

Subgoal 6

Are land use, recreation, and economic activities sustainable and supportive of a healthy ecosystem?

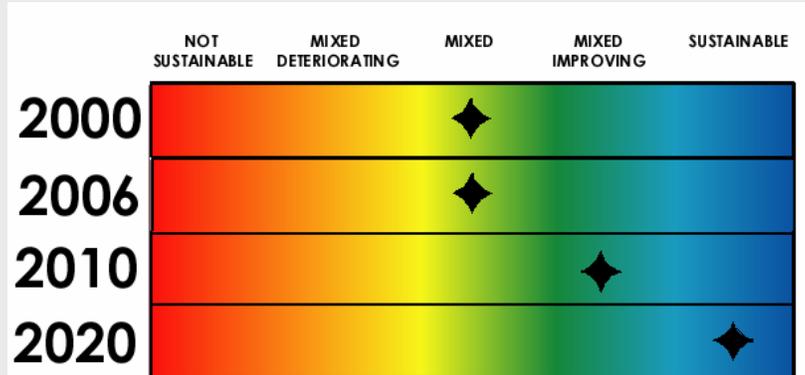
Status

Land use, recreation, and economic activities are more sustainable, healthy and supportive of a healthy ecosystem, but there is significant work that needs to be done. There is more information available on critical ecosystems, significant activity in better managing water resources and determining the true value of a healthy ecosystem. There is danger, however, that the ecosystem could deteriorate if the knowledge is not shared widely and translated into actions.

Indicators (State of the Lakes Ecosystem Indicators by Number)

- 3514 - Commercial / Industrial Eco-Efficiency
- 3516 - Household Stormwater
- 4863 - Land Use Adjacent to Wetlands (Coastal Wetlands)
- 7002 - Land Cover - Land Conversion
- 7000 - Urban Density
- 7006 - Brownfield Redevelopment
- 7028 - Sustainable Agriculture Practices
- Recycling
- 7043 - Economic Prosperity
- 7054 - Ground Surface Hardening
- 7056 - Water Withdrawal
- 7064 - Vehicle Use
- 7057 - Energy Consumption
- 7060 - Solid Waste Generation
- 7061 - Nutrient Management Plans
- 7062 - Integrated Pest Management
- 7100 - Natural Groundwater Quality and Human-Induced Changes
- 7101 - Groundwater and Land: Use and Intensity
- 7102 - Base Flow due to Groundwater Discharge
- 7103 - Groundwater Dependent Plant and Animal Communities
- 8114 - Habitat Fragmentation
- 8132 - Nearshore Land Use
- 8136 - Extent and Quality of Nearshore Natural Land Cover
- 8501 - Maintenance and Productive Capacity of Forest Ecosystems
- 8502 - Maintenance and Forest Ecosystem Health and Vitality
- 8503 - Forest Lands - Conservation and Maintenance of Soil and Water Resources

Lake Michigan Target Dates for Sustainability



Challenge

- Land use and human activities are undertaken by individuals aware of the lake ecosystem's capacity to support human and environmental activities

Next Steps

- Help develop Green Marina, Highway, and Golf Course programs for the basin
- Promote studies that investigate the status of groundwater resources and their impact on water quality and aquatic habitat
- Support studies to determine sustainable yields for Great Lakes water resources

Great Lakes Regional Collaboration Sustainability Vision Statement

Sustainability is not a government program or a spectator sport, it is a balancing act that requires full involvement of all Lake Michigan basin citizens. Until recently there were many published materials on "what is" sustainability and "how to" but we have now reached the point where we can begin to measure our progress or lack thereof. It is essential we track the use of our resources: climate, water, energy, land, industrial and municipal waste, water run off, flora and fauna.

Vision Statement

A sustainable Great Lakes ecosystem that ensures environmental integrity and that supports, and is supported by, economically viable, healthy communities.

The United Nations Brundtland Commission report defined sustainability as: development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In alignment with this sentiment is the Anishinaabeg Seventh Generation Principle that each generation considers the impact of its decisions on the next seven generations.

Sustainability

The interdependencies inherent in the ecosystem perspective require a balance between three fundamental elements: environmental integrity, economic vitality, and sociocultural well-being. The ability of these elements to function in balance over time is a measure of sustainability. The ecosystem perspective requires a shift of focus from resource programs to resource systems and in some cases their interaction. It places human activities and communities within an ecosystem and consequently, within ecosystem management.

