



Illinois  
Environmental  
Protection Agency

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# THE CONDITION OF ILLINOIS WATER RESOURCES 1999



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## **PURPOSE**

The *Condition of Illinois Water Resources, 1999*, was prepared by the Illinois Environmental Protection Agency (EPA) to describe in general terms the overall water quality conditions throughout Illinois. This includes facts about Illinois rivers and streams, inland lakes, Lake Michigan, and groundwater. The information in this report is summarized from more detailed information generated and submitted annually to the U.S. Environmental Protection Agency (U.S. EPA) as required by Section 305(b) of the federal Clean Water Act (CWA). In addition, a set of 33 water quality fact sheets has been created to look at specific water bodies in major Illinois watersheds. Inside the back cover of this report is a list of the 33 fact sheets and how they may be obtained from Illinois EPA.

## **THE ILLINOIS WATER QUALITY (305b) REPORT**

According to Section 305(b) of the federal CWA of 1972, and guidance provided by U.S. EPA, each state is to prepare and submit to the U.S. Congress and the U.S. EPA an annual report which includes:

- an assessment of the water quality for surface and groundwater resources;
- an analysis of the extent to which such waters provide for the protection and propagation of shellfish, fish, and wildlife as well as allow for recreational activities;
- an analysis of the extent to which the requirements of the CWA have been achieved;
- an estimate of the environmental impacts, costs and benefits, and time frame to achieve the requirements of the CWA; and
- a description of the nature and extent of nonpoint source pollution and recommendations to address this pollution.

## **WATER QUALITY IN ILLINOIS**

Illinois is blessed with abundant water resources. There are approximately 87,110 miles of interior streams in Illinois. Major interior rivers include the Des Plaines, Rock, Fox, Kankakee, Illinois, Sangamon, Kaskaskia, Vermilion, Cache, and Big Muddy. In addition, the state's natural borders to the west and southeast are formed by 1,089 miles of the Mississippi, Ohio, and Wabash rivers, respectively.

More than 87,600 inland lakes and ponds exist in Illinois (3,041 of which have surface areas of six acres or more). The majority of Illinois inland lakes (75 percent) are artificial impoundments, including reservoirs ranging up to 26,000 acres in surface area; dammed stream and side channel impoundments; and strip mine, borrow pit, and excavated lakes. Natural lakes include glacial lakes found in the northeastern counties, sinkhole ponds in the southwest, and oxbow and backwater lakes found along major rivers.



Illinois is bordered by one Great Lake - Lake Michigan. Illinois has jurisdiction over approximately one million acres of Lake Michigan stretching along the state's northeastern border and the city of Chicago. Lake Michigan is the third largest of the Great Lakes and is the largest body of freshwater totally within the boundaries of the United States. Together, the Great Lakes constitute the largest freshwater system on earth, with the exception of the polar ice caps.

Principal aquifer areas for groundwater in Illinois cover 32,400 square miles or 59 percent of the state. Approximately 11,800 square miles of overlapping areas (aquifers at different depths) are accounted for in this figure. Approximately 18,600 square miles of Illinois (33 percent of the state) are underlain by shallow aquifers with some 8,300 square miles designated as highly susceptible to groundwater contamination.

## ***SURFACE WATER QUALITY MONITORING***

The Illinois EPA has maintained a comprehensive surface water monitoring and assessment program since its inception in 1970. Changes and additions to the monitoring effort have been undertaken to keep pace with technological advances and broadening environmental concerns. Surface water monitoring activities focus on water and sediment chemistry as well as on physical and biological data (aquatic invertebrates, fish, and habitat). As a result of these monitoring programs, data from approximately 3,400 stations have been utilized in the assessment of surface water quality conditions. Data from these stations are utilized to make either "monitored" or "evaluated" resource assessments. "Monitored" assessments involve water samples collected and analyzed by Illinois EPA or other professional staff. "Evaluated" assessments consist of volunteer collected data, or monitored data that is five years or more old.

