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Data for Assessing Drought Vulnerability of Illinois' Community Surface Water Systems

by
Jory S. Hecht and H. Vernon Knapp

Prepared for the
Office of Water Resources,
Illinois Department of Natural Resources

January 2008

Illinois State Water Survey
Center for Watershed Science
Champaign, Illinois

A division of the Illinois Department of Natural Resources
and an affiliated agency of the University of Illinois

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Abstract

This report describes the compilation of existing information and data that may be used to characterize water supply yields and potential adequacy of community surface water systems in Illinois. Each of the 101 community surface water systems in Illinois was characterized by the type of surface water source used for its supply. This report contains summaries of supply source information on 72 systems that withdraw water from intrastate bodies of water, including impounding and off-channel reservoirs, free-flowing rivers, and reclaimed quarries and borrow pits. The remaining 29 systems not included in this study obtain their supply from Lake Michigan (16), the Mississippi River (12), or the Ohio River (1).

Much of the information presented for the selected systems was collected by telephone interviews with water system administrators (plant superintendents, operators, and/or public works directors). These interviews were particularly important for identifying their ongoing or future plans to augment or change their sources of supply. Additional information collected on each system includes water production data and service area populations [obtained primarily from the Illinois State Water Survey (ISWS) Water Inventory Program], reservoir capacities (ISWS files and field surveys), and identification of stream gage records directly applicable to each system for use in hydrologic analysis. Other sources of information on each system include a prior study on the adequacy of surface water systems performed by the ISWS and fact sheets that the Illinois Environmental Protection Agency (IEPA) has prepared on each system. Also included is a discussion of observed trends in community surface water use in Illinois.

In the past 18 years, 24 community water systems have discontinued using surface water sources. Twenty of these systems, many of which had service area populations of less than 3,300[1], are now purchasing water from other systems. Anecdotal evidence suggests that many small systems that have chosen to change their supply sources have had financial hardships in meeting new United States Environmental Protection Agency (USEPA) surface water treatment requirements that the 1996 Amendments to the Surface Drinking Water Act mandated. Larger systems with greater financial resources have not had the same level of difficulty meeting stricter treatment criteria. Drought vulnerability is another factor that has led systems to change or augment their water supply sources over the past 18 years. Most systems previously considered to be vulnerable to the effects of a 20-year drought have since taken various actions to either augment or change their source of supply. When vulnerability to the more severe 50-year drought is considered, size of the water supply system may be an important factor influencing the steps that are taken, as larger systems appear more capable of taking action to augment existing supplies than their smaller counterparts.

[1] The USEPA considers community water systems serving 3,300 or fewer people to be “small” systems.

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Appendices

Acknowledgments

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1. Introduction

In Illinois, 101 community water systems withdraw and treat water from surface sources (lakes, rivers, and streams) that supply more than 9.0 million residents in 575 communities (Figure 1). Approximately 80 percent of the surface water that these communities use originates from Lake Michigan and serves more than 6.7 million customers in the Chicago metropolitan area. Sixteen community water systems located in the Chicago metropolitan area operate intakes on the lake and also sell water to an additional 172 nearby systems. Most of the state's other 85 community surface water systems are located in central and southern Illinois where groundwater resources are often less abundant. These systems serve communities ranging from villages with less than 1,000 inhabitants to mid-sized cities with service area populations exceeding 100,000 (e.g., Springfield). Thirteen of these systems are located on the Mississippi and Ohio Rivers, which still have plentiful flow for water supply during severe droughts.

Many of the remaining 72 active community surface water systems rely upon rivers and reservoirs in which flow and storage volumes can diminish substantially during droughts. Periodic evaluations of these drought-susceptible systems are necessary to ensure that each one has adequate water resources available over the duration of severe droughts. McConkey-Broeren and Singh (1989) from the Illinois State Water Survey (ISWS) conducted the last evaluation of the adequacy of the state's community surface water supplies in 1989. They estimated that 27 community water systems would not have an adequate supply to meet projected water demands during a 50-year drought by 2020, and 18 of these systems would not have a sufficient supply during a less severe 20-year event. Since the completion of that 1989 study, water demands in many communities have changed while ongoing reservoir sedimentation has reduced the amount of water that can be stored for drought supply. In addition, some systems have developed new surface water sources or modified existing ones since that study was conducted. Others are contemplating economic development projects dependent upon the production capacity and drought vulnerability of their water systems.

The ISWS, in cooperation with the Illinois Department of Natural Resources (IDNR) Office of Water Resources, is reevaluating drought vulnerability of community surface water systems in Illinois. One of the initial steps in this effort is to identify reservoirs and river intakes that these systems currently use, as well as streamflow, reservoir surface area and capacity, and other hydrologic data necessary for evaluating the potential impact of drought on system yield. This report documents selected information on community surface water supplies in Illinois that will be used in determining yield and drought adequacy of these systems. Future reports will address yield estimates for specific water supply systems and uncertainties in these estimates.

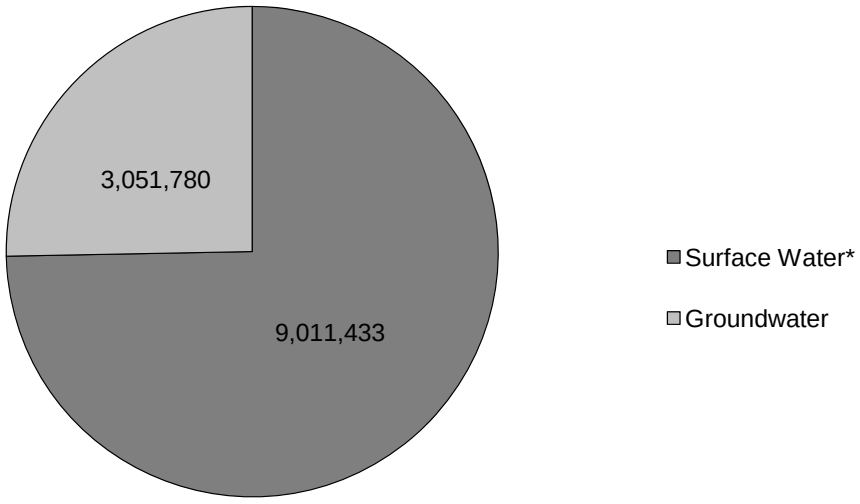
The next section (Section 2) of this report summarizes the types of surface water sources from which community water systems withdraw their supplies in Illinois and the populations that depend upon them. Section 3 describes the process by which the 72 systems included in this study were selected. Section 4 outlines the procedures used to collect data on these systems. Section 5 discusses two trends in community surface water use in Illinois: 1) an emerging trend for smaller systems to cease producing their own water and purchase from external purveyors and 2) the variety of responses that systems whose 20- and 50-year drought yields were estimated to be insufficient for their demands before 2020 have undertaken to improve the adequacy of their supply. Section 6 summarizes the main findings of the report. Section 7 presents a series of summary sheets describing sources, recent developments, communities served, and other pertinent information on the 72 community surface water systems in Illinois included in this study.

Figure 1. Locations of community surface water systems in Illinois.

2. Community Surface Water Systems in Illinois

The United States Environmental Protection Agency (USEPA) considers water systems that serve more than 25 people or 15 connections year-round to be community water systems (USEPA, 2006). Community surface water systems regularly draw from at least one surface water source and must have a treatment facility that meets USEPA surface water regulations. Surface water systems are more vulnerable to pollution than their groundwater counterparts and consequently must be subject to more rigorous treatment standards. For this reason, the USEPA classifies systems that rely upon both surface and groundwater sources as surface water systems. For example, Jacksonville is considered a surface water system even though less than 5 percent of the raw water it produced between 1996 and 2005 was withdrawn from its two surface water sources, Mauvaise Terre Lake and Lake Jacksonville. Community water systems that regularly rely upon groundwater and only access surface water sources during emergency situations were not considered in this study.

More than 9.0 million Illinois residents receive water from community surface water systems. Approximately 4.9 million consumers directly receive surface water from their own community systems, while the remaining 4.1 million consumers are served by systems that purchase their water from other community surface water systems and regional suppliers (Figure 2). Surface water sources, including Lake Michigan, large rivers forming part of Illinois' border (Mississippi and Ohio), intrastate rivers and streams; and reservoirs fed by these rivers and streams directly supply 101 community water systems in the state (Appendix A). Populations served by these surface water systems, as reported by the Illinois Water Inventory Program (IWIP), range from villages with less than 1,000 inhabitants to the Chicago system's 5.5 million consumers, including the 2.6 million residents in 125 suburban communities that purchase water from the Chicago system.



*Includes 521 residents receiving water from Lake Shannon (groundwater under the direct influence of surface water).

Figure 2. Estimated number of Illinois residents receiving water from surface and groundwater community water systems in 2007 (Sources: IWIP and conversations with system administrators).

Some communities can meet their water supply needs by withdrawing water directly from Lake Michigan or free-flowing rivers, while others have had to build storage reservoirs to provide their customers with a more reliable water supply. *Impounding reservoirs* consist of in-channel physical flow barriers that obstruct streamflow and store the impounded water in river valleys. These reservoirs typically store enough water to meet community demands for multiple years. *Off-channel reservoirs* receive water pumped from a river or stream, are typically smaller than impounding reservoirs, commonly hold up to two years of storage, and are not subject to the same long-term sedimentation risks as impounding reservoirs. *Low channel dams* also are constructed across a river channel, but they are different than impounding reservoirs and typically allow streamflow to pass over the dam in all but the lowest flow conditions. These barriers were not acknowledged as a distinct type of surface water source in this study because they typically impound only a few weeks' worth of storage. Several smaller communities also use *quarries* and *borrow pits* to collect and store water, although such systems are classified as off-channel reservoirs when they receive water pumped from nearby streams. No communities in Illinois pump water from any natural lakes besides Lake Michigan.

Several community water systems receive their water from more than one source type. In some systems, water may be routed through more than one source before it arrives at the treatment plant. For example, water pumped from a river intake may provide supplementary inflow to an impounding reservoir when the reservoir's level falls below its normal pool. In other cases, a system may have two independent sources with their own separate connections to the treatment plant. System summary sheets list each intake from which a system withdraws water, but only intakes connected directly to the plant were considered when classifying a system as having a "combination" of sources. The 101 community water systems that produce raw water from their own surface water sources in Illinois are classified as one of seven categories listed in Table 1.

Table 1. Types of Community Surface Water Systems

Name	Description
Border River Withdrawal (BRW)	Mississippi, Ohio, and Wabash Rivers
River/Stream Withdrawal (RW)	All other rivers and streams in Illinois
Off-Channel Reservoir (OCR)	Also known as side-channel and up-ground reservoirs
Impounding Reservoir (IR)	Impounding Reservoir
Quarry/Borrow Pit (QBP)	Quarry/Borrow Pit
Lake Michigan (LM)	Lake Michigan
Combination (C)	Contains more than one type of surface water source

It also should be noted that the combination category does not include surface water systems in which withdrawals from a single type of surface water source are supplemented regularly by groundwater production. The USEPA classifies any community water system relying upon surface water for any part of its regular supply as a surface water system, so a statewide count of the number of systems dependent upon both surface water and groundwater supplies could not be tabulated easily. Seven surface water systems (Aurora, Jacksonville, La Harpe, Macomb, Peoria, Taylorville, and Vienna), with a combined total population of 357,226 residents[2], however, regularly depend upon groundwater for part of their supply. An analysis was undertaken to count the number of each type of community surface water system in Illinois and to determine the population dependent upon water supplies from each system type. Figure 3 displays the number of each type of community surface water system in Illinois, and Figure 4 shows the number of Illinois residents that each type of system serves.

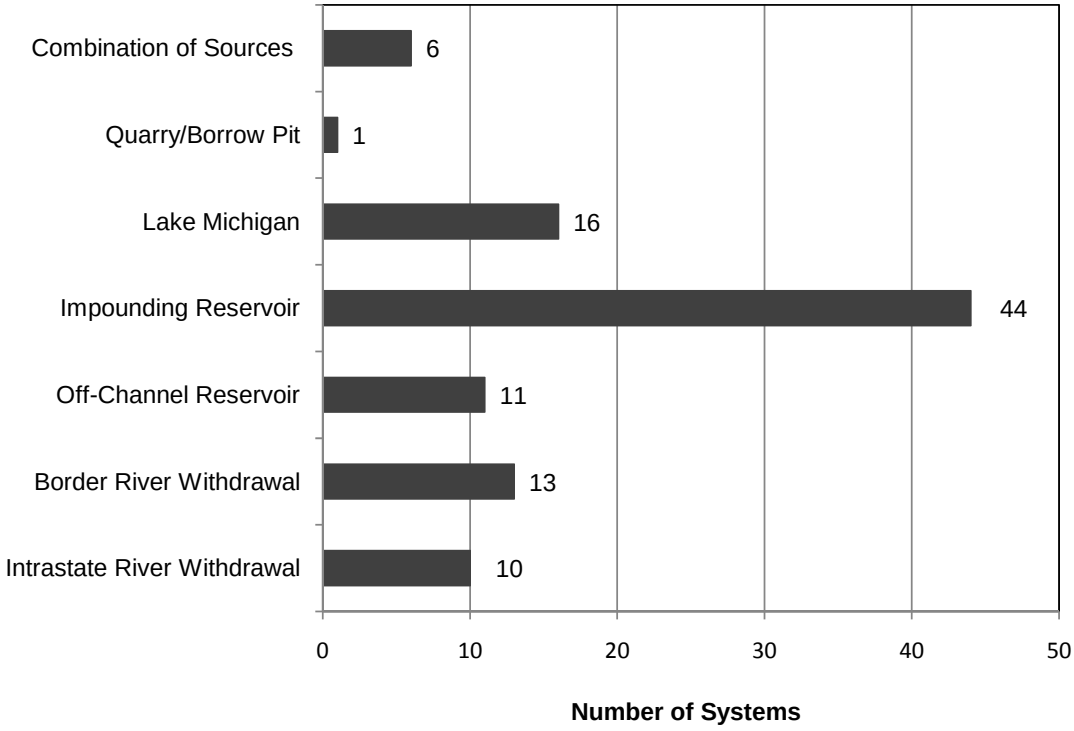
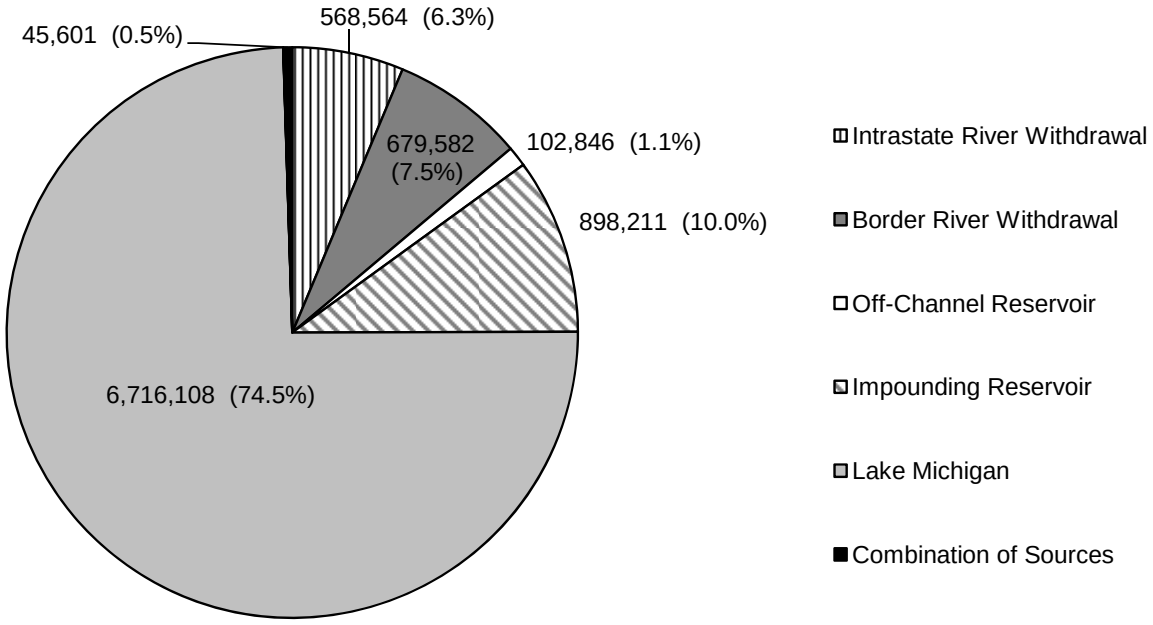


Figure 3. Types of community surface water system sources in Illinois as of October 2007.

[2] As reported to the Illinois Water Inventory Program (IWIP) in 2005.



Not shown: Quarry and borrow pit systems, which serve a total of 521 people.

Figure 4. Estimated number of Illinois residents served by different types of surface water sources as of October 2007 (Sources: IWIP and conversations with system administrators).

3. Selection of Systems for Study

This study identifies supply source data useful in assessing the drought vulnerability of Illinois' 72 community surface water systems dependent upon intrastate bodies of water, including impounding and off-channel reservoirs, free-flowing rivers, and reclaimed quarries and borrow pits.[3] The remaining 29 systems obtain raw water from Lake Michigan or rivers forming part of Illinois' borders (Mississippi and Ohio), all of which have 50-year drought yields that far exceed the demands of systems dependent upon them. Systems purchasing water from other systems that receive raw water from these sources but do not maintain their own intakes on them were not included in this study. Seventy systems included in this study actively were producing surface water in 2007. This includes five systems in various stages of either establishing purchasing agreements with external purveyors (Alto Pass, Flora, and New Berlin) or developing new groundwater resources (Paris and Pittsfield) that would entirely eliminate production from their own surface water resources. Other systems (Carthage and Vienna) that buy supplementary water from external purveyors are anticipating increases in these purchases. Two additional systems included in this study, the Gateway and Holland regional water supplies, were not producing water on a regular basis as of October 2007. The Gateway regional supply is expected to provide water to Flora and other communities in early 2008. In 2006, the Holland regional supply constructed a pipeline to one of its primary customers, the City of Effingham.

[3] Intrastate bodies of water include the Fox and Kankakee Rivers, which have their sources in Wisconsin and Indiana, respectively.

4. Data Collection

The following information was obtained to assess the drought vulnerability of each of the 72 water systems under study:

1. Water supply sources and 1980-2005 raw water production
2. Reservoir capacity and surface area
3. Available streamflow records
4. Service area population
5. Recent developments and drought concerns

Loosely structured telephone interviews were conducted with water system administrators, including plant superintendents, operators, and public works department directors. Archival research on each system was conducted prior to making each telephone call to allow more informed and efficient conversation with administrators and to cross-check information tabulated from different sources. These archival sources included self-reporting production totals that systems mail to the IWIP each year, previous IEPA site assessments, previous ISWS studies and notes, as well as Internet searches. In addition, administrators often identified engineering consulting firms and other institutions with useful information that had worked on their systems in the past.

Water Supply Sources and 1980-2005 Raw Water Production

Information on water supply sources typically was collected from the IWIP inventories with occasional supplemental information from IEPA fact sheets and other sources. System administrators and IEPA fact sheets often provided clear explanations about connections between different sources in multiple-source systems (e.g., links between river intakes and off-channel reservoirs). Source-by-source annual production charts were plotted for each system to identify trends during 1980-2005 and also inconsistencies in production data. In some cases, water system administrators only reported reliable data on the system's total raw water production, as they often arbitrarily divided production between different sources (e.g., splitting the water pumped at a river intake and stored in an off-channel reservoir in half) or did not have meters for particular sources (e.g., valve-controlled raw water transmission lines). In these cases, only the system's total production was analyzed. Production anomalies often were attributed to unclear data reporting and entry, and were remedied with ad hoc estimates of the most plausible values. Occasionally, system operators were asked to explain these discrepancies. For instance, Charleston's decrease in production since 2001 may be due to a water conservation program at Eastern Illinois University and production at Evansville (estimated population 750) has diminished since the 1980s due to the loss of its Ellis Grove satellite community (estimated population 720).

Reservoir Capacity and Surface Area

Various literature sources were consulted to obtain the most recent reservoir capacities and surface areas possible, including previous ISWS contract reports and IEPA fact sheets. In several instances, water system administrators provided direction for additional sedimentation surveys published by non-government sources in recent years (e.g., a Western Illinois University student's master's thesis on Macomb's Spring Lake in 1998). Many capacity measurements were obtained from a report by Singh and Durgonoglu (1990), which catalogues the most recent sedimentation estimates for

water supply reservoirs in Illinois up to that year. That study frequently was consulted because many systems have conducted no studies since then. Care was taken to distinguish between true sedimentation surveys featuring sediment particle size distributions and more rudimentary volumetric estimates, as administrators occasionally provided rough estimates of reservoir capacity based upon their knowledge of the water body surface areas and average depths. These rough estimates were used only if previous estimates extrapolated from in-situ measured data were not available or unless major modification (e.g., raising the dam or spillway level) to the source had occurred since the last volumetric measurement was conducted. In practice, these "ballpark" estimates were accepted only for off-channel reservoirs.

Singh and Durgonoglu's (1990) estimates of the 2010 capacity of impounding water supply reservoirs also were compiled to provide a temporally standardized comparison of reservoir capacities for all systems. These projections were not listed for reservoirs that were dredged or had spillway elevations altered after the latest pre-1990 survey. Information on these changes was gathered from both available literature and telephone conversations.

Surface area estimates often were cited from administrator-reported estimates, notes from the McConkey-Broeren and Singh 1989 study, a water body GIS layer from the National Hydrography Dataset (NHD), and miscellaneous literature sources. All surface area information was believed to represent the extent of reservoir surfaces at normal pool elevation. Unfortunately, documentation on the source of reservoir surface area estimates was often unavailable.

Available Streamflow Records

Stream discharge data from continuous recording gages are used for estimating the amount of water available during droughts. If a gage is located upstream of a water supply reservoir or on the same stream as a community water system's intake, then, for most cases, its record is directly useful for computing drought flow conditions at the intake or cumulative flow entering the reservoir. Usefulness of a gaging record on the same stream diminishes, however, with distance from the intake. If the watershed drainage area at the gage is between 50 and 200 percent of the drainage area at the intake, its flow record usually is considered to be applicable for the system's water yield computation using adjustments for differences in drainage area. Beyond this range, and if there is no gaging record on the same stream, regional regression equations typically are applied to estimate drought flow characteristics. These equations are developed using multiple gaging records within a region that has similar physiographic characteristics to the stream/watershed of interest. For both regional equations and direct application of a gaging record, statistical analysis of the available record(s) typically is used to estimate flow characteristics that would occur during a drought of fixed frequency, such as a 20-year or 50-year drought. In addition, care must be taken to ensure that gage stations contain an adequate period of record and, if possible, that years during which particularly severe droughts occurred are included in this period. All long-term flow records in Illinois available for this purpose are from gages operated by the United States Geological Survey (USGS).

Lists of active and discontinued USGS gages were examined to identify gages located upstream or downstream of a water supply system intake with a drainage area within the 50-200 percent range when compared to the intake's drainage area. Most direct river/stream withdrawals and about half of the off-channel reservoir intakes in Illinois are located on larger watersheds having nearby gaging records. In contrast, most impounding reservoirs used for water supply are located on smaller watersheds, and few of these have directly applicable flow records. Appendix B contains a list of all

gage stations that can be applied directly to this study. Future studies will address the analysis of drought flow characteristics for use in drought vulnerability analyses.

Service Area Population

Service area population (SAP) estimates were compiled from the 2005 IWIP system inventories, while IEPA fact sheets also contained estimates for many of the systems studied. Although the sources of these reported figures (e.g., 2000 census or administrator-reported values) were not always known, it was believed that the data were generally more consistent than the IEPA estimates gathered from the IEPA fact sheets produced between 1995 and 2004. Nonetheless, the IEPA fact sheets provided a valuable source of information with which to cross-check administrator-reported values, especially because they listed populations of satellite communities in some instances. In several cases, it was obvious that administrators' estimates did not include satellite communities, in which case the IEPA estimates were used in lieu of the ones reported in the IWIP inventories. On the other hand, many water systems have lost satellites in recent years due to both development of rural water districts (RWDs) and expansion of large regional water systems (e.g., Rend Lake). Administrator-reported estimates often included these recent changes. They also occasionally suggested small adjustments to figures reported to IWIP in 2005.

Developments since 1989 and Drought Concerns

Telephone calls with system administrators also provided an excellent opportunity to acquire information about ongoing developments and to place recent water source changes in context. These calls periodically yielded information on systems' plans to switch to groundwater sources or become part of large regional water supply systems. Many of these interviews became longer conversations in which administrators detailed their systems' current struggles with aging treatment plants, tougher USEPA surface water treatment regulations, and the 2005 drought. Water supply effects of that drought were most severe in the west-central part of the state, although local variations occurred due to available storage capacity, transport infrastructure capacity, and access to groundwater sources. Other systems reported the success of new sources developed in the wake of the more severe 1988-1989 drought (e.g., Pontiac and its new off-channel reservoir). Finally, communities occasionally mentioned a desire to develop emergency connections with nearby systems (e.g., Charleston and Mattoon) to further mitigate drought hazards.

5. Community Surface Water System Trends, 1989-2007

The ISWS last conducted a comprehensive statewide evaluation of drought vulnerability of Illinois' community surface water systems in 1989 (McConkey-Broeren and Singh, 1989). That study compared total 20-year and 50-year drought yields of each system's sources and drought water demands. That study assumed a system's drought demand to be 20 percent greater than its average annual demand unless the system had a reservoir with a critical duration less than or equal to 12 months. In this latter case, the system's drought demand was expected to be 30 percent greater than its average annual demand.

This report was limited to the presentation of available supply source data for an ensuing study of the drought vulnerability of Illinois' community surface water systems. An analysis of the continuity of the raw water production at community water systems considered to have inadequate supply sources (McConkey-Broeren and Singh, 1989) provides insights on the impact of drought vulnerability on a system's choice to maintain its raw surface water production. [Appendix C contains the list of the systems that McConkey-Broeren and Singh (1989) studied.] As of October 2007, 94 of the 96 community water systems operating in 1989 were still intact, although 24 of these 94 systems (25.5 percent) either had opted to purchase the entire supply from an external purveyor or develop their own groundwater resources.[4] McConkey-Broeren and Singh (1989) did not consider two-thirds (16) of the 24 community water systems that ceased surface water production between 1989 and 2007 as vulnerable to 20- or 50-year droughts. This suggests that other factors besides drought vulnerability have prompted community water systems to discontinue surface water production. Occasionally, telephone conversations with system administrators provided anecdotal evidence that systems were discontinuing surface water production because treatment plant upgrades required to meet stricter USEPA surface water treatment regulations, mandated in 1996 amendments to the Safe Drinking Water Act, were not cost effective.

