Illinois Rivers Decision Support System (ILRDSS)

by

Illinois State Water Survey, Illinois Natural History Survey,
Illinois State Geologic Survey, and Waste Management and Research Center
Illinois Department of Natural Resources

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**Report Prepared for the:
Illinois Department of Natural Resources**

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Contents

Abstract

The Illinois River has become a focus of state and federal agencies and other organizations interested in integrated watershed management. As a result, issues related to habitat restoration, floodplain management, navigation, erosion and sedimentation, and water quality of the Illinois River are being discussed at the watershed scale. In support of this effort, the Illinois Scientific Surveys have initiated development of the Illinois Rivers Decision Support System (ILRDSS) for use in documenting project activities within the watershed and assessing and evaluating the effectiveness of potential restoration projects and management practices. The ILRDSS will integrate and expand existing databases and numerical models of segments of the Illinois River into an integrated decision support system (DSS) for the entire Illinois River watershed. New databases and models also will be created for the watershed, as well as a comprehensive ILRDSS web portal to all available data and information about the Illinois River and its basin.

This report describes the current status of ILRDSS development and serves as an introduction to those unfamiliar with the Illinois Rivers Decision Support System.

Introduction

The Illinois River watershed is of vital importance to the State of Illinois. The basin covers 44 percent of the state, and 90 percent of Illinois' population resides within the 55 counties that are wholly or partially included in the watershed. The Illinois River, a major tributary of the Mississippi River, is part of the only inland waterway linking the Great Lakes to the Gulf of Mexico. As such, the Illinois Waterway is a nationally significant commercial waterway with more than 60 million tons of commodities shipped annually, ranking Illinois third among the 50 states in domestic waterborne commerce (Illinois Lt. Governor's Office, 2001b). The Illinois River is also one of the few remaining large rivers with a functioning ecosystem critical to a vast array of fish and wildlife. The Water Resources Development Act of 1986 designated the Illinois River, as part of the Upper Mississippi River System, a "nationally significant ecosystem"— the only inland river system in the United States to have such a designation (UMESC, 2001).

Physical Setting

The Illinois River watershed has a drainage area of 28,906 square miles (sq mi) or 75,156 square kilometers (sq km) of which approximately 25,000 sq mi (64,000 sq km) are located in Illinois with the remainder in Indiana and Wisconsin as shown in Figure 1. The Illinois River has more than a dozen tributaries, and the largest are the Sangamon, Kankakee, and Fox Rivers. The Illinois River watershed is generally flat and covered with fine soil, making it one of the best agricultural regions in the United States. More than 80 percent of the Illinois River basin is presently used for agricultural purposes; the remaining 20 percent contains 95 percent of Illinois' urban areas (Demissie et al., 1999)

Figure 1. Location of the Illinois River Watershed.

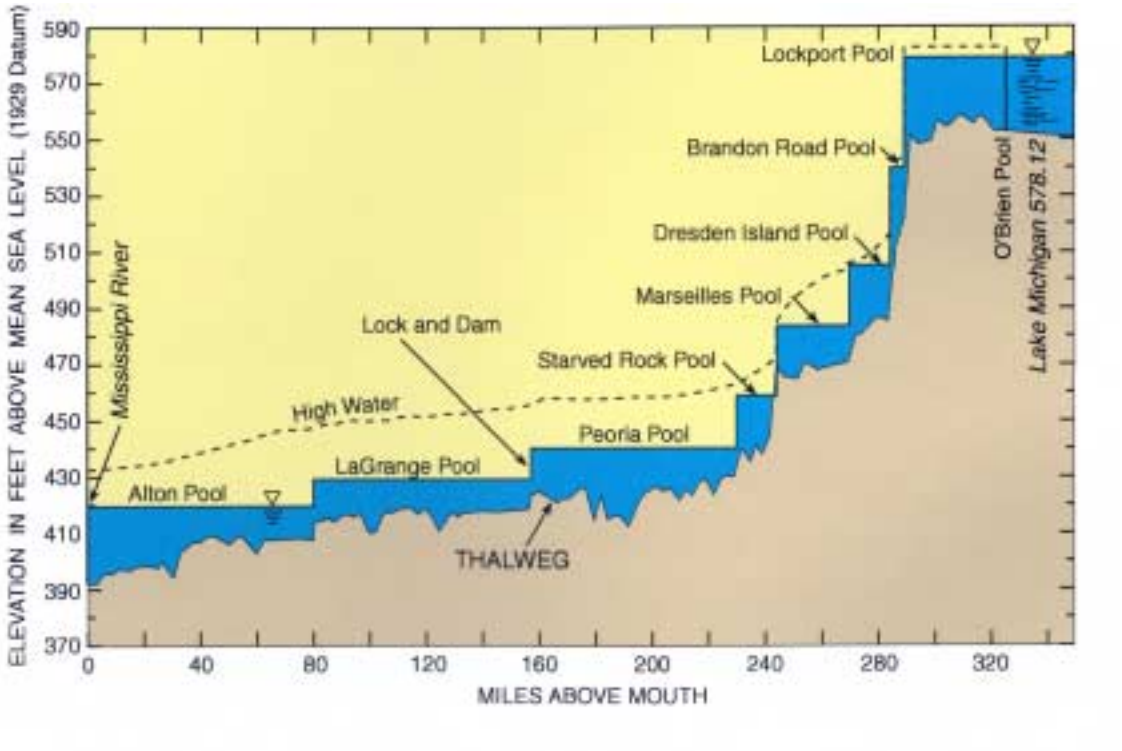


Figure 2. Profile of Illinois River Waterway.

Over the last century, there have been numerous attempts to control and manage low water levels along the Illinois River to provide river navigation between the Great Lakes and the Gulf of Mexico. An initial effort was made in the late 1800s by constructing four low-head dams to provide a 7-foot (ft) or 2.1-meter (m) navigation channel in the Lower Illinois River. These low-head dams provided adequate navigation depth during periods of low water in the Lower Illinois River until newer transport vessels were developed that required more depth. Plans were then created and finally authorized by the U.S. Congress in 1927 for a 9-ft (2.7-m) navigation channel along the Illinois River. In the 1930s, completion of seven modern locks and dams on the Illinois, Mississippi, and Des Plaines Rivers created the Illinois Waterway as we know it today. This waterway consists of the Illinois River, Des Plaines River, and the Chicago Sanitary & Ship Canal System, and is made navigable by a series of eight locks and dams along the Illinois River and its tributaries, as shown in Figure 2. The waterway ends at Grafton about 35 mi (56 km) upstream of St. Louis, Missouri, where the Illinois River joins the Mississippi River.

Another major factor that has significant influence on water levels along the Illinois River is the diversion of water from Lake Michigan to the Illinois River. The Lake Michigan diversion started in 1900 when the construction of the Chicago Sanitary & Ship Canal was completed primarily to divert diluted sewage away from Lake Michigan and into the Illinois River following a typhoid and cholera epidemic in Chicago in the late 1800s (Vonnahme, 1996). The annual diversion varied from 3,000 to 10,000 cubic feet per second (cfs) or 85 to 283 cubic meters per second (m^3/s) for the period from 1900 to 1939. After 1939, the total diversion was limited to an average of 3,200 cfs (90.6 m^3/s) by the U.S. Supreme Court. The allocation included 1,500 cfs (42.5 m^3/s) of diverted water for dilution and 1,700 cfs (48.1 m^3/s) for domestic water supply.

Illinois River Issues

The Illinois River has undergone significant changes in hydrology, hydraulic characteristics, and water quality over the years because of its location downstream from the Chicago metropolitan area, navigation improvements, and significant land-use changes in the watershed. The most profound influences have been related to commercial navigation, municipal and industrial waste discharges, and agricultural practices in the watershed. Talkington (1991); Demissie, Keefer, and Xia (1992); Sparks et al. (2000); and Demissie et al. (1999) effectively summarize the extent of the effects of these influences on the Illinois River and its watershed.

Over time these changes have resulted in environmental and ecological degradation along the river. State and federal agencies and local grassroots organizations are discussing issues related to habitat restoration, floodplain management, navigation, erosion, sedimentation, water quality, and point and nonpoint source pollution at the watershed level.

A result of these discussions was the Integrated Management Plan for the Illinois River Watershed (Kustra, 1997). In 1996, 150 Illinois residents who lived and worked in the watershed participated in strategy meetings to develop a management plan that considered and balanced the needs of human communities and ecological resources within the river basin (Illinois Lt. Governor's Office, 2001a). The plan includes 34 recommendations now being implemented by multiple agencies and organizations on varying geographical and temporal scales.

One of the major restoration efforts is a joint state/federal partnership called the Illinois River Conservation Reserve Enhancement Program (CREP), the result of an agreement between the State of Illinois and the United States Department of Agriculture (USDA). The goal is to implement conservation practices in the Illinois River watershed that improve water quality and habitat for wildlife by reducing sediment and nutrient delivery to the Illinois River and its tributaries. The program relies on voluntary agreements with landowners to retire environmentally sensitive cropland and convert the acreage to native vegetation in return for technical assistance and rental payments. Since its inception in 1998, the Illinois River CREP has become an exceedingly successful program and one for which total contract acres enrolled exceed enrollments in similar programs across the nation (USDA 2001).

In late October 1999, development started on a new long-range, comprehensive effort to restore and protect the Illinois River and its tributaries. The result was Illinois Rivers 2020 (IR2020), a voluntary, incentive-based approach to address threats to the economic and environmental sustainability of Illinois' waterways. The goal of IR2020 is to develop new technologies and approaches to: 1) enhance the waterway as a vital transportation corridor; 2) improve water quality within the entire basin; 3) protect farmland and open space; 4) provide for land treatment of storm water and best management practices for upland areas; 5) restore, enhance, and preserve habitat for plants and wildlife; and 6) increase economic opportunity for agriculture and business communities (Illinois Lt. Governor's Office, 2001c). Building upon Illinois' successes with CREP, IR2020 plans to use existing agency mechanisms, such as the Farm Bill programs, Clean Water Act Section 319, and Water Resources Development Act special considerations, to fund these restoration and prevention programs throughout the watershed.

