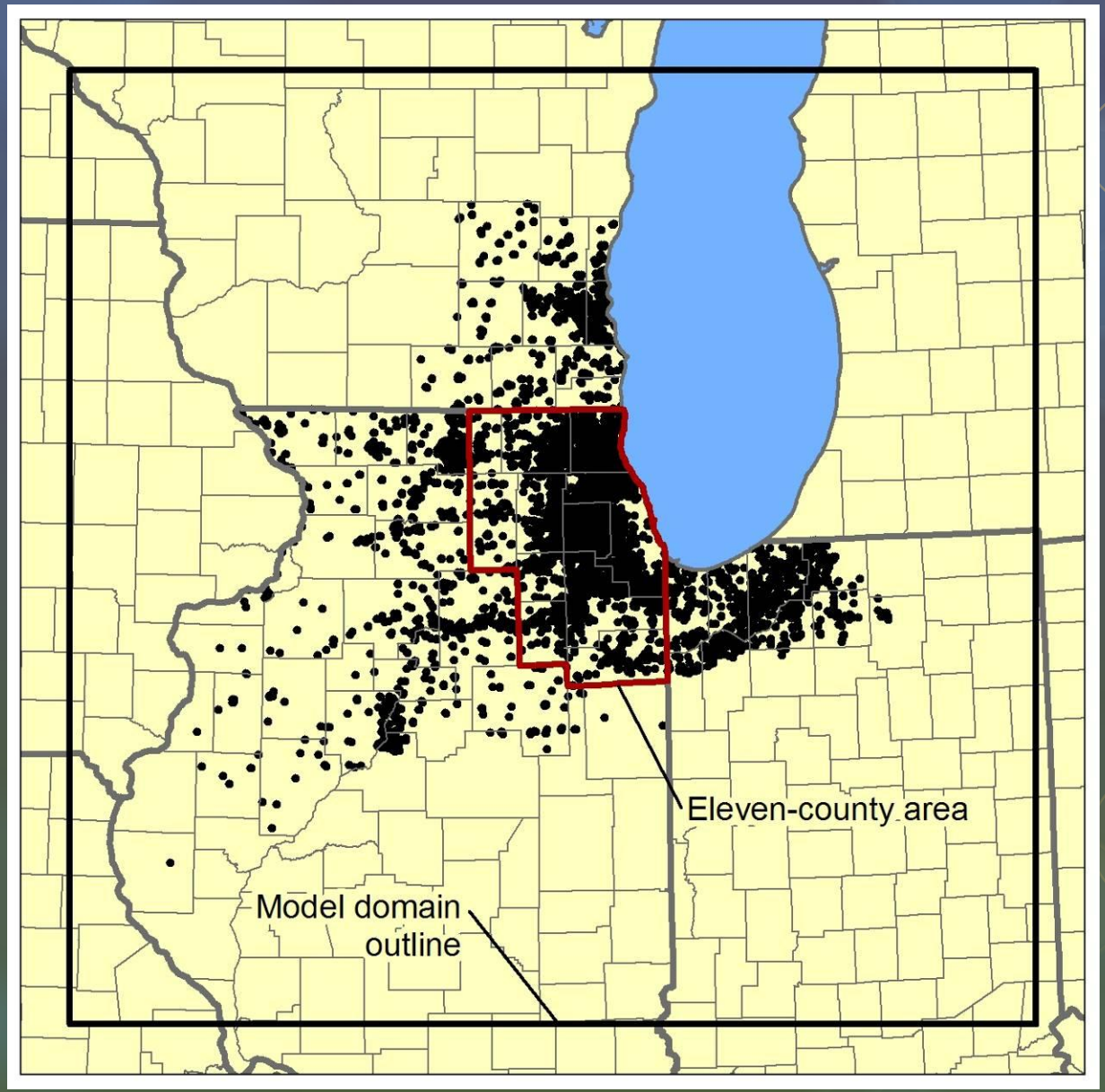
Illinois Water Inventory Program

- Statewide documentation of annual withdrawals began in 1978
- ~4,500 facilities are canvassed annually, representing over 11,000 wells and intakes: community supplies; self-supplied industry & commerce including power generation; “other” (ag-irrigation is sporadic)
- Voluntary program until 01/01/10, now mandatory based on amendments to the Illinois Water Use Act (PA99-0222)
- Annual cost was ~$125,000 before mandatory reporting
- Data is essential for any kind of water supply planning!

