

TEACHER'S GUIDE

Unit 1, Lesson 2

WATER AS A RESOURCE

This lesson and its corresponding activities are targeted to grades 5-9 and subject areas English language arts, mathematics, science, social science, physical development and health and fine arts,. Most of the activities and the following background information may be adapted to other grade levels.

About 75 percent of the earth's surface is covered with water. It is one of the most common substances found on earth, but it is also considered one of our most prized possessions. Life cannot exist without it. It has been referred to as the "liquid of life." The human body contains 65-70 percent water, and it must have 2.5 quarts of water a day. Most water need is satisfied through the daily intake of food, including the liquids we drink. Without water, we can survive for only a few days.

Water is the only substance on earth which can be found naturally in three separate forms--solid, liquid and gas. A single molecule of water can float as a vapor (gas) then fall to earth as rain (liquid) and then freeze into ice, sleet or snow (solid). Water is a finite resource--all the water we are ever going to have on earth is here now.

Who uses water?

- C Humans use water for many activities including cooking, bathing, washing clothes and dishes and brushing teeth.
- C Factories and industries use water to manufacture things that people use, like clothes, paper, gasoline, electricity, plastic and glass. Water is also used in the mining process.
- C Farmers use water to grow crops and raise animals for food. It takes about 15 gallons of water to grow the wheat to make one loaf of bread, about 120 gallons for a chicken to lay one egg and about 4,000 gallons to produce a pound of beef.
- C People use water for recreational purposes such as swimming, boating and fishing. Barges carry people and goods on rivers and lakes.
- C Water provides plants and animals food and shelter.

Every living thing on earth must have water. Even though it is a reusable resource, it must be shared by all water users and managed to ensure future supplies. Drinkable water is not free. Water treatment facilities and the distribution of drinking water are costly. Customers are charged according to the amount of water they use. A water meter is used to

measure how many gallons or cubic feet a household or business uses. Because users pay for water and because there is only so much fresh water available for use, we must conserve our supplies, using them as wisely and efficiently as possible.



It is important to keep data related to water usage for governmental agencies, public-supply operators, water-resource managers and researchers for assessing current water-use patterns and anticipating future water demands. State water use data are collected and compiled by the Illinois State Water Survey in cooperation with the U.S. Geological Survey.

Where is Illinois' Water?

Illinois is a water-rich state and most of those riches flow through its streams and rivers (see Figure 1). The state is bordered by three major rivers: the Mississippi to the west and the Ohio and the Wabash to the south and east. Sixty-three shoreline miles (976,640 acres) of Lake Michigan, one of the five great freshwater lakes between the United States and Canada, creates Illinois' northeast border. According to Illinois Environmental Protection Agency statistics, Illinois' 14 major river basins are drained by more than 87,000 miles of flowing water. This stream miles measurement figure constantly changes due to erosion, siltation and stream diversion. There are nearly 88,000 inland lakes and ponds (313,980 acres). Also, there are 1 million acres of wetlands and marshes, a tiny remnant of the original 8 million acres that existed in the state. This system of streams, rivers, lakes and creeks is called surface water. Much of the water we use exists out of sight--underground. This is called groundwater and is the supply of water under the earth's surface that forms natural reservoirs. Although groundwater accounts for only a fraction of the earth's supply of water, it is widely used for human consumption. Actually, it is more abundant than the water found in rivers, lakes and streams. Groundwater accounts for 99 percent of the world's freshwater supply. Forty-seven percent of the public water supply in Illinois comes from groundwater; industry extracts 21 percent, another 21 percent is used for agriculture