The Need for a Decision Support System

Major restoration efforts are under way to improve hydrologic characteristics, water quality, and habitats along the Illinois River and its watershed. A major challenge is accurately defining the watershed hydrology and river hydraulics so that watersheds and rivers are managed to promote and sustain ecological restoration while maintaining economic functions of the river.

The issues that need to be examined on a watershed basis for the Illinois River are not only limited to hydrology and hydraulics, but also include a range of issues related to water quality, sediment transport, groundwater/surface water interaction, impact of climate change or fluctuation, ecosystem restoration, and economic and societal impacts. Without basinwide analyses, conclusions and recommendations will be limited to selected sites, and broad application of results will be impractical. There is a need for developing an integrated system that can help decision-makers address these issues on a watershed basis; however, no formal evaluation tools for integrated watershed management currently exist. In addition, the many restoration efforts underway are not well coordinate or integrated.

A comprehensive support system would provide state and federal agencies, nongovernmental organizations, local agencies, and residential stakeholders a better means for organizing, accessing, and evaluating a wide range of information and alternative strategies, and to establish informed and scientifically sound positions regarding the major issues. Benefits from

such a support system include better access to information, improved evaluation tools, enhanced communication, and better project management.

To this end, the Illinois State Water Survey (ISWS) initiated development of the Illinois Rivers Decision Support System (ILRDSS) in 1999 to support implementation of the Integrated Management Plan (IMP) for the Illinois River. Demissie et al. (1999) summarize the initial project concept and structure outlined by early ILRDSS efforts.

Implementation of the IR2020 federal/state initiative will require substantial scientific support and access to high-quality information, and the evolving ILRDSS project was included as the primary support system for dissemination of scientific tools and information. Activities concentrated on developing the conceptual design of the ILRDSS for insertion in IR2020 legislative drafts, increasing outreach efforts to inform potential collaborators about proposed system capabilities and garner their support, and coordinating communication and development efforts among the agencies involved.

Development of the Illinois Rivers Decision Support System

The Illinois Rivers Decision Support System (ILRDSS) will provide scientific support and access to high-quality information for restoration of the Illinois River and its watershed. Once fully developed, the ILRDSS will enable decision-makers to assess and evaluate the effectiveness of different restoration projects, and the consequences of other natural or human-induced changes in the watershed. The ILRDSS also will improve dissemination of scientific tools and information by using the Internet as the primary access to inventories of current and historical projects, data, simulations, and involved agencies/participants within the Illinois River watershed. The ILRDSS website provides this information to a larger audience at a lower cost, in a more usable form, and much more quickly than previous outreach methods.

System Framework

This network and communication framework includes information resources, modular databases, and simulation models to evaluate the impact of water resources development, land-use changes, economic development, and climate variability on sedimentation, water quality, ecology, hydrology, and hydraulics in terms of long-term restoration and sustainability of the Illinois River.

Figure 3 displays in red the simplified relationships among the four main components of the ILRDSS: (1) the information system containing databases, maps, and other data products; (2) simulation and assessment models in the analytical tools component; (3) the user interface; and (4) the ILRDSS information processing system that allows information transfer among all the components. The diagram also details potential data and modeling subcomponents for inclusion in the information system and analytical tool modules. Early ILRDSS versions will provide basic information exchange between each user and individual data and tool components via direct database access and web-based interfaces. Later work will add web-based interactive modeling and simulation features with direct links to ILRDSS databases and models.

Initial ILRDSS users are expected to be scientists and professionals within state and federal agencies. As the ILRDSS expands and more components are added to aid in decision processes, system users will include a broader range of decision-makers.

Initial Developments and Applications

Activities to date have focused on developing the ILRDSS conceptual design, garnering support of potential collaborators, and coordinating communication and development efforts among participating agencies. These efforts have resulted in the creation of a prototype website (http://ilrdss.sws.uiuc.edu) initially populated with water resource data, numerical modeling results, and information generated by scientists at the five State Scientific Surveys: the Illinois State Geologic Survey, the Illinois State Museum, the Illinois State Natural History Survey (INHS), the Waste Management Research Center, and the Illinois State Water Survey (ISWS).

Web Development

In December 2000, the ISWS created a web development team to construct a comprehensive web portal to all available information and data on the Illinois River and its watershed. The team has five core members: a project coordinator who generates site content and acts as liaison between content donors and ILRDSS team members; a web designer/programmer who creates the graphic layout and coding for the ILRDSS web pages; and a Geographical Information System (GIS) specialist, a database administrator, and a web programmer who do not work exclusively on the ILRDSS project. To date the team has created a prototype website (http://ilrdss.sws.uiuc.edu) that is dynamically generated from a database currently containing more than 1,000 links to data, information, and graphical resources related to the Illinois River and its watershed. The team can update the ILRDSS site quickly and efficiently through new database entries. Database access also provides website users with increased search capabilities, which are vital to locating the volume of data and information envisioned for inclusion in the ILRDSS website.

Navigation of the ILRDSS website involves categories, products, and tabbed search features (Figure 4). The categories contain the primary academic disciplines related to Illinois River issues and allow website users to browse data and information within a specific category. For example, users selecting water resources can choose from among five subcategories: water quality, hydrology/hydraulics, sediment, water levels/flooding, and groundwater. After making a selection, a user can browse using interactive maps to find data and information for a specific site or region, or search from a list of products related to the subcategory (online data, maps and GIS data sets, models and modeling information, publications, and research and program listings). If a user initially wants a specific product, he/she can search directly for matching items using the products section rather than the categories section. The product grouping not only contains all products included on subcategory pages, but also an inventory (currently in progress) of all research and programmatic activities within the Illinois River watershed and all agencies and organizations involved. Website users wishing to browse by keywords or who are not sure of where to find specific information can use the primary tabbed search features.

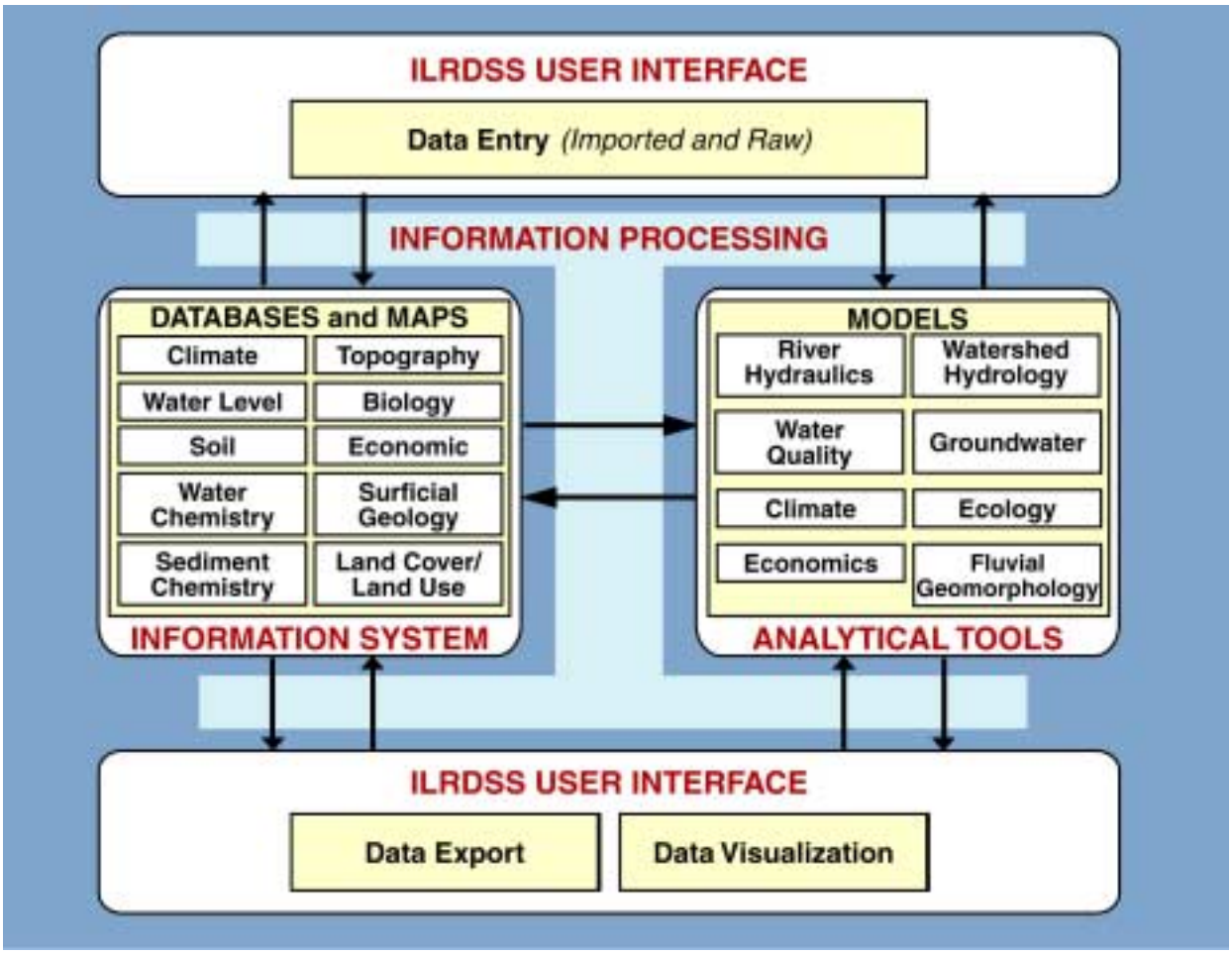


Figure 3. A simplified conceptual framework for the Illinois Rivers Decision Support System (ILRDSS).

Figure 4. The ILRDSS website homepage.

Hydrologic and Hydraulic Modeling

An ongoing effort by the ISWS Watershed Science Section is to develop hydrologic and hydraulic models for the entire Illinois River watershed, in cooperation with the U.S. Army Corps of Engineers (USACOE) Rock Island District and the Illinois Department of Natural Resources. In 2000, ISWS scientists developed an initial version of an uncalibrated hydrologic model of the Illinois River watershed based on BASINS 3.0 (beta version). The BASINS model was selected for the Illinois River basin because it offered the best-integrated modeling framework for examining management alternatives within Illinois River watersheds and can be developed much faster than other models. The ISWS scientists tested the Illinois River BASINS model using only coarse data sets. Overall, the initial tests have shown that the BASINS model has the capability for large-scale hydrologic modeling of the Illinois River basin.

