STRADDLING
THE DIVIDE
CONFERENCE

WATER SUPPLY PLANNING IN THE LAKE MICHIGAN REGION

Program

February 15 – 16, 2005

Holiday Inn-Merchandise Mart

Chicago, Illinois

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Ken Bradbury (Wisconsin Geological and Natural History Survey)
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International Association of Hydrogeologists
National Ground Water Association
Northwestern Indiana Regional Planning Commission
Southeastern Wisconsin Regional Planning Commission
U.S. Environmental Protection Agency
U.S. Geological Survey
University of Wisconsin Extension – Wisconsin Geological and Natural History Survey
Wisconsin Ground Water Association

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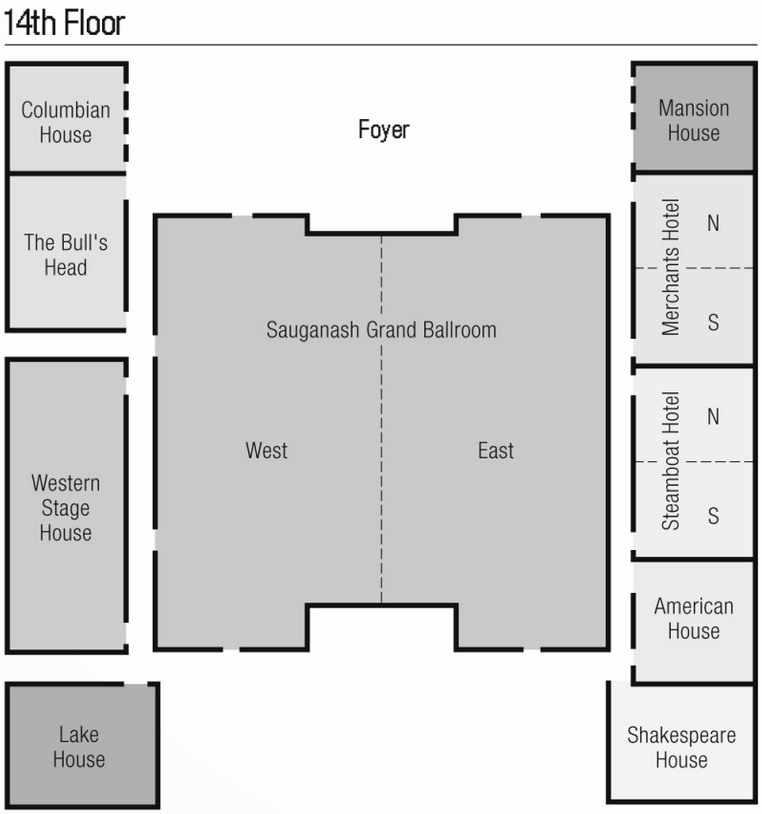
Tuesday, February 15

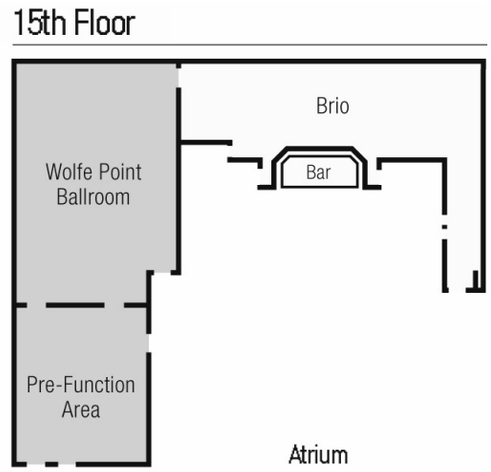
11:00–12:00	**Registration**		**ROOM:** Foyer
12:00–1:45	**Lunch:** Introduction by Ron Thomas, Executive Director of NIPC **Opening Address by Illinois Lt. Governor Pat Quinn**		**ROOM:** Sauganash
	Regional Water Supply Issues		**ROOM:** Sauganash
2:00–2:30	1A **An Overview of Regional Water Supply Planning** Sam Santell, NIPC		
2:30–3:00	1B **The Background Legal Regime** A. Dan Tarlock, Chicago-Kent College of Law		
3:00–3:30	1C **Regional Water Management Initiative** Dan Injerd, IDNR		
3:30–4:00	**Break**		**ROOM:** Foyer
	TECHNICAL	**POLICY**	
	Technical Needs for Policy Development	**Background/Source Water**	**ROOM:** Sauganash West (T) Sauganash East (P)
4:00–4:30	T2A **Kane County's 2030 Land Resource Management Plan and Water Resource Planning** Phillip S. Bus, Kane County	P2A **Source Assessment and Protection Web Site: A Resource for Local Water Resource Planning and Protection** Wade Boring, IEPA	
4:30–5:00	T2B **Water Supply Issues in Southeastern Wisconsin: Technical and Policy Needs** Robert Biebel, SEWRPC	P2B **The Hydrology of the Lake Michigan Region** Douglas S. Cherkauer, UW-M	
5:15–5:45	**Plenary Session:** **Water, the Lifeblood of Cities** David A. Ullrich, Great Lakes Cities Initiative		**ROOM:** Wolf Point Ballroom
5:45–7:00	**Social Hour**		**ROOM:** Wolf Point Ballroom

Wednesday, February 16

7:30–8:00	**Pre-Meeting Continental Breakfast**		ROOM: Foyer
	TECHNICAL	**POLICY**	
	Ongoing Studies/Available Data	**Resource Management**	ROOM: Sauganash West (T) Sauganash East (P)
8:00–8:30	T3A **Regional Hydrogeology and Groundwater Flow Modeling in Southeastern Wisconsin** Kenneth R. Bradbury, WGNHS	P3A **Environmental Concerns** Cheryl Mendoza, Lake Michigan Federation	
8:30–9:00	T3B **Investigations for Protection of Water Availability, Kane County, Illinois** Scott C. Meyer, ISWS	P3B **Coordinating Regional Monitoring** Ric Lawson, Lake Michigan Monitoring Coordination Council	
9:00–9:30	T3C **Ground-Water Inventory and Map for the State of Michigan** Howard W. Reeves, USGS-MI	P3C **Groundwater Recharge Area Protection: Using State Regulated Recharge Areas and Local Planning Tools** Howard Learner & Meleah Geertsma, ELPC	
9:30–10:00	**Break**		ROOM: Foyer
	Scientific Issues	**Water Usage**	ROOM: Sauganash West (T) Sauganash East (P)
10:00–10:30	T4A **Inside Groundwater Modeling** Daniel Feinstein, USGS-WI	P4A **NIRPC Study Results: Water Resources Protection and Conservation Toolkit** Sarah B. Nerenberg, NIRPC Consultant	
10:30–11:00	T4B **Surface Water Supply Planning Issues in the Southern Lake Michigan Region** H. Vernon Knapp, ISWS	P4B **Public/Private Partnerships: How They Can Be Used to Improve Water Resource Management** Dan Thompson, American Water	
11:00–11:30	T4C **Water Quality Issues in the Groundwater System of the Lake Michigan Basin** John Jansen, Reukert-Mielke	P4C **Integrating Demand-Side Planning and Management into the Water Supply Planning Process** Jack C. Kiefer, CDM	
11:45–1:30	**Lunch:** Introduction by Douglas D. Walker, Associate Hydrologist, Illinois State Water Survey **A Symphonic Approach to Water Management** Speaker: G. Tracy Mehan, The Cadmus Group		ROOM: Wolf Point Ballroom
	Combined Session: Case Studies		ROOM: Wolf Point Ballroom
1:45–2:15	5A **Edwards Aquifer/Central Valley Authority** Gregory Ellis, Edwards Aquifer Authority (Former General Manager)		
2:15–2:45	5B **The Metropolitan North Georgia Water Planning District** Pat Stevens, MNGWPD		
2:45–3:15	**Concluding Plenary Session** **Panel Discussion with NIPC, NIRPC and SEWRPC**		ROOM: Wolf Point Ballroom

