2.8 PLANNING ISSUES – WATER RESOURCES

Objectives:

1. To recognize an integrated system of land and water resources is a major component of our built and natural environment.

2. To preserve and protect the quantity and quality of drinking water supplies and to ensure sustainable yields for current and future generations.

3. To protect and improve the water quality and beneficial uses of surface waters for ecosystem habitat and healthy living.

4. To promote Integrated Water Resource Planning as a tool for water supply, stormwater management, and water reclamation and reuse in order to strategically link the beneficial uses of water over a broad spectrum of human and ecosystem needs.

5. To promote water conservation and efficiency, the reuse of gray water and the recycling of reclaimed water to reduce water demands and conserve energy.

6. To promote Green Infrastructure best management practices and technologies to filter and capture stormwater runoff for improved water quality, groundwater recharge and to enhance the health and livability of our communities and ecosystems.

7. To promote water resource driven land use decisions when updating land use policies and ordinances.

8. To promote drought management planning and the monitoring of aquifer levels and stream flows for decision making in the event of a drought.

9. To integrate water resource planning and management with energy, transportation, housing, wildlife habitat, open space and land use planning.

Chapter Focus

The increasing demand for water due to a growing County population and finding adequate and sustainable water supplies for both human and ecosystem needs is one of the major challenges in the 2040 Plan. Lake Michigan water is not considered a viable option for Kane County in the future due to cost and national and international laws so the long term sources for drinking water are the Fox River, shallow groundwater, and deep aquifers. Kane County is proud to be one of the leaders in the region and in Illinois in recognizing these resources as our greatest natural assets and this plan emphasizes their protection and enhancement. Besides the increasing population, the drought of 2005 emphasized the need for additional efforts in working with the 30 municipalities of Kane County along with our neighboring counties and the region to meet future water supply demands. This Water

Resource Chapter incorporates the results of the *Kane County Water Resources Investigation*s (2009) prepared by the ISWS, supports the efforts of CMAP to implement the *Northeastern Illinois Regional Water Supply/Demand Plan – Water 2050* (2010), reinforces the water resource recommendations in the CMAP *Go to 2040 Plan* (2010), and emphasizes the need to integrate water resources with land use-decision making.

This chapter examines:

- Regional Approach to Water Supply Planning
- Water Resources in Kane County
- Water Conservation and Drought Planning
- Water Resource Driven Land Use Decisions
- Integrated Water Resource Planning

Regional Approach to Water Supply Planning

In the United States most people have easy access to drinkable tap water that is clean and plentiful. While the Great Lakes Region as a whole has not experienced any major water shortages, the future water available to our region is finite. Most important to Kane County in this regard is that Lake Michigan water, although available to 77-percent of the population in the metropolitan Chicago region, it is not likely to ever be available to our County and other outlying counties in the region due to the excessive cost to construct a Lake Michigan pipeline and storage facilities. This leads the County in this Plan to identify a drinking water supply for a growing population as one of the major challenges facing our citizens and decision makers. The 2040 challenge to Kane County is providing drinking water for a growing population by utilizing the Fox River and the shallow and deep aquifer systems during times of both adequate rainfall and times of drought.

Kane County's leadership and commitment to water supply planning in the region is evidenced by the extensive Illinois State Water Survey (ISWS) and Illinois State Geological Survey (ISGS) scientific investigations conducted for Kane County between 2002 and 2009. These investigations, the first of their kind in the State of Illinois, further defined the sources of Kane County's drinking water, the shallow and deep groundwater aquifers, and the surface water in the Fox River, and their ability to be utilized for a growing population. These investigations also projected the limitations to water withdrawals from each of the sources. They further served as a jump-start for the scientific investigations and water supply planning in the 11 county Northeastern Illinois Regional Water Supply Planning Area.

Regional Water Supply Planning

In 1994 after numerous communities in northeastern Illinois abandoned their deep aquifer wells and began using Lake Michigan water, withdrawals from the deep aquifer system again began increasing beyond sustainable amounts. The minor drought of 2005 in northeastern Illinois raised additional concerns and caused the State of Illinois to initiate in earnest a program of long term water supply planning. In January 2006, the Governor signed Executive Order 2006-01, requiring the Illinois Department of Natural Resources (IDNR) to lead state and regional water-supply planning activities. To begin that effort, the ISWS prepared a report titled *Prioritizing Illinois Aquifers and Watersheds for Water Supply Planning.* The 11-county Northeastern Illinois Regional Water Supply Planning area was identified as one of the priority regions in that report. The State contracted with the Chicago Metropolitan Agency for Planning (CMAP) to initiate and facilitate the preparation of the 11-county *Northeastern Illinois Regional Water Supply/Demand Plan – Water 2050*, which was released in March 2010. The Plan recognizes that the water supply planning issues in Kane County and other collar counties that rely on inland surface water or groundwater for drinking water are different than in the Lake Michigan service area. Kane County is at the center of the Fox River Valley sub-region that will be dependent on groundwater and inland surface water in the future (Figure 55). Because of its projected population growth, Kane County will experience the impacts of over pumping of the deep aquifer and shallow aquifers more so than our neighbors to the north, west and south.

Figure 55

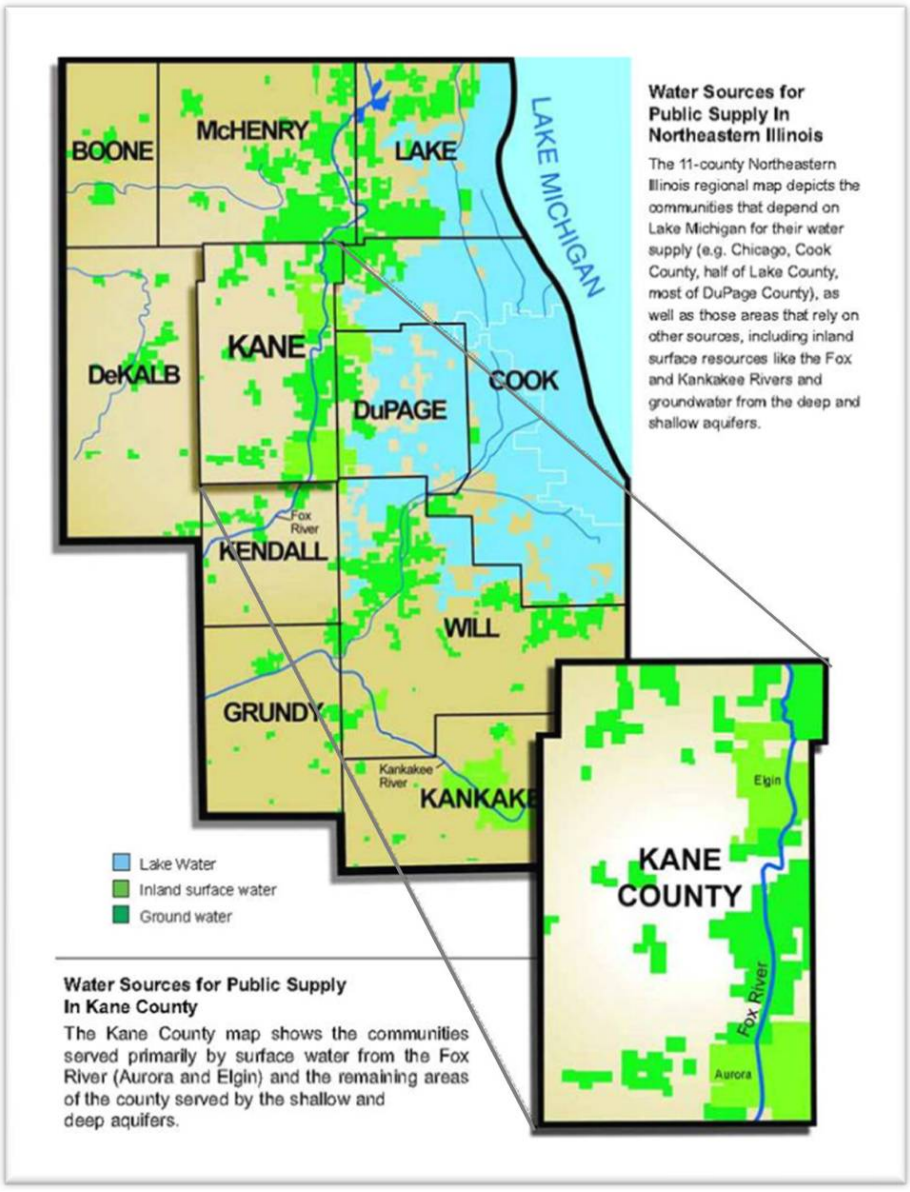


Figure 56

CMAP WATER 2050 Plan Recommendations that Promote the Policies and Objectives of the Kane County2040 Plan