The ISWS scientists also developed one- and two-dimensional hydraulic models for selected segments of the Illinois River. They are investigating the interaction of the Illinois River with its floodplain to better understand the influence of potential restoration efforts on river hydraulics.

One of the major restoration concepts is the reconnection of the Illinois River with its floodplain. In the Lower Illinois River, more than 30 levee and drainage districts (LDDs) have been established in the floodplain for agricultural production (Figure 5). State, federal, and nongovernmental organizations have purchased several LDDs to restore the connection between the Illinois River and its original floodplain. However, there is no consensus on how to reconnect the floodplain to the river or of the potential impacts of flooding in newly restored floodplains if reconnected. More detailed modeling would be required to answer some of these questions.

UNET. The initial hydraulic model used to evaluate different floodplain management alternatives for the Illinois River is based on the UNET, a one-dimensional unsteady flow model supported by the U.S. Army Corps of Engineers Hydraulic Engineering Center (USACOE-HEC, 1995). Output from the UNET model includes time-series stage and discharge values at selected locations and water surface profiles along the study reach. These values then can be used to evaluate changes in flood elevations and discharges for different floodplain management alternatives.

Figure 6 compares of simulated flood profiles for the Lower Illinois River and observed flood elevations for the 25-, 50-, and 100-year flood events (4%, 2%, and 1% exceedence probability, respectively). The results show that the UNET model can simulate flood profiles in the Illinois River with reasonable accuracy and can be used to evaluate the impacts of different floodplain management options on flood elevations along the river. For example, the UNET model for the Illinois River has been used to evaluate the impacts of using the Thompson Lake LDD in LaGrange Pool as temporal flood storage to reduce flood peaks. The model simulated the impacts of a 1,000-ft (305-m) wide spillway placed 2 ft (0.61 m), 4 ft (1.22 m), and 6 ft (1.83 m) below the Thompson Lake levee crest to allow floodwater to flow into the drainage district. Figure 6a shows the change in flood elevation at the levee district, while Figure 6b shows the change in flood elevations at Havana seven miles (11.3 km) downstream of the spillway. Table 1 provides reductions in the peak flood stages for two locations: at the Thompson Lake LDD and

at Havana. As shown in Figure 7 and Table 1, placing the spillway 2 ft (0.61 m) below the levee crest results in maximum reduction of flood peak for the flood analyzed.

RMA2. A second hydraulic model was developed using RMA2, a two-dimensional hydrodynamic model developed by the U.S. Army Corps of Engineers (1996). The model was developed for the segment of the Illinois River that included the Thompson Lake LDD and the Lake Chautauqua Fish and Wildlife Refuge. It was used to evaluate changes in flow patterns under different management alternatives: 1) a single spillway and 2) two spillways at the Thompson Lake LDD levee. Initial results show that two spillways along the levee allow flood conveyance through the drainage district while a single spillway permits only floodwater inflow into the LDD, as seen in Figure 8. Two-dimensional animations of these options are available for viewing and for download in Audio Video Interleave (AVI) format at the ILRDSS website.

Graphic Visualization Tools

Using World Construction Set 5 (a professional photorealistic terrain visualization, modeling, rendering and animation software package from 3D Nature), GIS specialists at ISWS have created three-dimensional "fly-through" animations depicting current and historical conditions along segments of the Illinois River that include portions of the LaGrange Pool and Peoria Lake (Figures 9 - 11). Proposed dredging and island construction proposals also have been animated (Figure 12). These realistic landscape images will help decision makers to visualize impacts of resource management options. Animations files are available for download in AVI format at the ILRDSS.

Geographical Information System (GIS) Products

Using links to the Illinois Natural Resources Geospatial Data Clearinghouse maintained at the Illinois State Geological Survey (ISGS), ILRDSS staff have created an ILRDSS portal to GIS data and imagery for Illinois River basin hydrology, geology, biology, ecology, conservation, environment, land use, infrastructure, and more. The appendix summarizes GIS data files related to the Illinois River and its watershed that are available from the ISWS and the Geospatial Data Clearinghouse. Figure 13 shows examples of GIS maps and datasets available for download from the ILRDSS website.

Complex data can be displayed in two- or three-dimensional graphical formats to help decision-makers organize, access, and evaluate a wide range of information on the Illinois River watershed via the Internet.

Data and Reports

The State Scientific Surveys have a long history of research and data collection within the Illinois River watershed. As a starting point, ILRDSS staff have focused on populating the ILRDSS website and databases with in-house data, graphics, and information.

The CTAP Database Project. As part of the ILRDSS, the Illinois Natural History Survey (INHS) is developing a database system to facilitate the entry, storage, and organization

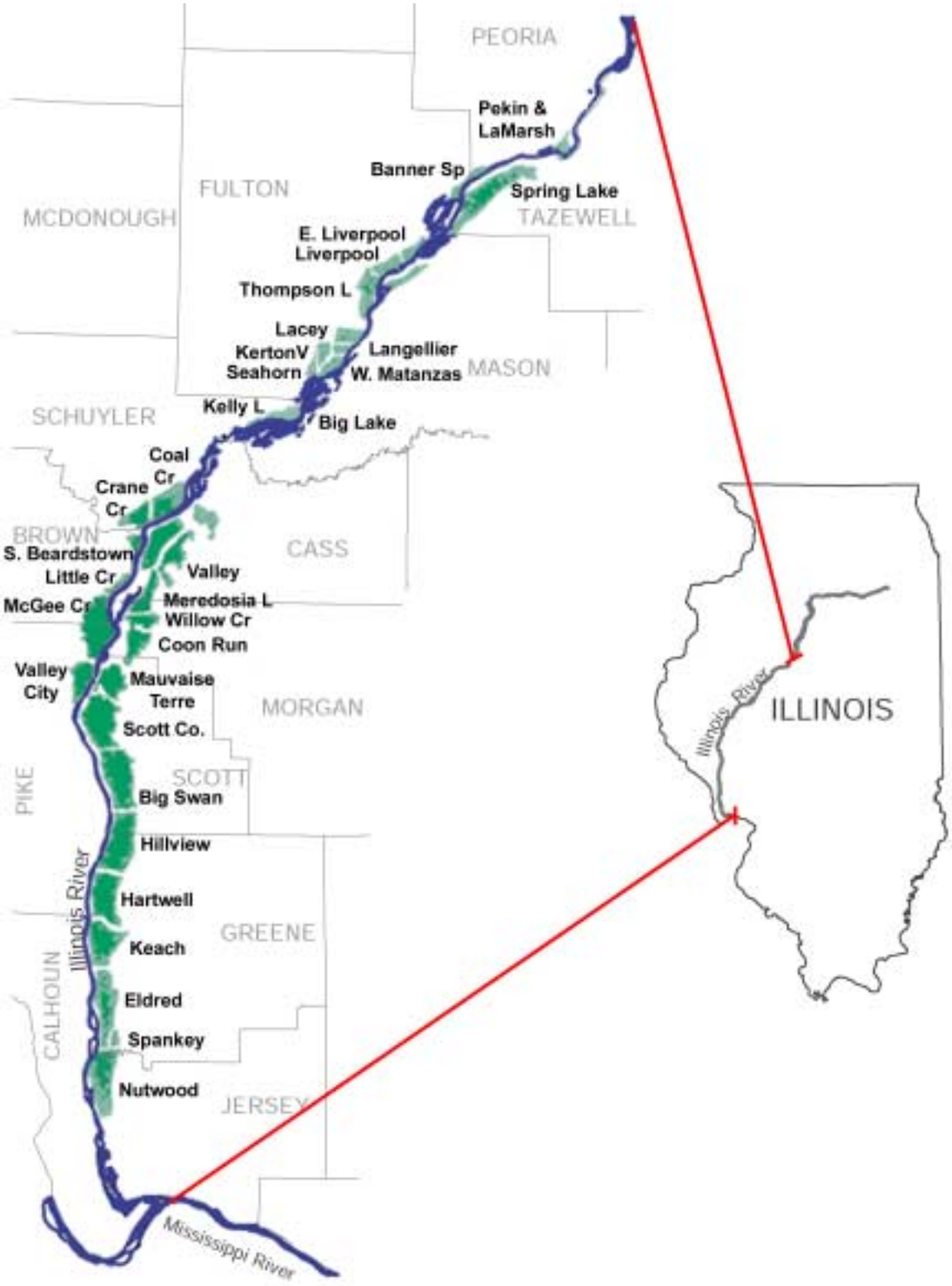


Figure 5. Levee and drainage districts (LDDs) along the Lower Illinois River.