Map of Chicago Mart Plaza





Session Summaries and Abstracts

Sessions are referenced by abbreviations, e.g., "T2A" is session 2, technical track, speaker A. Please refer to the Agenda on pages 4–5 for times and rooms.

Opening Address

Illinois Lt. Governor Pat Quinn will open the conference with remarks about the value of water to our region and the vital efforts needed to ensure a sustainable water supply for our future.

Lieutenant Governor Pat Quinn has served the people of Illinois, both as a citizen and public official, for over 25 years. He was elected Illinois State Treasurer in 1990, where his Linked Deposit Program helped more than 25,000 Illinois families and businesses get $2 billion in loans from banks for small business expansion and agriculture. A long-time consumer advocate, Quinn spearheaded the 1983 drive to create the Citizens Utility Board (CUB). In 2002, Quinn was elected Lieutenant Governor of Illinois on a platform promoting clean environment, support for military families and consumer advocacy. Quinn is a graduate of Georgetown University and the Northwestern University School of Law.

As Lieutenant Governor, Quinn chairs the Illinois River Coordinating Council, which addresses the economic, environmental, and recreational viability of the Illinois River Watershed. He is also the head of the Illinois delegation to the Great Lakes Commission. Quinn created It's Our River Day, an annual celebration of the natural, cultural and historical resources of Illinois' watersheds. In addition, Quinn is a leading proponent of cleaning up Illinois' beaches and using native plants to reduce flooding and drainage problems.

Opening Sessions: Regional Water Supply Issues

1A
An Overview of Regional Water Supply Planning

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By some estimates, population in the Lake Michigan region will grow 20 percent by the year 2030. In southeastern Wisconsin, much new growth will occur to the west of the built-up land ringing Lake Michigan; in northeastern Illinois, many people will settle in the outer suburbs of Chicago; and in northwestern Indiana, the pole of growth is well to the south of the industrialized strip along the lake. The most rapid growth will occur in areas where Lake Michigan water is not available. Groundwater and surface water are physically interconnected and their different users cannot enjoy them in isolation. A recent discovery in Wisconsin revealed that the flow of groundwater had been reversed; groundwater is being replenished by Lake Michigan. Thus, communities dependent on lake water are also dependent on the good stewardship of communities supplied by groundwater, for overuse of the aquifer threatens the groundwater seepage that partly maintains water levels in Lake Michigan. The complexity of regional water supply requires coordinated planning to make sure every community has the water it needs, at a price it can afford, for long into the future.

Water supply planning is not a new issue. The Northeastern Illinois Planning has performed assessments of regional water demand and supply a number of times dating back to the mid 1960's. Water supply concerns may have peaked in the mid 1970's when the deep sandstone aquifer that we share across state lines was being heavily pumped and groundwater levels were declining. When a number of Illinois communities gained access to Lake Michigan water in the 1980's, the region's most pressing water supply concerns were temporarily resolved and groundwater levels recovered. Subsequently, flooding over the last two decades coupled with no major droughts has led to a general lack of public consciousness about the possibility of having too little water. Four years ago, an analysis performed for NIPC's Strategic Plan for Water Resources indicated that 11 townships in the region may face water shortages by 2020. Using the 2030 population forecasts, this analysis now indicates that over 20 townships may experience water shortages or be using their resources in an unsustainable manner by 2030.

NIPC has been leading the Southern Lake Michigan Regional Water Supply Consortium to formulate an approach to address these issues in our region and cooperatively in adjoining regions in Wisconsin and Indiana. The Consortium has been a collaborative effort among a number of agencies, communities and interested parties to identify and voice the needs for regional water supply planning. The Consortium will continue to emphasize the need for regional water supply planning and provide a forum for planners, scientists, and water supply providers in the region to exchange ideas and provide updates on the ongoing water supply planning and management efforts.

The name of this conference, Straddling the Divide, acknowledges the physical divide that legally dictates who does and does not have access to Lake Michigan water. However, Straddling the Divide was also meant to convey the necessity to bridge the lines that separate us. We must work together across the political, geographical and organizational divides that separate us. Over 180 people have registered for this conference. These people represent 10 planning commissions, 15 non-profits or universities, 25 local governments, 20 state or federal agencies, 12 utilities or water providers and 24 consulting firms. There are urgent water supply issues facing our region, but there is still an opportunity to address them before we face a bigger crisis. This will take cooperation at the municipal, county, regional and interstate levels. This group needs to work together to lay the groundwork for water supply planning and management decisions that will lead to long term sustainable water supply in the Lake Michigan Region.

1B
The Regulatory/Legal Framework

The Background Legal Regime

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In Illinois surface water is allocated by the common law of riparian rights and groundwater is allocated by common law doctrines which have been slightly modified by statute. The common law of water rights is a land-based water allocation system. A riparian right is a natural usufructuary property right to use a portion of the natural flow of a watercourse and are limited to the ownership of land which abuts a stream and have traditionally characterized as a natural incident of land ownership. The core idea of riparianism was that in situ uses are the norm and ex situ ones the exception. This assumption is reinforced by the watershed rule limits uses to a stream's watershed or at least gives users in the watershed a preference over users outside the watershed. The watershed rule historically limited use to riparians within a watershed. Riparian rights do not promote conservation, rational planning or fair sharing because they are inchoate. Thus, it is difficult to predict in advance whether a use will be classified as reasonable or unreasonable. For example, they are inherently unstable because they arise by virtue of the ownership of land bordering a watercourse and thus do not have to be put to use. In theory, a riparian can exercise the right at any time and displace prior uses. Riparian rights are also difficult to measure because they are correlative; the amount of water to which a riparian is entitled is a function of the uses being made by other riparians. Thus, each individual right must be exercised with due regard for its impact on other users. Starting in the 19th century, per se property rules, which presumed injury from any diminution in flow, were replaced with tort like rules which compare the reasonableness of competing uses and limit relief to prove of substantial injury. Thus, reasonableness is entirely contextual and the standards for determining what is a reasonable use are incoherent. Groundwater law faces the same problems. The law encourages unlimited use.