The LaMP helps to identify the activities, partnerships, and locations where ecosystem management needs adjustment in order to attain a sustainable Lake Michigan basin. Sustainable landscapes are local ecosystems that are healthy enough to provide a range of valuable benefits and services, both now



Great Lakes Regional Collaboration Action Items

Sustainable Development

Ensuring the long term **sustainability** of the Great Lakes resource will require a number of significant changes in the way we approach such things as land use, agriculture and forestry, transportation, industrial activity, and many others. To start this process, we need to:

- adapt and maintain programs that promote sustainability across all sectors;
- align governance to enhance sustainable planning and management of resources;
- build outreach that brands the Great Lakes as an exceptional and competitive place to live, work, invest, and play; and
- provide leadership for sustainable development through implementation of the Strategy recommendations.

and in the future. Such benefits and services to humans include the following:

- Moderating natural events and human activities. Healthy landscapes can make communities safer and more livable by tempering the effects of natural events and human activities. For example, wetland systems can absorb and store storm waters, thereby aiding in flood control and ensuring more predictable stream flows and water levels and often providing for recharging local ground water.
- Enhancing social well-being. Healthy landscapes provide services that make communities more enjoyable and rewarding. For example, they provide opportunities for outdoor recreation, while also providing habitat for diverse plant and animal species. Plantings along stream banks can also provide buffers to filter pollutant runoff.
- Supporting local economies through tourism and sustainable natural resource use.

Water-Resources Issues

The Great Lakes basin, which encompasses Lakes Superior, Michigan, Huron, Erie, and Ontario, contains 95 percent of the fresh surface water in North America and 18 percent of the fresh surface water in the world. Ground water underlying the basin constitutes another large volume of freshwater. Humans, animals, and plants have adapted to this abundance in water resources. Yet, even in this water-rich area, water withdrawals, diversions, and use sometimes conflict with the needs of other users and ecosystems in the basin. For example, pumping of large water-supply wells in Wisconsin and Illinois has lowered ground-water levels in the area, increasing pumping costs and levels of such contaminants as radium. Because the Great Lakes basin contains so many communities, industries, and ecosystems that depend on present quantity sources of water, and because competition for available water is intensifying, there is a need to quantify the region's water resources and the trends affecting them so that

the potential for possible future water-use conflicts can be reduced or avoided.

In recent years, numerous government agencies, commerce, industry, and the general public all have expressed concern about potential large withdrawals of water within the Great Lakes basin. In response, the Great Lakes States and Canadian Provinces signed the Great Lakes Charter Annex Implementing Agreements in December 2005. These multi-state and binational agreements commit the States and Provinces to more effective water-resources management. This commitment requires a more detailed understanding of the region's water resources and a synthesis of available data and information.

Great Lakes Water Availability and Use

At the request of Congress, the U.S. Geological Survey (USGS) is assessing the availability and use of the Nation's water resources to gain a clearer

