

Chapter Four

Water Conservation in the Great Lakes-St. Lawrence River Region

Introduction

Annex 2001 of the Great Lakes Charter calls for a decisionmaking standard that includes water conservation measures. Although this topic was not part of the original project work plan, the Project Management Team agreed that water conservation can inform the decision support process and, consequently, authorized additional research. The information in this chapter outlines these research efforts, which were based on a survey of state and provincial water use and conservation programs and supplemented with information on conservation best management practices. The focus of the survey effort was limited to water conservation at the state and provincial scale. Additional research on local water conservation efforts undertaken by entities such as municipalities and agricultural districts would be extremely useful to more fully support Annex requirements. Additional information on existing programs and guidelines is found in the Appendix.

A Case for Water Conservation

The states and provinces of the binational Great Lakes-St. Lawrence River region are blessed with an abundance of high quality fresh surface water. Collectively, the Great Lakes and their connecting channels comprise the world's largest body of fresh surface water. They contain 6.5 quadrillion gallons (24.6 quadrillion litres) of fresh surface water, 20 percent of the world's supply and 95 percent of the supply in the United States. Due to this seemingly inexhaustible supply of fresh surface water, decisionmakers in the Great Lakes region have historically had minimal concern with water supply management issues such as water conservation. These concerns have heightened in recent decades, however, with the increasing frequency of localized water management conflicts and the broader realization of the Great Lakes system as a large, yet finite, supply of freshwater.

Reliable water supplies continue to be readily available to the majority of the basin's population and, in most cases, these supplies will be adequate to accommodate growth in demand. However, in some localized cases, water conservation and other responsible water use practices are needed to

provide a viable solution to current shortages or to provide protection to ecologically and hydrologically sensitive areas. Several cases in Michigan are illustrative of water management issues throughout the basin. Monroe County, located in the southeast corner of the state, relies on groundwater for drinking water and irrigation, but aquifers have been depleted due to quarry operations (Behnan, 2002). Oakland and Macomb counties, also in the southeastern portion of the state, likewise have recently experienced aquifer depletion due to low rainfall, higher than normal temperatures and rapid residential development (Patterson and Garrett, 2002). In Saginaw County, similar climatic conditions, along with increases in groundwater-based agricultural and golf course irrigation, have resulted in a loss of residential well water pressure for extended periods during the summer months (Saginaw County Dept. of Health, 2002). Developing additional infrastructure can provide for long-term dependable surface water supplies, but the potential cost savings from water conservation measures will likely be more economical.

Ecological benefits also result from water conservation because less water is removed from the source (e.g., lake, river, aquifer), thus reducing alterations to natural levels and flows and associated ecosystem disruptions.



Even in areas that currently have abundant sources of water, conservation measures may increase efficiencies and lead to lower operating costs. A public water supplier that implements an effective water conservation program can forego, delay and otherwise better manage system and plant expansion. The city of Barrie, Ontario, for example, uses water conservation to reduce wastewater flows, easing the need for supply and wastewater infrastructure while providing savings to customers (Ontario MOE, 1998). Saginaw, Michigan, has successfully used a similar conservation approach (Peters, 2002). Savings can also be realized in other sectors such as industry and agriculture. All communities should reassess the economic benefits of water conservation, and revisit their belief that conservation reduces water-related revenue.

Based on the potential benefits of water conservation, support for a regional water conservation approach has arisen in recent years. In its February 2000 report to the governments of the United States and Canada, the International Joint Commission (IJC) observes, "Because of a possible downward trend in net Basin (water) supply in the 21st century, water-conservation and demand-management practices should become increasingly important components of any overall sustainable use strategy." The report suggests, "Implementation of the Basin Water Resources Management Program – to which the states and provinces are committed under the Great Lakes Charter – could provide the opportunity to launch a water-conservation initiative." Through the Great Lakes Charter Annex, the region further committed itself to the pursuit of responsible water management through a new decisionmaking standard that includes water conservation.

Water Conservation Within a Decision Support System Framework

In Directive #3 of the Great Lakes Charter Annex, the Great Lakes governors and premiers agreed that a new decisionmaking standard on proposals for new or increased water withdrawals should be based on four principles. The first of these is "preventing or minimizing Basin water loss through return flow and implementation of environmentally sound and economically feasible water conservation measures." Clearly, a commitment to water conservation will be an essential consideration as a decision support system is designed and implemented. In addition to economic efficiencies, such measures can lower consumptive use and reduce individual and cumulative ecologic impacts of withdrawals.

Implementing water conservation measures within the basin also provides the region's decisionmakers with a basis to insist on such measures by prospective out-of-basin users.

