

Illinois State Water Survey
Illinois State Geological Survey

Annual Summary Progress Report: Water Supply Planning For Illinois
April 1, 2007 – March 31, 2008

Meetings: ISWS and ISGS staff participated in at least 72 meetings related to water supply planning, gave 47 presentations and participated in numerous conference calls. Periodic conference calls coordinated water supply planning activities between staff and members of the Mahomet Aquifer Consortium, the Chicago Metropolitan Agency for Planning, the State Water and Geological Surveys, and IDNR, including the Office of Water Resources Director Gary Clark and IDNR Deputy Director Deborah Stone.

Deliverables: Below are the deliverables for the period through March 31, 2008, and *commentary on their status*. These deliverables are as described in the initial \$2,637,000 research proposal, and the \$598,300 supplemental research proposal approved by IDNR in December 2007. More details are found in the quarterly reports.

July 1, 2006:

Renew the Illinois Water Inventory Program to document surface water and groundwater withdrawals across Illinois. *This program was fully reinstated beginning with the hiring of a full-time staff person on July 1, 2006 and the hiring of hourly staff throughout the reporting period to support the program.*

September 2006 and updated and improved constantly over the three years:

A Decision Support System (DSS) for state and regional water supply planning that will be publicly accessible via the Internet. The DSS will include identification of water sources, estimates of water withdrawals and use, water quality observations, relevant geological maps, observations and maps of groundwater and surface water levels, aquifer property estimates, estimates and maps of low streamflows, climate data, analytical tools and lists of ongoing projects, committees, meetings, and contacts. This deliverable will be met by conducting the following tasks. Tasks not reported here are listed separately under other deliverable dates:

Data management and web development: *A Water Supply Planning Web site, being updated and improved constantly, became publicly accessible at www.sws.uiuc.edu/wsp on March 19, 2007. This site includes the DSS features listed above, and includes the water supply planning related presentations made by staff of the Surveys.*

Analytical tool development, testing, and application, including:

Estimating groundwater recharge/discharge – *work is underway and continues over the three years.*

Regional climate model – *Due to a staff reassignment, this work, scheduled for completion in FY 08, has not been accomplished. Alternate arrangements to accomplish this work are being investigated.*

Continuous simulation watershed models – *The Fox River watershed model is complete. Calibration work on the Sangamon River watershed model is underway and is scheduled for completion in June 2008, ahead of the September 2008 scheduled date.*

Monitoring of groundwater levels: *Work is on-going and continues over the three years.*

Identification of groundwater-surface water interconnections: *Work is underway and continues through FY 08.*

Construction of observation wells: *In the last year the ISGS drilled three test borings and installed groundwater observation wells in NW Cook County, conducted four weeks of test drilling in Lake County, drilled test holes and installed monitoring wells in the Mahomet aquifer at Bondville (IAWC water supply area) and near Sadorus, Dewey and White Heath.*

Display of real-time water levels via the Internet: *Data logging equipment has been installed at selected locations and water level data are being collected daily; additional equipment will be purchased and installed this spring and summer. Telemetry equipment is being installed and made operational as weather permits. Web site programming is still needed for near real-time display via the Internet.*

Collection of synoptic groundwater head measurements for the Deep Bedrock Aquifer and Silurian Aquifer in northern Illinois: *Work is underway and scheduled through FY 08.*

Collection of synoptic groundwater head measurements for the Mahomet Aquifer in central Illinois: *Work is on-going and continues over the three years.*

Collection and analysis of water quality data: *Water quality reports on the shallow and deep bedrock aquifers in NE Illinois have been completed, as has water quality sampling of Kendall Co. wells.*

Baseline studies of water availability and water quality: *This work is on-going and is scheduled through early FY 09.*

Production of scenarios of future climate variations through analysis of historical data and model projections of the future: *Scheduled for FY 09.*

Identification of data needs for regional water supply planning and management: *Work is on-going and continues over the three years.*

December 2006:

Updated/new web-pages for the Mahomet and Deep Bedrock Aquifers containing initial information pertinent to water supply planning for these aquifers. A *Water Supply Planning Web site, which contains such information and is being updated and improved constantly, became publicly accessible at www.sws.uiuc.edu/wsp on March 19, 2007.*