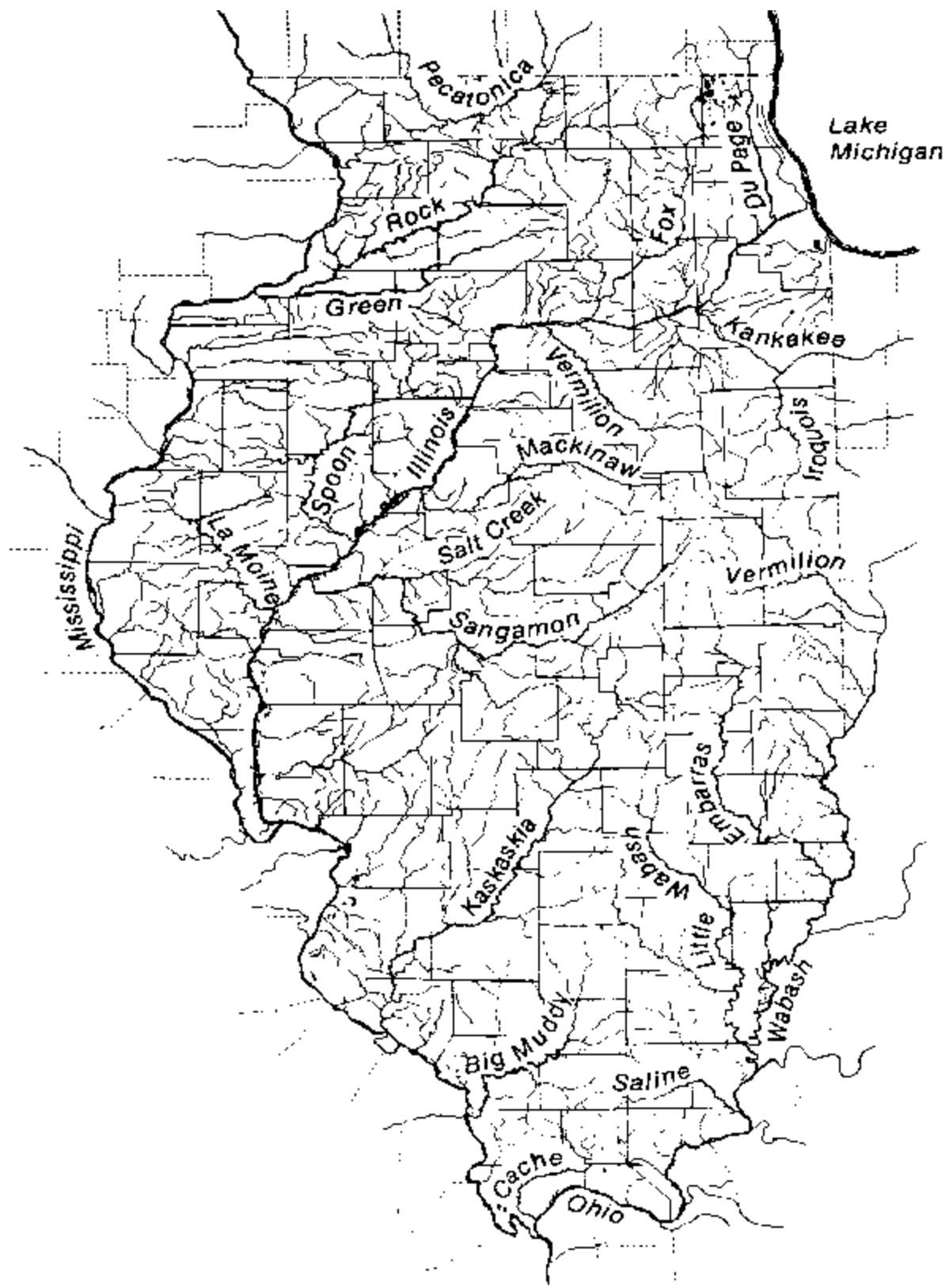


FIGURE 1

purposes and those who have private water supplies use 11 percent. Groundwater is much harder to access than surface water.

Self-supplied vs. Public Water Supplies

Self-supplied, or private, water is water that is withdrawn from a surface or groundwater source by a user rather than being obtained from a public supply. There are nearly



400,000 private wells in Illinois which serve approximately 1.3 million people (see Figure 2). A public water supply is water withdrawn by public and private water suppliers and delivered to groups of users. Public suppliers provide water for a variety of uses, such as domestic, commercial, hydroelectric power generation (using water to help generate electricity), industrial and public water use. Water provided by public water suppliers or water that is self-supplied can come from surface water or groundwater.

The self-supplied population is the difference between the total county population and the population served by public water supply. Eighty percent of the population of Illinois is served by public-supply facilities. In 1990 the largest supply of surface water withdrawals for public supply were from Lake Michigan, the Mississippi River and the Sangamon River (see Figure 3). The largest withdrawals of ground water for public supply were in Champaign, Cook, Du Page, Kane, Lake, La Salle, McHenry, Madison, Peoria, Tazewell, Will and Winnebago counties (see Figure 4). Although many commercial and industrial water users purchase water from public water supplies, a number of large users develop their own water supplies. This process creates competition between industry and domestic users for the same water supplies. Nearly all the self-supplied industry in Illinois can be divided into four major classifications: thermoelectric power generation, hydroelectric power generation, manufacturing and mineral extraction.

Uses of Water in Illinois

There are many ways to describe the “usage” of water. It can range from consumptive use where the water is combined with other materials to make a product, to using water to float a boat for recreation.

Drinking Water: There are several sources of drinking water in Illinois. One source is surface water from rivers and lakes. Almost half of Illinois residents rely on a second source, groundwater, to meet their daily water needs. Lake Michigan supports drinking water uses for the northeastern portion of the state. Approximately 1.1 billion gallons per day are removed from Lake Michigan for people to use.

Agricultural: Although irrigation uses relatively small amounts of water in terms of total withdrawal, it is a major water use in some areas of the state. According to the 1992 Census of Agriculture, Illinois has 2,061 farms that use irrigation, which calculates into 328,316 irrigated acres. Water for irrigation is applied during the growing season of May-August, but the total water used is averaged over the entire year. The source of most irrigation water is groundwater.

Water use for livestock purposes is determined by multiplying the county population of each major type of farm animal by the estimated water directly consumed by the animal and other water used in association with the animal (Kirk 1987). The estimated water used from direct consumption by and uses associated with each animal type are as follows.

Animal Type Estimated Water Usage <i>(gallons per day)</i>	
Dairy Cows	35.0
Beef Cattle	12.0
Horses/Mules	12.0
Hogs	4.0
Goats	3.0
Sheep	2.0
Turkeys	0.12
Chickens	0.06
Rabbits	0.05
Mink	0.03

The total amount of water for livestock and animal specialties used in 1990 was 62.74 million gallons per day in Illinois.

