



A Regional Water Supply Framework

FOR CHAMPAIGN COUNTY AND EAST-CENTRAL ILLINOIS

OCTOBER 2016

Executive Summary

MISSION STATEMENT:

TO HELP PROTECT THE QUALITY AND QUANTITY OF THE WATER SUPPLY FOR CHAMPAIGN COUNTY BY FOSTERING A SHARED UNDERSTANDING OF THE CURRENT STATUS OF WATER QUALITY AND QUANTITY IN EAST CENTRAL ILLINOIS AND RECOMMENDING AN ARRAY OF INFORMED PUBLIC POLICIES AND STRATEGIES USEFUL IN ACHIEVING THOSE POLICIES.

The importance of water in the ecosystem and to human life cannot be overstated. East-Central Illinois is a relatively water-rich region; here, with the Mahomet Aquifer spanning 14 counties and providing water to hundreds of thousands of people¹, water is plentiful. However, in terms of quantity, water resources are finite, and in terms of quality, water resources are vulnerable. The time to make plans and take action to protect the water supply is now, when there are many options and when there is the luxury of having time to plan well, not later, in an emergency, when both options and time are limited.

The scope of this report is, primarily, Champaign County. However, water systems cross jurisdictional boundaries; it is impossible to consider the conditions of water quality and water quantity in Champaign County without taking into account conditions elsewhere in East-Central Illinois. Furthermore, the concerns that led to the development of this report, and the strategies herein, are applicable in the greater regional context. The four general recommendations and 36 strategies outlined here offer options that stakeholders in East-Central Illinois, from counties, municipalities, and regional planning commissions to businesses, universities, and nonprofits, can implement. Strategies are listed by category: research, policy, or outreach. Many strategies combine aspects of all three themes, but their categorization reflects the primary area of concern of each strategy. Differences in funding, legislative ability (such as home rule status),

and organizational capacity mean that not every strategy will be right for every stakeholder, and not every strategy has to be implemented in order to move in the right direction. Furthermore, organizational resources are always limited; there are insufficient resources to implement every strategy in this report all at once. This report is intended to present possible actions, so that stakeholders can select and prioritize actions that fit their mission, vision, and capabilities.

The population of East-Central Illinois is growing and expected to keep doing so. In 2008, the population of a 15-county area of East-Central Illinois was projected to grow by nearly 30 percent between 2000 and 2050². The ramifications of this are clear: as the population continues to grow, if per capita water use grows, remains the same, or only slightly decreases, the demand for water will also increase. An estimated 509,000 people get their water from the Mahomet Aquifer, either from public water systems or private wells³. A 2011 study indicated that the available water supply of the Mahomet Aquifer is roughly 600 million gallons per day (mgd), significantly higher than the study's projected baseline demand, calculated out to 2050⁴. But having a large amount of water is not the same as having an unlimited amount of water, and having a plentiful, secure water supply is not a reason to do nothing, but a reason to take action to ensure that it remains plentiful and secure in the future. Furthermore, future climate and weather patterns are uncertain in regards to the amount and intensity of precipitation events in the Midwest in the coming decades. Such uncertainty presents planning challenges, but given a choice between planning for uncertainty and not planning at all, the former is the more responsible course of action.

Water issues have been much in the public eye in East-Central Illinois in the last several years. In 2015, part of the Mahomet Aquifer system was designated a "sole source" aquifer by the U.S. Environmental Protection Agency (EPA)⁵. The status of sole source aquifer provides additional protection against

¹ Layne Hydro, "Petition to designate the Mahomet Aquifer as a Sole Source aquifer," (submitted by City of Champaign, Town of Normal, City of Urbana, University of Illinois-Champaign/Urbana, City of Delavan, Village of Mahomet, Village of Mansfield, City of Gilman, December 10, 2012), 1.

² Wittman Hydro Planning Associates, Inc., "Water demand scenarios for the east-central Illinois planning region, 2005-2050," Final Report prepared for the East-Central Illinois Regional Water Supply Planning Committee, August 29, 2008, 46.

³ Layne Hydro, "Petition to designate the Mahomet Aquifer as a Sole Source aquifer," (submitted by City of Champaign, Town of Normal, City of Urbana, University of Illinois-Champaign/Urbana, City of Delavan, Village of Mahomet, Village of Mansfield, City of Gilman, December 10, 2012), 7.

⁴ Roadcap, G.S., Knapp, H.V., Wehrmann, H.A., & Larson, D.R., "Meeting East-Central Illinois water needs to 2050: Potential impacts on the Mahomet Aquifer and surface reservoirs," Illinois State Water Survey & Prairie Research Institute, 2011, 105.

⁵ US EPA, "EPA Designates Mahomet Aquifer as "Sole Source" of Drinking Water in East-Central Illinois," March 11, 2015, press release, <https://www.epa.gov/newsreleases/epa-designates-mahomet-aquifer-sole-source-drinking-water-east-central-illinois>.

contamination; the EPA is authorized to review projects receiving federal funding over the aquifer for public health risks⁶. Also in 2015, a lawsuit between the Mahomet Aquifer Coalition, a 14-member group of government agencies, and Clinton Landfill, Inc. was resolved by the approval of a consent decree. The litigation was based in part on Clinton Landfill, Inc.'s application to the U.S. EPA to be able to accept polychlorinated biphenyl (PCB) waste⁷. These events, and the amount of public interest and political attention that they drew, illustrate that water issues are a priority in the region.

GENERAL RECOMMENDATIONS FOR A REGIONAL WATER SUPPLY FRAMEWORK

Emphasize the connectivity between surface water and groundwater.

Water resources are inherently interconnected, and they must be considered, planned for, and protected with that in mind. It is easy to draw a distinction between surface water and groundwater, but to do so is to overlook both vulnerabilities and opportunities in protecting water quality and water quantity. It should be foundational in water education, and found throughout all outreach materials, that all water, no matter where it is currently located, is one system and one source. Each partner agency and each individual will be responsible for carrying out this strategy, beginning with how we think of, speak about, and plan for the water system, and how we encourage others to think, speak, and plan.

Prioritize research on the Mahomet Aquifer and other parts of the regional water system.

Efforts to plan for and protect the regional water supply should be based upon a sound scientific foundation and should be guided by the most current research on the regional water system. Significant amounts of research on the regional water system have already been done, but our understanding of the Mahomet Aquifer and the regional water system as a whole is far from complete. Additional research on topics like aquifer recharge, threats to water quality, and the flow of water through the aquifer should be prioritized; this will help identify and mitigate threats to the water system and allow for more informed planning efforts.

Partner agencies will be critical in undertaking this recommendation. Public agencies like local governments are among the regional water stakeholders and potential partners for objectives and strategies discussed in this report, but such agencies do not have the expertise or funding to perform the type of research that is needed; their ability to be directly involved in research tasks is limited at best. Depending on budgetary constraints, public agencies may, in some years, be able to contribute funding toward water systems research at institutions in the region, but for the most part their organizational capacities are not suited to conducting this research in-house.

Develop informed public policy relating to water quality and water quantity issues.

Effective public policy is informed public policy. In order to protect the quality and quantity of our water system, policy should be reflective of and responsive to recent research on threats to water quality and quantity and the recommended mitigation strategies of these threats. In partnerships or individually, local government stakeholders can work toward incorporating water quality and quantity best practices into relevant public policy.

Developing new or altering existing ordinances is a complex process involving many stakeholders and incorporating aspects of both research and outreach. Best practices research and local outreach are key steps in policy development; in this way, all three types of strategies – research, policy, and outreach – are interconnected. Research informs policy, while outreach shares the results of research and generates greater interest, which can then lead to more research and policy efforts. Implementation of policy strategies will vary from municipality to municipality; the same strategy adopted and implemented in two different municipalities will likely result in two different ordinances, even if both are based on similar best practices research. The policy strategies in this report are drafted to allow for flexibility, and can be implemented in different municipalities to best suit their mission, vision, community goals, and organizational capacity.

⁶ US EPA, "EPA Designates Mahomet Aquifer as "Sole Source" of Drinking Water in East-Central Illinois," March 11, 2015, press release, <https://www.epa.gov/newsreleases/epa-designates-mahomet-aquifer-sole-source-drinking-water-east-central-illinois>.

⁷ "14 Local Governments to Consider Mahomet Aquifer Consent Decree," *City of Champaign*, last modified August 20, 2015, <http://ci.champaign.il.us/2015/08/20/14-local-governments-to-consider-mahomet-aquifer-consent-decree/>.

Partner on outreach and education efforts.

Outreach and education are critical tools for planning for and protecting the water system. Some of the objectives and strategies in this report pertain to policy or institutional action, but many others involve individual resident and consumer choices. In order to make a case for these objectives, it is important to present clear, accessible information on the importance of water system issues, including those pertaining to both water quality and water quantity. There is a plethora of information already available, some of it specific to East-Central Illinois. Thus, outreach and education efforts include not only producing and distributing new materials, but also acting as a clearinghouse for existing materials. The number of strategies in the report that focus on outreach and education, and the time-consuming nature of such tasks, means that outreach efforts will require a significant amount of staff time. Generating stakeholder engagement without drought or immediate local water quality threats is an additional challenge. To accomplish these tasks, the position of water resources coordinator should be created and filled by a regional agency.

All references later in the document to a water resources coordinator as a responsible party in various strategies refer to a single position. If the water resources coordinator position is hosted at and funded by the Champaign County Regional Planning Commission (CCRPC), support for the goals and strategies presented in this report will be needed from CCRPC's member agencies.

In 2016, in a context of climate uncertainty and vulnerability to pollution and contamination, water issues are topical and pressing. East-Central Illinois is comparatively secure in its water quantity, but it would be a gross miscalculation to assume that not facing a water supply crisis now implies never having to face a water crisis in the future; also, having an ample quantity of water does not mitigate hazards to water quality.

Not every strategy outlined in this report will be appropriate for every stakeholder. However, everyone can do something to benefit the health of our water and of our environment. Acting now, incorporating water-conscious behavior into our plans, our policy, and our everyday lives, we have the opportunity to maintain a healthy, plentiful water supply.

Acknowledgments

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- City of Urbana



- Champaign County



- Village of Mahomet



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Strategy 6.6

Preserve, Protect, and, where feasible, expand existing wetland areas.

Strategy 6.7

Draft green infrastructure standards for public sites and facilities, if not already present. Promote implementation of these standards.

Strategy 6.8

Publicize benefits of green infrastructure concerning not only water but other environmental issues.

Strategy 6.9

Investigate feasibility, advantages, and disadvantages of using permeable pavement.

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If not already done, consider altering parts of local subdivision and/or zoning ordinances to encourage a smaller percentage of impervious surfaces in new development.

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Develop effective programs to minimize water contamination by hhw and ppcps.

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Introduction

MISSION STATEMENT:

TO HELP PROTECT THE QUALITY AND QUANTITY OF THE WATER SUPPLY FOR CHAMPAIGN COUNTY BY FOSTERING A SHARED UNDERSTANDING OF THE CURRENT STATUS OF WATER QUALITY AND QUANTITY IN EAST CENTRAL ILLINOIS AND RECOMMENDING AN ARRAY OF INFORMED PUBLIC POLICIES AND STRATEGIES USEFUL IN ACHIEVING THOSE POLICIES.

The importance of water in the ecosystem and to human life cannot be overstated. East-Central Illinois is a relatively water-rich region; here, with the Mahomet Aquifer spanning 14 counties and providing water to hundreds of thousands of people⁸, water is plentiful. However, in terms of quantity, water resources are finite, and in terms of quality, water resources are vulnerable. The time to make plans and take action to protect our water supply is now, when there are many options and when there is the luxury of having time to plan well, not later, in an emergency, when both options and time are limited. Furthermore, future climate and weather patterns are uncertain in regards to the amount and intensity of precipitation events in the Midwest in the coming decades. Such uncertainty presents planning challenges, but given a choice between planning for uncertainty and not planning at all, the former is the more responsible course of action.

This report was developed with that idea in mind. The purpose of the Regional Water Supply Framework planning effort, which led to this report, was to develop not a plan that would be published and shelved, but a working document that would provide concrete, implementable options for water conservation and protection, and would serve as a foundation for efforts to protect and preserve water quality and quantity in the region for years to come. The report is based on shared concerns and priorities, and is intended to serve as a flexible water planning framework.

This report was developed by a multiagency advisory panel beginning in 2014, convened and facilitated by Champaign County Regional Planning Commission staff. The advisory panel met on a monthly basis for roughly one year; meetings were a combination of discussion and presentations on water topics. The objectives and strategies in this report were developed through the discussion and presentations at these meetings. The scope of this report is, primarily, Champaign County. However, water systems cross jurisdictional

boundaries; it is impossible to consider the conditions of water quality and water quantity in Champaign County without taking into account conditions elsewhere in East-Central Illinois. Furthermore, the concerns that led to the development of this report, and the strategies herein, are applicable in the greater regional context.

The four general recommendations and 36 strategies outlined here offer options that stakeholders in East-Central Illinois, from counties, municipalities, and regional planning commissions to businesses, universities, and nonprofits, can implement. Strategies are listed by category: research, policy, or outreach. Many strategies combine aspects of all three themes, but their categorization reflects the primary area of concern of each strategy. Differences in funding, legislative ability (such as home rule status), and organizational capacity mean that not every strategy will be right for every stakeholder, and not every strategy has to be implemented in order to move in the right direction. Furthermore, organizational resources are always limited; there are insufficient resources to implement every strategy in this report all at once. This report is intended to illustrate possible actions, so that stakeholders can select and prioritize actions that fit their mission, vision, and capabilities.

Each strategy has a timeframe, identified as short-term, medium-term, long-term, or ongoing. “Short-term” strategies could begin to see progress within three years of the publication of this report, and “medium-term” in between four to 10 years. “Long-term” strategies are those that would take significant time to organize and implement, and will likely take at least 10 years. Many strategies in this report are “ongoing,” meaning that they do not have a specific endpoint and are unlikely to ever be truly “accomplished.” These categories are fluid, however, and should only act as an estimate of their implementation timeframes.

The fact that East-Central Illinois is relatively water-secure, and does not face the threat of scarcity that other regions in the U.S. are currently grappling with, is not an excuse or a reason not to plan and act for future water supplies. Furthermore, East-Central Illinois faces water quality threats related to pollution and contamination: having an ample supply of water does not mitigate threats to water quality. It is planning ahead and taking considered, responsible action that will keep East-Central Illinois water-secure, now and into the future.

⁸ Layne Hydro, “Petition to designate the Mahomet Aquifer as a Sole Source aquifer,” (submitted by City of Champaign, Town of Normal, City of Urbana, University of Illinois-Champaign/Urbana, City of Delavan, Village of Mahomet, Village of Mansfield, City of Gilman, December 10, 2012), 1.

Existing Conditions

POPULATION AND POPULATION GROWTH

The population of East-Central Illinois is growing and expected to keep doing so. In 2008, the population of a 15-county area of East-Central Illinois (including Cass, Champaign, DeWitt, Ford, Iroquois, Logan, Macon, Mason, McLean, Menard, Piatt, Sangamon, Tazewell, Vermilion, and Woodford) was projected to grow by nearly 30 percent between 2000 and 2050⁹. The ramifications of this are clear: as the population continues to grow, if per capita water use grows, remains the same, or only slightly decreases, the demand for water will also increase.

THE MAHOMET AQUIFER

The Mahomet Aquifer is a major source of groundwater for the East-Central Illinois region; 14 counties (Cass, Champaign, DeWitt, Ford, Iroquois, Logan, Macon, Mason, McLean, Menard, Piatt, Tazewell, Vermilion, and Woodford) are underlain by it, and an estimated 509,000 people get their water from it, supplied either by public water systems or private wells¹⁰.

An aquifer is a layer of porous rock that can transmit and store water¹¹. Aquifers can be unconfined, meaning that the top of the aquifer is at the surface of the Earth, or confined, meaning that the aquifer over- and underlain by less porous layers of rock¹². The overlying layers of rock create pressure, and when wells are drilled, this pressure causes the water level in the wells to rise above the top of the aquifer¹³. The distance between the top of the aquifer and the water

level in a given well is called the water level elevation; the measure of the water level elevation of all wells in a given area can be used to create a contour map of an aquifer's potentiometric surface¹⁴.

The Mahomet Aquifer is a sand and gravel aquifer that is unconfined, meaning that the aquifer reaches the surface, in the Havana Lowlands, and confined, meaning that it is overlain by glacial till and other sediment, for most of its area¹⁵. Aquifer recharge, or the replenishing of water in the aquifer, takes place largely in two ways: as infiltration of water from the surface, through any overlying layers of till and sediment, or as streamflow leakage from bodies of surface water¹⁶. Areas of greater interconnectivity between the Mahomet Aquifer and overlying aquifers exist¹⁷; these areas have been mapped using groundwater flow models, but knowledge of these recharge areas is not complete. It follows, however, that faster infiltration of water also allows for faster infiltration of potential contaminants, should a pollutant leak into or be dumped near a recharge area.

WATER QUANTITY

The 2011 study "Meeting East-Central Illinois water needs to 2050: Potential impacts on the Mahomet Aquifer and surface reservoirs" indicated that the available water supply of the Mahomet Aquifer is slightly under 600 million gallons per day (mgd), and is anticipated to increase by 2050 to slightly over 600 mgd¹⁸. The study projected groundwater demand to 2050 in three scenarios: a baseline scenario, a scenario where development is less resource intensive than at present, and a scenario where development is more resource intensive than at present. In all three scenarios, groundwater use is projected

⁹ Wittman Hydro Planning Associates, Inc., "Water demand scenarios for the east-central Illinois planning region, 2005-2050," Final Report prepared for the East-Central Illinois Regional Water Supply Planning Committee, August 29, 2008, 46.

¹⁰ Layne Hydro, "Petition to designate the Mahomet Aquifer as a Sole Source aquifer," (submitted by City of Champaign, Town of Normal, City of Urbana, University of Illinois-Champaign/Urbana, City of Delavan, Village of Mahomet, Village of Mansfield, City of Gilman, December 10, 2012), 7.

¹¹ "Aquifers and Groundwater," U.S. Geological Survey, the USGS Water Science School, last modified May 2, 2016, <http://water.usgs.gov/edu/earthqwaquifer.html>.

¹² "Aquifer: Hydrology," *Encyclopaedia Britannica*, copyright 2016, <https://www.britannica.com/science/aquifer#ref17731>.

¹³ "Aquifers and Groundwater," U.S. Geological Survey, the USGS Water Science School, last modified May 2, 2016, <http://water.usgs.gov/edu/earthqwaquifer.html>.

¹⁴ Roadcap, G.S., Knapp, H.V., Wehrmann, H.A., & Larson, D.R., "Meeting East-Central Illinois water needs to 2050: Potential impacts on the Mahomet Aquifer and surface reservoirs," Illinois State Water Survey & Prairie Research Institute, 2011, 35.

¹⁵ *Ibid*, 28-29.

¹⁶ Layne Hydro, "Petition to designate the Mahomet Aquifer as a Sole Source aquifer," (submitted by City of Champaign, Town of Normal, City of Urbana, University of Illinois-Champaign/Urbana, City of Delavan, Village of Mahomet, Village of Mansfield, City of Gilman, December 10, 2012), 61.

¹⁷ Water Quality: East Central Illinois," *Illinois State Water Survey, Prairie Research Institute*, copyright 2016, <http://www.isws.illinois.edu/wsp/regcellwq.asp>.

¹⁸ Roadcap, G.S., Knapp, H.V., Wehrmann, H.A., & Larson, D.R., "Meeting East-Central Illinois water needs to 2050: Potential impacts on the Mahomet Aquifer and surface reservoirs," Illinois State Water Survey & Prairie Research Institute, 2011, 105.

FIGURE 1: EAST CENTRAL ILLINOIS MAHOMET AQUIFER AREA

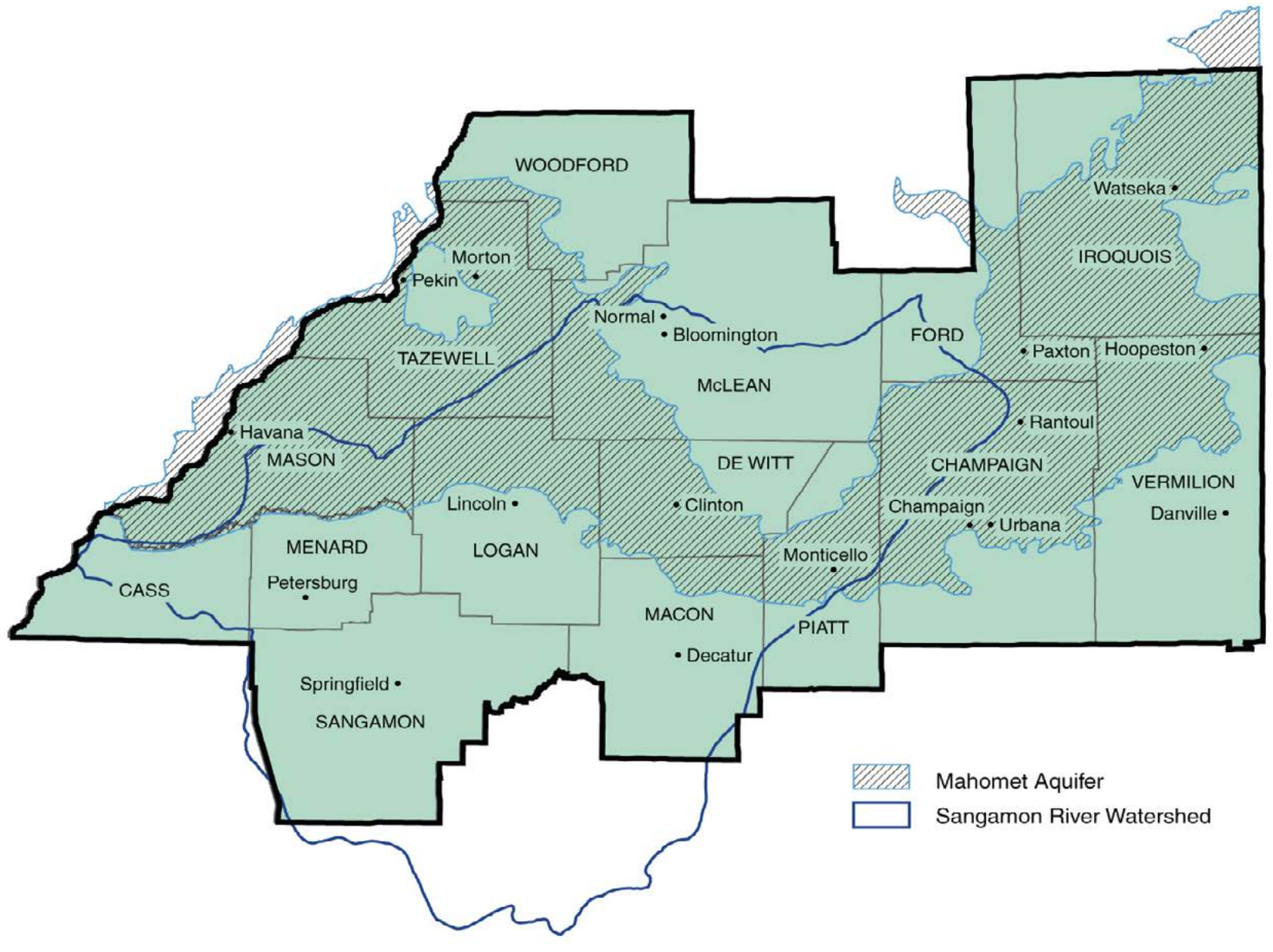


Photo: Mahomet Aquifer Consortium and Regional Water Supply Planning Committee. "Maps of the Mahomet Aquifer."
<http://www.mahometaquiferconsortium.org/info-maps.html>. Retrieved 18 October 2016.

to increase, from the 2005 use rate of 208 mgd to 265 mgd, 244 mgd, and 287 mgd, respectively¹⁹. The projected available supply in 2050 is over double the size of the projected available baseline scenario use in 2050²⁰. These projections include water use for irrigation purposes, and even in the scenario with the greatest increase in irrigation use by 2050, use is within the projected available supply in 2050²¹. Climate change and the threat of drought make predicting future conditions challenging, and greater study and analysis of well locations and pumpage rates are needed, but at this point, demand for irrigation for agricultural purposes is not expected to overwhelm the water supply of the Mahomet Aquifer.