Fox River Accounting Tool – 2050 Flow Conditions

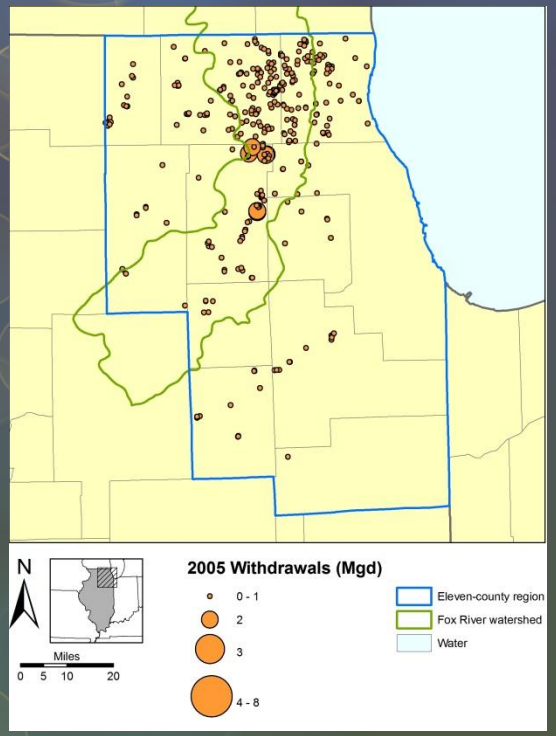


Existing Wells within Groundwater Flow Model Domain

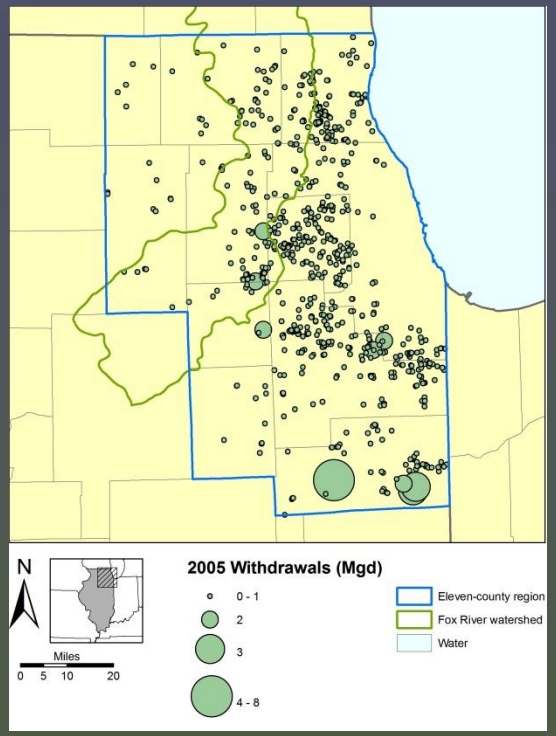


Simulated 2005 Groundwater Withdrawals

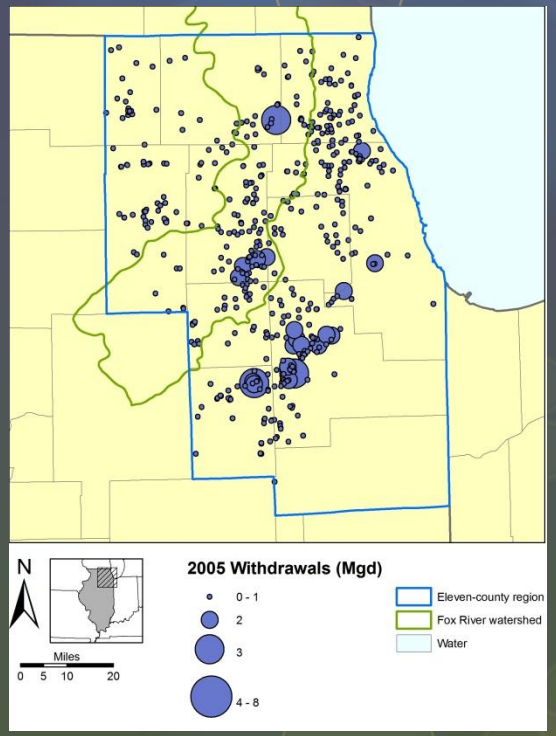
Sand and gravel aquifers



Shallow bedrock aquifers



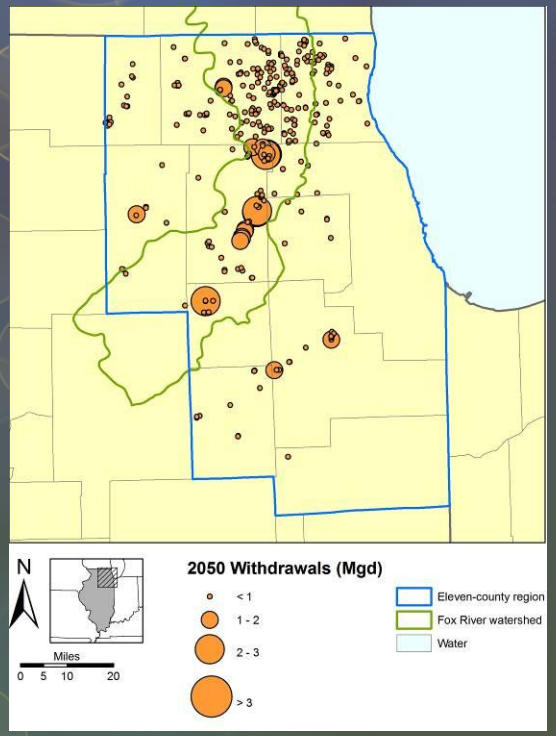
Deep bedrock aquifers



Simulated 2050 Groundwater Withdrawals

(Baseline Scenario)