Personal Hygiene and Other Uses: People use water for bathing, washing clothes and dishes and brushing teeth, as

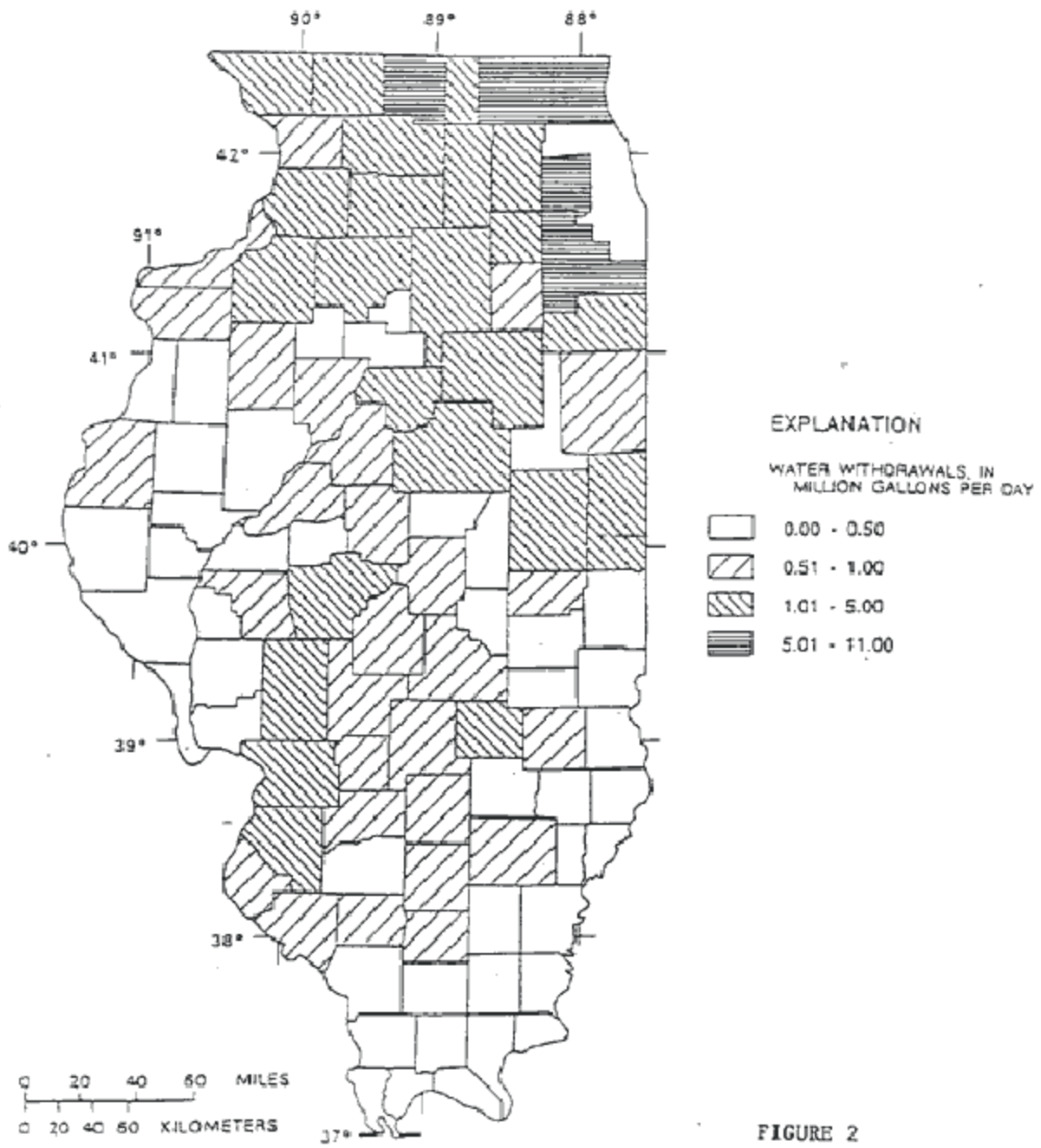


FIGURE 2

Estimated self-supplied domestic withdrawals of water in Illinois

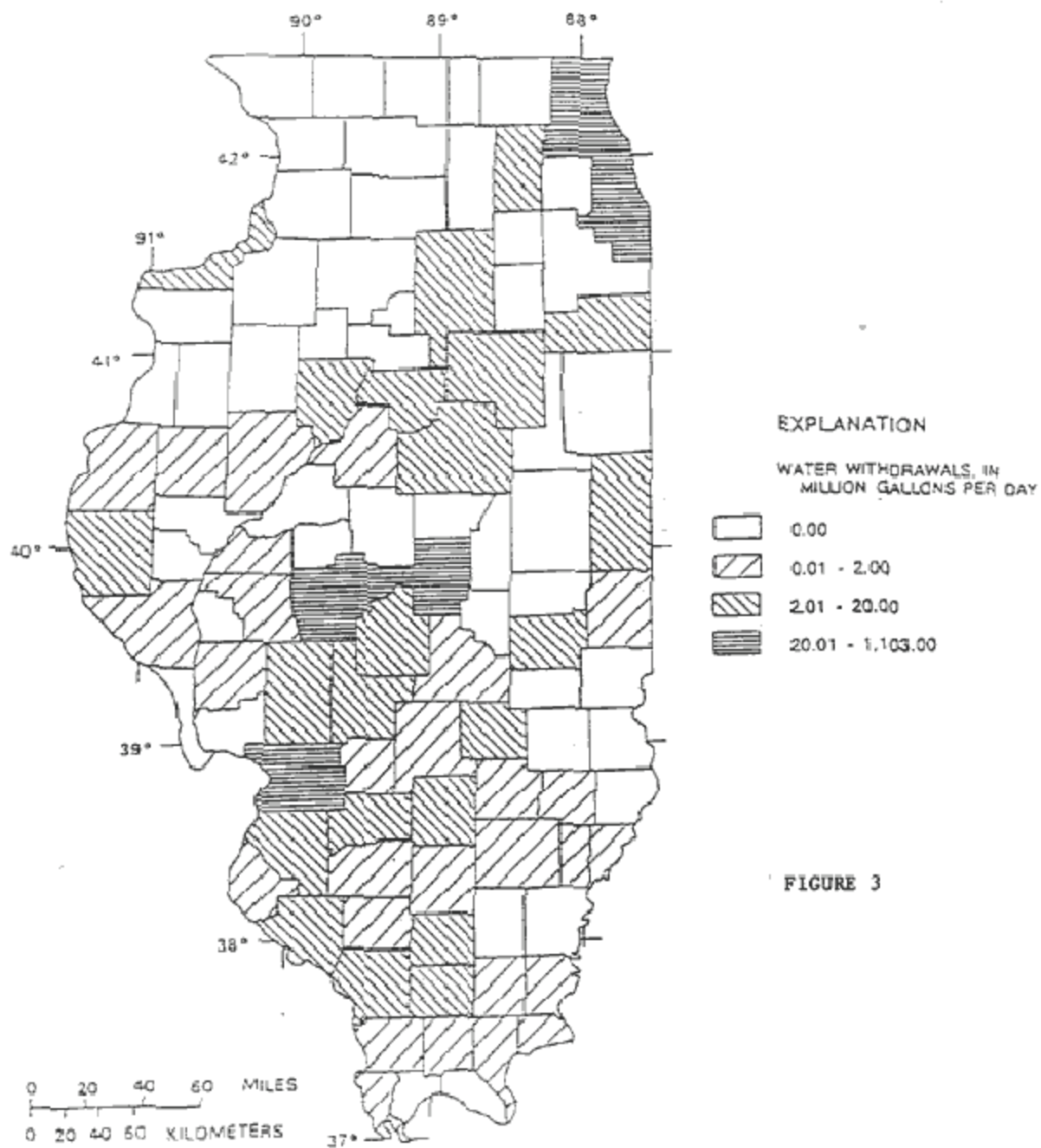


FIGURE 3

Public-supply withdrawals of surface water in Illinois