The Illinois EPA conducts a wide variety of water quality monitoring programs. Among these are the Ambient Water Quality Monitoring Network, Intensive River Basin Survey (in cooperation with IDNR), Facility-Related Stream Survey, Ambient Lake Monitoring Program, Clean Lakes Program Intensive, Volunteer (Citizen) Lake Monitoring Program, and National Nonpoint Source Monitoring Program.

The objectives of these monitoring and assessment programs are to:

- analyze and interpret data/information to evaluate attainment of designated uses (drinking water, recreation, etc.);
- determine long-term trends in physical, chemical, and biological conditions;
- identify water quality problems and problem areas and further investigate the extent and cause(s) of the problem; and
- provide a measure of the effectiveness of Illinois' water pollution control programs.

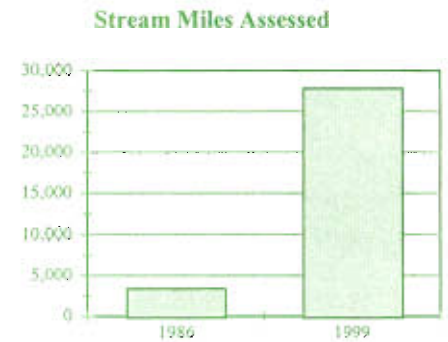
The Illinois EPA's water quality program is designed to evaluate and protect water resource "designated uses." Designated uses take into consideration the use and value of the waterbody for public water supply; for propagation of fish, shellfish and wildlife; and for recreational, agricultural, industrial and navigational purposes. In Illinois, waterbodies have been classified for a variety of designated uses that include: general use, public and food processing water supplies, secondary contact, and indigenous aquatic life. Lake Michigan has its own designated uses based upon a set of more stringent water quality standards. Water quality conditions are described in terms of the degree to which a waterbody attains its designated uses.

For this 1999 report and the 33 water quality fact sheets, water quality is rated as either "good," "fair" or "poor" based on physical, chemical and biological data collected through 1997. A "good" rating means a river or lake meets the needs of all designated uses. "Fair" means water quality has been impaired and the

waterbody meets the needs of a designated use. A waterbody that is rated as "poor" has water quality that has been severely impaired and cannot support designated uses to any degree.

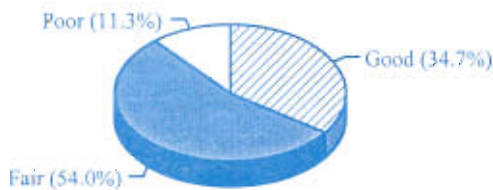
### RIVERS AND STREAMS ASSESSMENT

The quality of rivers and streams plays a fundamental role in the overall health of the environment, and has a direct bearing on both the economic and recreational opportunities available to the citizens of Illinois. Consequently, public interest in the value of water quality has increased significantly in recent years. For instance, through the Illinois Rivers Project, more than 170 Illinois high schools now include hands-on course work on the monitoring of river water quality.

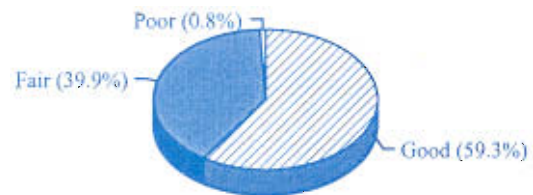


The miles of rivers and streams that are assessed by the Illinois EPA has increased significantly. In 1986, only 3,400 miles of rivers and streams were assessed as compared to the 27,832 miles that were assessed for this 1999 report. Of the 27,832 miles assessed in 1999 for overall resource quality, 59.3 percent were rated as "good," 39.9 percent were rated as "fair," and 0.8 percent were rated as "poor."