These projections bode well for the region having sufficient water quantity for the next several decades, but the challenge of planning for and protecting water quality remains critical. Furthermore, as stated in the introduction, having a large amount of water is not the same as having an unlimited amount of water, and having a plentiful, secure water supply is not a reason to do nothing, but a reason to take action to ensure that it remains plentiful and secure for the foreseeable future.

WATER USE

The amount of water withdrawn and used varies widely by sector and area within the East-Central Illinois region. The distinctions between water withdrawals, consumptive water use, and non-consumptive water use must be kept in mind when measuring and discussing water use. Water withdrawal is the process of removing water from its source. Consumptive uses are those through which

water is “removed from the immediate water environment and is not available for immediate or economical reuse”²². Agricultural withdrawals for irrigation purposes comprise a significant portion of total water use, and represent a consumptive use²³. Non-consumptive uses are those after which water can be returned to its source or to elsewhere in the water system after some degree of treatment, and can be used again²⁴. Electric power generation can account for large water withdrawals, but is generally non-consumptive, as most of the water withdrawn is returned to its source and can be used again²⁵.

In recent years, water withdrawal data from public water supply systems, which account for household water use delivered to users by a public agency or private company, has shown a decline in per capita water use²⁶. Water use for electric power generation is not a factor in Champaign County’s overall water use; recent data is not available for commercial water use in Champaign County²⁷. Groundwater pumping in Champaign County has resulted in a cone of depression, or an area where water levels of the potentiometric surface are significantly lower than in the surrounding areas, that affects groundwater flow patterns in the area²⁸. This cone of depression is projected to increase by between eight and 31 feet by 2050, depending on resource use in the next several decades²⁹. However, even with an additional drawdown of 31 feet, the lowest point of the cone of depression, as reflected in the potentiometric surface, is projected to remain above the top of the aquifer³⁰.

¹⁹ Roadcap, G.S., Knapp, H.V., Wehrmann, H.A., & Larson, D.R., “Meeting East-Central Illinois water needs to 2050: Potential impacts on the Mahomet Aquifer and surface reservoirs,” Illinois State Water Survey & Prairie Research Institute, 2011, 168.

²⁰ Ibid, 105.

²¹ Ibid, 12.

²² East Central Illinois Regional Water Supply Planning Committee. “A Plan to Improve the Planning and Management of Water Supplies in East-Central Illinois,” 2009, 12.

²³ Ibid, 12.

²⁴ Ibid, 12.

²⁵ Ibid, 12.

²⁶ Ibid, 13.

²⁷ “Water Use Data for Illinois. National Water Information System: Web Interface,” U.S. Geological Survey, U.S. Department of the Interior, last modified September 28, 2016, http://waterdata.usgs.gov/il/nwis/water_use?.

²⁸ Roadcap, G.S., Knapp, H.V., Wehrmann, H.A., & Larson, D.R., “Meeting East-Central Illinois water needs to 2050: Potential impacts on the Mahomet Aquifer and surface reservoirs,” Illinois State Water Survey & Prairie Research Institute, 2011, 46.

²⁹ Ibid, 89.

³⁰ Ibid, 41.

PUBLIC INTEREST IN WATER ISSUES

Water issues have been much in the public eye in East-Central Illinois in the last several years. In 2015, part of the Mahomet Aquifer system was designated a “sole source” aquifer by the U.S. Environmental Protection Agency (EPA)³¹. To become a sole source aquifer, an aquifer must be demonstrated to be a source of water with “no physically available or economically feasible alternative[s]” and whose contamination “would create a significant hazard to public health.” The Petition to Designate the Mahomet Aquifer as a Sole Source Aquifer was submitted to the U.S. EPA in December 2012 by a stakeholder group that included the City of Champaign, the Town of Normal, the City of Urbana, the University of Illinois Champaign/Urbana, the Village of Savoy, the City of Delavan, the Village of Mahomet, the Village of Mansfield, and the City of Gilman³². The status of sole source aquifer provides additional protection against contamination; the EPA is authorized to review projects receiving federal funding over the aquifer for public health risks³³.

Also in 2015, a lawsuit between the Mahomet Aquifer Coalition, a 14-member group of government agencies, and Clinton Landfill, Inc. was resolved by the approval of a consent decree. The basis of the litigation was Clinton Landfill, Inc.’s application to the U.S. EPA to be able to accept polychlorinated biphenyl (PCB) waste³⁴. The terms of the consent decree included Clinton Landfill, Inc. withdrawing its application to accept PCB waste and agreeing to accept no additional manufactured gas plant (MGP) waste, and taking precautions against contamination by MGP waste already in the landfill³⁵. These events, and the amount of public interest and political attention that they drew, illustrate that water issues are a priority in the region.

RECENT WATER PLANNING EFFORTS

East-Central Illinois has an active water planning and policy community. The Mahomet Aquifer Consortium (MAC) is a not-for-profit corporation, originally convened in 1998 and expanded in 2010³⁶, that meets regularly, shares water topics research, develops programming for events like the EPA’s annual Fix-a-Leak Week, and is an active advocate for water resources. The East Central Illinois Regional Water Supply Planning Committee, established by MAC in 2007, publishes materials on water planning and water supply management in the region³⁷. Research on water topics takes place across many departments at the University of Illinois and at the Prairie Research Institute (PRI) (which includes the Illinois Natural History Survey, the Illinois State Geological Survey, the Illinois State Water Survey, the Illinois State Archaeological Survey, and the Illinois Sustainable Technology Center). The Cities of Champaign and Urbana, the two largest municipalities in Champaign County, have both published a sustainability plan, a water plan, or both, and other local governments, public agencies, utilities, and organizations are engaged in water and sustainability issues. Many of the strategies in this report call for inter-agency partnerships, and in the region, there are a number of active, engaged stakeholders to work with.



Photo: University of Illinois, Urbana, Illinois, Champaign County Regional Planning Commission

³¹ US EPA, “EPA Designates Mahomet Aquifer as “Sole Source” of Drinking Water in East-Central Illinois,” March 11, 2015, press release, <https://www.epa.gov/newsreleases/epa-designates-mahomet-aquifer-sole-source-drinking-water-east-central-illinois>.

³² Layne Hydro, “Petition to designate the Mahomet Aquifer as a Sole Source aquifer,” (submitted by City of Champaign, Town of Normal, City of Urbana, University of Illinois-Champaign/Urbana, City of Delavan, Village of Mahomet, Village of Mansfield, City of Gilman, December 10, 2012), title page.

³³ US EPA, “EPA Designates Mahomet Aquifer as “Sole Source” of Drinking Water in East-Central Illinois,” March 11, 2015, press release, <https://www.epa.gov/newsreleases/epa-designates-mahomet-aquifer-sole-source-drinking-water-east-central-illinois>.

³⁴ “14 Local Governments to Consider Mahomet Aquifer Consent Decree,” *City of Champaign*, last modified August 20, 2015, <http://ci.champaign.il.us/2015/08/20/14-local-governments-to-consider-mahomet-aquifer-consent-decree/>.

³⁵ Ibid.

³⁶ “About,” *Mahomet Aquifer Consortium*, copyright 2016, <http://www.mahometaquiferconsortium.org/aboutmac.html>.

³⁷ “About RWSPC,” *Mahomet Aquifer Consortium*, copyright 2016, <http://www.mahometaquiferconsortium.org/RWSPC.html>.

General Recommendations for a Regional Water Supply Framework

EMPHASIZE THE CONNECTIVITY BETWEEN SURFACE WATER AND GROUNDWATER.

Water resources are inherently interconnected, and they must be considered, planned for, and protected with that in mind. It is easy to draw a distinction between surface water and groundwater, but to do so is to overlook both vulnerabilities and opportunities in protecting water quality and water quantity.

Surface water and groundwater are inextricably linked; groundwater can contribute to the flow of rivers and streams, and rivers and streams can contribute water to aquifers through recharge or streambank storage³⁸. Through interconnected areas, contaminants can spread from surface water to groundwater and vice versa³⁹. This movement of water between surface and ground sources can be variable over a small area. Rainwater is similarly transient: it can infiltrate the soil and recharge groundwater, while falling onto impermeable surfaces, and it also contributes to runoff, eventually discharged into bodies of surface water⁴⁰. In either case, it becomes part of a single water system.

It is important to think holistically about the water system. Strategies meant to protect groundwater will not be as effective if the health of lakes and streams are neglected; if all efforts focus on local bodies of surface water, the state of groundwater resources may not be taken into account. Instead of planning for surface water and groundwater as disparate entities, it is necessary to plan for the interconnected water system.

One way that this could be addressed is through a branding effort that raises awareness of the interconnected nature of the water system as a basis for further environmental learning. A slogan and logo emphasizing surface water and

groundwater as a single resource could be created and included in all outreach and education efforts, and used to underscore the importance of protecting the quality and quantity of both surface and groundwater bodies.

It should be foundational in water education, and found throughout all outreach materials, that all water, no matter where it is currently located, is one system and one source. Each partner agency and each individual will be responsible for carrying out this strategy, beginning with how we think of, speak about, and plan for the water system, and how we encourage others to think, speak, and plan.

PRIORITIZE RESEARCH ON THE MAHOMET AQUIFER AND OTHER PARTS OF THE REGIONAL WATER SYSTEM.

Efforts to plan for and protect the regional water supply should be based upon a sound scientific foundation and should be guided by the most current research on the regional water system. Significant amounts of research on the regional water system have already been done, but our understanding of the Mahomet Aquifer and the regional water system as a whole is far from complete. Additional research on topics like aquifer recharge, threats to water quality, and the flow of water through the aquifer should be prioritized; this will help identify and mitigate threats to the water system and allow for more informed planning efforts.

Partner agencies will be critical in undertaking this recommendation. Public agencies like local governments are among the regional water stakeholders and potential partners for objectives and strategies discussed in this report, but such agencies do not have the expertise or funding to perform the type of research that is needed; their ability to be directly involved in research tasks is limited at best. Depending on budgetary constraints, public agencies may, in some years, be able to contribute funding toward water systems research at institutions in the region, but for the most part their organizational capacities are not suited to conducting this research in-house.

³⁸ Winter, T.C., Harvey, J.W., Franke, O.L., & Alley, W.M., "Groundwater and Surface Water: A single resource," U.S. Geological Survey Circular 1139, U.S. Geological Survey, 1998, VI.

³⁹ Ibid, VI.

⁴⁰ "The Water Cycle," U.S. Geological Survey, the USGS Water Science School, last modified May 2, 2016, <http://water.usgs.gov/edu/watercycle.html>.

DEVELOP INFORMED PUBLIC POLICY RELATING TO WATER QUALITY AND WATER QUANTITY.

Effective public policy is informed public policy. In order to protect the quality and quantity of the water system, policy should be reflective of and responsive to recent research on threats to water quality and quantity and the recommended mitigation strategies of these threats. In partnerships or individually, local government stakeholders can work toward incorporating water quality and quantity best practices into relevant public policy.

Developing new or altering existing ordinances is a complex process involving many stakeholders and incorporating aspects of both research and outreach. Best practices research and local outreach are key steps in policy development; in this way, all three types of strategies – research, policy, and outreach – are interconnected. Research informs policy, while outreach shares the results of research and generates greater interest, which can then lead to more research and policy efforts. Implementation of policy strategies will vary from municipality to municipality; the same strategy adopted and implemented in two different municipalities will likely result in two different ordinances, even if both are based on similar best practices research. The policy strategies in this report are drafted to allow for flexibility, and can be implemented in different municipalities to best suit their mission, vision, community goals, and organizational capacity.

PARTNER ON OUTREACH EFFORTS.

Outreach and education are critical tools for planning for and protecting the water system. Some of the objectives and strategies in this report pertain to policy or institutional action, but many others involve individual resident and consumer choices. In order to make a case for any of these objectives, it is important to present clear, accessible information on the importance of water system issues, including those pertaining to both water quality and water quantity. A significant amount of information is already available, some of it specific to East-Central Illinois. Thus, outreach efforts include not only producing and distributing new materials, but also acting as a clearinghouse for existing materials. Partnering on outreach tasks will help create messages and material that are cohesive, informative, and accessible.

The number of strategies in the report that focus on outreach and education, and the time-consuming nature of such tasks, mean that outreach efforts will require a significant amount of staff time. Generating stakeholder engagement without drought or immediate local water quality threats is an additional challenge. To accomplish these tasks, the position of water resources coordinator should be created and filled by a regional agency. All references later in the document to a water resources coordinator as a responsible party in various strategies refer to a single position. If the water resources coordinator position is hosted at and funded by the Champaign County Regional Planning Commission (CCRPC), support for the goals and strategies presented in this report will be needed from CCRPC's member agencies.



Photo: University of Illinois Campus, Urbana, Illinois, Champaign County Regional Planning Commission

Section 1

STRATEGIES TO SUPPORT THE ADVANCEMENT OF
KNOWLEDGE REGARDING GROUNDWATER RESOURCES

Section 1

STRATEGIES TO SUPPORT THE ADVANCEMENT OF KNOWLEDGE REGARDING GROUNDWATER RESOURCES

Research is the first step of informed planning and policy, and must be prioritized as an intrinsic part of any future action. Much research on the Mahomet Aquifer has already taken place, but knowledge of the aquifer and the rest of the regional water system is still incomplete. Moving forward with the importance of research in mind will be key to developing informed public policy.

In the coming decades, our understanding of the water system and the Mahomet Aquifer will grow, while our circumstances will change. Working with outdated information can be as detrimental to effective conservation efforts as working with no information: what is a solid understanding of today's conditions will be little help when considering a situation 10, 20, 50, or 100 years from now. It is important to establish a culture of constant learning, in which we are able to acquire new information and incorporate it into environmental plans and programs on an ongoing basis. This will require work by the academic, technical, and policy-making communities, and communication between them. With these challenges in mind, stakeholder agencies should strive for a process in which research informs policy, and policy is responsive to new research and changing circumstances.

STRATEGY 1.1

BUILD RELATIONSHIPS BETWEEN RESEARCH AND POLICY MAKING COMMUNITIES VIA ORGANIZING AND SPONSORING OR COSPONSORING ROUNDTABLES, EXPOS, LECTURES, AND OTHER EVENTS.

STRATEGY 1.2

DEVELOP LIST OF ORGANIZATIONS CURRENTLY INVOLVED IN WATER RESEARCH AND ADVOCACY IN EAST-CENTRAL ILLINOIS.

STRATEGY 1.3

HIGHLIGHT BASIC WATER SCIENCE, INCLUDING ANNUAL AQUIFER WITHDRAWAL AND RECHARGE CYCLE, IN OUTREACH AND EDUCATION EFFORTS.

STRATEGY 1.4

FUND RESEARCH GRANTS TO SUPPORT FURTHER STUDY OF GROUNDWATER AND SURFACE WATER SYSTEMS.

Strategy 1.1

BUILD RELATIONSHIPS BETWEEN RESEARCH AND POLICYMAKING COMMUNITIES VIA ORGANIZING AND SPONSORING OR COSPONSORING ROUNDTABLES, EXPOS, LECTURES, AND OTHER EVENTS.

ACTION:
WORK TOWARD A MORE COLLABORATIVE ENVIRONMENT BY ORGANIZING A SERIES OF EVENTS THAT WILL INTRODUCE MEMBERS OF THE RESEARCH AND POLICYMAKING COMMUNITIES TO EACH OTHER AND FOSTER DISCUSSION OF RECENT RESEARCH, CURRENT BEST PRACTICES, AND POLICY TRENDS.

This action could take the form of an ongoing advisory group that includes representatives of many different agencies and hosts periodic events. Lectures with question-and-answer sessions could offer opportunities to learn about recent research developments, and roundtables could foster discussion on water policy and best practices. With events on a regular basis, attendees could foster ongoing relationships.

BACKGROUND

In order to strengthen ties between research and policy, it is necessary to build relationships among all who are involved in water issues in the East-Central Illinois region.

Residential water use and individual consumer behavior are not insignificant, but achieving larger-scale change in how our water system is protected involves altering the practices of institutions. Several strategies in this report involve public policy: introducing ordinances pertaining to products that

contribute to harmful runoff (4.1), and creating and promoting green infrastructure, landscaping, and irrigation guidelines (6.9, 3.1), to name a few. Such changes cannot happen without the interest and support of policymakers, and such changes should be supported by the most sound and recent research available. Bringing research institutions, planning staff, and elected officials into a single conversation on a regular basis will foster greater communication and understanding, and could facilitate any changes to water public policy.

RESPONSIBLE AGENCIES

Representatives of partner stakeholder agencies would contribute to the development of the group and the organization of the events, potentially including a rotating venue. Engaging the academic communities at the University of Illinois, State Geological and Water Surveys, and Parkland College will be critical. CCRPC has already convened an advisory panel working group for the development of this report, involving representatives from a variety of different stakeholder agencies; CCRPC staff can continue to coordinate a group involving the same and additional groups.

TIMEFRAME

This strategy has no effective endpoint; efforts to implement it will be ongoing.

Type: Research

Strategy: Build relationships between research and policymaking communities via organizing and sponsoring or cosponsoring roundtables, expos, lectures, and other events.

Responsible Agencies: Academic communities, municipal governments, planning staff, CCRPC

Timeframe: Ongoing

Strategy 1.2

DEVELOP LIST OF ORGANIZATIONS CURRENTLY INVOLVED IN WATER RESEARCH AND ADVOCACY IN EAST-CENTRAL ILLINOIS.

ACTION:

DEVELOP A DIRECTORY OF INSTITUTIONS AND ORGANIZATIONS IN THE REGION WHOSE MISSIONS INVOLVE WATER ISSUES.

The directory could take the form of a webpage. Organizations should be invited to develop their own listings, including topics of interest, recent activities, upcoming events and volunteer opportunities, and contact information. The information on the webpage should be public, rather than requiring login access, and the site should be easily searchable. This should be part of the central water website proposed for development in an earlier strategy.

BACKGROUND

In order to create the best possible partnerships and embark on programs and projects that are both as effective and inclusive as possible, it is necessary to understand what organizations are working in the region on water issues and what their specific areas of interest are.

Partnerships allow institutions and organizations to share resources and expertise; by working together, groups can implement programs and complete projects that would have been difficult or impossible to accomplish by any group working individually. A water workers directory would serve as a resource for all interested organizations in the region, and the

development of the directory would open up channels of communication and begin to build a network of organizations.

RESPONSIBLE AGENCIES

Development and maintenance of such a directory could be the responsibility of the water resources coordinator.

TIMEFRAME

This action could be undertaken within a year of the publication of this report. However, it will also be an ongoing effort to ensure that the information in the directory remains up to date.

Type: Research

Strategy: Develop list of organizations currently involved in water research and advocacy in East-Central Illinois.

Responsible Agencies: CCRPC staff

Timeframe: 0 to 5 years



Photo: Boneyard Creek at Second Street Detention Basin, Champaign County Regional Planning Commission

Strategy 1.3

HIGHLIGHT BASIC WATER SCIENCE, INCLUDING ANNUAL AQUIFER WITHDRAWAL AND RECHARGE CYCLE, IN OUTREACH AND EDUCATION EFFORTS.



Photo: University of Illinois Campus, Urbana, Illinois, Champaign County Regional Planning Commission

ACTION:

EMPHASIZE BASIC WATER SCIENCE THROUGHOUT OUTREACH AND EDUCATION EFFORTS.

There are several ways that this strategy could be implemented. Educational pamphlets could be created and made available, for free, at community locations such as public libraries. The same material could also appear on a central water topics website. Presentations could be developed and placed on the same website for free public use; this will be discussed further in Strategy 7.1. Representatives of stakeholder organizations could staff booths at community events or give talks at local schools, clubs, and community groups. A series of water education public service announcements could be developed in partnership with local public access media.

BACKGROUND

The understanding of basic water science by all stakeholders is critical for the development of informed public policy and as the foundation of public engagement. All stakeholders should be able to have the context that this background knowledge provides.

Type: Outreach

Strategy: Highlight basic water science in outreach and education efforts.

Responsible Agencies: Water resources coordinator

Timeframe: Ongoing

RESPONSIBLE AGENCIES

All stakeholders interested in outreach efforts could contribute to this strategy. The water resources coordinator could organize and facilitate implementation of this strategy.

TIMEFRAME

Because this is applicable to all outreach and education efforts, implementation of this strategy will be ongoing, and will depend on the amount of available staff time and volunteer interest.

Strategy 1.4 FUND RESEARCH GRANTS TO SUPPORT FURTHER STUDY OF GROUNDWATER AND SURFACE WATER SYSTEMS.

ACTION:

CREATE A GRANT PROGRAM, FUNDED JOINTLY AMONG SEVERAL STAKEHOLDERS, TO HELP COVER THE COSTS OF RESEARCH IN A VARIETY OF WATER TOPICS. CONVENE A GROUP OF PARTNER AGENCIES, DEVELOP A FUNDING STRUCTURE, AND FORM A REVIEW PANEL TO ADMINISTER THE APPLICATION PROCESS.

All stakeholder organizations in Champaign County will have the opportunity to opt in to the group implementing this strategy; any groups who opt in should contribute one or more representatives to a board that will develop and manage a grant program. This board would determine how much money the grant program could offer each year, depending on how much each involved entity could contribute, and how many projects the program could support. The board would also determine criteria of project eligibility and funding guidelines; a subcommittee of the board would be in charge of evaluating and selecting projects for funding.

In addition to the local grant program, local government agencies can assist researchers applying for outside grants by providing letters of support upon request. These letters of support and other indications of sponsorship can add weight to a grant application, and offer an opportunity for local government agencies to aid efforts to seek funding that does not require them to contribute funds themselves.

BACKGROUND

Research is a critical part of maintaining and expanding our understanding of our water resources. Research and development are what generate innovative water-saving techniques, develop and refine best practices, and allow for constant improvement in how we manage our water. It is indispensable, should be prioritized, and always requires resources, including funding, to carry out.

RESPONSIBLE AGENCIES

Any stakeholder agency that is interested in assisting with the grant program and able to consistently contribute funds to the grants, regardless of the size of the contribution, could be involved in the creation and administration of the grant program.

TIMEFRAME

The implementation timeframe of this item will depend heavily on the availability of funds. Strictly speaking of the time and work that it would take to organize such a fund, it could be realistically begun within five years of the publication of this report. However, whether agencies have funds available to contribute to and maintain the grant will affect when this strategy may be started.

Type: Research

Strategy: Fund research grants to support further study of groundwater and surface water systems.