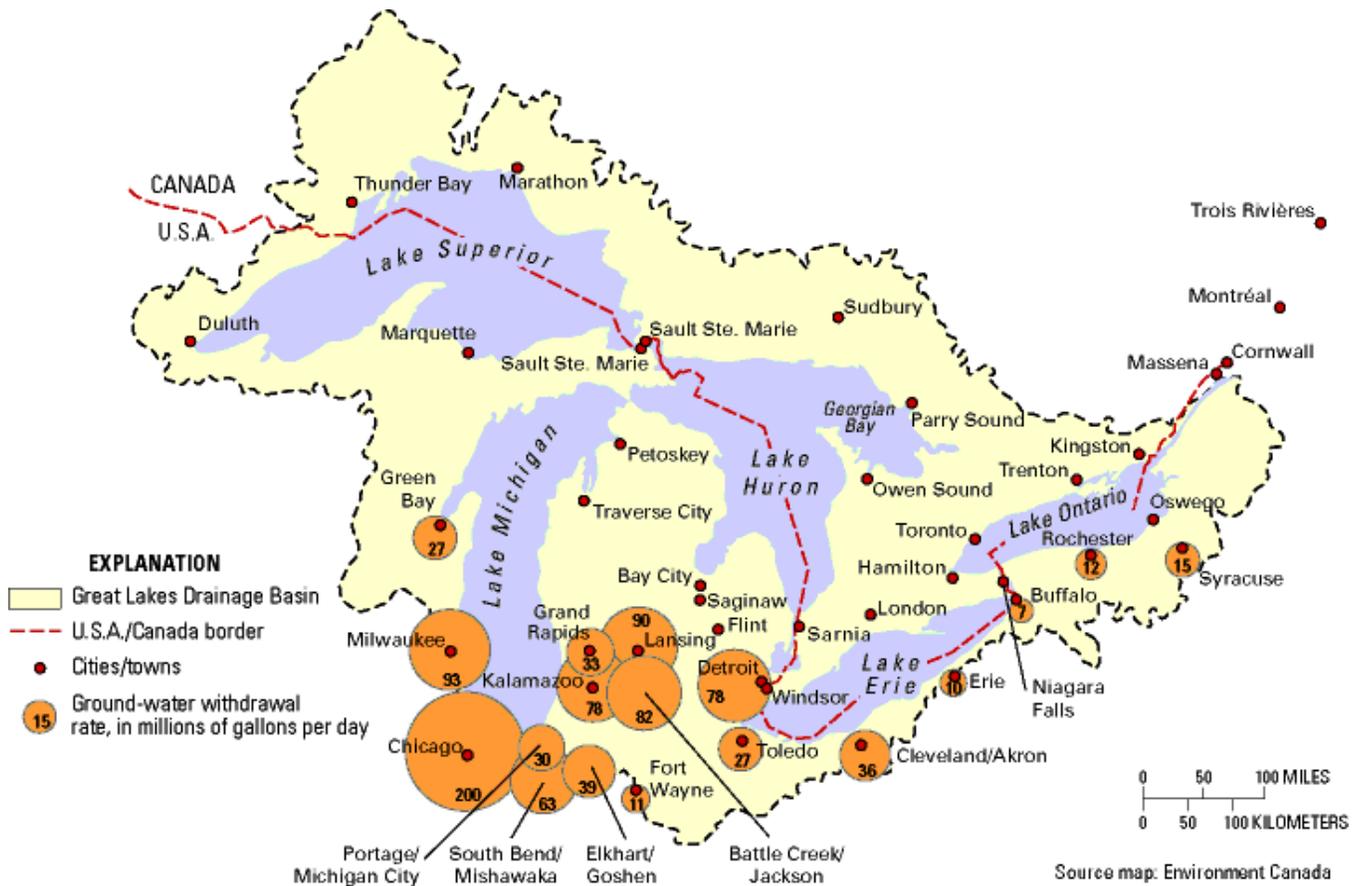


Figure 6-1 Groundwater Withdrawals in the Great Lakes Region



The Lake Michigan Toolbox Milwaukee Metropolitan Sewerage District Protects Land to Store Stormwater

The Milwaukee Metropolitan Sewerage District is purchasing and protecting land to reduce the impact of development on stormwater overflows. The program, Greenseams, formerly known as the Conservation Plan, is a flood management program that permanently protects key lands containing water absorbing soils. The program also aims to preserve land along stream corridors that connects the region's supply of public properties. Greenseams provides added support and protection for MMSD's structural flood management projects - infrastructure investments worth hundreds of millions of dollars. Greenseams identifies and purchases undeveloped, privately owned properties in areas that are expected to have major growth in the next 20 years and parcels of open space along streams, shorelines and wetlands. Sales are completely voluntary.

MMSD hired The Conservation Fund (TCF) to run Greenseams. TCF is a national non-profit conservation organization that forges partnerships to protect America's legacy of land and water resources. TCF performs high volume real estate transactions for local land trusts and government agencies throughout the country. All land acquired will remain as open space, protecting water and providing the ability to naturally store rain and melting snow in critical areas. Wetlands maintenance and restoration at these sites will provide further water storage.

In addition, preserving the properties also saves wildlife habitat and creates recreational opportunities for people living in the region. Where applicable, the properties can be used by the public for hiking trails, bird watching, and other passive recreation.

More information is available at: www.mmsd.com/floodmanagement/greenseams.cfm.



The Lake Michigan Toolbox Smart Growth Information Sources

Smart growth is development that serves the economy, the community, and the environment. It changes the terms of the development debate away from the traditional growth/no growth question to "how and where new development should be accommodated."

Smart Growth answers these questions by simultaneously achieving:

- Healthy communities -- that provide families with a clean environment. Smart growth balances development and environmental protection -- accommodating growth while preserving open space and critical habitat, reusing land, and protecting water supplies and air quality.
- Economic development and jobs -- that create business opportunities and improve local tax base; that provide neighborhood services and amenities; and that create economically competitive communities.
- Strong neighborhoods -- which provide a range of housing options giving people the opportunity to choose housing that best suits them. It maintains and enhances the value of existing neighborhoods and creates a sense of community. Transportation choices -- that give people the option to walk, ride a bike, take transit, or drive.
- A sample of smart growth information sources include:
 - www.epa.gov/smartgrowth/
 - www.cwp.org/index.html
 - www.lowimpactdevelopment.org/

understanding of the status of our water resources and the land-use, water-use, and natural climatic trends that affect them. The goal of the National Assessment of Water Availability and Use Program is to improve our ability to forecast water availability for future economic and environmental uses. Simply put, the assessment will help characterize how much water we have now, how water availability is changing, and how much water we can expect to have in the future.