Directly determining the extent to which problems with plant upgrades had contributed to systems' decisions to discontinue surface water production was difficult because a comprehensive survey directed at systems that elected to discontinue surface water production was not conducted. In general, smaller systems generally have more difficulty financing infrastructure upgrades than their more populous counterparts.[5] Because systems with smaller SAPs often have fewer financial resources available for these renovations, insights on impacts of these regulations and aging treatment infrastructure on these small systems were sought by computing the percentage of systems that had stopped producing their own surface water between 1989 and 2007. Four SAP groups, listed in Table 2, were considered in the analysis.

[4] Wilmington, which began pumping from the Kankakee River on January 2, 1990, also was included in this analysis. Lake Shannon, which the IEPA classifies as groundwater under the direct influence of surface water (GWUDI), was considered a surface water system in this study due to its dependence upon Lake Shannon.

[5] The 1996 amendments to the Safe Drinking Water Act did specify the State Drinking Water Revolving Loan Funds as a source of financing to help small community water systems fund required treatment technology upgrades.

Table 2. Number of Systems by Service Area Population and Risk to 20- and 50-year Droughts

Service area population	*Total number of systems*	*Number of systems at risk to both 20- and 50-year droughts*	*Number of systems at risk to only a 50-year drought*
3,300 or fewer	41	9	4
3,301 – 10,000	22	5	3
10,001 – 50,000	22	2	1
More than 50,000	9	2	1

Analysis results of these 94 systems show that community water systems with smaller SAPs have tended to abandon surface water resources at higher rates than their more populous counterparts (Figure 5). Nineteen of the 41 systems (46.3 percent) with SAPs of 3,300 or fewer people that were producing surface water in 1989 no longer withdraw water from their own surface water resources. This percentage diminishes to 18.2 percent (4 out of 22) for systems with SAPs of 3,301-10,000. Only one out of 22 systems with SAPs between 10,001-50,000 (Mount Vernon) halted surface water source production. Mount Vernon already had been purchasing over 72 percent of its water (from the Rend Lake Intercity Water System) in 1989. None of the nine systems serving more than 50,000 people abandoned their surface water sources.

Although economic considerations alone have triggered consolidation of many surface water systems in the state, the manner in which drought vulnerability has enhanced this tendency also was assessed. Multiple forms of evidence suggested that drought vulnerability has indeed had a secondary effect on the decisions of water systems with SAPs of 3,300 or fewer people to discontinue withdrawing water from their own surface sources. McConkey-Broeren and Singh (1989) identified nine systems with SAPs of 3,300 or fewer people whose projected yields during 20-year droughts were considered deficient or at risk: Coulterville, Farina, Loami, Oakland, Shipman, Sorento, Wayne City, West Salem, and White Hall. Six of these nine systems (Loami, Oakland, Shipman, Sorento, West Salem, and White Hall) switched from surface water production to either groundwater production or water purchasing between 1989 and 2007. On the other hand, all four systems serving 3,300 or fewer people that McConkey-Broeren and Singh (1989) declared as vulnerable only to a 50-year drought (Greenfield, Kinmundy, Mt. Olive, and Palmyra-Modesto) continue to pump from surface water sources, although Kinmundy (SAP = 1,078), unlike many other small communities, was able to finance the construction of New Kinmundy Lake in 1998. Altogether, 13 of the 32 systems (40.6 percent) with SAPs of 3,300 or fewer people that were not highly vulnerable to a 20-year drought have opted to stop withdrawing water from their own surface sources since 1989. All four systems with SAPs larger than 10,000 people and yields estimated to be at risk during 20-year droughts from 1990 to 2020 (Bloomington, Decatur, Marion, and Pontiac) have continued surface water production. Instead, their responses to drought vulnerability have included developing new surface water sources (Bloomington and Pontiac), augmenting capacity of existing reservoirs (Decatur), or purchasing additional water from external purveyors (Marion). Appendix D summarizes supply source changes that all systems considered at risk in 1989 have conducted since then.

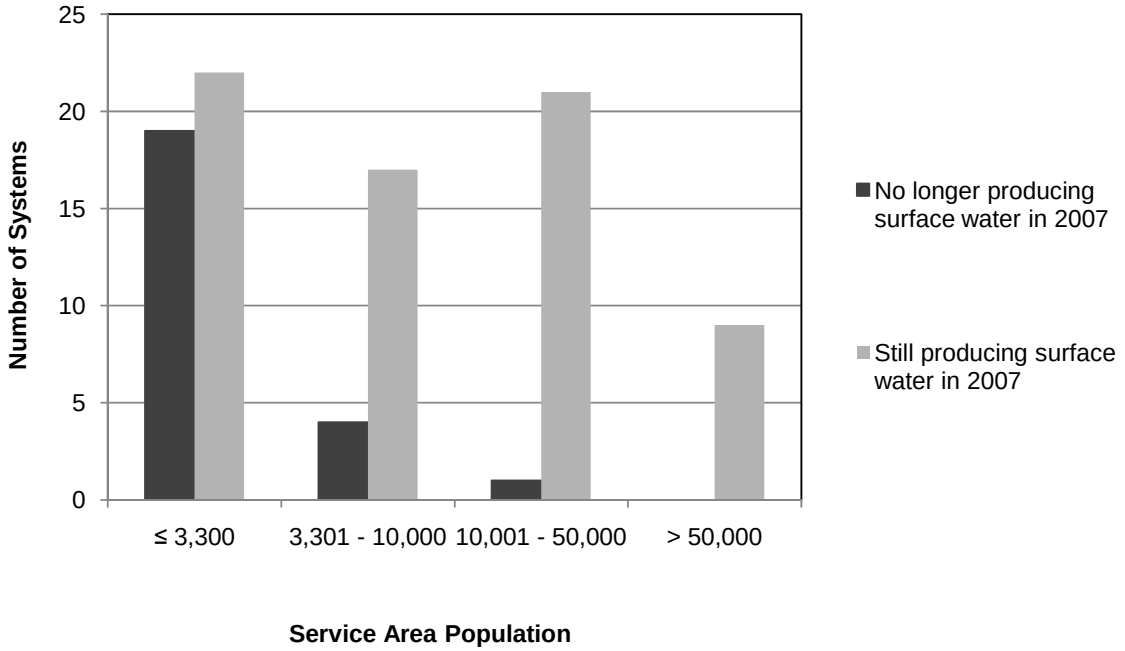


Figure 5. Changes in community surface water production among systems with different service area populations.

These results also suggested that a water supply system's SAP may be an important factor influencing steps taken to reduce drought vulnerability, particularly to more extreme events. All five systems that McConkey-Broeren and Singh (1989) considered to be only at risk during a 50-year drought that now have SAPs greater than 3,300 people (Canton, Carlinville, Fairfield, Gillespie, and Springfield) have made changes to increase their supply or at least are examining alternatives (e.g., Springfield). On the other hand, just one of the four small systems (Kinmundy) vulnerable to a 50-year drought has increased its supply. With respect to 20-year droughts, all but one of the 18 systems considered to be at risk in 1989 made supply source changes. Wayne City was the only one that took no measures to reduce its drought vulnerability. Its drought vulnerability was computed based upon a total storage of just 51.7 acre-feet (ac-ft) in its low channel impoundment and off-channel reservoir as compared to the total volume of 181.2 ac-ft gathered for this current study, however.

Findings of this analysis on trends in community surface water system production in Illinois highlight the multitude of factors that prompt community water systems to change their water sources and difficulties involved in attributing these changes to any specific factor. Assuming that SAP is an adequate proxy variable for a system's financial resources, smaller systems have found it more difficult to pay for renovations necessary to meet new USEPA requirements. These results also suggest that some systems jointly may consider drought vulnerability and economic hardships as reasons to discontinue withdrawing water from their surface sources. Systems with larger SAPs tend to expand existing sources or develop new sources altogether; thus, drought vulnerability does not appear to be the primary factor driving the consolidation of small water systems in Illinois. In addition, these findings

also show that larger systems may develop measures to protect their systems from more extreme 50-year droughts more often than their smaller counterparts.

6. Summary and Conclusions

This report contains an updated inventory of community surface water systems in Illinois and the types of sources from which they withdraw their water, producing summaries on 72 systems for an ensuing analysis of system drought vulnerability. Subsequent background research, including telephone calls with system administrators, has facilitated information updates on production and storage capacity of their sources. In addition, an inventory of USGS continuous record gages located along the streams upon which intakes are situated was compiled to identify records for use in estimating flows that dependent systems may receive during droughts of different durations. Water supply planners in Illinois are encouraged to use data presented in this report for other applications.

This report also catalogues the variety of measures that systems deemed vulnerable to 20-year droughts (McConkey-Broeren and Singh, 1989) have taken to reduce their drought vulnerability. It also examines other factors, particularly financial resources available to implement stricter USEPA surface water treatment requirements, which may contribute to a system's decision to modify existing sources or obtain water from new ones. An understanding of these underlying phenomena is critical for understanding particular changes in water supply sources that systems may undertake to reduce their drought vulnerability.

7. Community Surface Water System Summaries

System summary sheets on pages 25-96 were developed to summarize the information collected on 72 community water systems. Tables 3 and 4 describe the contents of each field contained in these summaries, and Table 5 presents abbreviations used in the summaries.

Table 3. Description of System Summary Contents: Field Descriptions

Field	Description
System Description	Briefly describes raw water transport from source intakes to treatment plant.
Satellite Communities and Water Districts	Lists all satellite communities and water districts that the system partially or completely serves.
Population Served	Estimated service area population, including all users in satellite communities and water districts.
County	County of community hosting the system's treatment plant.
Watersheds	Major watersheds of Illinois in which the system's sources are located. (http://www.sws.uiuc.edu/hilites/images/pcardb.jpg)
1989 Study	Assesses the adequacy of 20- and 50-year drought yields for 1990, 2000, and present levels of water use. The yields of six systems (Aurora, Elgin, Lake Shannon, Peoria, Vienna Correctional Center, and Wilmington) not evaluated in McConkey-Broeren and Singh (1989) were presumed to be adequate through 2020.
USGS Gages	Lists all USGS gages located on the same stream as a system's sources with drainage areas between 50% and 200% of the intakes' contributing areas. Gaging records must be representative for the present-day flow regime (i.e., records on lower Kaskaskia River preceding the construction of Lake Carlyle cannot be used).
Developments since 1989	Summarizes developments since 1989, including supply source changes and recent drought impacts as well as future plans.

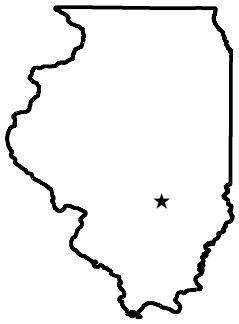
Table 4. Description of System Summary Contents: Water Source Table Description

Field	Description
Name	Common name of each surface water source.
Type	Type of surface water source based upon categories listed in Table 1. In addition, systems that use groundwater (GW) or purchase additional water from other surface water (SWP) or groundwater (GWP) systems are noted.
Stream	The stream from which water is withdrawn.
Drainage Area (DA)	Commonly listed drainage area in square miles (sq mi). Values may differ slightly from values computed using watershed delineation algorithms.
Surface Area (SA)	Estimated reservoir surface area measured in acres (ac).
Capacity (Cap.)	The most recent storage capacity esimate of the source in acre-feet (ac-ft).
Year Est.	Year of most recent reservoir capacity estimate recorded.
Est. 2010 Cap. (ac-ft)	Estimated 2010 capacity of the source measured in acre-feet (ac-ft) listed in Singh and Durgonoglu (1990) for impounding reservoirs whose capacities have not been altered by either spillway elevation changes or dredging since 1989 or at any date after the reservoir's last pre-1990 survey.

Table 5. Other Abbreviations Used in the System Summaries

Abbreviation(s)	Description
Br	Branch
Cr	Creek
Fk	Fork
gpm	Gallons per minute
Hld	Holding (Pond)
Lk	Lake
M	Middle
mgd	Million gallons per day
N, S, E, W	North, South, East, and West
N/A	Not applicable, not available
R	River
Subd.	Subdivision
Trib	Tributary
Water Comm.	Water Commission
WA, WC, RWC, WD, RWD	Water Association, Water Company/Corporation, Rural Water Company, Water District, Rural Water District

Altamont



System Description:

Water is pumped from Lake Altamont (Altamont New Reservoir) to the treatment plant at 350 gpm. Reservoir capacity never has been measured, and both its surface area and capacity may be overestimated.

Satellite Communities and Water Districts:

None

Population Served: 2,513

County: Effingham

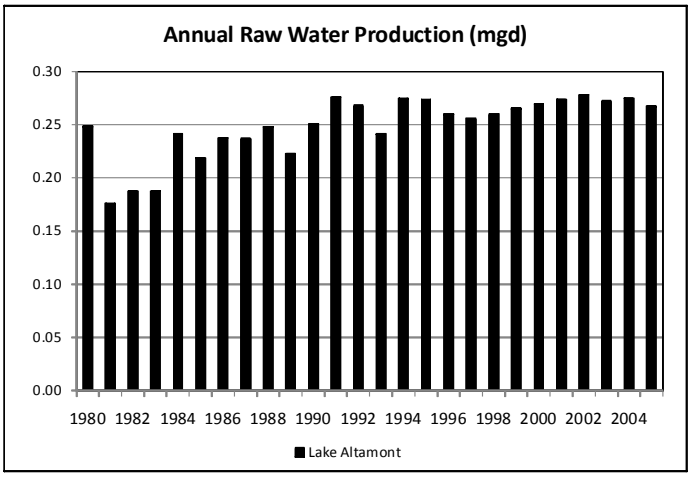
Watersheds: Little Wabash

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Altamont	IR	Turkey Cr	1.07	60	950	1980	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

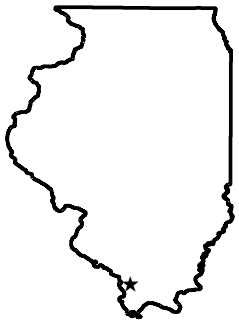
USGS Gages: No data available



Developments since 1989:

Lake Altamont dropped to record low levels during the 2005 drought, but it has since recovered. The community's old lake is now privately owned and cannot be used as an emergency supply.

Alto Pass Water District



System Description:

Two pumps convey water from Little Cedar Lake to the treatment plant at 125 gpm each via a small holding pond. Alto Pass Reservoir (Old City Lake) is available during emergencies.

Satellite Communities and Water Districts:

Cobden, Pomona, and Union-Jackson Farm Workers

Population Served: 1,200

County: Union

Watersheds: Big Muddy

Water Sources

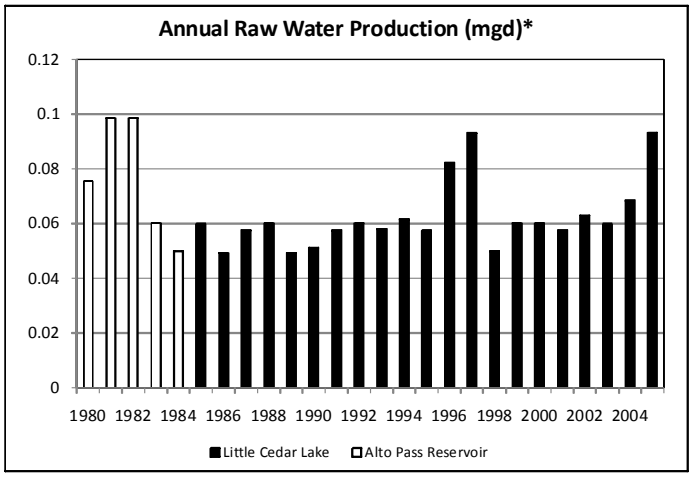
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Little Cedar Lake	IR	Cedar Cr	6.53	61	656	1976	249
Alto Pass Reservoir	IR	Cedar Cr Trib	0.62	8	108	1976	43
Holding Pond	OCR		N/A	N/A	3	2007	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

The community is making plans to switch to the Cobden WD within the next few years since their aging treatment plant is in poor condition.



Note: *Residents of the Union-Jackson Farm Workers camp raise summer water demand.

Ashland

System Description:

Water is pumped from Little Indian Creek at up to 150 gpm and Ashland Lake (Old Reservoir) at up to 100 gpm into an off-channel reservoir (New Reservoir) before reaching the treatment plant. Wells are available as emergency sources.

Satellite Communities and Water Districts:

None

Population Served: 1,360

County: Cass

Watersheds: Illinois

Water Sources

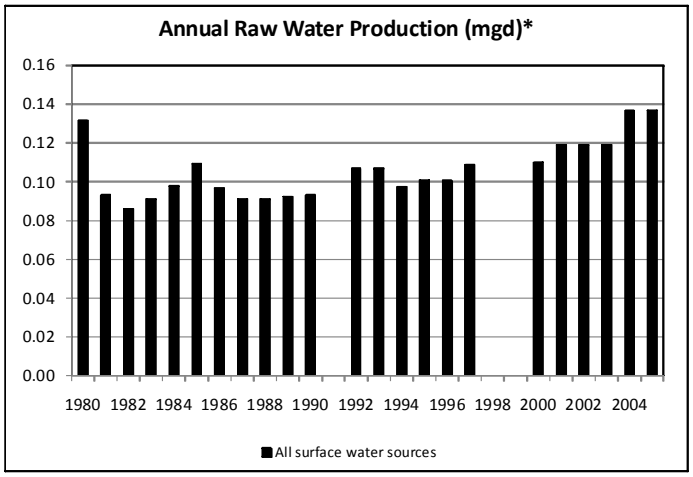
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Little Indian Creek	RW	Little Indian Cr	0.26	N/A	N/A	N/A	N/A
Ashland Lake	IR	Little Indian Cr Trib	N/A	10	83	1964	N/A
Off-Channel Res.	OCR	Little Indian Cr	N/A	35	117	1977	N/A
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

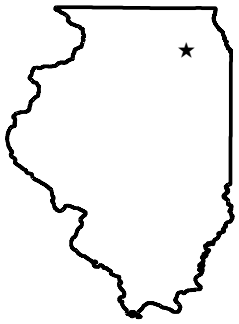
Developments since 1989:

Voluntary restrictions were implemented during the 2005 drought, during which emergency wells were used at least twice.



Note: *Emergency well use is not shown.

Aurora



System Description:

Aurora receives water from an intake on the Fox River and 17 wells. The Fox River supplies 40-60% of the system's water depending on water quality conditions. The amount of groundwater used increases during occasional periods when algae causes taste and odor problems in the river water.

Satellite Communities and Water Districts:

None

Population Served: 171,500

County: Kane

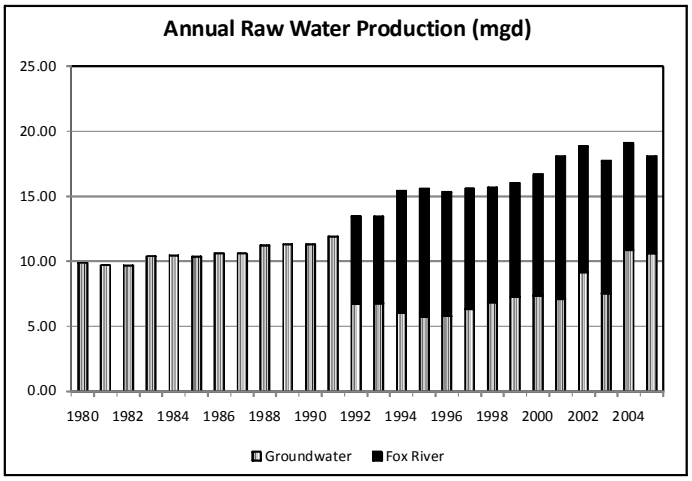
Watersheds: Fox

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Fox River	RW	Fox R	1706	N/A	N/A	N/A	N/A
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Fox River at Algonquin (05550000)



Developments since 1989:

Permanent ordinance for outdoor watering (odd- and even-day restrictions) was passed in 2006 to reduce summer demand. Continued population growth could raise average daily demand to 24.1 mgd and peak demand to 39.3 mgd in 2030. The system plans to add more wells to augment its supply.

Blandinsville

System Description:

Blandinsville pumps water from La Harpe Creek into an off-channel reservoir at up to 500 gpm. A second off-channel reservoir 1.5 miles upstream is available for backup storage when necessary.

Satellite Communities and Water Districts:

None

Population Served: 790

County: McDonough

Watersheds: La Moine

Water Sources

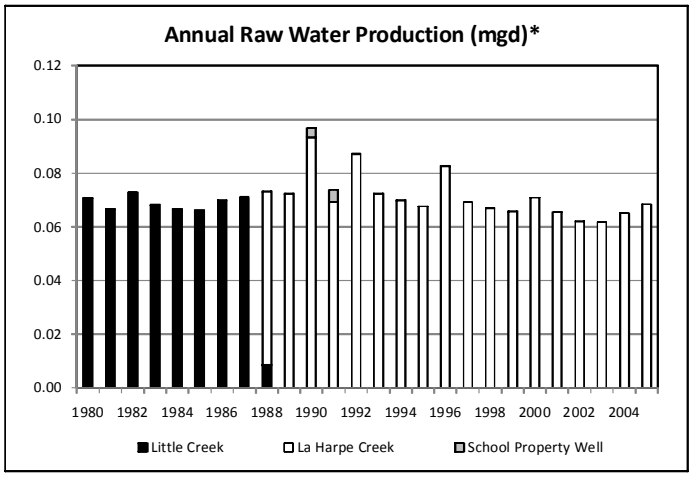
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Off-Channel Res. (#1)	OCR	La Harpe Cr	13.5	8	75	1978	N/A
Off-Channel Res. (#2)	OCR	La Harpe Cr	N/A	5	51	1992	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

A new off-channel reservoir for backup storage was constructed in 1992. The community did not implement any mandatory conservation measures during the 2005 drought, but it often could pump only 7-8 hours per day during this period.



Note: *The School Property well is no longer online due to poor water quality. Withdrawals from Little Creek ceased after 1988 due to low flow problems.

Bloomington

System Description:

Water is pumped directly to the treatment plant from two impounding reservoirs, Lake Bloomington and Evergreen Lake. An intake on the Mackinaw River can pump up to 14,000 gpm into Evergreen Lake during droughts if required instream flows in the river are maintained.

Satellite Communities and Water Districts:

Bloomington Township - West Phase, Crestwicke, Hudson, and Towanda

Population Served: 72,330

County: McLean

Watersheds: Mackinaw

Water Sources

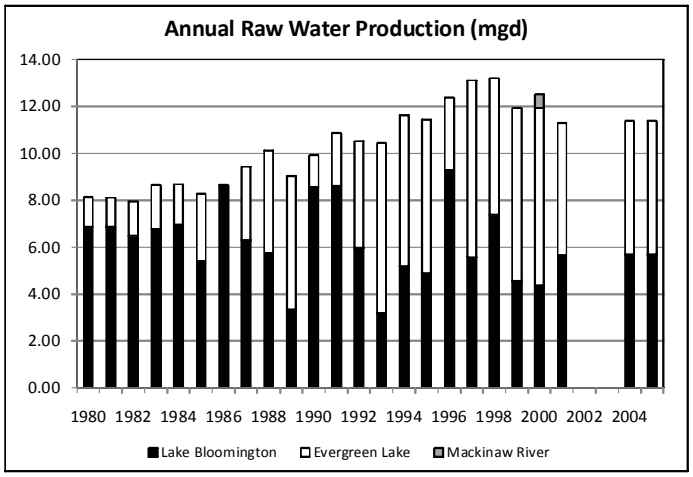
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Bloomington	IR	Money Cr	69.1	540	6800	1999	N/A
Evergreen Lake	IR	Six Mile Cr	N/A	900	15255	1999	N/A
Mackinaw River	RW	Mackinaw R	400	N/A	N/A	N/A	N/A

1989 Study: 20-year drought yield insufficient at 2000 level of water use.

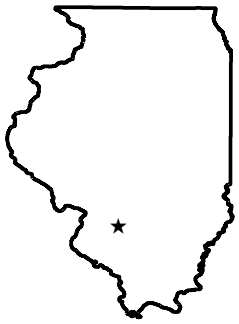
USGS Gages: Money Cr - Towanda (05564400), Hudson (05564500), Mackinaw R near Congerville (05567500)

Developments since 1989:

The Evergreen Lake spillway was raised 5 feet in 1995. The Mackinaw River was used in 2000 and 2006. New groundwater sources are being evaluated, including a ~20 mgd regional supply in western McLean County and another in the Danvers bedrock valley of the Mahomet aquifer that could provide 2-3 mgd for blending when nitrate levels in Lake Bloomington are high.



Breese



System Description:

Two separate intakes on Shoal Creek convey water at up to 700 gpm each into two off-channel reservoirs that can exchange water via a valve. A 2.0 mgd treatment plant (during normal operations) can receive water from either reservoir or directly from the downstream intake on Shoal Creek via gravity flow.

Satellite Communities and Water Districts:

Aviston, Carlyle SW, Germantown, North RWD, and St. Rose

Population Served: 9,500

County: Clinton

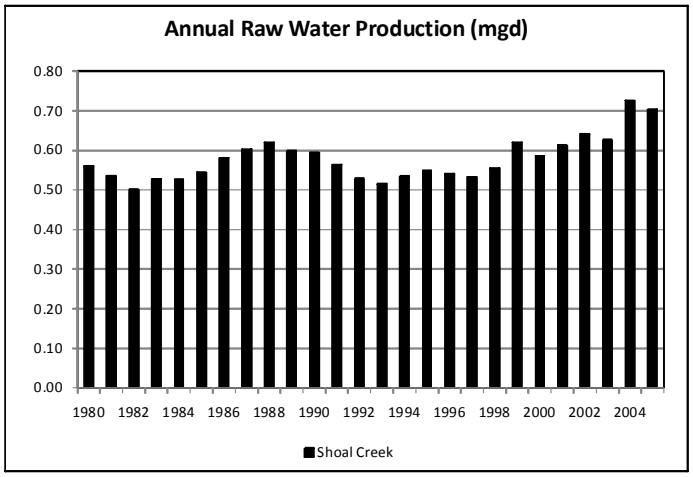
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Off-Channel Res. (#1)	OCR	Shoal Cr	735	8	94	2005	N/A
Off-Channel Res. (#2)	OCR	Shoal Cr	735	8	94	2005	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Shoal Creek (05594000) near Breese



Developments since 1989:

A 2.0 mgd treatment plant replaced its 1.2 mgd predecessor in 2006. A second 94 ac-ft off-channel reservoir was constructed in 2006, bringing total raw water storage capacity to 188 ac-ft.