- Protect Groundwater Recharge Areas
- Promote Stormwater Retention
- Use of Green Infrastructure
- Encourage Conservation Design
- Integrate Water Supply Planning with Land Use Planning
- Watershed Planning
- Water Quality Protection/Chloride Reduction
- Nutrient Reduction
- Conservation Coordinator
- Residential Plumbing/Appliance Retrofit
- Large Landscape Conservation Program
- Public Information Plan
- School Education Program
- Water Rate/Conservation Pricing
- Graywater Use
- Wastewater (Brown Water) Reuse
- Drought Preparedness

The CMAP *Water 2050* Northeastern Illinois regional water supply/demand plan calls for improved water conservation and demand management, and includes more than 200 recommendations directed at state, regional, county, municipal, and other public agencies. It also has practical suggestions for how residential and commercial consumers can reduce waste and conserve water. Appendix B in the CMAP Plan contains the detailed list of the recommendations. The recommendations that are directed to counties and municipalities and that promote the objectives and policies of this Plan are listed in Figure 56. CMAP also incorporated the recommendations into their GO TO 2040 Plan (October 2010).

Northwest Water Planning Alliance

Because of the lack of authority from the State of Illinois for local government to regulate water withdrawals, the use of intergovernmental agreements for water supply planning among counties and municipalities is an implementation strategy discussed in the CMAP *Water 2050 Plan*. Kane County initiated discussions in that regard with municipal leaders even before finalization of the recommendations of the *Water 2050 Plan.* Those discussions evolved into the Northwest Water Planning Alliance (NWPA) formed in September 2010, which utilizes the adoption of intergovernmental agreements among the counties of Kane, Kendall, DeKalb, McHenry and Lake County and five Councils of Government representing approximately 80 communities that will not rely on Lake Michigan water. The NWPA consists of county and municipal elected officials that serve in a leadership role as the Executive Committee and a Technical Advisory Committee made up of county and municipal non-elected water professionals to provide guidance to the Executive Committee on implementing the priority goals of the Alliance. One of the first goals being addressed by the NWPA is water conservation and efficiency.

Water Resources of Kane County

There are two groundwater aquifers below the ground surface in Kane County. The shallow aquifer formations are generally from 5 to about 400 feet below the ground surface and consist of sands, gravels and the upper portions of fractured limestone or shale bedrock. The shallow aquifers are replenished from local rainfall infiltration and streams. The

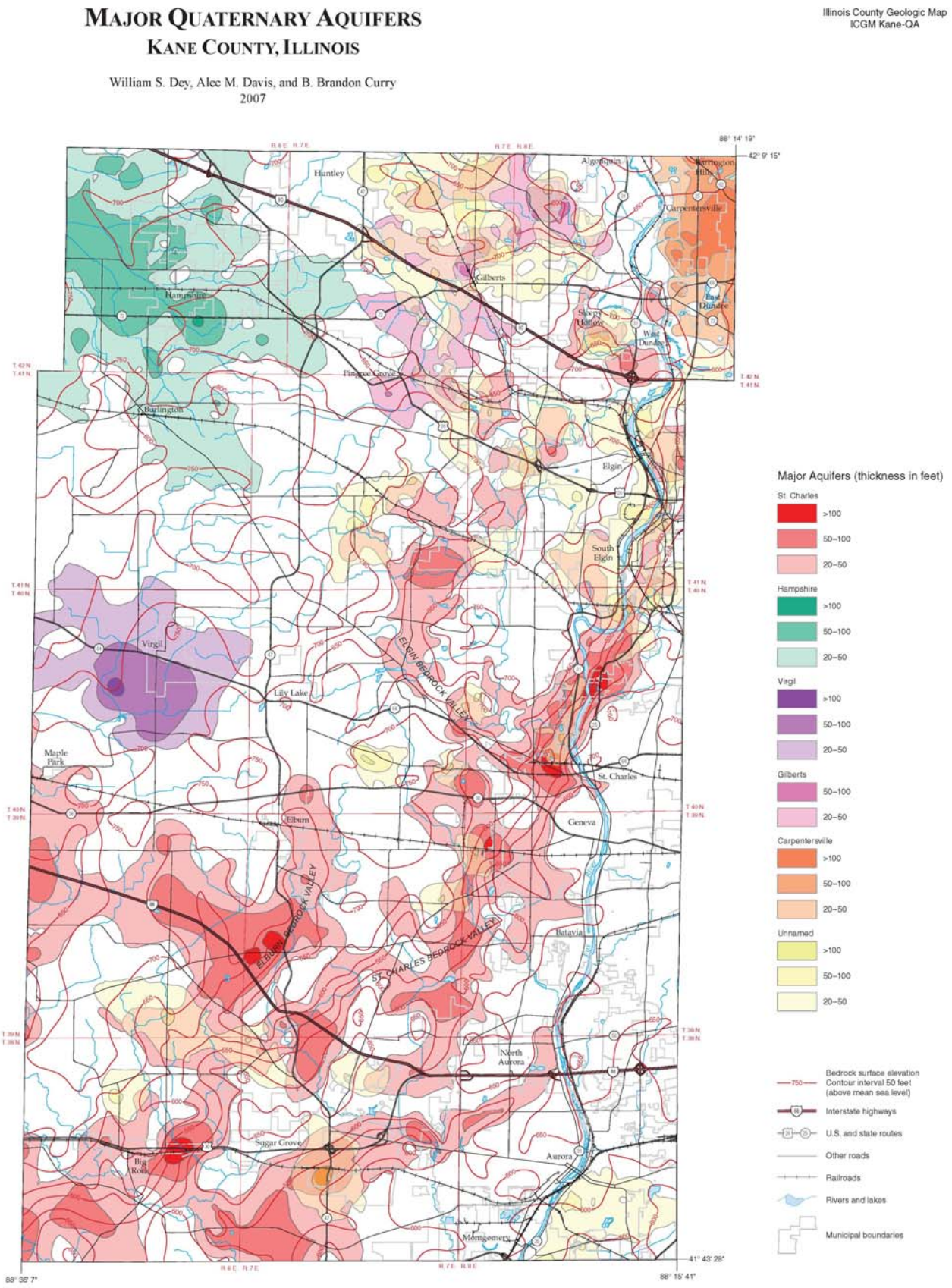
locations of the major shallow aquifers are concentrated in buried bedrock valleys and thick layers of sands and gravels throughout the County as shown in Figure 57.

The deep aquifer formations exist from about 600 to 2,000 feet below the ground surface and consist of different layers of sandstone and limestone that are separated from the shallow aquifers by a very hard layer of limestone that was considered by the ISWS in their scientific studies as impermeable. The deep aquifers are replenished by rainfall infiltration and streams in northwestern Illinois. However it takes several thousand years for the water to travel through the limestone and sandstone layers eastward into Kane County.