1C
Annex 2001 – An Update on the Proposed Great Lakes
Regional Water Management Initiative

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On June 18, 2001, the Great Lakes Governors and Premiers joined together in Niagara Falls, New York to sign the Great Lakes Charter Annex 2001. The Annex is an amendment to the Great Lakes Charter of 1985, and was developed to strengthen the Great Lakes regional water management system first proposed in the Great Lakes Charter of 1985.

Annex 2001 is a commitment by the Governors and Premiers to: 1) develop a new set of binding agreements that will retain authority by the Governors and Premiers over water withdrawals, building upon the existing structure and collective management efforts of the various governmental organizations within the Great Lakes basin, 2) include a broad-based public participation program in the process of developing and implementing the agreements, 3) establish a new decision-making standard that will be used by the States and Provinces to review proposals for water withdrawals, and 4) improve the Great Lakes water use data base.

On July 19, 2004, the Governors and Premiers Water Management Working Group released two documents for a 90 day public review period. The Great Lakes Basin Sustainable Water Resources Agreement, a good faith agreement among the 10 Great Lakes States and Provinces, and the Great Lakes Basin Water Resources Compact, an agreement amongst the eight Great Lakes States to join together in an interstate compact to utilize a common standard when reviewing proposals for new or increased water withdrawals.

The Water Management Working Group has received over 10,000 comments from interested citizens, environmental groups, industry and governmental bodies, expressing a broad range of viewpoints. While protecting and restoring the Great Lakes is a goal that all interested parties share, there are very different and conflicting views on just what should be done. The comments are being carefully reviewed as the Working Group begins the process to reshape the agreements.

This presentation will provide an overview of the Annex Implementing Agreements, discuss some of the key areas of the proposed agreements that generated the most interest during the public review period, and review some of the policy options the Working Group may consider as they seek to respond to the comments received.

Session T2: Technical Needs for Policy Development

The purpose of this session is to summarize the specific needs of planners and policymakers for data, information and knowledge regarding the water resources of the region. The presentations will be from the policymakers' perspective, presented to engineers and scientists, and will link regional growth and constraints to needs for data and analyses.

T2A
Northeastern Illinois Development and Kane County Needs

Kane County's 2030 Land Resource Management Plan and Water Resource Planning

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Kane, along with Lake, McHenry and Will, is one of four, fast growing, "Edge Counties" in Illinois. "Edge Counties", also know as "Metropolitan Growth Engines", range from 200,000 to 800,000 in population, are located in one of the 50 largest metropolitan areas of the United States, and have been growing at double-digit rates in each decennial census since 1950. The County's July 2003 Census estimate of population is 457,122, and it is projected to reach almost 700,000 by the year 2030. The current average annual growth rate is about 16,500 people per year. At this rate Kane County will reach 500,000 in population sometime in 2008. Providing a sustainable potable water supply for this metropolitan growth engine is a priority planning policy of the Kane County Board.

Most of Kane County's and the NIPC's "Edge County" municipalities are planning, managing and making decisions for their potable water supplies independent of other communities in the County and in the Region. The NIPC Draft Strategic Plan for Water Resource Management (September 2001) predicts potential water shortages by the year 2020 in four (4) Kane County Townships (Rutland, Geneva, St. Charles and Dundee) if current population growth trends do not change and if additional sources of water are not found.

Protecting and planning for the sustainable water supply of Kane County is called for in the County's recently adopted 2030 Land Resource Management Plan. The Plan is intended to be a shared community vision for future growth throughout the whole County. The Planning Issues section identifies certain Water Resource objectives including recognition of the interaction between land and water resources, protection and enhancement of the quantity and quality of ground and surface waters for drinking water supplies, reduction of pollutants that may affect water supplies, and encourages watershed planning that fosters understanding of the finite and irreplaceable water resources. The Planning Policies section identifies certain water resource policies that include the protection of groundwater, the principal source of potable water in Kane County; encourages water conservation programs; calls for state legislation that would allow the six Counties in the NIPC region to create countywide water authorities, but not the authority to regulate the agricultural use of water; calls for the development of a countywide source water protection plan; and calls for the development of a comprehensive set of countywide water resource management regulations to preserve and protect watersheds, stream banks, floodplains, wetlands, groundwater recharge and water supply.

In 2002, the County entered into a five (5) year agreement with the ISWS/ISGS to gather and study existing and new geologic and hydrogeologic data for both the shallow and deep aquifer systems underlying the County and to enter the data into a Geographic Information System database. The ISWS/ISGS will create both geologic and hydrogeologic models to assist in future planning for the County under the new 2030 Land Resource Management Plan. In the future, water regulatory measures using the data and models from the ISWS/ISGS study as the scientific basis, will need to be enacted within the County to ensure a long-term, sustainable water supply.

T2B
Water Supply Issues in Southeastern Wisconsin: Technical and Policy Needs

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The Southeastern Wisconsin Region is highly urbanized and comprises an area of 2,689 square miles and a resident population of about 2.0 million. About 36 percent of the population and jobs of the State are located within the Region, which comprises about 5 percent of the area of the State. While the seven-county Region is highly urbanized, agriculture is still a very important economic activity within the Region. About 1,395 square miles, or 52 percent, of the total area of the Region remain in agricultural use.

Groundwater is an important source of water supply within the Region. Over 30 percent of the Region's water supply is derived from groundwater. The counties of Washington, Ozaukee, Waukesha, and Walworth rely on groundwater for the vast majority of their needs. Specifically, in 2000, about 97 million gallons of groundwater per day were withdrawn for public, private-domestic, agricultural, commercial, and industrial uses within the Region. A total of 50 municipal water supply systems in the Region were supplied by groundwater as of that year. About 229 million gallons of Lake Michigan water per day were used for public water supply in 2000. A total of eight public water supply systems in the Region utilized surface water as a source of supply in that year. All eight used Lake Michigan water in providing water to a total of 30 municipalities.

About 1,680 square miles, or about 62 percent of the total area of the Region, lie west of the subcontinental divide which traverses the Region and separates the Mississippi River and the Great Lakes drainage basins. As a result, the use of Lake Michigan water as a source of supply within much of the Region is problematic. Significant growth in population and in urban land uses continues to occur in areas of the Region lying west of the divide. That growth will be accompanied by a concomitant increase in the demand for groundwater and the need for better management of groundwater resources.

A number of factors have contributed to the need for increased water supply management efforts in the Southeastern Wisconsin Region. These include, among others: water quality issues, including water quality radium standard exceedence in 22 of the systems; continued drawdown of the deep sandstone aquifer at rates of up to five feet per year; and potential conflicts over new well siting in the shallow aquifer.

To address these factors and related issues, a number of water supply management initiatives at the local and regional level have been undertaken. This presentation describes the water supply management program and discusses some of the important technical and policy issues and how they are being addressed.

Session P2: Background/Source Water

This session will provide a review of basic hydrology and an update of the source water assessment program.

