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FOR BEGINNERS

WATER SCARCITY



bursting the water bubble

Experts warn of a water shortage in Chicago by 2050 if sustainable practices aren't adopted quickly

BY JESSICA PUPOVAC

Let's face it—Chicagoans are a little cocky about their water supply. Forget the arctic winters, the ceaseless traffic jams, the political corruption—Chicagoans' access to clean, fresh water makes us proud to have chosen this particular locale to call home. We get self-righteous when talking with friends in Phoenix or Los Angeles. Who in their right mind would move to a desert, anyway? It's just impractical.

But a growing number of city officials, urban planners and environmental experts warn of a massive schism between Chicagoans' perception of water abundance and the reality—a future of water scarcity if we don't begin making radical changes in the way we collect, distribute and consume this vital resource.

"We are a water-rich area but the message is the same," said Injerd. "If we don't pay attention, look at how we use water, promote efficiency and become careful about how we use resources like Lake Michigan, we're going to have a problem. We have a large population here."

"It points to the need for planning," said Dan Injerd, Lake Michigan Management director at the Illinois Department of Natural Resources, which, since 2007, has been funding the northwestern Illinois Regional Water Supply Planning Group to develop a strategy to stave off a future of water scarcity in Chicago and its environs. The group, which

recently released its assessment and strategy plan, includes 35 water experts, environmental activists, city planners and other stakeholders. Although the group was funded by the state, it was born of an earlier grassroots movement for smarter water usage in the region that worked to raise awareness in the legislature and the governor's office about the precariousness of our future water supply.

Although the Great Lakes as a whole are a vast source of fresh water, we aren't the only state (or country, for that matter) that depends on them—and we are legally required to share. A 1967 U.S. Supreme Court decree, bolstered by a patchwork of international treaties and compacts, limits Illinois' Lake Michigan diversion to an average annual limit of 3,200 cubic feet of water per second, or 2.1 billion gallons per day. According to several experts, this allowance is unlikely to change anytime soon, if ever.

Until very recently, we had a hard time staying under our limit. But a number of factors—including improved water infrastructure, a shift away from a predominantly industrial economy and a growing awareness of the value of conservation—are helping reduce Illinois' consumption rates.

But we're still not out of the weeds. The roughly 5.4 million people in and around Cook County that depend on Lake Michigan water for daily use are currently con-

suming about 85 percent of our the state's annual diversion allowance—a tenuous rate, given the fact that the number of people sipping from that straw is likely to increase. According to the Chicago Metropolitan Agency for Planning, the total population of Cook and its collar counties has doubled since 1950 and is expected to grow at an even faster rate by 2050. In addition, rampant suburban development is exacerbating groundwater pollution and overuse, diminishing aquifers from Aurora to Joliet, according to a recent Illinois State Water Survey report. City officials in some of those areas are already starting to discuss ways to supplement their current water sources with water sourced from Lake Michigan.

All told, barring drastic changes in the way our region manages its water supplies, according to the Chicago Department of Water Management, we could be facing a regional water shortage by 2050.

"If we do have a shortage problem down the road, shame on us," warned Injerd. "If anybody ought to be able to make do with the resources they've been given, it should be us."

Preventing a water shortage

A significant part of Chicago's diversion allowance isn't a result of our consumption, but rather our engineering. Because of the 1900 reversal of the Chicago River, which secured

**WATER
USAGE**

Source: B. Dziegielewski & F.J. Chowdhury, 2008

80%
public
supply

4%
power
plants

3%
irrigation &
agriculture

2%
self-supplied
domestic

11%
self-supplied
I & C

The total population of Cook and its collar counties has **doubled** since 1950 and is expected to grow at an even faster rate by 2050

the city's water sanctity and made Chicago a livable city, much of the rain water that lands on in the region doesn't replenish regional aquifers or the lake, as nature intended, but instead flows into the Chicago sewer system. The storm water runoff from impervious surfaces such as roofs, streets, driveways and sidewalks makes its way into the sewer, through the Cook County Metropolitan Water Reclamation District's treatment facilities and is released into the canal system, eventually flowing on to the Mississippi River. According to the Supreme Court, since we are essentially depriving regional aquifers and Lake Michigan of the stormwater, all of that runoff counts against Illinois' allowable diversion.

A 2005 report commissioned by the Illinois Department of Natural Resources and carried out by the U.S. Army Corps of Engineers found that Illinois lost close to 28 percent of its annual diversion (or an average of 588 million gallons a day) through storm water runoff alone.

According to Injerd of the IDNR, the amount of runoff has "increased significantly over the last century as impervious surfaces have increased, and also as the frequency and intensity of rainfall has also increased." In 2008, the region had close to 50 inches of rain—one of the highest years of annual rainfall on record.