The Fox River is our largest surface water resource and supplies drinking water to the cities of Aurora and Elgin. The water quality of the Fox River has improved via major investments and improvements made to existing municipal sewage treatment plants and improved stormwater management. To further improve water quality, additional efforts are needed in removing nutrients and pharmaceuticals potentially harmful to aquatic life that are still being discharged into the river from these facilities. Also the pollutants carried in stormwater runoff from man's activities on the land (i.e.: fertilizers, pesticides, de-icing chemicals, oils and other non-biodegradable wastes) degrade water quality in the tributary streams and main stem of the Fox River. To meet drinking water standards these pollutants must be removed through very expensive treatment processes, the costs of which must be borne by the drinking water users. Future challenges will be to incorporate cost-effective advanced wastewater treatment technology to remove additional pollutants from wastewater and to incorporate Green Infrastructure on the land surface to further infiltrate or clean stormwater runoff.

The aquifers and the Fox River within Kane County extend beyond our borders into neighboring counties and Wisconsin. Whatever water is added or withdrawn in these areas from the aquifers and the river has an impact on the quantity and quality of the water available in Kane County. Additionally, Kane County and its 30 municipalities do not individually control the water in either the aquifers or the Fox River. Accordingly, the aquifers and the Fox River need to be considered as shared resources that must be managed and utilized for the common good and the health of the entire County population. The ISWS reports and maps show where communities in Kane County share the same aquifers and in some locations compete for the same water. This competition continues to lower the pumping levels in both shallow and deep aquifer wells (Figures 58 and 59). The reports also demonstrate that the reclaimed water discharged into the upper portions of the Fox River is the same water withdrawn downstream and purified for drinking water supply.

Figure 57



Note: A full map with the scale and the associated map text, which must be referred to when interpreting this map, and other maps and references to the Kane County Water Resources Investigations by the ISWS and ISGS are available for viewing and downloading at the following web site as of January 2012: http://www.isgs.uiuc.edu/maps-data-pub/county-maps/kane-co.shtml ".

Figure 58

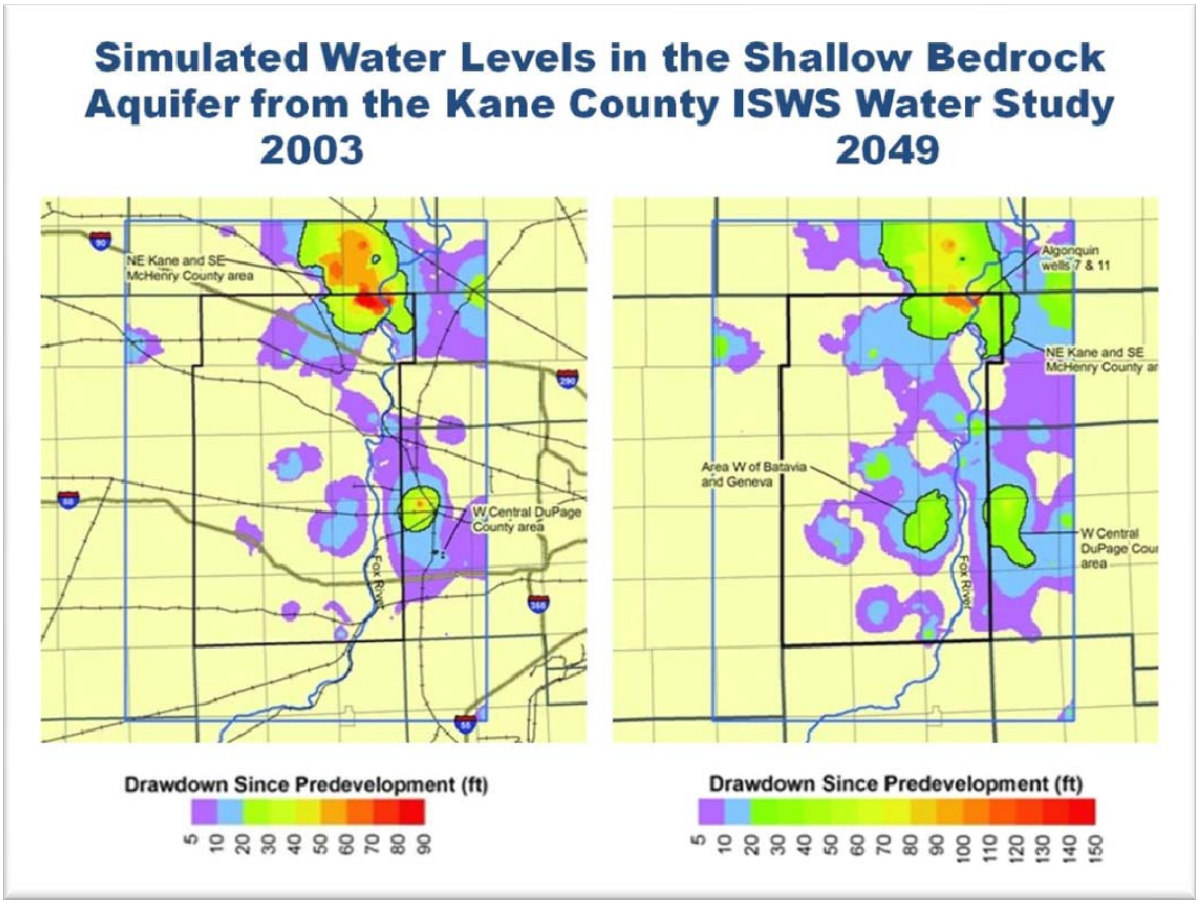
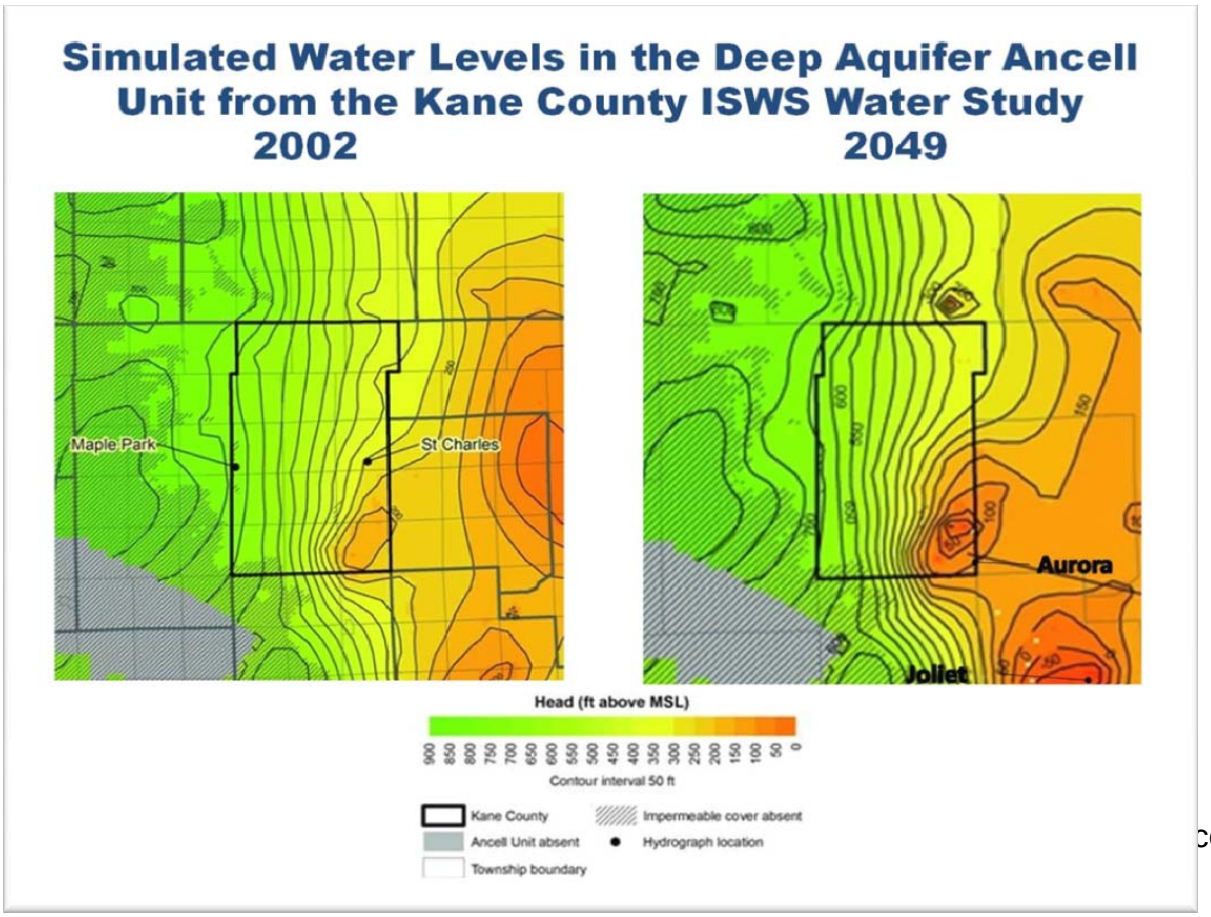