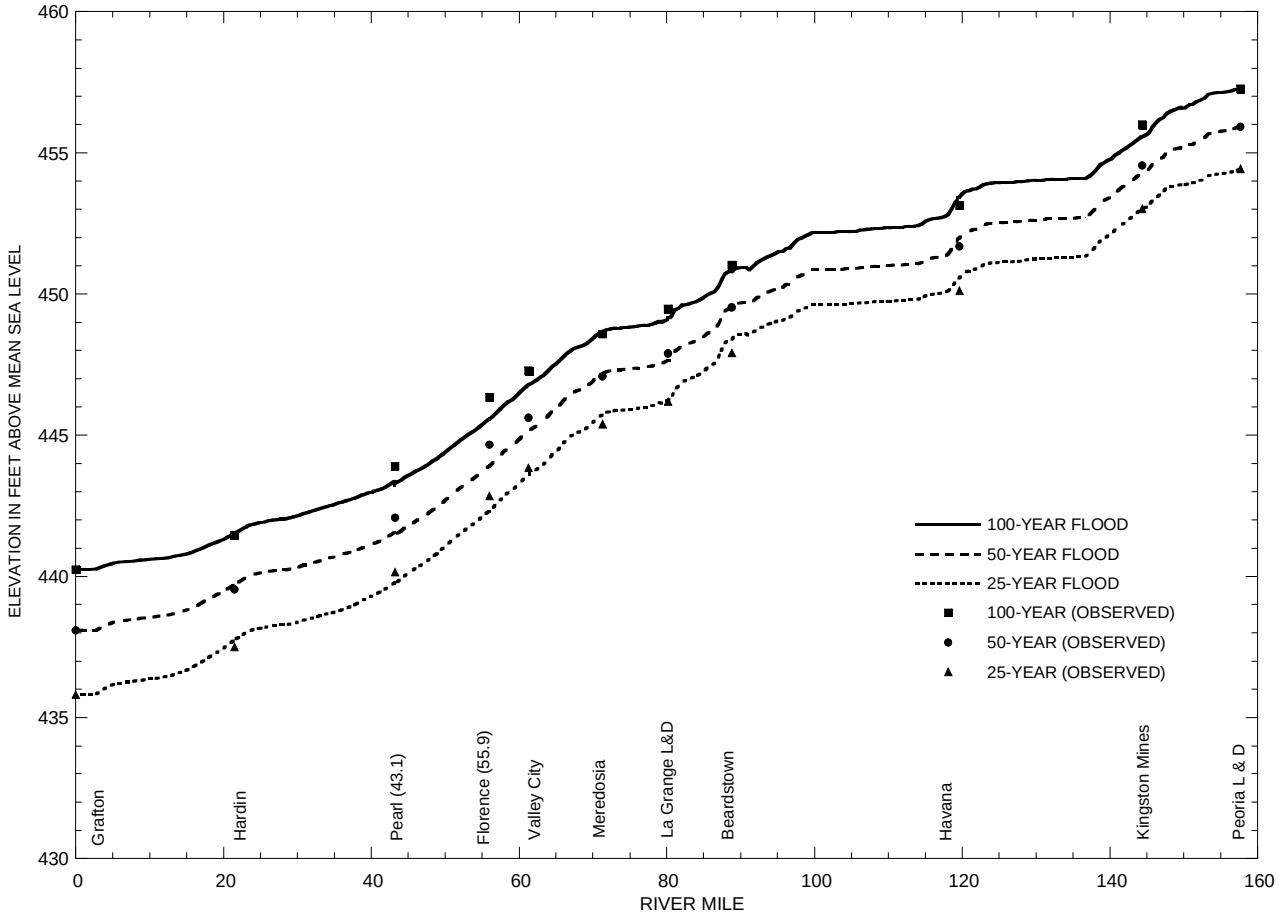
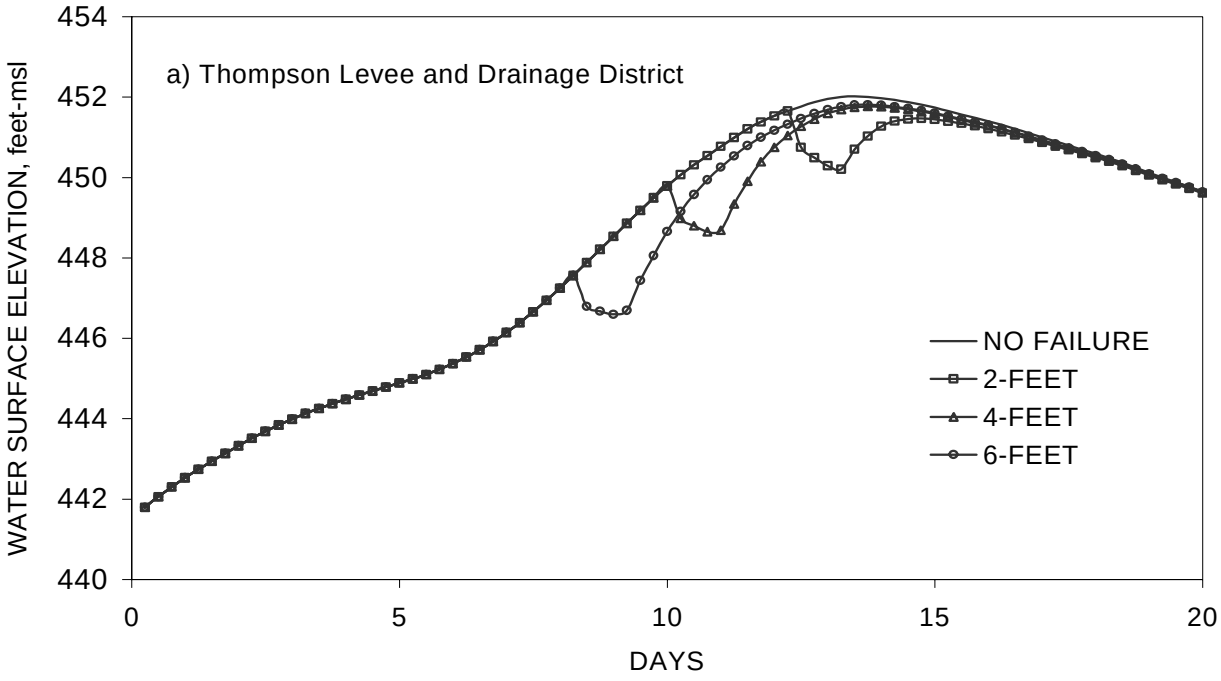


Figure 6. Simulated flood profiles for the Lower Illinois River with flood elevations for 25-, 50-, and 100-year flood events (4%, 2%, and 1% exceedence probability, respectively).

Table 1. Reduction of Peak Flood Stages (feet) at Thompson Lake Levee and Drainage District at Havana by Flood Storage Area

	Thompson Lake		*Havana*	
Depth of Opening (feet)	*Maximum stage*	*Peak stage reduction*	*Maximum stage*	*Peak stage reduction*
0	452.00	0.00	450.79	0.00
2	450.21	1.79	449.58	1.21
4	451.69	0.31	450.43	0.36
6	451.76	0.24	450.50	0.29

Note: 1 foot = 0.305 meters.



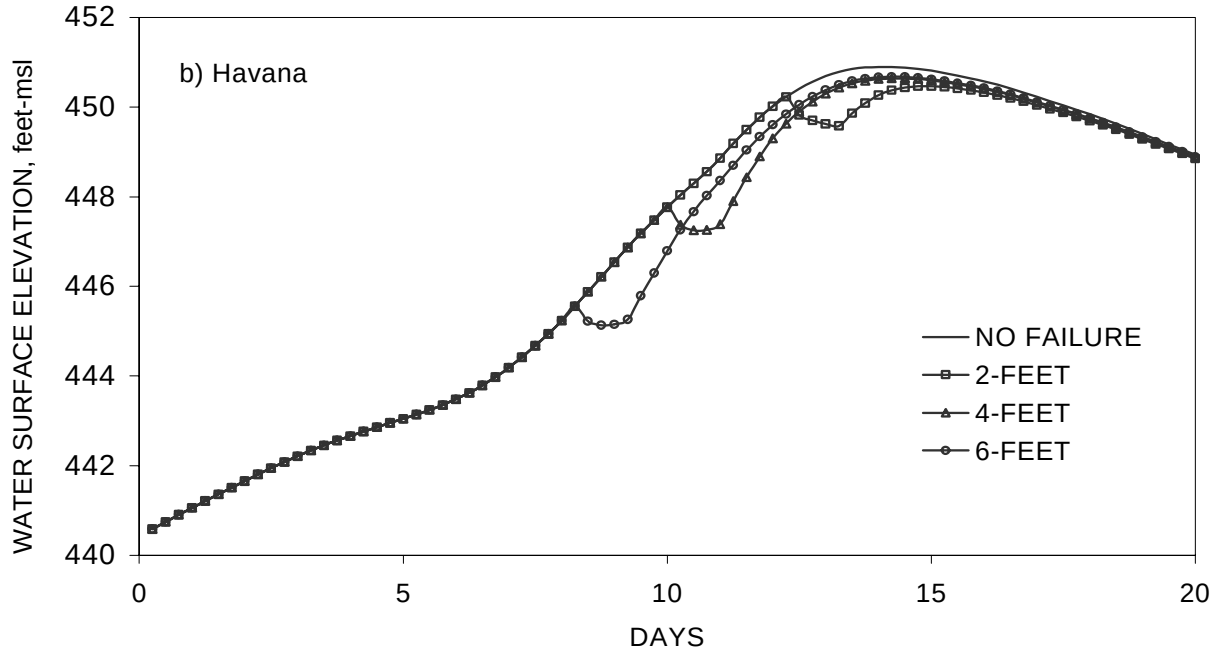


Figure 7. Impacts of using the Thompson Lake Levee and Drainage District as temporal flood storage to reduce flood peaks. The UNET model was used to simulated a 1,000-foot (305-meter) spillway placed 2 feet (0.61 meters), 4 feet (1.22 meters), and 6 feet (1.83 meters) below the Thompson levee crest to allow floodwater to flow into the drainage district. Figure 6a shows the change in flood elevation at the levee district. Figure 6b shows the change in flood elevations at Havana seven miles (11.3 kilometers) downstream of the modeled spillway.