The General Agreement on Tariffs and Trade, as well as World Trade Organization agreements that have been signed by the United States and Canada, "severely restrict the ability of the Great Lakes States and Provinces to arbitrarily or unilaterally limit the export of Great Lakes water" (Lochhead et al., 1999). The U.S. Constitution's interstate commerce clause also limits the ability of the states to restrict interstate water transfers. Water conservation for all prospective users is important and, by providing a measurement of how effectively the water resource will be used and protected, can determine the merits of a proposed use.

State/Provincial Water Conservation Programs and Drought Contingency Plans

While Great Lakes-St. Lawrence River states and provinces typically have the authority to implement water conservation programs, the relative absence of severe water shortages has limited the impetus for exercising that authority. Where they do exist, state and provincial water conservation programs vary widely in scope and content and are usually components of drought contingency plans.

Below is a summary of state and provincial water conservation programs and drought contingency plans. The conservation efforts detailed here focus largely on the public supply sector, a reflection of the fact that the state and provincial agencies surveyed are most closely involved with that level sector. (See Table 4-1.)

Illinois

Illinois has water conservation requirements in effect for the entire year for Lake Michigan water, and outdoor water use rules apply during the growing season (May 15-September 15). The state's water conservation program requires conservation by the end user and the owners of water distribution systems. Requirements for end users include metering of all new services, low-flow plumbing fixtures, lawn sprinkling restrictions and recycling on automatic car wash facilities. All of the municipal permittees have adopted the required ordinances and building codes pertaining to water conservation, so there is no direct monitoring of these conservation efforts by the state. Distribution

Table 4-1
State/Provincial Water Conservation Programs and Drought Contingency Plans (as of January 1998)

Jurisdiction	Conservation Program	Local Conservation Efforts	Drought Contingency Plan
Illinois	For Lake Michigan water, conservation required and outdoor rules apply during growing season. System owners and end users both required to conserve. Promotion through printed materials. Permittees cannot exceed unaccounted-for-flow of 8 percent.	Municipal permittees have adopted ordinances and building codes requiring conservation.	None, but individual plans encouraged for permitted users. Governor's Drought Task Force discusses drought conditions.
Indiana	None, except during drought.	Local governments support conservation efforts during drought.	Three water shortage phases used with recommendations for action. First phases use voluntary reductions and public outreach. Phase III uses mandatory restrictions. Water Shortage Task Force can be formed to advise the governor.
Michigan	None	Individual municipalities and local governments use drought measures as necessary.	None, but ad hoc interdepartmental task forces have been formed.
Minnesota	Permits require all users to be efficient. Public water suppliers and agricultural irrigators must have conservation plans.	Local demand management measures are required to obtain approvals for new municipal wells or increases in authorized water volumes.	Current plan specific to Mississippi River, but being updated to whole state. Public suppliers and surface water users must have contingency plans. Drought plan includes mandatory restrictions. Multi-agency/stakeholder task force implements the plan.
New York	Water suppliers required to have conservation programs. Goal to maintain unaccounted-for water below 15 percent. Publicity and consumer education efforts required.	Local entities may provide additional support.	State Drought Management Task Force recommends four different drought stages. The first two stages focus on voluntary reductions. The final two stages use mandatory restrictions.
Ohio	None, except during drought.	Local entities may provide additional support.	Four phases of drought are used. The second two phases use voluntary conservation and public education; phase four uses mandatory restrictions after governor declaration. Drought Executive Committee is activated in phase three.
Ontario	Building code and planning laws require low-flow plumbing and other conservation measures. Education initiatives promote conservation. Provincial Water Use Strategy guides efforts.	Municipal levels have regulations and are involved in education during low water conditions. Communities receive federal money to reduce public use.	Three drought indicator levels used. Level 1 is voluntary, Level 2 is regulatory and Level 3 is mandatory. Ontario Low Water Response Plan guides partnerships between local and provincial agencies. Local Water Response Teams develop conservation plans.
Pennsylvania	Public water suppliers using surface water required to have conservation program. Various conservation efforts are used.	Local entities may provide additional support.	Three drought stages used. The first two stages have voluntary restrictions of various levels. The third stage may also include mandatory restrictions. Water suppliers and commercial and industrial users required to have drought plans.
Québec	None, but provincial ministries provide financial support to local efforts and NGOs. The organization RÉSEAU-Environment promotes conservation through a variety of methods.	A range of conservation occurs at local scale, including infrastructure replacement, restrictions on water use, and education programs.	None
Wisconsin	None, but conservation plans recommended as part of wellhead protection plans (required for municipal wells). System losses regulated by Public Service Commission. Plumbing flows regulated by Department of Commerce.	Local entities may provide additional support.	Declaration determines the presence of drought emergency. Formal plan, stages not used. Mandatory restrictions imposed with declaration of drought emergency.

system owners, or permittees, report annually the amount of Lake Michigan water used along with the amount lost due to unaccounted-for-flow. If a permittee's unaccounted-for-flow exceeds 8 percent, a plan of action for meeting the 8 percent standard must be submitted. Water conservation is also promoted by a variety of pamphlets and booklets the Department of Natural Resources makes readily available.