Currently, the assessment is focused on the Great Lakes basin (See Figure 6-1) to determine the best methods to evaluate water resources, both surface and to develop strategies for delivering information about water availability and use. Planned activities for the pilot study include estimation of: (1) recent monthly streamflows; (2) spatial and temporal trends in streamflow characteristics, ground-water recharge, groundwater flow, and ground-water storage; (3) basin ground-water divides; and (4) consumptive water use. Other water-resources regions will be added to the assessment as evaluation methods improve and as funding permits. More information is available at: http://water.usgs.gov/ogw/gwrp/activities/wateravail_pilot.html.

Ground-Water-Flow Models in the Lake Michigan Basin

Application of ground-water-flow models is one of the most comprehensive ways to synthesize ground-water data and to analyze the response of a ground-water system to changes in the system, such as increased pumping rates, changes in pumping locations, changes in recharge, and climate variations. Regional models that simulate ground-water flow will greatly improve the overall understanding of ground-water conditions in the Great Lakes basin and provide a quantitative framework to help manage water resources in ways consistent with the Great Lakes Charter Annex agreements. Comprehensive ground-water-flow models are complex and time consuming to develop; therefore, the entire Great Lakes basin could not be modeled for this study. Instead, a ground-water-flow model of the Lake Michigan subbasin is being developed because (1) the entire watershed is in the United States, and many datasets already are available within the USGS; (2) ground water is withdrawn from bedrock and glacial-deposit

Great Lakes Charter Annex 2001 Implementing Agreements Approved and Signed

On December 13, 2005, the Great Lakes Governors and Premiers signed agreements at the Council of Great Lakes Governors' (CGLG) Leadership Summit that will provide unprecedented protections for the Great Lakes—St. Lawrence River basin. The historic agreements, which include a ban on new diversions of water outside the basin with limited exceptions, were approved by the Governors of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin and the Premiers of Ontario and Québec.

The agreements detail how the States and Provinces will manage and protect the Great Lakes—St. Lawrence River basin and will provide a framework for each State and Province to enact laws protecting the basin. The agreements include the following points:

There will be a ban on new diversions of water from the basin. Limited exceptions could be allowed, such as for public water supply purposes in communities near the basin, but exceptions would be strictly regulated.

- The States and Provinces will use a consistent standard to review proposed uses of Great Lakes water.
- The collection of technical data will be strengthened, and the States and Provinces will share the information, which will improve decision-making by the governments.
- Regional goals and objectives for water conservation and efficiency will be developed, and they will be reviewed every five years. Each State and Province will develop and implement a water conservation and efficiency program.
- Lasting economic development will be balanced with sustainable water use to ensure Great Lakes waters are managed responsibly.
- The waters of the basin are recognized as a shared public treasure and there is a strong commitment to continued public involvement in the implementation of the agreements.

Additional information regarding the Agreements may be found at the Council of Great Lakes Governors' web site at: www.cglg.org/projects/water/annex2001Implementing.asp.



The Lake Michigan Toolbox Green Infrastructure Overview Resources

Green infrastructure is an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations. The following are a series of resources for further protecting and developing green infrastructure.

- USEPA Low Impact Development page: www.epa.gov/owow/nps/lid
- Low Impact Development Center: www.lowimpactdevelopment.org
- Conservation Design Resource Manual: Language and Guidelines for Updating Local Ordinances, www.chicagowilderness.org/pubprod/miscpdf/CD_Resource_Manual.pdf
- Nonpoint Education for Municipal Organizations Network, <http://nemo.uconn.edu/national/index.htm>
- Center for Watershed Protection, An Introduction to Better Site Design www.cwp.org/better_site_design.htm
- Town of Franklin, Massachusetts, The Franklin Best Development Practices Guidebook www.franklin.ma.us/town/planning/HANDBOOK.PDF
- U.S. Department of Housing and Urban Development, The Practice of Low Impact Development, www.huduser.org/Publications/PDF/practLowImpctDevel.pdf.
- Prince George's County Low Impact Design Strategies, www.epa.gov/owow/nps/lid/lidnatl.pdf
- Planning with Power, Purdue University, www.planningwithpower.org
 - The Relationship Between Land Use Decisions and the Impacts on Our Water and Natural Resources, www.planningwithpower.org/pubs/id_260.pdf
 - Impacts of Development on Waterways, www.planningwithpower.org/pubs/id-257.htm



The Lake Michigan Toolbox Wisconsin Sea Grant Develops Online Planning Guide for Coastal Communities

The University of Wisconsin Sea Grant program developed an online planning guide for communities located on the Great Lakes. Communities situated on the Great Lakes in Wisconsin face a variety of challenges in developing comprehensive plans to guide future growth and development. In addition to all the elements of a comprehensive plan that inland communities must address (e.g., housing, transportation, infrastructure, land use, etc.), coastal communities also must tackle the preservation and sustainable use of coastal amenities, and the reduction of coastal hazards.