June 2007:

Revised state drought plan. *IDNR/OWR is the lead entity on this item. ISWS will provide data and information to assist in the revision, including the results of several on-going ISWS drought related studies.*

Updated potentiometric surface map of the Silurian dolomite aquifer in northeastern Illinois using newly available data from Kane and Kendall counties with existing data

from Lake, Cook, DuPage, McHenry and Will counties. *This work has been combined with an update of the same map using existing and new data, scheduled for completion in June 2008.*

Interactive maps of the priority areas containing water well information including geologic data, groundwater and surface water withdrawals, surface discharges, and appropriate climatologic data. *Work has not been initiated. Work is not essential to development of the State and two regional water supply management plans.*

September 2007:

Compilation of existing geologic sample descriptions, geophysical logs, regional and local geologic maps and reports of the Deep Bedrock Aquifer for northern Illinois. *This work is on-going and is nearing completion.*

Provide scientific data and regional groundwater flow model for input to development of an initial regional plan to manage the Deep Bedrock Aquifer of northern Illinois. *An updated an improved regional groundwater flow model has been calibrated and is ready for demand impact analysis model runs.*

Completion of surface water accounting tools for the Fox River Basin and central Illinois region. *This work has been completed and is ready for use in water demand impact analysis.*

December 2007:

Regional geologic maps and reports and groundwater flow models for the shallow aquifers underlying the Fox River Basin and in the Mahomet Aquifer in east-central Illinois. *Regional geologic maps for the Fox River Basin were delivered by the ISGS to the ISWS in February 2008. Due to a no-cost work extension with a related contract, delivery of regional geologic maps for the Mahomet aquifer systems has been delayed to April, 2008. However, groundwater flow models for northeastern Illinois and the Mahomet aquifer are expected to be available in time to conduct model runs and provide impact analysis by the end of September 2008.*

Provide output from regional deep bedrock flow model based on preliminary water demand scenarios created by ISWS. *Completed. Included in the Kane County report.*

Receive initial water demand scenarios to 2050 from the two regional water supply planning committees. *Initial water demand scenarios were provided by the Northeastern Illinois RWSPG in late December, 2007. Initial water demand scenarios were provided by the East Central RWSPC in late February, 2008. ISWS is awaiting final revisions from regional committee reviews and subsequent allocation of demand scenarios back to withdrawal points.*

Supplemental: 1. Deep bedrock aquifers of Northeastern Illinois. Collect deep aquifer water level measurements in the fall of 2007 (FY 08), water quality sampling, and installation of two deep-well water level dataloggers in DesPlaines and Joliet. These

dataloggers will be outfitted with telecommunications for daily transmission back to the Water Survey and viewing on the Web. *ISWS staff collected deep aquifer water level measurements and water quality samples in the fall. Installation of two deep-well water level dataloggers in DesPlaines and Joliet are scheduled for spring.*

Discussion of stakeholder interaction: *Staff of the Surveys assisted CMAP and the MAC with planning, and participated in meetings for formation of the Regional Water Supply Planning Committees (RWSPC), including assistance with the identification and selection of stakeholders. The Northeastern Illinois RWSPG was formed in December, 2006. The East Central RWSPC was formed in February, 2007. Following formation, staff of the Surveys have participated in all of the committee's meetings, made many presentations and provided support to subcommittees, and provided data and assistance to the committee's water demand scenario consultants.*

Deliverables – The Year Ahead: Below are the scheduled deliverables for the period April 1, 2008 through FY 09, June 30, 2009 as described in the initial \$2,637,000 research proposal, and the \$598,300 supplemental research proposal approved by IDNR in December 2007. Given current staffing and subject to continued funding in accordance with the contract, it is anticipated that these deliverables will be produced on a schedule that meets the overall program objectives.

May 2008:

Compilation of existing geologic sampling descriptions, geophysical logs, regional maps and reports of the Cambrian and Ordovician confining units above the Deep Bedrock Aquifer for northern Illinois.

New potentiometric surface map for the Deep Bedrock Aquifer in northern Illinois.

Complete revision of the methodology for analyzing reservoir yield and adequacy in Illinois.