Stream Water Quality Conditions 1972

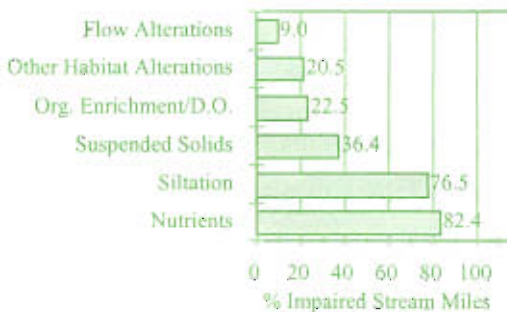


Stream Water Quality Conditions 1999

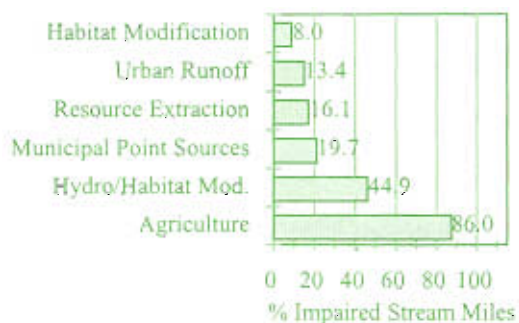


Various causes and sources of water quality problems are identified during the assessment process. For rivers and streams, the principal causes of impairment are nutrients, siltation, and suspended solids. The principal sources of impairment are agriculture, hydrologic/habitat modifications, and municipal point sources. Overall, stream water quality has steadily improved over the last 27 years. The total miles of water pollution impact by municipal and industrial point sources have declined; fewer stream miles are being impacted by nonpoint source pollution; and increased species diversity in the Illinois, Rock, and Mississippi Rivers has been documented.

Causes of Impairment Rivers & Streams

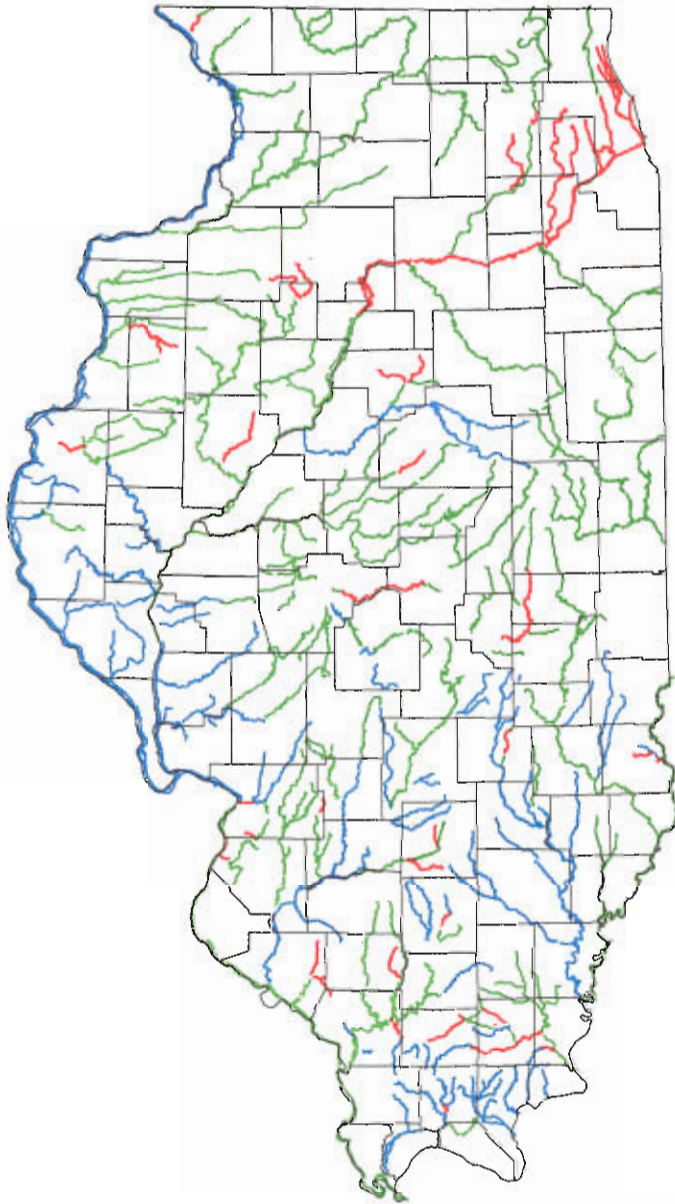


Sources of Impairment Rivers and Streams






# CONDITION OF ILLINOIS RIVERS AND STREAMS

1972



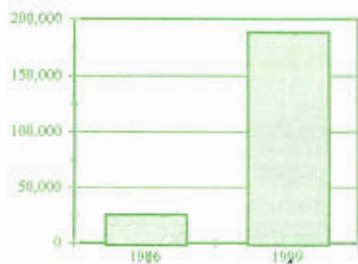
1999



-  Good Water Quality Conditions
-  Fair Water Quality Conditions
-  Poor Water Quality Conditions