Sand and gravel aquifers



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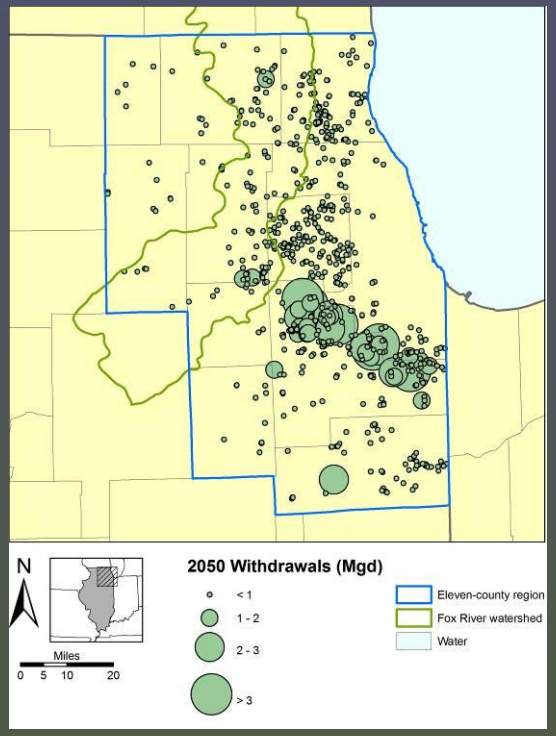