Canton

System Description:

Canton Lake provides water to the community. Two deep wells, which have had some radium contamination problems, can raise lake levels when necessary. Backup wells often supplement production from Canton Lake.

Satellite Communities and Water Districts:

Cuba, Dunfermline - St. David, Fairview, Fayette, Norris, and Wee-Ma-Tuk WD

Population Served: 20,000

County: Fulton

Watersheds: Illinois

Water Sources

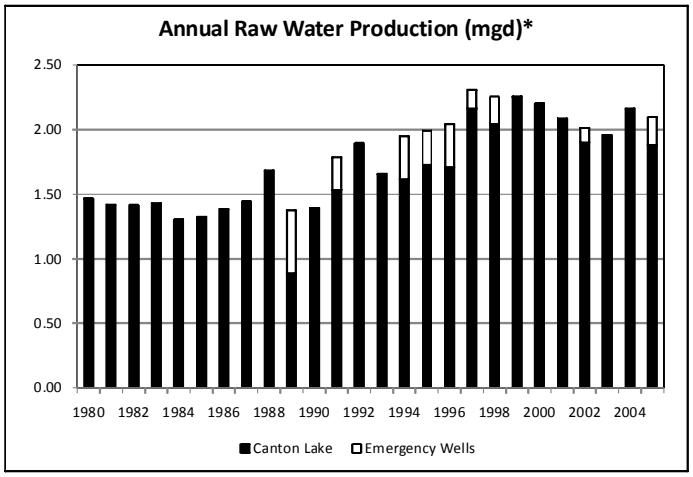
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Canton Lake	IR	W Br Copperas Cr	15	250	3020	1992	N/A
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available

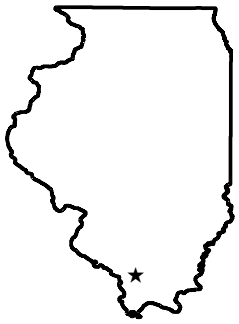
Developments since 1989:

The community is hoping to begin using a radial collection well to pump water from the Illinois River in 2009. The intake on Canton Lake still would be maintained as a backup source. The community did not experience any supply problems during the 2005 drought, but customers complained about the taste and odor of the water. Beginning in 2008, an ethanol plant will require 1 mgd.



Note: *Establishment of the Illinois River Correctional Center in 1989 raised Canton's water demand.

Carbondale



System Description:

Cedar Lake, the only regular source, supplies up to 17 mgd to the system. The Carbondale (City) Reservoir is available as an emergency source.

Satellite Communities and Water Districts:

Buncombe, Crab Orchard, Giant City State Park, Lakeside RWD, South Highway WD, and Southern Illinois University

Population Served: 38,785

County: Jackson

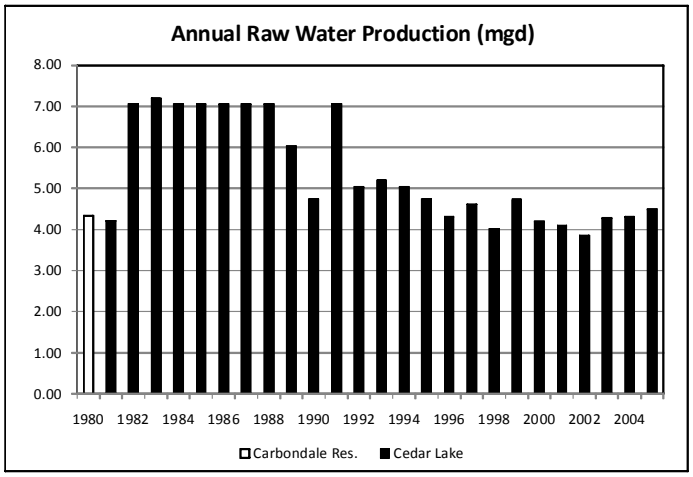
Watersheds: Big Muddy

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Cedar Lake	IR	Cedar Cr	30.2	2065	28365	1978	26577
Carbondale Res.	IR	Piles Fk Big Muddy	N/A	120	1193	1948	712

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available



Developments since 1989:

Limited access to Cedar Lake makes it less prone to sedimentation. The development of rural water districts in southern Illinois has reduced the system's water demand.

Carlinville

System Description:

The city receives water from Lake Carlinville (Lake I) at 1200 gpm. Loveless Lake (Lake II) provides backup storage. Both lakes have direct connections with the 1.58 mgd treatment plant.

Satellite Communities and Water Districts:

Central Macoupin County RWD and Lake Williamson

Population Served: 7,900

County: Macoupin

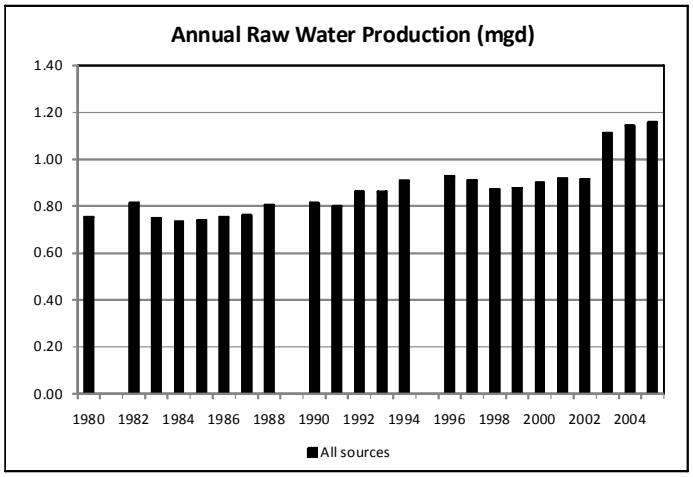
Watersheds: Macoupin

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Carlinville	IR	Honey Cr	25.4	170	1650	1986	1397
Loveless Lake	IR	Honey Creek Trib	N/A	N/A	1765	1995	N/A

1989 Study: 50-year drought yield insufficient at 1990 level of water use.

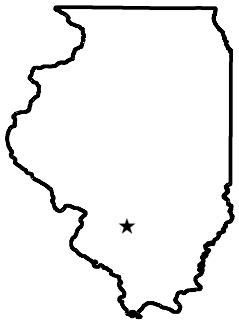
USGS Gages: No data available



Developments since 1989:

Carlinville purchased Loveless Lake from a private owner in 1995 to serve as a backup source. The lake was used during the 2005 drought. A proposed intake on Macoupin Creek would pump water to Lake Carlinville. The treatment plant soon will be upgraded to 2.25 mgd.

Carlyle



System Description:

Carlyle pumps up to 2 mgd from the Kaskaskia River downstream of Carlyle Lake. Breese can provide additional water to the Carlyle SW WD satellite during periods of high demand in Carlyle.

Satellite Communities and Water Districts:

Beckemeyer, Clinton County East WD, Clinton County North WD, Clinton County SW WD, and Keyesport

Population Served: 12,550

County: Clinton

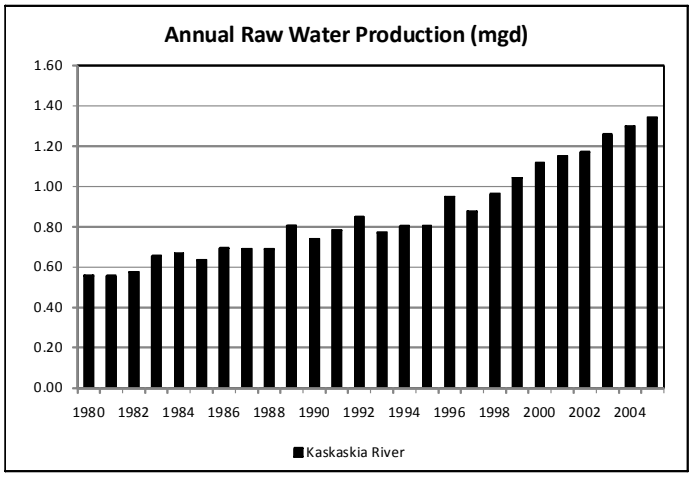
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Kaskaskia River	RW	Kaskaskia R	2717	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient for present level of water use.

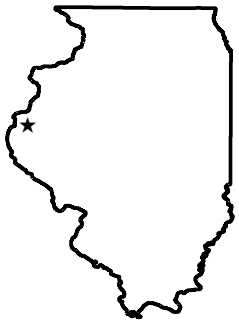
USGS Gages: Kaskaskia River near Venedy Station (05594100)



Developments since 1989:

Carlyle currently is expanding the capacity of the 2 mgd treatment plant it constructed in 1996 to 3 mgd.

Carthage



System Description:

Water from Carthage Lake can reach the treatment plant via gravity flow at up to 1,200 gpm, but the treatment plant only can process 600 gpm due to turbidity. Water from the Mississippi River also is purchased from Hamilton, although leaks in this transmission line reduce the amount that community actually receives.

Satellite Communities and Water Districts:

None

Population Served: 2,725

County: Hancock

Watersheds: Mississippi No. Central

Water Sources

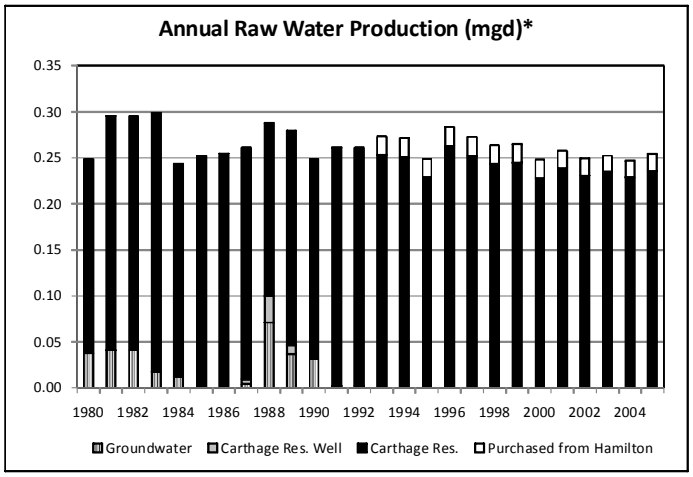
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Carthage Lake	IR	Long Cr Trib	3.07	37	487	1981	337
Hamilton CWS	SWP	Mississippi R	N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

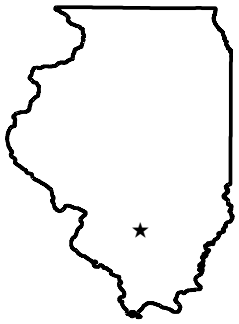
Developments since 1989:

The 2005 drought lingered in Carthage through March 2007. Bulk water sales were banned, but car washes were not shut off and lawn watering restrictions were often not enforced. Bidding for a new transmission line from Hamilton is underway. The viability of a deep well system also is being explored.



Note: *Carthage abandoned its wells after 1990. Daily purchases from Hamilton were as high as 0.18 mgd during the 2005 drought.

Centralia



System Description:

Centralia can pump up to 7.56 mgd from Carlyle Lake to Raccoon Lake via the Old Texaco pipeline. Water from Lake Centralia also is used to fill Raccoon Lake. In 2007, regular production from Carlyle Lake began.

Satellite Communities and Water Districts:

Hoffman, Hoffman RWD, Hoyleton RWC, Irvington, Junction City, Odin, Raccoon Water Co., Richview, Sandoval, and Wamac

Population Served: 36,000

County: Marion

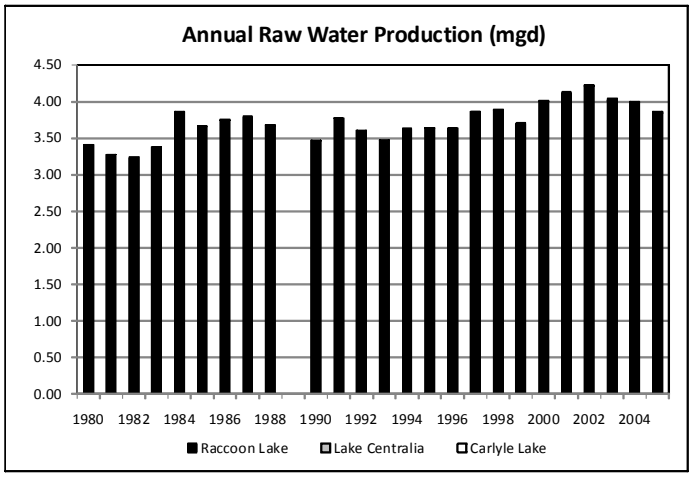
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Raccoon Lake	IR	Raccoon Cr	48.4	671	5230	1959	4128
Lake Centralia	IR	Martin Br	7	297	2772	1976	2632
Carlyle Lake*	IR	Kaskaskia R	2712	26000	32692	1976	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

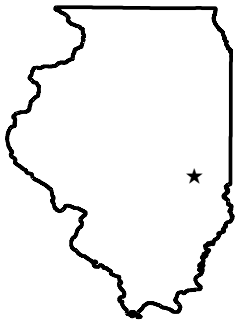


Note: *The capacity of Carlyle Lake listed is the volume allocated only for water supply.

Developments since 1989:

Construction of a new pipeline from the intake at Boulder on Carlyle Lake to Raccoon Lake was two-thirds complete as of October 2007. There are plans to build a larger near-shore intake on Carlyle Lake.

Charleston



System Description:

Water is pumped from the Embarras River to the Charleston Side Channel Reservoir (CSCR), an off-channel reservoir, at up to 7,500 gpm before being relayed to the community's new 4.5 mgd treatment plant at up to 3,125 gpm using a single-level intake structure.

Satellite Communities and Water Districts:

Eastern Illinois University and Long Acre Estates

Population Served: 21,520

County: Coles

Watersheds: Embarras

Water Sources

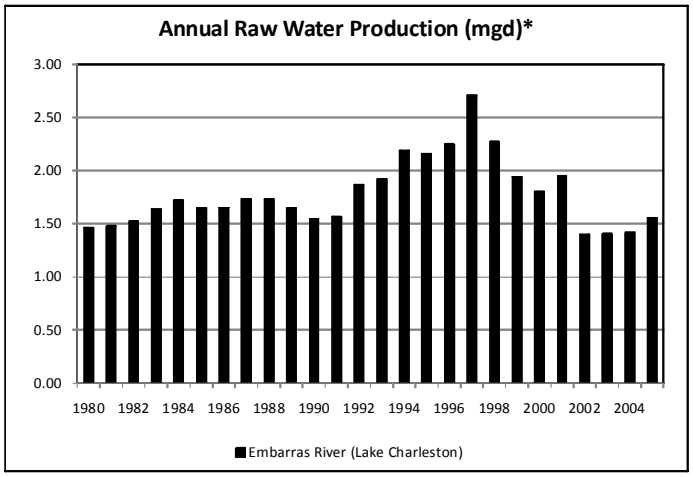
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Charleston	IR	Embarras R	786	N/A	226	N/A	N/A
Off-Channel Res.	OCR		1.77	339	2871	1996	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Embarras River near Diona (03344000) and at Ste. Marie (03345500)

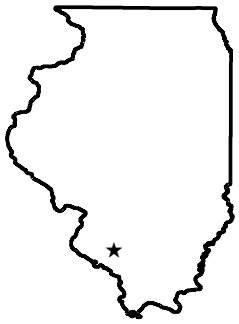
Developments since 1989:

A new treatment plant eliminated a chronic taste and odor problem in 2005. Several CSCR locations have received shoreline erosion treatment since 1991, and a sedimentation basin was built in its northwest cove. Eastern Illinois University implemented a conservation program 2006. There are plans to build an emergency connection with Mattoon.



Note: *Poor meter locations in old treatment plant may have overestimated production by 0.3 mgd prior to April 2005.

Coulterville



System Description:

Water is withdrawn from Lake Coulterville and pumped directly to the treatment plant at up to 400 gpm. Lake Coulterville also supplies the Black Beauty Coal Company's Gateway mine with potable water.

Satellite Communities and Water Districts:

None

Population Served: 1,300

County: Randolph

Watersheds: Kaskaskia

Water Sources

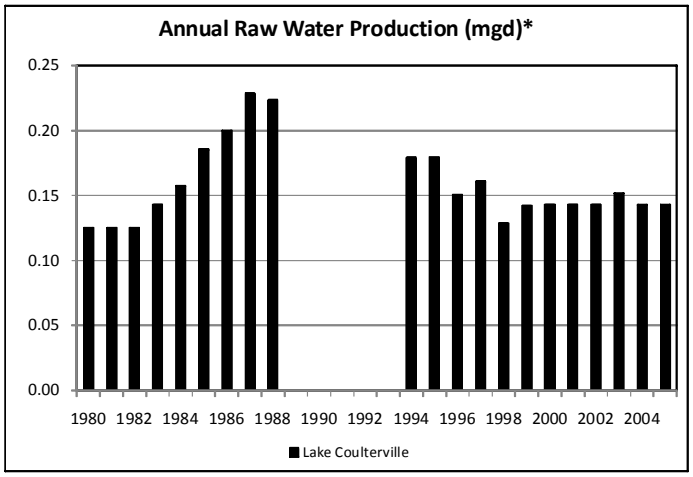
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Coulterville	IR	S Fk Mud Cr Trib	1.22	31	188	1954	150

1989 Study: 20-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available

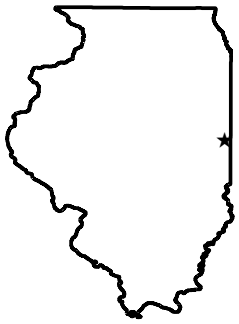
Developments since 1989:

Water supply implications for a possible expansion of the coal mine are unknown. In 1990, the community replaced the distribution system after only 40% of all raw water withdrawals were billed in 1988 and 1989.



Note: *Water withdrawals declined in the 1990s as the renovated distribution system had much lower loss rates.

Danville (Aqua Illinois)



System Description:

Water is released from Lake Vermilion to supply an intake located at a low channel dam next to the water treatment plant approximately 2.4 miles downstream of the lake.

Satellite Communities and Water Districts:

Danville, Belgium, Catlin, Tilton, and Westville

Population Served: 55,000

County: Vermilion

Watersheds: Vermilion - Wabash

Water Sources

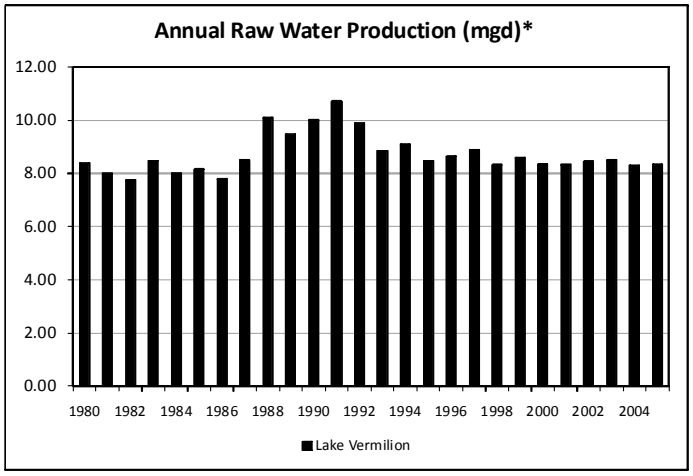
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Vermilion	IR	N Fk Vermilion R	298	878	7971	1998	6881

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: N Fk Vermilion River at Bismarck (03338780)

Developments since 1989:

Lake Vermilion's operating normal pool level was raised 4 feet in 1991.



Note: *Closure of industrial facilities has reduced water production in Danville over the past 15 years.

Decatur

System Description:

Water from Lake Decatur is pumped to a 36 mgd treatment plant. Archer Daniels Midland (ADM), a separate system, is allotted 19 mgd from the lake and purchases additional water from Decatur. During droughts, water is available from the DeWitt well field, and the Vulcan and Lake Tokorozawa gravel pits.

Satellite Communities and Water Districts:

Harristown, Long Creek, Mount Zion

Population Served: 90,243

County: Macon

Watersheds: Sangamon

Water Sources

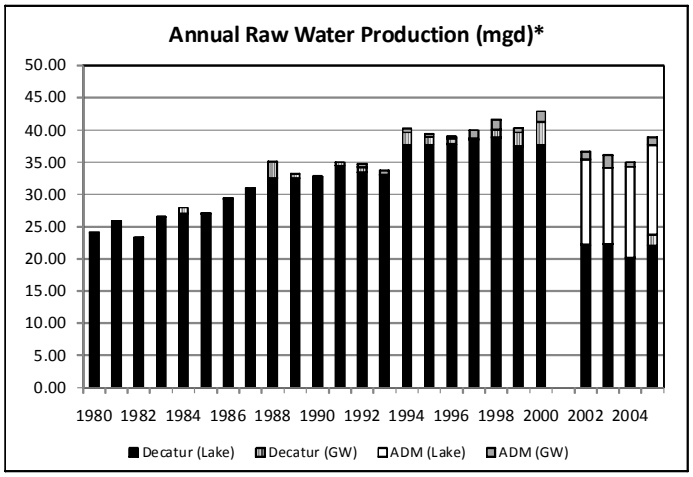
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Decatur	IR	Sangamon R	925	3093	21000	2007	15285

1989 Study: 20-year drought yield insufficient at present level of water use.

USGS Gages: Sangamon River at Monticello (05572000)

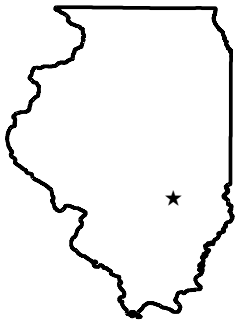
Developments since 1989:

Mandatory use restrictions were implemented in 1988 and 2007 while voluntary ones were requested in 1999 and 2000. The normal pool elevation was raised from 613.5 to 614.3 feet. Ongoing dredging projects maintain the reservoir's storage volume. A 6,200 ac-ft off-channel reservoir and an intake in the lower portion of the lake have been proposed.



Note: *Withdrawals for Decatur and ADM are shown separately to illustrate the impact the two systems may have on water availability in Lake Decatur. Production from ADM's wells is also shown.

Effingham



System Description:

Water is pumped from two intakes on the Little Wabash River to a 2.45 mgd treatment plant via CIPS Lake. Water from Lake Sara can be gravity fed to CIPS Lake during low flow periods. Direct lines connecting the Little Wabash River and Lake Sara to the plant are also available. A new transmission line allows water purchased from Holland Regional Water Supply to be pumped to Lake Sara.

Satellite Communities and Water Districts:

EJ Water Corp., Lake Sara Co-op, Heartville, Lincoln Prairie, Snake Trail WA, and Teutopolis

Population Served: 20,510

County: Effingham

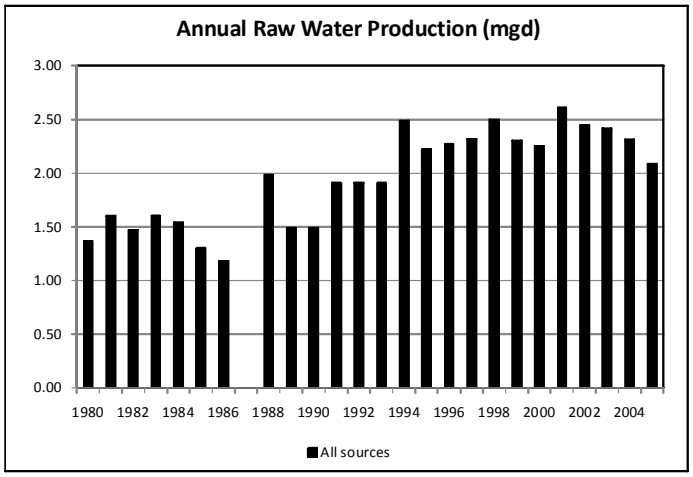
Watersheds: Little Wabash

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Sara	IR	Blue Point Cr	11.8	519	13808	1957	13263
Little Wabash River	RW	Little Wabash R	240	N/A	N/A	N/A	N/A
CIPS Lake	IR	Little Wabash Trib	0.84	17	282	1934	225
Holland Regional	SWP	Kaskaskia R	N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

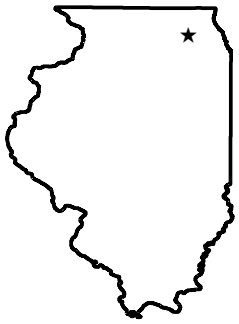
USGS Gages: Little Wabash River near Effingham (03378635)



Developments since 1989:

Effingham has an agreement to purchase up to 3 mgd from the Holland Regional Water Supply. In Decmbeer 2006, a pipeline from the regional supply to the city was completed.

Elgin



System Description:

Elgin pumps approximately 96% of its water from the Fox River and can treat up to 32 mgd. Withdrawals from eight wells are occasionally used for blending for ice control during the winter and infrequent taste and odor problems.

Satellite Communities and Water Districts:

Bartlett and Sleepy Hollow

Population Served: 125,100

County: Kane

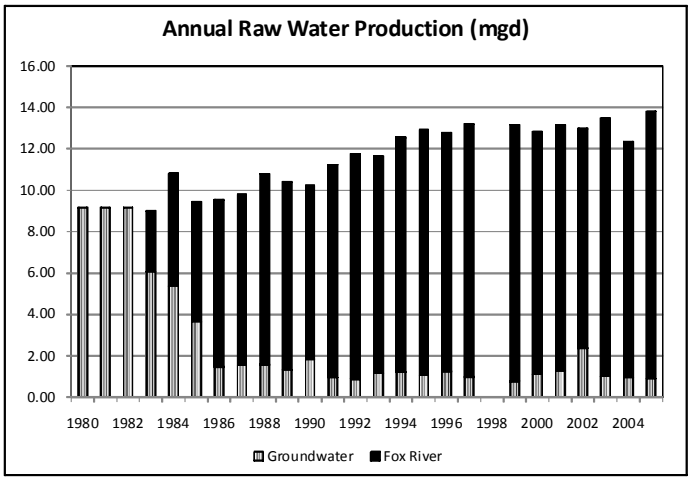
Watersheds: Fox

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Fox River	RW	Fox R	1550	N/A	N/A	N/A	N/A
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

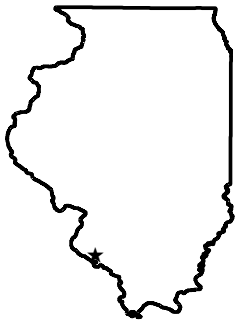
USGS Gages: Fox River at Algonquin (05550000)



Developments since 1989:

Elgin did not need to institute any use restrictions during the 2005 drought. The system is in the design phase of expanding their treatment plant's capacity to 42 mgd. This expansion should allow the Fox River to adequately supply the system's projected 2035 population of 190,000.