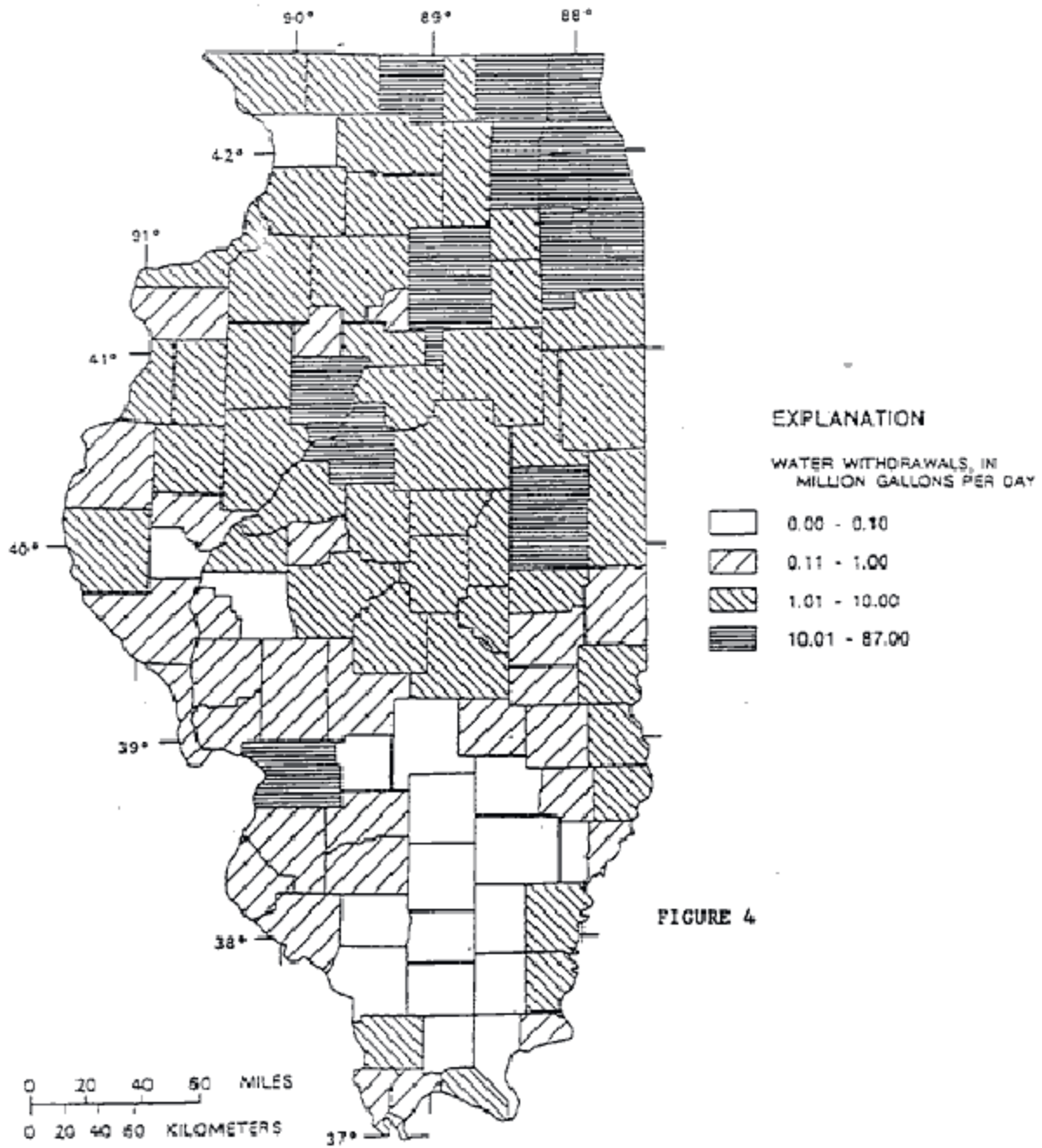


FIGURE 4

Public-supply withdrawals of ground water in Illinois

well as cooking and other uses. The average water user in the United States uses 80 to 100 gallons of water per day. A chart in Activity 2 shows the types of usages with approximate amounts.