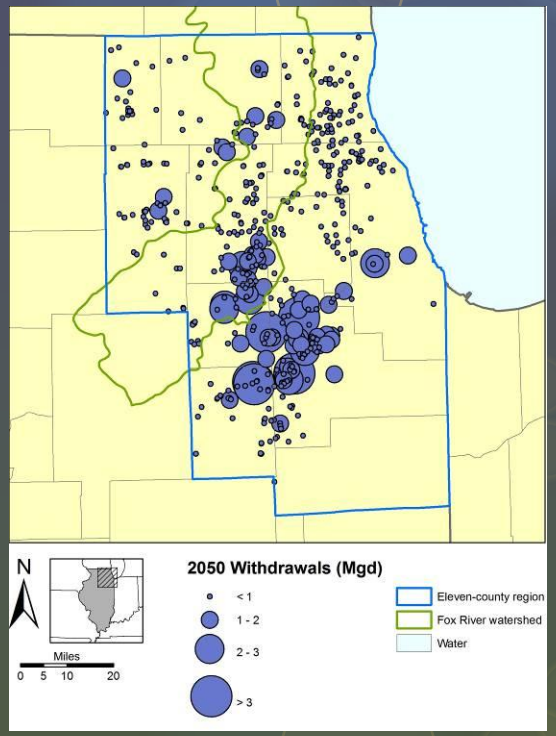
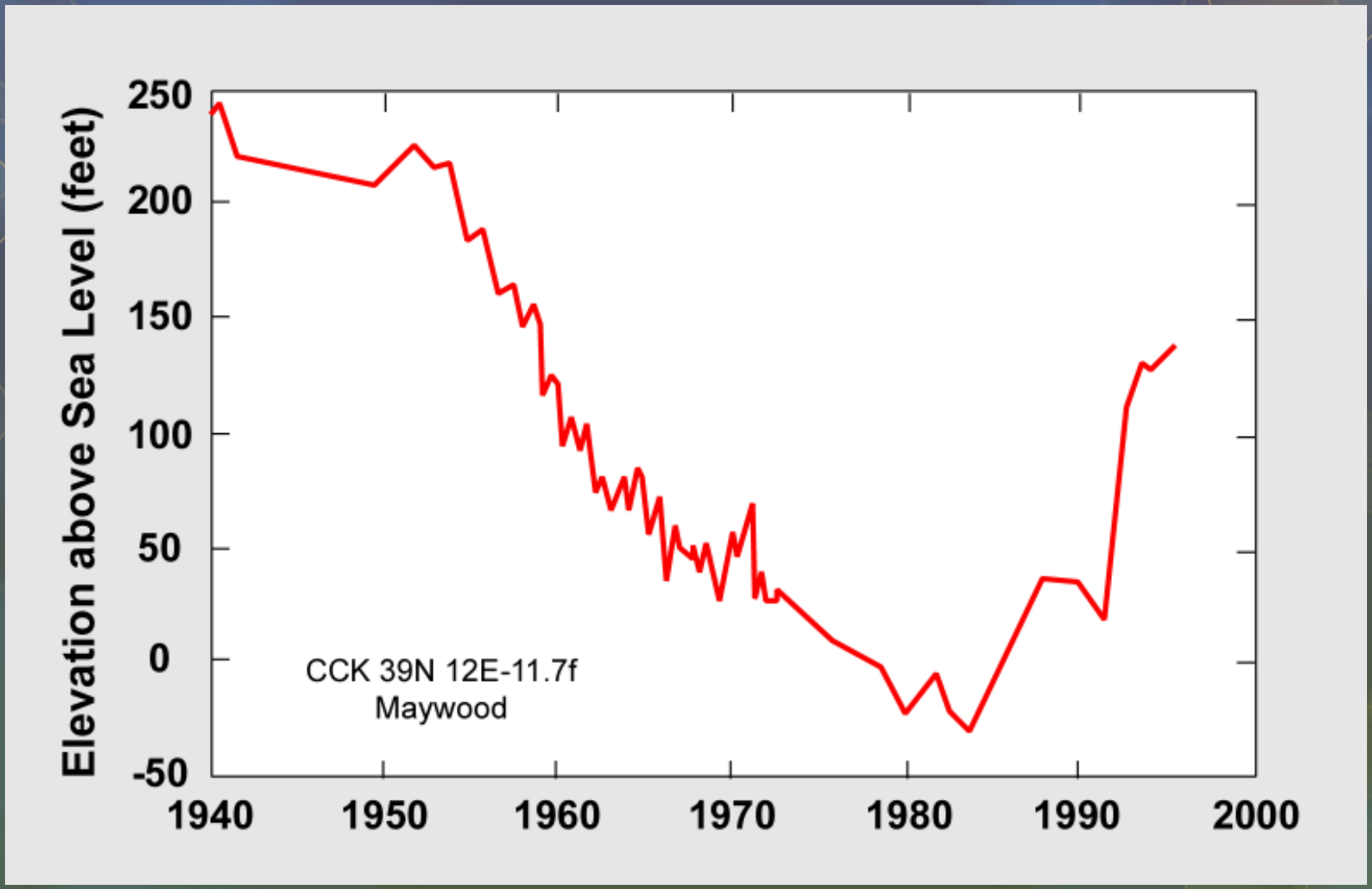