Figure 59



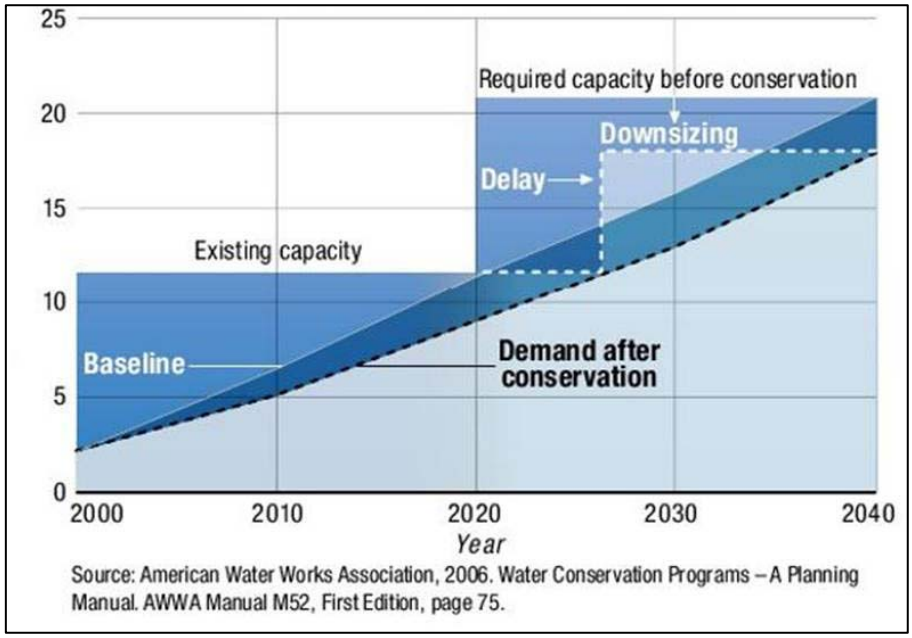
Current water withdrawal from the aquifers and the Fox River to meet population growth needs, without adequate conservation practices, will result in the County and adjacent portions of the region going beyond the long term safe yields and sustainable use of the aquifers and the Fox River. Furthermore, with future population growth water levels in wells will continue to drop, runoff will continue to be polluted and base flows in the Fox River and its tributaries will continue to diminish at an accelerated pace. This is a threat not only to the quality of life and healthy living in Kane County, but also to the ecosystems, open space and aquatic life that are highly valued by the citizens of Kane County. The Kane County Water Resources Investigations provide valuable tools for recognizing and predicting the limitations of our water supplies and projecting future withdrawal scenarios.

Water Conservation and Drought Planning

Benefits of Water Conservation and Efficiency

As Kane County's and the region's population continue to grow, water demand will continue to increase and must be balanced with conservation of available water supplies in order to attain sustainability. Water conservation is the term used when describing the demand side of the water supply/demand equation, and is related to good stewardship of the resource. A more suitable term when water supplies are limited in an area of growing population, such as in Kane County, is water efficiency, sometimes also called 'demand management'. It is related to the supply side of the equation, which can be directly translated to long-term savings in water system capital costs. The Alliance for Water Efficiency has determined that implementing water conservation and efficiency measures are the most cost-effective way of providing additional water supply and extending the service life of existing supplies and infrastructure. By reducing the demand for water, the construction of capital facilities can be delayed, existing water supplies will last longer, the total capacity of infrastructure facilities and water supplies will cost less, additionally, the quantity of water needed for a community's population growth will be less than without water conservation and efficiency programs. Figure 60 illustrates these concepts in a graph.

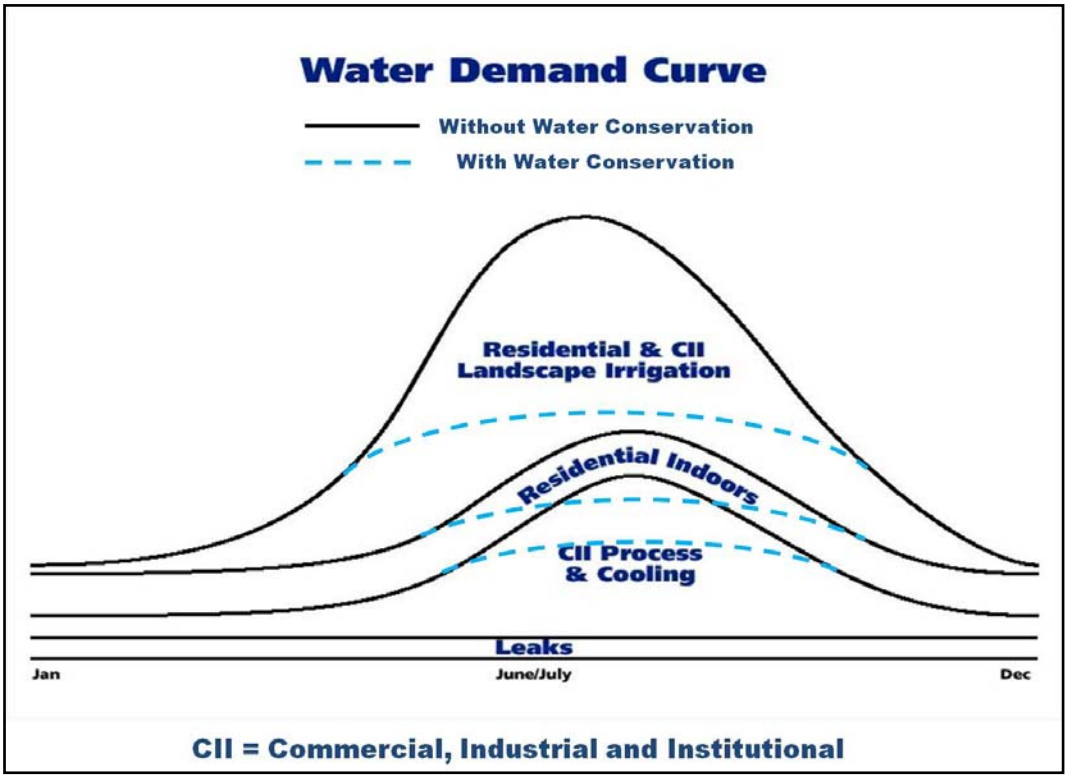
Figure 60. Example of delaying or downsizing a capital facility, *peak demand/capacity in million gallons per day*



Source: American Water Works Association, 2006. Water Conservation Programs – A Planning Manual. AWWA Manual M52, First Edition, page 75.

Seasonal water demands during the summer months also cause additional water storage and pumping systems to be constructed to meet peak water demands. Figure 61 illustrates how implementation of water conservation programs can greatly reduce these summer peaks and conserve drinking water for the future.