According to the 1995 Illinois Water Uses Summary published by the Illinois State Water Survey, the total water withdrawal (reported and estimated) in 1995 in Illinois was 1.9 billion gallons per day. Surface water furnished 1,496.74 million gallons per day (mgd) while groundwater supplied 368.93 mgd. The largest public water system is the Chicago Department of Water which services more than 5 million people within Chicago and the outlying areas. This system pumped 1,050.02 mgd from Lake Michigan in 1995. The largest area served by a public water supply system is the Rend Lake Conservancy District in southern Illinois. Reaching into parts of nine counties (Franklin, Jackson, Jefferson, Hamilton, Marion, Perry, Saline, Washington and Williamson), this conservancy district serves an area of more than 1,800 square miles. It pumped 12.87 mgd from Rend Lake in 1995.

Industrial: The total amount of self-supplied and public-supply delivery of water for industrial purposes in 1990 for the state was 727.72 million gallons per day.

Mining: Water is an important part of the mining process. Coal mining in southern Illinois consists of both surface and underground operations which utilize little to no groundwater for a consumptive purpose. Water is used to keep the coal dust down in the mines during the actual extraction of coal. Water is also used to wash the coal after it is extracted. The average coal mine in Illinois uses approximately 6 million gallons of water per month or 200,000 gallons per day. About a million gallons of that water can be recycled. Varied amounts of groundwater must be removed in both types of mining. It is typically pumped out of the mine and discharged off the site through a regularly monitored discharge point which must meet all state and federal regulations. The coal mining operator is required to replace any drinking water supply that is interrupted as a result of the mining operations. Even though surface and groundwater are closely monitored by the Illinois Department of Natural Resources, groundwater removal is not typically quantified.

Transportation: The Mississippi, Illinois, Ohio and Kaskaskia rivers are equipped with locks, dams and maintained channels. They serve as important transportation routes for commercial navigation in and through Illinois and add to the rich history water brings to Illinois.

Recreation: There are 328,139 acres of water areas open to the public in Illinois for recreation purposes. (An acre is

about the size of a football field.) Recreation and leisure are important parts of the day-to-day lives of most people. Swimming, fishing, hunting, trapping, boating, skiing, snowmobiling and observing wildlife are the major water-related activities. These activities provide the opportunity to enjoy the outdoors and contribute to our state's economy, bringing in millions of dollars from licenses, permits and registrations. They also contribute to local economies in the form of hotels, restaurants and gasoline. Sportfishing alone is estimated to produce annual expenditures of \$916 million statewide.



Illinois has 63 miles of Lake Michigan shoreline, 40 miles of which is publicly owned and devoted to open space and recreation. Ranging from Chicago's public beaches, parks, marinas and museums to Illinois Beach State Park's sand dunes, marsh and miles of natural beach, the Lake Michigan shoreline offers a rare mixture of active and passive recreational and scenic opportunities. In the midst of the Midwest's largest concentration of people, the Lake Michigan shoreline has the potential to impact the most people--both Illinois residents and tourists--of any of Illinois' recreational and scenic sites.

Education: Bodies of water and wetland areas provide field laboratories for students in the natural or physical sciences.

Habitat: The land/water connection is an extremely rich wildlife habitat due to the abundance of water, nutrients from plant decay and diverse vegetation providing both food and cover for hundreds of species of fish and wildlife. Many valuable plant and animal species are either located in wetlands or dependent upon them. The Illinois Wetlands Inventory (IDNR 1996) has identified 617 types of wetlands and deepwater habitats in our state. They provide food and shelter for 40 percent of the state's endangered or threatened species and serve as spawning grounds for many fish and shellfish. Wetlands are breeding, feeding and resting areas for waterfowl and shorebirds and also provide habitat for many species of insects, amphibians, reptiles, bacteria and other living organisms.

Utility Plants: The largest use of water in Illinois is for electric power generation--94.9 percent of total water usage. The electric utility industry is usually listed as the single largest user of water. Most of the water is for cooling, which is a nonconsumptive use. For example, a large power plant which can generate enough electricity for a city of 500,000 people would use up to a billion gallons of cooling water per day. Drinking water and other consumptive uses in that

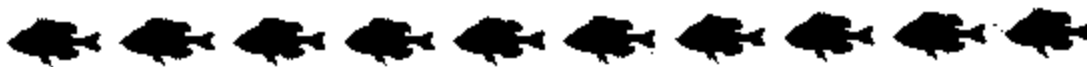
city would amount to about 50 million gallons per day.

Clinton Nuclear Power Plant (De Witt County) uses 568,700 gallons of water per minute in the cooling process; the Braidwood Nuclear Power Plant (Will County) uses 1,459,600 gallons per minute. However, the water these plants use is recycled. The only water that is actually lost is through evaporation, but because of the water cycle, even that will be recycled for the future.