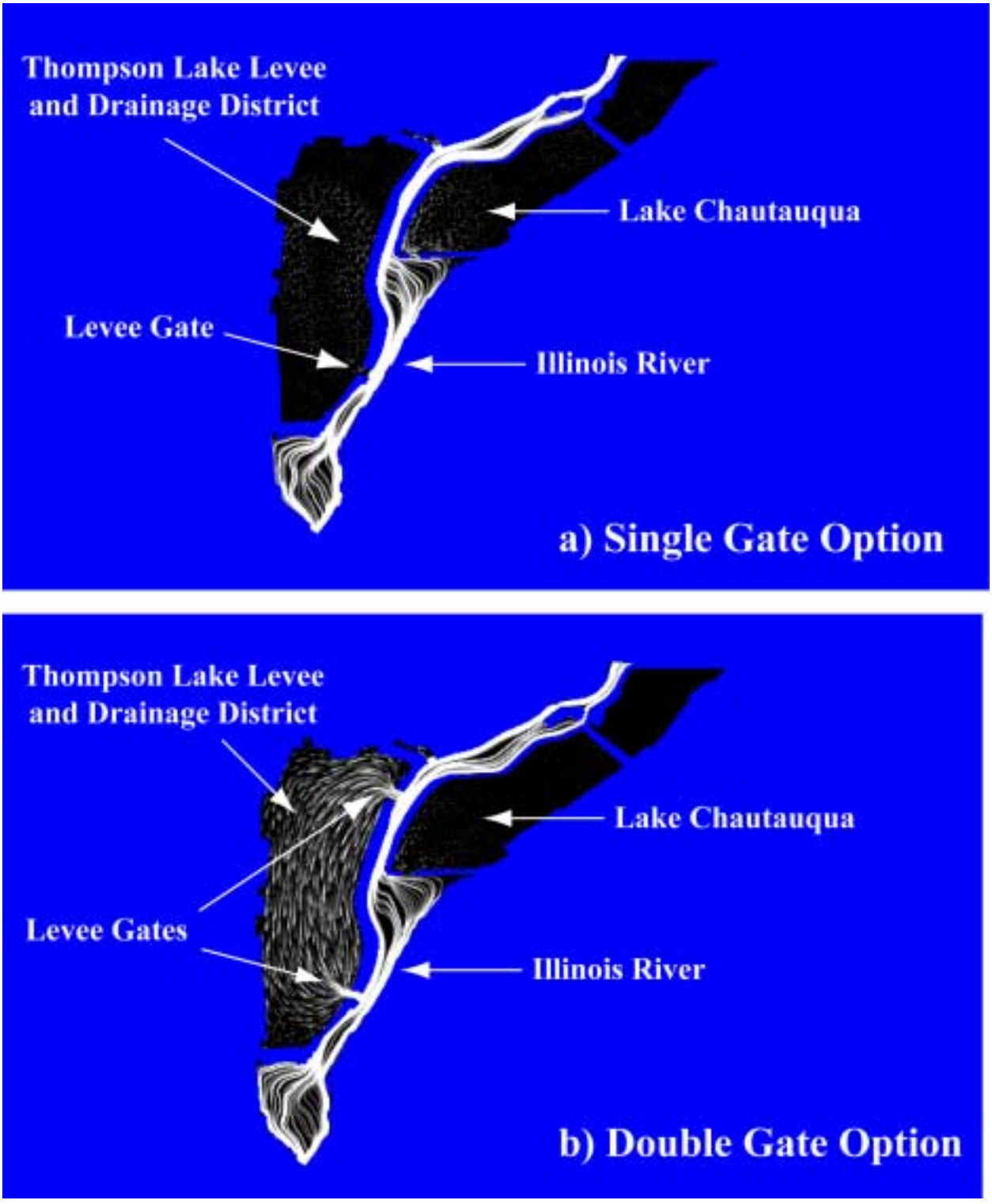


Figure 8. Simulated flow patterns along selected segments of the Illinois River floodplain under different restoration alternatives.

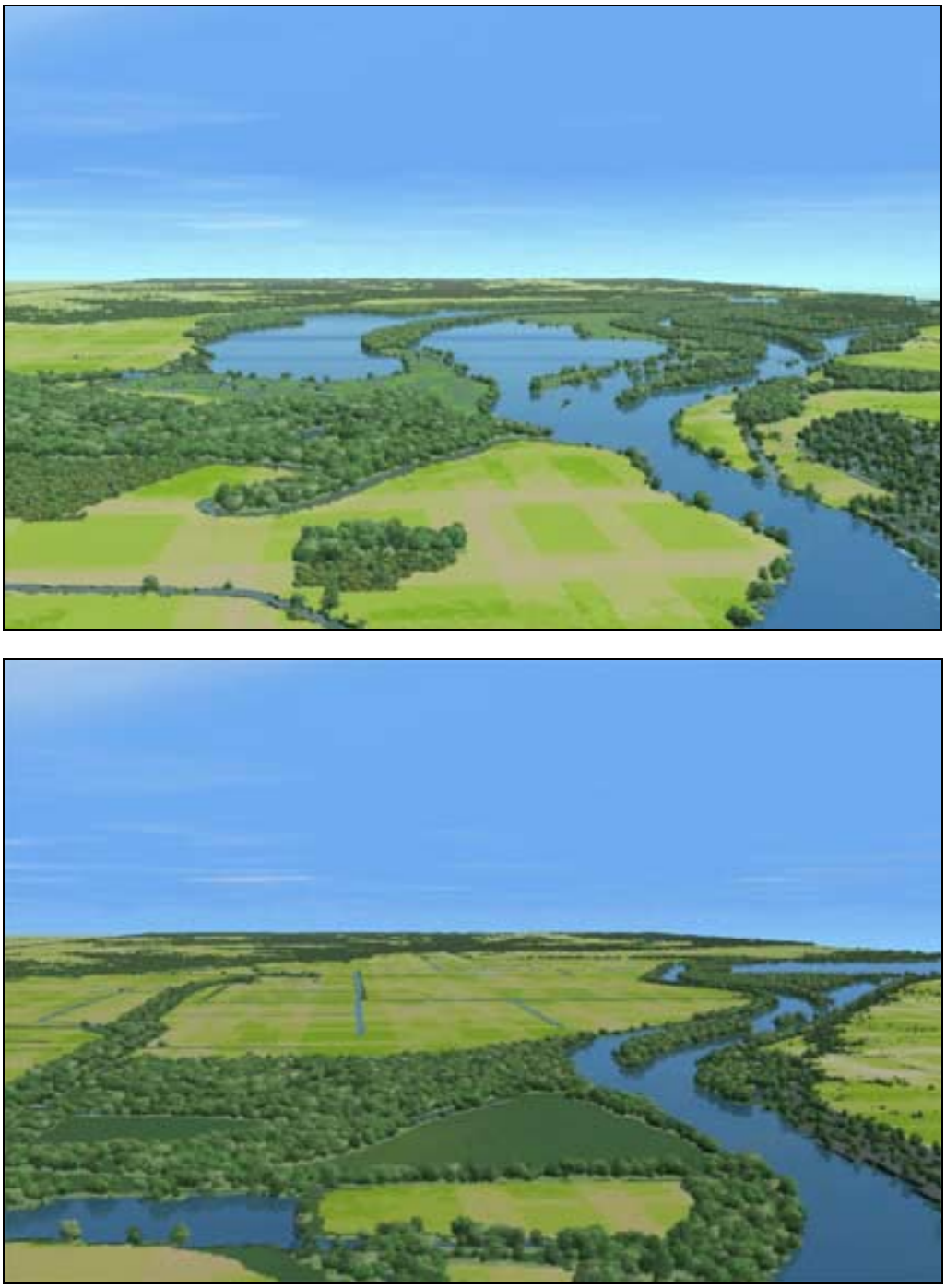
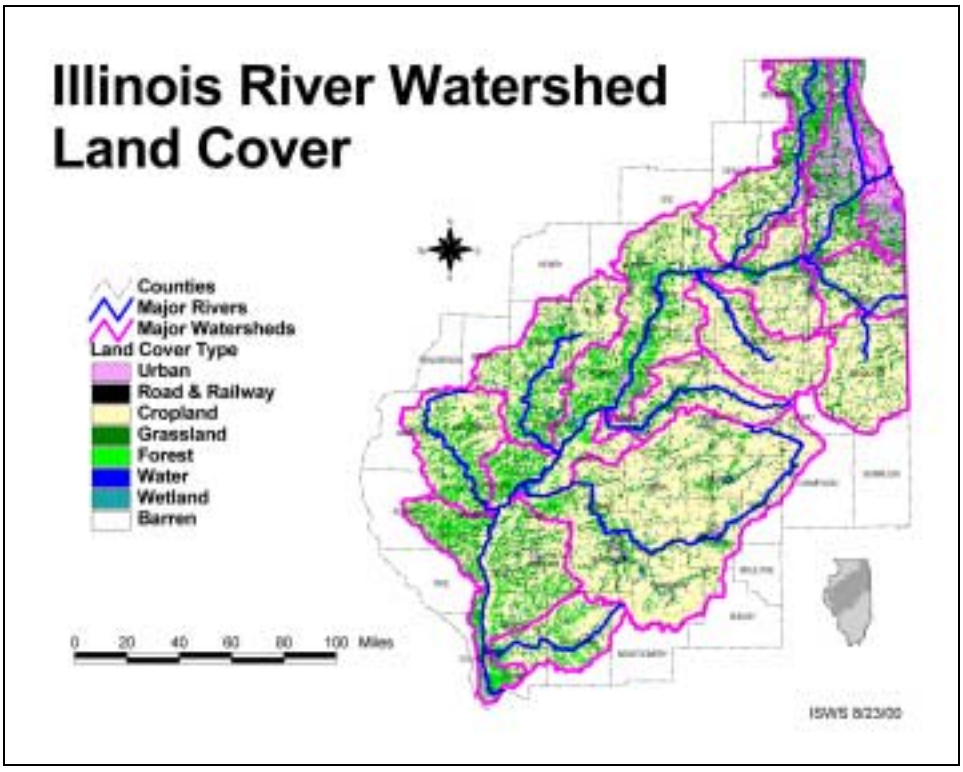


Figure 9. Still images from GIS animations depicting conditions 100 years ago (top image) and today (bottom image). This series features a 6-mile (9.7-kilometer) portion of the Illinois River beginning south of Havana (River Mile 119) and traveling upriver to the south end of Chautauqua National Wildlife Refuge (River Mile 125). The images focus on the west side of the river, a region called Emiquon. Historically, Thompson and Flag Lakes occupied the area (top image), but those lakes were drained for farmland (lower image). The area is now cultivated and part of the Thompson Lake Levee and Drainage District.

Figure 10. Still image from Lower Peoria Lake animation depicting an aerial northward “fly-by” over downtown Peoria’s riverfront (left bank) with the Arthur-Michael Bridge (foreground).

Figure 11. Time-lapse animation stills of Lower Peoria Lake development looking north. Water color indicates lake depth with darker blues representing deeper waters. Note construction of navigation channel and shallowing of lake backwaters.

