

Water Conservation and Efficiency Program Review

Illinois' Second Report to the Compact Council and Regional Body

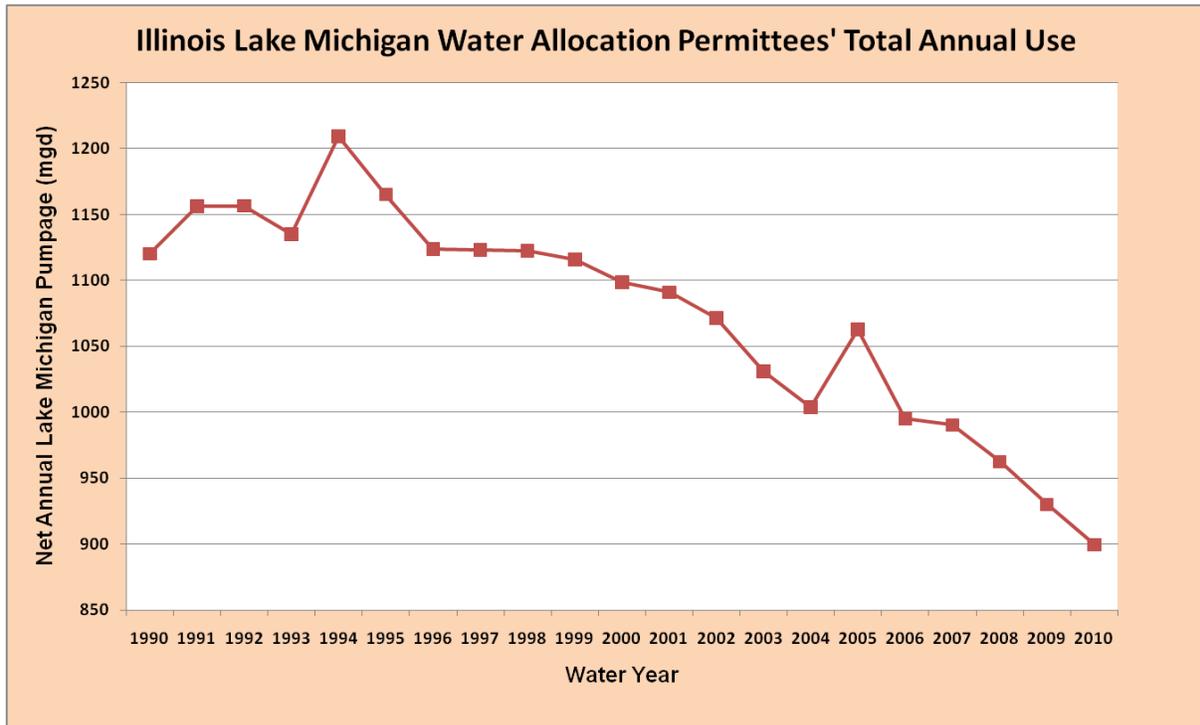
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Illinois' water conservation and efficiency program

A. Status of Illinois' Domestic Water Use from Lake Michigan

Total domestic use of Lake Michigan water was 931 million gallons per day in Water Year 2009 and 894 million gallons per day in Water Year 2010. This continues a downward trend in total domestic use of Lake Michigan water that we have observed since the early 1990s. The following chart illustrates this trend:



While the Lake Michigan water service population has been relatively stable over the last 10 years, there was a significant service population increase between 1990 and 2000. The significant (250 million gallons per day) reduction in total use is due in part to improvements in the efficient use and conservation of Lake Michigan water.

B. Program Legal Basis

A U.S. Supreme Court Decree [Wisconsin v. Illinois, 449 U.S. 48 (1980)] limits Illinois' diversion of Lake Michigan water to an annual average of 3200 cubic feet per second (cfs), approximately 2.1 billion gallons/day. The Decree and Illinois state law specifically require that:

“all feasible means reasonably available to the State and its municipalities, political subdivisions, agencies and instrumentalities shall be employed to conserve and manage the water resources of the region and the use of water therein in accordance with the best modern scientific knowledge and engineering practice.” [Level of Lake Michigan Act (615 ILCS 50/5)]

This is the operative judicial and statutory language that directs the Illinois Department of Natural Resources (Department) to develop and implement a water management and conservation program covering all permittees of Lake Michigan water.