Responsible Agencies: All interested stakeholder agencies

Timeframe: 0 to 5 years; Ongoing



Photo: Boneyard Creek, Urbana, Illinois, Champaign County Regional Planning Commission

Section 2

STRATEGIES TO STRENGTHEN UNDERSTANDING OF WATER USE

Section 2

STRATEGIES TO STRENGTHEN UNDERSTANDING OF WATER USE

One of the primary goals discussed in this report is to change habits of water use, in terms of both individual behavior and institutional policy. In some cases, this may mean using less water. In others, it may mean using the same amount of water more efficiently, or changing the way water is treated and returned to its source body after it is used. It may even mean changing what water it used, by collecting more rainwater and examining the potential of reusing greywater, or household wastewater from such sources as sinks, showers, washing machines, and dishwashers⁴¹, in Illinois.

However, it is not possible to fully understand the impact of any of these endeavors without an understanding of current water use. It is impossible to set informed, reasonable goals without an understanding of current use. Beyond the visioning process, projects need specific, often numeric goals to motivate action. Without knowing what the current usage is, and without knowing its trend in recent years, it is difficult to identify appropriate goals or benchmarks or understand when we are making progress. Thus, water use measurement and analysis efforts should be continued and expanded, and the results should be publicized whenever possible.

STRATEGY 2.1

STUDY FEASIBILITY OF IMPLEMENTING UNIT-BY-UNIT METERING IN MULTI-UNIT STRUCTURES; IMPLEMENT WHERE FEASIBLE.

STRATEGY 2.2

IMPLEMENT PILOT PROGRAM MEASURING INTERIOR AND EXTERIOR HOUSEHOLD WATER USE.

⁴¹ Mason, S.L. "Going Green May Mean Going Grey – Using greywater in the landscape," *University of Illinois Extension, The Homeowners Column*, <http://web.extension.illinois.edu/cfiv/homeowners/110812.html>.

Strategy 2.1

STUDY FEASIBILITY OF IMPLEMENTING UNIT-BY-UNIT METERING IN MULTI-UNIT STRUCTURES; IMPLEMENT WHERE FEASIBLE.

ACTION:
EVALUATE THE COST-EFFECTIVENESS OF UNIT-BY-UNIT METERING IN MULTI-UNIT STRUCTURES, AND IMPLEMENT UNIT-BY-UNIT METERING IN NEW CONSTRUCTION WHERE FEASIBLE.

There are several ways that this strategy could be implemented. At the largest scale, municipalities could require developers building new multi-unit structures to install a meter for each unit during the construction stage, or to plumb the building so that unit-by-unit metering could be implemented at a later date. An organization or organizations with the appropriate expertise could offer plumbing audits: free or inexpensive reviews of a building or its plans to check whether a unit-by-unit retrofit is possible without re-plumbing the building. Alternatively, a pamphlet on the benefits of and barriers to unit-by-unit metering in multi-unit structures could be developed and distributed.

BACKGROUND
Water use is frequently metered at the scale of the building. In single-family households, or in commercial cases where there is only one business occupying a single building, measurements from these meters offer comprehensive data. However, in multi-unit structures, no matter their land use, a single meter accounting for all the water use in the building presents a loss of information for all occupants.

Just as we cannot set large-scale goals without understanding our water use, occupants of

a building, whether it is a home or workplace, need to know what their water use is in order to attempt to reduce it. Without such data, occupants may adopt a behavior change, such as fewer loads of laundry per month or only running the dishwasher when it's full, but may not see that behavior change reflected in lower water use numbers. The behavior change will not be confirmed as effective, and may not become habitual.

At the same time, however, unit-by-unit metering may not be feasible in every case. The installation and maintenance costs of the meters themselves may financially outweigh the water use benefits that result from unit-by-unit metering. Some buildings do not have plumbing that is conducive to unit-by-unit metering: in such cases, implementing this strategy would require re-plumbing the entire structure. So implementing unit-by-unit metering is not recommended in all cases, but should be taken into serious consideration for new structures.

RESPONSIBLE AGENCIES
This strategy is most applicable to owners and operators of multi-unit structures, including but not limited to rental companies and landlords, and to developers who will build multi-unit structures. Information on unit-by-unit metering and its aptness for particular structures could come from water utilities and/or sanitary districts. Municipal staff would also need to be involved, if including meters for each unit in new multi-unit structure was to be incorporated into development guidelines.

Type: Research

Strategy: Study feasibility of implementing unit-by-unit metering in multi-unit structures; implement where feasible.

Responsible Agencies: Water utilities, sanitary districts, owners and operators of multi-unit structures

Timeframe: 5 to 10 years

TIMEFRAME
Strategy 2.1 is a medium-term item. While it may be possible to begin implementation of this strategy within five years, full execution and results will take longer to achieve.

Strategy 2.2

IMPLEMENT PILOT PROGRAM MEASURING INTERIOR AND EXTERIOR HOUSEHOLD WATER USE.

ACTION:

ESTABLISH A PILOT PROGRAM AT THE HOUSEHOLD OR SITE LEVEL TO MEASURE BOTH INTERIOR AND EXTERIOR WATER USE.



Photo: Courier Café Urban Gardens, Urbana, Illinois,
Champaign County Regional Planning Commission

To measure interior and exterior water use separately, a site would need separate meters. Potential sites should be evaluated for inclusion partially based on the feasibility of siting, installing and maintaining a separate meter to measure exterior water use, such as on a spout most often used for a hose or lawn-watering system.

BACKGROUND

Understanding how and for what purposes water is used at the household level will benefit all stakeholders. Measuring interior and exterior water use separately would provide additional insight into household water use. In order to comprehensively consider exterior water conservation programs (e.g., local-friendly, low-irrigation landscaping), and to evaluate the effect of any such programs, it is necessary to establish a baseline of exterior water use.

RESPONSIBLE AGENCIES

Any such program would require water utility participation, to install and maintain metering equipment. The program would also need a variety of volunteer sites: both households and commercial sites could be eligible to participate, but data from each type of site should be analyzed separately. Overall administration of the program could be undertaken by a water utility, research institution, or regional agency; data gathered from such a program should be aggregated for anonymity and made publicly available.

Type: Research

Strategy: Implement pilot program measuring interior and exterior household water use.

Responsible Agencies: Water utilities, research institution, CCRPC staff

Timeframe: 5 to 10 years

TIMEFRAME

Organizing a program of this complexity is a medium-term endeavor. Planning the program and recruiting participants are only the first steps. The duration of the measurement period must also be taken into consideration: a minimum of two to three years is advisable, to allow for at least a small amount of multi-year analysis. The data analysis following the measurement period will also be time-consuming.

Section 3

STRATEGIES TO HELP ACHIEVE SUSTAINABLE
LONG-TERM USE OF THE MAHOMET AQUIFER

Section 3

STRATEGIES TO HELP ACHIEVE SUSTAINABLE LONG-TERM USE OF THE MAHOMET AQUIFER

Although East-Central Illinois is relatively rich in water, it is important not to mistake an abundant resource for an unlimited resource. The Midwest enjoys a relative state of water security, especially compared to parts of the western United States, and water quality threats are generally thought to be a greater danger than drastic shortages in water quantity. However, rather than taking the region's relative water security as an excuse to be complacent, the better course of action is to plan ahead and conserve in moderation, in part to achieve any possible water savings but also to develop an ethic of conservation and environmental savvy.

Related to but distinct from reducing water use is reducing water waste. Reducing water use involves making conscious changes to both individual habits and institutional policies, to reduce the amount of water that is needed for everyday residential use and for institutional operations. Water waste is water that is lost, either through leaky fixtures and wasteful consumer behaviors, or as unaccounted-for flow at the utility scale. In addition to the strategies geared toward reducing the amount of water that is put to a purpose in households and organizations in the region, there also exists the need to reduce the amount of water that is lost without having been used. By addressing these two needs, there can be progress toward achieving sustainable long-term use of the Mahomet Aquifer.

STRATEGY 3.1

DEVELOP OR PROMOTE DEVELOPMENT OF LANDSCAPING AND IRRIGATION GUIDELINES.

STRATEGY 3.2

PROMOTE APPROPRIATE USE OF HIGH-EFFICIENCY FIXTURES IN BOTH NEW CONSTRUCTION AND RETROFITS.

STRATEGY 3.3

IMPLEMENT WATER USE CONTROLS FOR NEW DEVELOPMENT ON SITES ABOVE A CERTAIN SIZE OR USING ABOVE A CERTAIN AMOUNT OF WATER.

STRATEGY 3.4

DECREASE THE WATER SYSTEM LOSS TO BELOW 10%.

STRATEGY 3.5

EXAMINE FEASIBILITY OF POLICY REVISIONS THAT WOULD ALLOW GREYWATER REUSE.

Strategy 3.1

DEVELOP OR PROMOTE DEVELOPMENT OF LANDSCAPING DESIGN AND IRRIGATION GUIDELINES BY A PARTNER AGENCY AND/OR OTHER STAKEHOLDER GROUPS; PROMOTE IMPLEMENTATION OF THESE GUIDELINES.

ACTION:

PROMOTE WATER EFFICIENT LANDSCAPES FOR INSTITUTIONAL, COMMERCIAL, AND RESIDENTIAL LANDSCAPES IN CHAMPAIGN COUNTY VIA BEST MANAGEMENT PRACTICES RELATED TO PLANT CHOICE, SOIL TREATMENT, IRRIGATION SYSTEMS, AND INSECTICIDE USE.

Landscaping with native trees, shrubs, and other plants can help reduce the amount of water dedicated to outdoor uses. Plants native to East-Central Illinois are generally adapted to the region's climate. They get most or all of the moisture they need from rainfall, and need less watering than non-native plants⁴². The benefits of landscaping with native plants go beyond the water system. Some provide pollen and nectar for pollinators, others food for the butterfly larvae and other insects that birds use as food for their young. This is especially important because most plants from other continents are not palatable to the local insect herbivores that birds use as food. While these general wildlife habitat benefits are incidental to reducing water use, they contribute to food security and overall quality of life.

Multiple local resources on the subject of native plants and their water conservation benefits already exist. The Master Naturalists of East Central Illinois and University of Illinois Master Gardeners programs have produced the pamphlet "Invasive Plants of East Central Illinois," which includes recommended

actions and native alternatives to invasive plants. The EPA's WaterSense program provides even more information. So in the case of this strategy, the focus should not be on producing another publication, but on helping to get the practice of landscaping with more resilient and less labor- and water-intensive plants more widely adopted.

Soil quality and quantity also impact water use. In many newer developments, much of the topsoil is removed during construction and only a fraction returned. This thin layer of soil does not retain as much moisture as natural topsoil, which leads to more lawn irrigation. Another issue is soil compaction, which reduces the amount of water soaking into the ground and thereby increases runoff. Many beneficial insects aerate and turn over soil, making it more permeable and increasing water retention. The practice of regularly treating a lawn with insecticide as a preventative measure, instead of on an as-needed basis, kills these beneficial insects. Lawn irrigation systems are often controlled by timers and run on a schedule; they do not take into account recent rainfall; consideration should be given to encouraging the use of moisture-sensing irrigation systems.

Outreach efforts on all of these topics could be directed at developers, landlords and rental management companies, businesses and institutions that undertake large-scale landscaping projects,

Type: Policy

Strategy: Develop or promote development of landscaping and irrigation guidelines.

Responsible Agencies: Water resources coordinator, municipal or county staff, research institutions, other stakeholder groups

Timeframe: 5 to 10 years

and homeowners and neighborhood associations, in order to reach larger groups and impact larger areas. Agencies could partner with local experts in order to connect interested homeowners with experts who can give landscaping advice. Staff of partner organizations, with advice from local experts, could make information on native plants, soil care, and watering practices available and may be able to provide seed kits for distribution or sale at community events.

⁴² US EPA, "Water-Smart Landscapes Start with WaterSense," EPA WaterSense Program, July 2013, 5.

Strategy 3.1

DEVELOP OR PROMOTE DEVELOPMENT OF LANDSCAPING DESIGN AND IRRIGATION GUIDELINES BY A PARTNER AGENCY AND/OR OTHER STAKEHOLDER GROUPS; PROMOTE IMPLEMENTATION OF THESE GUIDELINES (CONTINUED).

BACKGROUND

According to an American Water Works Association Research Foundation statistic, cited in a U.S. EPA report, 30% of water used by American households nation-wide is used outside⁴³, mainly for landscaping. If Strategy 2.2 is implemented, the study discussed therein would provide local data on this topic. Outdoor water use will vary from household to household, but is likely to make up a significant portion of overall water use. Some factors that influence the use of landscape irrigation water include the types of plants selected, the depth and quality of topsoil, and soil permeability.

The benefits of landscaping with native plants, including trees, shrubs, and grasses, go beyond the water system. Some native plants can be particularly pollinator-friendly, and can provide wildlife habitat to local and migrating species⁴⁴; though not directly related to water issues, this is a valuable ancillary benefit.



Photo: Urbana Free Library, Urbana Free Library Garden, Urbana, Illinois, Champaign County Regional Planning Commission

RESPONSIBLE AGENCIES

Partnerships will be critical to implementing this strategy. The water resources coordinator will work to connect with organizations and agencies already working on landscaping and irrigation guidelines, as well as local experts and residents. A collaborative effort is needed to develop guidelines for such issues as soil retention at construction sites and best management practices for pesticide use.

TIMEFRAME

This item will require ongoing effort, but initial tasks could be implemented in a short- or medium-term timeframe.

RESOURCES

More information on water-efficient landscaping can be found online at the WaterSense website, <http://www3.epa.gov/watersense/index.html>, a U.S. EPA program, and at the University of Illinois Extension.

⁴³ US EPA, "Water-Smart Landscapes Start with WaterSense," EPA WaterSense Program, July 2013, 2.

⁴⁴ CMAP, Illinois-Indiana Sea Grant, Lake Michigan Coastal Program, Lawn to Lake, Northwestern Indiana Regional Planning Commission, Purdue University Calumet, Save the Dunes & University of Illinois Extension, "Sustainable Lawn & Landscape Practices for Communities: Lawn to Lake Guidebook for Illinois & Indiana," 2012, 12.

Strategy 3.2

PROMOTE APPROPRIATE USE OF HIGH-EFFICIENCY FIXTURES IN BOTH NEW CONSTRUCTION AND RETROFITS.

ACTION:
PROMOTE THE APPROPRIATE USE OF HIGH-EFFICIENCY FIXTURES IN BOTH NEW CONSTRUCTION AND RETROFITS AND IN BOTH RESIDENTIAL AND INSTITUTIONAL BUILDINGS.

There are numerous ways that this strategy could be implemented. A municipality could partner with a water or sanitary utility to offer rebates on home water audits, as the City of Urbana and Ameren Illinois did to offer energy audits. There have been local bicycle events that offer free bike lights and reflectors: as part of a larger event, partner agencies could fund a giveaway of faucet aerators or low-flow showerheads. Water utilities could include mailers in water bills offering water-saving suggestions for a variety of budgets.

BACKGROUND

There are many opportunities to save water and water costs by replacing existing fixtures and appliances with high-efficiency ones, including faucet aerators, low-flow toilets, and more efficient washing machines and dishwashers. While there are up-front replacement costs ranging from the relatively inexpensive to the major, the costs saved in water and energy use over time can recover, and eventually save, money for the resident.

If the water savings from these changes add up to savings for the household over the course of months and years, consider how the water savings of many households would add up over the course of those months and years. Beyond the level of the individual household, there is potential for water savings in public, institutional, and even some commercial buildings. The cumulative effect of retrofitting existing construction and making sustainable choices in new construction will have a positive impact on our water system.

RESPONSIBLE AGENCIES

This strategy can involve efforts from many different stakeholders, including municipalities, educational institutions, utilities, local businesses, tenants’ and homeowners’ groups, environmental nonprofits, and more. There are many opportunities for interagency partnerships in pursuit of this strategy.

TIMEFRAME

This will be an ongoing effort.

RESOURCES

Resources on water and energy savings through updating fixtures and appliances can be found online at www.epa.gov, and at www.energy.gov.

Type: Policy

Strategy: Promote appropriate use of high-efficiency fixtures in both new construction and retrofits.

Responsible Agencies: All interested stakeholders

Timeframe: Ongoing

Strategy 3.3

IMPLEMENT WATER USE CONTROLS FOR NEW DEVELOPMENT ON SITES ABOVE A CERTAIN SIZE OR USING ABOVE A CERTAIN AMOUNT OF WATER.

ACTION:

EVALUATE POTENTIAL WATER USE GUIDELINES FOR FUTURE DEVELOPMENT AT THE MUNICIPALITY LEVEL; DETERMINE WHICH, IF ANY, SUIT THE COMMUNITY'S VISION AND GUIDING PRINCIPLES; AND IMPLEMENT THEN WITHIN FIVE TO 10 YEARS OF THE PUBLICATION OF THIS REPORT.

The implementation of this strategy will vary from jurisdiction to jurisdiction. Some municipalities, like the City of Champaign and City of Urbana, have existing plans related to water system issues: Champaign Growing Greener and the Sustainable Water Management Plan, respectively. Implementation of this strategy for these municipalities could involve continuing to implement and update those plans. For communities without existing plans that address water system issues, and that may not have the technical capacity or the funding to prepare a full plan, a focus group could be formed to undertake a smaller-scale visioning and planning process, to identify water guidelines ideas that are a good fit for their area. A similar focus group could be formed for Champaign County as a whole, if there was interest in pursuing water use controls for new development in unincorporated areas of the county. The Champaign County Regional Planning Commission may be able to provide some technical assistance in such cases.

BACKGROUND

Promoting and incentivizing changing water use habits in existing development is a viable strategy. Another strategy to consider is the development and implementation of water use and other water system guidelines for new development, whether it is residential, industrial, or commercial. There are a number of ways that this could be accomplished (e.g., through subdivision ordinances and building codes, as part of economic development strategies), and, obviously, not every technique will be suitable or applicable for every case. Furthermore, not every technique will be appealing to every municipality in Champaign County.

Changing existing habits is difficult. Similarly, retrofitting an old building to be more water- and energy-efficient is complicated, often expensive, and sometimes just not feasible. New development is an opportunity to set guidelines for responsible water use at the outset of a project.

RESPONSIBLE AGENCIES

This strategy is flexible, and any resulting action will be tailored to its municipality. If interested, the governments and staff of each municipality would implement this strategy, involving their residents and stakeholders.

Type: Policy

Strategy: Implement water use controls for new development on sites above a certain size or using above a certain amount of water.

Responsible Agencies: Municipal staff and elected officials

Timeframe: Over 10 years

TIMEFRAME

This is a long-term strategy. It will take a significant amount of time and discussion for municipalities to evaluate, select, and implement any water use controls for new development. An opportune time to begin implementing this strategy would be during a comprehensive plan update, when a municipality is already considering its vision and values.

RESOURCES

The plans mentioned, Champaign Growing Greener and the Sustainable Water Management Plan, can be found on the City of Champaign and City of Urbana websites, respectively

Strategy 3.4 DECREASE THE WATER SYSTEM LOSS TO BELOW 10 PERCENT.

ACTION:

PARTNER WITH MULTIPLE STAKEHOLDER GROUPS TO GATHER BENCHMARK DATA AND ESTABLISH REDUCTION GOALS.

In order to determine the scale of this effort, benchmark data is needed: to know how far we have to go to reduce water system loss to below 10 percent, we need to know what Champaign County's water loss percentage is now. Once this data is obtained, county and municipal governments may wish to adopt a resolution confirming the goal of reducing water system loss to under 10 percent, and possibly outlining interim goals (e.g., 2 percent per year, a 5 percent reduction by 2020, etc.). Finding and fixing leaks will require both expertise and funding: the local water utility and local governments will both need to be involved in planning and implementing repairs.

BACKGROUND

Despite all efforts to conserve water by changing water use behaviors and improving water use efficiency, some water is lost due to leaks in aging pipes or faulty metering. According to white papers published by the American Water Works Company, non-revenue water levels are at roughly 20% in the United States⁴⁵.

With lost water, there is not a question of water use efficiency or good water use habits. Water lost through leaks is put to no purpose and provides no benefit: it is truly wasted. To decrease the amount of water that goes to waste below 10 percent, and maintain it, would be a significant savings in water each year. To prioritize repairing existing leaks, then repairing new leaks as they occur, would also set a beneficial precedent of devoting funds and time to ongoing infrastructure maintenance.

RESPONSIBLE AGENCIES

This strategy will require a partnership of multiple stakeholder groups. Water utility staff would provide the initial benchmark data. Municipal and county governments would be responsible for adopting a goal-setting under-10-percent resolution. Government and water utility groups, as well as other interested stakeholder groups, would collaborate to fund and implement efforts to find and repair leaks in the county.

Type: Policy

Strategy: Decrease the water system loss to below 10%.

Responsible Agencies: Water utilities, municipal and county governments

Timeframe: Over 10 years

TIMEFRAME

Not only are there several steps to initiating the process and several stakeholders involved, time and financial constraints mean that efforts toward this goal will have to take place over the course of years. Furthermore, as existing leaks are fixed, new leaks will appear. Thus, this will be a long-term and ongoing process.

RESOURCES

There are multiple reports, infographics, and white papers published by the American Water Works Company on the topic of water loss and non-revenue water. They can be found on their corporate responsibility website, at <http://www.amwater.com/corporate-responsibility/>.

⁴⁵ American Water Works Company, Inc., "Creating Operational Efficiencies in the Water Industry," white paper, 2014, 4.

Strategy 3.5 EXAMINE FEASIBILITY OF POLICY REVISIONS THAT WOULD ALLOW GREYWATER REUSE.

ACTION:

EVALUATE THE FEASIBILITY OF POLICY REVISIONS THAT WOULD ALLOW GREYWATER REUSE IN ILLINOIS.

This strategy will require research on the following topics: the Illinois Plumbing Code and the specific section pertaining to greywater; the enabling or prohibiting legislation pertaining to greywater in effect in other states; and the circumstances of previous changes to the Illinois Plumbing Code. Understanding these factors will shed some light on whether a policy change in regards to greywater reuse in Illinois is likely to occur.

BACKGROUND

The term “greywater” refers to household wastewater from such sources as sinks, showers, washing machines, and dishwashers⁴⁶. This wastewater is usually only mildly dirty or contaminated, and has potential for reuse for non-potable uses such as landscape irrigation⁴⁷. Greywater reuse systems that are connected to the public water supply fall under the Illinois Plumbing Code and require state approval.⁴⁸

Greywater reuse is not practical for every context. A single-family household is unlikely to produce enough greywater to meet their non-potable water needs. Reusing greywater from sinks may be achievable manually, but reusing greywater from showers or appliances would require a large investment in plumbing reconfiguration. However, there are contexts where greywater reuse could be practical; for example, at an employment center or an institution like a college or university, which has both a large population for at least part of each day and a large land area and building footprint, the cost savings of reusing some greywater for non-potable uses, rather than purchasing potable water for those uses, could be significant.

RESPONSIBLE AGENCIES

As this strategy is limited to current policy research, it could be undertaken by a representative of any interested stakeholder organization.

TIMEFRAME

This strategy will require some research, but as the goal is to evaluate the feasibility of policy revisions, not to promote and achieve policy revisions, this is a short-term item.

Type: Policy

Strategy: Examine feasibility of policy revisions that would allow greywater reuse.

Responsible Agencies: Any interested stakeholders

Timeframe: 0 to 5 years

RESOURCES

The Illinois Plumbing Code can be found online in the General Assembly’s Illinois Administrative Code database, at <http://www.ilga.gov/commission/jcar/admincode/077/07700890sections.html>.