The Great Lakes Coastal Communities section of the Community Planning Resource Website provides a toolkit to support comprehensive planning and sustainable development along the Lake Michigan and Lake Superior coasts of Wisconsin. The website includes:

- A Planning Guide
- Information on Hazards Planning
- Plan Examples
- Laws and Regulations
- Training Materials
- Additional Links
- Maps and Data
- News and Events

More information is available at: http://planning.lic.wisc.edu/new_Coastal/Coastal_Home.htm



The Lake Michigan Toolbox Index of Sustainability Web Pages

The USEPA Sustainability web site examines sustainability and provides links to USEPA programs and tools in four key areas: the Built or Human-created Environment; Water, Ecosystems and Agriculture; Energy and the Environment; and Materials and Toxics. Links to the programs and tools are organized in three categories: Policies and Programs; Research, Tools and Technologies; and Assessments and Performance Measures.

More information is available at: www.epa.gov/sustainability/index.htm and www.epa.gov/sustainability/links.htm



The Lake Michigan Toolbox Managing Stormwater for Sustainability

Overviews

- Catching the Rain: a Great Lakes Resource Guide for Natural Stormwater Management, American Rivers www.amrivers.org/doc_repository/Stormwater_Guide_Book_FINAL2.pdf
- An Eight-Step Approach to Stormwater Retrofitting: How to Get Them Implemented, Center for Watershed Protection, www.cwp.org/retrofit_article.htm.
- Watershed-Based National Pollutant Discharge Elimination System Permitting Implementation Guidance, USEPA www.epa.gov/npdes/pubs/watershedpermitting_finalguidance.pdf.
- Stormwater BMP Design Supplement for Cold Climates, Center for Watershed Protection, www.cwp.org/cold-climates.htm.
- Lake County Stormwater Management Commission Technical Reference Manual, Lake County, Illinois, www.co.lake.il.us/smc/regulatory/tac/refmanual.asp

Example Stormwater Ordinances

- Stormwater Ordinances, www.stormwatercenter.net
- Stormwater Manual Builder, www.stormwatercenter.net
- Watershed Development Ordinance, Lake County Illinois, www.co.lake.il.us/smc/regulatory/wdo/default.asp
- Post-Construction Stormwater Management Ordinances, USEPA www.epa.gov/owow/nps/ordinance/postcons.htm.
- Post-Construction Stormwater Management Ordinances, Stormwater Center, www.stormwatercenter.net/Model%20Ordinances/Post%20Construction%20Stormwater%20Management/post_construction_runoff_control.htm.
- Operation and Maintenance Criteria for Stormwater Practices, www.stormwatercenter.net/Model%20Ordinances/Operation%20&%20Maintenance.htm
- Grand Traverse County, Michigan Soil Erosion and Stormwater Runoff Control Ordinance, including construction and post-construction runoff control. www.stormwatercenter.net/Model%20Ordinances/Post%20Construction%20Stormwater%20Management/grand_traverse_county_soil_erosi.htm

aquifers, both of which are important aquifer systems throughout the Great Lakes basin; (3) important issues related to ground-water and surface-water interaction can be simulated with the model; (4) ground-water withdrawals in the Lake Michigan subbasin may affect the locations of ground-water divides with Lakes Superior, Huron, and Erie; and (5) problems caused by large-scale ground-water withdrawals have been documented in the subbasin. In addition, one or more separate models within the Lake Michigan subbasin will be developed specifically to simulate ground-water and surface-water interaction in smaller watersheds because this is an important component of the water balance not only here but elsewhere in the Great Lakes basin. These models will be used to test new techniques for simulating the interactions of ground water and surface water at the appropriate scale. More information is available at <http://pubs.usgs.gov/fs/2005/3113>.

Lake Levels

The water-level elevations of Lakes Michigan, Huron, Erie, and Ontario have varied about 6 feet since 1860, when accurate records of lake levels were first recorded. Water levels in Lake Superior varied about 3 feet during the same interval. Prehistoric variations were much greater and were strongly correlated with climate change. Changes in water levels of the Great Lakes constitute the largest changes in the amount of water in the region. The Great Lakes basin study will summarize what is known about lake levels over the past 4,700 years. This analysis of lake levels will help put recent low lake levels into perspective, especially given the prospect of future global warming.