## INLAND LAKES ASSESSMENT

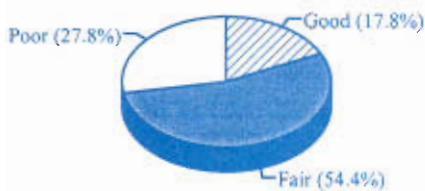
**Lake Acres Assessed**



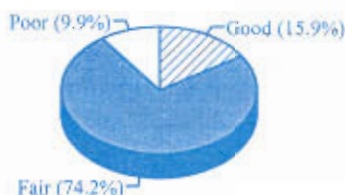
In Illinois, more than 3,000 lakes (more than six acres in size) cover nearly 250,000 acres. These resources are a vital component to the economic and social well-being of the state, generating 90 million visitor days of general recreation annually. Publicly-owned lakes greater than 20 acres in size were assessed, along with public and non-public lakes in the Illinois EPA's Volunteer Lake Monitoring Program.

Like rivers and streams, the number of inland lake acres assessed by Illinois EPA has increased significantly. In 1986, only 25,302 acres were assessed as compared to the 188,484 acres that were assessed for this 1999 report. Of the *acreage* assessed (188,484 acres) for overall resource quality, 15.9 percent were rated as "good," 74.2 percent were rated as "fair" and 9.9 percent were rated as "poor." Of the *number* of lakes assessed (503), good, fair, and poor conditions were 41.6, 52.4 and 6.0 percent, respectively.

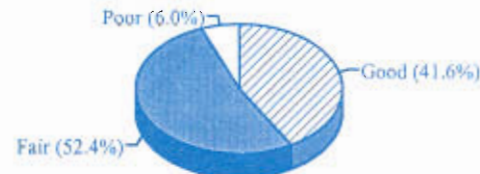
**Lake Water Quality Conditions  
1972 - Acres**



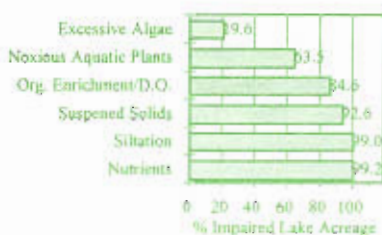
**Lake Water Quality Conditions  
1999 - Acres**



**Lake Water Quality Conditions  
1999 - Lakes**

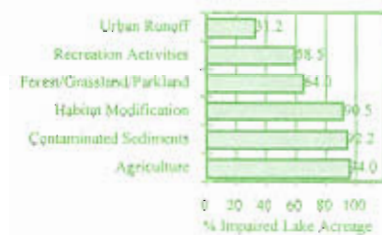


**Causes of Impairment  
Inland Lakes**



Various causes and sources of water quality problems were identified during the assessment process. For inland lakes, the principal causes of impairment are nutrients, siltation, and suspended solids. The principal sources of impairment are agriculture, contaminated sediments (in-place contaminants such as sediment, or phosphorus attached to sediment particles), and habitat modifications.

**Sources of Impairment  
Inland Lakes**



A major effort to improve inland lakes began in 1995 with the passage of Conservation 2000. The Illinois EPA now receives approximately \$1.5 million annually to implement expanded public education, technical assistance, monitoring, and financial incentives programs. Because of Conservation 2000, Illinois has one of only a handful of state-funded, comprehensive lake management programs in the country.