⁴⁶ Mason, S.L. “Going Green May Mean Going Grey – Using greywater in the landscape,” *University of Illinois Extension, The Homeowners Column*, <http://web.extension.illinois.edu/cfiv/homeowners/110812.html>.

⁴⁷ Ibid.

⁴⁸ Public Building Commission of Chicago, “Water Reuse Handbook,” August 2011, 5.

Section 4

STRATEGIES TO HELP PREVENT GROUNDWATER POLLUTION

Section 4

STRATEGIES TO HELP PREVENT GROUNDWATER POLLUTION

Preventing groundwater pollution from both point and non-point sources is integral to ensuring a safe and sustainable water supply for future use.

Non-point source pollution is now one of the largest contributors of contaminants our water system, according to the U.S. EPA⁴⁹. A non-point source is one that does not have a specific point of discharge, but rather is carried by stormwater runoff from many sources or areas into the water system⁵⁰. Runoff is the portion of precipitation that flows over the land surface, picking up pollutants on its way to nearby streams and storm sewers, rather than infiltrating into the soil⁵¹. Poorly managed runoff can carry pollutants directly into the water system through storm drains. There are a multitude of possible pollutants: street litter, road salts, fertilizers and pesticides, even automotive fluids that leak from cars and fall onto the ground⁵². Poorly managed runoff can also exacerbate urban flooding, which occurs when an amount of precipitation beyond what the drainage and stormwater systems can manage accumulates on streets and lawns and in basements⁵³.

Point source pollution, or pollution discharged from a single source⁵⁴, is another damaging and preventable detriment to the water system, and industrial discharges can still be made cleaner and less environmentally damaging. The easiest and most inexpensive clean-ups are those that do not have to happen, because the water system was not polluted in the first place. By mitigating industrial discharge even further, and by ensuring that industrial discharge that does occur is as clean and safe as possible, efforts for prevention can take the place of some, though not all, efforts for restoration.

STRATEGY 4.1

DEVELOP PROGRAMS THAT PROMOTE THE AVOIDANCE OF PURCHASING OF PRODUCTS THAT CAUSE OR CONTRIBUTE TO HARMFUL RUNOFF, AND THE SUBSTITUTION OF THEIR SAFER ALTERNATIVES.

STRATEGY 4.2

DRAFT, PROMOTE, AND IMPLEMENT MODEL RESOLUTION OUTLINING BEST MANAGEMENT PRACTICES IN AVOIDING HARMFUL RUNOFF FROM ROAD SALT APPLICATION.

STRATEGY 4.3

DEVELOP NEW OR PUBLICIZE EXISTING GUIDELINES ON APPROPRIATE, RESPONSIVE USE OF FERTILIZERS AND PESTICIDES IN URBAN AND RURAL CONTEXTS.

STRATEGY 4.4

PROMOTE AND ASSIST, WHERE POSSIBLE, EFFORTS TO LOCATE AND SEAL ABANDONED WELLS.

⁴⁹ "What is Nonpoint Source? Polluted Runoff: Nonpoint Source Pollution," US EPA, last modified January 5, 2016, <https://www.epa.gov/polluted-runoff-nonpoint-source-pollution/what-nonpoint-source>.

⁵⁰ Ibid.

⁵¹ Rasmussen, T.J. & Schmidt, H.C., "Stormwater Runoff: What it is and why it is important in Johnson County, Kansas," U.S. Geological Survey Fact Sheet 2009-3103, 2009, 1.

⁵² US EPA, "Protecting Water Quality from Urban Runoff," EPA 841-F-03-003, February 2003, 2.

⁵³ Center for Neighborhood Technology, "The Prevalence and Cost of Urban Flooding: A Case Study of Cook County, IL," 2014, 2.

⁵⁴ "Water Resources of the United States: Water Basics Glossary," U.S. Geological Survey, last modified June 17, 2013, http://water.usgs.gov/water-basics_glossary.html.

Strategy 4.1

DEVELOP PROGRAMS THAT PROMOTE THE AVOIDANCE OF PURCHASING PRODUCTS THAT CAUSE OR CONTRIBUTE TO HARMFUL RUNOFF, AND THE SUBSTITUTION OF THEIR SAFER ALTERNATIVES.

ACTION:

DEVELOP A LIST OF PRODUCTS OR PRODUCT COMPONENTS KNOWN TO BE HARMFUL THAT HAVE SAFER ALTERNATIVES. IF FUNDING ALLOWS, OFFER REBATES ON ENVIRONMENTALLY SAFE PRODUCTS. ALTERNATIVELY, PROMOTE ADOPTION OF A PURCHASING RESOLUTION TO PRIMARILY PURCHASE AND USE PRODUCTS ALREADY RECOGNIZED BY AN EXISTING PROGRAM OR ENVIRONMENTAL DESIGNATIONS.

A purchasing program could be developed for local agencies and businesses, inviting them to pledge to avoid environmentally unsafe products. There should be recognition of some kind involved in this program, such as a seal or sticker for businesses to display and show their commitment to being environmentally friendly. If there is the will and capacity to do so, public agencies could consider implementing an internal purchasing resolution.

Programs that designate or recognize environmentally friendly products already exist; this strategy could also be undertaken by researching the criteria of each program and drafting a purchasing resolution to primarily purchase products with the designation of a chosen program.

A more restrictive option would be implementing a ban on a specific product or product component. If there is sufficient interest at the county level in

pursuing this strategy, staff at the Champaign County Regional Planning Commission could research and draft the text of a model ordinance. If there is interest at the municipal or county level, staff at the interested municipality or county could undertake the research and drafting process.

BACKGROUND

Certain products in widespread use are known to cause or contribute to harmful runoff. For example, research has shown that runoff from coal-tar based pavement sealcoat can pollute surface water, but a safer alternative, asphalt-based pavement sealcoat, is also already in use⁵⁵. For cases such as these, where a product is confirmed to be environmentally unsafe and there is an available alternative at a comparable cost, programs at either the county or municipal level could be developed to promote the purchasing of the alternative product.

Any list of products that contribute to harmful runoff will change and grow. Some products may be found to be less harmful than initially thought, while others in use for decades may be discovered to be seriously damaging, but only in combination with another material or under a certain set of circumstances. Because our understanding of our environment and how it is impacted by different products will change, local programs and policy must also be able to change in response.

Type: Policy

Strategy: Develop programs that promote the avoidance of purchasing products that cause or contribute to harmful runoff, and the substitution of their safer alternatives.

Responsible Agencies: Municipal, county and/or CCRPC staff

Timeframe: 5 to 10 years

⁵⁵ Mahler, B.J., Van Metre, P.C., & Foreman, W.T., "Concentrations of polycyclic aromatic hydrocarbons (PAHs) and azaarenes in runoff from coal-tar and asphalt-sealcoated pavement," *Environmental Pollution* 188 (2014): 81.

Strategy 4.1

DEVELOP PROGRAMS THAT PROMOTE THE AVOIDANCE OF PURCHASING PRODUCTS THAT CAUSE OR CONTRIBUTE TO HARMFUL RUNOFF, AND THE SUBSTITUTION OF THEIR SAFER ALTERNATIVES (CONTINUED).

RESPONSIBLE AGENCIES

Researching, drafting, and presenting a model ordinance or resolution could be done by CCRPC, county, and/or municipal staff, depending on local interest in this strategy. Researching the criteria of existing green product designations could also be done by CCRPC, county, and/or municipal staff. Keeping informed about product news would be something that every stakeholder can be involved in. Current product research would be a key piece of this strategy, and would come from universities and institutions both within and outside of our region. Compilation and distribution of a safe products list would be done by the water resources coordinator, while a regional agency or existing local business organization could develop and administrate a purchasing pledge program.

TIMEFRAME

Given the amount of policy and product research required as the first steps of this strategy, it is categorized as a medium-term item.

Strategy 4.2

DRAFT, PROMOTE, AND IMPLEMENT MORE RESOLUTION OUTLINING BEST MANAGEMENT PRACTICES IN AVOIDING HARMFUL RUNOFF FROM ROAD SALT APPLICATION.

ACTION:

RESEARCH, DRAFT, AND PRESENT A MODEL RESOLUTION ADVOCATING FOR ROAD SALT BEST MANAGEMENT PRACTICES.

The first step toward implementing this strategy would be performing a significant amount of research on what the current road salt application practices are throughout the county, if and to what degree any of Champaign County's waterways are impaired specifically by road salts, and what best management practices in use in other parts of the country will be applicable to East-Central Illinois. Some products, including beet molasses and cheese brine, have been used either to replace or supplement road salt, thereby decreasing the total amount of road salt used⁵⁶. Additional research should be done to determine whether these or other alternatives may be applicable for Champaign County.

Once research has been completed, by municipal, county, or CCRPC staff and in consultation with local engineers and highway jurisdictions responsible for road salt application, it can be used to draft a model resolution to be presented to local governments for consideration.

BACKGROUND

The use of deicing salt on roads and sidewalks is a critical part of maintaining safe transportation infrastructure during the winter months; however, when used in large amounts, it can also present serious water quality hazards⁵⁷.

Road salt contamination can be detrimental to the water system in a variety of ways. It poses a threat to aquatic ecosystems, and can corrode transportation infrastructure⁵⁸. Roadside plants and soils can also be harmed by run-off carrying road salt⁵⁹. However, in the Midwestern climate, the use of road salt cannot be avoided. Because road salt application is integral to resident safety, ubiquitous for part of every year, and harmful to the environment when done to excess or under the wrong conditions, it is important to ensure that all actions possible are taken to mitigate road salt's detrimental effects.

Type: Policy

Strategy: Draft, promote, and implement more resolution outlining best management practices in avoiding harmful runoff from road salt application.

Responsible Agencies: Municipal, county and/or CCRPC staff

Timeframe: 0 to 5 years

⁵⁶ Post, Rachael, "The alternatives to salt for battling ice: cheese, beets, and ash." *The Guardian* (U.S. edition), March 3, 2014, <https://www.theguardian.com/sustainable-business/alternatives-salt-battling-ice-cheese-beets-ash>.

⁵⁷ "Road salt and water quality," Minnesota Pollution Control Agency, accessed January 21, 2016, <https://www.pca.state.mn.us/water/road-salt-and-water-quality>.

⁵⁸ "The 411 on Road Salt," Maryland Department of the Environment, accessed January 21, 2016, <http://www.mde.state.md.us/programs/Marylander/Pages/roadSalt.aspx>.

⁵⁹ Gould, A., "Impact of Road Salt on Adjacent Vegetation," *Plant & Pest Advisory, Rutgers Cooperative Extension*, posted March 20, 2013, <http://plant-pest-advisory.rutgers.edu/impact-of-road-salt-on-adjacent-vegetation/>.

Strategy 4.2

DRAFT, PROMOTE, AND IMPLEMENT MORE RESOLUTION OUTLINING BEST MANAGEMENT PRACTICES IN AVOIDING HARMFUL RUNOFF FROM ROAD SALT APPLICATION (CONTINUED).

RESPONSIBLE AGENCIES

Staff either at CCRPC or a partner agency would be responsible for the research stages of this strategy, and would present the research to county, city, and village boards and townships for discussion and possible implementation. Agencies responsible for deicing practices, such as highway jurisdictions, must be included in developing any best management practices related to this strategy. The MS4 jurisdictions in Champaign County (listed in Strategy 6.7) will also be important partner agencies for this strategy.

TIMEFRAME

This strategy is categorized as a short-term item. If selected as a priority by stakeholder agencies, the research steps of implementing this strategy could take place within a few years of the publication of this report.

RESOURCES

Information about the environmental impacts of excessive road salt application can be found online in resources released by several state agencies, including the Minnesota Pollution Control Agency and the Maryland Department of the Environment, as well as academic and extension sources.



Photo: Salted sidewalk outside of Leal School, Urbana, Illinois, Champaign County Regional Planning Commission

Strategy 4.3

DEVELOP NEW OR PUBLICIZE EXISTING GUIDELINES ON APPROPRIATE, RESPONSIVE USE OF FERTILIZERS AND PESTICIDES IN URBAN AND RURAL CONTEXTS.

ACTION:

INVENTORY AND PUBLICIZE EXISTING GUIDELINES FOR RESPONSIBLE FERTILIZER AND PESTICIDE USE. IF NO GUIDELINES EXIST AT THE LOCAL LEVEL, DEVELOP AND PUBLICIZE GUIDELINES TAILORED TO THE NEEDS AND CIRCUMSTANCES OF CHAMPAIGN COUNTY.

If partner agencies have already developed resources, they could be utilized in a number of ways depending on their target audience. For example, materials covering residential use could be distributed to homeowners and landlords as mailers or at community events. In implementing this strategy, branding should not be discounted: a local, specific rating scale could be developed to make materials related to this strategy both recognizable and relatable. Resources such as model resolutions could be developed and shared throughout the county and considered for adoption.

BACKGROUND

When applied improperly or to excess, fertilizers and pesticides can contribute to harmful runoff and non-point source pollution⁶⁰. The application of pesticides preemptively, to prevent pest problems, contributes to these detrimental effects; pesticides should be applied in response to a pest problem, in

isolated spots where the problem occurs, rather than on a wider scale to prevent such a problem.

Like road salt (discussed in Strategy 4.2), the use of fertilizers and pesticides is so widespread that its detrimental effects to the environment can quickly accumulate and become serious. Following best practices for fertilizer and pesticide application can help homeowners, landscapers, farmers, and developers mitigate their effect on the environment.

RESPONSIBLE AGENCIES

Publicizing existing guidelines would occur in partnership between the agency that originally developed the resource and the water resources coordinator. Developing new resources, including the decision of the most effective type of outreach materials to develop, could be undertaken by partner agency and regional agency staff as well as the water resources coordinator.

TIMEFRAME

Some progress has already been made on this item in the agricultural community. In 1979, existing state regulations were consolidated into the Illinois Pesticide Act⁶¹. More recently, also at the state level, the Illinois Nutrient Loss Reduction Strategy was released

Type: Policy

Strategy: Develop new or publicize existing guidelines on appropriate, responsive use of fertilizers and pesticides in urban and rural contexts.

Responsible Agencies: Municipal, county and/or CCRPC staff

Timeframe: Ongoing

in 2015, and working groups including, but not limited to, the Nutrient Science Advisory Committee and the Agricultural Water Quality Partnership Forum have been convened for the implementation of this strategy⁶². Moving forward, implementation will likely be ongoing.

RESOURCES

More information on fertilizer and pesticide best practices and alternatives can be found online at the Illinois Department of Agriculture website, Illinois EPA website, and US EPA website.

⁶⁰ "Crops Information," Illinois Environmental Protection Agency, copyright 2015, <http://www.epa.illinois.gov/topics/agriculture/crops/index>.

⁶¹ "Pesticide Use and Regulation," Illinois Department of Agriculture, copyright 2014, <https://www.agr.state.il.us/pesticide-use-regulation>.

⁶² "Illinois Nutrient Loss Reduction Strategy Implementation," Illinois Environmental Protection Agency, copyright 2015, <http://www.epa.illinois.gov/topics/water-quality/watershed-management/excess-nutrients/nutrient-loss-reduction-strategy/index>.

Strategy 4.4 PROMOTE AND ASSIST, WHERE POSSIBLE, EFFORTS TO LOCATE AND SEAL ABANDONED WELLS.

ACTION:

PROMOTE, SUPPORT, AND, WHEN FEASIBLE, CONTRIBUTE FUNDING TO LOCAL PROGRAMS THAT LOCATE AND SEAL ABANDONED WELLS.

One major challenge in sealing abandoned wells is that, in many cases, the locations of abandoned wells are unknown. However, there exist methods, tools, and technologies that facilitate locating abandoned wells. In Minnesota, beginning in 1989, a program was undertaken to locate and seal abandoned wells on state land; with funding allocated beginning in 1995, the program was completed by 2007 with nearly 1400 abandoned well sealed⁶³. Given funding, it is possible to accomplish a project of this type on a large scale. If it is not feasible to fund and implement a well-sealing program on such a large scale, a smaller-scale program could be funded at the county level, offering incentives for homeowners to locate abandoned wells on their property and have them sealed.

BACKGROUND

Abandoned or improperly sealed wells pose a risk to water quality and present other safety hazards⁶⁴. Abandoned wells that are not properly sealed increase the risk of groundwater contamination. In addition to the water quality risks of unsealed, unmarked, abandoned wells, it is also possible for people and animals to fall into them⁶⁵.

RESPONSIBLE AGENCIES

The Champaign County Soil & Water Conservation District's Partners for Conservation Program, according to the CCSWD website, seals "a limited number of abandoned wells each year."⁶⁶ Rather than creating a redundant program, this strategy could be implemented by partnering with the Champaign County Soil & Water Conservation District to expand the existing program and increase the number of abandoned wells that can be sealed each year.

TIMEFRAME

Locating and sealing abandoned wells is a complex and expensive process. The necessity of finding sufficient funding may mean that this strategy will be a long-term one, with initial implementation possibly not taking place until several years after the publication of this report.

Type: Policy

Strategy: Promote and assist efforts to locate and seal abandoned wells.

Responsible Agencies: Other partner agencies

Timeframe: Over 10 years

RESOURCES

More information on the risks of abandoned wells can be found on the websites of the Illinois EPA, the Illinois Department of Public Health, and the Champaign-Urbana Public Health District. For information on the Partners for Conservation Program, contact the Champaign County Soil & Water Conservation District. See the Illinois Water Well Construction Code for more information on abandoned wells and the state regulations that pertain to them.

⁶³ Minnesota Department of Natural Resources, Department of Natural Resources Waters, "Final Status Report of Well Sealing on State Land," 2007, 3, 6.

⁶⁴ Illinois Department of Public Health, "Environmental Health Fact Sheet: Abandoned Wells," updated 2010, <http://www.idph.state.il.us/envhealth/factsheets/abndwlsFS.htm>.

⁶⁵ Ibid.

⁶⁶ Champaign County Soil & Water Conservation District, "Champaign County Soil & Water Conservation Programs," copyright 2012, <http://www.ccswd.com/programs/>.

Section 5

STRATEGIES TO ENCOURAGE REGIONAL COOPERATION
IN PROTECTION OF THE MAHOMET AQUIFER

Section 5

STRATEGIES TO ENCOURAGE REGIONAL COOPERATION IN PROTECTION OF THE MAHOMET AQUIFER

The Mahomet Aquifer is a regional resource, and region-wide effort will be needed to fully protect its water quality and water quantity.

The movement and flow of water through the aquifer could allow contaminants to spread far from their original entry point, potentially impacting residents and communities across East-Central Illinois. In addition to water quality concerns, the quantity and flow of water across the aquifer is interconnected: the Champaign cone of depression shows that it is possible for localized water use (in this case, large-scale pumping) to have an effect on aquifer flow in the wider region.

Regional issues require coordinated, regional efforts and solutions not only to address the full scope of the issue, but also to achieve organizational capacity benefits. Budgetary constraints are inescapable, and no staff of any organization have unlimited time or expertise. By forming local or regional partnerships, organizations can share costs and expertise in order to achieve greater results than would have been possible by working individually.

STRATEGY 5.1

CONTINUE THE ANNUAL RAIN BARREL AND COMPOST BIN SALE HELD IN THE CITY OF URBANA. EXPAND VIA GROUP PARTNERSHIPS, AS FEASIBLE, TO INCLUDE ADDITIONAL DATES AND/OR SITES.

STRATEGY 5.2

PUBLICIZE SUSTAINABLE WATER USE SUCCESS STORIES FROM ALL SECTORS.

Strategy 5.1

CONTINUE THE ANNUAL RAIN BARREL AND COMPOST BIN SALE HELD IN THE CITY OF URBANA. EXPAND VIA GROUP PARTNERSHIPS, AS FEASIBLE, TO INCLUDE ADDITIONAL DATES AND/OR SITES.

ACTION:

CONTINUE AND, IF POSSIBLE, EXPAND THE RAIN BARREL AND COMPOST BIN SALE TO INCLUDE OTHER DATES AND SITES WITHIN THE COUNTY.

The goal of this strategy is to increase rain barrel use by Champaign County residents. Likely, the best way to reach the most additional residents would be to add sale sites in other parts of the county, to make the sale more conveniently accessible to residents outside of the immediate Champaign-Urbana area. Sales should take place at similar times of day and within the same month. The sales could take place in separate locations on the same day, or on different days; there are operational advantages and disadvantages to both options. Currently, the operation of the sale is bid out to a vendor. The vendor transports the stock to the site and provides the labor to run the sale.

BACKGROUND

The City of Urbana, in partnership with the City of Champaign and the University of Illinois Extension, has held an annual rain barrel sale for the last three consecutive years. In addition to rain barrels, the sale also offers kitchen scrap pails and compost bins, aerators, and thermometers. Rebates are offered to residents of Champaign and Urbana.

Installation and use of rain barrels have positive impacts on both water quality and water quantity: rain barrels decrease stormwater runoff, and collected rainwater can be used to irrigate plants and lawns⁶⁷. Each year of the sale, roughly 500 rain barrels have been sold; this is a consistent figure, showing no signs as yet of market saturation.

RESPONSIBLE AGENCIES

Staff at the cities of Champaign and Urbana already involved in organizing the event, and staff at CCRPC and any interested villages in Champaign County, could be involved in organizing any expansion of the event, but that the operation of the sale should continue to be bid out to a third-party vendor. If this strategy is implemented, either additional bids for additional sale days should be posted, or the parameters of the existing bid should be expanded so that it calls for a multi-site event.

Type: Outreach

Strategy: Continue the annual rain barrel and compost bin sale held in the city of Urbana. Expand via group partnerships, as feasible, to include additional dates and/or sites.

Responsible Agencies: Municipal, county and/or CCRPC staff

Timeframe: Ongoing

TIMEFRAME

As there is an established, successful method of holding this type of event in this area, it should be possible to expand the practice to additional dates and sites within a few years of the publication of this report, depending on available funding. As the rain barrel sale is an annual event, this will obviously be an ongoing effort.

RESOURCES

Information about the annual rain barrel sale can be found online, at the City of Urbana website (<http://urbanainillinois.us/>).

⁶⁷ "Soak Up the Rain: Rain Barrels," U.S. EPA, last modified August 23, 2016, <http://www.epa.gov/soakuptherain/rain-barrels>.

Strategy 5.2 PUBLICIZE SUSTAINABLE WATER USE SUCCESS STORIES FROM ALL SECTORS.

ACTION:

INCLUDE LOCAL WATER SUCCESS STORIES IN ANY OUTREACH AND EDUCATION EFFORTS.

Local water success stories could include anything from a volunteer stream clean-up to milestones reached in a research project to a description of the sustainable water use practices of a particular business or sector. Information about such events and projects could be included in other outreach avenues, such as a regular newsletter or a website.



Photo: Boneyard Creek, Urbana, Illinois, Champaign County Regional Planning Commission

BACKGROUND

Outreach and education are critical components of protecting water quality and quantity. Other strategies discuss the distribution of information about why water issues are important in our region, and how to address common issues at the household level. But it is also beneficial to include in our outreach efforts not only information on the problems, but also on positive work that is already taking place.

Including positive news in outreach efforts is beneficial in a number of ways. The scale and complexity of water issues can be daunting, and it is not difficult to get overwhelmed by the amount of work involved in addressing even one facet of water system health. Noting as part of the overall outreach efforts that some work is already being done, just like noting that significant research has been done and is ongoing, can make the tasks seem less insurmountable. On a more concrete level, publicizing water health activities can draw increased interest and increase participation, and may inspire other groups or individuals to organize or participate in the next water use success story.

Type: Outreach

Strategy: Publicize sustainable water use success stories from all sectors.