Figure 12. Still image from Lower Peoria Lake animation depicting proposed artificial island construction across from downtown Peoria's riverfront (upper left) and looking northeast. The island will be built with dredged material from the lake, as described in Demissie, Soong, and Bhowmik (1988).



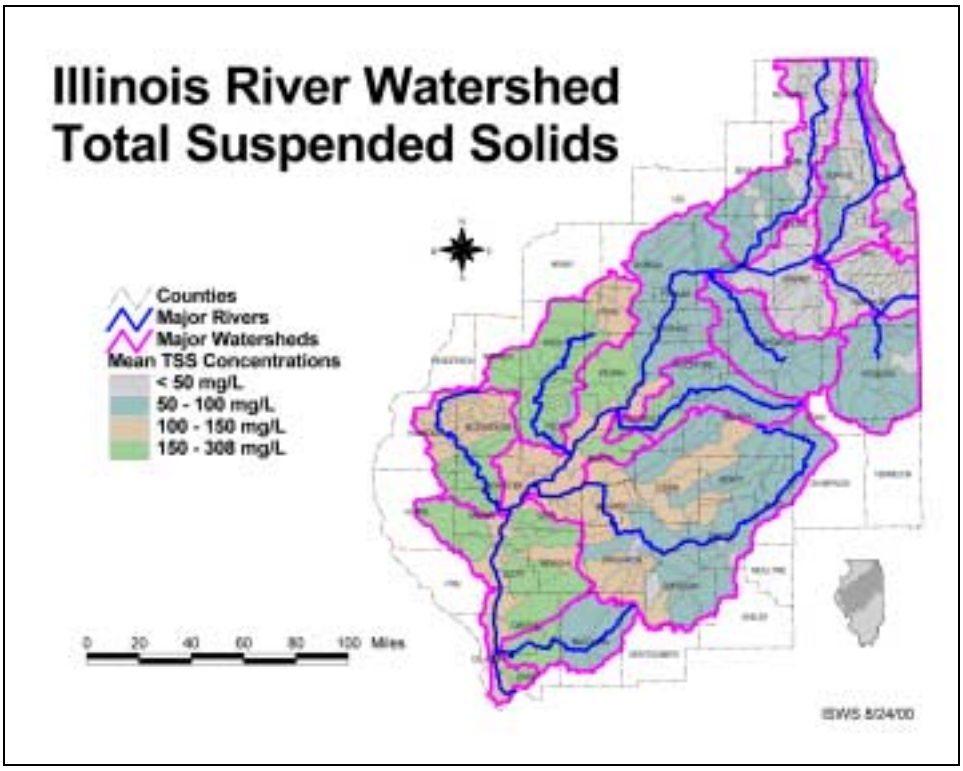


Figure 13. Example GIS products available from the ILRDSS website (http://ilrdss.sws.uiuc.edu/maps_cat.asp).

of the Critical Trends Assessment Program (CTAP) monitoring data – the only source of statewide, quantitative data available on multiple ecosystems.

The CTAP long-term monitoring program of the Illinois Department of Natural Resources (IDNR) consists of complementary programs conducted by professionals (i.e., INHS biologists) and citizen scientist monitoring efforts (i.e., Illinois EcoWatch Network). Program participants conduct statewide and regional assessments throughout Illinois to systematically monitor ecological conditions and provide information for ecosystem-based management. These collaborative efforts collect a very large amount of data at multiple scales. Until recently, individual scientists managed professional data by discipline (e.g., entomologists manage entomological data) on desktop computer systems that were not accessible to the public. This not only hindered project managers from efficiently accessing individual databases and summarizing program information, but also prevented Illinois citizens, academicians, state offices, and preserve managers from viewing data. Consequently, there is strong need for a centralized, efficient data storage and retrieval system with easy-to-use data-entry interfaces, automated printed and electronic report production, and web-based products for the general public.

In February 2001, the INHS hired a bioinformatics information manager to join the core ILRDSS team to begin developing a relational database for a multi-user environment to simplify, centralize, and increase the speed of queries across CTAP's diverse data tables. The INHS undertook a two-tiered approach to data storage and retrieval: professional scientists will use an internal desktop database application approach while EcoWatch citizen scientists will enter data via a web-based interface. This interface also will function as a web portal for Illinois citizens to view, understand, and use CTAP data.

The INHS bioinformatics information manager made significant progress in 2001 with the Microsoft Access relational database. He conducted information interviews with CTAP scientists, INHS network administration, the ISWS-ILRDSS team, and EcoWatch staff to determine information management needs and completed initial CTAP database construction, including its associated desktop interface. He coordinated in-house user testing of the Data Entry Module of the desktop application underwent in-house user testing. The information manager also developed a Quality Assurance Module to log activity of data entry personnel and to automatically produce quality assurance/quality control reports for professional data. Entry of CTAP 2001 data is currently underway.

Conversion of CTAP Printed Reports. Under the CTAP program, the State Scientific Surveys have been preparing watershed assessment reports based on existing data and information for most of the watersheds in Illinois that have formed Ecosystem Partnerships. These partnerships are coalitions of local stakeholders united by a common interest in the natural resources of their area's watershed. The ISWS-ILRDSS staff have begun converting of the most recent CTAP printed reports into Adobe Acrobat portable document format (PDF) for inclusion on the ILRDSS website. Table 2 summarizes the conversion progress. Because the State Scientific Surveys are major contributors to CTAP reports, ILRDSS staff have direct access to original text and graphics for individual reports covering geology, water resources, living resources, socioeconomic profiles, environmental quality, archaeological resources, and historical accounts within the Illinois River watershed. Currently public access to these data is

Table 2. Current Progress in Electronic Conversion of 1998 Critical Trends Assessment Project (CTAP) Reports Covering Areas in the Illinois River Watershed

Ecosystem area	*Original material*	*Current status*		
		Text	*Graphics*	*Maps*
Big Rivers	□	✓		
Calumet Area	■	✓	✓	+
Chicago River/Lake Shore	■	✓	✓	+
DuPage River	■	✓	✓	
Fox River	✱	✓		
Illinois River Bluffs	□	✓		
Kankakee River	□	✓		
Lower Des Plaines	■	✓	✓	+
Lower Sangamon River	■	✓	✓	
Mackinaw River	✱	✓		
Prairie Parklands	■	✓	✓	
Spoon River	□	✓		
Thorn Creek	■	✓	✓	
Upper Des Plaines	✱	✓		
Upper Sangamon	■	✓	✓	
Vermilion River	■	✓	✓	+

Notes:
■ Electronic text and electronic graphic/map files available
□ Electronic text files and only paper-printed graphics/maps available
✱ Electronic text only – no graphic/map images available
✓ Adobe PDF conversion complete
\+ Most files converted to Adobe PDF format; remainder need technical revision

restricted to the original printed reports. Inclusion on the ILRDSS website as electronic documents will greatly increase report usability and access.

Conference Presentations and Briefings

Development of the ILRDSS requires collaboration among scientists in the Scientific Surveys, universities, and state and federal agencies. To this end, the ILRDSS staff have presented project briefings and topical scientific reviews at national conferences, agency meetings, and staff meetings. They also have published informational reports, abstracts, and conference proceedings. Table 3 lists presentations and publications undertaken since July 1999.

Future Developments and Applications

Activities in 2002 will include continuing ILRDSS design, development, and maintenance of the comprehensive website as well as continued hydraulic and hydrologic model development. Web efforts will focus on expanding access to reports, databases, and simulations from sources outside the ISWS. This will include developing and maintaining a comprehensive, statewide inventory of activities, organizations, and data resources pertaining to the Illinois River and its watershed. Modeling efforts will include linking hydrologic model output to the hydraulic model to allow better investigation of flow routing along the Illinois River mainstem.

The GIS specialist will continue to expand two-dimensional and three-dimensional animation efforts by incorporating additional projects visualizing scientists' work. Animations of the Kankakee River and the Lake Calumet area are scheduled. An interactive mapping server software (ARC/IMS) will be installed on the ILRDSS web server and GIS map-based navigation tools and maps will be developed for the public website.

Development of the CTAP database development will continue with design, testing, debugging, and maintenance for the desktop database application. The development phase will shift towards more complex designs, such as interactive data analysis and reporting via a web interface. In March 2002, the INHS will hire a web programmer to produce web pages to permit access of raw data and will provide expertly interpreted information at multiple scales of interest. This latest development is estimated to be functional by late summer of 2002, with continued development on additional features and functionality for about a year beyond.

To keep partnering agencies, organizations, and users abreast of development progress, the ILRDSS team will introduce a status report to the *About ILRDSS* section of the ILRDSS website (http://ilrdss.sws.uiuc.edu/dss_about.asp). The update will include current and future program activities.

