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Illinois State Water Survey

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Illinois State Geological Survey
What is Water Supply Planning?

- Is there enough water of sufficient quality for future use?
- What are the existing water resources?
- What are the current and future needs for water?
  - Drinking water
  - Agricultural, industrial, energy needs
  - Environmental requirements
- Information needed: hydrology, geology, and current and future water demands
Taking a Regional Approach

Regional Supply Planning done for 3 highest priority regions:
- Northeastern Illinois
- East-Central Illinois
- Kaskaskia R. Basin

Funding pulled in the middle of the planning process

WHEREAS, the citizens of Illinois rely on surface water and groundwater for personal consumption, and industries of the State use a significant amount of that water for economic development, and

WHEREAS, the increasing demands on Illinois' water resources and the impacts of drought may lead to conflicts between the multiple water supply users and may adversely affect the health of the State's citizens as well as adversely impacting the environment and the economy, and

WHEREAS, the quantity of surface water and groundwater in Illinois must be properly assessed through a sound planning process as an essential part of any responsible, economically viable and secure water supply development for the citizens of the State, and

WHEREAS, the Illinois Emergency Management Agency, the Illinois State Water Survey, and the Illinois State Water Plan Task Force have identified the Priority Water Quantity Planning Areas that are most at risk for water shortages and conflicts; and

WHEREAS, the Illinois Integrated Water Quantity Planning and Management Committee recommends the development of regional aquifer and watershed plans for managing water supplies;

THEREFORE, BE IT ORDERED that the following actions shall be executed:

Consistent with the authority granted to the Department of Natural Resources under the Rivers, Lakes, and Streams Act, 615 ILCS 5/5 et seq, and the Water of Lake Michigan Act, 615 ILCS 301 et seq, the authority of the Department of Natural Resources' Office of Water Resources under 20 ILCS 601/5-5, the Office of Water Resources, in coordination with the State Water Survey, shall:

1. Define a comprehensive program for state and regional water supply planning and management and develop a strategic plan for its implementation consistent with existing laws, regulations and property rights;

2. Provide for public review of the draft strategic plan for water supply planning and management program;

3. Establish a scientific basis and an administrative framework for implementing state and regional water supply planning and management;

4. Develop a package of financial and technical support, and encouragement of, locally based decisional water supply planning committees. These committees, whether existing or new entities, shall be organized for participation in the development and approval of regional plans in the Priority Water Quantity Planning areas;
Starting summer 2014, IDNR funding the State Water and Geological Surveys to begin working on several new areas of the state.

- Regions based on natural breaks in hydrology or geology, or specific water needs and/or water availability.
- Local stakeholder input critical to the process (Regional Water Supply Planning Committees)
Water Supply Planning Regions

Three New Regions

1. Middle Illinois R. (6 counties)
2. Northwest Illinois (10 counties)
3. Kankakee R. (sub-region)
Regional Tasks: Groundwater (ISWS)

1. Compile and evaluate existing maps and data, including water level, water use, water chemistry, and aquifer properties data
2. Identify and instrument observation wells
3. Perform mass measurements of water levels
4. Collect samples for groundwater chemistry
5. Construct groundwater flow models
Regional Tasks: Groundwater (ISGS)

1. Updating of maps for input into Flow Models
   * Major Sand and Gravel Aquifer distributions and thicknesses
   * Elevation and thickness of major bedrock units and bedrock surface topography
2. Updated Hydrogeologic Characterization
   * Analysis of water well data base
   * Summaries of aquifer distribution and character
   * Updated maps
1. Characterize stream flow during periods of low flow and drought, including quantifiable human impacts (existing effluent discharges, withdrawals, reservoirs)

2. Project future (2060) changes in low flow and availability as impacted by changes in water demands and potential climate change

3. Model individual surface water supply systems to determine drought vulnerability and yield

4. Model regulated rivers (Illinois, Kaskaskia) to see how management impacts availability
Other Activities for Statewide Water Supply Program

- Illinois Water Inventory Program (IWIP)
- Water demand forecasting
- Development of Illinois Cooperative Groundwater Monitoring Well Network
- Mass measurement of Cambrian-Ordovician aquifers in northern Illinois
- Development/updating of region-based web sites
- Education and outreach on groundwater recharge
1. Identify and assess existing groundwater monitoring wells (multi-agency)
2. Develop monitoring strategies for this network
3. Develop database for managing network data
4. Outfit selected network wells with telemetry
   - 8 bedrock wells in NE Illinois
   - 5 monitoring wells outfitted in Lee/Whiteside Counties
5. Install two new bedrock monitoring wells in Kendall County near the Sandwich Fault Zone
Groundwater Monitoring Well Water Level Data

Northern Champaign Co.
Mass Measurement of Cambrian-Ordovician Aquifers

* Synoptic measurements made every 5 – 8 years
* Using as many wells as possible that were sampled in previous mass measurements
* Wisconsin participating this time
2014 Mass Measurement

50-100 wells in SE Wisconsin
Potentiometric Surfaces

From Burch (2002)
Regional Water Demand Forecasting

- Dr. Ben Dziegielewski (SIU-retired) working with and training ISWS staff
- Preparing/analyzing water use data in each of the regions for input in water demand models
- Develop scenarios with input from Regional Water Supply Planning Committees
- Going out to 2060
Water Demand Projections

East-Central Illinois

Pumpage (mgd)

200 250 300 350

2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

Mahomet Aquifer
MRI
BL
LRI

Surface Water
MRI
LRI