## LAKE MICHIGAN ASSESSMENT

As a natural resource of immeasurable value, Lake Michigan serves a broad spectrum of purposes. It provides drinking water for an estimated six million residents in the northeastern Illinois area. Its recreational and habitat value attract fishing, boating, swimming and other water-oriented interests. Because of the importance of this natural resource, Lake Michigan is protected to a greater degree than inland lakes by having more stringent water quality standards.

Lake Michigan is monitored through a cooperative agreement between the city of Chicago and the Illinois EPA. All 63 miles of Illinois' Lake Michigan shoreline were assessed for this report, and were rated as having "good" overall water quality. All 63 miles of shoreline support drinking water uses. Sources of

impairment threatening the water quality of Lake Michigan include atmospheric deposition, urban runoff and contaminated sediments. Illinois' portion of Lake Michigan does have a sport fish advisory for some fish species that limits their consumption.

### ***GROUNDWATER MONITORING AND ASSESSMENT***

Groundwater withdrawals in Illinois have historically exceeded 950 million gallons per day (MGD). Groundwater supports domestic (drinking water use), commercial, agricultural, industrial, mining, thermoelectric and special resource uses. Special Resource Groundwater is described as the groundwater contributing to highly sensitive areas such as dedicated nature preserves. In addition, groundwater in Illinois supports ecologically sensitive areas such as the karst plain located in Monroe, St. Clair and Randolph counties.

Approximately 4.1 million people use groundwater as a source of public water supply in Illinois. There are 5,534 groundwater dependent public water supplies in the state, of which 1,195 are community water supplies (CWSs). The community supplies serve about 3.1 million people. Approximately 400,000 residences of the state are served by their own private wells. Seventy percent of CWSs in the state withdraw water from confined aquifers that have natural geologic protection from surface and near surface activities.

However, the remaining 30 percent of the communities withdraw water from unconfined aquifers that are susceptible to pollution from land use and other surface activities.

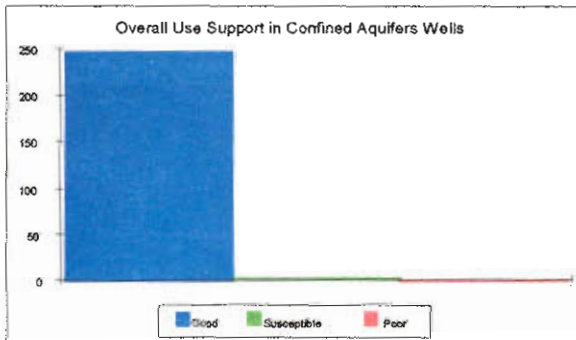


Groundwater quality is a major concern in Illinois. Water quality degradation or contamination results from point and nonpoint sources throughout the state. In many industrialized areas, including the metropolitan areas of Chicago, Rockford, and St. Louis, groundwater has been degraded by improperly contained or disposed of chemicals. In many agricultural areas, the quality of groundwater in shallow aquifers has been degraded by the routine application of agricultural chemicals. Nearly 10 percent of the CWS wells in the state are predicted to have water quality which is either susceptible, or of poor quality, as a result of impacts by one of the three contaminant groups assessed (volatile organic/aromatic compounds, nitrate, immunoassayalachlor and triazine). Approximately 22 percent of the CWS wells using unconfined aquifers and 2 percent of the CWS wells using confined aquifers have been impacted. The figure on the following page illustrates the statewide distribution of good, susceptible, and poor water quality in confined vs. unconfined CWS Network wells.

# Overall Use Support in CWS Network Wells

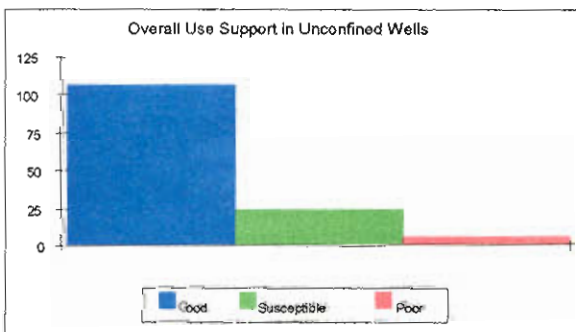
## CWS Network Wells in Confined Aquifers