P2A
Source Water Assessments

Source Assessment and Protection Web Site: A Resource for Local Water Resource Planning and Protection

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The Illinois Environmental Protection Agency (Illinois EPA) worked with the United States Geological Survey, Illinois State Water Survey, and Illinois State Geological Survey to develop a source water assessment and protection (SWAP) web site. Illinois EPA's SWAP site is part of the Agency's Environmental Facts On-Line (ENFO) system that is intended to provide environmental information to the citizens of Illinois. The resulting web-based application brings together information that should be a valuable asset to water resource planners, consultants, water supply officials, and other local decision makers in protecting water quality and quantity.

Source water assessments are the cornerstone to the development and implementation of source water protection plans. Pollution prevention, like preventive medicine, starts with awareness. Thus, source water assessment is the cornerstone essential to the development and implementation of source water protection plans and includes the following: 1) Delineating the source water protection area (e.g., watersheds and wellhead protection areas); 2) Inventorying potential contamination sources; 3) Determining the susceptibility of the source water to contamination; 4) Providing recommendations to protect the source water; and 5) Providing this information to the public. Source water protection (SWP) consists of implementing pollution prevention practices to protect the water quality in a watershed or wellhead protection area serving a public water supply. Along with treatment, source water protection establishes a multi-barrier approach to assuring clean and safe drinking water to the citizens of Illinois.

SWAP includes source water assessment fact sheets for every community water supply in the state. Further, the SWAP site includes an Internet geographic information system (GIS) designed using the Environmental Systems Research Institute Arc Internet Map Server (IMS) and MySQL as the integrated database. Illinois EPA's Internet GIS is organized based on the following ten general information classifications: 1) administrative/public land survey system; 2) environmental concerns; 3) infrastructure; 4) miscellaneous; 5) resource; 6) surficial/bedrock geology; 7) water quality; 8) water resources; 9) water use/source water protection area; and 10) background images. These general classifications expanded into eighty-nine data layers that can be overlaid, queried and downloaded.

This application provides a powerful and dynamic spatial analysis, and planning tool that has never been available before.

Key Words: (Internet GIS; fact sheets; Source water assessment; source water protection plans; URL: http://www.epa.state.il.us/water/groundwater/source-water-assessment/)

P2B
The Hydrology of the Lake Michigan Region

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The Lake Michigan region has an abundance of fresh water. Yet, within the region, there are communities that have water shortages, real or perceived, and ecosystems that are stressed by human diversions of their natural water supply. There should be enough water to satisfy reasonable demands, but only if it is properly managed. Such management requires an understanding of how the hydrologic system works, its physical limitations, and the role that humans play in altering it. Successful management will also require cooperation across political boundaries and communication among policy makers and technical personnel.

This presentation is intended to serve as a primer on the hydrologic systems of the Lake Michigan region. It will examine the water budget concept and then apply it to Lake Michigan. Precipitation accounts for over half of the water entering the lake. River flow provides another 40% of the inflow to the lake, but the bulk of that amount is actually ground water discharge. As these inflows have changed through time, the lake's water level and its storage have also varied. Understanding the interactions of the lake with ground water and surface flow and their variation through time is integral to knowing the lake's water supply.

Away from the lake, the primary source of water for human consumption is ground water. Within the Lake Michigan watershed, humans withdraw nearly 1.4 billion gallons a day from aquifers, often with no real knowledge of where it comes from or how it got there. This presentation will discuss how ground water is recharged, how it moves below the ground and where it discharges. It will address the effect human intervention in ground water systems has on both ground and surface water bodies and what effects pumping will have on the future of the supply.

Human activity can also produce increased concentrations of radium, arsenic, nitrogen, pesticides and other chemicals in ground water. This reduces the amount of the potable water supply, but in many instances can be prevented through good planning and management.

Plenary Session

Water, the Lifeblood of Cities

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Cities all along the Great Lakes and St. Lawrence River have been watching and participating with much interest over the past three years as the states and provinces have been developing the new water management system for the basin. It was the water of the Great Lakes that brought settlement and development to the area initially, and it continues to be instrumental in the quality of life and economic well being of the cities. Thus, the cities are fully committed to the protection and restoration of the resource and are working closely with all parties having a similar interest. Both quality and quantity are important, as both are necessary for the future.

Access to water has been central to the success of cities all along the Great Lakes. As a source of drinking water for growing populations, it is essential. It also serves the other domestic uses for households, and provides a place for sending treated wastewater. Large quantities of water have also been required for industries such as steel, pulp and paper, oil refining, power generation, and many others, as well as agriculture. Water based transportation systems to serve those and other industries have also been a key element of the economy in the area. Increasingly, large bodies of water are important for their recreational and aesthetic value, as boating, fishing, swimming, and residential development along the lakes are more in demand.

Cities want to be in the forefront of better water management in the future. The Great Lakes must be treated as the magnificent resource it is, where it is protected and sustained so that it can serve the region indefinitely into the future. This will only be possible if a reliable system for managing the region's ground and surface water is put in place. The proposal by the Council of Great Lakes Governors, who worked along with the Premiers of Ontario and Quebec, is a major step in the right direction for water management, and the Great Lakes Cities Initiative supports the proposal. GLCI has made comments and suggestions to improve the system, and hopes that these will be taken into account as the final system is put in place. Most importantly, the proposal prohibits diversions unless the water is returned to the basin, with very limited exceptions. In addition, we need a system that requires and up front demonstration that no significant adverse impact will result from withdrawals, either individually or collectively. It will be very difficult to administer this new system, and it will require a significant investment of resources to make it successful. The states and provinces need to make this commitment.

Cities, likewise, need to make a commitment. The area for greatest improvement is in water conservation. Cities have many opportunities to improve their conservation practices, and need to move ahead aggressively with these programs, even if they are not seeking additional withdrawals in the future. Cities can share best practices around the region so that they can serve as a model for water management to the rest of the world, even with such an abundant resource at their front door.

Session T3: Ongoing Studies/Available Data

This session will summarize the technical aspects of several of studies of water resources being conducted in the region. Because each of these studies includes the review and compilation of data and information in this region, these talks will also discuss the types, formats, status and adequacy of the supporting data for these studies.

T3A
Regional Hydrogeology and Groundwater Flow Modeling in Southeastern Wisconsin

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Recently completed hydrogeologic studies in southeastern Wisconsin have provided a better understanding of the groundwater system and new tools for water-supply planning and decision making. A new groundwater flow model created for the seven counties that make up the Southeastern Wisconsin Regional Planning Commission (SEWRPC) region can be used to quantify the effects of long-term pumping on the natural circulation and replenishment of that area's groundwater. The model simulates groundwater movement through the entire geologic section extending from shallow glacial and dolomite units near the land surface to sandstone units at depths of more than 2,000 feet. The model includes major surface-water features such as Lake Michigan, major rivers, lakes, and wetlands, and computes the groundwater component of the water budget for these features. By incorporating all known municipal and industrial wells operating now and in the past into transient runs, the model illustrates the evolution of groundwater levels and flows between 1864 and 2000 and allows predictions of future conditions.