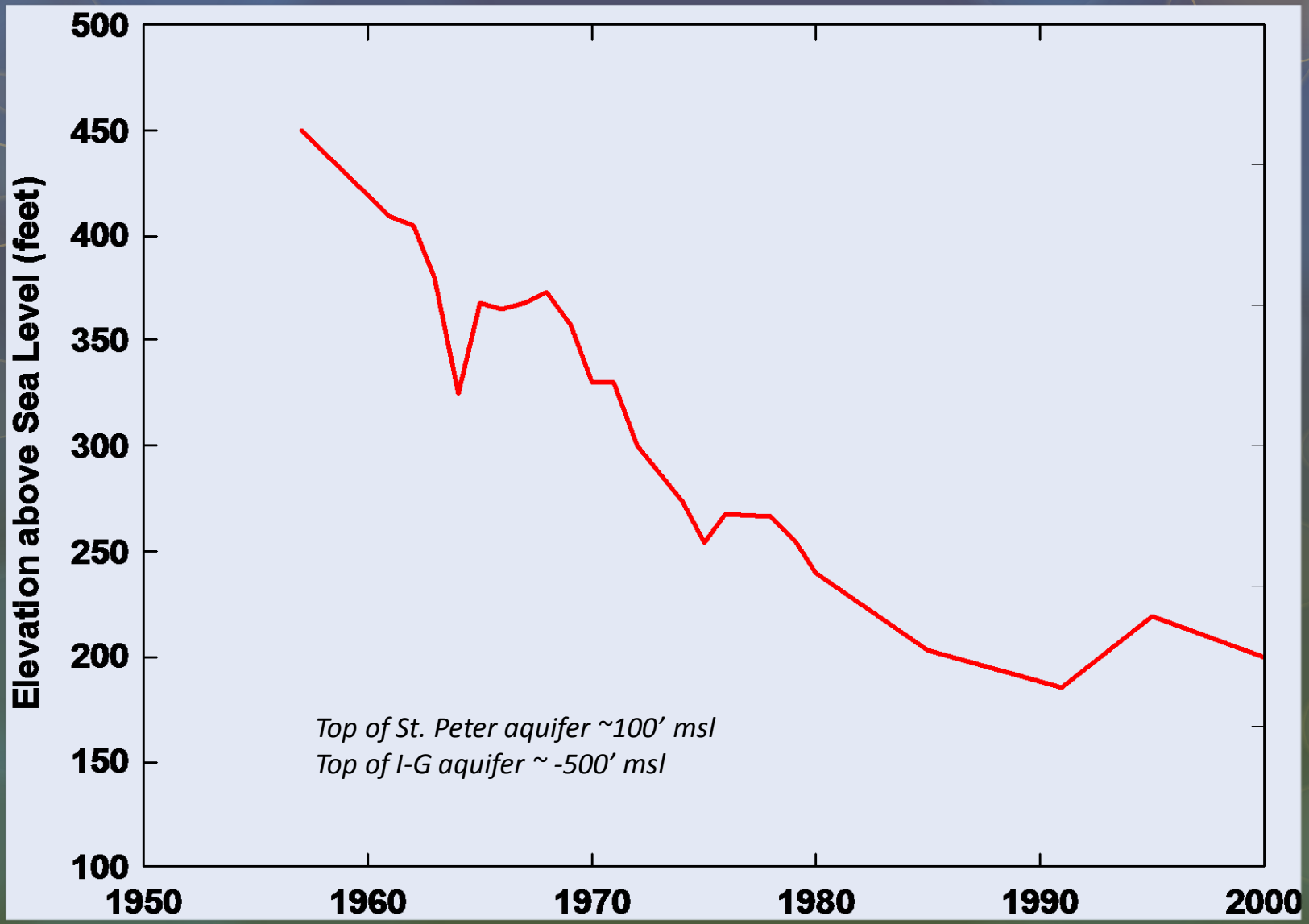
Deep bedrock aquifers



Deep Well Water Levels, Cook County

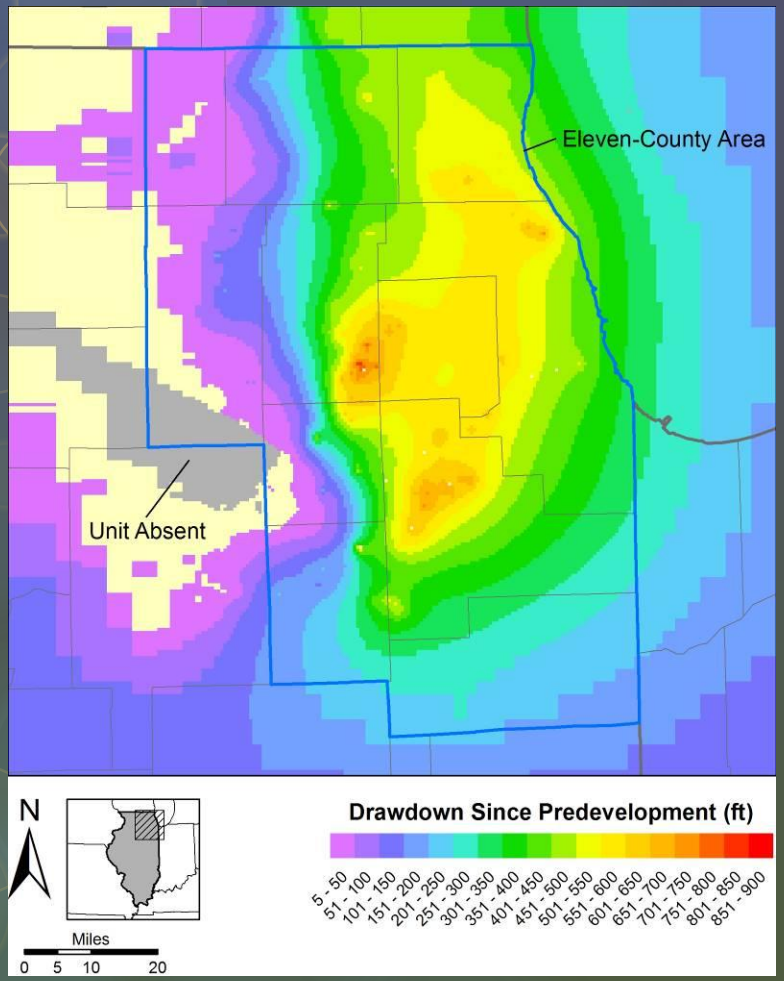


Deep well water levels, Oswego #3 (Kendall County)