REFERENCES

- Council for Environmental Education. 2001. *Project WILD Aquatic*. Council for Environmental Education, Houston, Texas. 269 pp.
- Illinois Department of Natural Resources. 1992. *Groundwater: Illinois' buried treasure education activity guide*. Illinois Department of Natural Resources, Springfield, Illinois. 161 pp.
- Illinois Department of Natural Resources. 1996. *Illinois acres for wildlife and friends*. 3(1). Illinois Department of Natural Resources, Springfield, Illinois.
- Illinois Department of Natural Resources, Illinois State Water Survey, Office of Groundwater Information. 1996. *Illinois water use summary*, 1995. Illinois Department of Natural Resources, Springfield, Illinois. 2 pp.
- Illinois Department of Nuclear Safety. 1996. *Byron/Braidwood final safety analysis report*. Volume 11, Chapter 10. Illinois Department of Nuclear Safety, Springfield, Illinois. 700 pp.
- Illinois Department of Nuclear Safety. 1996. *Clinton final safety analysis report*. Volume 15, Chapter 10. Illinois Department of Nuclear Safety, Springfield, Illinois. 700 pp.
- Illinois Environmental Protection Agency. 1994. *1994-95 Illinois water quarterly report 305B. Volume I*. Illinois Environmental Protection Agency, Springfield, Illinois. 241 pp.
- Kirk, J. R. 1987. *Water withdrawals in Illinois: Illinois State Water Survey Circular 167*. Illinois Department of Natural Resources, Champaign, Illinois. 43 pp.
- Massachusetts Water Resources Authority (Water Watchers). 1996. *The liquid of life*. Boston, Massachusetts. 5 pp.
- The Nature of Illinois Foundation and The Illinois Department of Natural Resources. 1994. *The changing Illinois environment: critical trends*. Illinois Department of Natural Resources, Springfield, Illinois. 89 pp.
- Tennessee Valley Authority Environmental Education Section and Legacy Inc., Partners in Environmental Education in cooperation with U.S. Environmental Protection Agency. 1994. *Water sourcebook*. Water Environment Federation, Alexandria, Virginia. 512 pp.
- U.S. Bureau of Census. 1989. *Census of agriculture 1987: volume 1-geographic areas series, part 13-Illinois state and county data*. U.S. Government Printing Office, Washington, D.C. 478 pp.
- U.S. Environmental Protection Agency. 1996. *Simple water science*. <http://www.epa.gov/OGWDW/kids/tuar.html>.
- U.S. Environmental Protection Agency. 1996. *We need your input on drinking water*. <http://www.epa.gov/OGWDW/tap.html>
- U.S. Geologic Survey in cooperation with the Illinois State Water Survey, Illinois Department of Natural Resources. 1996. *Estimated water withdrawals and use in Illinois, 1990*. U.S. Geological Survey, Denver, Colorado. 55 pp.
- The Watercourse and Council for Environmental Education. 1995. *Project WET*. The Watercourse, Bozeman, Montana. 516 pp.
- Williams, R. 1996. *H₂O below--an activity guide for groundwater study*. Illinois Department of Natural Resources, Springfield, Illinois. 238 pp.

See related CD-ROM components: *Aquatic Illinois* video; *River Navigation Today--Locks and Dams*; Unit 1, Lesson 1; Unit 2, Lesson 2; Unit 3, Lesson 2; *Illinois Aquatic Species Fact Sheets*; *Endangered Aquatic Species in Illinois*; *Frog and Toad Calls* audio.



UNIT 1, LESSON 2

ACTIVITY 3

BOATING SAFETY

SUGGESTED GRADE LEVELS: 5-9

SUBJECTS: English language arts, physical development and health

SKILLS: analysis, discussion, generalization, inference, public speaking, reading, small group work, writing

CORRELATION TO ILLINOIS LEARNING STANDARDS: English language arts 1C, 3C, 4A, 4B; physical development and health 22A

OBJECTIVES

Students will: 1) increase their awareness of the need for boating safety education; and 2) learn the main causes of fatal boating accidents and how they could have been prevented.

METHOD

Students take the “Boating Safety Knowledge Quiz” and complete open-ended situations about actual Illinois boating accidents.

BACKGROUND

Recreational boating grows in popularity every year as people take to the waves of Illinois lakes and rivers. More than 380,000 boats are registered in Illinois. The character of recreational boating is changing, however, as fast, small, inexpensive personal water craft become increasingly utilized. These small boats are maneuverable, fun and popular with young people.

With the increase in the number of boaters over the years, a corresponding increase in accidents has been recorded. Personal water craft, popularly known as “wave runners” and “jet skis,” represent about four percent of registered water craft in Illinois yet they account for about 44 percent of reported accidents. There are many causes of boating accidents (standing up in small or overloaded boats, failing to follow “rules of the road,” boating in unsafe conditions, excessive consumption of alcohol, inexperienced operators, carelessness, etc.), but most people who die in boating accidents drown because they end up in the water without a personal flotation device (PFD), sometimes called a life jacket. Chances of surviving any boating accident are greatly improved by wearing a PFD. Alcohol and drug abuse are involved in a majority of the fatal boating accidents. The fatality rate from boating accidents in Illinois has remained relatively steady for several years (32 fatalities in 1993, 17 in 1994, 16 in 1995, 27 in 1996, 14 in 1997, 19 in 1998, 13 in 1999, 14 in 2000, 8 in 2001).

Education and enforcement are being used to help reduce the number of accidents. Boating safety courses are required for operators of water craft who are at least 10 years of age and are under 18 years of age. Boating safety courses are offered by the Illinois Department of Natural Resources. For information about class locations call 1-800/832-2599.