If climate change predictors are accurate, rainfall will only become more intense in coming years, with longer dry spells in between storms.

That's one reason that groups like the Center for Neighborhood Technology are working to build interest in green infrastructure projects in Chicago and its surrounding suburbs.

"People can plant a rain garden, use permeable pavement when resurfacing their driveways, walkways or patios. They can consider vegetative roofs. There are a lot of ways to reduce the adverse affect of stormwater runoff," Steve Wise, CNT's Natural Resources Director, told *Mindful Metropolis*.

Wise said that city and county agencies can also step up their efforts. The city of Chicago, for example, can offer more incentives for responsible stormwater management. And the MWRD could stop resisting calls to expand its storm wa-

Illinois lost close to **588 million gallons** a day of its annual diversion through storm water runoff alone

ter ordinance, requiring more buildings to trap rainwater before it runs into nearby sewers. He'd also like the new ordinance to give more credit to those choosing to invest in green infrastructure. Wise had some suggestions for the General Assembly, as well, calling upon them to pass Senate Bill 32, which would assess and open the door to revise the state plumbing code to allow individuals greater flexibility for how they use collected rain water. Previously, collected storm water, or "gray water" could not be used indoors, except to water plants, per Illinois law, but the IL Rainwater Harvesting Bill SB 2549, which would allow new and retrofitted developments to reuse rainwater for non-potable indoor uses (flushing toilets), was approved by the IL Senate in March. Now it's on to the House for a vote.

"There are a lot of groups and individuals working on these things all over the city," Wise said, "but we have to have this be allowable in ordinances and regulations if it is going to have a larger, institutional impact."

That also includes state agencies and communities working to advance green water infrastructure so that if and when federal money becomes available for such projects, Illinois is ready to get in line. The federal government recently made a substantial commitment to reinvest in sustainable water infrastructure, with twenty percent of stimulus funds earmarked for the Clean Water Revolving Loan set aside for sustainable infrastructure projects. While many other states with programs already in place were able to capture those funds, Illinois missed out. The Center for Neighborhood Technology and other advocates are pushing to have the so-called Green Reserve become a regular fixture in water-related federal revolving loan funds and working to make sure that Illinois communities are better positioned to take advantage of those loans should they be made available again.

Positive signs

Beyond the Regional Water Supply Planning Group and the progress they are already making in raising awareness and devising regional strategies for water sustainability, there is much happening at the local level that many hope are an indicator of things to come. For

Replacing 75 miles of water main pipes per year for the next six years would save the city **40,000 gallons** of water per day

one, the Chicago Department of Transportation is digging up concrete alleyways and replacing them with pervious pavement in an attempt to reduce storm water runoff. As part of the Green Alleys program, more than 80 Chicago alleyways got eco-friendly makeovers between 2006 and 2008.

In 2007, the Chicago City Council passed a stormwater management ordinance that requires new developments and larger redevelopments to capture the first half-inch of runoff from all impervious surfaces and allow the water to return to the ground. For developments that do not directly discharge to waterways or to a separate municipal storm sewer system, the ordinance calls for a 15 percent reduction in impervious surfaces.

The city is also encouraging smarter development through a number of specific buildings—like City Hall, the Center for Green Technology and McCormick Place—that model efficient water management. The green roof on the McCormick Place West Building, for example, not only has plants that absorb and filter rain water but also features a 3,100 foot storm water tunnel which diverts an estimated 55 million gallons of water per year directly back into Lake Michigan.

The MWRD is trying to make stormwater management more accessible to residents by offering rain barrels at a discounted price. (The barrels, however, are only offered three days per month.)

Meanwhile, the Chicago Departments of Environment and Water Management are distributing literature on how to disconnect downspouts and install and use these and other green technologies in the home. [For more information and links, please go to mindfulmetropolis.com]

The water waste you don't see

According to Josh Ellis, water expert with the MPC, "A lot of communities, Chicago included, are really starting to take water issues seriously, because there is a growing understanding that our water supply is finite and under pressure." However, he added, "there is a backlog of problems that need to be solved."

The major culprit in many U.S. cities, Chi-

chicago included, is aging water infrastructure. Most of Chicago's water mains were installed between 1880 and 1930, at a rate of 75 miles per year—and at a time when cast-iron and yes, hollowed out logs, were occasionally used as pipes. Not surprisingly, a lot of them have over-run their lifespan and need to be repaired or replaced. Rates of replacement have ranged from 14 miles per year in the '80s to 40 miles per year in the '90s. In the past decade, the city has endeavored to ramp up replacement to 70 miles per year, a move that water department spokesman Tom Laporte says has kept the city's water consumption rate relatively stable despite an increasing population. Although the Department of Water Management was unable to estimate a rate of daily water lost from the old pipes, Water Commissioner John Spatz estimated at a water forum in October that replacing 75 miles per year for the next six years alone would save the city 40,000 gallons of water per day.