Responsible Agencies: Water resources coordinator

Timeframe: Ongoing

RESPONSIBLE AGENCIES

This strategy would be best undertaken by the water resources coordinator, and included on the central water website and in other outreach avenues. Content should be provided by all stakeholder groups, then moderated and posted by the water resources coordinator.

TIMEFRAME

This is an inherently ongoing effort. The establishment of avenues of outreach may be achievable in the short- or medium-term, but the information in them should be updated regularly.

Section 6

STRATEGIES TO ENCOURAGE REGIONAL COOPERATION IN
PROTECTIING THE QUALITY AND QUANTITY OF SURFACE WATER

Section 6

STRATEGIES TO ENCOURAGE REGIONAL COOPERATION IN PROTECTING THE QUALITY AND QUANTITY OF SURFACE WATER

The health of surface water ecosystems is critical to the health of the water system. As stated earlier, current local research is important, because it is necessary to know baseline conditions before planning and implementing appropriate actions to improve current conditions.

Streams commonly have a variety of physical conditions, ranging from rapidly flowing reaches to slow-moving pools. They also have varying depths and streamside conditions. The volume of water can change dramatically in response to floods, droughts, and human activity. The flora and fauna in and near a stream utilize the different habitats and are adapted to survive the periodic disruptions caused by drought and floods. Such factors as dissolved oxygen, temperature, and concentration of various pollutants vary with streamflow and other conditions. Changes in streamflow caused by urban and rural projects and development can impact the ecological, economic, and recreational value of a stream. In Champaign County, surface water quantity is heavily influenced by changes in discharge from water treatment plants and, to a much lesser extent, by withdrawals.

Thus, it is important to support continuing research on regional surface water and riparian ecosystems, to better understand their historic and current conditions and the ecological services they provide. This will assist in making informed decisions regarding both conservation and development; with results from research in mind, it will be possible to set and work toward goals for improving the health of those ecosystems. Like all parts of the water system, surface water ecosystems involve a wide range of stakeholders. Contributions from research, policy, and community groups will be needed in order to improve and protect stream health.

STRATEGY 6.1

PARTNER WITH EXPERTS TO DEVELOP SPECIFIC RECOMMENDATIONS FOR IMPROVING IMPAIRED STREAMS.

STRATEGY 6.2

PARTNER WITH EXPERTS TO DETERMINE TARGET STREAMFLOW CONDITIONS FOR MAJOR STREAMS.

STRATEGY 6.3

PARTNER WITH OTHER STAKEHOLDERS ON RESTORATION EFFORTS.

STRATEGY 6.4

RECOMMEND THAT MUNICIPALITIES INVENTORY THE CHANNELIZED STREAMS WITHIN THEIR BOUNDARIES.

STRATEGY 6.5

CREATE A STREAM STAKEHOLDERS INVENTORY, IDENTIFYING POTENTIAL PARTNERS FOR EACH CREEK, STREAM, AND RIVER.

STRATEGY 6.6

PRESERVE, PROTECT, AND, WHERE FEASIBLE, EXPAND EXISTING WETLAND AREAS.

STRATEGY 6.7

DRAFT GREEN INFRASTRUCTURE STANDARDS FOR PUBLIC SITES AND FACILITIES, IF NOT ALREADY PRESENT. PROMOTE IMPLEMENTATION OF THESE STANDARDS.

Section 6

STRATEGIES TO ENCOURAGE REGIONAL COOPERATION IN PROTECTING THE QUALITY AND QUANTITY OF SURFACE WATER



Photo: Second Street Detention Basin, Champaign, Illinois, Champaign County Regional Planning Commission

STRATEGY 6.8

PUBLICIZE BENEFITS OF GREEN INFRASTRUCTURE CONCERNING NOT ONLY WATER BUT OTHER ENVIRONMENTAL ISSUES.

STRATEGY 6.9

INVESTIGATE FEASIBILITY, ADVANTAGES, AND DISADVANTAGES OF USING PERMEABLE PAVEMENT.

STRATEGY 6.10

IF NOT ALREADY DONE, CONSIDER ALTERING PARTS OF LOCAL SUBDIVISION AND/OR ZONING ORDINANCES TO ENCOURAGE A SMALLER PERCENTAGE OF IMPERVIOUS SURFACES IN NEW DEVELOPMENT.

STRATEGY 6.11

DEVELOP EFFECTIVE PROGRAMS TO MINIMIZE WATER CONTAMINATION BY HHW AND PPCPS.

STRATEGY 6.12

EVALUATE OPPORTUNITIES TO PROMOTE CLEANER INDUSTRIAL DISCHARGE, INCLUDING INCREASED ON-SITE PRETREATMENT OF INDUSTRIAL DISCHARGE.

STRATEGY 6.13

EVALUATE AND PUBLICIZE RISKS TO WATER QUALITY FROM SWIMMING POOLS NOT RECEIVING APPROPRIATE CARE.

Strategy 6.1 PARTNER WITH EXPERTS TO DEVELOP SPECIFIC RECOMMENDATIONS FOR IMPROVING IMPAIRED STREAMS.

ACTION:

PUBLICIZE THE STATUS OF ASSESSED STREAMS ACCORDING TO THE ILLINOIS EPA BUREAU OF WATER'S ILLINOIS INTEGRATED WATER QUALITY REPORT AND SECTION 303(D) LIST, AND DEVELOP RECOMMENDATIONS TO IMPROVE THE QUALITY OF EACH STREAM FOUND TO BE IN POOR CONDITION.

The Long-Range Transportation Plan Report Card (LRTP), an annual document prepared and published by the Champaign Urbana Urbanized Area Transportation Study (CUUATS) that tracks progress toward the goals set forth in the LRTP, includes the status of all assessed streams within the urbanized area. This document could be linked from a central water website. The central water website could also include links to the report and maps, information on the status of all assessed streams in the county, and more detailed maps of Champaign County, its assessed streams and their results.

All of this information could be used as a basis of discussion between scientific and policy groups to begin planning informed stream restoration efforts. With the Integrated Water Quality Report and Section 303(d) List as a starting point, planning departments in each jurisdiction could engage with local experts to develop stream-specific recommendations for restoration of their non-supporting streams, which should be implemented as feasible.

BACKGROUND

Every other year, the Illinois EPA's Bureau of Water releases the Illinois Integrated Water Quality Report and Section 303(d) List, most recently in 2016. The Illinois Integrated Water Quality Report and Section 303(d) List is an evaluation of Illinois streams and the degree to which they support their designated use or uses (e.g., aesthetic quality, aquatic life, fish consumption, indigenous aquatic life, primary contact, public and food processing water supply, and secondary contact)⁶⁸. Not every stream in the state is evaluated: according to the report, 15 percent of stream miles were assessed in the most recent edition of the Illinois Integrated Water Quality Report and Section 303(d) List, and this figure has been similar through the last several reporting cycles⁶⁹.

The Illinois Integrated Water Quality Report and Section 303(d) List provide an existing framework of measurement, and local agencies should take advantage of that. There is significant detail in the Illinois Integrated Water Quality Report and Section 303(d) List on what stretches of streams are impaired and what is causing the impairment. Not every stream in the county is assessed, but the information therein about the assessed streams can be used to help direct and inform local stream restoration efforts.

Type: Research

Strategy: Partner with experts to develop specific recommendations for improving impaired streams.

Responsible Agencies: Research institutions

Timeframe: 0 to 5 years

RESPONSIBLE AGENCIES

The Illinois Integrated Water Quality Report and Section 303(d) List is useful and informative to all stakeholders. CCRPC staff could help to coordinate discussions about the results and potential courses of action. Interested parties could include, but are not limited to, Champaign County, local municipalities, Prairie Research Institute, the University of Illinois Extension, Parkland College, and environmental nonprofits and other agencies.

⁶⁸ Illinois Environmental Protection Agency Bureau of Water, "Illinois Integrated Water Quality Report and Section 303(d) List, 2016. Clean Water Act Sections 303(d), 305(b) and 314. Water Resource Assessment Information and List of Impaired Waters Volume I: Surface Water," 2016, 2.

⁶⁹ Ibid, 1.

Strategy 6.1

PARTNER WITH EXPERTS TO DEVELOP SPECIFIC RECOMMENDATIONS FOR IMPROVING IMPAIRED STREAMS
(CONTINUED).

TIMEFRAME

As a new edition of the Illinois Integrated Water Quality Report and Section 303(d) List is released every two years, it provides an opportunity to base ongoing effort on current, consistent research. The recently released 2016 report offers a chance to begin considering its results in a short-term timeframe, while the data is still timely.

RESOURCES

The Illinois Integrated Water Quality Report and Section 303(d) Lists are available for free online at <http://www.epa.illinois.gov/topics/water-quality/watershed-management/tmdls/303d-list/index>.



Photo: Garden Hills Park, Champaign, Illinois, Champaign County Regional Planning Commission

Strategy 6.2

PARTNER WITH EXPERTS TO DETERMINE TARGET STREAMFLOW CONDITIONS FOR MAJOR STREAMS.

ACTION:

PARTNER WITH EXPERTS FROM THE UNIVERSITY OF ILLINOIS, PRAIRIE RESEARCH INSTITUTE, AND OTHER INSTITUTIONS TO PERFORM THE NECESSARY RESEARCH TO IDENTIFY TARGET STREAMFLOW CONDITIONS FOR MAJOR STREAMS IN CHAMPAIGN COUNTY.

Implementation of this strategy may involve partner agencies providing funding to research institutions. The viability of pursuing this strategy will depend on the availability of funding in local budgets.



Photo: Second Street Detention Basin, Champaign, Illinois, Champaign County Regional Planning Commission

BACKGROUND

Streamflow is an important part of overall stream health, and involves not only water quantity, but also flow timing⁷⁰. A stream's flow is complex, variable and related to a number of environmental factors⁷¹. Drainage projects, urbanization, and discharges from wastewater treatment facilities have dramatically altered Champaign County's presettlement streamflow. Such changes in streamflow can impact the species currently utilizing the streams, as well as recreational and other uses. Research is needed to determine such things as minimum flow necessary to support existing uses and optimal flow regimes for desired uses, and should serve as a basis for future restoration or modification efforts. Presettlement flow conditions cannot be restored on a large scale, but it should be possible to maintain sufficient flow for a healthy aquatic and riparian ecosystem.

Significant amounts of research is called for to ensure that any restoration and development plans in the county can be based on a clear, science-based understanding of the flow required for healthy local streams.

Type: Research

Strategy: Partner with experts to determine target streamflow conditions for major streams.

Responsible Agencies: Research institutions

Timeframe: 0 to 5 years

RESPONSIBLE AGENCIES

Partner agencies, including but not limited to Champaign County, municipalities, and other public agencies, could contribute to an effort to provide funding for streamflow research to be performed by an institution such as the University of Illinois or Prairie Research Institute.

TIMEFRAME

Given that efforts toward this strategy should be underway before any stream restoration efforts begin, implementation should begin in the short-term timeframe. Some county-specific streamflow research should be undertaken within three years of the publication of this report.

⁷⁰ Poff, N.L., Allan, J.D., Bain, M.B. Karr, J.R., Prestegard, K.L., Richter, B.D., Sparks, R.E., & Stromberg, J.C. "The natural flow regime: A paradigm for river conservation and restoration," *BioScience* 47, no. 11 (1997): 769-784, 769.

⁷¹ Ibid, 769-770.

Strategy 6.3

PARTNER WITH OTHER STAKEHOLDERS ON RESTORATION EFFORTS.

ACTION:
BEGIN TO PLAN RESTORATION EFFORTS INFORMED BY TARGET STREAMFLOW CONDITIONS AND EXISTING AND ONGOING STREAMFLOW RESEARCH.

It is likely that what will have the greatest impact on the implementation of this strategy will be the availability of funding. The most practical way to begin may be to categorize restoration projects by priority and by the amount of investment needed, then begin projects on a rolling basis as funding becomes available. This funding could come from grants, and from dedicated portions of the budgets of partner agencies as feasible. Project sites could be located with the assistance of stakeholder experts and groups like the local Municipal Separate Storm Sewer (MS4) group, which includes the City of Urbana, City of Champaign, Village of Savoy, University of Illinois, and Champaign County.

BACKGROUND
This strategy relates to Strategy 6.2. The research to identify target streamflow conditions will be invaluable, but unless it is acted upon, there will be no improvement to stream health.

As noted in Strategy 6.2, streamflow impacts ecosystem health. Being able to undertake stream restoration efforts will improve our surface water quality, and thus the health of the entire water system. In addition to their functional importance as part of the water system, streams can be highly visible, attracting public interest topics of water and environmental health.

RESPONSIBLE AGENCIES
Implementing this strategy would be a highly collaborative effort. CCRPC staff could both act in a coordinating capacity and prepare grant applications in pursuit of funding. Other participants include, but are not limited to, municipal and county governments and groups such as MS4; state agencies such as IEPA and the Prairie Research Institute; the University of Illinois; Parkland College; and nonprofit and volunteer groups.

Type: Policy

Strategy: Partner with other stakeholders on restoration efforts.

Responsible Agencies: Any/all interested stakeholder agencies

Timeframe: Over 10 years; Ongoing

TIMEFRAME
This item would be short-term, but ongoing. Restoration efforts informed by research can obviously not take place until research has been done, so the timing of the implementation of this strategy will depend on the implementation of Strategy 6.2. However, other restoration projects, including pools and riffles, can be begun in a short-term timeframe.

Strategy 6.4 RECOMMEND THAT MUNICIPALITIES INVENTORY THE CHANNELIZED STREAMS WITHIN THEIR BOUNDARIES.

ACTION:

ENCOURAGE MUNICIPALITIES TO TAKE AN INVENTORY OF ANY CHANNELIZED AND/OR UNDERGROUND STREAMS WITHIN CORPORATE LIMITS, AND TO EVALUATE THE FEASIBILITY, COSTS, AND BENEFITS OF DECHANNELIZING THESE STREAMS.

All streams within each municipality should be mapped and identified as channelized or free-flowing, surface or underground, and natural or created (as in the case of a drainage ditch or retention pond). At different points along its length, a stream may be both channelized and free-flowing and both at the surface and underground; any maps should be sufficiently detailed to show these transitions clearly. Maps showing streams by characteristic may already be available; to avoid duplication of effort, existing maps should be reviewed. As stated above, dechannelization will not be appropriate in all cases, so there must be critical analysis and evaluation of each site to determine whether either should be further considered as an action. An early step in this process could be to collect information on the land immediately around the streams: parcels and ownership, land use, and other factors that will shape whether dechannelizing a stream would be advantageous or viable.

This action relates to promoting the incorporation of green infrastructure elements into local stormwater management.

BACKGROUND

Stream channelization is the alteration of a stream's course, straightening the channel to increase flow speeds and drainage rates⁷². However, channelization of streams also has detrimental impacts on stream-side habitat and increases sedimentation and streambank erosion⁷³.

Dechannelizing streams can be a complex undertaking, especially if the land immediately around the channelized stream is privately owned and/or owned by several different parties. Despite the difficulties that can be present in a complex process like dechannelization, there can be environmental benefits, like the mitigation of the faster streambank erosion and habitat damage. In addition, there can be recreational benefits: depending on its location, a dechannelized stream can serve as a community amenity.

However, the process will not be appropriate for every case, for a variety of reasons. But it is an option to consider, and it is critical to have as much information as possible about the pros and cons of such a project.

Type: Research

Strategy: Recommend that municipalities inventory the channelized streams within their boundaries.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: 5 to 10 years; Ongoing

RESPONSIBLE AGENCIES

The inventory of underground or channelized streams may be able to be compiled at the municipal level, by staff of public works departments. However, it is possible that any evaluation and cost estimates of potential dechannelization projects will require more specialized expertise.

TIMEFRAME

A municipal inventory of channelized streams could be compiled within five years, but the case-by-case evaluation of streams and whether dechannelization would be beneficial or feasible is an inherently ongoing practice.

⁷² University of Illinois Extension, "60 Ways Farmers Can Protect Surface Water: 25. Avoid Channelization of Streams and Creeks," This Land, Publications Plus, College of Agricultural, Consumer and Environmental Sciences, accessed August 15, 2016, http://www.thisland.illinois.edu/60ways/60ways_25.html.

⁷³ Ibid.

Strategy 6.5

CREATE A STREAM STAKEHOLDERS INVENTORY, IDENTIFYING POTENTIAL PARTNERS FOR EACH CREEK, STREAM, AND RIVER.

ACTION:

DEVELOP A STAKEHOLDERS INVENTORY THAT IDENTIFIES POTENTIAL PARTNER ORGANIZATIONS AND AGENCIES FOR EACH MAJOR STREAM IN THE COUNTY.

Potential partner organizations could include, but are not limited to, municipal and county governments that border the stream; municipal and county governments upstream and downstream; agencies and institutions such as agricultural agencies, sanitary districts, colleges, research groups, universities, and nonprofit and other public groups near the stream; and even interested parties from neighboring jurisdictions whose residents visit Champaign County streams for recreational purposes. The major challenge of this strategy will be ensuring that all stakeholders have the opportunity to participate in stream restoration efforts, while keeping the inventory specific.

First, an inventory should be made of existing maps of Champaign County and the surrounding six-county area. Each stream in the county should be mapped, and may have multiple maps at different scales, to illustrate both context and detail; existing maps may already show the county streams in sufficient detail. New maps should only be made to supplement existing maps, where a stream or streams are not shown on existing maps in sufficient detail. Using existing and new maps as a visual aid, stakeholders for each stream should be listed. A database of stakeholders should also be developed, and should include each organization's mission statement,

any goals related to water policy or environmental protection, and any relevant project that it has worked on in recent years. The database and maps should be able to show stakeholders grouped by watershed or sub-watershed, to highlight potential partnerships based on geographic context.

This information will help determine which organizations may be the best fit, in terms of experience, interest, and organizational capacity, for each potential project. The inventory developed will likely overlap significantly with the directory recommended for development in Strategy 1.2: it is possible that these two strategies can be combined to produce one highly detailed directory that includes the content outlined in both sections.

BACKGROUND

As has been stated throughout this report, the implementation of any of the strategies herein will be collaborative in nature, although some will be more so than others. Likewise, the implementation of these strategies will largely depend on the availability of funding. Partnerships, for the sake of equity and sharing resources, will be critical. A stakeholders inventory will serve as a starting point for organizing and facilitating these partnerships.

RESPONSIBLE AGENCIES

The ideal party to take on this strategy would be a representative or staff member of a regional agency that already has working relationships with many local governments, agencies, and organizations, as well as

Type: Policy

Strategy: Create a stream stakeholders inventory, identifying potential partners for each creek, stream, and river.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: 0 to 5 years

the organizational capacity to facilitate interagency partnerships.

The Champaign County Soil & Water Conservation District has contributed to existing watershed plans whose area includes parts of Champaign County. These plans should be considered and utilized in this and other strategies related to stream restoration, and the Champaign County Soil & Water Conservation District should be considered a stakeholder for all county streams.

TIMEFRAME

This item is categorized as a short-term item. It will be most conducive to further action in stream protection and restoration if the inventory of interested parties and potential partners is developed as soon as possible after the publication of this report.

Strategy 6.6 PRESERVE, PROTECT, AND, WHERE FEASIBLE, EXPAND EXISTING WETLAND AREAS.

ACTION

PROTECT AND PRESERVE WETLAND AREAS WITHIN THE COUNTY, AND PROMOTE THE CONSIDERATION OF EXPANDING EXISTING WETLANDS AS PART TO SERVE AS PART OF A LARGER GREEN INFRASTRUCTURE SYSTEM.

Action toward this strategy should begin with reviewing existing maps of wetland areas in Champaign County. A full set of National Wetlands Inventory Maps for Champaign County is on file at the Champaign County Department of Planning and Zoning. Wetland map data is also available online, to view and download, at the National Wetlands Inventory's Wetlands Mapper (<http://www.fws.gov/wetlands/Data/Mapper.html>). The National Wetlands Inventory is a product of the U.S. Fish & Wildlife Service.

In addition to the review of existing wetlands maps, existing ordinances should be reviewed in order to evaluate what protections are already in place. Further action should be informed by the findings of the map and ordinance reviews.

BACKGROUND

A very small portion of Champaign County is considered to be wetland area, defined as an area that “periodically support[s] wetland plants,” and/or possesses “substrate of predominantly undrained hydric soil,” and/or is “covered by shallow water for at least part of the year.”⁷⁴

Wetlands are a critical part of the water system, and in addition to their water quality benefits, they can mitigate flooding, provide habitat for fish and wildlife, store carbon, and offer recreational opportunities⁷⁵.

RESPONSIBLE AGENCIES

Work on this strategy will involve working with local county and municipal government and staff.

TIMEFRAME

Any efforts undertaken to protect and expand wetlands will be complex and ongoing, and will require both local interest and funding.

Type: Policy

Strategy: Preserve, Protect, and, where feasible, expand existing wetland areas.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: Ongoing

RESOURCES

Information on wetlands in Champaign County can be found in the Champaign County Land Resource Management Plan, created by CCRPC in 2010. Information on the importance of wetlands in general can be found online at the U.S. EPA website. The National Wetlands Inventory (<http://www.fws.gov/wetlands/index.html>) provides national wetlands data and information.

⁷⁴ Champaign County Regional Planning Commission, “Land Resource Management Plan Volume 1: Existing Conditions and Trends,” 2010, 10-23.

⁷⁵ “Why are wetlands important?”, U.S. EPA, last modified March 28, 2016, <http://www.epa.gov/wetlands/why-are-wetlands-important>.

Strategy 6.7

DRAFT GREEN INFRASTRUCTURE STANDARDS FOR PUBLIC SITES AND FACILITIES, IF NOT ALREADY PRESENT. PROMOTE IMPLEMENTATION OF THESE STANDARDS.

ACTION:

IF NOT ALREADY IN PLACE, DRAFT STANDARDS FOR CITY SITES AND FACILITIES TO INCORPORATE GREEN INFRASTRUCTURE ELEMENTS, IN ADDITION TO OR INSTEAD OF GRAY INFRASTRUCTURE ELEMENTS.

A set of standards could be drafted for review and potential adoption by municipal or county government bodies, requiring that new public buildings or sites incorporate one or more green infrastructure element, and resolving that less intensive elements (e.g., planting trees or utilizing rain barrels) should be implemented on existing sites as funding becomes available.

Obviously, not every green infrastructure element is appropriate to every site. To require wholesale implementation of every technique at every site would be not only expensive, but unworkable. To acknowledge this, the drafted standards should include an array of options, to allow for flexible site planning that will maximize benefits. The standards should be written or revisable to be appropriate for adoption by public agencies beyond municipal governments. The array of options should be made available to private developers, and should include current cost-benefit information and technical guidelines for each option.

The Municipal Separate Storm Sewer Systems (MS4) program requires its jurisdictions to implement green infrastructure where appropriate: local MS4 jurisdictions include Champaign County, the City of Champaign, the City of Urbana, the Village of Savoy, and the University of Illinois. This strategy could be used to supplement the existing MS4 program, or to encourage non-MS4 jurisdictions in Champaign County to also implement green infrastructure.

BACKGROUND

Green infrastructure, either on its own or hybridized with traditional “gray” infrastructure, is a cost-effective way to manage stormwater and brings with it a host of other benefits. Green roofs, urban forestry, rain gardens and barrels, constructed wetlands and bioswales: all of these elements, when well-planned, appropriately sited, and properly maintained, provide a range of environmental services beyond their stormwater management function⁷⁶.