Evansville



System Description:

Water is withdrawn from an intake along the Kaskaskia River downstream of Carlyle Lake at up to 400 gpm.

Satellite Communities and Water Districts:

None

Population Served: 750

County: Randolph

Watersheds: Kaskaskia

Water Sources

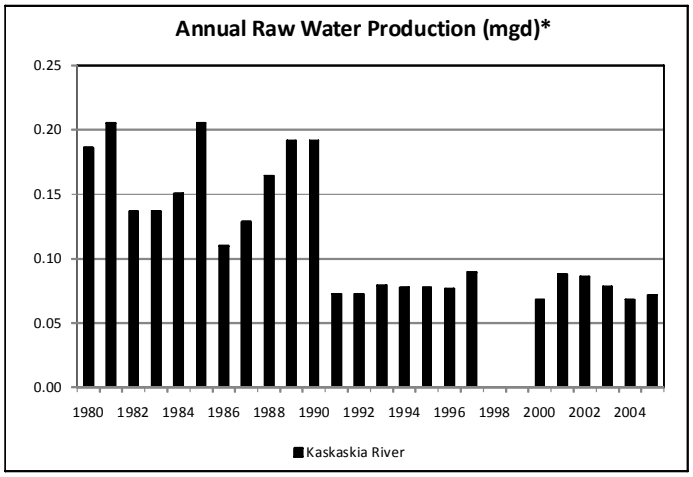
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Kaskaskia River	RW	Kaskaskia R	5718	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Kaskaskia River near Venedy Station (05594100)

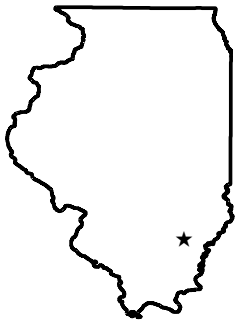
Developments since 1989:

None



Note: *Loss of satellite community at Ellis Grove (circa 1991) reduced overall production.

Fairfield



System Description:

An intake on the Little Wabash River can pump water to an off-channel reservoir or directly to the system's 2.1 mgd treatment plant.

Satellite Communities and Water Districts:

Boyleston, Jasper, and New Hope

Population Served: 6,621

County: Wayne

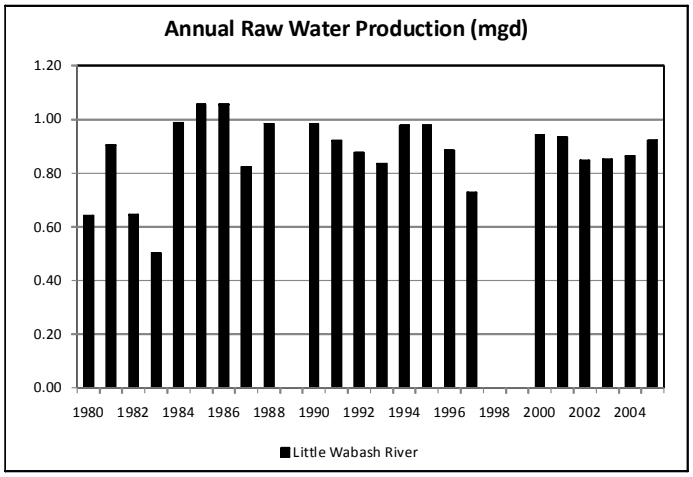
Watersheds: Little Wabash

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Little Wabash River	RW	Little Wabash R	1792	N/A	N/A	N/A	N/A
Off-Channel Res.	OCR	Little Wabash R	N/A	56	276	1989	N/A

1989 Study: 50-year drought yield insufficient at 1990 level of water use.

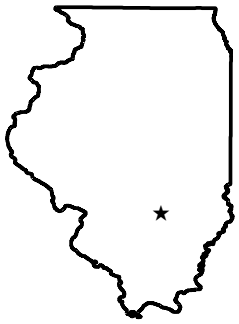
USGS Gages: Little Wabash River below Clay City (03379500)



Developments since 1989:

A new, small impoundment, expected to be built within the next few years, will receive water pumped through the first off-channel reservoir, but likely will not directly receive river water. There are plans for a new treatment plant with a capacity between 2.5 and 5 mgd. The current plant began operating in 1920.

Farina



System Description:

The Farina Borrow Pit stores water pumped from the East Fork of the Kaskaskia River at up to 1250 gpm while the Loy Borrow Pit receives runoff from a drainage ditch at up to 900 gpm. The Loy Borrow Pit feeds the Farina pit, and the recently constructed Sigrist Pit, which came online in 2006, is connected to the Loy pit.

Satellite Communities and Water Districts:

None

Population Served: 550

County: Fayette

Watersheds: Kaskaskia

Water Sources

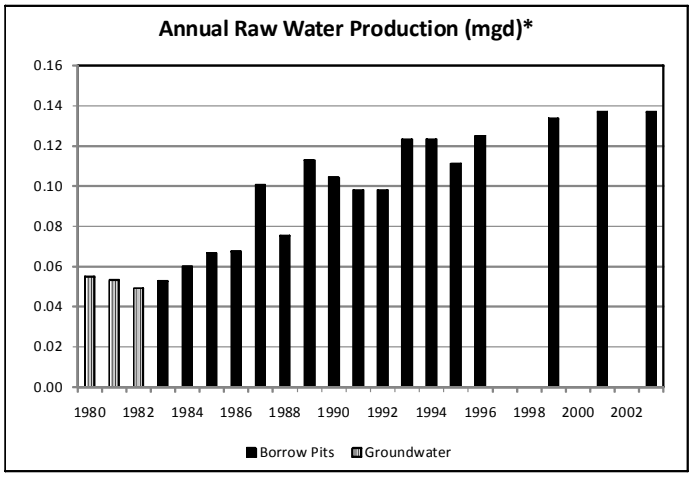
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Farina Borrow Pit	OCR	E Fk Kaskaskia R	3.26	2	20	N/A	N/A
Loy Borrow Pit	OCR	E Fk Kaskaskia R	N/A	6	68	N/A	N/A
Sigrist Borrow Pit	QBP	N/A	N/A	6	74	2006	N/A

1989 Study: 20-year drought yield insufficient at present level of water use.

USGS Gages: No data available

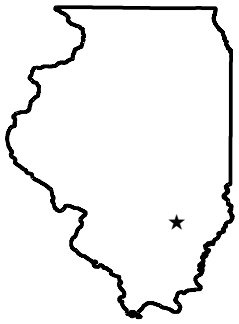
Developments since 1989:

The community developed the Loy pit several years after the 1988-89 drought. The Sigrist Borrow Pit was used for the first time in October 2007 to preserve fish in the other pits during drought conditions.



Note: *Brown Produce now uses more water to clean its storage tanks than it used in the past.

Flora



System Description:

Up to 1,300 gpm is pumped from the intake on the Little Wabash River directly to the treatment plant.

Satellite Communities and Water Districts:

Clay County WD and Xenia

Population Served: 6,100

County: Clay

Watersheds: Little Wabash

Water Sources

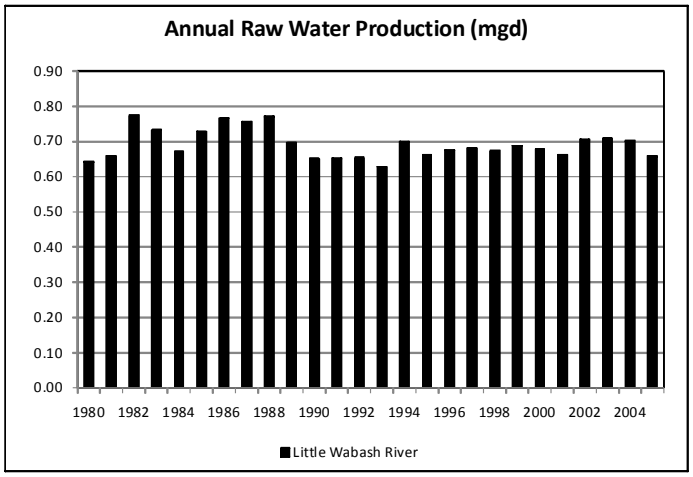
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Little Wabash River	RW	Little Wabash R	750	N/A	N/A	N/A	N/A

1989 Study: 20-year drought yield insufficient at 1990 level of water use.

USGS Gages: Little Wabash River at Louisville (03378900) and below Clay City (03379500)

Developments since 1989:

Flora plans to begin purchasing water from the Gateway Regional Water Supply when the system comes online in early 2008.



Gateway Regional Water Supply

System Description:

The Gateway Regional Water Supply expects to begin pumping water from Carlyle Lake to more than 15,000 people in Flora and eight other communities and rural water districts in early 2008. Patoka and Vernon will receive service later in 2008.

Satellite Communities and Water Districts:

Flora, Alma, Clay Co. WC, FMC WC, Iuka, NE Marion Co. WC, Raccoon WC, W. Wayne WD, and Xenia

Population Served: 15,000

County: 4 Counties**

Watersheds: Kaskaskia

Water Sources

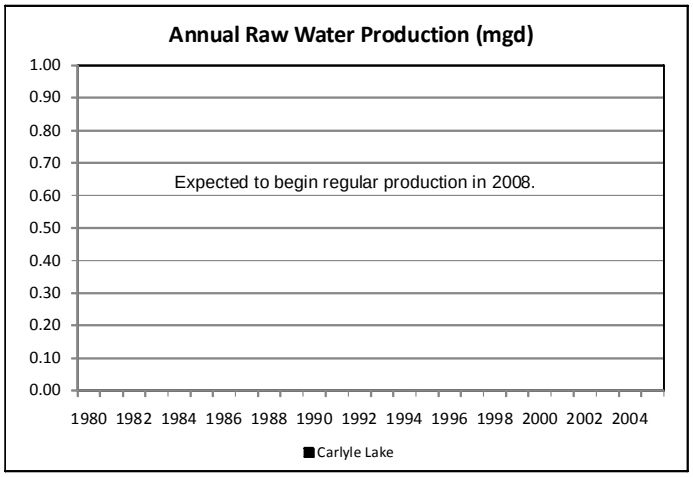
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Carlyle Lake*	IR	Kaskaskia R	2712	26000	32692	1976	N/A

1989 Study: Not in existence in 1989.

USGS Gages: Kaskaskia River at Vandalia (05592500)

Developments since 1989:

A proposed ethanol plant in Salem has expressed interest in obtaining 2 mgd from Gateway.



Note: *The capacity of Carlyle Lake listed is the volume allocated only for water supply. **The system will serve communities in Clay, Fayette, Marion, and Wayne counties.

Gillespie

System Description:

Two intakes on New Gillespie Lake pump water to the treatment plant at up to 1.4 mgd. The pumping station design allows for a dam raise up to 12 feet. Old Gillespie Lake can be accessed as an emergency source with portable pumps.

Satellite Communities and Water Districts:

Benld, Dorchester, Eagerville, Lake Kaho WD, Mount Clare, Sawyerville, and Wilsonville

Population Served: 7,700

County: Macoupin

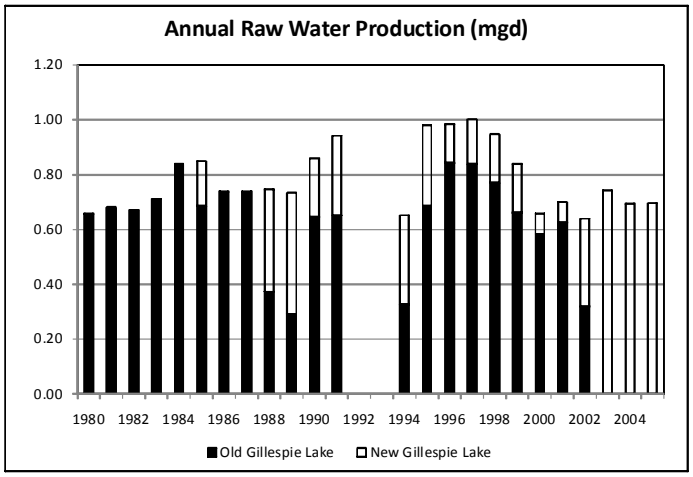
Watersheds: Macoupin

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
New Gillespie Lake	IR	Dry Fk	12.25	216	2325	1996	2131
Old Gillespie Lake	IR	Dry Fk	5.73	71	592	1996	544

1989 Study: 50-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available



Developments since 1989:

The line to Old Gillespie Lake was abandoned in 2003. However, the lake is still accessible with portable pumps during emergencies.

Greenfield

System Description:

Greenfield Lake is the main regular source while portable pumps can extract water from Coles Lake, a pond upstream, during emergencies, although this source has never been used. Water is piped directly from the lake to the system's 2.5 mgd treatment plant at 350 gpm.

Satellite Communities and Water Districts:

None

Population Served: 1,140

County: Greene

Watersheds: Macoupin

Water Sources

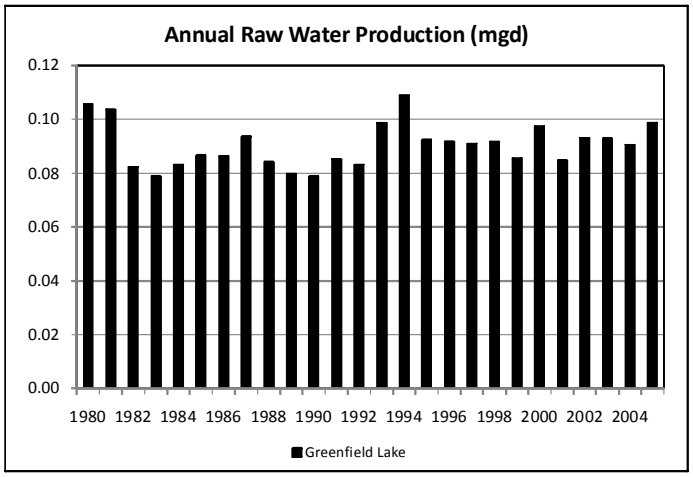
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Greenfield Lake	IR	Rubicon Cr Trib	1.11	50	564	1980	517
Coles Lake*	IR	Rubicon Cr Trib	N/A	7	49	2007	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

This community had to shut off pools and car washes and ban lawn and garden watering due to shortages from a water deficit that began during the 2005 drought. Bulk water sales were prohibited from May 2006 to January 2007. The community is working on an emergency connection with the Greene RWD.



Note: *Coles Lake never has been used as an emergency source. Its capacity estimate is based upon a rough estimate of its surface area (7 ac) and average depth (7 ft).

Greenville

System Description:

Water from Governor Bond Lake is pumped to the treatment plant by one of three pumps at up to 2100 gpm. Water from Bond-Madison WD can be obtained during emergencies.

Satellite Communities and Water Districts:

Donnellson, Mulberry Grove, Panama, Royal Lake, and Smithboro

Population Served: 7,500

County: Bond

Watersheds: Kaskaskia

Water Sources

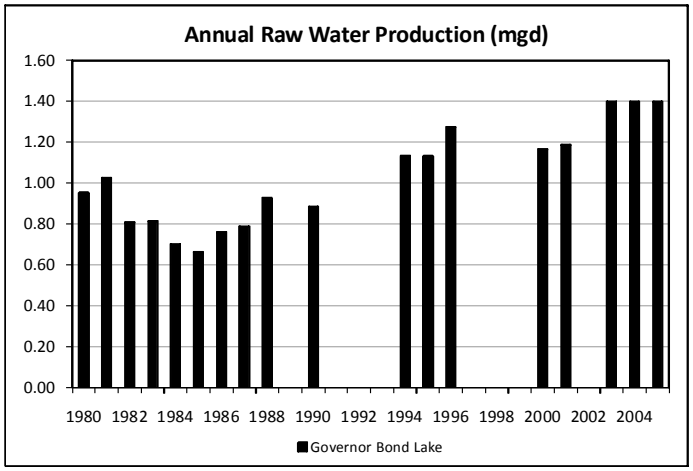
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Governor Bond Lake	IR	Kingsbury Br	735	800	9159	1996	9014

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

None



Highland

System Description:

Water is pumped from an intake on Highland Silver Lake via a wet well to a 2.2 mgd treatment plant. This system sometimes is listed as a recipient of purchased water from East St. Louis (Illinois-American) only because the village of St. Jacob receives part of its water from Bond-Madison WD, which, in turn, receives its water from East St. Louis.

Satellite Communities and Water Districts:

Grantfork, Pierron, and St. Jacob (partially)

Population Served: 12,808

County: Madison

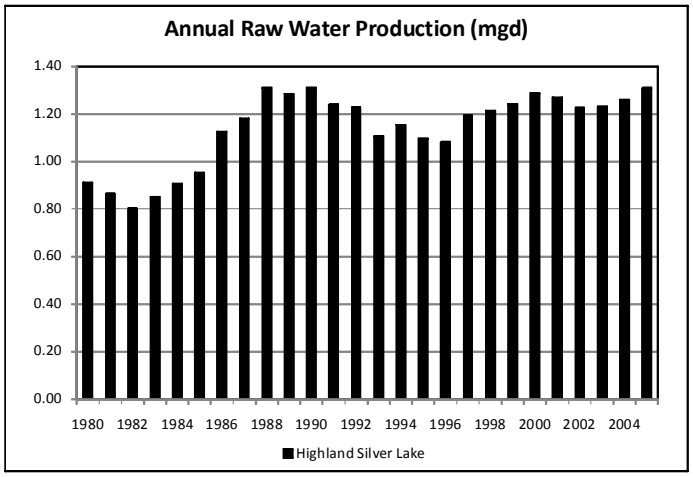
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Highland Silver Lake	IR	E Fk Silver Cr	47.1	600	5832	1999	5073

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available



Developments since 1989:

Highland is evaluating possible sedimentation reduction projects. This includes a coffer dam on the north side of the lake and fencing off a grazing ground just north of Interstate 70, which bisects the lake. Algae caused minor taste and odor problems during the 2005 drought.

Hillsboro

System Description:

The treatment plant receives water from Glenn Shoals Lake and Lake Hillsboro at 1200 gpm. Glenn Shoals Lake provides about 90 percent of the water, although the plant does not meter the two sources separately. A 38-acre sediment and nutrient control basin is located on the lake's northeastern shore.

Satellite Communities and Water Districts:

Coffeen, Schram City, and Taylor Springs

Population Served: 9,000

County: Montgomery

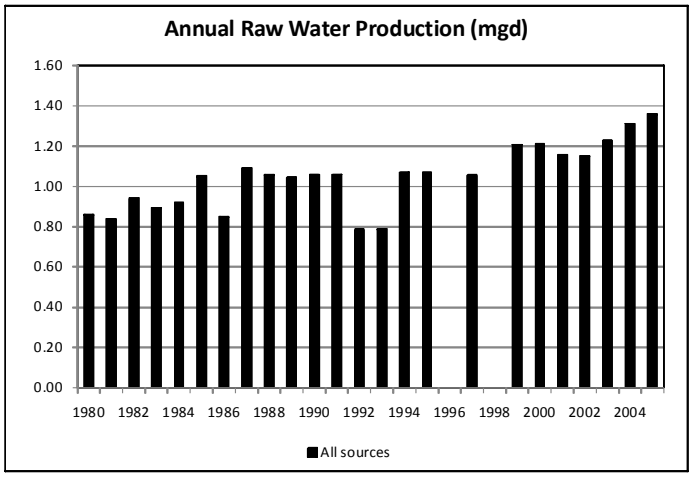
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Glenn Shoals Lake	IR	M Fk Shoal Cr	80	1250	9717	2006	11395
Lake Hillsboro	IR	Lake Hillsboro Cr	7.44	105	1018	1982	816

1989 Study: 50-year drought yield sufficient at present level of water use.

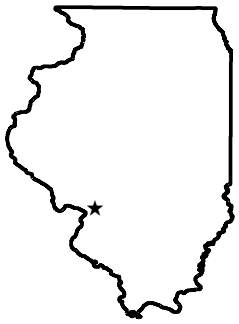
USGS Gages: No data available



Developments since 1989:

Voluntary odd- and even-day watering restrictions between 6 - 9 a.m. and 6 - 9 p.m. were instituted during the 2005 drought. Plant capacity also limited production during the summer of 2007. A new 3.5 mgd treatment plant is expected to come online in October 2008.

Holiday Shores



System Description:

Alternating pumps on two adjacent intakes on Holiday Lake convey water to the treatment plant, which currently can process just 0.38 mgd. This limited capacity constrains the community's available water supply. The lake's capacity is difficult to determine because unknown quantities constantly are being dredged.

Satellite Communities and Water Districts:

Holiday Lake Shores

Population Served: 3,192

County: Madison

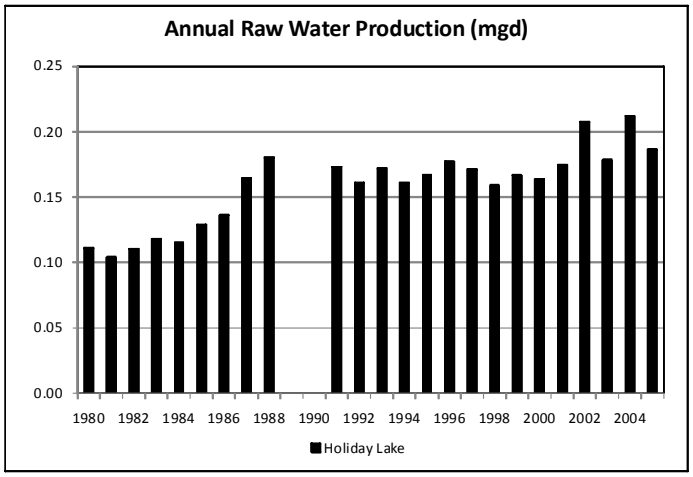
Watersheds: Mississippi So. Central

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Holiday Lake	IR	Joulters Cr	6.33	384	4605	1968	4342

1989 Study: 50-year drought yield sufficient at present level of water use.

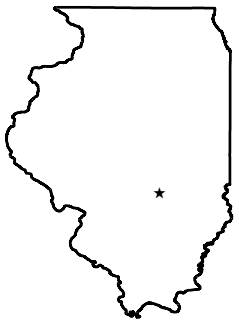
USGS Gages: No data available



Developments since 1989:

Henry, Meisenheimer, and Gende, Inc. began conducting a water supply assessment in 2007 due to the community's population growth potential (700 lots currently available). The system needs a temporary water source to repair the drains on the lake's dam. Pre-drought drawdown exacerbated 2005 drought impacts on boating, but lake levels have recovered.

Holland Regional Water Supply



System Description:

The Holland Regional Water Supply and Holland Energy share an intake on the Kaskaskia River. A 5 mgd allocation from Lake Shelbyville releases will be split between Effingham (3 mgd), EJ Water Co. (1.5 mgd), and the Lake Sara Water Co-op (0.5 mgd). The pipeline to Effingham was completed in December 2006, although regular deliveries have not begun.

Satellite Communities and Water Districts:

Effingham, EJ WC, and Lake Sara Co-op

Population Served: 0

County: Effingham

Watersheds: Kaskaskia

Water Sources

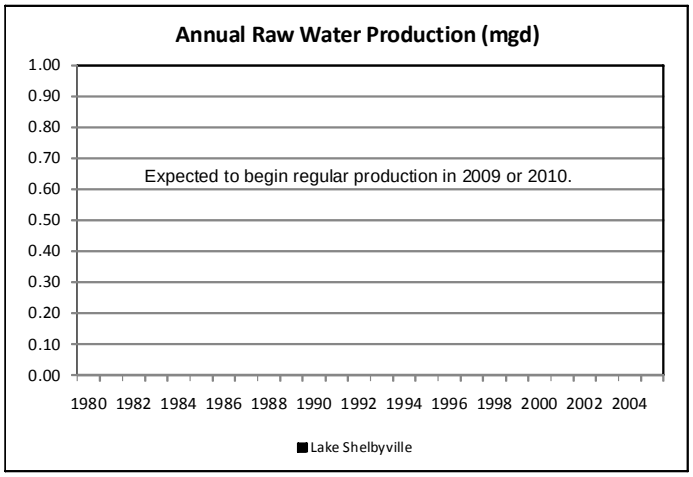
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Shelbyville*	IR	Kaskaskia R	N/A	11000	24714	N/A	N/A

1989 Study: Not in existence in 1989.

USGS Gages: Kaskaskia River at Lake Shelbyville (05592000)

Developments since 1989:

The EJ Water Co. plans to construct its own water treatment plant in 2009 or 2010.



Note: *Capacity of Lake Shelbyville listed is the total volume allocated for water supply. In 2002, Lake Shelbyville's total capacity was an estimated 177,795 ac-ft.

Jacksonville

System Description:

Most of the community's supply comes from groundwater, but Mauvaise Terre Lake supplies water during higher demand periods. Lake Jacksonville is used only to increase levels in Mauvaise Terre Lake during emergencies. A valve at the 11 mgd treatment plant lets in additional water from Mauvaise Terre Lake as needed.