Good	Susceptible	Poor
248	5	1

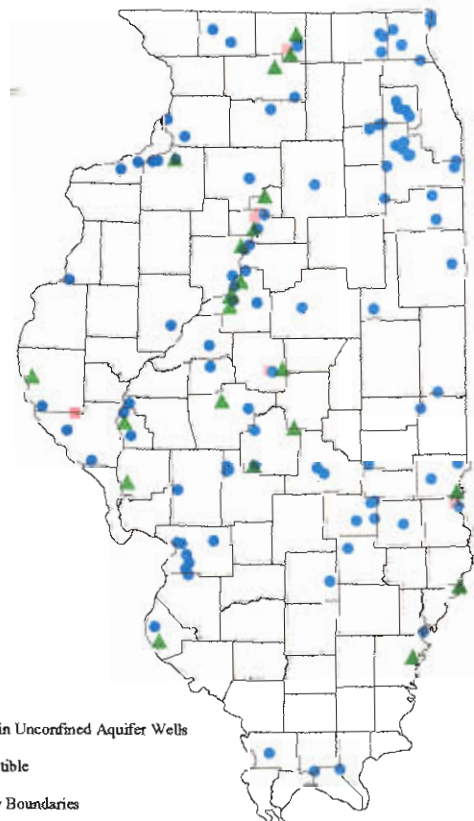
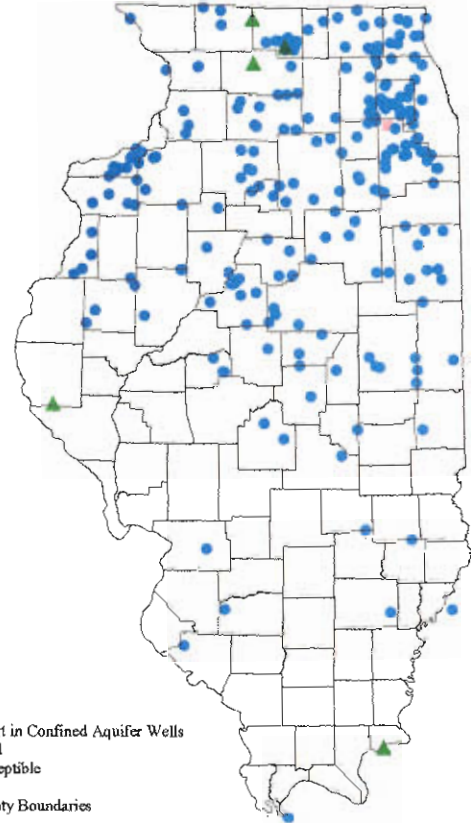


## CWS Network Wells in Unconfined Aquifers

Good	Susceptible	Poor
106	24	6

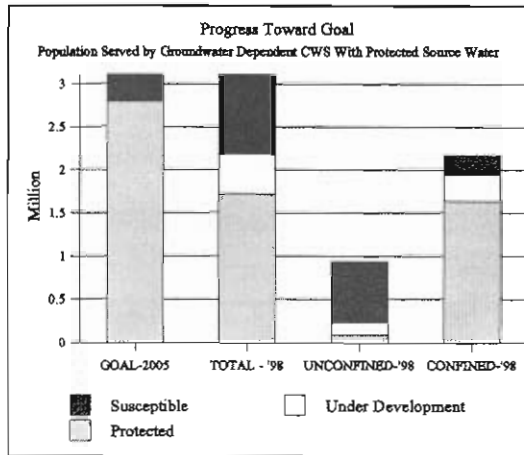


Source Information  
 County boundaries obtained from the ISGS.  
 Use support information and map compiled  
 by Illinois EPA Groundwater Section