Table 3a. Presentations and Briefings by ILRDSS Staff since July 1999

Date	*Activity*	*Location*
August 1999	ILRDSS briefing	Illinois State Water Planning Task Force
November 1999	ILRDSS briefing	Board of Natural Resources and Conservation (BNRC) quarterly meeting
December 1999	ILRDSS briefing	Illinois State Water Survey staff meeting
January 2000	ILRDSS briefing	Illinois State Museum staff meeting
January 2000	ILRDSS briefing	Illinois Natural History Survey staff meeting
January 2000	ILRDSS briefing	Illinois State Geological Survey
March 2000	Conference presentation	Environmental Horizons 2000 Conference
March 2000	ILRDSS briefing	Illinois River Coordinating Council (IRCC) Science Advisory Committee meeting
November 2000	ILRDSS briefing	U.S. Army Corps of Engineers (USACOE) Illinois River Basin Work Group meeting
November 2000	Seminar: ILRDSS project	Illinois State Water Survey
November 2000	ILRDSS briefing	Scientific Survey joint administration
February 2001	ILRDSS briefing and poster	Illinois Legislators' Visit to Scientific Surveys
February 2001	ILRDSS briefing	USACOE Illinois River Ecosystem Restoration meeting
March 2001	Conference presentation	Environmental Horizons 2001 Conference
March 2001	ILRDSS briefing	USACOE Illinois River Ecosystem Restoration meeting
May 2001	ILRDSS briefing	Illinois State Water Planning Task Force meeting
June 2001	Conference presentation	American Water Resources Association Summer Specialty Conference on Decision Support Systems for Water Resources Management
June 2001	ILRDSS briefing	Illinois River Coordinating Council Science Advisory Committee meeting
August 2001	Conference presentation	Wetland Engineering River Restoration Conference 2001, American Society of Civil Engineers
October 2001	Conference presentation	Governor's Conference on the Management of the Illinois River System
November 2001	ILRDSS briefing	Illinois River Ecosystem Restoration Project meeting

Table 3b. Publications and Proposals by ILRDSS Staff since July 1999

Date	*Publication*	*Citation*
July 1999	Contract report	Demissie, M., Y. Guo, H.V. Knapp, and N.G. Bhowmik. 1999. *The Illinois River Decision Support System (ILRDSS)*. Illinois State Water Survey Contract Report 648, Champaign, IL.
May 2001	Conference proceedings paper	Demissie, M., Y. Lian, and N. Bhowmik. 2001. *Application of Hydraulic Models for the Analysis of the Interaction of the Illinois River and Its Floodplain*. Proceedings, Bridging the Gap – Meeting the World's Water and Environmental Resources Challenges. Environmental and Water Resources Institute of the American Society of Civil Engineers, Reston, VA, CD-ROM.
February 2001	Proposal	USACOE – Hydrologic Model Development for the Illinois River Basin
June 2001	Conference proceedings paper	Demissie, M. and M. Tidrick. 2001. *The Illinois Rivers Decision Support System (ILRDSS)*. Proceedings, Summer Specialty Conference on Decision Support Systems for Water Resources Management, American Water Resources Association, Snowbird, UT, June 27-30, pp. 7-12.
August 2001	Conference proceedings paper	Demissie, M. and M. Tidrick. 2001. *The Illinois Rivers Decision Support System*. Proceedings, Wetland Engineering River Restoration Conference 2001. Environmental and Water Resources Institute of the American Society of Civil Engineers, Reston, VA, CD-ROM.
October 2001	Conference proceedings abstract	Bhowmik, N.G. 2001. *Modeling for Artificial Island Construction within the Lower Peoria Lake*. Proceedings of the 2001 Governor's Conference on the Management of the Illinois River System. Peoria, IL, Oct. 2-4.
January 2002	Information/Educational material report	State Scientific Surveys. 2002. *Illinois Rivers Decision Support System (ILRDSS)*. Illinois State Water Survey Information/Educational Material 2002-02, Champaign, IL.

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Appendix. GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Administrative	County boundaries for Illinois	Political county boundaries	/gis2/illinois/admin/counties	polygon	Illinois	N/A	Arc/Info
Administrative	County boundaries for individual counties	Individual boundary files	/gis2/illinois2/<countyname>/bnd	polygon	Illinois	1:100,000	Arc/Info
Administrative	Municipalities by county	County municipalities	/gis2/illinois2/<countyname>/mun	polygon	Illinois	1:100,000	Arc/Info
Administrative	Railroad lines by county	County railroad lines	/gis2/illinois2/<countyname>/rails	line	Illinois	1:100,000	Arc/Info
Administrative	Roads (County) by county	County roads	/gis2/illinois2/<countyname>/roads	line	Illinois	1:100,000	Arc/Info
Administrative	Roads (State) by county	State roads	/gis2/illinois2/<countyname>/stroads	line	Illinois	1:100,000	Arc/Info
Administrative	Roads (U.S.) by county	U.S. roads	/gis2/illinois2/<countyname>/usroads	line	Illinois	1:100,000	Arc/Info
Administrative	Roads (Interstates) by county	Interstate roads	/gis2/illinois2/<countyname>/interstates	line	Illinois	1:100,000	Arc/Info
Administrative	Public Land Survey System (PLSS) by county	Township, range, and section data by county	/gis2/illinois2/<countyname>/trs	polygon	Illinois	1:100,000	Arc/Info
Administrative	Utilities by county	County-wide utilities	/gis2/illinois2/<countyname>/utils	line	Illinois	1:100,000	Arc/Info
Administrative	Zip codes within county	County-wide zip codes	/gis2/illinois2/<countyname>/zip92	polygon	Illinois	1:100,000	Arc/Info
Hydrology	Major rivers	Major rivers in Illinois	/gisserv_isws/illidata/illinois/surfacewater/majorrivs00	line	Illinois	N/A	Arc/Info
Hydrology	High groundwater yield areas	Identifies areas where groundwater yields are 14, 28, and 78 million gallons/day	/gis2/illinois/gh20/gypymg	polygon	Illinois	1:500,000	Arc/Info
Hydrology	IDOT drainage basins	The 26 major drainage basins in Illinois	/gis2/illinois/hydro/drainbasins	polygon	Illinois	1:1,000,000	Arc/Info
Hydrology	Piezometric surface of Cambrian-Ordovician aquifer	Represents the piezometric surface of the Cambrian-Ordovician Aquifer	/gis2/illinois/hydro/pzlnmg	polygon	Illinois	1:500,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Hydrology	River entry, upstream terminal, confluence, and exit points		/gis2/illinois/hydro/confluence-pt	point	Illinois	1:500,000	Arc/Info
Hydrology	River locks		/gis2/illinois/hydro/river-lock	point	Illinois	1:500,000	Arc/Info
Hydrology	SCS Watersheds	Watershed boundaries compiled by the SCS	/gis2/illinois/hydro/subunits	polygon	Illinois	1:500,000	Arc/Info
Hydrology	Statewide streams for Illinois	Detailed streams coverage for Illinois	/gis2/illinois/hydro/streams	line	Illinois	1:500,000	Arc/Info
Hydrology	Statewide waterbodies	Surface waterbodies in Illinois	/gis2/illinois/hydro/waterbodies	polygon	Illinois	1:500,000	Arc/Info
Hydrology	Stream elevation		/gis2/illinois/hydro/stream-elev	point	Illinois	1:500,000	Arc/Info
Hydrology	Surface water withdrawl intakes		/gis2/illinois/hydro/surf-wd-intak	point	Illinois	1:500,000	Arc/Info
Hydrology	ISWS instream sediment monitoring stations		/gis2/illinois/hydro/sed-monit-stn	point	Illinois	1:500,000	Arc/Info
Hydrology	ISWS lake and reservoir sedimentation survey sites		/gis2/illinois/hydro/sed-surv-site	point	Illinois	1:500,000	Arc/Info
Hydrology	ISWS mass measurement of groundwater level areas		/gis2/illinois/hydro/gh20-level	polygon	Illinois	1:500,000	Arc/Info
Hydrology	ISWS observation wells		/gis2/illinois/hydro/sws-obs-well	point	Illinois	1:500,000	Arc/Info
Hydrology	ISWS sanitary discharge points		/gis2/illinois/hydro/sanit-disch	point	Illinois	1:500,000	Arc/Info
Hydrology	ISWS water quality monitoring stations		/gis2/illinois/hydro/swswq	point	Illinois	1:500,000	Arc/Info
Hydrology	USGS hydrologic units	USGS watershed catalog units	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:500,000	Arc/Info
Hydrology	USGS observation wells		/gis2/illinois/hydro/usgs-obs-well	point	Illinois	1:500,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Hydrology	USGS river mileage		/gis2/illinois/hydro/river-mileage	point	Illinois	1:500,000	Arc/Info
Hydrology	USGS surface water gaging stations		/gis2/illinois/hydro/usgsgages	point	Illinois	1:500,000	Arc/Info
Hydrology	USGS water quality stations		/gis2/illinois/gis2/illinois/hydro/usgswq	point	Illinois	1:500,000	Arc/Info
Hydrology	USGS watersheds	Hydrologic basins of Illinois - 11-digit Hydrologic Unit Code	/mercury1/NRCS/NRCS-WS	polygon	Illinois	1:24,000	Arc/Info
Hydrology	ISWS/IEPA subwatersheds	Subwatershed delineation	/gisserv_isws/illidata/illinois/watersheds/wshed-all	polygon	Illinois	1:24,000	Arc/Info
Hydrology	Floodzones	FEMA floodzones by county	http://www.isgs.uiuc.edu/nsdihome/webdocs/county.html	polygon	Illinois	1:6,000 to 1:24,000	Arc/Info
Hydrology	Wetlands	Wetlands data by county	http://www.isgs.uiuc.edu/nsdihome/webdocs/county.html	all	Illinois	1:24,000	Arc/Info
Hydrology	Streams	Streams by county	http://www.isgs.uiuc.edu/nsdihome/webdocs/county.html	line	Illinois	1:100,000	Arc/Info
Hydrology	Streams	Streams by river basin name - Illinois Environmental Protection Agency coverage	/venus4/twa/rf3-new	line	Illinois	1:24,000	Arc/Info
Hydrology	Major bedrock aquifers within 300 feet of ground surface	Distribution of major bedrock aquifer units within 300 feet of ground surface containing potable water in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:500,000	Arc/Info
Hydrology	Major bedrock aquifers within 500 feet of ground surface	Distribution of major bedrock aquifer units within 500 feet of ground surface containing potable water in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:500,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Hydrology	Major bedrock aquifers greater than 500 feet below ground surface	Distribution of major bedrock aquifer units at depths greater than 500 feet below ground surface in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:500,000	Arc/Info
Hydrology	Major sand and gravel aquifers	Distribution of major sand and gravel aquifers at any depth in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:500,000	Arc/Info
Hydrology	Coarse-grained materials within 50 feet of ground surface	Distribution of coarse-grained materials and permeable bedrock within 50 feet of ground surface in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:250,000	Arc/Info
Hydrology	Karst areas	Distribution of karst areas in Illinois that contain one or more sinkholes throughout Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:100,000	Arc/Info
Hydrology	Nitrate leaching classes of soils	Soil characteristics relating to nitrate leaching, generated to aid in determining aquifer sensitivity to nitrate leaching in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:250,000	Arc/Info
Hydrology	Nitrate leaching class ranges	Nitrate leaching class ranges for soils, generated to aid in determining aquifer sensitivity to nitrate leaching in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:250,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Hydrology	Aquifer sensitivity to contamination by nitrate leaching	Potential for contamination of shallow aquifers by nitrate, designed for statewide evaluation of agrichemical leaching characteristics and associated aquifer sensitivity to contamination	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:250,000	Arc/Info
Hydrology	Pesticide leaching classes of soils	Soil characteristics relating to pesticide leaching, generated to aid in determining aquifer sensitivity to pesticide leaching in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:250,000	Arc/Info
Hydrology	Pesticide leaching class ranges	Pesticide leaching class ranges for soils, generated to aid in determining aquifer sensitivity to pesticide leaching in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:250,000	Arc/Info
Hydrology	Aquifer sensitivity to contamination by pesticide leaching	Potential for contamination of shallow aquifers by pesticides, designed for statewide evaluation of agri-chemical leaching characteristics and associated aquifer sensitivity to contamination	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	polygon	Illinois	1:250,000	Arc/Info
Hydrology	Public water supply surface water intakes	Public water supplies in Illinois that depend all or in part on surface water	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-hydro.html	point	Illinois	1:24,000	Arc/Info
Hydrology	Municipal wells	Locations of municipal wells in Illinois	/gisserv_isws/illidata/groundwater/muniwells	point	Illinois	1:24,000	Shapefile
Hydrology	County level hydrology	Streams in each county	/gis2/illinoi2/<countyname>/hydro-ln	line	Illinois	1:100,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Geology	Bedrock geology	Distribution and extent of the bedrock geologic units within Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolb.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Bedrock topography	Topography of the bedrock surface in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolb.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Bedrock valleys	Continuous lines representing the lowermost elevations/ locations of (buried) bedrock valleys in the state of Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolb.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Glacial boundaries	Glacial boundary lines representing the extent of glaciation for major glacial episodes in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Quaternary deposits, 1979	Quaternary Deposits in Illinois that lie at or near the land surface, including loess deposits	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Quaternary deposits, 1996	Updated version of Quaternary Deposits of Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:2,500,000	Arc/Info
Geology	Driftless areas	These areas are analogous to areas of the state where the bedrock surface is not buried by glacial drift	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Glacial drift thickness and character	Unconsolidated deposits, mainly glacial drift, overlie the bedrock surface in most of Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	line	Illinois	1:500,000	Arc/Info
Geology	Thickness of surficial deposits/thickness of glacial drift - polygons		/gis2/illinois/glacial/sdpymg	polygon	Illinois	1:500,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Geology	Thickness of surficial deposits/thickness of loess - lines		/gis2/illinois/loess/sdlnma	line	Illinois	1:500,000	Arc/Info
Geology	Thickness of surficial deposits/thickness of loess - polygons		/gis2/illinois/loess/sdpyma	polygon	Illinois	1:500,000	Arc/Info
Geology	Landslide inventory: polygons	Polygon locations of landslides in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Moraines (end moraines) of the Wisconsin episode	Named Woodfordian moraines, or Wisconsinan End Moraines, of Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Physiographic divisions	Physiographic divisions of Illinois, including provinces, sections, and divisions	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:300,000 to 1:3,100,000	Arc/Info
Geology	Soil associations map (500K)	Soil associations in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:500,000	Arc/Info
Geology	Stack-unit mapping of geologic materials to a depth of 15 meters	Stack-unit maps show the distribution of earth materials vertically from the surface to a specified depth and horizontally over a specified area	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:250,000	Arc/Info
Natural History	Ecoregions	Extent of the four major ecoregions in Illinois	/gis2/illinois/itu/eco	polygon	Illinois	1:2,500,000	Arc/Info
Natural History	Forest/prairie distribution, 1820	Locations of prairies and forests in Illinois at the time of settlement	/gis2/illinois/forest/fppymg	polygon	Illinois	1:2,500,000	Arc/Info
Natural History	Federal Reserve system units		/gis2/illinois/admin/fed-land-pt	point	Illinois	1:250,000-500,000	Arc/Info
Natural History	Federal Reserve system units		/gis2/illinois/admin/fed-land-py	polygon	Illinois	1:250,000-500,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Natural History	Inventory of public recreation land sites - points		/gis2/illinois/admin/recreation-pt	point	Illinois	variable	Arc/Info
Natural History	Inventory of public recreation land sites - lines		/gis2/illinois/admin/recreation-ln	line	Illinois	variable	Arc/Info
Natural History	Inventory of public recreation land sites - polygons		/gis2/illinois/admin/recreation-py	polygon	Illinois	variable	Arc/Info
Natural History	Land Use	21 classes of land use in 30 meter GRID	/venus2/gis_data/land_lf/landcov1	raster	Illinois	30 meter pixel resolution	Arc/Info grid
Natural History	Land Use	23 classes of land use in 30 meter GRID	/venus2/gis_data/land_lf/landcov2	raster	Illinois	30 meter pixel resolution	Arc/Info grid
Natural History	Land Use at the county level	Land Use designations at the county level	/gis2/illinois2/<countyname>/luda	polygon	Illinois	1:100,000	Arc/Info
Natural History	Natural heritage landmarks		/gis2/illinois/admin/heritage-py	polygon	Illinois	1:500,000	Arc/Info
Natural History	Natural divisions		/gis2/illinois/itu/natdiv	polygon	Illinois	1:1,000,000	Arc/Info
Natural History	Potential natural vegetation		/gis2/illinois/itu/potveg	polygon	Illinois	1:2,500,000	Arc/Info
Natural History	Soil Conservation Service land resource areas		/gis2/illinois/itu/resarea	polygon	Illinois	1:2,500,000	Arc/Info
Natural History	Special Federal Reserve designations - point		/gis2/illinois/admin/sfed-land-pt	point	Illinois	1:500,000	Arc/Info
Natural History	Special Federal Reserve designations - polygon		/gis2/illinois/admin/sfed-land-py	polygon	Illinois	1:500,000	Arc/Info
Natural History	State natural areas		/gis2/illinois/admin/natural-py	polygon	Illinois	1:250,000-750,000	Arc/Info
Natural History	State reserve system units - point		/gis2/illinois/admin/state-land-pt	point	Illinois	1:500,000	Arc/Info