Satellite Communities and Water Districts:

Alexander WD, Chapin, Concord, Franklin, Murrayville-Woodson Water Commission, North Morgan WD, and SMG WD

Population Served: 23,000

County: Morgan

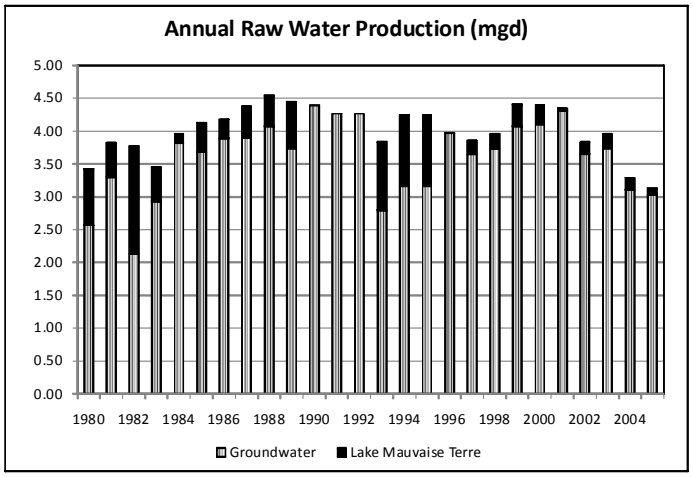
Watersheds: Illinois

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Mauvaise Terre Lake	IR	Mauvaise Terre Cr	32.6	143	628	1979	281
Lake Jacksonville	IR	Sandy Cr	10.8	465	5830	1986	5435
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

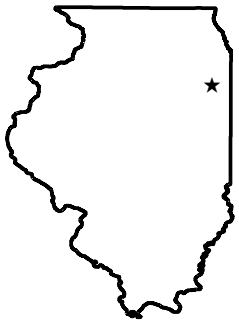
USGS Gages: No data available



Developments since 1989:

The city is considering dredging Mauvaise Terre Lake. The newly formed North Morgan County RWD connected to the system in 2007. Although groundwater access buffers the community from drought hardships, storage from Lake Jacksonville had to be released into Mauvaise Terre Lake during the 2005 drought.

Kankakee (Aqua Illinois)



System Description:

Water is pumped from two separate intakes on the Kankakee River to the water treatment plant. Plant capacity limits pumping to 22 mgd, but 30 mgd would be feasible with its four river pumps. An "air bladder" dam allows the system to create pools of water at different levels.

Satellite Communities and Water Districts:

Aroma Park, Bradley, Bourbonnais, Grant Park, and Manteno

Population Served: 76,000

County: Kankakee

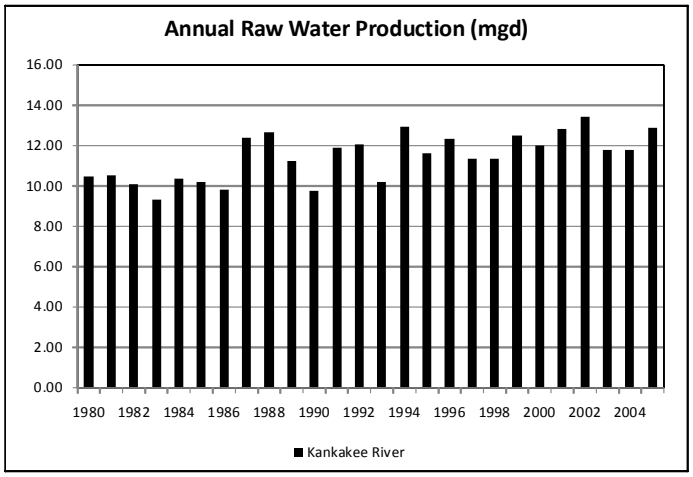
Watersheds: Kankakee

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Kankakee River	RW	Kankakee R	2159	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Kankakee River at Momence (05520500)



Developments since 1989:

Aroma Park, Grant Park, and Manteno have become part of the system's service area in the past decade.

Kaskaskia Water District

System Description:

Up to 2.23 mgd is pumped from an intake in the Kaskaskia River directly to the treatment plant. A second intake in a junction box can be activated during floods. The treatment plant could process 3.3 mgd if they upgraded their river pumps.

Satellite Communities and Water Districts:

Lenzburg, Marissa, New Athens, Peabody Coal Co., Tilden, and Washington County WC

Population Served: 25,528

County: St. Clair

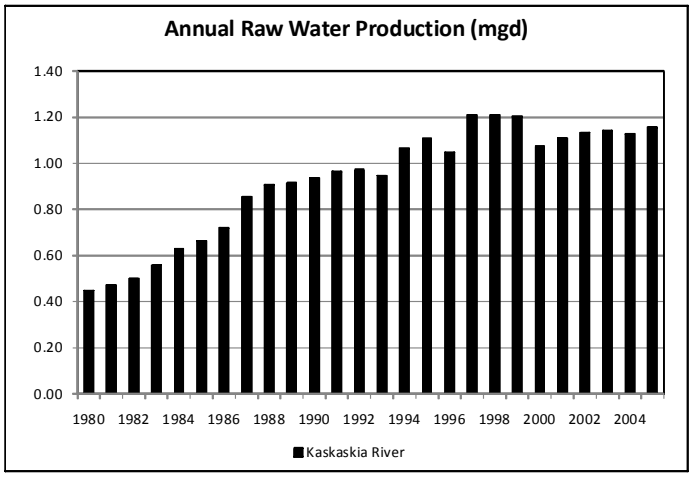
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Kaskaskia River	RW	Kaskaskia R	5181	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

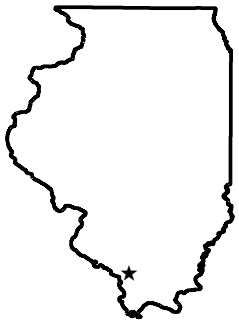
USGS Gages: Kaskaskia River near Venedy Station (05594100)



Developments since 1989:

The system has begun cleaning an area around its intake with a track hoe semi-annually to prevent sedimentation problems. A new coal power plant (Peabody Energy Campus) is expected to join the system upon completion (~5 years). The district also has attempted to use an old strip mine as an off-channel reservoir or settling basin.

Kinkaid Area Water System



System Description:

Water is pumped from intakes at three different levels in Kinkaid Lake (8 feet, 16 feet, and 24 feet) directly to the treatment plant at up to 4 mgd.

Satellite Communities and Water Districts:

Alvarado WD, Ava, Campbell Hill, De Soto, Elkville, Gorham, Murdale WD, Murphysboro, Oraville WD, and Willisville

Population Served: 27,000

County: Jackson

Watersheds: Big Muddy

Water Sources

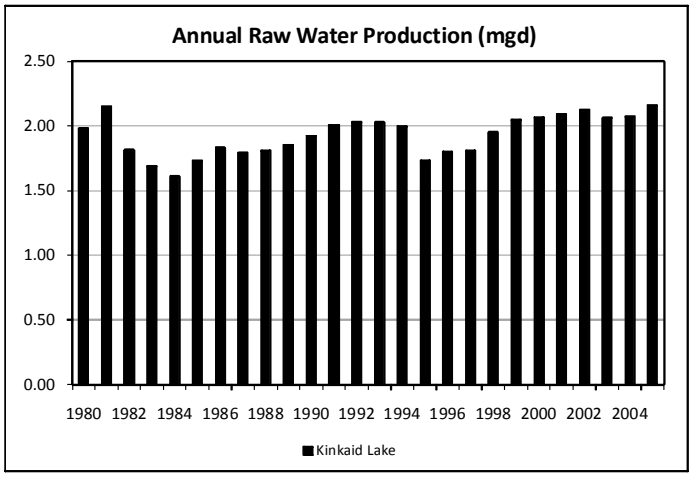
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Kinkaid Lake	IR	Kinkaid Cr	62.3	2350	79000	1976	75312

1989 Study: 50-year drought yield sufficient at present level of water use.

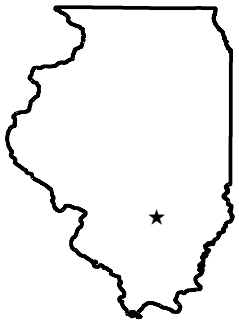
USGS Gages: No data available

Developments since 1989:

Treatment plant capacity expanded to 4.0 mgd in 1996.



Kinmundy



System Description:

New Kinmundy Reservoir, the primary source, pumps water directly to the treatment plant at up to 120 gpm. Old Kinmundy Reservoir and the Kinmundy Borrow Pit are used only during emergencies. Old Kinmundy Reservoir upstream is now used as a settling basin for New Kinmundy Reservoir. Forbes State Park uses up to 150,000 gallons per month during the summer.

Satellite Communities and Water Districts:

Forbes State Park

Population Served: 1,078

County: Marion

Watersheds: Kaskaskia

Water Sources

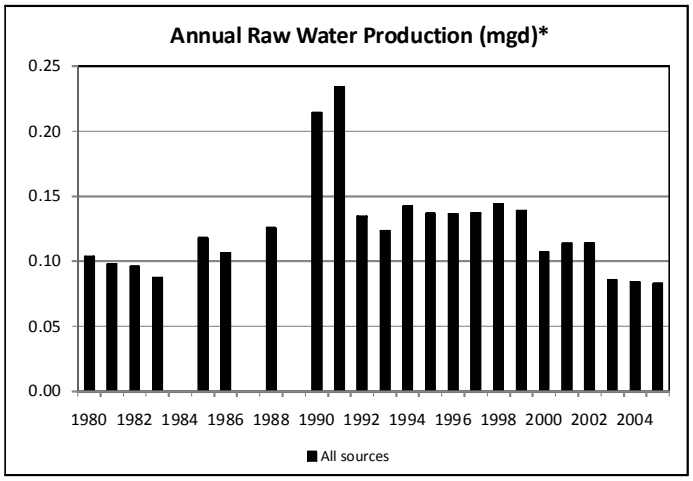
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
New Kinmundy Res.	IR	E Fk Kaskaskia Trib	1.4	107	1228	1998	N/A
Old Kinmundy Res.	IR	E Fk Kaskaskia Trib	0.55	N/A	149	1959	N/A
Kinmundy Borrow Pit	QBP	E Fk Kaskaskia Trib	N/A	10	200	1989	N/A

1989 Study: 50-year drought yield insufficient at 2020 level of water use.

USGS Gages: No data available

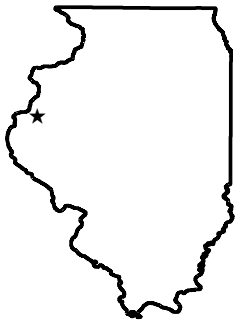
Developments since 1989:

New Kinmundy Reservoir came online in 1998. Old Kinmundy Reservoir was lowered 4 feet for a wetlands program and now is used as a settling basin. Kinmundy Borrow Pit was taken offline in 2006. These latter two sources are still available during emergencies. The new lake's large storage capacity has allowed summer bulk water sales at rates up to 0.05 mgd.



Note: *The loss of the Alma satellite (pop. ~350) has diminished recent production.

La Harpe



System Description:

Water pumped from Crooked Creek to the La Harpe off-channel reservoir at up to 500 gpm provides approximately 60 percent of the community's water. Water can be pumped from the reservoir to the surface water treatment plant at up to 160 gpm. A shallow well supplies the remaining 40 percent, all of which is treated at a separate plant.

Satellite Communities and Water Districts:

None

Population Served: 1,440

County: Hancock

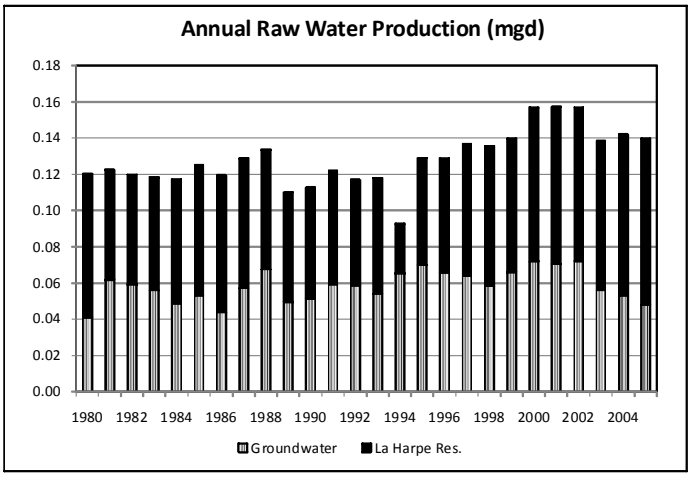
Watersheds: La Moine

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
La Harpe Reservoir	OCR	La Harpe Cr	N/A	9	99	N/A	N/A
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

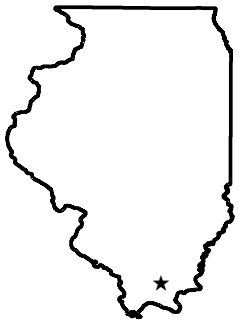
USGS Gages: No data available



Developments since 1989:

Crooked Creek went dry during the 2005 drought, but La Harpe's groundwater supply limited that impact to a bulk water sales ban. These withdrawals lowered the water table just 8 feet above the pump (70 feet below the surface), roughly 5 feet lower than the average annual minimum level. Boy Scouts have built another sedimentation basin.

Lake of Egypt Public Water District



System Description:

Water from the Lake of Egypt is purchased from the Southern Illinois Power Company and pumped to the treatment plant located in the city of Marion.

Satellite Communities and Water Districts:

Creal Springs, Devil's Kitchen, Lick Creek, and New Burnside

Population Served: 12,200

County: Williamson

Watersheds: Saline

Water Sources

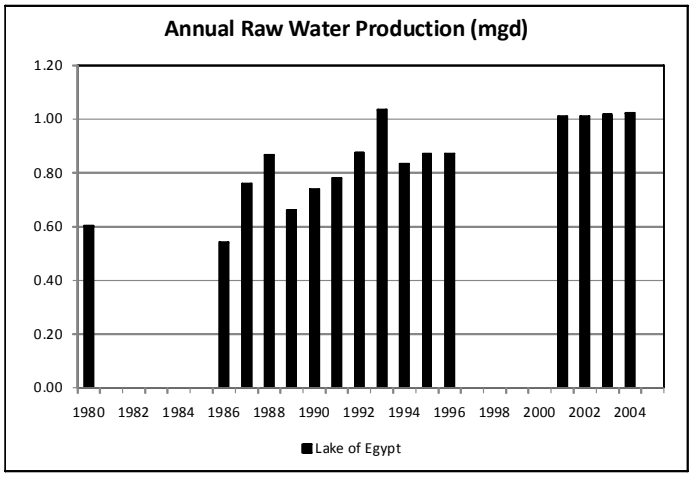
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake of Egypt	IR	S Fk Saline R	33.34	2119	41497	1961	37915

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

None



Lake Shannon, Inc.

System Description:

The IEPA considers Lake Shannon to be a groundwater under the direct influence of surface water (GWUDI) community water system. Water is withdrawn from a manhole located approximately 10 feet from this lake, which lies in a former mining pit (average depth of 45 feet). Only 90 of the community's 196 homes are occupied year-round.

Satellite Communities and Water Districts:

None

Population Served: 521

County: Kankakee

Watersheds: Illinois

Water Sources

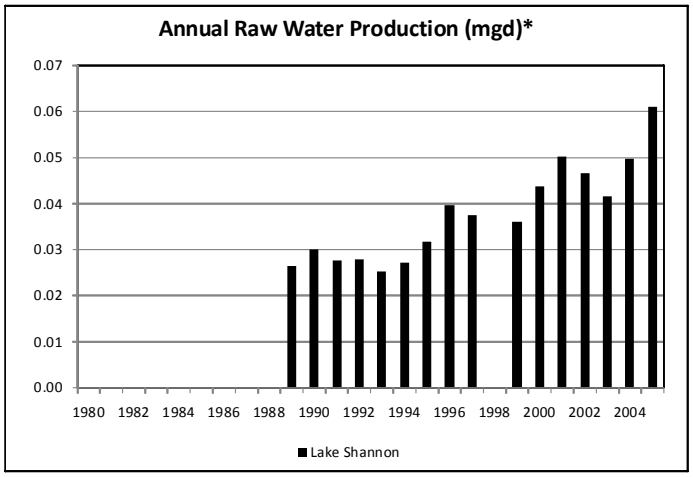
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Shannon	QBP	Lake Shannon	N/A	80	3600	N/A	N/A

1989 Study: 50-year drought yield sufficient for present level of water use.

USGS Gages: No data available

Developments since 1989:

Lake Shannon's level does not fluctuate very much during droughts. The lake only dropped one foot during the 1988-1989 drought.



Note: *Lake Shannon, Inc. began reporting its surface water use to the Illinois Water Inventory Program in 1989, but the system already was using the source prior to that date.

Litchfield

System Description:

Lake Lou Yaeger, the system's principal water source, conveys water to the 2.7 mgd treatment plant. During most years, water from Litchfield Lake is withdrawn when Lake Lou Yaeger is drawn down 4-5 feet in December to alleviate seasonally recurring water quality problems.

Satellite Communities and Water Districts:

Butler, Henderson WD, Rocky Hollow WD, and Three County WD

Population Served: 13,000

County: Montgomery

Watersheds: Kaskaskia

Water Sources

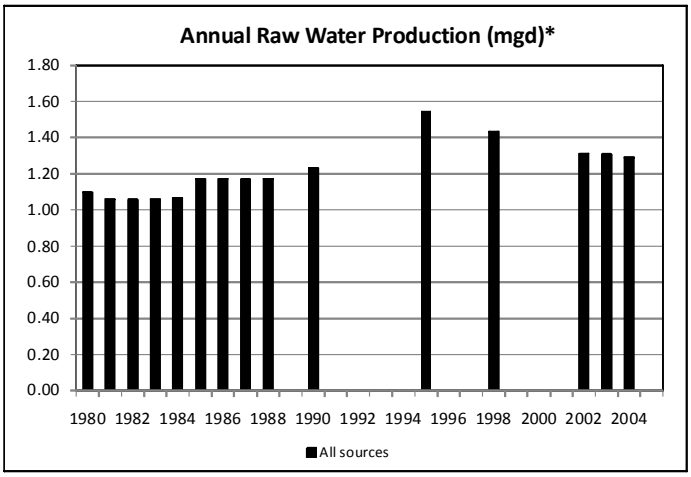
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Lou Yaeger	IR	W Fk Shoal Cr	115	1205	13906	1977	N/A
Litchfield Lake	IR	W Fk Shoal Crk Trib	N/A	13	303	1980	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

A new 4 mgd treatment plant is scheduled to go online in August 2008. Its processing capacity could be doubled to 8 mgd if necessary.



Note: *Lake Lou Yaeger and Litchfield Lake are not metered separately.

Macomb

System Description:

The system receives water from both surface (Spring Lake) and groundwater sources. The wells have been in service since a reverse osmosis plant was constructed in 2004.

Satellite Communities and Water Districts:

Bardolph, Colchester, Tennessee, and Western Illinois University

Population Served: 20,185

County: McDonough

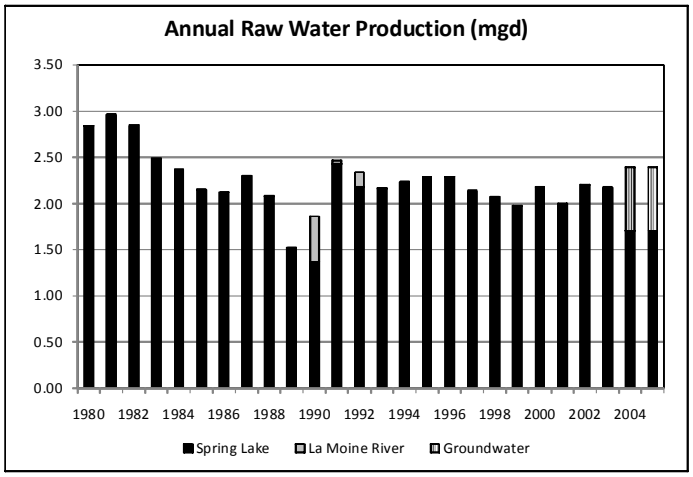
Watersheds: La Moine

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Spring Lake	IR	Spring Cr	20.2	278	1715	1996	2247
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available



Developments since 1989:

Groundwater production is expected to increase in coming years. This dependable water supply allowed the community to profit from bulk water sales during the dry 2006 summer. Western Illinois University conducted a sediment survey of Spring Lake in summer 2007 and is currently processing the results.

Marion

System Description:

Marion City Reservoir is the principal water source. Water purchased from Herrin Lake No. 2 can boost supply when needed. The city recently signed a contract with Rend Lake Intercity Water System and could join the system within two years. It would continue pumping from Marion City Reservoir on a reduced basis once this connection becomes activated.

Satellite Communities and Water Districts:

Wye WD (~50%)

Population Served: 17,700

County: Williamson

Watersheds: Big Muddy

Water Sources

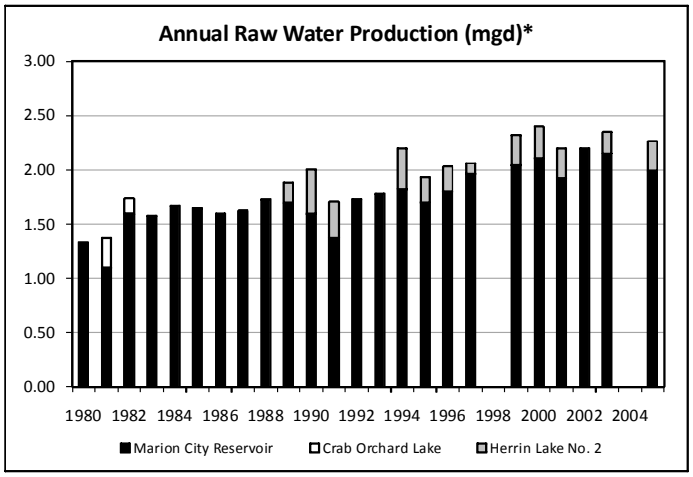
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Marion City Res.	IR	Limb Br	6.48	240	1478	1970	1318
Herrin Lake No. 2	IR	Wolf Cr	N/A	50	N/A	N/A	N/A
Marion Holding Pond	OCR	Crab Orchard Trib	N/A	N/A	N/A	N/A	N/A

1989 Study: 20-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available

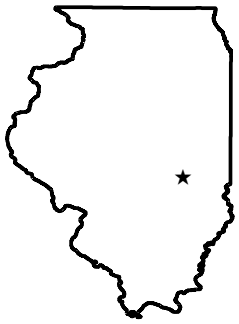
Developments since 1989:

Right-of-way easements are necessary for the city's line to Rend Lake to be constructed. In 2005, mandatory conservation measures were implemented, including car wash shutdowns and outdoor watering bans. Transmission line leaks cause the system to lose water obtained from Herrin Lake No. 2.



Note: *Crab Orchard Lake was abandoned in the 1980s due to unsafe PCB concentrations. The United States Penitentiary in Marion has its own water system.

Mattoon



System Description:

Water can be pumped to the 7 mgd treatment plant from a 4 mgd intake on Lake Paradise. Lake Mattoon is used to fill Lake Paradise as needed. Lake Mattoon water also is leased to Neoga and the Reliant Energy peaker plant.

Satellite Communities and Water Districts:

Humboldt

Population Served: 19,500

County: Coles

Watersheds: Little Wabash

Water Sources

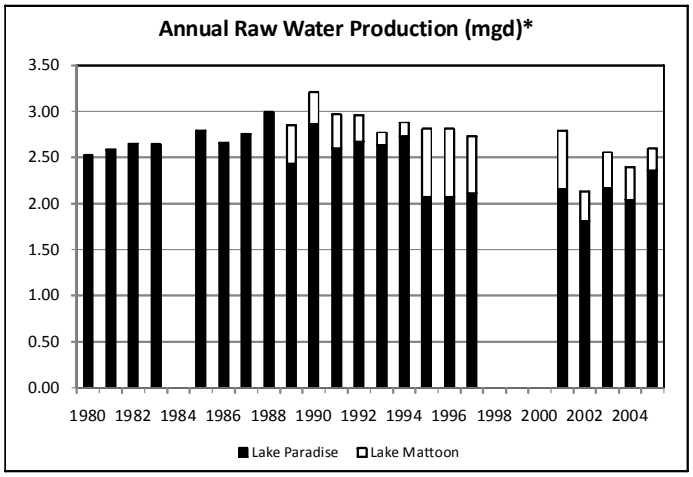
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Mattoon	IR	Little Wabash R	18.1	1027	11588	2001	9922
Lake Paradise	IR	Little Wabash R	56.0	166	1252	2001	1164

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

Reliant Energy peaker power plant has withdrawn water from Lake Mattoon since 2001. A sedimentation basin was constructed upstream of Lake Paradise in 2006. There are plans for an emergency connection with Charleston.



Note: *Withdrawals from Lake Paradise may include water originally pumped from Lake Mattoon, especially before 1989.

Mount Olive

System Description:

Old Mount Olive Lake pumps water to the treatment plant at 400 gpm. Water is pumped from New Mount Olive Lake to Old Mount Olive Lake as needed.

Satellite Communities and Water Districts:

White City

Population Served: 2,360

County: Macoupin

Watersheds: Kaskaskia

Water Sources

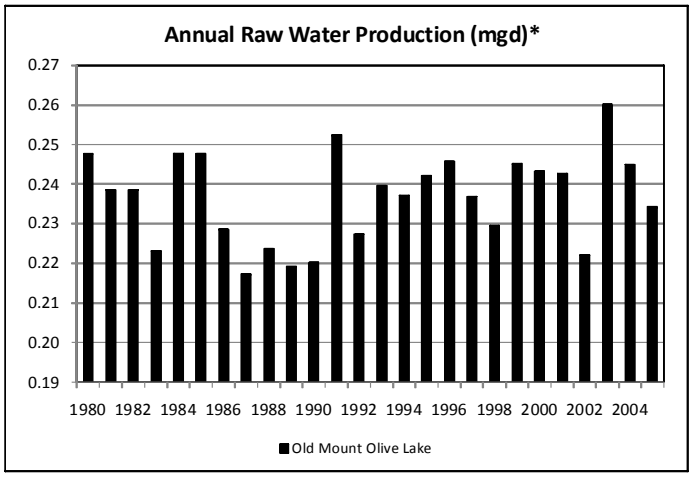
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
New Mt. Olive Lake	IR	Panther Cr	5.21	38	282	1981	N/A
Old Mt. Olive Lake	IR	Sugar Cr	0.7	29	382	1981	361

1989 Study: 50-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available

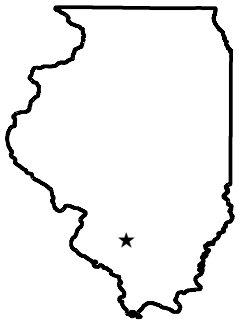
Developments since 1989:

No problems dealing with the 2005 drought were reported in spite of the system's location near other systems in west-central Illinois that suffered during the drought. No proposals to raise the lake's spillway have been successful.



Note: *Water from New Mount Olive Lake can fill Old Mount Olive Lake during droughts.

Nashville



System Description:

Water from the Kaskaskia River (1700 gpm) and the Washington County Conservation Area (CCA) Lake (500 gpm) is piped to the Nashville Reservoir before it is routed to the 2.0 mgd treatment plant at 1400 gpm. No information on Nashville's allocation of water from Washington CCA Lake could be obtained.