Figure 61



Water Conservation Measures

There are many examples nationwide of various degrees of success with water conservation measures. The Alliance for Water Efficiency (AWE) is a nationwide support organization that is very familiar with the nation's progress in water efficiency and provided guidance to the Northeastern Illinois' Regional Water Supply Planning Group (RWSPG) and the Chicago Metropolitan Agency for Planning (CMAP) during the preparation of the *Water 2050 Plan*. CMAP used that guidance to conduct additional research on water efficiency programs and prepared a menu of thirteen water-use conservation measures for our region that are discussed in Chapter 4 of the *Water 2050 Plan (*Figure 62). These measures call for municipalities to invest up front in staff time, school education and public information campaigns even before implementing programs that actually demonstrate water conservation.

Figure 63 is a diagram of how water conservation measures can be implemented over time at the local and regional levels using a phased approach with four levels of implementation. Levels 1 through 4 are incrementally more difficult and more costly to implement. The higher levels also rely upon additional coordination with the regional entities outside of the local water utilities. Chapter 4 of the *Water 2050 Plan* gives additional guidance on the individual measures contained in each level and moving them forward to implement water conservation techniques at local and regional government levels.

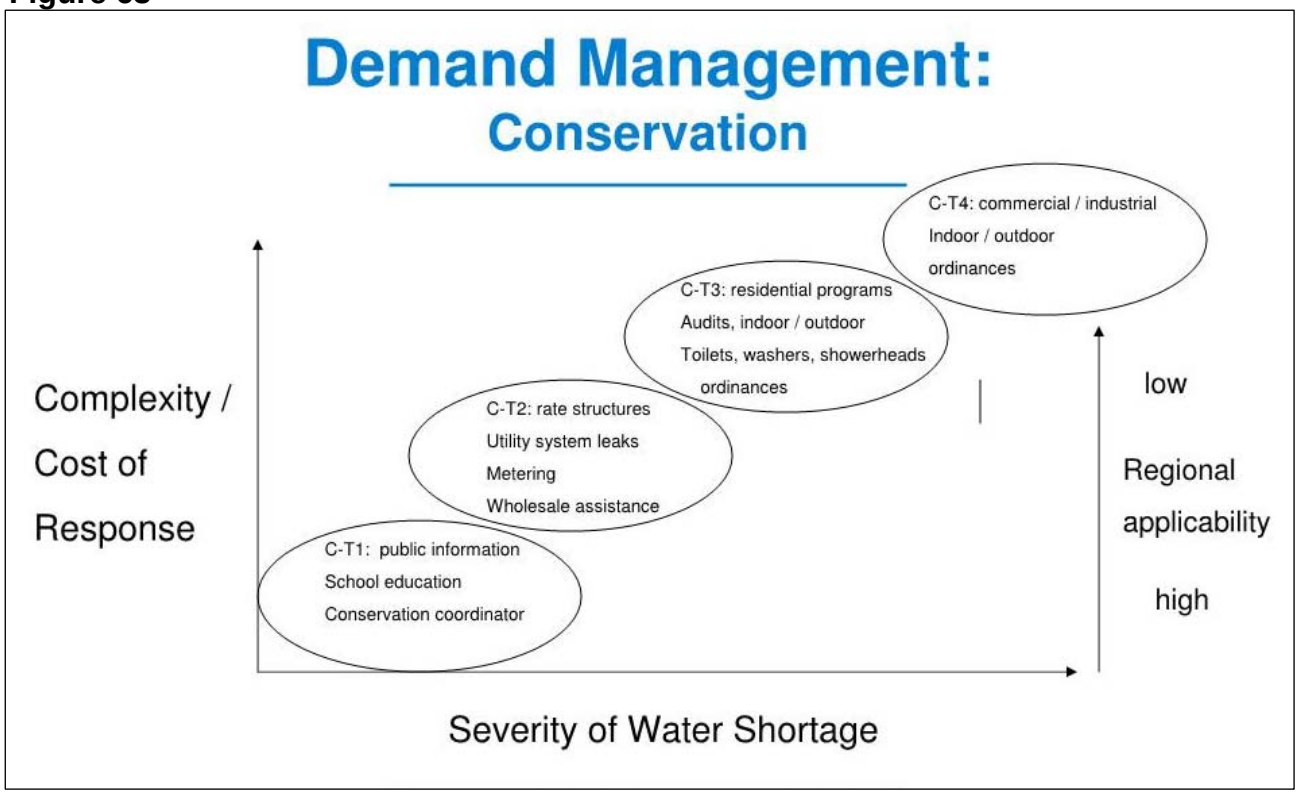
Figure 62

Water-Use Conservation Measures for Chicago Region

1. Conservation Coordinator
2. Water Surveys for Single-Family and Multifamily Residential Customers
3. Residential Plumbing Retrofit
4. Residential High Efficiency Toilet Program
5. High Efficiency Clothes Washer Program
6. System Water Audits, Leak Detection, and Repair
7. Metering with Commodity Rates for New Connections and Retrofit of Existing Connections
8. Water Waste Prohibition
9. Large Landscape Conservation Programs and Incentives
10. Conservation Programs for Commercial, Industrial, and Institutional Accounts
11. Wholesale Agency Assistance Programs.
12. Public Information
13. School Education

Source: CMAP, Water 2050, 2010.

Figure 63



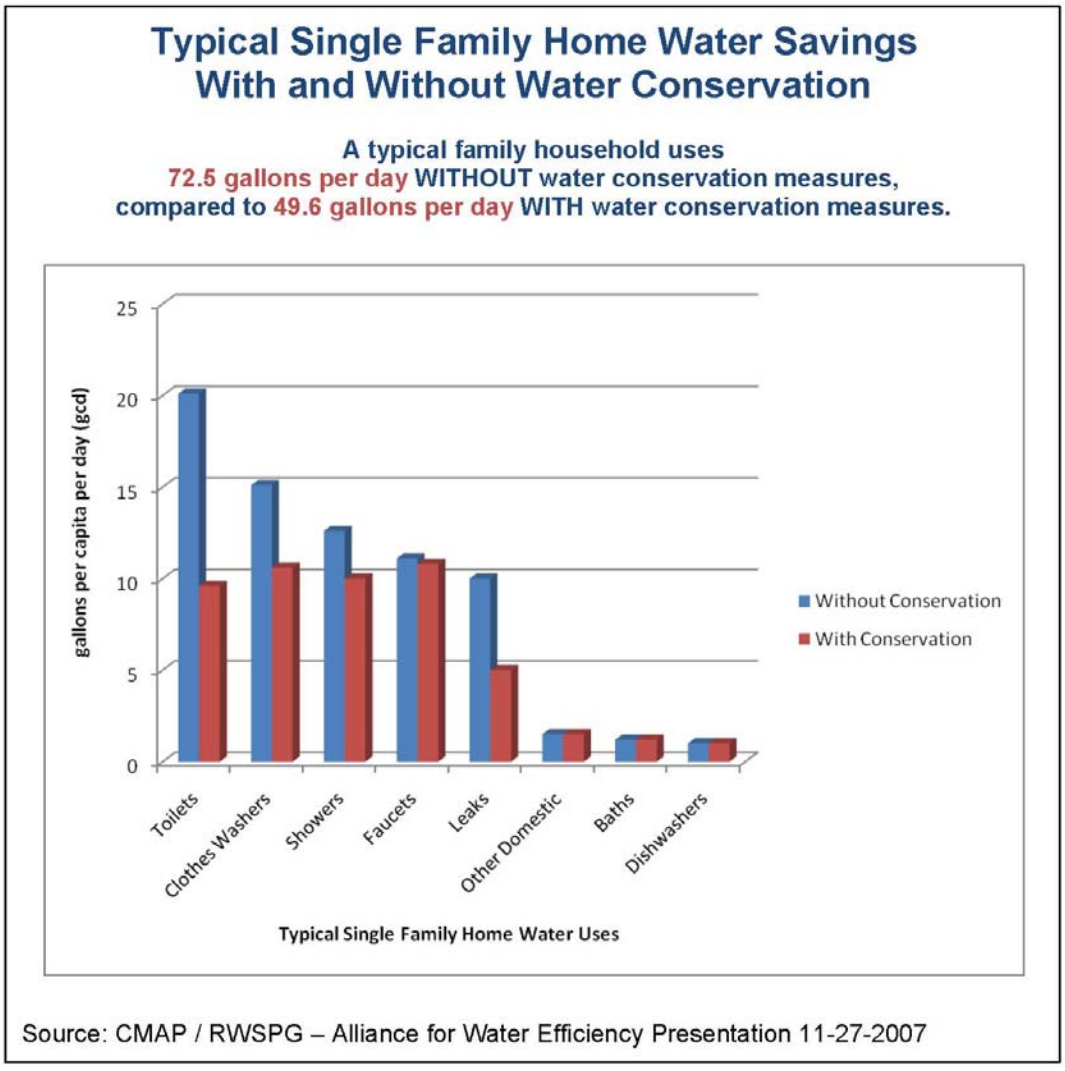
Source: CMAP, Water 2050, 2010.