C. Program Objectives

Illinois' first report to the Compact Council and Regional Body (dated December 8, 2009) reviewed the water conservation requirements that all domestic users of Lake Michigan water must comply with as a condition of receiving a Lake Michigan water allocation permit. Following that report, the Department developed and posted to its website <http://dnr.state.il.us/owr/LakeMichiganWaterAllocation.htm> Illinois' Lake Michigan Water Conservation Goals and Objectives, as required by the Compact and the Regional Agreement.

The Department's water conservation and efficiency program objectives are:

- Enforce the adoption of standards that require the efficient use and conservation of Lake Michigan water by the end user (homeowner, business/industry).
- Establish standards for good water system management and leakage control by the owner/operator of a water supply system.
- Ensure that Lake Michigan water diverted directly into the Chicago Waterway system for various purposes is kept to a minimum.
- Collect water use data annually; monitor changes in water use patterns. Encourage public water supply systems to evaluate the effectiveness of their conservation efforts.
- Prepare and maintain long-term water demand forecasts.
- Promote the adoption of water rate structures that encourage conservation and water efficiency.
- Encourage water suppliers to invest in water infrastructure and the use of innovative technology to improve water systems management.
- Encourage research, development and implementation of water efficient technologies. Develop linkages with organizations such as USEPA's WaterSense Program, the Alliance for Water Efficiency and others, to keep abreast of the latest conservation technologies.
- Inform, educate and increase awareness regarding water use, conservation and efficiency via newsletters and other such means of communication.
- Work with our Lake Michigan water allocation permittees and our Great Lakes basin partners to enhance information sharing.

D. Program Activity – Updating Administrative Rules

The Department's Administrative Rules for the Allocation of Water from Lake Michigan (17 IAC 3730) have been in effect for over 30 years. These Rules are available on the Department's website (listed earlier). The Department has begun a review of the Rules, with a particular emphasis on the sections that relate to efficient use and conservation. A lot has happened in the last 30 years, and there have been significant advances in the area of water conservation and efficient water use practices. The Illinois' Lake Michigan water allocation program has emphasized the efficient use and conservation of Lake Michigan water, and we have concluded that our Rules and Regulations need to be updated.

There are two primary areas that we intend to focus on. The first area is Section 3730.307(c)(4), which specifies water efficient plumbing fixtures. Our existing standards on plumbing fixture flow limits were eclipsed in 1992 when the Federal Energy Policy Act was enacted and, since then, new USEPA 'WaterSense' labeled plumbing fixtures have become readily available in the marketplace. WaterSense labeled fixtures use even less water.

The second area concerns the accounting formula that is used by water suppliers to calculate unaccounted-for-flow (UFF) (17 IAC 3730.101) and determine compliance with the 8% maximum UFF standard (17 IAC 3730.307(b)). Current practice allows a calculation for "unavoidable leakage" which is excluded from the calculation of UFF. The formula used to calculate unavoidable leakage has its origins in studies that were done in the 1970s, based on what was then considered a well maintained water system and on a much lower value of water. For many of our water systems, the unavoidable leakage value is anywhere from 3-8% of their net annual pumpage, a significant quantity of lost water and dollars. This allowance was originally included so as not to penalize older communities with older water systems. With the current cost of water, the need to keep water infrastructure in good working condition, and the need to demonstrate that Illinois is using its allowable Lake Michigan diversion wisely, we are considering the elimination of the unavoidable leakage allowance in UFF calculations.

Proposed revisions to the Rules have been drafted and are currently undergoing internal review. Once that process has been completed, the proposed changes will be circulated to our Lake Michigan communities for their review and comment. Since this will be the first substantive change to the Lake Michigan water allocation rules in over 30 years, we anticipate receiving a substantial amount of comment and input. After this process is completed, the next step will be to submit the revised Rules to the Joint Committee on Administrative Rules, the legislative body which oversees agency rulemaking. The goal is that this process will be completed by the end of calendar year 2012.