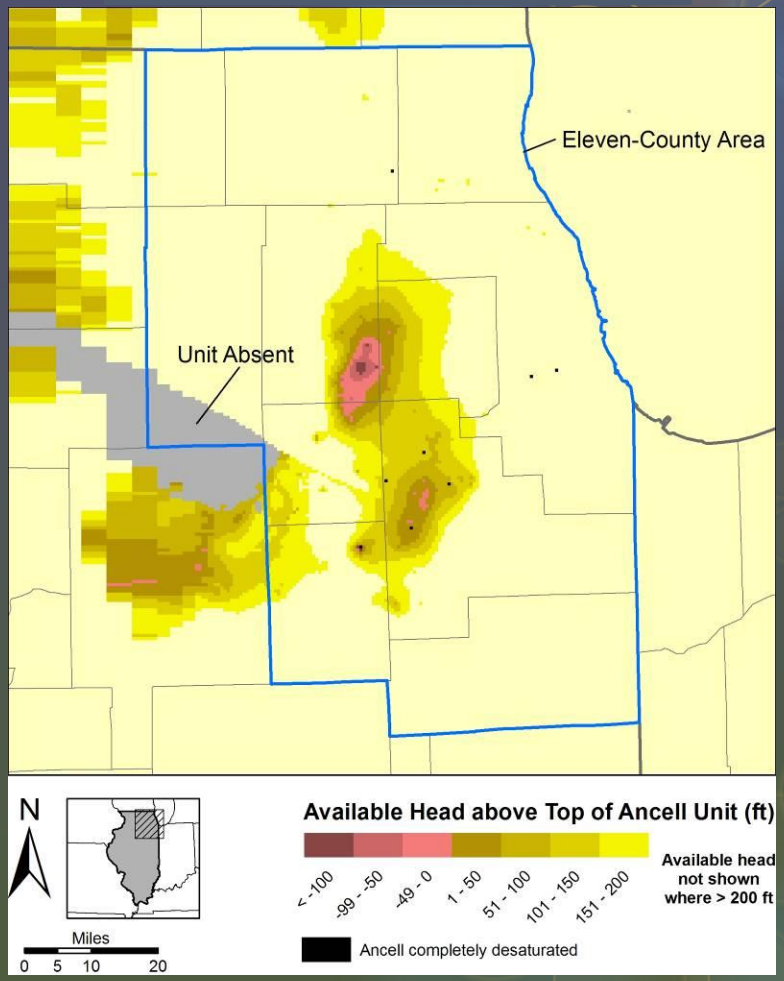


2050 Simulation – Ancell Unit

Drawdown

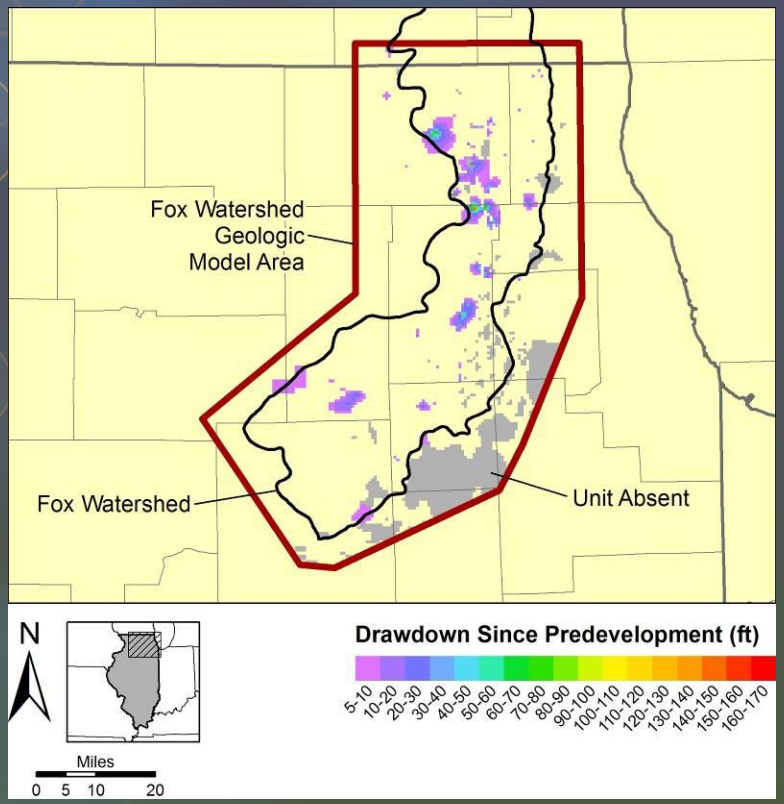


Available Head above Unit Top

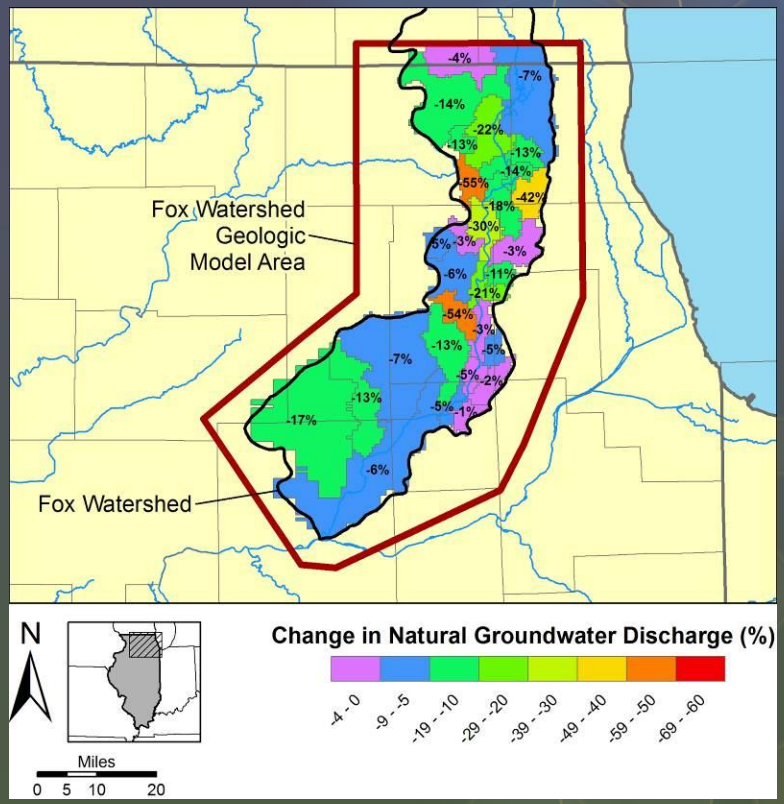


2050 Simulation – Sand & Gravel Aquifers

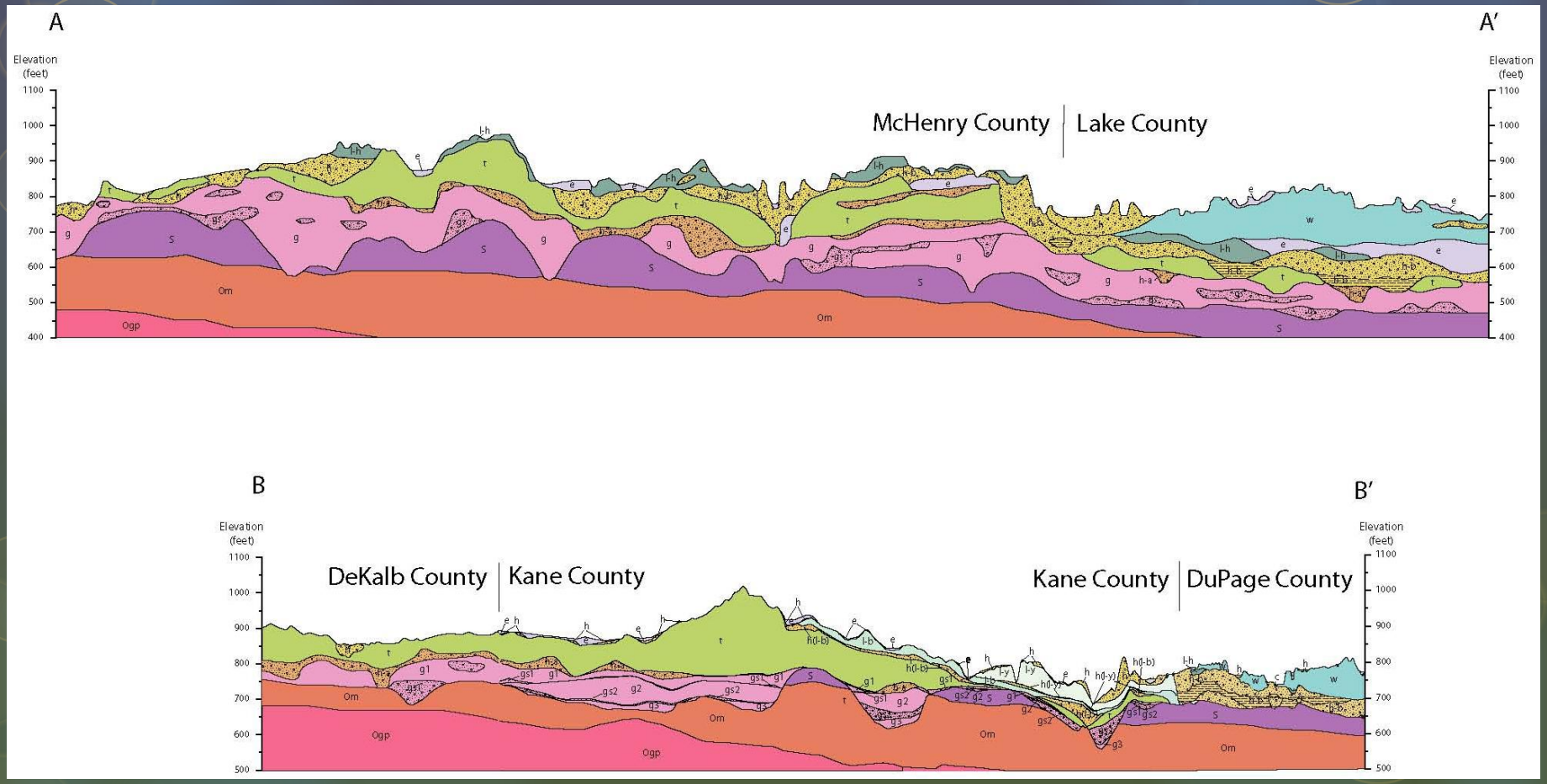
Drawdown



Baseflow Capture



Mapping NE Illinois' Complex Glacial Geology



Challenges for Water Supply Planning

- Estimating availability: need for more & better data (e.g., geologic maps, groundwater levels, aquifer hydraulic properties, lake bathymetric surveys, streamflow) and analytical tools (e.g., models)
- Demand forecasting (population, economic, etc.)
- Influence of climate variability and change on precipitation, runoff, groundwater recharge & water demand
- Water quality and contamination, treatment options
- Water law
- Water resource management

Summary

- We are NOT running out of water!
- But, we need to better manage our water resources so that we can continue to enjoy plentiful water. Start by implementing the *Water 2050* Plan. And updating the Plan on a regular basis.
- We also need to support long-term basic data collection activities of the ISWS & others, especially the *Illinois Water Inventory Program*.