Some of the problems that implementing green infrastructure elements can address are serious ones. Urban flooding is an expensive and dangerous problem⁷⁷. Large amounts of runoff also pose water quality risks, as the runoff can collect any contaminant

Type: Policy

Strategy: Draft green infrastructure standards for public sites and facilities, if not already present. Promote implementation of these standards.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: 5 to 10 years

on the impermeable surfaces it flows across, from road salt to trash to fluids that leak from vehicles. Unrelated to water issues, poor air quality and urban heat island conditions can pose public health risks and contribute to increased energy consumption and greater emissions⁷⁸. Green infrastructure elements can mitigate these problems while providing additional benefits beyond their primary function. However, adoption and implementation of green infrastructure does not occur at every possible site. If green infrastructure elements are adopted and implemented successfully on public sites, it could demonstrate their efficacy and cost-effectiveness in addition to providing their functional benefits.

⁷⁶ Center for Neighborhood Technology, “The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental, and Social Benefits,” 2010, 3.

⁷⁷ Center for Neighborhood Technology, “The Prevalence and Cost of Urban Flooding: A Case Study of Cook County, IL,” 2014, 1.

⁷⁸ “Heat Island Impacts,” U.S. EPA, last updated June 27, 2016, <https://www.epa.gov/heat-islands/heat-island-impacts>.

Strategy 6.7

DRAFT GREEN INFRASTRUCTURE STANDARDS FOR PUBLIC SITES AND FACILITIES, IF NOT ALREADY PRESENT. PROMOTE IMPLEMENTATION OF THESE STANDARDS (CONTINUED).

RESPONSIBLE AGENCIES

CCRPC, county, and/or municipal staff would be needed to research green infrastructure elements and existing municipal standards. They could then draft and present any additional text for review by local government bodies.

All MS4 Jurisdictions, as noted above, should be considered partner agencies for this strategy.

TIMEFRAME

Model public agency site requirements could be drafted within several years of the publication of this report, depending on agency interest and the availability of staff time to devote to the process. Implementation of the requirements would depend on adoption by the respective municipal government and by the availability of funding.

RESOURCES

Information about green infrastructure can be found online, published by the U.S. EPA, state agencies, and nonprofit organizations.



Photo: University of Illinois Campus, Urbana, Illinois, Champaign County Regional Planning Commission

Strategy 6.8

PUBLICIZE BENEFITS OF GREEN INFRASTRUCTURE
CONCERNING NOT ONLY WATER BUT OTHER ENVIRONMENTAL ISSUES.

ACTION:

MAKE GREEN STORMWATER INFRASTRUCTURE A TOPIC OF FOCUS THROUGHOUT OUTREACH EFFORTS.

The non-water benefits of green infrastructure should be included in overall outreach efforts, including recurring outreach events such as lecture series and roundtables. For example, if roundtables occur once a month, then one or two per year could be on a green infrastructure topic. A green infrastructure lecture series could be organized, with each lecture covering a different facet of the overarching topic.

The local MS4 group holds regular stormwater quality conferences. This conference could be attended and promoted by partner agencies, while the water resources coordinator could work with conference organizers to ensure that future events related to this strategy are complementary to, but not duplicative of, this existing event.

BACKGROUND

As noted in Strategy 6.7, the benefits of green infrastructure extend beyond the water system. In addition to improving stormwater infiltration, increased tree cover improves air quality and can mitigate urban heat island conditions⁷⁹. Green roofs reduce an area's stormwater runoff, and can also have positive impacts on urban heat island conditions⁸⁰. Permeable pavement not only has water quality and runoff reduction benefits, as discussed in Strategy 6.9, but can also mitigate urban flooding and urban heat island conditions⁸¹. Trees, bioswales, green streets, and other green infrastructure elements can also be aesthetically pleasing local amenities⁸².

Gray infrastructure is the status quo. There are frameworks in place allowing new facilities to meet their stormwater management requirements using green infrastructure elements, but implementing green infrastructure instead of gray infrastructure for some, not even most, projects requires a significant operational change. It is easiest to make a case for operational change when it can be argued that the change is important, beneficial, and relatively simple or easy. In the case of implementing green infrastructure more widely, the operational change involved would be neither simple nor easy. Thus, it is important to emphasize the importance and the

Type: Outreach

Strategy: Publicize benefits of green infrastructure concerning not only water but other environmental issues.

Responsible Agencies: Water resources coordinator

Timeframe: Ongoing

benefits in order to not only allow but incentivize the implementation and expansion of green infrastructure elements.

Green infrastructure and its benefits are already relatively well-known; although this strategy focuses on publicizing green infrastructure benefits further, it should also include taking into consideration why green infrastructure elements are not adopted, in cases where only gray infrastructure elements are used. This analysis can help guide and shape future outreach efforts.

⁷⁹ Center for Neighborhood Technology, "The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental, and Social Benefits," 2010, 6-7.

⁸⁰ Ibid, 4-5.

⁸¹ Ibid, 10-11.

⁸² Ibid, 3.

Strategy 6.8

PUBLICIZE BENEFITS OF GREEN INFRASTRUCTURE
CONCERNING NOT ONLY WATER BUT OTHER ENVIRONMENTAL ISSUES (CONTINUED).

RESPONSIBLE AGENCIES

As with all outreach-based strategies, Strategy 6.8 would mainly be the responsibility of the water resources coordinator. The coordinator will need to work with other agencies and local experts in order to develop current content and organize area-wide events.

TIMEFRAME

Due to the need to keep the information distributed as current as possible, and due to the recurring nature of effective outreach events, this item will be an ongoing effort.

RESOURCES

Information on the non-water benefits of green infrastructure can be found online at the EPA website (<<http://www.epa.gov/green-infrastructure/benefits-green-infrastructure>>), as well as at the websites of other research and planning institutions.



Photo: Near Prairie School, Urbana, Illinois, Champaign County Regional Planning Commission

Strategy 6.9 INVESTIGATE FEASIBILITY, ADVANTAGES, AND DISADVANTAGES OF USING PERMEABLE PAVEMENT.

ACTION:

EVALUATE THE PROS AND CONS OF DIFFERENT TYPES OF PERMEABLE PAVEMENT FOR DIFFERENT TYPES OF PROJECTS IN EAST-CENTRAL ILLINOIS.

A detailed permeable pavement feasibility evaluation could be researched and drafted by CCRPC or partner agency staff. There are already examples of permeable pavement use in the Champaign-Urbana area, including at the Champaign-Urbana Mass Transit District's Urbana facility and a Champaign Illinois American Water plant; it is implementable in this region, but which type of permeable pavement would be most effective will differ from site to site. A detailed evaluation outlining the characteristics of different types of permeable pavement, and site characteristics that impact which types would be more or less effective, would be a helpful tool for planners and developers.

The best way to conduct this evaluation is to partner with experts: an engineering consulting firm or university researchers. However, commissioning an evaluation for every potential project may be a prohibitive expense, and to mitigate that, a preliminary evaluation template could be developed for in-house use. The template could outline characteristics of a site that make it ideal for permeable pavement (e.g.,

slope, soil, traffic load), as well as characteristics of a site that would be inappropriate for permeable pavement. A prospective site could be evaluated against this template, and a full evaluation only pursued if the site is deemed feasible using the template.

BACKGROUND

Permeable pavement allows precipitation to infiltrate through the surface layer into the soil below, rather than becoming runoff or ponding on the surface. There are several types of permeable pavement in use, including pervious concrete, porous asphalt, and interlocking pavers, each with its own advantages and disadvantages, but all with water system and other environmental benefits⁸³. The installation costs of permeable pavement can be higher than that of traditional pavement, but the lifespan of the installation is estimated to be equal to or greater than that of traditional pavement, and permeable pavement brings with it a range of environmental benefits that are not present in traditional pavement⁸⁴. Permeable pavement should be evaluated as an option each time a parking lot is constructed or repaved at a city- or other agency-owned site, and implemented if it is cost-effective, making sure to take into account all environmental benefits.

Type: Research

Strategy: Investigate feasibility, advantages, and disadvantages of using permeable pavement.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: 5 to 10 years

There are numerous benefits to permeable pavement. In addition to increasing groundwater recharge and reducing stormwater runoff, thus mitigating erosion and preserving water quality, permeable pavement can reduce the need for the application of road salt in winter; this mitigates the problem of road salt pollution via runoff, and reduced application road salt also reduces costs for municipalities and other agencies⁸⁵. Permeable pavement reflects less heat than impermeable pavement, which mitigates urban heat island conditions, and some types can also decrease ambient road noise⁸⁶.

⁸³ University of Maryland Extension, Howard County Master Gardeners, "Permeable Pavement Fact Sheet: Information for Howard County, Maryland Homeowners," last revised January 17, 2016, 1-3.

⁸⁴ "Water Management: Permeable Paving," City of Chicago, copyright 2010-2016, https://www.cityofchicago.org/city/en/depts/water/supp_info/conservation/green_design/permeable_paving.html.

⁸⁵ Center for Neighborhood Technology, "The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental, and Social Benefits," 2010, 10.

⁸⁶ Ibid, 11.

Strategy 6.9 INVESTIGATE FEASIBILITY, ADVANTAGES, AND DISADVANTAGES OF USING PERMEABLE PAVEMENT (CONTINUED).

RESPONSIBLE AGENCIES

A local engineering firm or university researchers would likely have to be involved in a full site evaluation. The preliminary evaluation template could be researched and compiled by municipal, county, or CCRPC staff.

TIMEFRAME

This item is listed as medium-term and ongoing. Passing a resolution to consider the implementation of permeable pavement for all large-scale repaving or construction projects is a one-time undertaking and could theoretically be accomplished within a few years of the publication of this report. Compiling an evaluation template would be a short-term project, while the actual evaluation of the feasibility of permeable pavement on a project-by-project basis will be an ongoing effort.

RESOURCES

More information on permeable pavement, its benefits, and its installation costs can be found in resources published by the U.S. EPA, the City of Chicago, extensions and agencies in other states, and several professional and research organizations.



Photo: Permeable sidewalk at Carle Park, Urbana, Illinois, Champaign County Regional Planning Commission

Strategy 6.10 IF NOT ALREADY DONE, CONSIDER ALTERING PARTS OF LOCAL SUBDIVISION AND/OR ZONING ORDINANCES TO ENCOURAGE A SMALLER PERCENTAGE OF IMPERVIOUS SURFACES IN NEW DEVELOPMENT.

ACTION:

ENCOURAGE THE COUNTY AND MUNICIPALITIES TO EVALUATE THE OPTION OF ALTERING THEIR SUBDIVISION CODE, OR ALTERING THE ZONING ORDINANCE IN PART OR ALL OF THEIR JURISDICTION, TO ENCOURAGE A SMALLER PERCENTAGE OF IMPERVIOUS SURFACES PER LOT FOR NEW DEVELOPMENT.

For some municipalities, creating or altering ordinances as suggested by this strategy would be redundant, as relevant recommendations and regulations may already be in place. The cities of Champaign and Urbana already have in place a stormwater utility fee, which disincentivizes large areas of impervious surfaces by assessing a fee based on the amount of impervious surface on a given property. But for municipalities within Champaign County that do not already have such a policy in place, municipal or CCRPC staff could assess whether a similar stormwater utility fee or alteration to a subdivision or zoning ordinance would be legally possible and successful in their area.

New development could attain a smaller percentage by maintaining the originally planned amount of impervious surfaces (e.g. building footprint, parking lot with conventional pavement)

and increasing the lot size, leading to unintended sprawling development. Any action toward this strategy would have to be carefully written to avoid incentivizing or mandating sprawl.

BACKGROUND

Impervious surfaces exacerbate the effects of stormwater runoff in a variety of ways. Permeable surfaces allow precipitation to soak through into the ground, rather than pooling on the surface and becoming potentially damaging runoff⁸⁷.

Impervious surfaces contribute to the damaging effects of stormwater runoff. Precipitation that falls on impervious surfaces flows into storm drains as runoff; stormwater runoff can pick up contaminants and carry them into the water system⁸⁸. Large precipitation events can lead to flooding, and gray infrastructure exacerbates, rather than mitigates, these risks⁸⁹. Runoff can also contribute to streambank erosion⁹⁰. When appropriately sited and engineered, permeable pavements mitigate these issues by allowing precipitation to infiltrate through the surface that it falls on⁹¹.

Type: Policy

Strategy: If not already done, consider altering parts of local subdivision and/or zoning ordinances to encourage a smaller percentage of impervious surfaces in new development.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: 5 to 10 years

RESPONSIBLE AGENCIES

Staff, whether at each municipality, the county, or CCRPC, would begin by researching the problem: they would take an inventory of the relevant policies already in place in their jurisdiction, as well as the policies in place throughout the county. They could then work together with municipalities throughout the county that have no policies related to impervious surfaces or runoff in place, to gauge interest in and evaluate feasibility of implementing something of that nature.

⁸⁷ Center for Neighborhood Technology, "The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental, and Social Benefits," 2010, 10.

⁸⁸ "Benefits of Green Infrastructure," U.S. EPA, last modified April 19, 2016, <http://www.epa.gov/green-infrastructure/benefits-green-infrastructure>.

⁸⁹ Ibid.

⁹⁰ Center for Neighborhood Technology, "The Value of Green Infrastructure: A Guide to Recognizing Its Economic, Environmental, and Social Benefits," 2010, 10.

⁹¹ Ibid, 10.

Strategy 6.10

IF NOT ALREADY DONE, CONSIDER ALTERING PARTS OF LOCAL SUBDIVISION AND/OR ZONING ORDINANCES TO ENCOURAGE A SMALLER PERCENTAGE OF IMPERVIOUS SURFACES IN NEW DEVELOPMENT (CONTINUED).

TIMEFRAME

This item would be short-term, but ongoing. Restoration efforts informed by research can obviously not take place until research has been done, so the timing of the implementation of this strategy will depend on the implementation of Strategy 6.2. However, other restoration projects, including pools and riffles, can be begun in a short-term timeframe.

RESOURCES

More information on the benefits, costs, and types of permeable pavements is available online from professional organizations, nonprofits, university extensions, and other sources. More information on the stormwater utility fees already in place in the City of Champaign and City of Urbana can be found on their respective websites.



Photo: Impervious sidewalk at Garden Hills Park, Champaign, Illinois, Champaign County Regional Planning Commission

Strategy 6.11 DEVELOP EFFECTIVE PROGRAMS TO MINIMIZE WATER CONTAMINATION BY HHW AND PPCPS.

ACTION:

PUBLICIZE THE RISKS OF WATER CONTAMINATION VIA HHW AND PPCPS, DISTRIBUTE INFORMATION ON MITIGATION STRATEGIES, AND DEVELOP EFFECTIVE PROGRAMS TO PREVENT HHW AND PPCP CONTAMINATION. PUBLICIZE ONGOING RESEARCH AND THE RECOMMENDATIONS INCLUDED IN THE “LOCAL GOVERNMENT TOOLKIT: IMPROVING HHW COLLECTION OPTIONS IN ILLINOIS.”

In Champaign County and regionally, there are limited programs in place to address this strategy. In the case of unwanted pharmaceuticals, as the result of a multi-agency partnership, the C-U Area Medicine Take-Back Program provides three 24-hour accessible points of collection for safe drop-off of unwanted or expired medications as an alternative to throwing them away or flushing them into the water system.

Additional support to this program would enable increased public awareness and the means to provide additional points of collection in outlying areas. Apart from the C-U Area Medicine Take-Back Program, the current options available to area residents to safely dispose of HHW and other PPCPs are extremely limited.

The Champaign County Regional Planning Commission, in partnership with other organizations, recently completed a three-phase study, “A Strategy for Improving HHW Collection Options for East Central Illinois.” This effort resulted in the development of a “Local Government Toolkit: Improving HHW Collection Options in Illinois.” Further action toward this strategy could include the support for and implementation of items included in this toolkit.

BACKGROUND

Common household products can be highly toxic, and pharmaceuticals and personal care products (PPCPs) have been detected in bodies of surface water in low concentrations⁹². Both household hazardous waste (HHW) and PPCPs can have adverse environmental impacts, depending on their use and disposal method⁹³.

Common household products that are hazardous to the environment are just that: common. And while one resident dumping the unused portion of lawn chemicals, herbicides, pesticides, oil-based paint, or old gasoline down a sink or storm drain or directly onto the ground may seem like a small-scale problem, it becomes a much larger issue when one considers that many residents have the same types of

Type: Policy

Strategy: Develop effective programs to minimize water contamination by HHW and PPCPs.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: Ongoing

unused HHW that they would like to dispose of, and that they often do not have the opportunity to do so safely. The problem of PPCPs is similarly one of scale. The amount of PPCP contamination generated by one person or a small group is minimal, but the amount of PPCP contamination generated by many people in a relatively small area can have considerable environmental impacts.

⁹² “Contaminants of Emerging Concern including Pharmaceuticals and Personal Care Products,” US EPA, last modified September 27, 2016, <http://www.epa.gov/wqc/contaminants-emerging-concern-including-pharmaceuticals-and-personal-care-products>.

⁹³ “Household Hazardous Waste (HHW). Household Hazardous Waste Collection – East Central Illinois,” Champaign County Regional Planning Commission, <http://hhw-ccrpc.info/>.

Strategy 6.11 DEVELOP EFFECTIVE PROGRAMS TO MINIMIZE WATER CONTAMINATION BY HHW AND PPCPS (CONTINUED).

RESPONSIBLE AGENCIES

All stakeholder agencies could have a role in this strategy. The water resources coordinator could take charge of publicizing the problem, and a leadership team could follow up with program development. County and municipal governments would evaluate funding and level of support.

TIMEFRAME

Some aspects of this strategy, such as outreach, could initially be implemented within a few years of the publication of this report. Other aspects of this strategy will be longer-term and ongoing.

RESOURCES

More information on where to safely dispose of certain types of HHW can be found at <http://hhw-ccrpc.info/>. Information about the C-U Area Medicine Take-Back Program can be found at the City of Champaign website at <http://ci.champaign.il.us/2013/05/23/prescription-drug-disposal-program/>, and at the City of Urbana website at <http://urbanaillinois.us/posts/2013/05/c-u-area-medicine-take-back-program>. The “Local Government Toolkit: Improving HHW Collection Options in Illinois” and accompanying Background Report are available at <http://hhw-ccrpc.info/>.



Photo: Boneyard Creek Community Day, 2016, Melissa Mitchell-Boulware, <http://www.boneyardcreek.org/index.html#photos>

Strategy 6.12 EVALUATE OPPORTUNITIES TO PROMOTE CLEANER INDUSTRIAL DISCHARGE, INCLUDING INCREASED ON-SITE PRETREATMENT OF INDUSTRIAL DISCHARGE.

ACTION:

EVALUATE WHETHER POINT-SOURCE INDUSTRIAL DISCHARGE IS CURRENTLY A SERIOUS PROBLEM IN CHAMPAIGN COUNTY. IF SO, LOOK FOR OPPORTUNITIES TO PROMOTE CLEANER INDUSTRIAL DISCHARGE.

First, it is advisable to evaluate the degree to which damaging point-source industrial discharge is a problem in Champaign County. If this is a prevalent local issue, municipal or county governments could pursue regulations and incentives to mitigate the issue. Existing industrial uses may find it difficult to add pretreatment facilities to their sites, but may instead respond well to incentives promoting the use of cleaner, safer materials so that the eventual discharge of waste is also cleaner and safer. Regulations or incentives could be put in place by a municipal or county government, requiring any new industrial sites to include a certain level of pretreatment, outlining a list of materials that cannot be used in or discharged after industrial processes in Champaign County, and/or allowing a company that chooses not to comply with either option to instead pay a given amount of money per year into a clean-up fund. This strategy allows for flexibility: in creating an evaluation of several options, they can then be weighed at the county or municipal level, and any or none can be selected to pursue further.

BACKGROUND

Significant progress in reducing and mitigating water pollution from industrial discharges has already been made through federal legislation such as the Clean Water Act, amended from the original Federal Water Pollution Control Act in 1972⁹⁴. However, point source pollution being less of a problem than in the past does not mean that it is no longer a problem, or that it will never be a problem in the future.

Protecting the water system against future risks is a key part of environmental stewardship, and pollution that never makes its way into the water system is pollution that no funds, time, or other resources need to be devoted to cleaning up at a later date. Furthermore, the attitude of preventing environmental degradation now rather than attempting to fix it later is a valuable operational precedent to set.

RESPONSIBLE AGENCIES

This strategy would involve a partnership among multiple stakeholder organizations. If there are any sites in Champaign County with problematic industrial discharge, county and municipal governments, regional agency staff, industry groups, and the Champaign County Economic Development Corporation will all have valuable input on strategies and opportunities to mitigate industrial discharge pollution in the future.

Type: Policy

Strategy: Evaluate opportunities to promote cleaner industrial discharge, including increased on-site pretreatment of industrial discharge.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: Over 10 years

TIMEFRAME

Brainstorming and evaluating opportunities for increased on-site pretreatment of industrial discharge could be a relatively short-term process, at least at the outset. However, developing and implementing programs that will help increase on-site pretreatment of industrial discharge would be a longer-term and ongoing effort.

⁹⁴ "Laws & Regulations: History of the Clean Water Act," U.S. EPA, last modified May 25, 2016, <http://www.epa.gov/laws-regulations/history-clean-water-act>.

Strategy 6.13 EVALUATE AND PUBLICIZE RISKS TO WATER QUALITY FROM SWIMMING POOLS NOT RECEIVING APPROPRIATE CARE.

ACTION:

DETERMINE WHETHER IMPROPER SWIMMING POOL CARE PRESENTS A WATER QUALITY RISK IN CHAMPAIGN COUNTY.

A starting point for the assessment would be to determine whether draining swimming pools for the winter is a common practice in Champaign County. A survey could be drafted to be distributed to pool owners, through such avenues as Home Owners Associations (HOAs) or neighborhood associations, and agencies that operate public pools. Inquiries could also be made, as noted above, of local pool manufacturers, to find out whether winter draining is something they recommend or if they're aware of it being a common practice in the area.

In addition to these ideas, a map could also be produced, using existing aerial photography data, that shows the storm sewer infrastructure and locations of swimming pools in the urbanized area. If swimming pool maintenance practices are found to pose a threat to water quality in the area, publications could be produced and distributed on a seasonal basis outlining proper maintenance practices.

BACKGROUND

Swimming pools can have an adverse impact on the water system if they are not properly

maintained or if their water is improperly drained or discharged; chlorinated water can contaminate surface water if discharged into storm sewers or directly into streams⁹⁵. Improper storage of pool chemicals is similarly hazardous to water quality⁹⁶. The risks presented by improper pool maintenance in Champaign County should be evaluated, and if improper pool maintenance is a prevalent local problem, information on correct, environmentally safe pool maintenance should be distributed on a seasonal basis.

It is difficult to say how much of a risk to water quality that environmentally unsafe swimming pool care presents in Champaign County. It would require some study (e.g., a survey of local pool manufacturers to assess whether residents typically drain their pools in the winter months) to determine if any action regarding swimming pool care should be taken. Resources are limited: it is important to not dedicate a large amount of staff time and funding to a problem that is minimal in our area. Thus, it is important, first and foremost, to assess the problem.

RESPONSIBLE AGENCIES

The survey and mapping assessment could be done by CCRPC, municipal, county, or partner agency staff. Alternately, it may be possible to identify

Type: Outreach

Strategy: Evaluate and publicize risks to water quality from swimming pools not receiving appropriate care.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: 0 to 5 years or 5 to 10 years

an area scientist or research institute willing to partner in this endeavor. Producing publications on proper pool maintenance would be a task best suited to the water resources coordinator position created to deal with all outreach responsibilities.

