

Northwest Illinois Water Study: Community Input from Survey & Charting a Course

Summary

In the deluge of a wet spring, it may be difficult for stakeholders to give a broad perspective regarding local water supply. Many in northwest Illinois are simply doing whatever they can at this time of year to rid themselves of excess. Yet, as the area experienced in 2012 and in earlier years, northwest Illinois is not necessarily immune to dry spells or other types of supply disruptions.

People who live and/or work in Boone, Bureau, Carroll, Henry, Jo Daviess, Lee, Ogle, Rock Island, Stephenson, Whiteside, and Winnebago counties were asked to participate in an online and paper-based survey to help kick-off Phase I of the Northwest Illinois Water Study.¹ The purpose of the overall project is to identify water supply shortages/disruptions and generate a region-wide water resource management planning framework. An unscientific survey was used help planning process participants understand local water supply perceptions. Blackhawk Hills Regional Council is facilitating the study in conjunction with the Illinois State Water Survey, the Illinois Department of Natural Resources, and other regional planning organizations/agencies (BSRC, NCICG, R1PC).

Overall, BHRC received 159 responses to the survey. Some major concerns resonating throughout the responses were water quality, aging/failing infrastructure, and lack of educational resources.

One of the survey questions asked residents to select any contamination concerns they had for their water supply and majority of the respondents identified at least one. Some of the contaminants listed as a concern to residents included nitrates, radium, barium, iron/rust, sediment, hardness, and excess fluoridation.^{2,3} Only 29% of respondents expressed that they do not have concerns regarding the quality of their water supply.

Additionally, aging infrastructure was an extensive community concern, as it can pose many problems for municipalities and residents. Leaking water mains can both overload storm and wastewater infrastructure and waste treated drinking water. Some residents commented that street and basement flooding occur during heavy rain and snowmelt events. Contaminants may be beyond the capabilities of local treatment or cause disruption in supply, such as a boil order. Further, with fairly stagnant population growth in the region, respondents expressed apprehension regarding funding for update and maintenance costs.

Another common theme that surfaced was that residents and workers in the region would like their communities to educate and provide water-related resources, especially about what they can do help reduce consumption and increase infiltration. Many practices are multi-faceted, meaning one practice

¹ Boone County was added later on.

² Further education and relationship-building may be required to persuade some of the well-documented benefits of fluoridation.

³ Some information discussed here (including about contaminants) was collected at public meetings.

can address multiple problems. For example, filter strips not only reduce erosion, but also slow water down, allowing better infiltration into the soil.

The next phase of the project will include finalizing the Illinois State Water Survey's *Water Demand in the Rock River Water Supply Planning Region* and meeting with the study's Stakeholder Committee to determine next steps and goals/objectives for the area.

Survey Narrative: Long Version

Farms and Businesses

The survey questionnaire was targeted at those who live and/or work within the study area. Of the 159 responses, 59 (37%) identified that they either own or manage a farm or business in the northwest Illinois region. Owners and operators that responded to the survey belonged mostly to the agricultural (i.e., crop and livestock production) and commercial related sectors, with 22 (37%) agricultural operations and 9 (15%) commercial. Some other industries reported in the survey included municipal government (14%), tourism/hospitality (5%), recreation/land management (5%), healthcare/social services (5%), education (5%), engineering (5%), manufacturing (3%), and mining (2%).

Importance of Water Supply

The majority of respondents found water to be “very important” or “important” for daily operation of their farm or business, while 22% found water to be “not important.” This, of course, is dependent on the industry, as many industries are more reliant on water than others. A farm, for instance, may use water for crop production or to water livestock, whereas an office building only supplies water for human consumption, cleaning, and waste removal. Industries are different in physical scale, purpose of water use, and volume consumed. 29% of farms or businesses that participated in the survey reported using water for irrigation/livestock consumption. Domestic uses, such as human consumption, cleaning, grooming, and laundry were more common responses (44%).

Water Supply Source

Another factor that the type of industry may influence regarding water supply is location. Agricultural operations are more often than not in rural or unincorporated areas, and geographical location is typically the determinant of a water source. Of the 59 farms or businesses respondents, 56% retrieve water from a private well and 37% from a municipal system.

Water Management

Many (84%) of the farms or businesses that responded reported that the amount of water they use is “about the same” as it has been in the past, while 10% expressed that usage is increasing. Only 7% of respondents expressed a decrease in use. 25% of respondents noted that a continuity plan exists to manage water use in the event of a supply shortage. This may be skewed by the amount of respondents who work in the government sector, as many municipalities and water utility companies have a plan in

place in the event of a shortage or contamination threat to ensure safe drinking water is delivered to its constituents. The remaining responses reported not having a plan or were not sure if their farm or business has one in place.