Lake Michigan was measured at 2 feet below the long-term average in 2001, having dropped more



The Lake Michigan Toolbox

LEED Certification of Green Buildings

The LEED (Leadership in Energy and Environmental Design) Green Building Rating System® is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings. LEED standards include:

- New commercial construction and major renovations
- Existing building operations
- Commercial interiors projects
- Core and shell projects
- Homes
- Neighborhood development

LEED was created to:

- define "green building" by establishing a common standard of measurement
- promote integrated, whole-building design practices
- recognize environmental leadership in the building industry
- stimulate green competition
- raise consumer awareness of green building benefits
- transform the building market

LEED provides a complete framework for assessing building performance and meeting sustainability goals. LEED emphasizes state of the art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

The U.S. Green Building Council is currently working with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); and the Illuminating Engineering Society of North America (IESNA) to develop proposed Standard 189, Standard for the Design of High-Performance Green commercial Buildings.

Scheduled for completion in 2007, the proposed standard will apply to new commercial buildings and major renovation projects, addressing sustainable sites, water use efficiency, energy efficiency, a building's impact on the atmosphere, materials and resources, and indoor environmental quality.

Standard 189P will be an ANSI-accredited standard that can be incorporated into a building code. It is intended that the standard will eventually become a prerequisite under LEED.

More information is available at: www.usgbc.org/

than 40 inches since 1997 when it was at near record highs. Levels increased for the 2002, but were still below average. The decrease in precipitation over the last five years resulted in Lake Michigan hitting its lowest point since 1966. Lake levels rose between the mid 1960s and the late 1990s.

The lower lake levels cause problems for the shipping and boating industry. Cargo ships are forced to lighten their loads, and many boat ramps became inaccessible. According to the U.S. Great Lakes Shipping Association, for every inch of water that Lake Michigan loses, a cargo ship must reduce its load by 90 to 115 metric tons, leading to losses of between \$22,000 and \$28,000 per trip.

Early reports for 2006 indicate that the lake remains below average. The fluctuation may be part of a 30 year cycle but deserves closer monitoring. Levels have remained lower for longer than they have in recorded history and may reach its lowest levels recorded since the drought of the 1930s.

There are other potential factors affecting the levels. The International Joint Commission has proposed a study to investigate possible physical changes in the upper St. Clair River that may be causing water level changes in Lakes Michigan and Huron. This work would revise its upper Great Lakes Plan of study.

Lake Level Monitoring

Current Lake Michigan levels can be monitored online through a new National Oceanographic and Atmospheric Administration website, <http://glakesonline.nos.noaa.gov>. The site provides immediate water level and meteorological data from water level stations. There is a six minute interval between data readings and plans for real time wind speed and direction data, in addition to barometric pressure and air temperature data. This augments the U.S. Army Corps of Engineers website that provides water level information <http://huron.lre.usace.army.mil/levels/hmpglv.html>.

Land Use Impacts Water Quality

The urbanized land area in the United States has quadrupled since 1954. To compound the problem, populations in coastal areas, which contain some of the most sensitive ecosystems, have been increasing

even faster than in the rest of the country. From 1982 to 1996, the population in the Chicago-Northwest Indiana area grew by 10.9 percent but consumed 44.2 percent of the land. (Urban Roadway Congestion: Annual Report 1998) Wetlands, which naturally help control runoff from urban areas by storing flood and surface water and slowly releasing and filtering it, have been destroyed in the Lake Michigan basin to a greater degree than elsewhere in the country.

USEPA's Office of Environmental Information states that "the construction of impervious surfaces such as roads and rooftops leads to the degradation of water quality by increasing runoff volume, altering regular stream flow and watershed hydrology, reducing groundwater recharge, and increasing stream sedimentation and water acidity." A 1-acre parking lot produces a runoff volume 16 times as large as that produced by an undeveloped meadow. Many impervious construction materials have higher surface temperatures that may cause ambient air

temperatures to rise. When combined with a decrease in natural vegetation, areas are subject to what is called the urban heat island phenomenon, which may increase utility bills, cause health problems associated with heat stress, and accelerate formation of harmful smog. Clearly the effect of urban development on our communities and environment is a cross-cutting issue.

Oil and Gas Drilling in the Great Lakes

With the energy "crisis" in California in 2001 came renewed interest in tapping oil and natural gas reserves. In the Great Lakes basin, much of these resources lie under the lakes themselves. Drilling under the lakes raises concerns because a spill would lead to harm of the world's single largest source of freshwater providing drinking water to 33 million people.