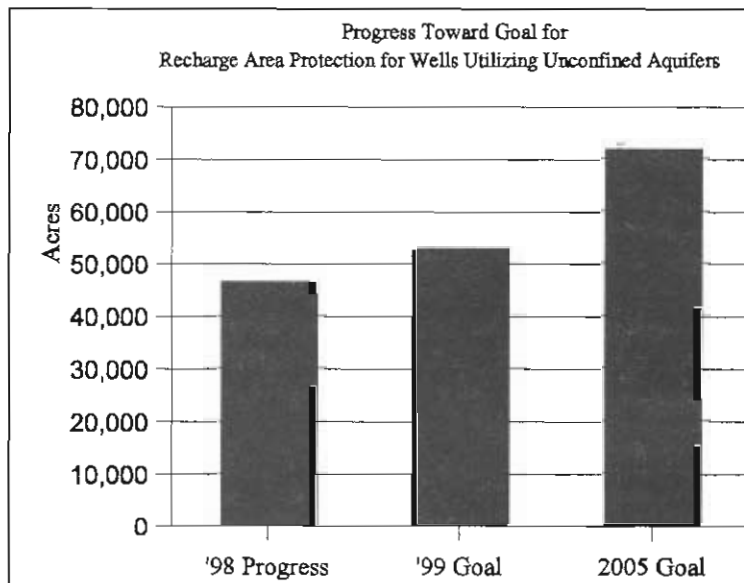




Protection of Illinois' valuable groundwater resource is critical. The Illinois EPA has made considerable progress in groundwater protection through such initiatives as the groundwater quality standards, Regional Groundwater Protection Planning Programs, and the Safe Drinking Water Act Monitoring Waiver Program. Illinois continues to address the need for protecting groundwater by accomplishing the mission set forth in the Illinois Groundwater Protection Act and through federal, state and local partnerships to establish groundwater protection programs. These partnerships have utilized regulatory and non-regulatory programs to achieve success. As illustrated in the table on this page, Illinois EPA is measuring the population served by systems with protected unconfined and confined aquifer resources.