For more information on continuity planning or how to prepare your workplace in the event of a shortage, visit <http://emergencypreparedness.cce.cornell.edu/disasters>. You can also contact your local utility provider for further resources to prepare and help mitigate potential water supply disruptions.

Residents

Another target audience of the survey was residents. Of the 159 total responses to the survey, 148 reported living in the northwest Illinois region. The responses were fairly dispersed, geographically, throughout the study area. Most responses originated from Winnebago and Whiteside counties.

Water Supply Source

In our region, a majority of municipal systems⁴ pull water from the ground, treat it to ensure that it is safe for human use, and then pump it using a series of pipes to residences and businesses that are connected to the system. Of the 148 respondents, 79 (53%) reported being on a municipal system.

The other major water supply source is a private well, which 68 (46%) of the responses reported using as their water source. Private wells are the responsibility of the landowner and are not typically treated for contaminants (as is done in a municipal system), unless the well owner has installed a treatment system. A small number of respondents reported picking up water or having water delivered.

Home Activities that Use the most Water

There are many routine activities or parts of everyday life that require water at home. The survey asked respondents to select the activities that they believe use the most water at home. The most water consuming activities reported were bathing/showering (92%), laundry (84%), and dishwashing (65%). Other noteworthy activities respondents found to use the most water were cooking/baking/drinking (49%), teeth brushing (32%), grooming (22%), garden irrigation (15%), and landscape irrigation (11%).

The average person uses 80 to 100 gallons of water per day, which means that the average northwest Illinois household (approx. 2.5 persons⁵) could fill an Olympic-sized swimming pool of over 660,253 gallons in 8 years with the water consumed. Of those who responded to the survey, 56% report their daily use at about “average” (80 to 100 gal/day), and 37% expressed their daily use as “below average”. Only 7% of respondents found their daily water use to be “above average”. To add, a majority of residents (78%) reported that the amount they use remains the same and 15% noted that their use is “decreasing”. The remaining 7% of residents expressed that their use is “increasing”.

⁴ Groundwater is the source of supply for all but three major municipal systems in the northwest Illinois region. East Moline, Moline, and Rock Island use surface water from the Mississippi River as their public supply source.

⁵ US Census Bureau, American Community Survey 2009-2013 5-Year Estimates, Persons per Household.

Water Management and Quality Concerns

There are many ways to conserve water at home, including practices that reduce use and/or help water infiltrate back into the ground. Both types of conservation practices can alleviate strain in supply while acting to filter water resources. A large number of residents who responded to the survey reported using one or more conservation practices at home, the most common practice being installation of “WaterSense”⁶ labeled products or “low flow faucets, showerheads, or toilets” (51%). Some other noteworthy conservation practices of respondents include “taking shorter showers” (42%), “restricting general use during drought conditions” (29%), “reducing irrigation” (27%), and “reducing decorative use” (25%). Water retention based practices were reported, though not as popular as use reduction practices, with 21% of respondents “using rainwater storage” (rain barrels) and 18% having installed a vegetative buffer to retain/detain water.

The last part of this section asked residents to select any contamination concerns they have for their water supply and majority of the respondents identified at least one type of contaminant. Of the 148 responses, 61% selected “chemical contaminants (nitrates, etc.)” as a concern, 48% selected “elemental contaminants (arsenic, barium, lead, radium, etc.),” and 45% selected “biological contaminants (E. coli, legionella, cryptosporidium, etc.).” Only 29% of respondents expressed that they do not have concerns regarding the quality of their water supply.

Residents on a Municipal System

The third subsection of the survey focused on residents in incorporated areas, or areas with a municipal system, to better understand how residents may perceive their community’s water management. Of the 159 total responses to the survey, 108 respondents claimed to live within an incorporated area or village within northwest Illinois. A common theme throughout this section was that many residents were not aware of or did not know the state of their community’s water use or whether their community has experienced a supply disruption in the last five years. Although 36% of responses claimed the water use in their community is “staying about the same” and 11% reported it to be “increasing,” over 49% of respondents selected the “I don’t know” option. To add, many residents claimed that their community should provide further education regarding water supply issues and conservation practices, as well as resources to help residents get started.

Municipal System Issues

The most common responses/comments throughout the survey regarding public water supply were in reference to the integrity of the system itself, whether that be capacity, failing infrastructure, or water contamination. Just over 50% of residents reported having received a notice (such as a boil order) regarding a public infrastructure failure within the last five years.

Aging infrastructure can pose many problems for municipalities and residents. Leaking water mains can both overload storm and wastewater infrastructure and waste treated drinking water (which may also lead to subsidence). Some residents commented that street and basement flooding occurs during heavy

⁶ WaterSense is an EPA-sponsored program that certifies and labels consumer products that are water-efficient. To learn more, visit <https://www.epa.gov/watersense>.