Due to this concern, an amendment to the Energy and Water Development Appropriations Act of 2002

Michigan Governor Granholm Signs 2006 Water Withdrawal Law

Michigan Governor Jennifer Granholm signed legislation managing all water withdrawals over 100,000 gallons per day. The bipartisan package provides an important framework for comprehensive water management in Michigan. It allows the state to manage large quantity water withdrawals of over 100,000 gallons per day and prohibits withdrawals that would have an adverse impact on the water resource.

The legislation also requires all new or increased bottled water operators with withdrawals of over 250,000 gallons per day to meet high standards, including no adverse resource impact, no impact on riparian rights or common water law, and must address hydrologic impacts.

Illinois Governor Blagojevich Orders Comprehensive Water Supply Study

Governor Rod Blagojevich issued an Executive Order to develop a comprehensive, statewide water supply planning and management strategy. The Department of Natural Resources will oversee the process in conjunction with the State Water Survey.

While Illinois is on the shores of Lake Michigan and also has significant groundwater and surface water resources, portions of the state face legal and physical restraints to increasing water supplies. Shortages, like the one faced in 2005, are rare, but the growing population and increasing demand will strain current sources.

Lake Michigan Diversion to Chicago Water Deficit Reduced Faster than Planned

During the late 1990s, the diversion of water from Lake Michigan to the Chicago River exceeded the U.S. Supreme Court consent decree limit (2.1 billion gallons per day) by nearly 15% because of leakage at the Chicago River control works. Following a Memorandum of Agreement among the Great Lakes states, Illinois agreed to reduce its annual diversion over 14 years to pay off its water debt caused by the leakage. Repairs to the Chicago River locks and construction of new control works were completed in 2000.

The Chicago District of the U.S. Army Corps of Engineers completed work for an independent review of the current accounting procedures. Based on a preliminary analysis it is expected that the State of Illinois' cumulative diversion deficit (-1,858 cfs-years as of Water Year 2001) will likely be paid off by Water Year 2004. The Technical Committee's review reports can be accessed through the USACE Chicago District's internet web site at: www.lrc.usace.army.mil.

The general pace for repayment of the water debt has been faster than required under the memorandum of understanding signed by the Great Lakes states in 1996. This is due to the repairs at the river locks and the lower water levels. At one point during the 1990s, the locks did not fully close, allowing the water to flow freely from Lake Michigan. The lower water levels have decreased the amount of water that flows between the lake and the river when the Chicago locks are opened.

prohibits all federal and state governments from issuing leases or permits for new oil and gas directional or offshore drilling in or under the Great Lakes for two years. An extension of this moratorium is pending. Michigan's legislature passed legislation that would ban all direct and directional drilling in its portion of the Great Lakes basin. Furthermore, a proposed natural gas pipeline for lake bed of Lake Michigan from Wisconsin to Indiana was withdrawn in 2001.

Currently in the Lake Michigan basin, only Illinois has never issued an oil or gas mineral lease for Lake Michigan bottomlands. Indiana has permitted limited exploratory drilling, but no oil or gas has been produced. Wisconsin allows drilling for oil and gas in certain circumstances and, in the past, Michigan has allowed drilling that begins on land with the pipes "slanting" under the lake.

Next Steps

All of the LaMP subgoals are interconnected with this chapter. For example, subgoal 9 addresses stewardship and is the response to the sustainability challenge. See Chapter 9 for needed steps, and as well as Chapter 2 for source water assessment needs.

Over the next 2 years, the LaMP is also targeting the following for completion:

- Help develop Green Marina, Highway, and Golf Course programs for the basin
- Promote studies that investigate the status of groundwater resources and their impact on water quality and aquatic habitat
- Support studies to determine sustainable yields for Great Lakes water resources

Clean-up of Sediments Could Raise Property Values

Early results from a study by University of Illinois professor John Braden indicates that contaminated sites reduce property values between 9 and 27 percent. The study is sponsored in part by the Sheboygan River basin Partnership. If Sheboygan area waterways were cleaned of PCBs, it could mean an increase in overall property values by as much as \$36 million.

Dr. Braden's earlier study of Waukegan, Illinois found that properties within five miles of the contaminated harbor were 9 to 19 percent lower in value than similar properties not near contaminated waterways.