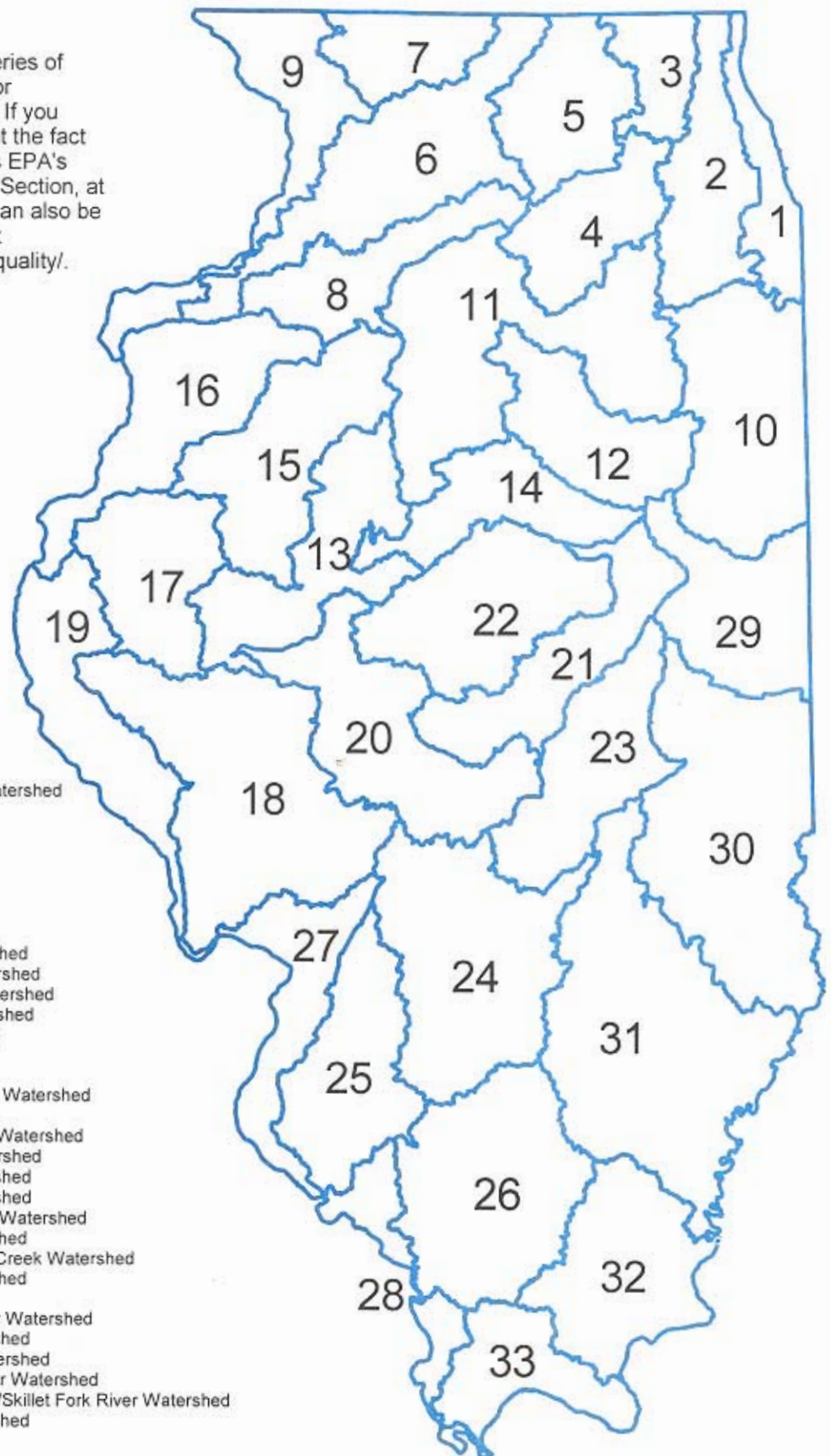


Since approximately one million people in Illinois rely on susceptible unconfined aquifers for their source of drinking water, Illinois has placed added emphasis on the protection of these groundwater systems. Protecting the land surface areas around susceptible unconfined aquifer wells (recharge areas) can help prevent contamination of groundwater. Coupled with the population served, as documented in the table to the right, measuring the acres with protection programs under development or in place provides an effective indicator of Illinois' progress in protecting these susceptible areas.



# Watersheds of Illinois

The Illinois EPA has created a series of 33 fact sheets, one for each major watershed in the state of Illinois. If you would like more information about the fact sheets, please contact the Illinois EPA's Bureau of Water, Surface Water Section, at 217/782-3362. The fact sheets can also be found at Illinois EPA's web site at [www.epa.state.il.us/water/water-quality/](http://www.epa.state.il.us/water/water-quality/).



- 1 Great Lakes/Calumet River Watershed
- 2 Des Plaines River Watershed
- 3 Upper Fox River Watershed
- 4 Lower Fox River Watershed
- 5 Kishwaukee River Watershed
- 6 Rock River Watershed
- 7 Pecatonica River Watershed
- 8 Green River Watershed
- 9 Mississippi North River Watershed
- 10 Kankakee/Iroquois River Watershed
- 11 Upper Illinois/Mazon River Watershed
- 12 Vermilion (Illinois) River Watershed
- 13 Middle Illinois River Watershed
- 14 Mackinaw River Watershed
- 15 Spoon River Watershed
- 16 Mississippi North Central River Watershed
- 17 La Moine River Watershed
- 18 Lower Illinois/Macoupin Creek Watershed
- 19 Mississippi Central River Watershed
- 20 Lower Sangamon River Watershed
- 21 Upper Sangamon River Watershed
- 22 Salt Creek of Sangamon River Watershed
- 23 Upper Kaskaskia River Watershed
- 24 Middle Kaskaskia River/Shoal Creek Watershed
- 25 Lower Kaskaskia River Watershed
- 26 Big Muddy River Watershed
- 27 Mississippi South Central River Watershed
- 28 Mississippi South River Watershed
- 29 Vermilion (Wabash) River Watershed
- 30 Embarras/Middle Wabash River Watershed
- 31 Little and Lower Wabash River/Skillet Fork River Watershed
- 32 Saline River/Bay Creek Watershed
- 33 Cache River Watershed