Satellite Communities and Water Districts:

Hoyleton and New Minden

Population Served: 3,997

County: Washington

Watersheds: Big Muddy, Kaskaskia

Water Sources

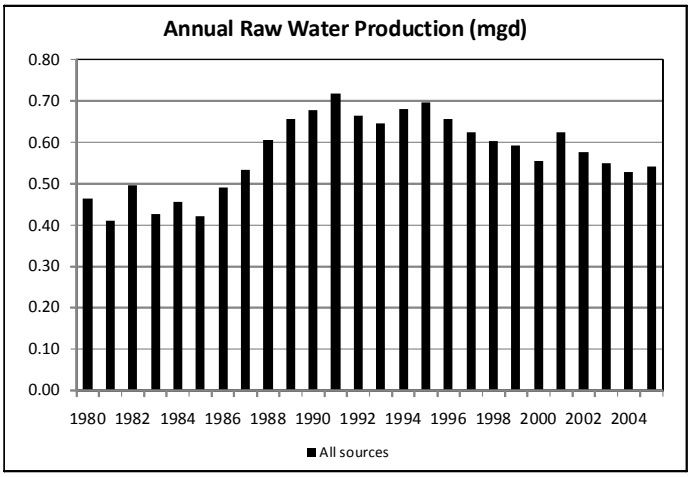
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Nashville Res.	IR	Nashville Cr Trib	1.39	52	400	1979	351
Kaskaskia River	RW	Kaskaskia R	N/A	N/A	N/A	N/A	N/A
Washington CCA Lk*	IR	Locust Creek Trib	N/A	248	3204	2004	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Kaskaskia River near Venedy Station (05594100)

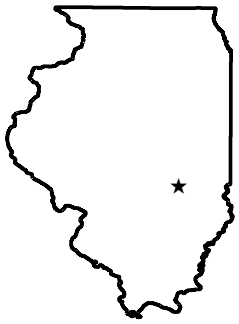
Developments since 1989:

A new 2.0 mgd treatment plant came online in 1996.



Note: *An IEPA estimate of Washington CCA Lake's capacity is reported here since it is much higher than the last reported measurement of 248 ac-ft. in 1972. No information on any storage changes could be found.

Neoga



System Description:

Neoga leases Lake Mattoon water from the City of Mattoon. The Reliant Energy peaker plant also withdraws water from the lake. Neoga has one intake on the lake that can transport water directly to the treatment plant at 255 gpm. During droughts, Lake Mattoon water is allocated to Mattoon and Neoga based on population ratios.

Satellite Communities and Water Districts:

None

Population Served: 1,854

County: Cumberland

Watersheds: Little Wabash

Water Sources

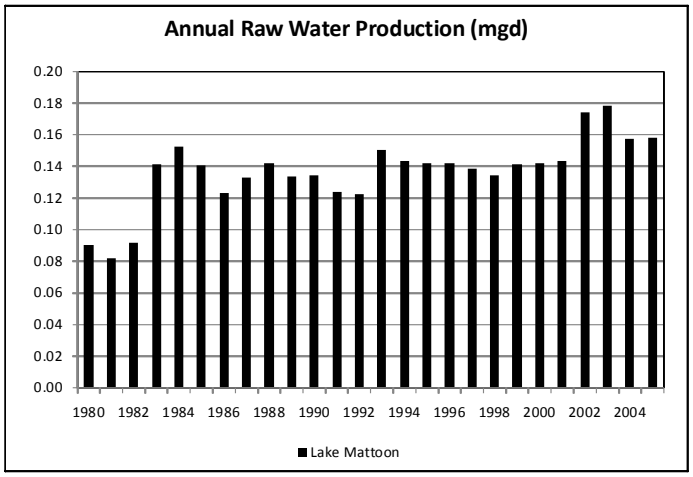
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Mattoon	IR	Little Wabash R	18.1	1027	11588	2001	9922

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

The Reliant Energy peaker plant began withdrawing water from Lake Mattoon in 2001.



New Berlin

System Description:

Two intakes on Spring Creek can pump water at up to 700 and 400 gpm to an off-channel reservoir. However, water stored in the off-channel reservoir is pumped to the plant at only 150 gpm.

Satellite Communities and Water Districts:

None

Population Served: 1,075

County: Sangamon

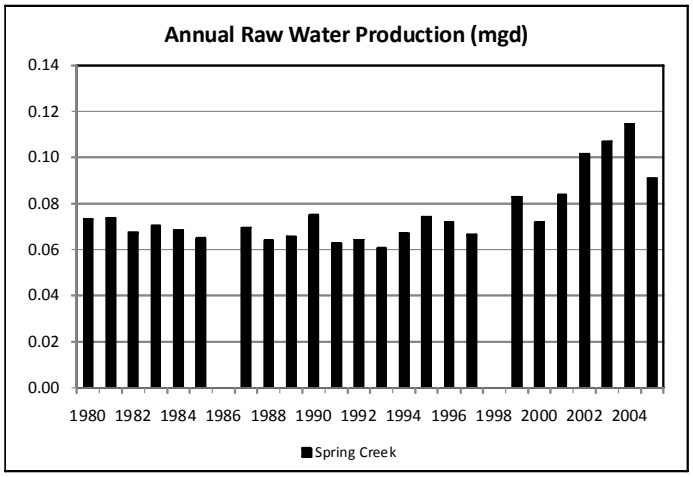
Watersheds: Sangamon

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Off-Channel Res.	OCR	Spring Cr	32.7	1	13	1977	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

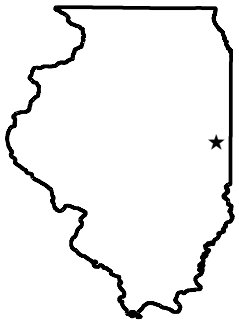
USGS Gages: No data available



Developments since 1989:

The system is evaluating the cost-effectiveness of abandoning its surface water treatment plant and joining the Curran-Gardner system, as the IEPA is requiring it to spend $1.3 million to upgrade its treatment plant. A March 2006 storm prevented the system from instituting restrictions following a shortage that began in 2005.

Oakwood



System Description:

Water is pumped from an intake along the Salt Fork of the Vermilion-Wabash River at 350 gpm and stored in two holding ponds before arriving at the treatment plant.

Satellite Communities and Water Districts:

None

Population Served: 1,521

County: Vermilion

Watersheds: Vermilion - Wabash

Water Sources

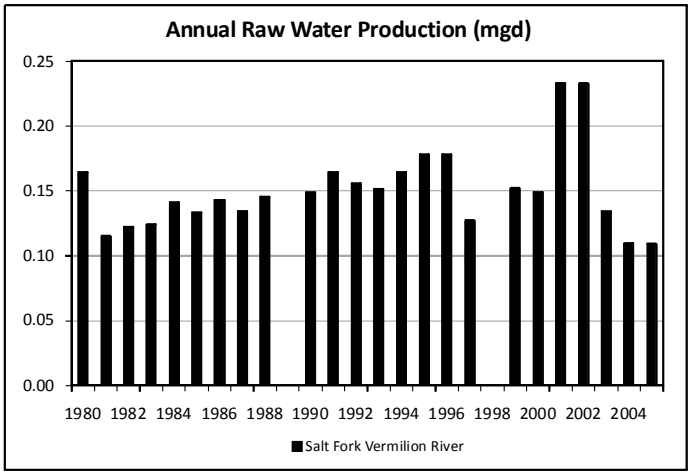
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Salt Fk Vermilion R	RW	Salt Fk Vermilion R	489	N/A	N/A	N/A	N/A
Oakwood Hld. Ponds	OCR		N/A	1	9	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

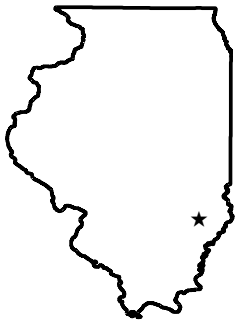
USGS Gages: Salt Fork Vermilion R (03338000)

Developments since 1989:

None



Olney



System Description:

East Fork Lake is the only active source, and its water is piped directly to the treatment plant. Clarifiers limit plant capacity to 2.23 mgd. All other sources are unused and would need repairs before reactivation.

Satellite Communities and Water Districts:

Kincade Acres Mobile Home Park, Noble, Parkersburg, Watergate Subdivision, and West Liberty-Dundas WD

Population Served: 12,000

County: Richland

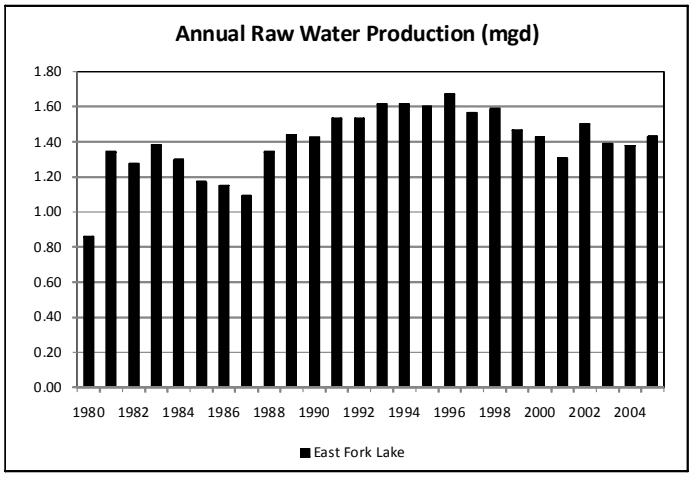
Watersheds: Little Wabash

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
East Fork Lake	IR	E Fk Fox R	10.4	930	12460	1978	12205

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available



Developments since 1989:

Volunteer measurements of lake depth have shown that reservoir sedimentation has been minimal since the 1980s due to construction of grass waterways and buffer strips upstream. There are plans to double the capacity of the 2.23 mgd treatment plant in the next few years.

Otter Lake Water Commission

System Description:

Water is pumped from Otter Lake to the treatment plant at up to 2200 gpm. An emergency connection with Chatham is available. Most of the sedimentation occurs in the lake's northern basin, although a new sedimentation basin should alleviate this problem.

Satellite Communities and Water Districts:

Auburn, Divernon, Girard, Glen Arm, Henderson P. Thayer WD, Hettick*, N Macoupin County, Nilwood, Pawnee, S Palmyra WD*, Tovey, and Virden

Population Served: 16,300

County: Macoupin

Watersheds: Macoupin

Water Sources

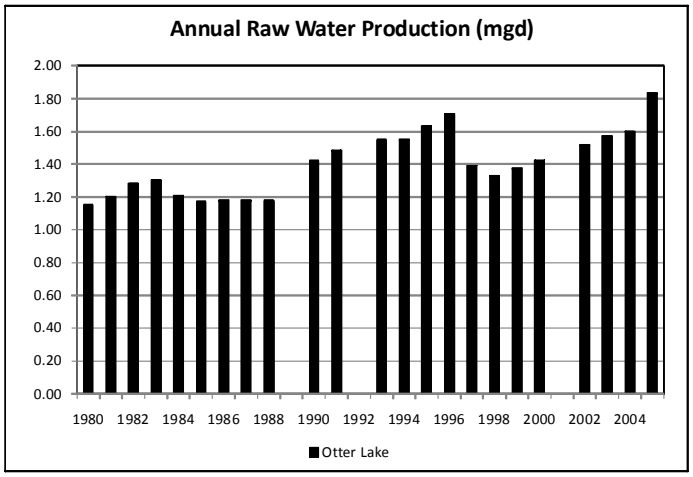
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Otter Lake	IR	W Fk Otter Cr	20.2	765	15043	1998	15914

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

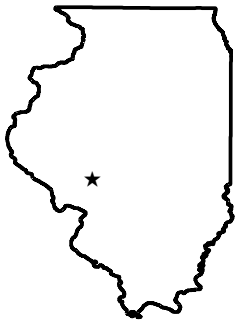
Developments since 1989:

A plant upgrade from 2.7 mgd to 3.5 mgd is proposed. Emergency access to Taylorville's supply via Chatham is being considered. During the 2005 drought, an algae bloom generated many complaints about the water's taste and odor, requiring solar-powered circulators and heavy doses of powder-activated carbon for treatment.



Note: *Hettick and the South Palmyra WD receive approximately half of their supply from Otter Lake.

Palmyra-Modesto



System Description:

The community directly receives water from Palmyra-Modesto Lake at up to 200 gpm. Terry Park Lake, located immediately upstream, serves as a sedimentation basin. There is an emergency connection with Otter Lake, but it is difficult to activate the connection's check valve.

Satellite Communities and Water Districts:

Hettick*, Scottville Rural Water, and South Palmyra*

Population Served: 1,735

County: Macoupin

Watersheds: Macoupin

Water Sources

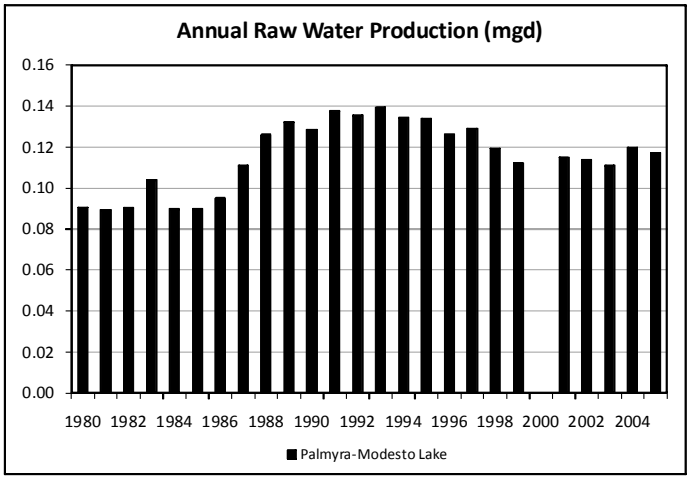
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Palmyra-Modesto Lk	IR	Nassa Cr Trib	1.7	35	534	1965	471

1989 Study: 50-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available

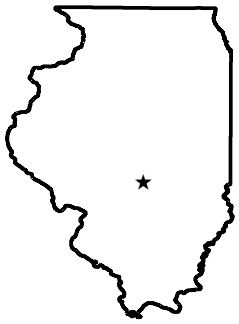
Developments since 1989:

Drought restrictions were considered in 2005 but never implemented. The dam was raised 14 inches during the 1980s. Terry Park Lake (2-3 ac), immediately upstream of the reservoir, was dredged in 1990. The 0.25 mgd treatment plant is around 40 years old. A 1 mgd hog operation closed in 1996, but S Palmyra and Hettick have recently began purchasing water from the system.



Note: *Hettick and the South Palmyra WD receive approximately half of their supply from Otter Lake.

Pana



System Description:

Water is pumped from Lake Pana to the treatment plant using two pumps with a capacity of 1,000 gpm each.

Satellite Communities and Water Districts:

Beyers Lake Subd., and Oak Ridge Subd.

Population Served: 6,914

County: Christian

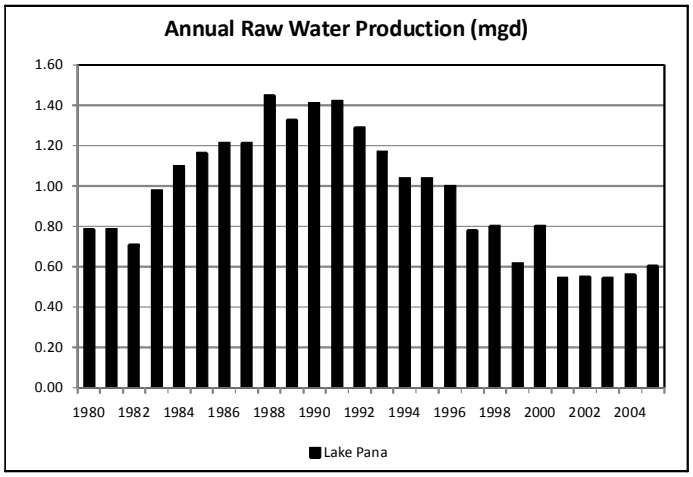
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Pana	IR	Beck Cr	8.5	238	3080	2000	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

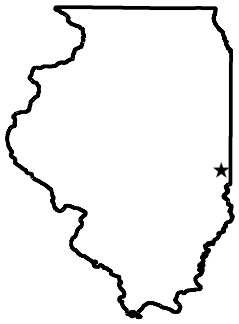
USGS Gages: No data available



Developments since 1989:

Raw water production dropped after 1990 due to a decline in the city's rose industry and repair of a major break in the water distribution line.

Paris



System Description:

Paris Twin Lakes operate as one lake with the East Lake's dam controlling the reservoir pool elevation. Water can travel to the treatment plant at up to 2000 gpm. West Lake, whose capacity increased from 150 ac-ft to 231-ft after a 1991 dredging project, effectively serves as a sedimention basin for East Lake downstream.

Satellite Communities and Water Districts:

None

Population Served: 9,077

County: Edgar

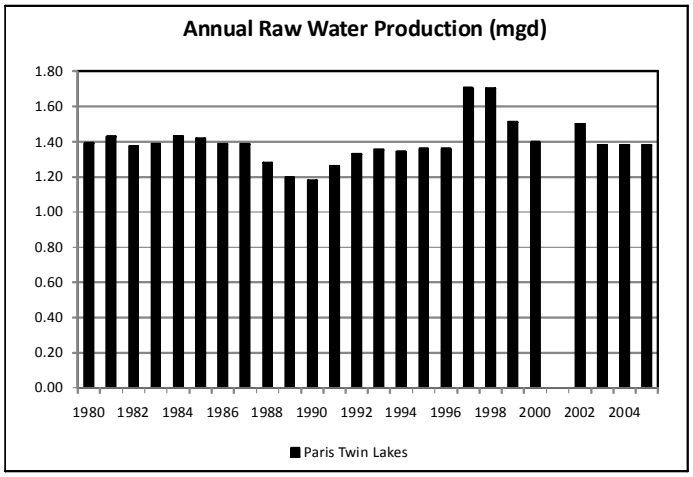
Watersheds: Wabash

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Paris Twin Lakes	IR	Sugar Cr	21.7	232	1639	1991	N/A

1989 Study: 20-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available



Developments since 1989:

The community is receiving bids for a new groundwater system withdrawing from a Wabash Valley aquifer well field (not under surface water influence) in Indiana. It hopes to have the system online by the end of 2008. Nearby Chrisman also may join the new system. Paris Twin Lakes will go offline once construction is complete.

Peoria (Illinois-American)

System Description:

Approximately 40% of Peoria's water supply is pumped (up to 15 mgd) from a single intake on the Illinois River while the remainder of its water comes from 13 wells.

Satellite Communities and Water Districts:

Belleview, Burtonview, Dunlap, and Hanna City

Population Served: 143,365

County: Peoria

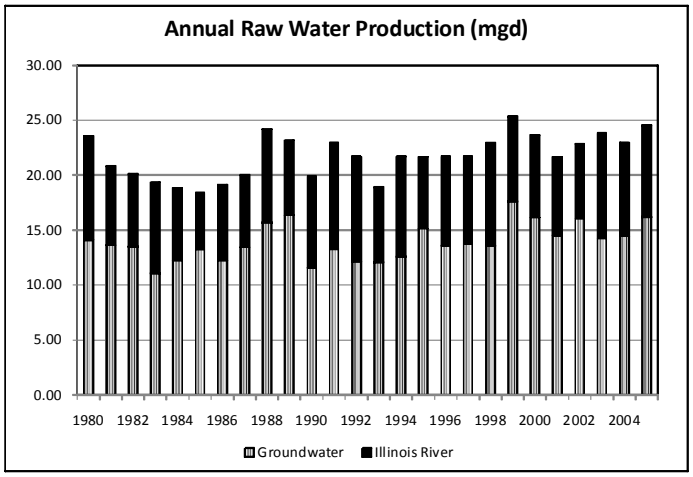
Watersheds: Illinois

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Illinois River	RW	Illinois R	14005	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient for present level of water use.

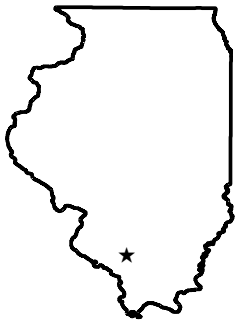
USGS Gages: Illinois River at Kingston Mines (05568500)



Developments since 1989:

None

Pinckneyville



System Description:

Water is pumped from Pinckneyville Reservoir to the treatment plant at up to 1,000 gpm. A second intake on Beaucoup Creek is capable of pumping up to 3,500 mgd with two pumps into Pinckneyville Reservoir when necessary. A 2.2 cfs downstream flow requirement limits withdrawals from Beaucoup Creek.

Satellite Communities and Water Districts:

Consolidated 204 WD, Possum Branch WA

Population Served: 6,923

County: Perry

Watersheds: Big Muddy

Water Sources

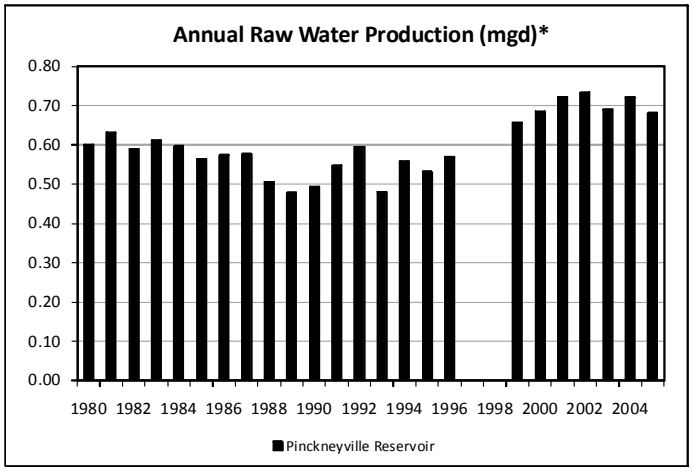
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Pinckneyville Res.	IR	Opossum Cr	6.51	192	2020	1990	2617
Beaucoup Creek	RW	Beaucoup Cr	227	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Beaucoup Creek near Matthews (05599000)

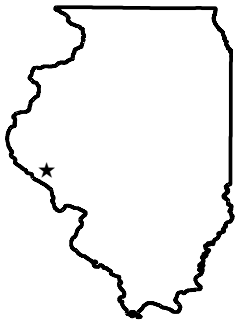
Developments since 1989:

A new 1.5 mgd treatment plant was constructed in 1999. An intake was constructed along Beaucoup Creek in 2002 to meet the demand of the new Ameren peaker plant and to protect the system against drought. This intake has been used only to fill the lake with a total of 26.5 million gallons during the 2005 drought.



Note: *Production has increased in recent years due to demands of the Ameren peaker plant.

Pittsfield



System Description:

Lake Pittsfield pumps water directly to the treatment plant at up to 480 gpm. Numerous springs and four intakes at different drawing levels buffer the system against drought. The treatment plant is designed to process 1 mgd but chemical treatment constraints limit production to 0.68 mgd.

Satellite Communities and Water Districts:

None

Population Served: 4,650

County: Pike

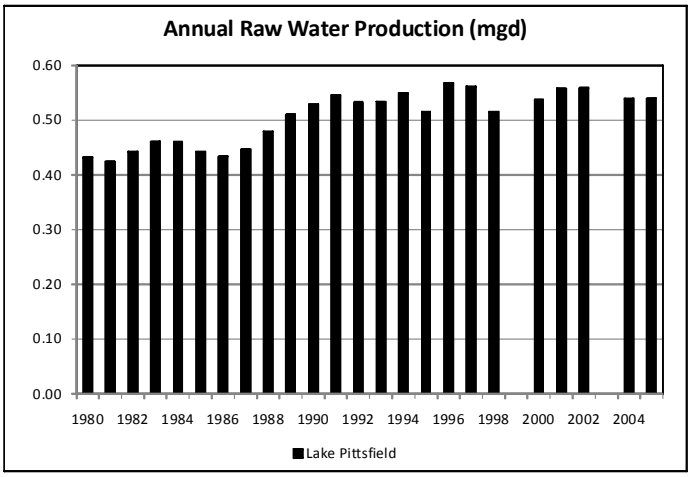
Watersheds: Mississippi N Central

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Pittsfield	IR	Blue Creek	11.1	200	2679	1992	2015

1989 Study: 50-year drought yield sufficient at present level of water use.

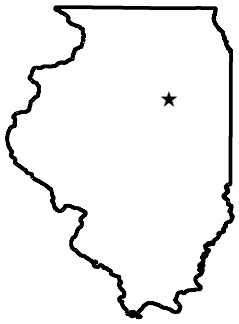
USGS Gages: No data available



Developments since 1989:

The system is considering taking Lake Pittsfield offline and piping in groundwater from wells in the Mississippi Bottoms 12 miles away, partly due to increased surface water treatment costs. Sedimentation also has reduced the surface area of the lake's northern basin. The quantity of sediment removed from recent dredging could not be obtained.

Pontiac (Illinois-American)



System Description:

Water is pumped from the Vermilion River at up to 3,125 gpm either directly to the treatment plant or via an off-channel reservoir. That reservoir also serves as a storage basin for low nitrate water and as a pre-treatment sedimentation basin.

Satellite Communities and Water Districts:

None

Population Served: 12,000

County: Livingston

Watersheds: Vermilion - Illinois

Water Sources

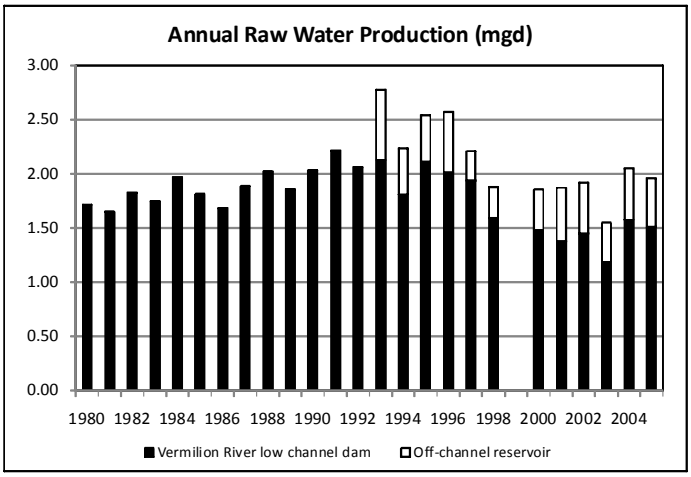
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Off-channel reservoir	OCR	Vermilion R	N/A	250	1075	1993	N/A
Vermilion River*	RW	Vermilion R	579	38	153	1993	N/A

1989 Study: 20-year drought yield insufficient at present level of water use.

USGS Gages: Vermilion River at Pontiac (05554500)

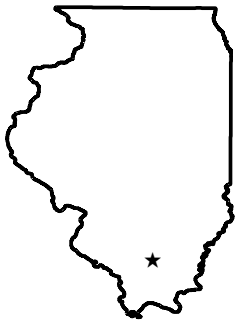
Developments since 1989:

The construction of an off-channel reservoir in 1993 protected the community from water shortages during the 2005 drought.