Model results show how intensive groundwater use has influenced the groundwater flow system throughout the SEWRPC area and beyond its borders. Groundwater withdrawals from municipal and industrial wells have created a regional cone of depression. Although Milwaukee was the major groundwater user during the early 1900s, today's largest groundwater consumer is eastern Waukesha County. In response, the center of the cone of depression in the deep part of the flow system has migrated westward about 8 miles from Milwaukee toward the city of Waukesha. Water levels in the deep aquifer have dropped about 500 ft since the early 1900s and continue to decline at about 6 ft/yr. If historic consumption trends continue, pumping will increase by as much as 40 percent between 2000 and 2020; the model shows that this increased use will produce over 100 ft of additional drawdown.

Along with increased drawdown, pumping has reduced groundwater discharge to springs, lakes, and wetlands, has shifted groundwater divides, has increased flow from the shallow to the deep parts of the aquifer system, and has redirected groundwater flow lines. The most important source of water to pumping wells is water transferred from surface water to the groundwater system.

In addition to its value in understanding the groundwater system and the impacts of groundwater use, the regional model provides a decision-making tool for new well placement and water-management options, a basis for delineating contributing areas for municipal wells, and a framework for more detailed studies and models of specific areas within the region.

T3B
Investigations for Protection of Water Availability, Kane County, Illinois

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The population of Kane County, Illinois is predicted to grow to nearly 700,000 residents by the year 2030, an increase of over 70 percent above the population in 2000. The expected increase in water demand accompanying this growth has prompted a study of the water resources in the area conducted jointly by the Illinois State Water Survey and Illinois State Geological Survey. The specific objectives of the investigation are to assist Kane County in protecting groundwater quality, preserving groundwater availability, providing a basis for the formulation of policy and management strategy for its water resources, and providing baseline data and a framework for future studies. The investigations, which will conclude in 2007, will accomplish these objectives through geologic and hydrologic field studies, records searches, database construction and management, and computer-assisted mapping and modeling of the geology, groundwater and surface water systems.

Groundwater flow models on two scales are a central deliverable because they constitute tools for future evaluation of the consequences of groundwater development schemes and management scenarios. These include a high-resolution model of shallow aquifers in Kane County and adjacent areas, a high resolution model of deep bedrock aquifers in north-eastern Illinois, and a lower-resolution, regional scale model covering parts of Illinois, Wisconsin, Michigan and Indiana developed to provide boundary conditions for the high resolution models. The scope of the present investigation includes application of these models for analysis of groundwater availability to existing well networks, capture zone delineation, and mapping of groundwater recharge/discharge patterns. The modeling has required the organization and interpretation of large amounts of geological and hydrological data, some based on primary field observation, but most obtained from existing published and unpublished resources. GIS software has been used for the processing and transfer of information from databases and geological models into advanced numerical groundwater models. MODFLOW has been employed to simulate the groundwater flow field.

Significant effort has been directed toward developing a three-dimensional geologic model of the glacial drift and upper bedrock of Kane County and its immediate surroundings. The geological model provides the framework for the high-resolution shallow aquifer modeling of the Kane County area. Also, the geologic model is being used to produce derivative maps for county scale planning.

Since Kane County obtains significant water from surface waters, principally the Fox River, the scope of the study includes construction of a computer flow accounting model for major streams in the county. This interactive model will permit local officials and planners to assess the quantity of flow in these streams for in-stream and off-stream purposes as well as to estimate the effects of differing patterns of water use on streamflow quantity. The program will also provide specific flow quantity information for low-flow and drought scenarios needed to evaluate the probable availability of surface water for public water supplies and other uses.

T3C
Ground-Water Inventory and Map for the State of Michigan

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In August 2003, the State of Michigan enacted Public Acts 148 and 177. P.A. 148 requires that a ground-water inventory and map be generated for the State by August 2005. P.A. 177 sets up a procedure to address ground-water-withdrawal conflicts between ground-water users in the State. A research team from the State of Michigan, Department of Environmental Quality; the U.S. Geological Survey; and Michigan State University was assembled to meet the requirements of P.A. 148. *Will these acts impact water-supply planning? What scientific and technical challenges does P.A. 148 pose? Should the inventory and map generated through P.A. 148 be extended throughout the Great Lakes Region?* I will address the first two of these questions and leave the third open for discussion at the conference.

Water-supply planning requires estimates of water budget components, current water use, aquifer properties, and an understanding of the spatial and temporal variability of these quantities. The ground-water inventory and map developed through P.A. 148 will summarize much of this information and present it in an integrated, consistent format. The ground-water inventory and map should provide the initial ground-water information sought in any water-supply evaluation. P.A. 177 explicitly provides a mechanism to address ground-water-withdrawal conflicts. In water-supply planning, these conflicts will typically be between high-capacity wells and domestic wells. The interaction between high-capacity users and domestic supply is an important consideration in ground-water resource planning, and codifying conflict resolution may help clarify the costs of high-capacity wells.

A major challenge of this study is the short timeframe for completion; therefore, the study must rely on existing data sources. Available data were collected on different spatial scales, for different purposes, and vary in quality. These data, however, must be combined to develop a consistent interpretation for the State. The uncertainty inherent in the aquifer characteristics derived from these data also must be estimated and communicated. Point data include well logs and aquifer-test analyses. Most well logs have only lithologic information and some well logs also have specific capacity data. These data are observations of the aquifer applicable to a limited area around the well. Point data provide information regarding the heterogeneity of the system and on the range of aquifer properties observed. Areal data include both geologic and hydrogeologic maps. Statewide maps may be too general to describe important differences on the county or township level, and they do not capture the heterogeneity observed in the aquifer properties of glacial deposits. To meet the requirements of P.A. 148, methods to combine existing point and areal data are sought to provide the required information for quantifying ground-water-resource availability.

Session P3: Resource Management

Water supply planning and management decisions must be scientifically sound and balance the competing interests within the region. These sessions will present the environmental concerns that must be considered by water supply planners, and the ongoing and needed monitoring efforts.

P3A
Environmental Concerns

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Urban sprawl is responsible for a significant loss of natural resources, including one related directly to a basic need for human survival – water. Undeveloped land is vital, not only for fish and wildlife or recreation, but for its ability to clean and store fresh water. Sprawl can cause pollution of water resources by runoff. Rain that runs off impervious surfaces such as roads, roofs or parking lots, picks up pollutants such as fertilizers, pesticides or leaky chemicals from automobiles and carries them into rivers, lakes and streams. Sprawl also replaces wetlands, meadows and forests with impervious surfaces. This prevents groundwater recharge, or the seepage of precipitation into the ground to provided a needed service — refilling of our groundwater aquifers, where more than 1/3 of Americans get their drinking water. Instead, water is carelessly swept away by gutters and sewers. Compounding the problem further is exploding population growth throughout the Great Lakes, particularly in some communities that are already experiencing water shortages, spurring conflicts over use of aquifers. Because water is a finite resource — it cannot be artificially manufactured — demand continues to grow exponentially, outstripping available supplies. This presentation will describe how sprawl and current development trends threaten our fresh water resources and provide an important foundation for subsequent sessions that offer tools for transforming how we develop and use land in ways in order to protect and conserve a basic human need — fresh water.