TIMEFRAME

The survey and mapping assessment could both be short- or medium-term implementation items, depending on funding and prioritization. If they are found to be necessary, the production of informational pamphlets would be an ongoing effort.

⁹⁵ Massachusetts Department of Conservation and Recreation, Wachusett Reservoir Watershed. Division of Water Supply Protection, "Swimming Pools and Surface Water Quality: Best practices guide for swimming pool owners in the Wachusett Reservoir Watershed," 2011, 2.

⁹⁶ Ibid, 2.

Section 7

STRATEGIES TO FURTHER PUBLIC
ENGAGEMENT IN AND EDUCATION ON WATER ISSUES

Section 7

STRATEGIES TO FURTHER PUBLIC ENGAGEMENT IN AND EDUCATION ON WATER ISSUES

Outreach and education are critical tools for planning for and protecting the water system. There have been recent cases of significant public interest in water issues in East-Central Illinois; if water issues are going to be prioritized through research, policy-making, and funding efforts, it will be necessary to maintain public engagement on water quality and quantity topics and further public education in water science.

There is a plethora of information already available, some of it specific to East-Central Illinois. Thus, outreach and education efforts include not only producing and distributing new materials, but also acting as a clearinghouse for existing materials. Redundant materials and duplicated efforts are a poor use of time and resources, and can contribute to confusion and fatigue in the intended audience. In order to avoid these issues as much as possible, partner agencies should work together on outreach and education efforts to produce and distribute materials with content that is clear, cohesive, and region-specific. Branding efforts should not be ignored: an Illinois-specific designation could be developed as a tool for outreach on native landscaping and safe or beneficial products.

It can be difficult to generate public interest in water topics when the region is not currently affected or threatened by drought or poor water quality. Generating public support and stakeholder engagement in years where there is no immediate water-related crisis will be one of the first and foremost challenges of all the strategies in this report related to outreach and education. Developing methods and strategies to address this challenge should be an overarching goal of outreach efforts.

STRATEGY 7.1

PREPARE PRESENTATIONS ON THE WATER CYCLE, CONNECTIVITY BETWEEN SURFACE WATER AND GROUNDWATER, AND OTHER WATER TOPICS, AND GUIDELINES ON REVISING THEM FOR MULTIPLE AUDIENCES. DEVELOP PAMPHLETS OR BROCHURES COVERING THE SAME CONTENT. EVALUATE ANY EXISTING OPEN SOURCE RESOURCES AVAILABLE FOR PUBLIC USE COVERING THIS CONTENT.

STRATEGY 7.2

BEGIN A WATER NEWSLETTER COVERING CURRENT AND UPCOMING EVENTS, RESEARCH PROJECTS, AND OTHER ITEMS OF INTEREST.

STRATEGY 7.3

CREATE VOLUNTARY CONSERVATION ACTIONS LIST FOCUSED ON CONSUMER BEHAVIORS.

STRATEGY 7.4

PARTNER WITH OTHER STAKEHOLDERS TO SPONSOR WATER SCIENCE FAIRS AND OTHER EDUCATIONAL EVENTS.

STRATEGY 7.5

SPONSOR STREAM AREA LITTER CLEAN-UPS IN PARTNERSHIP WITH OTHER STAKEHOLDERS, PROVIDING BOTH CLEAN-UP BENEFITS AND EDUCATIONAL OPPORTUNITIES. PROMOTE GREATER ENFORCEMENT AND AWARENESS OF EXISTING ANTI-DUMPING ORDINANCES.

STRATEGY 7.6

PUBLICIZE AVAILABILITY AND USEFULNESS OF EXISTING WATER USE DATA.

Strategy 7.1

PREPARE PRESENTATIONS ON THE WATER CYCLE, CONNECTIVITY BETWEEN SURFACE WATER AND GROUNDWATER, AND OTHER WATER TOPICS, AND GUIDELINES ON REVISING THEM FOR MULTIPLE AUDIENCES. DEVELOP PAMPHLETS OR BROCHURES COVERING THE SAME CONTENT. EVALUATE ANY EXISTING OPEN SOURCE RESOURCES AVAILABLE FOR PUBLIC USE COVERING THIS CONTENT.

ACTION:

DEVELOP A SERIES OF PRESENTATIONS ON WATER TOPICS, INCLUDING BUT NOT LIMITED TO THE WATER CYCLE AND WATER SYSTEM, HOUSEHOLD WATER CONSERVATION, WATER USE IN AGRICULTURE, AND POINT- AND NON-POINT SOURCE POLLUTION PREVENTION. MAKE THIS CONTENT AVAILABLE ONLINE FOR FREE AND OPEN USE, AND PRINT IT IN SMALL BROCHURES OR BOOKLETS FOR DISTRIBUTION AT COMMUNITY EVENTS. MAKE MULTIPLE VERSIONS OR REVISION GUIDELINES AVAILABLE TO FACILITATE ADAPTING THE CONTENT TO A RANGE OF AGES AND AUDIENCES.

Many educational resources on water topics already exist that are free and available for public use. In addition to development of new materials, an evaluation of existing resources and their potential use and distribution should be undertaken. To avoid duplicating effort and resources, staff of a regional agency could begin by evaluating any existing free-to-use resources produced by partner agencies. As part of the overall outreach strategy, any existing free-to-use resources could be curated and linked from a central water website, always with appropriate credit to the source organization. Following an inventory of existing resources, staff could begin to develop the original content material on a variety of topics and for a range of audiences. This material should also be made available online for free and public use, on the central water website.

BACKGROUND

Education on the importance of a healthy water system is one of the most vital goals of this report. Some of the strategies in this report call for individual behavior change; many underscore the need for water health to be more highly valued on an institutional level. In order to promote either of these outcomes, we need to provide information on why we should value our water more, and how behavior change reflecting that increased value will be beneficial.

RESPONSIBLE AGENCIES

CCRPC staff could coordinate effort from several partner agencies on this strategy. Topics could be divided up among partner agencies, so that the most expert on each topic would take responsibility for developing that content. Any representative of any partner agency could use the original material developed as part of this strategy at any outreach event.

TIMEFRAME

Work on this strategy could conceivably begin shortly after the publication of this report. However, it will be ongoing in that the resources that partner agencies create would need to be updated on a regular basis.

Type: Outreach

Strategy: Prepare and distribute presentations and printed materials on water topics.

Responsible Agencies: Water resources coordinator

Timeframe: 0 to 5 years

Strategy 7.2

BEGIN A WATER NEWSLETTER COVERING CURRENT AND UPCOMING EVENTS, RESEARCH PROJECTS, AND OTHER ITEMS OF INTEREST.

ACTION:

DEVELOP A WATER TOPICS NEWSLETTER, TO BE PUBLISHED ON A REGULAR SCHEDULE AND DISTRIBUTED TO STAKEHOLDERS THROUGHOUT THE REGION.

Items to appear in the newsletter would include, but not be limited to, upcoming events, such as rain barrel sales or water science fairs; data and analysis, such as the previous month's water use and how it compares to past years; opportunities for funding; recent research publications; and seasonal advice for water users.

While keeping water topics visible to the general public is important, distributing a newsletter too frequently, without sufficient new content in each edition, would likely be counterproductive. To avoid this, the publication schedule of the newsletter would need to be determined through careful consideration of how much activity occurs in the region. Depending on the needs of the community, it could be available online, made available in public areas such as libraries, or mailed out with water bills.

BACKGROUND

The creation, curation, and distribution of information is critical to any venture, especially those involving a wide variety of stakeholders. A water topics newsletter would make data and information available to stakeholders throughout the region, and would keep water topics in the public eye.

RESPONSIBLE AGENCIES

The amount of work involved in soliciting, developing, and editing content for a newsletter, as well as the production stages beyond content development, should not be underestimated. Staff time would be required at a stakeholder agency to oversee production of the newsletter, though items for inclusion would ideally be submitted by partner organizations throughout the region. The amount of staff time required to implement this strategy would depend on the frequency of publication. The creation and management of a newsletter would be most suited to the position of water resources coordinator.

TIMEFRAME

This action should be implemented immediately: the first edition of the newsletter should be published within a year of report adoption. This action will require ongoing effort.

Type: Outreach

Strategy: Begin a water newsletter covering current and upcoming events, research projects, and other items of interest.

Responsible Agencies: Water resources coordinator

Timeframe: 0 to 5 years

Strategy 7.3

CREATE VOLUNTARY CONSERVATION ACTIONS LIST FOCUSED ON CONSUMER BEHAVIORS.

ACTION:

DEVELOP AND DISTRIBUTE A DOCUMENT DESCRIBING A RANGE OF VOLUNTARY CONSUMER CONSERVATION ACTIONS.

The list could be compiled, updated as necessary, and distributed in several ways: mailed as an attachment in household water bills, made available online and linked from relevant websites, and printed to be handed out at any events at which a partner agency is engaging in outreach efforts.

BACKGROUND

In addition to the large-scale conservation measures discussed in other sections of this report, the everyday behaviors that make up residential water use have an effect on overall water use. Conservation behaviors are accessible to all residents, regardless of tenancy or budget, and this should be emphasized in any outreach efforts. A renter may not be able to replace appliances with higher-efficiency models, but would have less difficulty obtaining and installing faucet aerators. Not everyone can afford to install low-flow toilets in their bathrooms or a rain garden in their yard, but everyone can turn the tap off when brushing their teeth. Everyone can decline a glass of water at a restaurant if they don't intend to drink it, or reduce how often they take their car to the car-wash. A thorough, well-organized list of options and ideas can show that conservation decisions can be easy and accessible.

Residential water use, when compared to the figures for industrial, commercial, and agriculture use, can, so to speak, seem like a drop in the bucket. However, that is not to suggest that individual consumer behaviors are unimportant. Changing regular habits (e.g., water saved twice a day when brushing one's teeth, water saved each week by running a full dishwasher instead of hand-washing dishes, water saved each month by installing a more efficient washing machine) can and do add up. A point to emphasize when developing this list is that not every household or individual needs to attempt to take every listed action: as noted above, not every option will work for everyone. However, the benefit of such a list is not only providing information that may lead to reduced water use, but also encouraging water users to be more aware of their own habits and behaviors.

RESPONSIBLE AGENCIES

This strategy could be undertaken by a number of groups. CCRPC staff could oversee the compilation and some distribution of the list. CCRPC developed a model water use restriction ordinance in 2012; voluntary actions from that draft could be incorporated into the new document. Contributions could be made by representatives of municipalities, non-profits, or interested residents. Distribution could be undertaken in conjunction with all partner groups, including water utilities.

Type: Outreach

Strategy: Create voluntary conservation actions list focused on consumer behaviors.

Responsible Agencies: Municipal, county, and/or CCRPC staff

Timeframe: 0 to 5 years

TIMEFRAME

Initial implementation of this strategy is a short-term project. Distribution of the list, and keeping it updated, would be ongoing endeavors.

Strategy 7.4

PARTNER WITH OTHER STAKEHOLDERS TO SPONSOR WATER SCIENCE FAIRS AND OTHER EDUCATIONAL EVENTS.

ACTION:

SPONSOR OR CO-SPONSOR WATER-RELATED COMMUNITY EVENTS ON AN ANNUAL OR BIENNIAL BASIS.

Such events could include organizing the expos and roundtables outlined earlier in the report (Strategy 1.1), partnering with other agencies on expanding existing events, or hosting entirely new events, such as an annual water science fair, green infrastructure walking or biking tours, or household water-saving demos. Household water-saving demos would lend themselves well to a venue that already generates and attracts significant foot traffic, such as a farmers market or local festival. Green infrastructure tours could be incorporated into week- or month-long series of similar events. A water science fair could be created and held on an annual basis, using a venue such as a campus facility or public library.

Each of these educational opportunities could be made interesting and entertaining for multiple audiences, and each would be successful in keeping water topics in the public eye. Implementing several different types of educational events allows for participation at varying levels of time commitment from the audience: a water demo booth at a farmers market only requires a few minutes of attention from an audience at an event that they were already at, while participation in a water science fair would require a much larger time investment both in the home and at the event itself.

BACKGROUND

Water science outreach and education is foundational to many of the strategies in this report. By partnering with such educational institutions as local school districts, Parkland College, and the University of Illinois, a water science fair could be created, offering students and community members a participatory learning opportunity. Household water-saving demos, as part of a water science fair or at other community events, with tips that can be useful to both owners and renters, can also make water conservation accessible.

RESPONSIBLE AGENCIES

Like many of the strategies set out in this report, this will require significant collaboration. The water resources coordinator could be made responsible for overall coordination of such events. Partner agencies could contribute funding, labor, or space to any of the events discussed. Setting up a water-saving demo booth would require coordination with the host event and staff to design and implement it. A water science fair would likely require partnering with one or more local educational institutions; it would likely also require volunteers from the academic community to serve as judges.

Type: Outreach

Strategy: Partner with other stakeholders to sponsor water science fairs and other educational events.

Responsible Agencies: Water resources coordinator

Timeframe: 0 to 5 years

TIMEFRAME

This would be an ongoing effort, with the first educational event ideally to be held within five years of the publication of this report. Organization of the first of any type of event will be more time-consuming than organization of the same event in subsequent years.

Strategy 7.5

SPONSOR STREAM AREA LITTER CLEAN-UPS IN PARTNERSHIP WITH OTHER STAKEHOLDERS, PROVIDING BOTH CLEAN-UP BENEFITS AND EDUCATIONAL OPPORTUNITIES. PROMOTE GREATER ENFORCEMENT AND AWARENESS OF EXISTING ANTI-DUMPING ORDINANCES.

ACTION:

SUPPORT EXISTING OR CO-SPONSOR NEW REGULAR LITTER CLEAN-UPS INVOLVING A VARIETY OF COMMUNITY GROUPS, TO IMPROVE STREAM HEALTH AND PROVIDE EDUCATIONAL OPPORTUNITIES FOR PARTICIPANTS. PROMOTE GREATER ENFORCEMENT AND AWARENESS OF EXISTING ANTI-DUMPING ORDINANCES.

The annual Boneyard Creek Community Day, now in its eleventh year, is a multi-site cleanup event organized and sponsored by many local stakeholders⁹⁷. Additional stakeholder agencies could become sponsors for this event. CCRPC staff could work with the current organizers to assess the feasibility of adding other clean-up dates throughout the year, using the contacts and operational methods of the existing event.

If there is sufficient interest and sufficient accessible, safe locations, an ongoing program could be created and administrated, three times a year (in spring, summer, and autumn), with the option of organizing additional, smaller events upon request for individual classes or clubs.

Anti-dumping laws are already in place that cover larger items; greater enforcement and awareness of existing ordinances could also mitigate the dumping problem.

BACKGROUND

Streams in both urban and rural areas can collect detritus large and small. Plastic bags, food wrappers, and larger litter such as shopping carts and furniture can be discarded from vehicles and by pedestrians and accumulate in streams and on streambanks. With no action taken, the litter can remain in the area where it was dumped, detrimental both environmentally and aesthetically, or it can move downstream and present the same troubles in another area.

Stream litter and illegal dumping can impact water quality and human and ecosystem health, has a negative effect on any aesthetic or recreational benefits that the littered stream may provide. And while littering is a well-known environmental problem, first-hand experience on the part of clean-up volunteers can further raise awareness of the prevalence of the issue, and may possibly help alter individual behavior and prevent future littering.

RESPONSIBLE AGENCIES

Staff of any interested agencies not already involved in the Boneyard Creek Community Day could become partners or sponsors for the existing event, or could propose expanding the event as detailed above. Interested agencies could also work with law enforcement to promote greater enforcement and awareness of existing anti-dumping ordinances.

Type: Outreach

Strategy: Sponsor stream area litter clean-ups in partnership with other stakeholders, providing both clean-up benefits and educational opportunities. Promote greater enforcement and awareness of existing anti-dumping ordinances.

Responsible Agencies: Any/all interested stakeholder agencies

Timeframe: Ongoing

TIMEFRAME

This item is an ongoing effort.



Photo: Boneyard Creek Community Day, 2014, Greg McIsaac, <http://www.boneyardcreek.org/index.html#photos>

⁹⁷ University of Illinois at Urbana-Champaign Facilities & Services, "News Release. Boneyard Creek Community Day Begins Its Second Decade of Protecting Champaign Urbana Waterways," March 1, 2016, 1.

Strategy 7.6 PUBLICIZE AVAILABILITY AND USEFULNESS OF EXISTING WATER USE DATA.

ACTION:

INCLUDE AN INVENTORY OF RELATED RESEARCH OR OTHER DATA COLLECTION THAT HAS ALREADY BEEN DONE AS THE INITIAL STEP IN THE PLANNING PROCESS FOR ANY WATER-RELATED PROGRAM.

This strategy can easily fit into any research or planning methodology: for the sake of thoroughness, any agency or institution should be aware of existing or previous local projects and programs that relate to their own endeavors.

BACKGROUND

Although data and measurement are critical to goal-setting and benchmarking, it is also important not to discount the measurement and analysis already being done and the water data already available. Monthly water use appears on many residents' water bills, often in comparison with their water use in previous months. Water use data at the county and state level, broken down by sector, is also available online from the National Water Information System (NWIS), a USGS program, though it is only released once every five years.

Addressing goals of the scale discussed in this report is a daunting enough prospect without repeating work that has already been done. Significant amounts of data are already collected and distributed, and

much research has already been completed. Taking inventory of what research already exists and what programs are already underway, and doing so early in the planning process for any new project, can reveal opportunities for interagency partnerships and prevent duplicating efforts.

RESPONSIBLE AGENCIES

All stakeholders, and anyone performing research or developing programs related to water quality or water quantity, should incorporate this strategy into their practices.

TIMEFRAME

Like Strategy 1.3, this strategy is an inherently ongoing item: it is a recommendation to be applied to all future water planning endeavors, rather than an action item in and of itself.

RESOURCES

State- and county-level water data can be found on the USGS website, at <http://waterdata.usgs.gov/nwis>, using the National Water Information System's web interface.

Type: Outreach

Strategy: Publicize availability and usefulness of existing water use data.

Responsible Agencies: Any/all interested stakeholder agencies

Timeframe: Ongoing

Implementation and Conclusion

In 2016, in a context of recent drought and climate uncertainty, water issues are topical and pressing. East-Central Illinois is comparatively secure in its water quality and quantity, but it would be a gross miscalculation to assume that not facing a water crisis now implies never having to face a water crisis in the future.

This report is not intended to be an end unto itself. The strategies laid out in this document call for, and provide starting points for, action. They comprise a menu of options that stakeholders, from local governments to individual residents, can undertake. Stakeholder agencies can commit to work in partnerships or choose to act individually, selecting actions guided by their goals, organizational capacity, funding, and priorities. This report is also not comprehensive: there are still strides to be made in the areas of erosion control, stormwater detention, watershed management, and floodplain management, as well as in the areas discussed in this document. With approval from its member agencies, CCRPC will be able to facilitate partnerships and begin implementation of some strategies listed in this document, but other stakeholders can select, commit to, and begin implementing strategies as they see fit, without CCRPC's involvement, and using any planning and implementation process that is suitable to them.

Not every strategy outlined in this report will be appropriate for every stakeholder. However, everyone can do something to benefit the health of our water system and of our environment. Acting now, incorporating water-conscious behavior into our plans, our policy, and our everyday lives, we have the opportunity to maintain a healthy, plentiful water supply.

Appendix A:

Strategies Reference Guide

GENERAL RECOMMENDATIONS:

GR.1: EMPHASIZE THE CONNECTIVITY BETWEEN SURFACE WATER AND GROUNDWATER.

GR.2: PRIORITIZE RESEARCH ON THE MAHOMET AQUIFER AND OTHER PARTS OF THE REGIONAL WATER SYSTEM.

GR.3: DEVELOP INFORMED PUBLIC POLICY RELATING TO WATER QUALITY AND WATER QUANTITY ISSUES.

GR.4: PARTNER ON OUTREACH AND EDUCATION EFFORTS.

SECTION 1: STRATEGIES TO SUPPORT THE ADVANCEMENT OF KNOWLEDGE REGARDING GROUNDWATER RESOURCES

STRATEGY 1.1: Build relationships between research and policymaking communities via organizing and sponsoring or cosponsoring roundtables, expos, lectures, and other events.

ACTION: Work toward a more collaborative environment by organizing a series of events that will introduce members of the research and policymaking communities to each other and foster discussion of recent research, current best practices, and policy trends.

STRATEGY 1.2: Develop list of organizations currently involved in water research and advocacy in East-Central Illinois.

ACTION: Develop a directory of institutions and organizations in the region whose missions involve water issues.

STRATEGY 1.3: Highlight basic water science, including annual aquifer withdrawal and recharge cycle, in outreach and education efforts.

ACTION: Emphasize basic water science throughout outreach and education efforts.

STRATEGY 1.4: Fund research grants to support further study of groundwater and surface water systems.

ACTION: Create a grant program, funded jointly among several stakeholders, to help cover the costs of research in a variety of water topics. Convene a group of partner agencies, develop a funding structure, and form a review panel to administrate the application process.

SECTION 2: STRATEGIES TO STRENGTHEN UNDERSTANDING OF WATER USE

STRATEGY 2.1: Study feasibility of implementing unit-by-unit metering in multi-unit structures; implement where feasible.

ACTION: Evaluate the cost-effectiveness of unit-by-unit metering in multi-unit structures, and implement unit-by-unit metering in new construction where feasible.

STRATEGY 2.2: Implement pilot program measuring interior and exterior household water use.

ACTION: Establish a pilot program at the household or site level to measure both interior and exterior water use.

SECTION 3: STRATEGIES TO HELP ACHIEVE SUSTAINABLE LONG-TERM USE OF THE MAHOMET AQUIFER

STRATEGY 3.1: Develop or promote development of landscaping design and irrigation guidelines by a partner group; promote implementation of these guidelines.

ACTION: Promote the use of native plants in institutional, commercial, and residential landscaping in Champaign County.

STRATEGY 3.2: Promote appropriate use of high-efficiency fixtures in both new construction and retrofits.

ACTION: Promote the appropriate use of high-efficiency fixtures in both new construction and retrofits and in both residential and institutional buildings.

STRATEGY 3.3: Implement water use controls for new development on sites above a certain size or using above a certain amount of water.

ACTION: Evaluate potential water use guidelines for future development at the municipality level; determine which, if any, suit the community's vision and guiding principles; and implement them within five to 10 years of the publication of this report.

STRATEGY 3.4: Decrease the water system loss to below 10 percent.

ACTION: Partner with multiple stakeholder groups to gather benchmark data, establish reduction goals, adopt resolutions, and implement strategies to reach the set goals.

STRATEGY 3.5: Examine feasibility of policy revisions that would allow greywater reuse.

ACTION: Evaluate the feasibility of policy revisions that would allow greywater reuse in Illinois.

SECTION 4: STRATEGIES TO HELP PREVENT GROUNDWATER POLLUTION

STRATEGY 4.1: Develop programs that promote the avoidance of purchasing of products that cause harmful runoff, and the substitution of their safer alternatives.

ACTION: Develop a list of products or product components known to be harmful that have safer alternatives. If funding allows, offer rebates on environmentally safe products. Alternatively, promote adoption of a purchasing resolution to primarily purchase and use products already recognized by an existing program or environmental designation.

STRATEGY 4.2: Draft, promote, and implement a model resolution outlining best management practices in avoiding harmful runoff from road salt application.