Critical to the success of water conservation programs across a region is the percentage of communities that will actually be successful in implementing such programs. Low conservation participation according to CMAP will result in typically only 10% participation by households, employees, or 10% of the water demand. High conservation participation may demonstrate a maximum expected participation of households, employees and water demand savings at the 50% level. Further discussion on his topic is in Chapter 4 of the

CMAP *Water 2050 Plan.* The success of water conservation and efficiency programs rests at the local level, rather than at the regional or state level, because the local level is where the implementation of the programs must take place.

Is water conservation really worth all the effort and expense? It is necessary to go to such measures to provide sustainable water supplies in Kane County? Many government, quasi-government, and privately sponsored groups are standing together in this region where water shortages have occurred and where water efficiency measures had to be implemented, sometimes in emergency situations, saying "Yes!" to implementing these conservation measures. Kane County has been very fortunate, together with the help and expertise of the ISWS, to predict eventual water shortages and recommend action to lessen or prevent them from ever happening. The Alliance for Water Efficiency lists a number of Water Conservation facts as presented in Figure 64 in support of implementing water conservation measures. CMAP, the Metropolitan Planning Council, the Illinois Department of Natural Resources, the Illinois State Water Survey, the NWPA and local Councils of Government along with Kane County are now engaged in working together to continue providing safe and sustainable water for the region.

Figure 64



Drought Management Planning and Response

The American Water Works Association *Drought Preparedness and Response Handbook* states that, "In the most general sense, drought is a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental purpose. . . Such conditions could last two to three months or extend over a period of years." While water supplies cannot be made entirely "drought proof," Figure 65 highlights the basic contents of a drought management plan and emphasizes the importance of planning for a drought before one occurs.

Figure 65

Drought Management Plan

from the
Drought Management Handbook
(AWWA 2002)

"A drought management plan is a document that (1) defines the conditions under which a drought-induced water supply emergency exists and (2) specifies the actions that are to be taken in response. The basic goal is to preserve essential public services and minimize the adverse effects of a water supply emergency on public health and safety, economic activity, environmental resources, and individual lifestyle. The cardinal principle of drought planning is to determine the actions and procedures for responding to a drought-related water supply emergency in advance of an actual emergency. . . The practical value of a drought management plan, as opposed to ad hoc crisis management, is that it reduces the likelihood of either over or under reacting to a water supply emergency"

Need for Drought Planning in Kane County

As Benjamin Franklin once said, "When the well runs dry, you know the worth of water". Once the effects of a drought begin to manifest themselves, it is already too late to take measures to avoid the effects of a drought and take preventative measures. Effective planning for drought with stakeholders and developing a drought management plan can take months or even a few years depending on knowledge and ability to collect data that can lead to advance indications of an impending drought. Stream flows, groundwater/aquifer elevations, and surface water/wetland elevations need to be measured at least quarterly in normal periods and more frequently during drought periods. Together with the Kane County groundwater models, this information can give estimates of water supplies available during drought periods and provide decision makers information needed to call for various stages or tiers of demand reduction measures throughout the County. Having a drought management plan in place saves valuable time when measures need to be taken to lessen the impacts of a drought.

There are several indicators that call for such a plan for Kane County. The ISWS study and groundwater model already indicate a lowering of the water surface in shallow aquifers in at least three areas in the County. It has also predicted the reduced base flows in tributary streams to the Fox River. During a drought, these streams and certain wetlands may turn dry, having a detrimental impact to the ecosystems and habitat dependent on these water bodies. It also has identified capture zones of wells in the northern part of the County where

wells from adjacent municipalities are pumping from the same zones of an aquifer, thus competing for the same water even during normal precipitation conditions.

Historically, the minor drought of 2005 caused at least one municipal well in the County to be taken out of service because a neighboring community's well had lowered the water surface below the first community's pump elevation in the well This also happened repeatedly with private wells in unincorporated areas of the County where wells "ran dry" due to over pumping of the aquifer. In several instances, neighbors complained because their well ran out of water when other neighbors were irrigating their lawns. This type of water waste is prevalent in both unincorporated and incorporated areas throughout the County. Water waste also leads to over capitalizing water supply systems and taking water from the deep aquifer, which is not renewable and should be left for emergency use and as a legacy for future generations to use wisely.

A drought management plan also provides for a proactive approach to drought rather than a reactive approach. Priorities for use of available water in a community can be set for:

- Health and Safety (Interior residential, firefighting, health care facilities)
- Commercial, Industrial, Institutional (Maintain economic base, protect jobs)
- Environment (Reduce losses to natural resources, ecosystems, habitat)
- Permanent Crops (Protect crops that take years to replace)
- Annual Crops (Protect jobs and the largest single industry in the County)
- Landscaping (Protect jobs, maintain established trees, shrubs and community character)
- New Demand (Protect investments of construction projects already approved)

A staged demand reduction plan can be evaluated for all the above users of water, based on a collaborative approach of the stakeholders to decide what levels of water use reduction can be tolerated without serious detrimental impacts to their water needs.