P3B
Coordinating Regional Monitoring

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One of the major challenges in managing coastal resources is to cooperatively collect and evaluate critical ecological, economic, and social information. Too often, financial resources dedicated to long-term monitoring and broad-scale data collection are limited, and the data are collected by a diverse mix of agencies and organizations. When attempting to understand the underlying mechanisms in such a large system like the Lake Michigan basin, it is important that monitoring organizations collaborate to share data effectively and efficiently. The Great Lakes Commission is involved in several efforts in the Lake Michigan basin and across the Great Lakes to coordinate monitoring, and consolidate and disseminate critical information to better inform policy makers and resource managers. These efforts can be organized into three distinct approaches:

1) Facilitating monitoring coordination bodies;
2) Developing online monitoring and data inventories and exchanges; and
3) Coordinating collaborative monitoring events and programs.

This presentation will highlight several related efforts in the Lake Michigan basin including: the Lake Michigan Monitoring Coordination Council, Michigan Clean Water Corps and the Lake Michigan Tributary Monitoring Project. Several Great Lakes wide initiatives will also be discussed such as the Great Lakes Coastal Wetlands Consortium and the Great Lakes Monitoring Inventory. These approaches each address a different aspect of the data collection and communication problem and provide possible solutions to the need for coordination of regional data collection and use.

Several lessons learned through these initiatives can be applied to water supply management. The presentation will highlight a number of issues that bear discussion in this context and suggest several policy changes or management initiatives that could improve information availability and use by water supply planners in the region.

P3C
Groundwater Recharge Area Protection: Using State Regulated Recharge Areas and Local Planning Tools

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Illinois law and regulations authorize the creation of Regulated Recharge Areas ("RRAs") to protect specific groundwater resources that are highly susceptible to contamination. This underutilized tool provides for defined set-back zones to limit new and existing potential sources of contamination near vulnerable groundwater resources. As a land use planning tool, RRAs can be used to protect drinking water resources in rapidly developing communities where water supplies are constrained. Either the Illinois Environmental Protection Agency or a regional planning committee can initiate the RRA process based on protection needs and hydrogeologic data from a Source Water Assessment and Protection analysis. The Illinois Pollution Control Board ultimately determines the scope, boundaries and protections within the RRA.

This important local planning tool has been underutilized since its authorization in the 1980s because of limited awareness by local officials and a lack of adequate hydrogeologic data. The State's new databases and sophisticated mapping capabilities better enable municipalities and counties to use the potentially important RRA tool. RRAs primarily address point-source, non-household contamination sources. To lessen non-point source contamination of water resources, localities may also consider other protection tools, including reducing impermeable surface areas and incentivizing pro-conservation designs.

Session T4: Addressing Data Gaps and Uncertainties

The Lake Michigan Region has a wealth of scientific knowledge for use in planning and managing its water resources, but there are gaps in data and understanding that lead to uncertainties in evaluating the consequences of management decisions. Given the needs identified in session T2, this session will outline the uncertainties and additional scientific and engineering studies needed to provide the data, information and knowledge used in planning.

T4A
Inside Groundwater Modeling

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Aquifers have long been important sources of water supply; development pressures have only increased their importance. However, it is difficult to simulate the response of the water resource to increased demand due to the presence of subsurface heterogeneity, variable recharge, connections between groundwater and surface water, and unknowns regarding water use. This talk summarizes the elements that constitute a regional groundwater study and, after reviewing some of the methods and difficulties of estimation, illustrates how elements can be integrated to evaluate the sustainability of the resource.

Regional groundwater studies aimed at providing planners with a tool for managing water resources generally assume the form of flow models. The model integrates information about the geometry of the subsurface, the properties of aquifers and aquitards, and the sources and sinks for groundwater. Of particular importance for understanding the response of the system to pumping trends are long-term data involving water levels, discharge to streams, and water-use.

The main natural source of water to the water table is recharge. A variety of methods have been developed for its estimation with their own strengths and weaknesses. Of particular importance in temperate climates are methods that equate recharge with stream base flow and use hydrograph separation to estimate base flow. Recharge varies in time as well as space. Increasingly, research is aimed at studying the effect of climate variability and climate change on recharge patterns. Superposition of climatic cycles is one way of understanding the succession of wet and dry periods, but models of the subsurface are needed to determine the extent to which the climatic forcing is dampened in its effect on groundwater storage.

The chief natural sink for groundwater is surface water. Indeed, from many viewpoints groundwater and surface water constitute a single resource. The patterns of groundwater-surface water interactions with or without pumping are well known, although it can be difficult to estimate the parameters that control exchange. Recent advances in modeling have improved our ability to represent groundwater flow to and from lakes and to simulate the routing of groundwater as baseflow through surface-water networks.

When the various elements of the ground-water system are integrated, it is possible to evaluate the sustainability of the resource under different pumping regimes. Every discharging well changes the ground-water system, generally by reducing baseflow. Water can be plentiful, but at the same time the local and even the regional effect of pumping on surface water can be pronounced. In this sense, there is no such thing as safe yield, only choices constraining how water is budgeted. Examples from a regional groundwater model of southeastern Wisconsin show how a model is used to simulate historical and future changes in the water budget for different parts of the flow regime.

T4B
Surface Water Supply Planning Issues in the Southern Lake Michigan Region

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Many areas of the Southern Lake Michigan region are experiencing accelerated urban growth. There are increasing pressures to maintain the existing health of streams and still provide stream uses that are typically needed in the urban/suburban environment, including wastewater assimilation and, in some areas, water supply. Interest is currently placed on developing groundwater supplies in growth areas; however, the use of shallow groundwater supplies could also indirectly affect stream uses because of hydrologic connections between shallow aquifers and base streamflow. Integrated management approaches are needed that maintain the viability of both resources. Several larger communities on the fringes of the Chicago metropolitan area use streamflow for water supply, and expanded use of the surface water resources in these and other areas may be useful in avoiding overuse of local aquifers. Rivers in growth areas that have the potential to serve as a water supply source are also most likely to be receptors for wastewater, and effluent discharges can cause these streams to have low flows that are higher than the natural condition. Although the quantity effects of surface water withdrawals must be considered, the primary management concern for maintaining instream uses in these rivers is more often the water quality associated with the assimilation of wastewaters and other pollutants.

Scientific analyses and data are needed to better understand factors related to the use of water in our streams in and near urban areas, including the aforementioned: 1) capacities of streams to assimilate wastewaters and 2) groundwater-surface water interactions that affect the natural supply of low flow to streams; but also: 3) the behavior and enhancement of aquatic ecosystems, 4) wastewater treatment technologies, 5) the effects of various types of best management practices on flow quantity and quality, and 6) water conservation and reuse. Hydrologic processes and impacts related to many of these factors are often presented as simple and presumed relationships, but more often the cause-effect relationships are complex and difficult to ascertain or verify using common hydrologic data. Defensible scientific assessment will often require an adaptive approach that combines sound modeling with intensive data collection designed specifically to meet modeling goals, and also examines uncertainties in both the model and data. The impact of watershed scale also must be addressed, as hydrologic impacts observed on the local scale may not effectively translate to similar impacts at the regional scale.