E. Program Activity –Lake Michigan Water Allocation Newsletter

In August, the Department posted its 2011 Lake Michigan Water Allocation Newsletter on our website: <http://dnr.state.il.us/owr/LakeMichiganWaterAllocation.htm>.

This newsletter is one of the ways the Department utilizes to encourage the efficient use and conservation of Lake Michigan water. This particular issue called attention to the work of the Northeastern Illinois Regional Water Supply Planning Group, which on January 26, 2010 adopted a Northeastern Illinois Regional Water Supply Plan (Water 2050). This regional water supply planning effort was initiated through an Executive Order from the Governor, and funding support was provided by the Department. A central theme of this report encourages

municipalities and water suppliers to incorporate water conservation strategies into their current and long range water supply plans. As an additional aid to local government, the Chicago Metropolitan Agency for Planning, which oversaw the development of the Northeastern Illinois Regional Water Supply Plan, developed a Model Water Use Conservation Ordinance in March of 2010. This model ordinance contains a comprehensive suite of recommendations for developing a strong water conservation program at the local level, and the Department has encouraged our Lake Michigan communities to carefully review this document. Both the Regional Water Supply Plan Report (Water 2050) and the model ordinance can be downloaded at: <http://www.cmap.illinois.gov/water-2050>.

F. Program Activity – Develop Linkages with other Conservation Organizations

One of the Department's water conservation program objectives is to 'encourage research, development and implementation of water efficient technologies', primarily through the development of linkages with organizations that focus on conservation. In October 2011, the Department became a 'WaterSense Partner' with the USEPA's WaterSense Program. We look forward to this partnership and believe it will enhance our ongoing efforts to promote the efficient use and conservation of Lake Michigan water.

G. Program Activity – Water Rate Survey

One of the Department's Lake Michigan water conservation program objectives is to promote the adoption of water rate structures that encourage conservation and water efficiency. We continue to see evidence that local government is paying more attention to this issue. In 2010, the Department released its fourth survey of water rates within the Lake Michigan water service area (also available on the Department's website). In 2010 the average Lake Michigan residential water rate was \$5.22/1000 gallons. The average commercial rate was \$5.45/1000 gallons. From 2005 to 2010 the average Lake Michigan residential water rate increased from \$3.65/1000 gallons to \$5.22/1000 gallons, an average increase of 8.6% per year. The commercial rate increase was also 8.6% per year. We have also noticed a significant decrease in the use of declining block rates over the last 15 years, with a concurrent increase in the use of an increasing rate structure.

H. Program Activity – Water Use and Water Loss Monitoring

As mentioned in our first report, we continue to believe that improving the management and accountability of a municipal water system offers the greatest potential for a significant reduction in water consumption. The Department continues to monitor, on a yearly basis, the reported unaccounted-for-flow (UFF) of all our domestic Lake Michigan water suppliers. In 2010, the average UFF in the Lake Michigan water service area was about 4.8%. While the regional average continues to be below our regulatory standard of 8%, in 2010 we had 36 permittees whose UFF exceeded the 8% standard. With the total number of Lake Michigan water systems reporting in 2010 at 203, this represents fewer than 18% of our permittees exceeding the standard. Water systems that have a very high UFF are contacted to ensure that they have a program in place to reduce UFF and return to compliance with the standard.

Water loss control is an ongoing process. In 2007/2008, we placed 27 water systems on our unaccounted-for-flow non-compliance list. Since that time, 16 water systems have returned to compliance. That's very positive progress over just two years. However we have also added 8 new water systems to our non-compliance list. This illustrates the value in monitoring water use

and water loss on an annual basis. Our goal remains to have all of our permittees in compliance with this standard.

To ensure consistent reporting of water use data by our Lake Michigan water allocation users, the Department requires the annual submittal of water use data on a form known as the Annual Water Use Audit Form (available on the Department's website). This form has been required since the late 1970s, so there is a longterm data base that enables the Department to monitor the impact of this conservation requirement. In 1979, the first year for which the Department compiled statistics on UFF for 182 water systems in northeastern Illinois, the average UFF was 10.4%. Over the last five years, the average UFF has been around 4-5%.