ACTION: Research, draft, and present a model resolution advocating for road salt best management practices.

STRATEGY 4.3: Develop new or publicize existing guidelines on appropriate use of fertilizers and pesticides in urban and rural contexts.

ACTION: Inventory and publicize existing guidelines for responsible fertilizer and pesticide use. If no guidelines exist at the local level, develop and publicize guidelines tailored to the needs and circumstances of Champaign County.

STRATEGY 4.4: Promote and assist, where possible, efforts to locate and seal abandoned wells.

ACTION: Promote, support, and, when feasible, contribute funding to local programs that locate and seal abandoned wells.

SECTION 5: STRATEGIES TO ENCOURAGE REGIONAL COOPERATION IN PROTECTION OF THE MAHOMET AQUIFER

STRATEGY 5.1: Continue the annual Rain Barrel and Compost Bin Sale held in the City of Urbana. Expand via group partnerships, as feasible, to include additional dates and sites.

ACTION: Continue and, if possible, expand the Rain Barrel and Compost Bin Sale to include other dates and sites within the county.

STRATEGY 5.2: Publicize sustainable water use success stories from all sectors.

ACTION: Include local water success stories in any outreach and education efforts.

SECTION 6: STRATEGIES TO ENCOURAGE REGIONAL COOPERATION IN PROTECTING THE QUALITY AND QUANTITY OF SURFACE WATER

STRATEGY 6.1: Partner with experts to develop recommendations tailored to improving impaired streams.

ACTION: Publicize the status of assessed streams according to the Illinois EPA Bureau of Water's Illinois Integrated Water Quality Report and Section 303(d) list, and develop recommendations to improve the quality of each stream found to be in poor condition.

STRATEGY 6.2: Partner with experts to determine target streamflow conditions for major streams.

ACTION: Partner with experts from the University of Illinois, Prairie Research Institute, and other institutions to perform the necessary research to identify target streamflow conditions for major streams in Champaign County.

STRATEGY 6.3: Partner with other stakeholders on restoration efforts.

ACTION: Begin to plan restoration efforts informed by target streamflow conditions and existing and ongoing streamflow research.

STRATEGY 6.4: Recommend that municipalities inventory the channelized streams within their boundaries.

ACTION: Encourage municipalities to take an inventory of any channelized and/or underground streams within corporate limits, and to evaluate the feasibility, costs, and benefits of dechannelizing these streams.

STRATEGY 6.5: Create a stream stakeholders inventory, identifying potential partners for each creek, stream, and river.

ACTION: Develop a stakeholders inventory that identifies potential partner organizations and agencies for each major water body in the county.

STRATEGY 6.6: Preserve, protect, and, where feasible, expand existing wetland areas.

ACTION: Protect and preserve wetland areas within the county, and promote the consideration of expanding existing wetlands as part to serve as part of a larger green infrastructure system.

STRATEGY 6.7: Draft green infrastructure standards for public sites and facilities, if not already present. Promote implementation of these standards.

ACTION: Draft standards for city sites and facilities to incorporate green infrastructure elements, in addition to or instead of gray infrastructure elements.

STRATEGY 6.8: Publicize benefits of green infrastructure concerning not only water but other environmental issues.

ACTION: Make green stormwater infrastructure a topic of focus throughout outreach efforts.

STRATEGY 6.9: Investigate feasibility, advantages, and disadvantages of using permeable pavement.

ACTION: Evaluate pros and cons of different types of permeable pavement for different types of projects; develop site characteristics evaluation template.

STRATEGY 6.10: If not already done, consider altering parts of local subdivision and/or zoning ordinances to encourage a smaller percentage of impervious surfaces in new development.

ACTION: Encourage the county and municipalities to evaluate the option of altering their subdivision code, or altering the zoning ordinance in part or all of their jurisdiction, to encourage a smaller percentage of impervious surfaces per lot for new development.

STRATEGY 6.11: Develop effective programs to minimize water contamination by HHW and PPCPs.

ACTION: Publicize the risks of water contamination via HHW and PPCPs, distribute information on mitigation strategies, and develop effective programs to prevent HHW and PPCP contamination. Publicize ongoing research and the recommendations included in the “Local Government Toolkit: Improving HHW Collection Options in Illinois.”

STRATEGY 6.12: Evaluate opportunities to promote cleaner industrial discharge, including increased on-site pretreatment of industrial discharge.

ACTION: Look for opportunities to promote cleaner industrial discharge, including incentivizing increased on-site pretreatment of industrial discharge.

STRATEGY 6.13: Evaluate and publicize risks to water quality from swimming pools not receiving appropriate care.

ACTION: Determine whether improper swimming pool care presents a water quality risk in Champaign County.

SECTION 7: STRATEGIES TO FURTHER PUBLIC ENGAGEMENT IN AND EDUCATION ON WATER ISSUES

STRATEGY 7.1: Prepare presentations on the water cycle, connectivity between surface water and groundwater, and other water topics, and guidelines on revising them for multiple audiences. Develop pamphlets or brochures covering the same content. Evaluate any existing open source resources available for public use covering this content.

ACTION: Develop a series of presentations on water topics, including but not limited to the water cycle and water system, household water conservation, water use in agriculture, and point- and non-point source pollution prevention. Make this content available online for free and open use, and print it in small brochures or booklets for distribution at community events. Make multiple versions or revision guidelines available to facilitate adapting the content to a range of ages and audiences.

STRATEGY 7.2: Begin a water newsletter covering current and upcoming events, research projects, and other items of interest.

ACTION: Develop a water topics newsletter, to be published on a regular schedule and distributed to stakeholders throughout the region.

STRATEGY 7.3: Create voluntary conservation actions list focused on consumer behaviors.

ACTION: Develop and distribute a document describing a range of voluntary consumer conservation actions.

STRATEGY 7.4: Partner with other stakeholders to sponsor water science fairs and other educational events.

ACTION: Sponsor or co-sponsor water-related community events on an annual or biannual basis.

STRATEGY 7.5: Sponsor stream area litter clean-ups in partnership with other stakeholders, providing both clean-up benefits and educational opportunities.

ACTION: Support existing or co-sponsor new regular litter clean-ups involving a variety of community groups, to improve stream health and provide educational opportunities for participants. Promote greater enforcement and awareness of existing anti-dumping ordinances.

STRATEGY 7.6: Publicize availability and usefulness of existing water use data.

ACTION: Include an inventory of related research or other data collection that has already been done as the initial step in the planning process for any water-related program.

Appendix B:

Strategies by Theme

Theme	Strategy	Timeframe	Text
Research	1.1	Ongoing	Build relationships between research and policymaking communities.
	1.2	Short-term	Develop list of organizations currently involved in water research and advocacy in East-Central Illinois.
	1.4	Short-term and ongoing	Fund research grants to support further study of groundwater and surface water systems.
	2.1	Medium-term	Study feasibility of implementing unit-by-unit metering in multi-unit structures; implement where feasible.
	2.2	Medium-term	Implement pilot program measuring interior and exterior household water use.
	6.1	Short-term	Partner with experts to develop specific recommendations for improving impaired streams.
	6.2	Short-term	Partner with experts to determine target streamflow conditions for major streams.
	6.4	Medium-term and ongoing	Recommend that municipalities inventory their channelized streams.

Theme	Strategy	Timeframe	Text
	6.9	Medium-term	Evaluate pros and cons of different types of permeable pavement for different types of projects; develop site characteristics evaluation template.
Policy	3.1	Medium-term	Develop or promote development of landscaping and irrigation guidelines.
	3.2	Ongoing	Promote appropriate use of high-efficiency fixtures in both new construction and retrofits.
	3.3	Long-term	Implement water use controls for new development on sites above a certain size or using above a certain amount of water.
	3.4	Long-term	Decrease the water system loss to below 10%.
	3.5	Short-term	Examine feasibility of policy revisions that would allow greywater reuse.
	4.1	Medium-term	Develop programs that promote the avoidance of purchasing of products that cause harmful runoff, and the substitution of their safer alternatives.
	4.2	Short-term	Draft, promote, and implement model resolution outlining best management practices in avoiding harmful runoff from road salt application.
	4.3	Ongoing	Develop new or publicize existing guidelines on appropriate use of fertilizers and pesticides in urban and rural contexts.
	4.4	Long-term	Promote and assist efforts to locate and seal abandoned wells.
	6.3	Long-term and ongoing	Partner with other stakeholders on stream restoration efforts.
	6.5	Short-term	Create a stream stakeholders inventory, identifying potential partners for each creek, stream, and river.
	6.6	Ongoing	Preserve, protect, and, where feasible, expand existing wetland areas.
	6.7	Medium-term	Draft green infrastructure standards for public sites and facilities, if not already present; promote implementation of these standards.

Theme	Strategy	Timeframe	Text
	6.1	Medium-term	If not already done, consider altering parts of local subdivision and/or zoning ordinances to encourage a smaller percentage of impervious surfaces in new development.
	6.11	Ongoing	Develop effective programs to minimize water contamination via HHW and PPCPs.
	6.12	Long-term	Evaluate opportunities to promote cleaner industrial discharge.
Outreach	1.3	Ongoing	Highlight basic water science in outreach and education efforts.
	5.1	Ongoing	Continue the annual Rain Barrel and Compost Bin Sale held in the City of Urbana, and expand via group partnerships, as feasible, to include additional dates and/or sites.
	5.2	Ongoing	Publicize sustainable water use success stories from all sectors.
	6.8	Ongoing	Publicize benefits of green infrastructure concerning not only water but other environmental issues.
	6.13	Short- or medium-term	Evaluate and publicize risks to water quality from swimming pools not receiving appropriate care.
	7.1	Short-term	Prepare and distribute presentations and printed materials on water topics.
	7.2	Short-term	Begin a water newsletter covering current and upcoming events, research projects, and other items of interest.
	7.3	Short-term	Create voluntary conservation actions list focused on consumer behaviors.
	7.4	Short-term	Partner with other stakeholders to sponsor water science fairs and other educational events.
	7.5	Ongoing	Sponsor stream area litter clean-ups in partnership with other stakeholders. Promote greater enforcement and awareness of existing anti-dumping ordinances.
	7.6	Ongoing	Publicize availability and usefulness of existing water use data.

Appendix C:

Strategies by Timeframe

Timeframe		Strategy	Responsible Agencies	Text
Within Years	Five	1.2	CCRPC staff	Develop list of organizations currently involved in water research and advocacy in East-Central Illinois.
		1.4	All interested stakeholder agencies	Fund research grants to support further study of groundwater and surface water systems.
		3.5	Any interested stakeholders	Examine feasibility of policy revisions that would allow greywater reuse.
		4.2	CCRPC, municipal, and/or county staff, municipal and/or county elected officials	Draft, promote, and implement model resolution outlining best management practices in avoiding harmful runoff from road salt application.
		6.1	CCRPC, ISWS, University of Illinois Extension, other environmental agencies and groups	Partner with experts to develop specific recommendations for improving impaired streams.
		6.2	ISWS, University of Illinois, county and municipal governments	Partner with experts to determine target streamflow conditions for major streams.
		6.5	CCRPC staff	Create a stream stakeholders inventory, identifying potential partners for each creek, stream, and river.
		6.13	CCRPC, municipal or county staff	Evaluate and publicize risks to water quality from swimming pools not receiving appropriate care.

Timeframe	Strategy	Responsible Agencies	Text
Five to 10 Years	7.1	CCRPC, all interested partner agencies	Prepare and distribute presentations and printed materials on water topics.
	7.2	Water resources coordinator	Begin a water newsletter covering current and upcoming events, research projects, and other items of interest.
	7.3	CCRPC staff	Create voluntary conservation actions list focused on consumer behaviors.
	7.4	Water resources coordinator, all interested stakeholder agencies	Partner with other stakeholders to sponsor water science fairs and other educational events.
	2.1	Water utilities, sanitary districts, owners and operators of multi-unit structures	Study feasibility of implementing unit-by-unit metering in multi-unit structures; implement where feasible.
	2.2	Water utilities, research institution, CCRPC staff	Implement pilot program measuring interior and exterior household water use.
	3.1	Water resources coordinator, municipal or county staff, research institutions, other stakeholder groups	Develop or promote development of landscaping design and irrigation guidelines.
	4.1	Municipal and CCRPC staff, research institutions, water resources coordinator	Develop programs that promote the avoidance of purchasing of products that cause harmful runoff, and the substitution of their safer alternatives.
	6.4	CCRPC, municipal and/or county staff	Recommend that municipalities inventory their channelized streams.
	6.7	Municipal, county, and/or CCRPC staff	Draft green infrastructure standards for public sites and facilities, if not already present; promote implementation of these standards.
	6.9	Municipal, county, and CCRPC staff, expert partners	Evaluate pros and cons of different types of permeable pavement for different types of projects; develop site characteristics evaluation template.
	6.1	Municipal, county, and/or CCRPC staff	If not already done, consider altering parts of local subdivision and/or zoning ordinances to encourage a smaller percentage of impervious surfaces in new development.
	6.13	CCRPC, municipal or county staff	Evaluate and publicize risks to water quality from swimming pools not receiving appropriate care.

Timeframe	Strategy	Responsible Agencies	Text
Over 10 Years	3.3	Municipal staff and elected officials	Implement water use controls for new development on sites above a certain size or using above a certain amount of water.
	3.4	Water utilities, municipal and county governments	Decrease the water system loss to below 10%.
	4.4	Champaign County Soil & Water Conservation District	Promote and assist efforts to locate and seal abandoned wells.
	6.3	Any interested stakeholders	Partner with other stakeholders on stream restoration efforts.
	6.12	County and municipal governments, Champaign County Economic Development Corporation, industry groups	Evaluate opportunities to promote cleaner industrial discharge.
Ongoing	GR.1	All stakeholders	Prioritize research on the Mahomet Aquifer and other parts of the regional water system.
	GR.2	All stakeholders	Emphasize the connectivity between surface water and groundwater.
	GR.3	All stakeholders	Partner on outreach and education efforts.
	1.1	Academic communities, municipal governments, planning staff, CCRPC	Build relationships between research and policymaking communities.
	1.3	Water resources coordinator	Highlight basic water science in outreach and education efforts.
	3.2	All interested stakeholders	Promote appropriate use of high-efficiency fixtures in both new construction and retrofits.
	4.3	Water resources coordinator	Develop new or publicize existing guidelines on appropriate use of fertilizers and pesticides in urban and rural contexts.
	5.1	CCRPC, municipal and county staff, sale vendor	Continue the annual Rain Barrel and Compost Bin Sale held in the City of Urbana, and expand via group partnerships, as feasible, to include additional dates and/or sites.

Timeframe	Strategy	Responsible Agencies	Text
	5.2	Water resources coordinator	Publicize sustainable water use success stories from all sectors.
	6.6	CCRPC staff, municipal and county governments	Preserve, protect, and, where feasible, expand existing wetland areas.
	6.8	Water resources coordinator	Publicize benefits of green infrastructure concerning not only water but other environmental issues.
	6.11	CCRPC, HHW leadership team (representative of all stakeholders)	Develop effective programs to minimize water contamination via HHW and PPCPs.
	7.5	All interested stakeholders	Sponsor stream area litter clean-ups in partnership with other stakeholders. Promote greater enforcement and awareness of existing anti-dumping ordinances.
	7.6	All stakeholders and partner agencies	Publicize availability and usefulness of existing water use data.

Appendix D:

Strategies by Responsible Party

Responsible Agency or Party	Strategy	Timeframe	Text
Any/all interested stakeholder agencies	GR.1	Ongoing	Prioritize research on the Mahomet Aquifer and other parts of the regional water system.
	GR.2	Ongoing	Emphasize the connectivity between surface water and groundwater.
	GR.3	Ongoing	Partner on outreach and education efforts.
	1.1	Ongoing	Build relationships between research and policymaking communities.
	1.4	Short-term and ongoing	Fund research grants to support further study of groundwater and surface water systems.
	3.1	Medium-term	Develop or promote development of landscaping and irrigation guidelines.
	3.2	Ongoing	Promote appropriate use of high-efficiency fixtures in both new construction and retrofits.
	6.3	Long-term and ongoing	Partner with other stakeholders on stream restoration efforts.
	7.5	Ongoing	Sponsor stream area litter clean-ups in partnership with other stakeholders. Promote greater enforcement and awareness of existing anti-dumping ordinances.
	7.6	Ongoing	Publicize availability and usefulness of existing water use data.

Responsible Agency or Party	Strategy	Timeframe	Text
Water resources coordinator	1.3	Ongoing	Highlight basic water science in outreach and education efforts.
	5.2	Ongoing	Publicize sustainable water use success stories from all sectors.
	6.8	Ongoing	Publicize benefits of green infrastructure concerning not only water but other environmental issues.
	7.1	Short-term	Prepare and distribute presentations and printed materials on water topics.
	7.2	Short-term	Begin a water newsletter covering current and upcoming events, research projects, and other items of interest.
	7.4	Short-term	Partner with other stakeholders to sponsor water science fairs and other educational events.
Municipal, county, and/or CCRPC staff	1.2	Short-term	Develop list of organizations currently involved in water research and advocacy in East-Central Illinois.
	3.1	Medium-term	Draft green infrastructure standards for public sites and facilities, if not already present; promote implementation of these standards.
	3.3	Long-term	Implement water use controls for new development on sites above a certain size or using above a certain amount of water.
	3.5	Short-term	Examine feasibility of policy revisions that would allow greywater reuse.
	4.1	Medium-term	Develop programs that promote the avoidance of purchasing of products that cause harmful runoff, and the substitution of their safer alternatives.
	4.2	Short-term	Draft, promote, and implement model resolution outlining best management practices in avoiding harmful runoff from road salt application.
	4.3	Ongoing	Develop new or publicize existing guidelines on appropriate use of fertilizers and pesticides in urban and rural contexts.
	5.1	Ongoing	Continue the annual Rain Barrel and Compost Bin Sale held in the City of Urbana, and expand via group partnerships, as feasible, to include additional dates and/or sites.

Responsible Agency or Party	Strategy	Timeframe	Text
	6.4	Medium-term ongoing	Recommend that municipalities inventory their channelized streams.
	6.5	Short-term	Create a stream stakeholders inventory, identifying potential partners for each creek, stream, and river.
	6.6	Ongoing	Preserve, protect, and, where feasible, expand existing wetland areas.
	6.7	Municipal, county, and/or CCRPC staff	Draft green infrastructure standards for public sites and facilities, if not already present; promote implementation of these standards.
	6.9	Medium-term	Evaluate pros and cons of different types of permeable pavement for different types of projects; develop site characteristics evaluation template.
	6.1	Medium-term	If not already done, consider altering parts of local subdivision and/or zoning ordinances to encourage a smaller percentage of impervious surfaces in new development.
	6.11	Ongoing	Develop effective programs to minimize water contamination via HHW and PPCPs.
	6.12	Long-term	Evaluate opportunities to promote cleaner industrial discharge.
	6.13	Short- or medium-term	Evaluate and publicize risks to water quality from swimming pools not receiving appropriate care.
	7.3	Short-term	Create voluntary conservation actions list focused on consumer behaviors.
Research institutions	6.1	Short-term	Partner with experts to develop specific recommendations for improving impaired streams.
	6.2	Short-term	Partner with experts to determine target streamflow conditions for major streams.
Water utilities	2.1	Medium-term	Study feasibility of implementing unit-by-unit metering in multi-unit structures; implement where feasible.
	2.2	Medium-term	Implement pilot program measuring interior and exterior household water use.
	3.4	Long-term	Decrease the water system loss to below 10%.
Other partner agencies	4.4	Long-term	Promote and assist efforts to locate and seal abandoned wells.

Appendix E: Strategies by Water Quality/Water Quantity Focus

Type	Strategy	Timeframe	Text
Water Quality	4.1	Medium-term	Develop programs that promote the avoidance of purchasing of products that cause harmful runoff, and the substitution of their safer alternatives.
	4.2	Short-term	Draft, promote, and implement model resolution outlining best management practices in avoiding harmful runoff from road salt application.
	4.3	Ongoing	Develop new or publicize existing guidelines on appropriate use of fertilizers and pesticides in urban and rural contexts.
	4.4	Long-term and ongoing	Promote and assist efforts to locate and seal abandoned wells.
	6.1	Short-term	Partner with experts to develop specific recommendations for improving impaired streams.
	6.2	Short-term	Partner with experts to determine target streamflow conditions for major streams.
	6.3	Long-term and ongoing	Partner with other stakeholders on stream restoration efforts.
	6.6	Ongoing	Preserve, protect, and, where feasible, expand existing wetland areas.
	6.9	Medium-term	Evaluate pros and cons of different types of permeable pavement for different types of projects; develop site characteristics evaluation template.

Type	Strategy	Timeframe	Text
	6.11	Ongoing	Develop effective programs to minimize water contamination via HHW and PPCPs.
	6.12	Short- to long-term	Evaluate opportunities to promote cleaner industrial discharge.
	6.13	Short-term or medium-term	Evaluate and publicize risks to water quality from swimming pools not receiving appropriate care.
	7.5	Ongoing	Sponsor stream area litter clean-ups in partnership with other stakeholders. Promote greater enforcement and awareness of existing anti-dumping ordinances.
Water Quantity	2.1	Medium-term	Study feasibility of implementing unit-by-unit metering in multi-unit structures; implement where feasible.
	2.2	Medium-term	Implement pilot program measuring interior and exterior household water use.
	3.1	Short- or medium-term and ongoing	Develop or promote development of landscaping and irrigation guidelines.
	3.2	Ongoing	Promote appropriate use of high-efficiency fixtures in both new construction and retrofits.
	3.3	Long-term	Implement water use controls for new development on sites above a certain size or using above a certain amount of water.
	3.4	Long-term and ongoing	Decrease the water system loss to below 10%.
	5.1	Ongoing	Continue the annual Rain Barrel and Compost Bin Sale held in the City of Urbana, and expand via group partnerships, as feasible, to include additional dates and/or sites.
	5.2	Ongoing	Publicize sustainable water use success stories from all sectors.
	7.3	Short-term	Create voluntary conservation actions list focused on consumer behaviors.
	7.6	Ongoing	Publicize availability and usefulness of existing water use data.

Type	Strategy	Timeframe	Text
Both Water Quality and Water Quantity, or Other	1.1	Ongoing	Build relationships between research and policymaking communities.
	1.2	Short-term	Develop list of organizations currently involved in water research and advocacy in East-Central Illinois.
	1.3	Ongoing	Highlight basic water science in outreach and education efforts.
	1.4	Short-term and ongoing	Fund research grants to support further study of groundwater and surface water systems.
	3.5	Short-term	Examine feasibility of policy revisions that would allow greywater reuse.
	6.4	Medium-term and ongoing	Recommend that municipalities inventory their channelized streams.
	6.5	Short-term	Create a stream stakeholders inventory, identifying potential partners for each creek, stream, and river.
	6.7	Medium-term	Draft green infrastructure standards for public sites and facilities, if not already present; promote implementation of these standards.
	6.8	Ongoing	Publicize benefits of green infrastructure concerning not only water but other environmental issues.
	6.1	Short- or medium-term	If not already done, consider altering parts of local subdivision and/or zoning ordinances to encourage a smaller percentage of impervious surfaces in new development.
	7.1	Short-term	Prepare and distribute presentations and printed materials on water topics.
	7.2	Ongoing	Begin a water newsletter covering current and upcoming events, research projects, and other items of interest.
	7.4	Short-term and ongoing	Partner with other stakeholders to sponsor water science fairs and other educational events.

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