Note: *A low channel dam on the river creates storage as noted in the table.

Rend Lake Intercity Water System



System Description:

Water is pumped from Rend Lake directly to a 19.1 mgd treatment plant. The State of Illinois has access to 109,000 ac-ft of the lake's total storage of 175,059 ac-ft. Rend Lake's allocation is currently 17.5 mgd and negotiations are being conducted with the State to increase this allocation. In 2007, two coal-based industries were allocated a total of 14.5 mgd.

Satellite Communities and Water Districts:

Benton, Mount Vernon, and 64 other community water systems

Population Served: 164,696

County: Franklin

Watersheds: Big Muddy

Water Sources

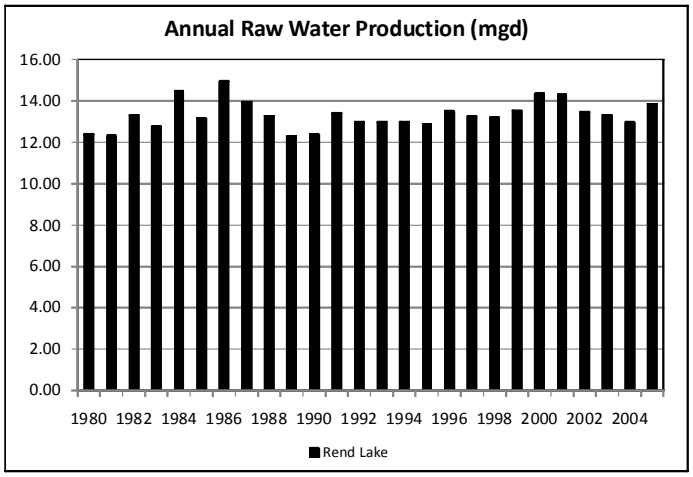
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Rend Lake	IR	Big Muddy R	488	16187	175059	1986	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

See "System Description".



Salem

System Description:

Water flows from Salem Reservoir directly to a 3.5 mgd treatment plant. Since 1988, the system has been allocated up to 6 mgd from Carlyle Lake to fill the Salem Reservoir when necessary.

Satellite Communities and Water Districts:

Northeast WC, Odin, and Raccoon WC

Population Served: 12,275

County: Marion

Watersheds: Kaskaskia

Water Sources

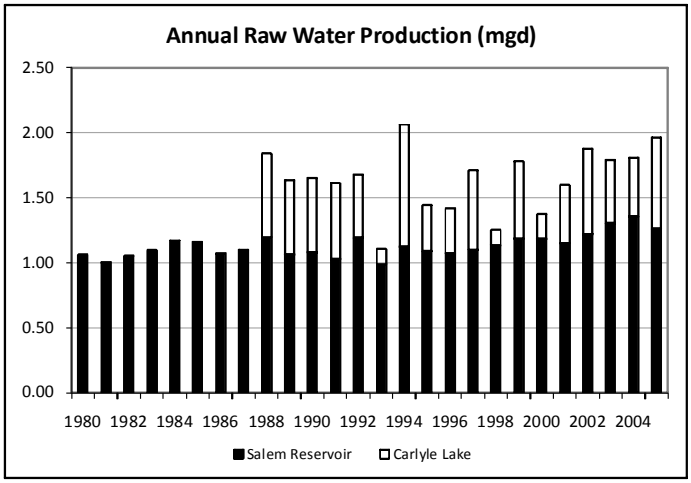
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Salem Reservoir	IR	Town Cr	4.02	84	531	1960	470
Carlyle Lake*	IR	Kaskaskia R	2712	26000	32692	1976	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

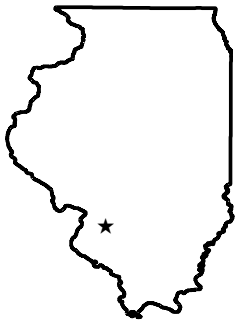
Developments since 1989:

The Salem Reservoir dam was lowered 15 inches in 1993 due to flood hazards it posed for nearby State Highway 137. In 2005, water was withdrawn from Carlyle Lake during 102 days to buffer drought impacts.



Note: *The capacity of Carlyle Lake listed is the volume allocated only for water supply.

SLM Water Commission



System Description:

The Summerfield-Lebanon-Mascoutah (SLM) Water Commission receives water that is pumped from the Kaskaskia River into an off-channel reservoir at up to 3900 gpm and is then relayed to a 5.6 mgd treatment plant.

Satellite Communities and Water Districts:

Summerfield, Lebanon, Mascoutah, Fayettevile, Freeburg, Hecker, New Baden, New Memphis, Smithton, Trenton, and Tri-Township WD

Population Served: 30,000

County: St. Clair

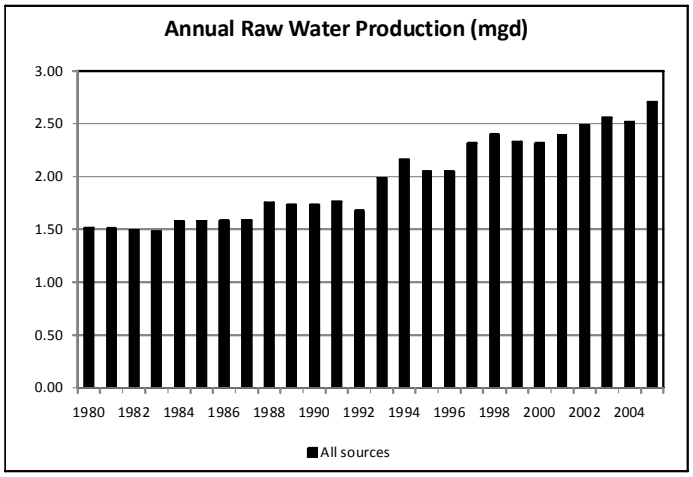
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Off-Channel Res.	OCR	Kaskaskia R	4509	7	77	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

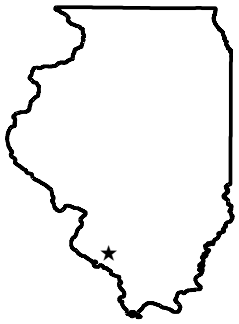
USGS Gages: Kaskaskia River near Venedy Station (05594100)



Developments since 1989:

None

Sparta



System Description:

Water from the Kaskaskia River is pumped to the South (Old) Reservoir at up to 450 gpm. This water then is conveyed to a 1 mgd treatment plant below the South Reservoir dam via gravity flow. The Sparta NW Strip Pit is also available as a 900 gpm emergency source.

Satellite Communities and Water Districts:

Baldwin, Eden WD, and Egyptian WD

Population Served: 5,801

County: Randolph

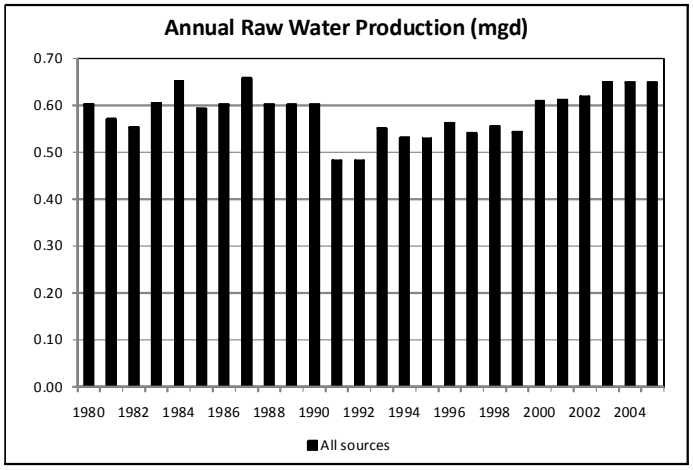
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Kaskaskia River	RW	Kaskaskia R	1940	N/A	N/A	N/A	N/A
Sparta NW Strip Pit	QBP	N/A	N/A	18	350	2007	N/A
S (Old) Sparta Res.	IR	Maxwell Cr Trib	1.18	35	227	1989	228

1989 Study: 50-year drought yield sufficient at present level of water use.

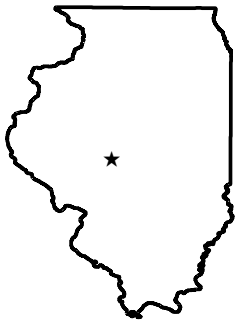
USGS Gages: Kaskaskia River near Venedy Station (05594100)



Developments since 1989:

The Sparta NW Strip Pit was connected to the system in 1989 to replace the North (New) Res, which has been used only once (in 2002) since 1994. The river intake now has two alternating pumps. A new 1.8 mgd treatment plant will be built upstream of the dam as the current one is situated in a floodplain right below it.

Springfield



System Description:

Lake Springfield, an impounding reservoir on the Sangamon River, is the primary source. Water from the South Fork of the Sangamon River can be pumped into the lake to help meet the city's 1996-2005 average daily use of 21.6 mgd. Springfield's coal power plants use roughly 6.9 mgd for ash sluicing and 2.4 mgd more for forced lake evaporation from heated discharges.

Satellite Communities and Water Districts:

Chatham, Curran-Gardner Township, Grandview, Jerome, Leland Grove, Loami, Rochester, Sherman, Southern View, Sugar Creek PWD, and Williamsville

Population Served: 133,000

County: Sangamon

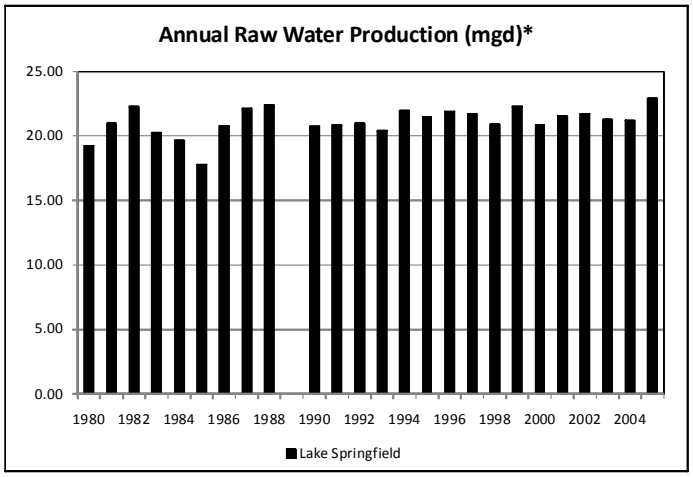
Watersheds: Sangamon

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
S Fk Sangamon	RW	S Fk Sangamon R	867	N/A	N/A	N/A	N/A
Lake Springfield	IR	Sugar Cr	265	4000	49247	2004	48732

1989 Study: 50-year drought yield insufficient at present level of water use.

USGS Gages: S Fk Sangamon River near Rochester (16791260)



Note: *Includes pumpage from the South Fork of the Sangamon River at its confluence with Horse Creek.

Developments since 1989:

Mandatory restrictions were last implemented in 1988 and lowered high summer demand rate by 15%. In 2005, Lake Springfield received 2,173 mg from the South Fork of the Sangamon River to maintain lake levels. The proposed Hunter Lake (46,000 ac-ft) would provide an additional 19 mgd supply. Chatham is considering switching to a groundwater source.

Staunton

System Description:

Water is pumped from Staunton Lake to the treatment plant with two alternating 725 gpm pumps. Only a very limited two-inch "hydro-type" connection with Williamson (which has another connection with Livingston) is available during emergencies.

Satellite Communities and Water Districts:

Williamson

Population Served: 5,281

County: Macoupin

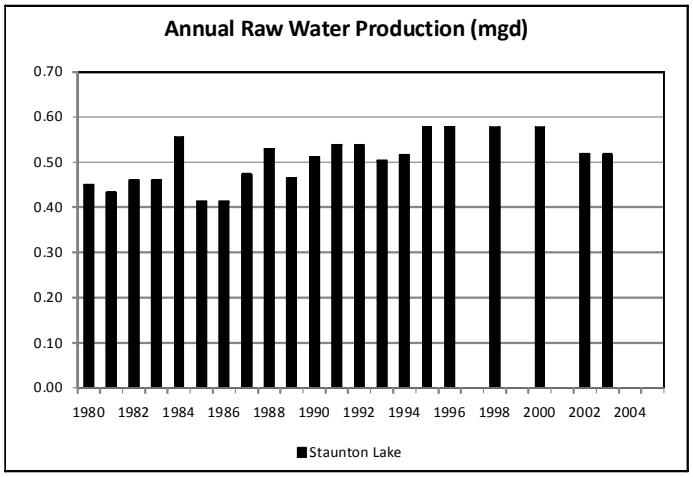
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Staunton Lake	IR	East Cr	3.68	140	1940	1998	942

1989 Study: 50-year drought yield insufficient at 1990 level of water use.

USGS Gages: No data available



Developments since 1989:

Staunton Lake's spillway was raised 9 feet in 1995. This increased capacity could facilitate future growth along the part of the I-55 corridor that the town recently annexed.

Streator (Illinois-American)

System Description:

A low channel dam along the Vermilion River (Illinois) stores 1075 ac-ft of water and an additional 728 ac-ft can be pumped into an old quarry, which functions as an off-channel reservoir, a storage basin for low nitrate water, and a pre-treatment sedimentation basin. While the treatment plant can process 6 mgd, typically just one 3 mgd variable frequency drive pump is used.

Satellite Communities and Water Districts:

Kangley and South Streator

Population Served: 18,000

County: La Salle

Watersheds: Vermilion - Illinois

Water Sources

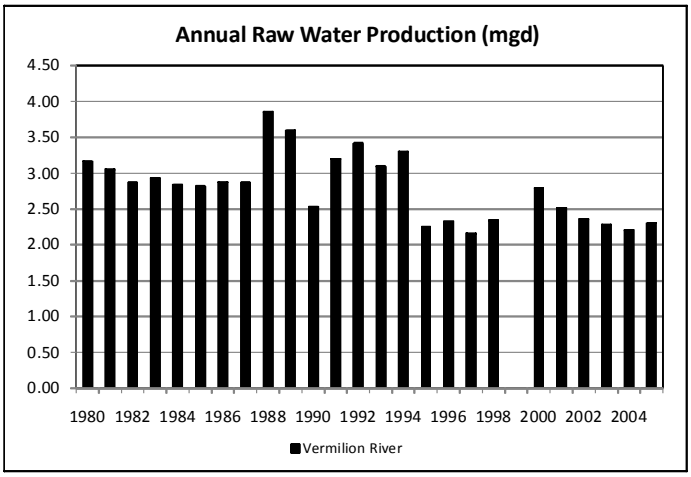
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Vermilion River*	RW	Vermilion R	1084	N/A	1075	2006	N/A
Streator Quarry	OCR	Vermilion R	N/A	30	728	2006	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: Vermilion River near Leonore (05555300)

Developments since 1989:

None



Note: *A low channel dam on the river creates storage as noted in the table.

Taylorville

System Description:

Water from Lake Taylorville is pumped to the treatment plant from either the West pump (2100 gpm) or both the Central (700 gpm) and East (700 gpm) pumps. An additional 800 gpm comes from three rotating drift wells, while water from a fourth well with a high iron concentration is available during emergencies.

Satellite Communities and Water Districts:

Bertinelli Addition, Hewittville, Kincaid, Langleyville RWD, Owaneco, and Taylorville Correctional Center

Population Served: 17,500

County: Christian

Watersheds: Sangamon

Water Sources

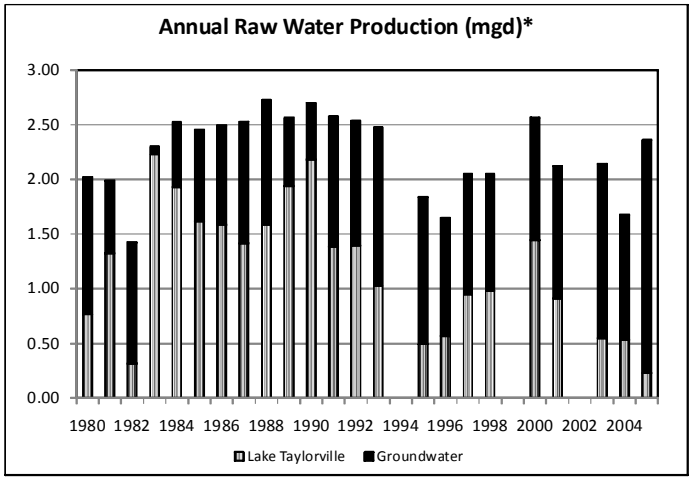
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Lake Taylorville	IR	S Fk Sangamon R	131.3	1200	7942	1977	5297
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

Developments since 1989:

The Taylorville Water Department hopes that the installation of two large and 13 small sedimentation basins reduces the reservoir sedimentation rates by 80%. The city plans to continue using the lake as a regular source in spite of increased groundwater withdrawals. Ample groundwater resources protect the community from drought.



Note: *Water production declined after the ADM plant moved in 1995. High water treatment costs and subsequent price increases have reduced surface water withdrawals in recent years.

Vandalia

System Description:

Water from Vandalia Lake and the Kaskaskia River is pumped to the treatment plant. Lake and river intakes have pumping capacities of 4.0 and 1.5 mgd, respectively. However, the treatment plant currently can treat just 1.5 mgd.

Satellite Communities and Water Districts:

None

Population Served: 7,010

County: Fayette

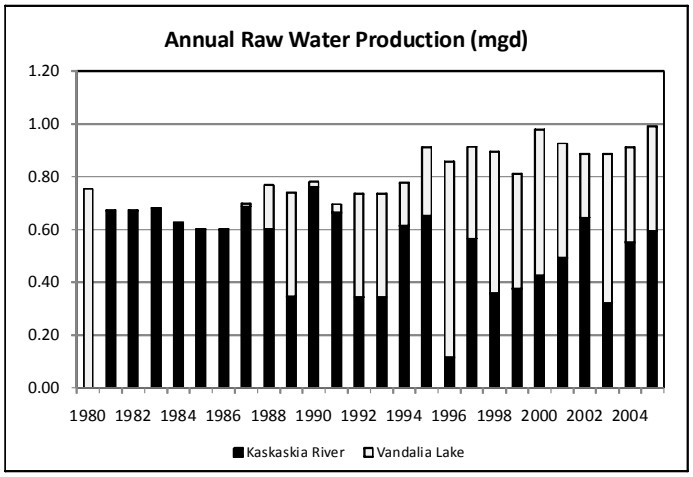
Watersheds: Kaskaskia

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Vandalia Lake	IR	Bear Cr	26	660	6751	1965	N/A
Kaskaskia River	RW	Kaskaskia R	1940	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

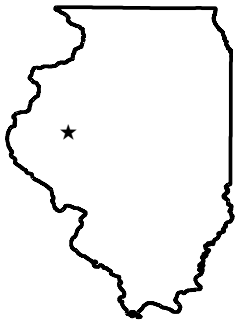
USGS Gages: Kaskaskia River at Vandalia (05592500)



Developments since 1989:

In January 2007, the system reported plans to build a new intake on Vandalia Lake later in the year due to sedimentation problems with the current one. The Vandalia Correctional Center is now part of the water system.

Vermont



System Description:

Water is piped at up to 300 gpm via gravity flow from Vermont Lake to the treatment plant 200 feet downstream.

Satellite Communities and Water Districts:

None

Population Served: 814

County: Fulton

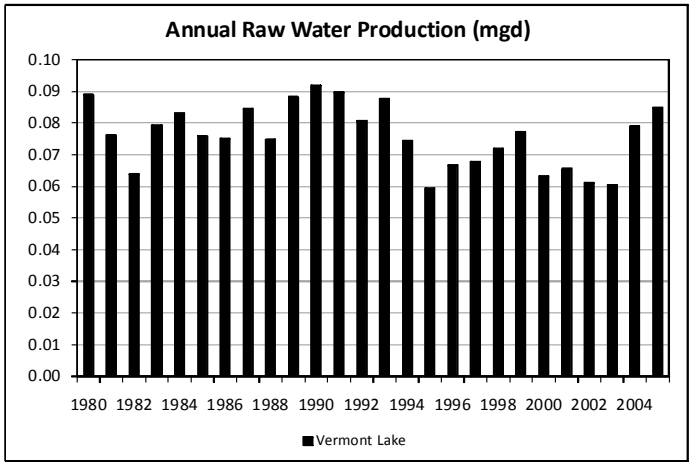
Watersheds: Illinois

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Vermont Lake	IR	Sugar Cr Trib	2.33	41	223	1980	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

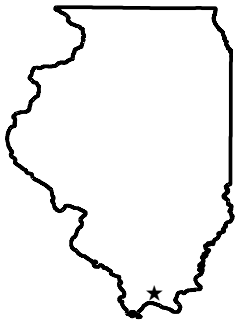
USGS Gages: No data available



Developments since 1989:

Although the dam was raised 2 feet in 1998, a general advisory still had to be issued in this village during the 2005 drought. A new treatment plant was constructed in 1993.

Vienna



System Description:

Two 550 gpm pumps convey water from Bloomfield Lake (Vienna City Lake) to an off-channel reservoir or directly to the treatment plant via a valve-controlled bypass. Some customers are directly connected to the Millstone Water District, which regularly provides the system with 0.01 mgd and can offer more during emergencies.

Satellite Communities and Water Districts:

None

Population Served: 1,600

County: Johnson

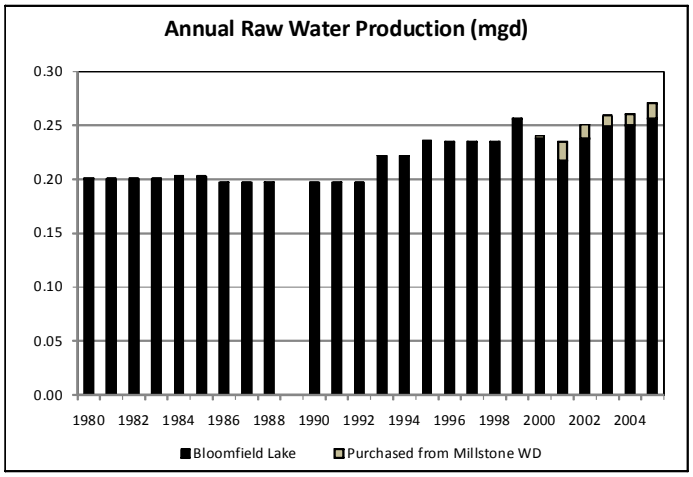
Watersheds: Cache

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Bloomfield Lake	IR	Little Cache Cr Trib	1.16	54	1473	1979	1404
Off-Channel Res.	OCR	Little Cache Cr Trib	40.2	8	117	N/A	N/A
Millstone WD	GWP		N/A	N/A	N/A	N/A	N/A

1989 Study: 50-year drought yield sufficient at present level of water use.

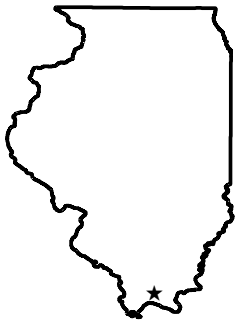
USGS Gages: No data available



Developments since 1989:

Vienna has purchased additional water from Millstone WD since 2000 and has the option of purchasing more water during droughts. These purchases may continue to increase in the near future.

Vienna Correctional Center



System Description:

Two 700 gpm pumps convey water from the Vienna Correctional Center Lake to the 2.0 mgd treatment plant.

Satellite Communities and Water Districts:

Shawnee Correctional Center

Population Served: 3,700

County: Johnson

Watersheds: Cache

Water Sources

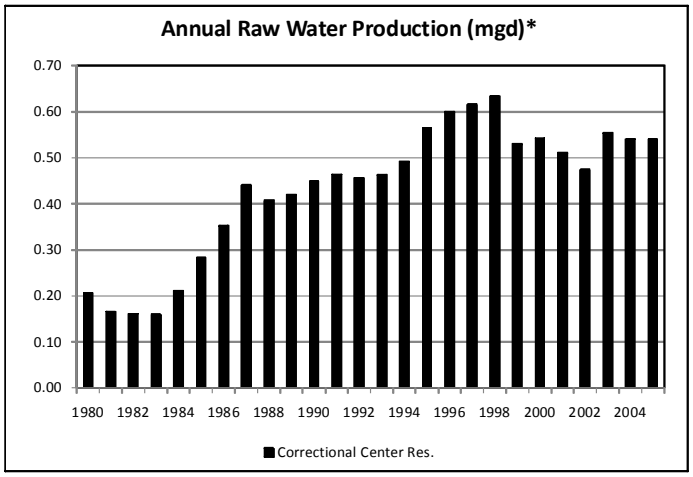
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Vienna Corr. Ctr. Lake	IR	Little Cache Cr Trib	N/A	77	1082	1996	N/A

1989 Study: Not studied in 1989.

USGS Gages: No data available

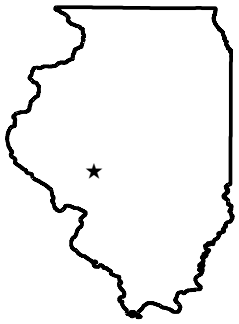
Developments since 1989:

The Vienna Correctional Center Lake's depth has protected the system from recent droughts.



Note: *Production increases are due to inclusion of Shawnee Correctional Center in 1984 and overall inmate population growth.

Waverly



System Description:

Water is piped from Waverly Lake to the 0.72 gpm treatment plant using three pumps with a combined capacity of 430 gpm.