The state has no drought contingency plan, but the Department of Natural Resources encourages permittee emergency water conservation plans in case of temporary water supply failure. A Governor's Drought Task Force makes recommendations on drought situations.

Indiana

Indiana has no formal water conservation program. The Indiana Water Shortage Plan provides criteria for determining the severity of a drought and recommends actions that should be taken during three water shortage phases. The plan recommends approaches for individuals, utilities, and local and state governments to conserve water during different stages of drought and establishes priorities for water use. Phase I and Phase II occur through a joint declaration of the Department of Natural Resources and the State Emergency Management Agency. These phases focus on voluntary water use reductions and public outreach. Phase III involves an emergency declaration by the governor and mandatory restrictions on certain water uses. Also, a governor's advisory Water Shortage Task Force can be formed with representatives from several agencies.

Michigan

Michigan has no formal statewide water conservation program or drought management plan. In the past, interdepartmental task forces have been formed to address drought conditions. Individual municipali-



Belle Isle fountain, Detroit, Mich.

ties or local governments implement drought management measures as necessary.

Minnesota

Minnesota's water conservation program includes both planning and permitting requirements. The state requires all permittees to use water efficiently and meet certain permit conditions. The state Department of Natural Resources coordinates conservation requirements with the state Department of Health for well construction approvals, Drinking Water Revolving Fund requests and wellhead protection efforts. Approaches to water conservation include planning, education, conservation rate structures, metering, leak detection and repair, retrofitting programs, local regulations, and elimination of wasteful use.

Minnesota statutes specifically require conservation plans for public water suppliers and agricultural irrigators. Public water suppliers must implement demand reduction measures before requesting approvals for construction of new municipal wells and increases in permitted water withdrawals. Public water suppliers must have unaccounted-for water volumes below 20 percent as a condition of their permit. Irrigation permit applicants must obtain approval from the county soil and water conservation district, which may impose site-specific conservation requirements.

The state's drought contingency plan is specific to the Mississippi River, but is being updated to reflect all state resources. As part of the drought plan, public water suppliers serving more than 1,000 people must have an approved water emergency and conservation plan that is updated every 10 years. These plans are required for wellhead protection plans and applications for the state's Drinking Water Revolving Fund. All surface water appropriators must have an approved contingency plan. As the plan goes into effect, statutory water use priorities determine which water uses are suspended. An agency and stakeholder task force helps implement the plan.

New York

The Department of Environmental Conservation's Public Water Supply Permit Program (PWSPP) requires new water supply permit applicants to have water conservation programs. The water supplier holds responsibility for implementing the program, and the PWSPP monitors compliance with the programs. The PWSPP requires permittees to develop and implement long-term water

conservation measures such as metering, meter replacement/calibration, system water audits and leak detection and repair. The goal of each program is to keep unaccounted-for water to 15 percent or less. The PWSPP also requires publicity and consumer education efforts.

The State Drought Management Task Force, comprised of several state agencies, evaluates drought conditions and recommends to the governor and State Disaster Preparedness Commission which drought stages should be announced. During “Watch” and “Warning” stages, conservation recommendations focus on outdoor use and there are no mandatory statewide restrictions. The governor can declare an “Emergency” stage and require water conservation measures. In the “Disaster” stage, restrictions can be stricter and the governor may request federal assistance. The state Department of Health (DOH) also requires community water supply systems with more than \$125,000 in annual gross operating revenues to have a Water Supply Emergency Plan. Local water suppliers are responsible for implementation, and the DOH monitors compliance.

Ohio

Ohio has no formal water conservation program. Ohio’s Drought Response Plan has four phases, with increasing amounts of water conservation. Various levels of voluntary water conservation measures are requested during Phase Two and Phase Three Drought Alerts. At these levels, public water suppliers, their customers, and private withdrawers are asked to voluntarily reduce their water use. A Phase Four Drought Emergency, which involves mandatory water use restrictions, occurs by the governor’s declaration when water supplies will not meet projected demands and the Palmer Drought Severity Index reaches 4.0 or lower. The Ohio Emergency Management Agency heads Ohio’s drought response team and enforces water use restrictions. The Drought Executive Committee is activated during Phase Three and includes relevant agencies and interest groups that assist in monitoring water use to identify non-compliance.