The Department's standards have served as a strong incentive for communities to begin the necessary leakage control studies and water audits to improve their accountability. They have also yielded very favorable cost returns. Water that is lost from the distribution system because of leakage is revenue lost, even though the cost is there to produce the water. This has the effect of increasing water rates to the consumer. For example, a 3 million gallon per day system with a 20% UFF will cut consumption by 360,000 gallons per day if they reduce their UFF down to the required 8%. Since many of our communities purchase water from the City of Chicago, at the current purchase price of \$2.00/1000 gallons, this represents an annual savings of \$263,000 per year. With the recently announced water rate increases by the City of Chicago, the savings will become even more significant, up to approximately \$500,000 per year.

I. Program Activity – Control of Direct Diversion into Chicago Waterway System

In Water Year 2009, the total amount of Lake Michigan water diverted into the Chicago Waterway System for discretionary diversion and navigation makeup flow averaged 297 cubic feet per second (cfs). This was 7 cfs less than the combined allocation for these two components of direct diversion. In Water Year 2010, the total amount diverted for these flow components was 301 cfs, or 4 cfs below the total amount allocated. At the end of the 2010 Water Year, the five year running average of these two components of direct diversion stands at 298 cfs, or 7 cfs below the amount allocated.

The other primary use of Lake Michigan water diverted directly into the Chicago Waterway System is to operate the navigation locks at the mouth of the Chicago River and on the Calumet River. Both of these lock facilities are operated and maintained by the U.S. Army Corps of Engineers. In April of 2011, the Corps of Engineers completed a project to replace both the upper and lower lock gates at the Chicago River Controlling Works. The old gates were way beyond their useful life, and at times allowed uncontrolled diversion into the Chicago River. The new gates will significantly reduce the potential for leakage of Lake Michigan water through the Chicago River lock. Illinois does not have any control over the amount of water diverted for lockage or for leakage through this structure.

In addition, last fall the Department completed a project to reduce uncontrolled leakage through the "headlands area", which is a fill structure and breakwater just north of the Chicago River lock. This area is part of the series of structures that separate Lake Michigan from the Chicago River. With the completion of this project, leakage of Lake Michigan water into the Chicago River should be kept to a minimum.

J. Project Activity – Status of Water Demand Forecasts

In 2008, the Department completed a comprehensive water reallocation for all our water supply permittees. As part of this reallocation, water demand forecasts for each year, out to the year 2030, were developed and ultimately included in the Department's new Lake Michigan water allocations. A primary reason for this long timeframe is to ensure that the Department's water allocation program is sustainable over the foreseeable future, and will continue to keep Illinois' total diversion below the authorized U.S. Supreme Court Decree limit of 3200 cfs.

In the 2009-2010 timeframe, the Department issued 13 new water allocations to new applicants. These allocations also extend out to the year 2030, and the allocations reflect the implementation of efficient use and conservation practices.

During the past year, the 2010 census data became available on the municipal level. This is an important new set of data and will be used by the Department in future water demand forecasting.

K. Project Activity - Water Infrastructure

The potential revisions to the Department's Rules, along with the documented increase in water rates throughout the Lake Michigan water service area, will serve as a catalyst for water suppliers to invest in water infrastructure maintenance, replacement and improvement. For example, the City of Chicago recently proposed a significant increase in water rates for the express purpose of investing in water infrastructure. Their goal is to accelerate and increase the number of miles of old water main to be replaced. They plan to replace 100 miles of old water main per year over the next ten years for a total of 1000 miles of new water main. Combined with the over 522 miles of water main that have been replaced since 1997, this represents 36% of their entire water distribution system.

Conclusion

Illinois has had a Lake Michigan water conservation program for over 30 years. Our program is consistent with and fully supports the Great Lakes-St. Lawrence River Basin Water Conservation and Efficiency Objectives. The unique nature of Illinois' Lake Michigan water use and diversion as allowed under a U.S. Supreme Court Decree has resulted in a water conservation and efficiency program that is implemented primarily as a regulatory program, with additional measures, such as conservation pricing, conservation education and information sharing, implemented through a non-regulatory effort.