In addition to the above factors, water supply planning must also address the potential for hydrologic impacts related to climate change and climate variability. This presentation includes comparisons of modeling efforts and predictions of climate change impacts on hydrology in the Midwest and the uncertainties associated with these predictions. Recent hydrologic trends and the context of climate change impacts within the region's historical variability in climate and streamflow are also discussed.

T4C
Water Quality Issues in the Groundwater System of the Lake Michigan Basin

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The sandstone aquifer has been a major producer of potable water for eastern Wisconsin and northern Illinois for over 100 years. While portions of the sandstone aquifer close to Lake Michigan in Wisconsin, and the deeper portions of the aquifer in Illinois, have been known to contain saline water for decades, several recent wells have shown the distribution of saline water to be more complex than expected. Zones of saline water have been found associated with Precambrian mounds in eastern Wisconsin or the Des Plaines disturbance in northern Illinois. In addition, saline water in the lower Mount Simon formation has been found in Waukesha County and in northern Illinois. Upward migration from improperly abandoned deep wells completed across multiple zones of the sandstone aquifer has caused contamination of shallower units of the sandstone aquifer in the Chicago area. More recently, several deeper wells in Waukesha County have experienced rising salinity due to vertical migration through a weak confining unit in the upper Mt. Simon formation in response to the large drawdown in the aquifer. Partial dewatering of the sandstone aquifer has caused increases in arsenic levels in several areas in Wisconsin and caused nuisance bacteria problems in several deep wells. A new drinking water standard for radium has forced hundreds of water systems to consider expensive treatment technologies or finding alternative water sources.

The shallow aquifer system is becoming a more important source of water due to the declining head and water quality problems in the sandstone aquifer. The shallow aquifer system receives more rapid recharge and promises to be a more sustainable water source. However the rapid recharge makes the aquifer more susceptible to contamination from a variety of manmade sources and increases the impact of pumpage on surface water features. A recent sampling found 38% of the wells in Wisconsin have traces of agricultural chemicals. Impacts from other anthropogenic sources are less frequent but have stricter regulatory minimum setbacks. As a result, most new municipal wells in the shallow aquifer are drilled in less developed agricultural areas where the municipality has less zoning control and the threat of agricultural contamination is higher. Citizen's groups are aggressively opposing several proposed new wells over perceived threats to lakes, streams, springs and wetlands.

Several communities have tried to use the sandstone aquifer as a storage vessel for surface water using Aquifer Storage and recover (ASR) wells. Unfortunately disinfection byproducts have created concerns over contamination of the aquifer and oxidation reactions with sulfides in the aquifer have led to problems with arsenic in at least one trial. These concerns have caused the regulatory bodies of Illinois and Wisconsin to adopt permitting procedures for ASR systems that are more stringent than in the rest of the country, severely impairing the economic advantages to such systems. Efforts to increase the use of surface water beyond the sub continental divide are limited by international compacts and US law. A comprehensive water supply plan is needed to protect the long term economic development and environment of the region.

Session P4: Water Usage

P4A
NIRPC Study Results: Water Resources Protection and Conservation Toolkit

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The three counties in Northwestern Indiana are predicted to see greater growth in areas not currently receiving Lake Michigan water as the population declines in the urban core along the Lake Michigan shoreline. Because of this change and the unknowns in future water quality and quantity in the three-county region, NIRPC is taking the lead in the region to educate local governments on the availability, protection, and conservation of its water resources.

Under a grant from the Joyce Foundation and with assistance from the Cadmus Group and the Lake Michigan Federation, NIRPC is producing a Water Resources Protection and Conservation Toolkit. The toolkit provides background on water resources and methods to best protect critical water resources in and near the Great Lakes watershed.

These tools are intended to help communities in these areas to most effectively protect and conserve water resources and protect the natural water cycle. The toolkit is intended to assist communities meet part of the major goal of the Great Lakes Charter Annex of 2001 — to protect, conserve, restore, and improve the water and water dependent natural resources of the Great Lakes.

The toolkit will consists of a series of fact sheets that provide overviews of the key issues and identify a series of resources saved on a CD that will assists homeowners, local governments, water utilities, and developers in making choices that better protect, conserve, and sustain local water resources.

This presentation will frame the water resources issues in Northwestern Indiana, present the challenges, provide an overview of the key players, and summarize the content and intention of the toolkit.

P4B
Public/Private Partnerships: *How They Can Be Used to Improve Water Resource Management*

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Water supply planning and resource management issues transcend utility ownership. In Illinois and Indiana alone, private utility companies provide water service to more than 2 million people. Further, resource management issues involve not only water utilities but wastewater utilities as well. Like the public utility service providers, private utility providers face these challenges everyday. This presentation will profile some of the regions private utility operations and examine the similarities and differences of how water supply issues are addressed by the private owner.

This presentation will also present several ideas and concepts demonstrating how partnerships between publicly owned utility service providers and private utility service providers can bring innovative technical solutions and sound environmental practices to communities facing water supply issues. Specific examples and success stories will be presented in areas such as water reclamation and reuse, Lake Michigan water supply systems, and water resource sharing.

P4C
Integrating Demand-Side Planning and Management into the Water Supply Planning Process

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Traditionally, water supply planning has focused exclusively on engineering solutions for meeting long-term private and social needs for potable water. However, due to evolving physical, environmental, and legal-regulatory constraints, additional water supplies have become much more costly to develop and maintain. Contemporary approaches to water supply planning consider the benefits and costs of non-structural measures that may extend the life of current water supplies. Demand-side management, or water conservation, must now be considered as part of any viable analysis and plan for managing long-term water supplies.

This session will present an overview of fundamental building blocks for integrating demand-side management into the broader water supply planning process. The discussion will provide examples of demonstrated benefits from demand-management programs implemented around the United States. The session will identify an integrated framework for demand-side planning and management activities. In doing so, the discussion will outline the critical steps in formulating a demand-management plan. The major components of the framework will be explained to include:

- *Baseline studies* to determine and understand how water is used in your water service area
- Elements of a good *water demand forecast* that projects how water will be used in the future, given the dynamics of the factors that influence water demand
- Differentiation of *passive and active water efficiency measures*
- *Impact and process evaluation* of candidate water efficiency measures
- *Decision rules* for evaluating demand management programs as part of a comprehensive package of alternatives to meet future needs

In addition to these building blocks, the session will review the role of water pricing as a management tool for encouraging efficient use of water. The session will provide a summary of ratemaking practices in the State of Illinois and offer insights on how pricing practices can be improved to set the proper basis from which to conserve water using technological approaches.