Still, says Ellis, "we're still talking about a system with over 4,000 miles of pipes. There's still this inherited backlog of work that ideally we would have been doing all along."

In the meantime, the pipes are leaking, cracking and, occasionally busting at the seams. In one such incident, in January 2008, a water main near Montrose Avenue broke wide open, causing the sand beneath the road to erode and the road itself to buckle, leaving an 80-foot-wide crater in the street. The city lost 10 million gallons of water in the eight hours it took crews to shut down that line. Several businesses in the vicinity had to close up shop for days and, as repair work dragged on into the year, suffered significant losses.

Water department spokesman Tom Laporte could not give exact figures but told *Mindful Metropolis* that water main breaks are on the rise, but, he added, "we never have enough money."

A strategy plan recently released by the regional water supply planning group, which represents the first of its kind, recommends the water department charge more for its services.

It's a move Ellis supports. "If we as consumers don't pay the full cost of water now, somebody is going to have to do it later—often your municipal government, by taking out a loan, which then has to be repaid by the citizens anyway," he said. "Even if we pay more now, it's still going to be less than what we will pay when more water mains start breaking or water resources dwindle."

It all begins at home

Although the Chicago Department of Water Management isn't talking—at least openly—about increasing rates just yet, they are advocating that Chicagoans volunteer to have water meters installed on their home. Water Commissioner John Spatz estimates that full-

city metering could reduce Chicago's water consumption by 20 or 30 million gallons a day.

Most Chicago homes are now billed according to a formula that takes into account household size, age and the number of faucets in the building, with only about seven percent of homes paying according to their actual use. Officials say they have seen that when individuals are conscious of their own consumption, it tends to lead to reduced usage.

"We've seen so far that people save about 25 percent of their bill," said Spatz at an October water forum.

To that end, they are currently offering a host of incentives to people who volunteer to have their home metered, including a promise that they won't get charged a penny more than their current rate for at least seven years.

We all sink or swim together

The Regional Water Supply Planning Group is calling for a number of changes at the local, regional and individual level. They are calling for: water supply agencies to charge residents the "full cost" of water, raising rates and metering homes; cities to audit their water systems, detecting and repairing leaks and inefficiencies and for residents to use high-efficiency appliances, harvest their rainwater and re-use gray water for irrigation and other purposes, among other actions.

As *Mindful Metropolis* went to press, the Planning Group was convening the first-ever Metropolitan Chicago Water Supply Summit. They are hoping that through careful planning and coordinated action, including a massive public education campaign, the area can not only stave off a future water shortage, but drastically alter our relationship with our water resources, replenishing local waterways currently at risk.

Injerd of the IDNR, said he is hopeful. He has seen many such efforts to coordinate regional water planning in the past, but this one, he said, is different.

"This one is designed to be a bottom-up approach," he said. "While it's being funded through the state, the process is being planned locally—whether it be through county boards or organizations. It has a lot more local input and involvement."

Mary Sue Barrett, president of the MPC, agrees. "By coordinating at the local, regional, and state levels, Illinois can stave off projected water supply shortages," she said. "However, we must start now."

Read more about this topic at mindfulmetropolis.com/blog.

Jessica Pupovac is a Chicago-based freelance writer.

what can i do?

Advocates interviewed for this story recommended a number of actions individuals can take to help ensure the future of regional water supplies:

- 1 If you live in a home with outdoor green space, disconnect your downspout and install a rain barrel for outdoor use, such as watering your lawn or washing your car. Go to mwrld.org to purchase a rain barrel for \$40 or to the Department of Environment website at cityofchicago.org for more information.
- 2 Go to Metersave.org and call to set up a time for them to install a water meter in your home.
- 3 If you cannot use collected storm water to water your lawn, do not use an automatic sprinkler. Turn on your sprinkler or water your lawn only when you need it, and only at night, when the water is better able to seep into the ground.
- 4 If you see a fire hydrant pried open, call 3-1-1 immediately to have fire crews turn off the line and close the hydrant.
- 5 For more information on conserving water resources, visit the Department of Water Management, the Center for Green Technology and the Department of Environment's websites at cityofchicago.org.
- 6 Urge your legislators to support the Green Reserve to help secure future funding for sustainable water infrastructure projects.