Appendix (continued). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Natural History	State reserve system units - line		/gis2/illinois/admin/state-land-ln	line	Illinois	1:500,000	Arc/Info
Natural History	State reserve system units - polygon		/gis2/illinois/admin/state-land-py	polygon	Illinois	1:500,000	Arc/Info
Natural History	Critical Trends Assessment land cover database, 1991-1995	County by county land cover grid data for Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	raster	Illinois	1:100,000	Arc/Info grid
Natural History	Federally-owned lands	Federal lands in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	polygon	Illinois	1:24,000	Arc/Info
Natural History	Natural areas: part 1 - polygons	Natural areas in Illinois, digitized from USGS 7.5 minute quadrangles or from aerial photographs	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	polygon	Illinois	1:8,000	Arc/Info
Natural History	Natural areas: part 2 - points	Supplemental point coverage to the natural areas polygon data set	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	point	Illinois	1:8,000	Arc/Info
Natural History	Nature preserves	Nature preserves of Illinois, digitized from USGS 7.5 minute quadrangles	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	polygon	Illinois	1:8,000	Arc/Info
Natural History	State conservation areas	State conservation areas in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	polygon	Illinois	1:24,000	Arc/Info
Natural History	State forests	State forests in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	polygon	Illinois	1:24,000	Arc/Info
Natural History	State fish and wildlife areas	State fish and wildlife areas in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	polygon	Illinois	1:24,000	Arc/Info
Natural History	State parks	State parks in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-naths.html	polygon	Illinois	1:24,000	Arc/Info
Topography	Surface elevation: Digital Elevation Model (DEM)	This Arc/Info grid (raster) data set consists of edge-matched USGS 1:250,000 DEM tiles for Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	raster	Illinois	1:250,000	Arc/Info grid
Topography	Surface elevation: Triangular Irregular Network (TIN)	Used to create slope data and shaded relief images	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:250,000	Arc/Info grid

Appendix (concluded). GIS Data Pertaining to the Illinois River Watershed Available from the Geospatial Data Clearinghouse and the Illinois State Water Survey

Category	Name	Description	Location at ISWS* or on Web	Type	Extent	Resolution	Format
Topography	Surface elevation: shaded relief map	Landforms of Illinois with a shaded relief portrayal	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	raster	Illinois	1:250,000	.tif image
Topography	Surface elevation: slopes	Surface elevations in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:250,000	Arc/Info stored off-line
Topography	Surface elevation: generalized slopes	Generalized slopes in Illinois	http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html	polygon	Illinois	1:250,000	Arc/Info
Topography	1:24,000 Digital Raster Graphics (DRGs)	Scanned USGS topographic maps	http://www.isgs.uiuc.edu/nsdihome/webdocs/drgs/	raster	Illinois	1:24,000	.tif image
Topography	1:100,000 Digital Raster Graphics (DRGs)	Scanned USGS topographic maps	http://www.isgs.uiuc.edu/nsdihome/webdocs/drgs/	raster	Illinois	1:100,000	.tif image
Topography	1:250,000 Digital Raster Graphics (DRGs)	Scanned USGS topographic maps	http://www.isgs.uiuc.edu/nsdihome/webdocs/drgs/	raster	Illinois	1:250,000	.tif image
Aerial	Digital Orthophoto Quarter Quads (DOQQs) - statewide	Digital Orthographic Quarter Quadrangles	http://www.isgs.uiuc.edu/nsdihome/webdocs/doqs/	raster	Illinois	1:12,000	MrSID
Soils	"STATSGO" soils data		/venus5/gis3/statsgo	polygon	Illinois	N/A	Arc/Info

Notes:
The data format used is Arc/Info coverage unless otherwise specified.
N/A denotes metadata not available.
* These datasets are stored at the ISWS. For questions, please contact the ISWS GIS Manager at (217) 244-5459.
"SCS" denotes Soil Conservation Service (now Natural Resources Conservation Service)
"IDOT" denotes Illinois Department of Transportation
"IEPA" denotes Illinois Environmental Protection Agency
"USGS" denotes United States Geological Survey
"FEMA" denotes Federal Emergency Management Agency

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