Energy Sustainability Potential

- USEPA's Green Resource Conservation Challenge calls for 35% of total annual municipal waste generated to be recycled by 2008 yielding benefits of 1.72 quadrillion BTUs or 13.7 billion gallons of gas and the attendant positive impacts on the climate.
- In an April 2005 preliminary Briefing Paper by Scott Pryor, Mark Shahinian and Matt Stout of the University of Michigan School of Natural Resources and Environment for the Michigan Renewable Energy Program, "Offshore Wind Energy Development in the Great Lakes" the researchers indicate that Lake Michigan is ranked second behind Lake Superior in Offshore Wind Power Potential.
- Wisconsin Governor Jim Doyle signed a law mandating that at least 10 percent of the state's power come from renewable fuels by 2015, and ordering state agencies to reach 20 percent by 2010. Industry insiders expect wind to make up the bulk of that new investment.

Great Lakes Regional Collaboration Goals and Recommendations Relevant to the Lake Michigan LaMP Subgoal 6



Sustainability Goals and Recommendations

The goal is a Great Lakes basin where human activities support a strong and vibrant economy, meeting societal and cultural needs in balance with a diverse and resilient ecosystem. A sub-goal that is essential to this desired state is a Great Lakes community that has fully embraced and routinely applies sustainability in all decisions and actions. While the near-term actions recommended herein will have specific milestones, the adoption and use of sustainability as a guide to local and regional decision making will take time. As sustainability becomes embedded in the fabric of individual, corporate and governmental thinking, the return on that investment should continue indefinitely.

Recommendations

1. Adapt and maintain programs that promote sustainability across all sectors

- Action (a): States should incorporate sustainable criteria into sewer and water infrastructure loan and grant programs in the Great Lakes as a means of prioritizing those projects that pursue sustainable objectives.
- Action (b): Federal agencies should review existing grant, loan and subsidy programs applicable to the Great Lakes basin and incorporate sustainable criteria to provide priority for those projects that pursue sustainable objectives.
- Action (c): Local communities should re-use brownfields to revitalize lakeside and tributary waterfronts, with emphasis on public access and recreational opportunities. Federal and state grant programs should give increased funding priority for these projects.
- Action (d): Conduct a review of examples of sustainable practices, evaluate their effectiveness and applicability to the Great Lakes basin, and develop potential criteria for "green" certification and potential criteria for prioritizing proposals for funding programs.

2. Align governance to enhance sustainable planning and management of resources

- Action (e): Conduct a three-year demonstration project in three to four Great Lakes major metropolitan areas for development of a consistent, sustainable land use plan that uses best available new technologies to integrate with regional transportation plans and other public infrastructure plans including extensive public participation and local involvement. The regional 2040 framework plan of the Northeast Illinois Planning Commission provides a model.
 - Action (f): In order to start to address two critically inter-related issues, transportation and invasive species (aquatic and terrestrial), authorize and fund a comprehensive study that integrates long-term invasive species control and management with sustainable intermodal transportation for Great Lakes-St. Lawrence basin.
 - Action (g): Identify, expand, and enhance existing online clearinghouses to provide additional capacity for education and outreach, tourism projects and products, and local watershed planning initiatives
 - Action (h): Enhance the capacity of local communities to apply sustainability through training and technical assistance provided with priority funding from multiple federal and state grant and assistance programs.
 - Action (i): Initiate two new and maintain two existing watershed or regional partnerships with emphasis on rural, multi-ecosystem watersheds that incorporate sustainable criteria and local government capacity enhancing programs into a comprehensive strategic planning initiative.
 - 63
 - Action (j): Enhance the capacity of Great Lakes ports and marinas to implement best management practices in partnership with the outreach initiative of the American Association of Port Authorities
- #### 3. Build outreach that brands the Great Lakes as an exceptional, healthy, and competitive place to live, work, invest, and play
- Action (k): Develop and implement a marketing

strategy for the Great Lakes targeted at a national audience that delivers messages of the region's ecological and economic importance to the nation/world

- Action (m): Develop additional education and outreach modules on sustainability (such as WET and Water Riches curricula for water conservation) and promote their incorporation into school curriculum (K-12)
- 4. Provide leadership for sustainable development through the implementation of the**
- Action (n): Congress should authorize and appropriate funding for development of a phased implementation plan for the recommendations in the Strategy that provides a scientifically sound process for prioritization, sequencing, development of detailed cost data,

evaluation of alternatives, and assignment of responsibilities, utilizing sustainable development as the overarching guide

- Action (o): The Great Lakes Regional Collaboration should amend its Framework to provide oversight of the development, approval, and application of a phased implementation plan for the Great Lakes Strategy using sustainable development as the overarching guide. The Collaboration should also monitor and report on the status of implementation.
- Action (p): The Governors, Mayors, and Tribal leaders of the Great Lakes should renew and expand their commitments to the sustainable use, development and conservation of Great Lakes resources and utilize the Great Lakes Commission and Great Lakes and St. Lawrence Cities Initiative as a proactive advocates for