Water Resource Driven Land Use Decisions

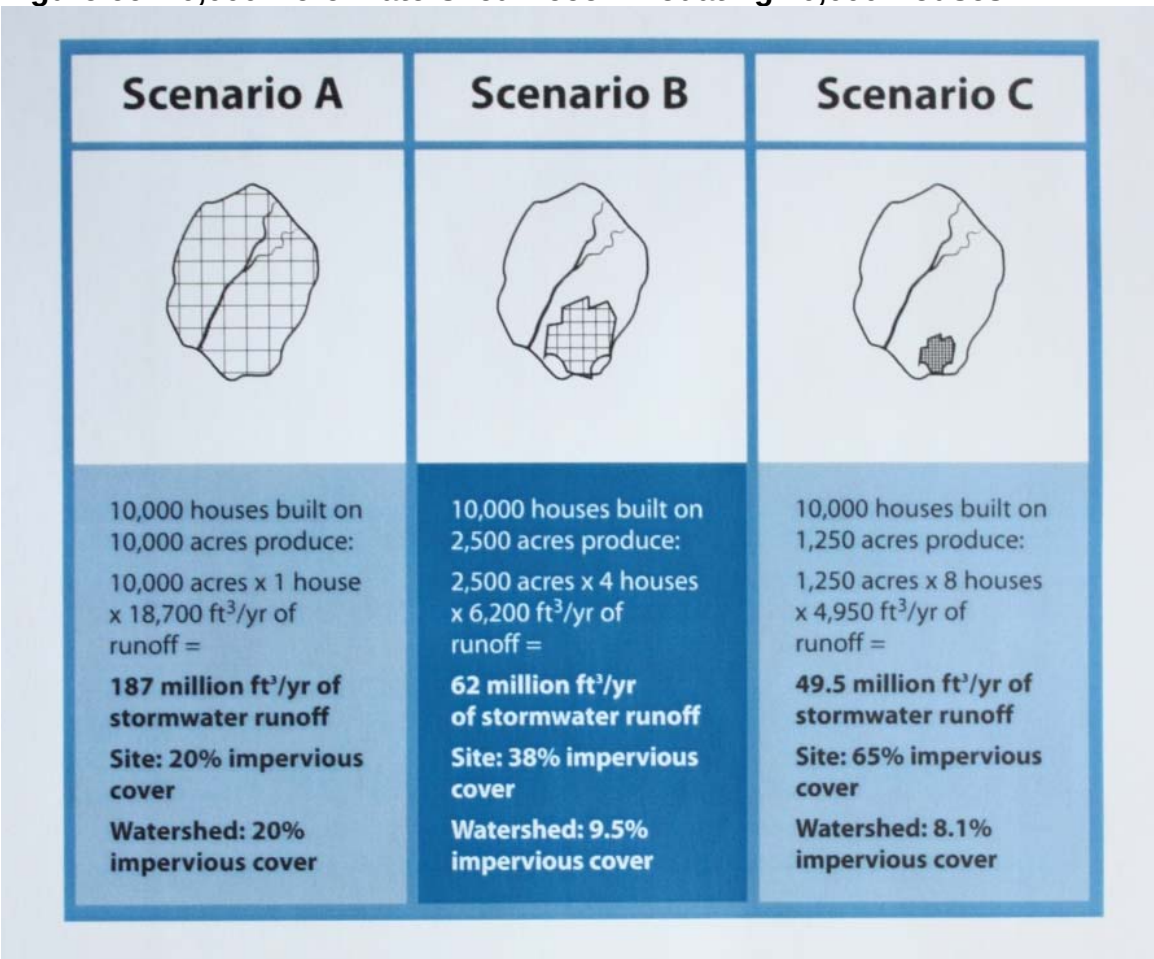
In the past, many communities, planning regions and state agencies believed that low-density, sprawling development automatically protects water quality. This conventional thinking has recently been shown not to be true in many instances and the pursuit of low-density development can in fact be counterproductive, contributing to high rates of land conversion, increased stormwater runoff, reduced groundwater recharge, and increased potential for groundwater and surface water pollution. Higher density development can reduce the impact of development by reducing land consumption. This in turn allows communities to protect valuable open space, habitat, farmland and ecologically sensitive areas and improves water quality by reducing impervious cover and polluted stormwater runoff.

In January 2006 the USEPA issued a report, *Protecting Water Resources with Higher-Density Development.* The report reviews the concept of how development density impacts water quality in areas where population growth is inevitable, and indicates that a more

intergovernmental and proactive approach is available for making land use decisions that promote water quality in growing areas such as Kane County.

Figure 66 is from the USEPA report and illustrates how increasing density in the context of watershed management can mitigate the impacts of impervious cover. Overall impervious cover for the watershed decreases as site density increases given a fixed amount of growth.

Figure 66. 10,000-Acre Watershed Accommodating 10,000 Houses



The 'Findings/Discussion' section of the report states the following:

> "Typically, a planning department analyzes the projected stormwater runoff impacts of a developer's proposal based on the acreage, not the number of houses being built. Based on the results from the one-acre level example, communities might conclude that lower-density development would minimize runoff. Runoff from one house on one acre is roughly half the runoff from eight houses. However, where did the other houses, and the people who live in those houses, go? The answer is almost always that they went somewhere else in that region—very often somewhere within the same watershed. Thus, those households still have a stormwater impact. To better understand the stormwater runoff impacts from developing at low densities, the

impacts associated with those houses locating elsewhere need to be taken into account. This approach has two advantages:

- It acknowledges that the choice is not whether to grow by one house or eight but is instead where and how to accommodate the eight houses (or whatever number by which the region is expected to grow).
- It emphasizes minimization of total imperviousness and runoff within a region or watershed rather than from particular sites—which is more consistent with the science indicating that imperviousness within the watershed is critical" [underline added].

The 'Findings/Discussion' section of the report concludes:

- Low-density development may not always be the preferred strategy for reducing stormwater runoff.
- Higher densities may better protect water quality—especially at the lot and watershed levels.
- Higher-density developments consume less land to accommodate the same number of houses as lower density.
- Consuming less land means less impervious cover is created within the watershed.
- To better protect watershed function, communities must preserve large, continuous areas of open space and protect sensitive ecological areas, regardless of how densely they develop.
- While increasing densities on a regional scale can, on the whole, better protect water resources at a regional level, higher-density development can have more site-level impervious cover, which can exacerbate water quality problems in nearby or adjacent water-bodies.
- To address this increased impervious cover, numerous site-level techniques are available to mitigate development impacts. When used in combination with regional techniques, these site-level techniques can prevent, treat, and store runoff and associated pollutants.
- Many of these practices incorporate some elements of low-impact development techniques (e.g., rain gardens, bio-retention areas, and grass swales), although others go further to include changing site-design practices, such as reducing parking spaces, narrowing streets, and eliminating cul-de-sacs. Incorporating these techniques can help communities meet their water quality goals and create more interesting and enjoyable neighborhoods".

A challenge to Kane County and its municipalities during the next three decades of growth will be to integrate compact mixed-use development with progressive watershed planning, open space preservation, water quality protection and groundwater recharge in the

developing watersheds of the critical growth area west of the Fox River. The CMAP *GO TO 2040 Plan* reinforces the idea that land use policies that promote mixed-use development will reduce residential water use and reduce both capital and operating costs for water utilities. Higher density, compact mixed use development in the sustainable urban area also provides opportunities for retrofitting and redeveloping older neighborhoods with Green Infrastructure techniques and beginning to truly integrate renewal of water supply, wastewater and stormwater infrastructure in the older urban areas of the County.

Integrated Water Resource Planning

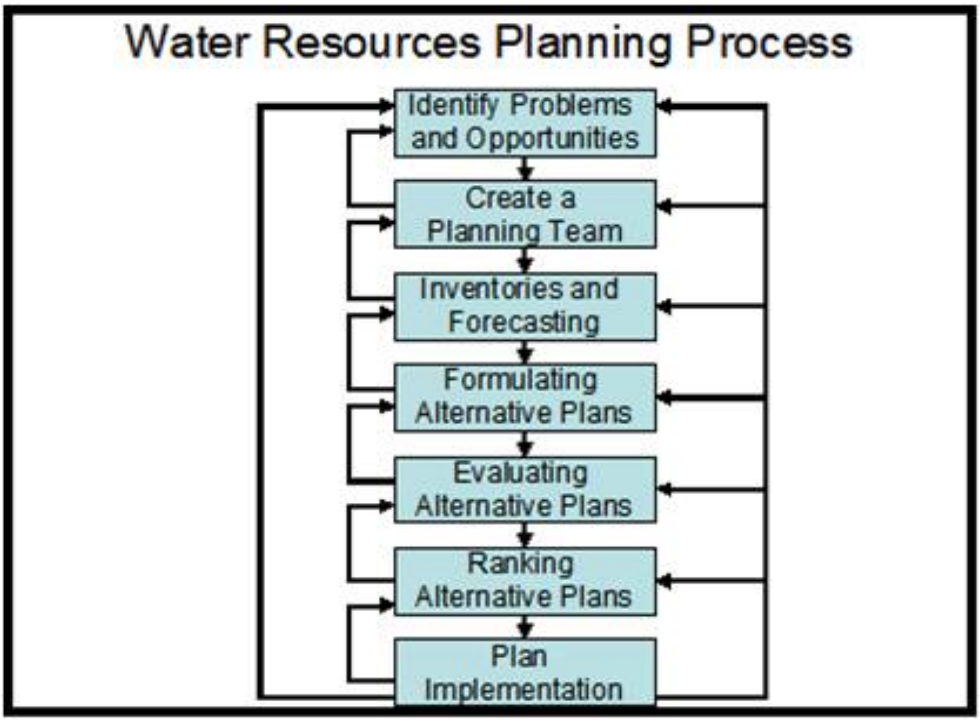
Kane County was introduced to the process of Integrated Water Resource Planning at the 2007 Priority Places Workshop on *Implementing a Sustainable Water Supply for Kane County's Future* by the keynote speaker, Dr. Richard N. Palmer, PhD, P.E., who co-authored with Kathryn V. Lundberg a paper with the same title. It is a subset of or the more general Integrated Resource Planning (IRP) methodology.