MATERIALS

copies of “Boating Situation Cards;” copy of “Solution to Boating Situation Cards;” copies of “Illinois Boating Safety Knowledge Quiz;” paper; writing materials

PROCEDURE

1. Discuss boating with students. Ask how many of them have boated on the waters of Illinois. Poll them in regards to why they were boating (recreation, fishing, skiing, others). Have students take the “Boating Safety Knowledge Quiz.” Discuss responses.

2. Divide the class into small groups. Provide each group with one of the “Boating Situation Cards.” An alternate way of doing the activity is to give each group the entire set of cards. Each Situation Card provides the conditions for an actual fatal boating accident in Illinois. You may want to withhold that information from students for the present time. (NOTE: These are actual incidents: to avoid unnecessary embarrassment and discomfort to students, ask if anyone has knowledge

about anyone who died or was injured in a boating accident in Illinois in 1993-1995.)

3. Explain to the students that each card contains information about a boating trip. They should analyze the conditions, stating what is good and bad about the situation. Have them write two outcomes for the situation--one using what could go wrong and one using what could prevent an accident. The actual situations are given for you to discuss with the students at the end of the activity.
4. Have each group read their situation to the class. They should point out the positive and negative points in the situation. Let them summarize their outcomes for the class. Do other class members agree with their interpretation?
5. Read and discuss the actual outcome of each situation. Were the students close to the actual results?

ANSWERS TO ‘ILLINOIS BOATING SAFETY KNOWLEDGE QUIZ:’ 1) C 2) A 3) D 4) A 5) D 6) C
7) A (clear skies reported in 75-80 percent of accidents) 8) A (calm water reported in 45-52 percent of accidents)
9) D 10) A

EXTENSIONS

1. Invite your local Conservation Police Officer or local fire protection district officer to speak to the class about boating safety. Check the telephone book under the Illinois Department of Natural Resources for the phone number of the officer in your area.
2. Let the groups make up their own situations or use personal experiences to write more situation cards. Trade cards with other groups and repeat the activity.
3. Organize a boating safety awareness campaign for the school and community. Students could develop posters, bumper stickers, announcements or other items to promote safe boating.
4. Sponsor a boating safety education course. Call 1-800/832-2599 and ask to speak to your local Volunteer Services Coordinator. Please state your county when calling.

EVALUATIONS

1. Students will submit their written reports and be evaluated on the presentation.
2. Students will summarize the main factors in the fatality reports and discuss how these people could have survived.
3. Find photographs of boaters. Give one to each student to analyze for positive and negative features.

ILLINOIS BOATING SAFETY KNOWLEDGE QUIZ

1. Approximately how many boats are registered in Illinois?
A. 1 million B. 2 million C. about 380,000 D. about 180,000
2. How many boating accidents are reported in a typical year for Illinois?
A. 100-200 B. 10-20 C. 500-600 D. 1,000-2,000
3. How many people are injured in these accidents?
A. 10-20 B. 30-40 C. 50-60 D. 80-150
4. What are the three months when boating accidents are most often reported?
A. June, July, August B. July, August, September
C. April, May, June D. May, June, July
5. On which three days of the week are the most accidents reported?
A. Sunday, Monday, Tuesday B. Friday, Saturday, Sunday
C. Thursday, Friday, Saturday D. Saturday, Sunday, Monday
6. During which of the following time periods do the majority of boating accidents occur?
A. Midnight - 6:00 a.m. B. 6:01 a.m. - noon
C. 12:01 p.m. - 6:00 p.m. D. 6:01 p.m. - 11:59 p.m.
7. What is the prevailing weather condition when most boating accidents occur?
A. Clear skies B. Cloudy skies C. Rain D. Fog
8. What is the prevailing water condition when most accidents occur?
A. Calm B. Choppy C. Rough D. Strong current
9. What type of accident is most frequently reported?
A. Falling overboard B. Capsizing
C. Collision with a fixed object D. Collision with another vessel
10. The majority of people involved in boating accidents in Illinois received no formal instruction in boating safety.
A. True B. False

BOATING SITUATION CARDS

#1 - Two fishermen were trying to cross a cold, shallow water lake during strong winds. The boat was a 12-foot jon boat powered by a 5-horsepower motor. The operator was inexperienced and a nonswimmer. PFDs were worn by both occupants. What could go wrong? What could prevent an accident?

#2 - Four fisherman were trolling below a dam. The current started to take the boat upstream towards the dam. A trolling motor and motor were both on the boat. PFDs were present but not worn. What could go wrong? What could prevent an accident?

#3 - Two jet skiers were traveling together with a third jet skier following behind. The two lead skiers made an abrupt turn to the right. PFDs may have been worn. What could go wrong? What could prevent an accident?

#4 - Four friends went canoeing using two canoes. No one was wearing a PFD, although throwable PFDs were available. It was dark when they came to a dam. They portaged around the dam. The first pair put their canoe in the water, and the second pair put their canoe in between the first pair and the dam. As the second pair shoved off, the canoe's bow turned toward the dam. What could go wrong? What could prevent an accident?

#5 - A father and his 14-year-old son were boating. The father was operating the boat and passing a barge. When he got well beyond the barge, he turned to cross in front of it. The father was wearing a PFD, but the son was not. What could go wrong? What could prevent an accident?

#6 - After an evening of heavy alcohol consumption, two adult boaters went out in a small jon boat equipped only with oars, beer, cigarettes and a PFD rated for a 90-pound person. The operator stood up in the boat and walked to the front. What could go wrong? What could prevent an accident?

#7 - A person was riding an inner tube that was being pulled by a boat. This person was wearing a PFD. A second boat was operating parallel to the boat towing the tuber. The second boat suddenly cut behind the first boat. What could go wrong? What could prevent an accident?