Satellite Communities and Water Districts:

Apple Creek Co-op

Population Served: 1,456

County: Morgan

Watersheds: Illinois

Water Sources

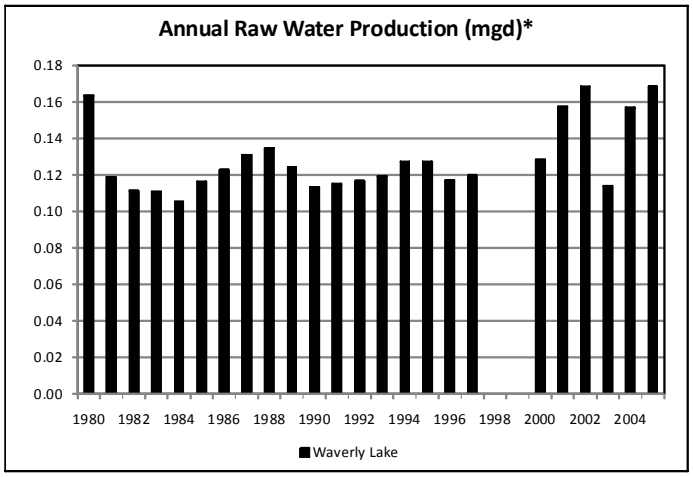
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Waverly Lake	IR	Woods Cr Trib	9.24	94	825	1984	705

1989 Study: 50-year drought yield sufficient at present level of water use.

USGS Gages: No data available

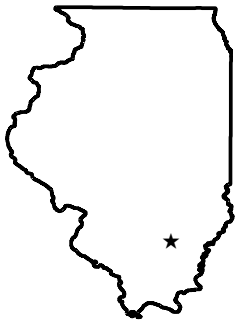
Developments since 1989:

None



Note: *No major increases in production occurred after the dam height was raised 7 ft in 1984 (prior to the sediment survey).

Wayne City



System Description:

Water from the Little Wabash River's Skillet Fork is impounded behind a low channel dam and then pumped to an off-channel reservoir at up to 500 gpm before being directed to the 0.72 gpm treatment plant at the same rate. The reservoir is filled periodically and may not be filled for as long as two months when water quality is poor.

Satellite Communities and Water Districts:

Sims and Western Wayne WD

Population Served: 1,350

County: Wayne

Watersheds: Little Wabash

Water Sources

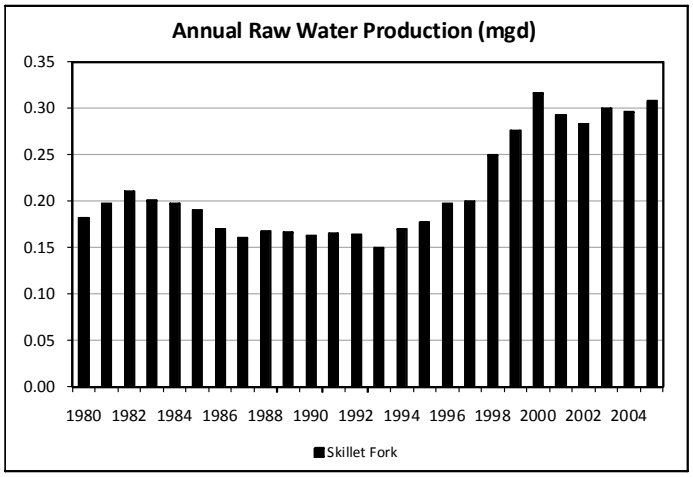
Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Skillet Fork*	RW	Skillet Fk	464	N/A	17	N/A	N/A
Off-Channel Res.	OCR	Skillet Fk	N/A	14	164	1983	N/A

1989 Study: 20-year drought yield insufficient at 1990 level of water use**

USGS Gages: Skillet Fork Little Wabash at Wayne City (03380500)

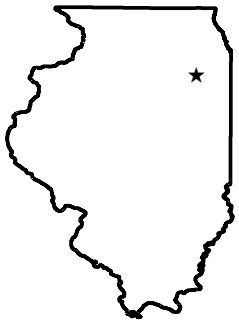
Developments since 1989:

The creation of the Western Wayne RWD (~1,500 people served) boosted production, although it will join the Gateway Regional Water Supply once it becomes available.



Note: *A low channel dam on the river creates storage as noted in the table. **Reservoir size used in this study was just 34.7 ac-ft, resulting in a poor estimate of the system's drought vulnerability.

Wilmington



System Description:

Wilmington can process up to 4.8 mgd from the Kankakee River. Water is gravity fed into a wet well before it is pumped to the plant. Its intake can pump 1000 gpm, but its plant can treat only 600 gpm. The system maintains a backup well on an island in the Kankakee River.

Satellite Communities and Water Districts:

Lakewood Shores

Population Served: 6,150

County: Will

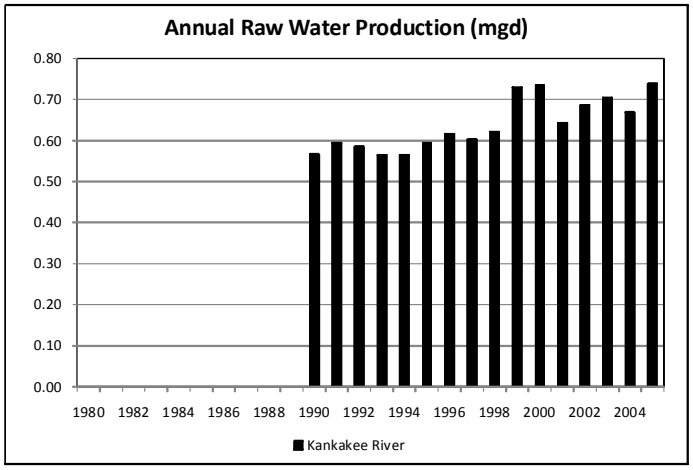
Watersheds: Kankakee

Water Sources

Name	Type	Stream	DA (sq mi)	SA (ac)	Capacity (ac-ft)	Year Est.	Est. 2010 Cap. (ac-ft)
Kankakee River	RW	Kankakee R	4953	N/A	N/A	N/A	N/A
Groundwater	GW		N/A	N/A	N/A	N/A	N/A

1989 Study: Not in existence in 1989.

USGS Gages: Kankakee River near Wilmington (05527500)



Developments since 1989:

Wilmington began pumping from the Kankakee River in 1990 due to concerns about radium contamination in its groundwater and overall cost efficiency.

8. References

McConkey-Broeren, S., and K.P. Singh. 1989. *Adequacy of Illinois Surface Water Supply Systems to Meet Future Demands*. Illinois State Water Survey Contract Report 477 (CR-477), Champaign, IL.

Singh, K.P., and A. Durgonoğlu. 1990. *An Improved Methodology for Estimating Future Reservoir Storage Capacities: Application to Surface Water Supply Reservoirs in Illinois*. Second Edition. Illinois State Water Survey Contract Report 493 (CR-493), Champaign, IL.

United States Environmental Protection Agency. 2006. Terminology Reference System (http://iaspub.epa.gov/trs/trs_proc_qry.navigate_term?p_term_id=6817&p_term_cd=TERM, accessed on September 11, 2007).

Appendix A. Active Community Surface Water Systems in Illinois

Refer to Table 1 for source type abbreviations. Systems whose drought vulnerability were examined in the 1989 study and are examined in this study are noted.

System Name	County	Source Type	1989 Study	Current Study	Est. 2005 Service Area Population
Altamont	Effingham	IR	X	X	2,513
Alto Pass Water District	Union	IR	X	X	1,200
Alton (Illinois-American)	Madison	BRW			86,325
Ashland	Cass	C	X	X	1,360
Aurora	Kane	RW			171,500
Blandinsville	McDonough	OCR	X	X	790
Bloomington	McLean	IR	X	X	72,330
Breese	Clinton	OCR	X	X	9,500
Cairo (Illinois-American)	Alexander	BRW			3,723
Canton	Fulton	IR	X	X	20,000
Carbondale	Jackson	IR	X	X	38,785
Carlinville	Macoupin	IR	X	X	7,900
Carlyle	Clinton	RW	X	X	12,550
Carthage	Hancock	IR	X	X	2,725
Central Lake County Joint Action Water Agency	Lake	LM			198,669
Centralia	Marion	IR	X	X	36,000
Charleston	Coles	OCR	X	X	21,520
Chester	Randolph	BRW			9,422
Chicago	Cook	LM			5,539,601
Coulterville	Randolph	IR	X	X	1,300
Danville (Aqua Illinois)	Vermillion	IR	X	X	55,000
Decatur	Macon	IR	X	X	90,243
East Moline	Rock Island	BRW			22,300
East Saint Louis (Illinois-American)	St. Clair	BRW			345,709
Effingham	Effingham	C	X	X	20,510
Elgin	Kane	RW			125,100
Evanston	Cook	LM			359,986

Appendix A. Continued

System Name	County	Source Type	1989 Study	Current Study	Est. 2005 Service Area Population
Evansville	Randolph	RW	X	X	750
Fairfield	Wayne	OCR	X	X	6,621
Farina	Fayette	QBP	X	X	550
Flora	Clay	RW	X	X	6,100
Gateway Regional Water Supply	Clay, Fayette, Marion, Wayne	IR			15,000[1]
Gillespie	Macoupin	IR	X	X	7,700
Glencoe	Cook	LM			8,762
Granite City (Illinois-American)	Madison	BRW			65,581
Great Lakes Naval Training Station	Lake	LM			28,150
Greenfield	Greene	IR	X	X	1,140
Greenville	Bond	IR	X	X	7,500
Hamilton	Hancock	BRW			5,906
Hammond (Indiana)[2]	Cook	LM			176,339
Highland	Madison	IR	X	X	12,808
Highland Park	Lake	LM			61,479
Highwood	Lake	LM			5,470
Hillsboro	Montgomery	IR	X	X	9,000
Holiday Shores Sanitary District	Madison	IR	X	X	3,192
Holland Regional Water Supply	Effingham, Shelby	IR			N/A
Jacksonville	Morgan	IR	X	X	23,000
Kankakee (Aqua Illinois)	Kankakee	RW	X	X	76,000
Kaskaskia Water District	St. Clair	RW	X	X	25,528
Kenilworth	Cook	LM			2,494
Kinkaid Area Water System	Jackson	IR	X	X	27,000
Kinmundy	Marion	IR	X	X	1,078
La Harpe	Hancock	OCR	X	X	1,440
Lake County WD	Lake	LM			28,353

Appendix A. Continued

System Name	County	Source Type	1989 Study	Current Study	Est. 2005 Service Area Population
Lake Forest	Lake	LM			21,778
Lake of Egypt Public WD (So. Ill. Electric Corp.)	Williamson	IR	X	X	12,200
Lake Shannon, Inc.[3]	Kankakee	IR		X	521
Litchfield	Montgomery	IR	X	X	13,000
Macomb	McDonough	IR	X	X	20,185
Marion	Williamson	IR	X	X	17,770
Mattoon	Coles	IR	X	X	19,500
Moline	Rock Island	BRW			44,718
Mount Olive	Macoupin	IR	X	X	2,360
Nashville	Washington	C	X	X	3,997
Nauvoo	Hancock	BRW			1,621
Neoga	Cumberland	IR	X	X	1,854
New Berlin	Sangamon	OCR	X	X	1,075
North Chicago	Lake	LM			18,950
Northbrook	Cook	LM			38,177
Oakwood	Vermillion	OCR	X	X	1,521
Olney	Richland	IR	X	X	12,000
Otter Lake Water Commission	Macoupin	IR	X	X	16,300
Palmyra-Modesto Water Commission	Macoupin	IR	X	X	1,735
Pana	Christian	IR	X	X	6,914
Paris	Edgar	IR	X	X	9,077
Peoria	Peoria	RW			143,365
Pinckneyville	Perry	IR	X	X	6,923
Pittsfield	Pike	IR	X	X	4,650[4]
Pontiac (Illinois-American)	Livingston	OCR	X	X	12,000
Quincy	Adams	BRW			45,000
Rend Lake Intercity Water System	Franklin	IR	X	X	164,696
Rock Island	Rock Island	BRW			39,684
Rock Island Arsenal	Rock Island	BRW			7,800
Salem	Marion	IR	X	X	12,275

Appendix A. Concluded

System Name	County	Source Type	1989 Study	Upcoming Study	Est. 2005 Service Area Population
SLM Water Commission[5]	St. Clair	OCR	X	X	30,000
Sparta	Randolph	C	X	X	5,801
Springfield	Sangamon	IR	X	X	133,000
Staunton	Macoupin	IR	X	X	5,281
Streator (Illinois-American)	La Salle	OCR	X	X	18,000
Taylorville	Christian	IR	X	X	17,500
Vandalia	Fayette	C	X	X	7,010
Vermont	Fulton	IR	X	X	814
Vienna	Johnson	C	X	X	1,600
Vienna Correctional Center	Johnson	IR		X	3,700
Warsaw	Hancock	BRW			1,793
Waukegan	Lake	LM			101,020
Waverly	Morgan	IR	X	X	1,456
Wayne City	Wayne	OCR	X	X	1,350
Wilmette	Cook	LM			109,261
Wilmington	Will	RW		X	6,150
Winnetka	Cook	LM			17,619

[1] The Gateway Regional Water Supply will serve approximately 15,000 Illinois residents when it comes online in 2008, including the residents that the Flora system currently serves.

[2] Residents in 10 Cook County communities receive their water supply from Hammond, Indiana.

[3] The IEPA lists Lake Shannon, Inc. as a groundwater source under the direct influence of surface water (GWUDI). The system withdraws water from a manhole located 5 feet from the lakeshore.

[4] Pittsfield's service area population includes approximately 400 inmates living in the Pittsfield Work Camp that were added to Pittsfield's reported population estimate of 4,250.

[5] Summerfield-Lebanon-Mascoutah Water Commission.

Appendix B. Streamgaging Stations Directly Applicable for this Study

System	Source	Intake DA (sq mi)	Station Name	USGS Station ID	Period of Record	Station DA (sq mi)	Ratio
Aurora	Fox River	1706	Fox River at Algonquin	05550000	1915-	1403	1.22
Bloomington	Lake Bloomington	69	Money Creek near Towanda	05564400	1958-1982	49	1.41
			Money Creek above Lake Bloomington	05564500	1933-1958	53	1.30
	Mackinaw River	400	Mackinaw River near Congerville	05567500	1947-	767	0.52
Breese	Shoal Creek	735	Shoal Creek near Breese	05594000	1945-	735	1.00
Carlyle	Kaskaskia River	2717	Kaskaskia River near Venedy Station	05594100	1969-	4393	0.62
Charleston	Embarras River	786	Embarras River at Ste. Marie	03345500	1914-	1516	0.52
			Embarras River near Diona	03344000	1970-1982	919	0.86
Danville (Aqua Illinois)	Lake Vermilion	298	North Fork Vermilion River near Bismarck	03338780	1988-	262	1.14
Decatur	Lake Decatur	925	Sangamon River at Monticello	05572000	1914-	550	1.68
Effingham	Little Wabash River	240	Little Wabash River near Effingham	03378635	1966-	240	1.00
Elgin	Fox River	1550	Fox River at Algonquin	05550000	1915-	1403	1.10
Evansville	Kaskaskia River	5718	Kaskaskia River at Venedy Station	05594100	1969-	4393	1.30

Appendix B. Continued

System	Source	Intake DA (sq mi)	Station Name	USGS Station ID	Period of Record	Station DA (sq mi)	Ratio
Flora	Little Wabash River	750	Little Wabash River at Louisville	03378900	1965-1982	745	1.01
	Little Wabash River	750	Little Wabash River below Clay City	03379500	1914-	1131	0.66
Gateway Regional Water Supply	Kaskaskia River (Lake Carlyle)	2719	Kaskaskia River at Vandalia	05592500	1914-	1940	1.40
Holland Regional Water Supply	Kaskaskia River	N/A	Kaskaskia River at Lake Shelbyville	05592000	1970-	1054	N/A
Kankakee (Aqua Illinois)	Kankakee River	4790	Kankakee River near Wilmington	05527500	1914-	5150	0.92
Kaskaskia WD	Kaskaskia River	5181	Kaskaskia River near Venedy Station	05594100	1969-	4393	1.18
Nashville	Kaskaskia River	3000	Kaskaskia River near Venedy Station	05594100	1969-	4393	0.68
Oakwood	Salt Fork Vermilion River (Wabash)	489	Salt Fork Vermilion River near Homer	03338000	1944-1958	340	1.44
Peoria (Illinois American)	Illinois River	14005	Illinois River at Kingston Mines	05568500	1939-	15818	0.89

Appendix B. Concluded

System	Source	Intake DA (sq mi)	Station Name	USGS Station ID	Period of Record	Station DA (sq mi)	Ratio
Pinckneyville	Beaucoup Creek	231	Beaucoup Creek near Matthews	05599000	1945-1982	293	0.78
Pontiac	Off-channel reservoir	579	Vermilion River at Pontiac	05554500	1947-	579	1.00
SLM Water Commission	Kaskaskia River	4509	Kaskaskia River near Venedy Station	05594100	1969-	4393	1.03
Sparta	Kaskaskia River	5513	Kaskaskia River near Venedy Station	05594100	1969-	4393	1.25
Springfield	South Fork Sangamon River	867	South Fork Sangamon River near Rochester	05576000	1949-	867	1.00
Streator (Illinois-American)	Off-channel reservoir	1084	Vermilion River near Leonore	05555300	1931-	1251	0.87
Vandalia	Kaskaskia River	1940	Kaskaskia River at Vandalia	05592500	1914-	1940	1.00
Wayne City	Off-channel reservoir	464	Skillet Fork Little Wabash River at Wayne City	03380500	1928-	464	1.00
Wilmington	Kankakee River	4953	Kankakee River near Wilmington	05527500	1914-	5150	0.96

Appendix C. Systems Assessed in the 1989 Study

System Name	Current Source Type[1]	Current Population[2]
Altamont	SW	2,513
Alto Pass Water District	SW	1,200
Ashland	SW	1,360
Ashley	SWP	650
Blandinsville	SW	790
Bloomington	SW	72,330
Breese	SW	9,500
Camelot (Illinois-American)	IS	N/A
Canton	SW	20,000
Carbondale	SW	38,785
Carlinville	SW	7,900
Carlyle	SW	12,550
Carrier Mills	GWP	2,365
Carthage	SW	2,725
Centralia	SW	36,000
Charleston	SW	21,520
Clay City	GWP	1,114
Coulterville	SW	1,300
Danville - Aqua Illinois	SW	55,000
Decatur	SW	90,234
Dongola	GWP	841
Douglas County Water Company	IS	N/A
Effingham	SW	20,510
Eldorado Water Company	GWP	5,469
Eureka	GW	5,071
Evansville	SW	750
Fairfield	SW	6,621
Farina	SW	550
Flora	SW	6,100
Georgetown	GW	4,063
Gillespie	SW	7,700
Greenfield	SW	1,140
Greenville	SW	7,500
Hettick	SWP	184
Highland	SW	12,808
Hillsboro	SW	9,000
Holiday Shores Sanitary District	SW	3,192

Appendix C. Continued

System Name	Current Source Type	Current Population
Jacksonville	SW	23,000
Kankakee (Aqua Illinois)	SW	76,000
Kaskaskia Water District	SW	25,528
Keyesport	SWP	517
Kinkaid Area Water System	SW	27,000
Kincaid	SWP	1,775
Kinmundy	SW	1,078
La Harpe	SW	1,440
Lake of Egypt Public WD (So. Ill. Electric Corp)	SW	12,200
Litchfield	SW	13,000
Loami	SWP	850
Louisville	GWP	1,100
Macomb	SW	20,185
Marion	SW	17,700
Mattoon	SW	19,500
Mount Olive	SW	2,360
Mount Vernon	SWP	32,003
Nashville	SW	3,997
Neoga	SW	1,854
New Berlin	SW	1,075
Oakland	GWP	996
Oakwood	SW	1,521
Olney	SW	12,000
Omaha	GWP	286
Otter Lake Water Commission	SW	16,300
Palmyra-Modesto Water Commission	SW	1,735
Pana	SW	6,914
Paris	SW	9,077
Patoka	SWP	931
Pinckneyville	SW	6,923
Pittsfield	SW	4,650
Pontiac (Illinois-American)	SW	12,000
Rend Lake Intercity Water System	SW	164,696
Royalton	SWP	2,503
Salem	SW	12,275
Shipman	SWP	700
SLM Water Commission[3]	SW	30,000

Appendix C. Concluded

System Name	Current Source Type	Current Population
Sorento	SWP	645
Sparta	SW	5,801
Springfield	SW	133,000
St Elmo	GWP	3,070
Staunton	SW	5,281
Streator (Illinois-American)	SW	18,000
Taylorville	SW	17,500
Vandalia	SW	7,010
Vermont	SW	814
Vienna	SW	1,600
Virginia	GW	1,728
Waterloo	SWP	9,038
Waverly	SW	1,456
Wayne City	SW	1,350
West Salem	GWP	1,058
White Hall	GW	2,900

[1] Source types include surface water (SW), groundwater (GW), purchased surface water (SWP), purchased groundwater (GWP) as well as systems that have become inactive since 1989 (IS).

[2] The population of systems purchasing water from other surface water systems that will be included in the upcoming drought adequacy study may be double counted.

[3] Summerfield-Lebanon-Mascoutah Water Commission.

Appendix D-1. Changes in Community Water Systems at Risk of 20-Year Drought between 1989 and 2020

System Name	Year Supply < Drought Demand (1.2 or 1.3 Q_d)	Current Source Type	Description of Changes (1989 – 2007)
Bloomington	2000	SW	Lake Evergreen's spillway was raised 5 feet in 1995. Water from the Mackinaw River is now available during emergencies and was used to fill Lake Evergreen in 2000 and 2006. Lake Evergreen no longer can be used to raise Lake Bloomington's levels.
Coulterville	1990	SW	Lake Coulterville's spillway raise of 14 inches was completed in 1989. Their distribution system was heavily renovated the following year.
Decatur	1990	SW	Lake Decatur is still the community's primary source, but wells have been developed and new surface and groundwater sources are sought. An ongoing dredging program maintains reservoir capacity.
Farina	1990	SW	The Loy Borrow Pit boosted Farina's storage capacity after the 1988-1989 drought. The Sigrist Pit was constructed in 2006, and was first used in October 2007 to preserve fish in the other two borrow pits.
Flora	1990	SW	Flora is still using an intake on the Little Wabash River, although it will become part of the Gateway Regional Water Supply in 2008.
Georgetown	1990	GW	Georgetown has been using groundwater exclusively since 2003.
Loami	1990	SWP	Loami has been purchasing water since 1994. It switched from Springfield's City Water, Light & Power to the Otter Lake Water Commission in 2006.
Marion	1990	SW	Marion is obtaining right-of-way easements for a line to the Rend Lake Intercity Water System after repeated attempts to build a new lake have failed.
Oakland	1990	GWP	Oakland has been purchasing its entire supply from the Embarras Area Water District since 2003.

Appendix D-1. Continued

System Name	Year Supply < Drought Demand (1.2 or 1.3 Q_d)	Current Source Type	Description of Changes (1989 – 2007)
Paris	1990	SW	Paris has continued to use Paris Twin Lakes as its primary source. West Lake was dredged in 1991. Capacity increased from 150 ac-ft (1983) to 239 ac-ft in 1991 (East Lake had 1400 ac-ft in 1983). Paris is the final steps of the process necessary to begin building a system for a new groundwater source from the Wabash Valley aquifer. This system is expected to go online by the end of 2008.
Pontiac (Illinois-American)	1990	SW	Pontiac built a new 350 MG (1,075 ac-ft) off-channel reservoir in 1993. This additional storage enabled Pontiac to cope with the 2005 drought much better than the 1988-1989 one.
Shipman	1990	SWP	Shipman has been purchasing water from Jersey County Water District since 1998.
Sorento	1990	SWP	Sorento has been purchasing its entire supply from Three County Water District since 2003, which purchases from Litchfield.
Staunton	1990	SW	Staunton Lake's spillway was raised 9 feet in 1995, increasing estimated storage from 1,409 ac-ft to 1,940 ac-ft based on a first-order polynomial extrapolation of the original curve.
Waterloo	1990	SWP	Waterloo has purchased water from the Illinois-American Company in East St. Louis since 1994 due to continual problems with seepage losses from its own reservoir.

Appendix D-1. Concluded

System Name	Year Supply < Drought Demand (1.2 or 1.3 Q_d)	Current Source Type	Description of Changes (1989 – 2007)
Wayne City	1990	SW	Wayne City has continued using its intake on the Skillet Fork of the Little Wabash River. It may lose the West Wayne WD satellite, picked up during the 1990s, sometime in 2007.
West Salem	1990	GWP	West Salem has been purchasing from R.E. Water since 2003. Two shallow wells provided the community's entire supply in 2002 after its two lakes were taken offline.
White Hall	1990	GW	White Hall has been obtaining its entire supply from its own wells since 1999.

Appendix D-2. Changes in Community Water Systems at Risk of 50-Year Drought between 1989 and 2020

System Name	Year supply < Drought Demand (1.2 or 1.3 Q_d)	Current Source Type	Description of Changes (1989 – 2007) and Recent Developments
Canton	1990	SW	Two backup wells have been developed for supplemental supply. These wells, first used in 1989, have supplemented production from Canton Lake during 11 of the past 22 years, including 2006 and 2007. A radial collector well that would obtain water from the Illinois River's alluvial aquifer has been proposed.
Carlinville	1990	SW	Loveless Lake (Lake II) became a backup source in 1995. Carlinville is now looking into an intake on the Mackinaw River, as production at the Monterey Coal Mine has increased demand.
Fairfield	1990	SW	A second 276.3 ac-ft (90 MG) off-channel reservoir will provide additional storage for water from the Little Wabash River.
Gillespie	1990	SW	New Gillespie Lake became the primary source in 2003. A portable pump can provide water from Old Gillespie Lake during an emergency.
Greenfield	1990	SW	Lake Greenfield is still the system's only designated water source. A portable pump could be used on Coles Lake if necessary.
Kinmundy	1990	SW	New Kinmundy Lake went online in 1998. The old lake now functions as a sedimentation basin. Kinmundy Borrow Pit was taken offline in 2006.
Mount Olive	1990	SW	No major changes have been made. The spillway raise proposed in 1990 was never implemented.

Appendix D-2. Concluded

System Name	Year supply < Drought Demand (1.2 or 1.3 Q_d)	Current Source Type	Description of Changes (1989 – 2007) and Recent Developments
Palmyra-Modesto	1990	SW	An unknown quantity of sediment from Terry Park Lake upstream of Lake Palmyra was dredged and now effectively functions as a sedimentation basin for Lake Palmyra. A large hog operation closed in 1996, but South Palmyra and Hettick now obtain part of their supply from this system.
Springfield	1990	SW	A 46,000 ac-ft reservoir (Hunter Lake) has been proposed to augment Springfield's water supply.

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