Lunch Speaker – Day 2

A Symphonic Approach to Water Management

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A great theologian once said that "Truth is symphonic." Effective water management in the 21st century will bear out this insight. To meet the needs of the world, the nation and the Great Lakes region, water managers must harmonize many different but related parts of a very complex piece: quantity, quality, and flow; land and water; surface and groundwater; watershed and political boundaries; chemical, physical, and biological components of the ecosystem; as well as supply and demand. To compose the necessary partnerships, across jurisdictional and watershed boundaries, will require leadership in the public, private, and not-for-profit sectors. It is these partnerships which will drive progress toward appropriate water management regimes at multiple levels of society. While the federal government will be a necessary partner, it will be a limited one due to fiscal and political constraints. Historically, the citizens of the Great Lakes have demonstrated an aptitude for managing at a regional and binational scale, which will serve them well in meeting these pressing challenges to water stewardship. However, ultimate success will require that the region fully value the resource and supporting infrastructure in terms of both their ecological and economic worth.

Joint Session: Case Studies

5A
Edwards Aquifer/Central Valley Authority

Edwards Aquifer Authority Case Study

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The Edwards Aquifer

The southern portion of the Edwards Aquifer (Aquifer) is one of the world's unique groundwater resources, extending 180 miles across South Central Texas. The sole-source of water for a unique system of aquatic life, including several threatened and endangered species, the Aquifer also provides water to cities, towns, rural communities, and farm and ranch lands for household, agricultural, industrial and recreational purposes. People began drilling wells into the Edwards in the 1930's and utilization of the Aquifer continually increased through the mid-1990s. The Aquifer also provides source water for several springs, including San Marcos Spring and Comal Springs, each home to several endangered species and headwaters to tributaries in the Guadalupe River system. Spring water usually makes up a majority of the surface water in the southern Guadalupe River system, and cities, industry and farms rely on the Guadalupe River as their primary source of water. Average recharge recorded from 1934 to 1999 at 680,000 acre-feet per year will not keep up with growing demand. Recharge is entirely dependant on rainfall. Therefore, during drought periods less recharge is available to meet ever-increasing demand. Various groups and entities in the Edwards Aquifer region have undertaken the difficult task of addressing present and future water needs. This task was greatly hampered by Texas common law, which prevents landowners from using the courts to prevent overpumping aquifers or interference between wells. The Texas Legislature reacted to a crisis drought by creating the Edwards Aquifer Authority to regulate production from the Edwards Aquifer.

The Edwards Aquifer Authority

The Edwards Aquifer Authority (the Authority) is a regulatory agency charged with preserving and protecting the Edwards Aquifer in an eight-county region including all of Uvalde, Medina and Bexar counties, plus portions of Atascosa, Caldwell, Guadalupe, Comal and Hays counties. The Authority was created by the Texas Legislature in 1993 with the passage of the Edwards Aquifer Authority Act (the Act) to preserve and protect this unique groundwater resource. Legal challenges prevented the Authority from beginning operations until June 28, 1996, the day the Texas Supreme Court issued a decision that the Act was facially constitutional. The Authority is charged with regulating pumping from the Aquifer by issuing up to 450,000 acre feet in production permits to persons who can prove beneficial use between 1972 and 1993. The claims for this historic use far exceeded the available permit limits, a problem that continues to plague the Authority. Over a 7 year period, the Authority reviewed over 1000 applications, investigated claims dating back over 20 years, and finally issued permit decisions on all but a handful of the applications. In the meantime, the regulated community reacted by creating a new market for Aquifer permits and planning for alternative water supplies. Although the Authority has struggled at times, overall it is a great success.

5B
The Metropolitan North Georgia Water Planning District

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In the year 2000, concerns over existing water quality problems and future water supply issues caused the business community in metro Atlanta to convene a task force of regional government and business leaders to study the situation. This task force, known as the "Clean Water Initiative," recommended that a water planning district be established. Following those recommendations, the Metropolitan North Georgia Water Planning District was created by the Georgia General Assembly in 2001 to provide comprehensive water resources plans, establish policies, prepare model ordinances, and promote intergovernmental water resources coordination. The District area currently covers 5,150 square miles of metro Atlanta, a population of over four million, and includes 119 governmental jurisdictions (16 counties, 94 cities and 9 water/sewer authorities).

The District enabling legislation provided much detail for the structure of the organization and the development of water resources plans. Key elements included: a board of 17 local city and county elected officials and 10 appointed members; provision for first Chair; staff to be provided by the existing regional commission, a technical committee; six basin advisory councils; detailed elements and deadlines for the creation plans; funding through state appropriations and local mandatory funding; local implementation requirements; and state plan standards; and enforcement by state through existing regulatory authority and water-related permits. This detailed agenda and strong support from the State, including $1 million of state funds during the first year, helped jump start the process.

Within the first year and a half the District created an organization that engaged hundreds of people on a regular basis. It raised funds, primarily through a local dues formula, to fund the organization and prepare major plans with the help of consultants. In 2002, a Short-term Wastewater Plan to address immediate problems was adopted as well as a suite of Model Stormwater Management Ordinances. In 2003, three major plans were adopted: a District-wide Watershed Management Plan; a Long-term Wastewater Management Plan and a Water Supply and Water Conservation Plan. The plans include recommendations for both local and state agencies. Implementation activities began in 2004 and surveys show progress is being made.

There were a number of key success factors. The integration of the three major plans was important for holistic water resources planning. The structure of the board and the technical committee ensured involvement by local governments that are responsible for implementing the plans. Use of existing staff at the regional commission allowed for less costs and start-up time. Involvement by the state Environmental Protection Division staff was important to decision-making during the process. An in-depth and open stakeholder process involved monthly meetings with over 500 people and the use of a trained facilitator with decision software. A website posted all deliverables, meeting summaries and presentations. Finally, the legislative deadlines and enforcement incentives that drove the process were key.

Concluding Plenary Session

A panel of representatives from the Northeastern Illinois Planning Commission, the Northwestern Indiana Planning Commission and the Southeastern Wisconsin Regional Planning commission will wrap up the conference and discuss upcoming efforts for water supply planning.

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Regional cooperation and coordinated planning are key to the effective management of interjurisdicational resources. In recognition of this, the regional planning commissions of southeastern Wisconsin, northeastern Illinois, and northwestern Indiana, along with the Chicago Area Transportation Study, signed an agreement known as the Wingspread Accord to harmonize planning efforts across state lines and improve interagency communication. Adopted in April 2002, one of its first outcomes was the formation of the Southern Lake Michigan Regional Water Supply Consortium. This group serves as a forum and information exchange for environmental and resource agencies, firms, universities, and nonprofit environmental advocates. Since its inception in spring of 2003, the Consortium has been funded by the Illinois-Indiana Sea Grant and subsequently by the Joyce Foundation. It has worked to identify and raise awareness of the need for water supply planning on a regional scale, conducting outreach and producing a technical needs assessment and framework for coordinated planning across the region. Almost two years later, the first signatories to the Wingspread Accord remain committed to addressing shared concerns over water resources through the Consortium.

NOTES