June 2008

Model the impact of climate change on Great Lakes water levels with the GLERL model.

Supplemental: 3. Enhance Knowledge of Recharge. Retain the services of a technical writer, as an independent contractor, to produce a report to further advance the general understanding of recharge in Illinois by defining the existing state of knowledge about recharge, focusing on northeastern Illinois and the Mahomet aquifer.

September 2008:

Updated geologic characterizations and regional maps and a preliminary analysis of the uncertainty within these characterizations and maps of the Deep Bedrock Aquifer for northern Illinois, based on analysis and integration of recent information and discoveries.

Update geologic characterizations and regional maps, preliminary analysis of the uncertainty within these geologic maps.

Improved groundwater flow models for shallow aquifers underlying the Fox River Basin and in the Mahomet Aquifer.

Provide analysis of impacts from initial water demand scenarios to the two regional water supply planning committees.

December 2008:

Complete the analysis of drought and flooding impacts on surface water supplies and risks and uncertainties.

Receive revised water demand scenarios to 2050 from the two regional committees. *Revised water demand scenarios from the two regional committees are scheduled for delivery on May 1, 2008.*

May 2009:

Updated geologic characterizations and regional maps and a preliminary analysis of the uncertainty within these characterizations, and maps of the Cambrian and Ordovician confining units above the Deep Bedrock Aquifer for northern Illinois, based on analysis and integration of recent information and discoveries.

Evaluation of the uncertainty within the geologic characterizations and maps for the shallow aquifers underlying the Fox River Basin, the Deep Bedrock Aquifer for northern Illinois and the Mahomet Aquifer, and an analysis of the implications of these uncertainties for regional water supply planning and management.

New potentiometric surface map for the Mahomet Aquifer.

Revised groundwater flow models for the Mahomet Aquifer, the Deep Bedrock Aquifer of northern Illinois, and the shallow aquifers underlying the Fox River Basin utilizing 2050 water demand projections provided by the regional water supply planning committees.

Suite of climate scenarios for regional planning areas.

June 2009: Definition of a comprehensive program for state and regional water supply planning and management.

Publicly reviewed strategic plan for state and regional water supply planning and management.

Supplemental:

1. Shallow aquifer maps in the Fox River Basin (FRB). Fuller integration of existing data into a 3-D geologic model of the FRB quaternary deposits. Geologic maps from Kane, DeKalb, portions of Lake, and Kendall Counties will be digitally combined. Non-digital McHenry County data will be scanned into digital format for combining. Conduct

hydrogeologic field investigations to collect new data, including surface geophysics, borehole geophysical logging, observation well construction, level measurements and sampling. Drilling will be in or near Kane County to supplement current data, in LaSalle County where geologic maps have not been completed previously, and in western Lake and eastern McHenry counties to examine significant groundwater interactions with wetlands and lakes

Mahomet aquifer system maps. Conduct hydrogeologic field investigations including surface geophysics, borehole geophysical logging, and construction of observation wells and sampling for major inorganics including arsenic to provide more detail of the geologic features associated with Sangamon River connections near Monticello and north of Champaign.

Groundwater–surface water interactions. Reaches of the Fox and Vermilion Rivers will be examined, as well as lakes and wetlands in western Lake/eastern McHenry County. Techniques may include shallow piezometry, flux discharge (seepage) measurements, and water sampling.

2. Surface Water Accounting Tools, Watershed Models. Surface water accounting tools will be prepared in the Kankakee and Vermilion-Wabash watersheds to evaluate impacts of water supply scenarios on flow in regional streams. Continuous simulation watershed models will be prepared for selected watersheds in the two priority regions to evaluate potential water supply impacts of climate change scenarios.

3. Enhance Knowledge of Recharge. Increase the understanding of infiltration and recharge by determining relationships between shallow groundwater levels, soil moisture, soil permeability, and climate data at ISWS Illinois Climate Network (INC) sites.

4. Produce Planning and Management Program in a Publicly Understandable Form. Retain a technical writer to produce, under ISWS, ISGS and IDNR/OWR direction, a comprehensive state and regional water supply planning and management program, and supporting documentation suitable for presentation to and understanding by the general public.