#8 - A teenager deliberately rode a small, inflatable raft over a low head dam. There were no paddles or PFDs in the raft. What could go wrong? What could go wrong? What could prevent an accident?

#9 - A man and woman were in a boat at night. The man turned the running lights off in the boat so as to not attract mosquitoes. When another boat approached, he briefly turned the lights back on to alert the other operator of his presence. What could go wrong? What could prevent an accident?

#10 - The operator of a personal water craft was traveling above a dam on a river. He had purchased the personal water craft two days previously. The man was an avid skier and familiar with this section of the river. He was wearing a wet suit and a PFD. Warning buoys for the dam were not in place on this section of the river. What could go wrong? What could prevent an accident?

#11 - A 14-foot boat was occupied by seven people on Lake Michigan. One of the passengers was a 16-year-old girl who was celebrating her birthday. No PFDs were used. The motor stalled, and the operator restarted it while in reverse. What could go wrong? What could prevent an accident?

#12 - A personal water craft and a power boat were on course for a head-on collision on a river. The operator of the power boat veered to the right. Both operators were wearing PFDs. The operator of the personal water craft had been drinking alcohol and using marijuana. What could go wrong? What could prevent an accident?

#13 - A boat which had been purchased the day before was traveling down river at a high rate of speed. The operator and occupants were drinking heavily. PFDs were worn. The boat was traveling over shallow water with rocks along the bottom. What could go wrong? What could prevent an accident?

**BOATING SITUATION CARDS
SOLUTIONS**

#1 - The boat was swamped and capsized. The passenger swam to shore leaving the operator with the boat. The passenger searched through flooded timber until he found a state highway. From there he walked to the home of a friend to report the accident. The friend had already gone to look for the boaters. Four hours elapsed before the body of the operator was found. He died from drowning and hypothermia. The accident occurred in Putnam County.

Contributing factors - operator inexperience, adverse weather, hypothermia

#2 - The operator tried to start the motor and flooded it. The trolling motor was not strong enough to pull the boat out of the current and away from the dam. One man pulled out PFDs, but two of the men jumped out of the boat. One of these two made it to the dam wall, but the other did not and drowned. The boat nosed into the boil, spun around and stood on its side. A third occupant was thrown or jumped from the boat and drowned. The fourth occupant put on two PFDs before being thrown into the water. He was rescued by other boaters. The accident occurred on the Mississippi River in Hancock County.

Contributing factors - no person acting as a lookout for danger, failure to wear PFDs

#3 - The operator of the third jet ski made an evasive turn to the left but could not avoid striking one of the jet skis. The operator of this ski was killed. The victim died from internal injuries. The accident occurred in Kankakee County.

Contributing factors - carelessness, navigational rule violation

#4 - In spite of frantic paddling, the second canoe was pulled into the spillway and capsized. One of the canoeists was able to free himself from the boil, but his companion drowned. The accident happened in Stephenson County.

Contributing factors - inexperience, no wearable PFDs available

#5 - As the father turned in front of the barge the motor stalled, and he was unable to start it. He told his son to jump into the river, which the son did. The boat was struck by the barge, and the operator was trapped inside. The operator was freed from the boat by rescuers using a chain saw. His son drowned. The accident occurred on the Illinois River near Peoria.

Contributing factors - failure of victim to wear PFD, possible equipment failure, possible carelessness of operator

#6 - The boat capsized, and the other occupant drowned. The victim, a 200-pound woman, was found face up in the water wearing the PFD. The operator was arrested for operating a water craft under the influence of alcohol (OUI). The operator was convicted of felony OUI and was sentenced to four years in prison.

Contributing factors - insufficient number of PFDs in boat, PFD of inappropriate size, impairment due to alcohol

#7 - The tuber was killed instantly when he was run over by the boat. The operator of the second boat stated that he did not realize that someone was being towed. The victim died of massive chest injuries.

Contributing factors - careless operation of second boat, no proper lookout

#8 - The teenager was killed. Two friends were on an inflatable air mattress and went over the dam, too. They were kicked free from the boat and rescued.

Contributing factors - carelessness, no PFDs worn or available

#9 - The woman was killed when a second boat ran up over the back of the boat she was riding in. The boat that struck them came up from behind at a high rate of speed and did not see the unlighted boat until it was too late to avoid the collision.

Contributing factors - unlawfully operating a water craft at night without running lights, excessive speed for operating at night

#10 - The operator was killed when he lost control of the water craft. He was caught in the boil and drowned. The accident happened in Kane County.

Contributing factors - warning buoys not in place, inexperience with personal water craft

#11 - The boat went backwards, and water came over the transom, capsizing it. The 16-year-old girl drowned. The operator was arrested for operating a water craft under the influence of alcohol (OUI).

Contributing factors - overloading, OUI, no PFDs used

#12 - As the power boat operator veered to the right, the personal water craft mirrored his actions. Each time the power boat attempted to evade, the personal water craft moved in the same direction. The boats collided head on, and the operator of the personal water craft died of massive head injuries. The accident happened in McHenry County.

Contributing factors - navigational rule violation, alcohol and marijuana use

#13 - Three occupants were injured and two died in this accident on the Ohio River in Hardin County. The boat hit the rocks and became airborne. It came to rest upside down, partially in the water. Both victims were pinned underwater by the boat. The three injured people were thrown onto shore. One of them walked and crawled all night to reach help. The victims died from blunt trauma.

Contributing factors - excessive speed, inexperience, alcohol use