No single definition of Integrated Resource Planning is widely agreed upon; however the overall process for guiding and developing water resource plans is basically the same among many users. The American Water Works Association (AWWA) definition that appears in their Manual M50 on Water Resources Planning and also used by Dr. Palmer describes the process as follows:

> "IRP is a comprehensive form of planning that encompasses least-cost analyses of demand-side and supply-side management options as well as an open and participatory decision-making process, the development of water resource alternatives that incorporates consideration of a community's quality of life and environmental issues that may be impacted by the ultimate decision, and recognition of the multiple institutions concerned with water resources and the competing policy goals among them. IRP attempts to consider all direct and indirect costs and benefits of demand management, supply management, and supply augmentation by using alternative planning scenarios, analyses across disciplines, community involvement in the planning, decision making, and implementation process, and consideration of other societal and environmental benefits.
>
> IRP includes planning methods to identify the most efficient means of achieving the goals while considering the costs of project impacts on other community objectives and environmental management goals. These planning methods specifically require valuation of all benefits and costs, including avoided costs and life-cycle costs". (AWWA, 2001)

Following this IRP approach, many municipal, county and regional planning entities around the country have begun to incorporate a much broader view of water resource planning into their policies and land use decisions. In this chapter, reference is primarily made to water resources, so the process here will be referred to as IWRP. Dr. Palmer refers to the IWRP as a seven step process as shown in Figure 67.

Figure 67



Prior to the formation of the Northeastern Illinois Regional Water Supply Planning Group and the Northwest Water Planning Alliance there has been minimal progress made on coordinating efforts to plan for and protect our drinking water supplies in the region other than to shift the supply of water for many communities from the deep aquifer system to Lake Michigan. Kane County will not be able to do that, and in the absence of that ability, relying on the traditional methods for future water supplies will not provide cost effective, long term, sustainable drinking water supplies. Combining that assessment with a growing population and the results of the ISWS investigations, which demonstrate declining water levels in aquifers and water quality concerns in shallow and deep aquifers as well as surface water supplies from the Fox River, the IWRP process must begin to be implemented in water resource planning efforts in the county and in the region. The ISWS studies and results, the CMAP *Water 2050 Plan* and the NWPA that bring together stakeholders to build consensus on water resource issues are pillars to the IWRP process in Kane County, but much more planning, consensus building and funding is needed.

Over the next three decades, the three most important Water Resource issues facing Kane County that need Integrated Water resource Planning are the following:

- Water Supply - Kane County now has the best data and computer models of its aquifers and surface water supplies in Illinois. We were able to work with the ISGS and ISWS in assembling the data and the creation of the geologic, aquifer and Fox River flow models because of the advances in technology that have created Geographic Information Systems to store geologic and aquifer data in a three dimensional array, and the advances in computing ability and data storage. These models and data are available for use in the IWRP process to find sustainable drinking water supplies for Kane County.

- Wastewater - The Illinois EPA and the Fox River Study Group have begun an IWRP process to take a holistic look at the water quality in the river and to determine the critical pollutants that are entering the river. Technological advances in wastewater treatment, such as additional nutrient removal (Nitrogen and Phosphorus), ultraviolet (UV) disinfection (no chlorine byproducts) and energy conservation retrofits and

practices, as well as advances in pollutant detection are ready to be incorporated into the bigger discussion among IWRP stakeholders of how the critical pollutants can be kept out of the Fox River to avoid having to further treat river water to drinking water standards.

- Stormwater - The County has adopted a countywide Stormwater Management Plan and Stormwater Ordinance, a major Kane County success story of an IWRP process in its own right. The County has also worked with the Conservation Foundation, the NRCS, NIPC, CMAP, adjacent counties and other environmental groups over the years to develop watershed plans for almost every creek and the major watersheds of the Fox and Kishwaukee Rivers. New thinking on Green Infrastructure that will aide in addressing stormwater runoff quantity and quality and groundwater recharge is discussed elsewhere in the Plan and needs to be incorporated in revisions to the current Stormwater Ordinance and in water supply planning through stakeholder involvement in the IWRP process.

An excellent example of using IWRP in Kane County is the City of Aurora's recently completed strategic plan to use Green Infrastructure to avoid the costs of building new Combined Sewer Overflow treatment while reducing stormwater runoff and improving water quality in the Fox River. This approach addresses stormwater, wastewater and water supply components of our water resources. In addition to cleaner stormwater, less wastewater, and groundwater recharge, Aurora's Green Infrastructure /Integrated Water Resource Planning approach further contributes to neighborhood rejuvenation, addresses aging infrastructure, enhances habitat and reduces the urban heat island effect.

Policies:

1. Preserve and protect the quality of groundwater and surface water, the primary sources of drinking water in Kane County, and encourage water conservation and efficiency programs.

2. Utilize the results of the ISWS/ISGS Kane County Water Resources Investigations to develop a countywide drought management plan, using water levels in aquifers and flow rates in streams to develop tiered, water use reduction measures and practices related to the severity and length of drought.

3. Promote Integrated Water Resource Planning for the Fox River and its tributaries and the tributaries of the Kishwaukee River in order to maximize their potential for water supply, wildlife habitat, recreation, and other uses.

4. Review and periodically update the countywide Stormwater Management Plan and Stormwater Ordinance to incorporate new planning goals, new technology, updated regulations, new methods, and Green Infrastructure systems and techniques.

5. Reclaim and reuse water in an environmentally sound manner, conducive to the health of ecosystems and humans, including the encouragement of water reclamation and reuse systems, land application of reclaimed water, reuse of gray

water, and wetland or other types of treatment to reduce the demand on drinking water supplies, promote energy conservation, and healthy living.

6. Monitor aquifer levels, stream flow, rainfall, and water quality in all critical aquifers, major streams and urbanizing watersheds in Kane County in cooperation with local, state, and federal agencies and programs.

7. Cooperate with Forest Preserve, local government entities, park districts, and private landowners in the development of watershed preserves, conservation areas, greenways, reforestation programs, wetlands and buffers in order to minimize the negative impacts of developing areas to our water resources and to promote the use of Green Infrastructure practices and techniques.

8. Maintain a coordinated NPDES Phase II Program with local government entities under the Countywide Stormwater Management Program in order to reduce stormwater pollutants, enhance water quality and promote healthy ecosystems and healthy living.

9. Promote and adopt goals and policies, plans, and adopt ordinances at the municipal and county levels in the 5-county NWPA region that lead to water conservation and efficiency, source water protection, sustainable water supplies, healthy ecosystems, healthy living, and drought management.

10. Carefully evaluate NPDES Permit applications for new or expanded point source discharges that may be unhealthy to ecosystems and humans or increase nutrient loadings that reduce the IBI Stream Class and degrade fish, macroinvertebrates, and other aquatic species.

11. Support CMAP and IEPA amendments to Facility Planning Areas only where aquifer or surface water scientific investigations demonstrate the water supply to be sustainable and will not negatively impact neighboring municipalities' drinking water supplies.

12. Require that all new or expanded waste water treatment facilities, whether conventional or reclamation and recycling systems, be owned and operated by a unit of local government capable of assessing property taxes and imposing user fees.

13. Protect water resources through compact, mixed- use development to reduce impervious cover and runoff volume on a per unit basis within a watershed, and use Green Infrastructure practices to reduce imperviousness in redevelopment areas, recharge aquifers, and avoid degrading wetlands and ecosystems.