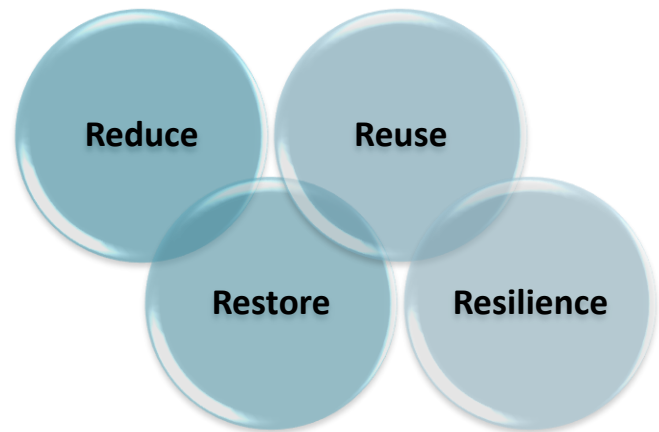
rain events (some of this may be “urban flooding,” defined as flooding that occurs in locations outside of the flood plain or way). Contaminants may be beyond the capabilities of local treatment. A recent and local example is a case of naturally occurring radium increasing in concentrations in a village’s groundwater supply, forcing the municipality to pay for new treatment equipment to lower radium concentrations. Other quality concerns included nitrates, iron/rust, sediment, barium, hardness, and excess fluoridation.⁷

Charting a Course: Addressing Community Concerns Through Goal-Setting

Reduce

Reducing consumption would involve both an educational and policy component for agricultural, residential, industrial, and commercial sectors.

- Agricultural Practices⁸
 - Irrigation scheduling
 - Measuring water use (awareness method)
 - Conservation tillage (reduce runoff and encourage infiltration)
 - Irrigation audit (tests performance and efficiency)
- Residential, Commercial, and Industrial Practices⁹
 - Water-efficient features (showerheads, toilets, etc.)
 - Landscaping practices (drought resistant plantings, moisture testing for more efficient irrigation, etc.)
 - Water rates (block rate schedules)
 - Regulating types of planting or irrigation strategies for businesses (e.g., form-based codes)
 - Stormwater regulations, including enforcement



Reuse

Reusing water is a rather nuanced method of reducing consumption. Many cities are changing policies and regulations to include and allow the use of “graywater” or “brown water” for municipal uses (landscape irrigation)¹⁰. This water is only partly treated, relieving the load on wastewater treatment plants and encouraging more infiltration. In the residential sector, residents should be incentivized and educated about “graywater” and detaining rainwater for outdoor use.

⁷ As aforementioned, further education and relationship-building may be required to persuade some of the well-documented benefits of fluoridation.

⁸ http://www.twdb.texas.gov/publications/brochures/conservation/doc/AgBrochure2_irrigation.pdf

⁹ <https://www.planning.org/publications/document/9108406/>

¹⁰ <https://www.planning.org/publications/report/9131532/> (pg. 78-80)

Restore

Restoring water is rather three-fold and refers to restoring the water back to the ground (recharge), restoring the health of ground and surface water resources, and restoration of aging infrastructure.

- Recharge and water quality can be approached using the same strategies. Helping water infiltrate, whether urban or rural, also helps to clean it and reduce soil erosion.
- Restoration of municipal infrastructure is likely the most difficult objective to achieve. Different areas of the study region have different contaminant concerns, but most are in need of major updates to deliver systems. A region-wide inventory of capital improvement plans (CIPs) could better assess the issue.

Resilience (or – Resilient, Revive, Revitalize)

Resiliency encourages sustainable growth and a strong economy. From an economic development perspective, the region can use its strengths of adequate water supply and ample water access (aesthetic, cultural, recreational, etc.) to attract new businesses and industries. Resiliency also refers to sustainable or “green” growth, meaning new development considers the implications it may have on the surrounding environment and works to mitigate them.

- *Sustaining Places* – American Planning Association PAS Report 578¹¹
 - Planning principle: Resilient Economy.
 - “Ensure that the community is prepared to deal with both positive and negative changes in its economic health and to initiate sustainable urban development and redevelopment strategies that foster green business growth and build reliance on local assets”
 - Best practice 3.5 – “Encourage community-based economic development and revitalization. Community-based economic development is development that promotes, supports, and invests in businesses that serve local needs and are compatible with the vision, character, and cultural values of the community. This approach encourages using local resources in ways that enhance economic opportunities while improving social conditions and supporting locally owned and produced goods and services. These activities foster connections and a sense of place, reduce the need for imports, and stimulate the local economy. This in turn can increase investment in and revitalization of downtowns, commercial areas, neighborhoods, and other place-based community resources.”

Other Community Resources

<http://emergencypreparedness.cce.cornell.edu/disasters/Documents/Preparing%20for%20a%20Water%20Emergency.pdf>

¹¹ <https://www.planning.org/publications/report/9026901/> (pg. 43-44)