Ontario

Ontario has no formal water conservation program, but federal, provincial and local governments employ a variety of conservation strategies. Many communities restrict outdoor water use, require meter installations and require conservation plans, while the federal government supports water

conservation through research, information sharing and funding local conservation efforts.

At the provincial level, a number of regulations impact water conservation. The Ministry of Environment (MOE) “Permit to Take Water” program requires a permit for withdrawals greater than 50,000 litres (13,200 gallons) per day and gives priority to natural ecosystem function protections. Water conservation is required for permit applications in the Greater Toronto Area. Provincial building codes require low-flow plumbing fixtures, retrofits, education programs and support for municipal conservation efforts. The Provincial Planning Act requires consideration of water conservation during planning. The MOE undertakes provincial water conservation education initiatives and the Ministry of Agriculture and Food promotes agricultural best management practices for agriculture.

Drought is managed through the Ontario Low Water Response Plan, which uses partnerships between local and provincial agencies. A local water response team is comprised of stakeholders who work with provincial ministries to find ways to reduce demand. The plan relies on existing legislation to ensure provincial preparedness and to support and coordinate local response. For example, the Ontario Water Resources Act allows the Minister of Environment to limit water withdrawals for permitted uses. The plan includes three drought indicator levels. Level I seeks a voluntary 10 percent reduction in water use. Level II seeks a voluntary 20 percent reduction, and municipal bylaws may be enacted to restrict non-essential uses. Level III includes mandatory water use restrictions and allocation priority recommendations.

Pennsylvania

In Pennsylvania, public water supply agencies withdrawing or using surface water are required to develop a water conservation program. The Department of Environmental Protection (DEP) provides its Drought Information Center guidelines to assist in program development, and a Permit Compliance Report process ensures that a variety of conservation efforts occur. The state investigates public water supply systems that do not have water use that falls between 40 and 70 gallons (150 and 265 litres) per capita per day. The last comprehensive study indicated a statewide average usage of 62 gallons (235 litres) per capita per day for metered systems. The state also investigates unaccounted-for-flows that exceed 20 percent by looking at domestic connection per capita usage.

Streamflow, groundwater levels, reservoir storage, precipitation, and the Palmer index are all used to determine one of three stages of drought. Levels of reduced water use are targeted within each stage: 5 percent in Drought Warning, 10 percent to 15 percent in Drought Watch and at least 15 percent in Drought Emergency. The third stage may also include mandatory restrictions. Water suppliers in a drought emergency area can ration water during the emergency stage with approval from the Commonwealth Drought Coordinator. The state's drought regulations require water supply systems with more than 50 connections to provide the DEP with drought contingency plans. Industrial and commercial water users that use more than 100,000 gallons (380,000 litres) per day in any 30-day period must also have a drought plan.

Québec

Québec has no mandatory water conservation program or drought contingency plan. Conservation efforts occur at the local level, and provincial ministries provide financial support to some non-governmental organizations, such as RÉSEAU Environment, which promotes water conservation through publications, conferences, publicity campaigns and a website (www.reseau-environnement.com). Québec also provides financial support to small municipalities for replacement or improvement of drinking and wastewater infrastructure. Municipalities implement conservation measures (e.g., limiting hours when lawns can be watered) and work with other organizations to provide education and incentive programs. Some municipalities and organizations, such as the Montreal Urban Community, have education programs in schools and awards for institutions that improve their water management.

Wisconsin

Wisconsin has no required formal water conservation program, but the state recommends water conservation plans as part of wellhead protection plans that are required for all new municipal wells. The Department of Natural Resources regulates supply sources and users, such as community water supplies and hydroelectric facilities. The Public Service Commission regulates water rates, pressure standards and system losses, and the Department of Commerce regulates water use standards for new plumbing fixtures.

The statewide drought contingency plan takes effect when the governor declares an Emergency Executive Order. This plan can include mandatory water conservation measures that occur as a

drought increases in severity, but there are no compliance provisions. A statewide technical advisory committee has given consideration to the criteria for determining the stages of a drought, but no statute or rule has been adopted.

Summary Analysis

A variety of water conservation efforts are occurring at the state/provincial level, but further progress is needed. Current water conservation practices that some jurisdictions require or encourage include: use of low-flow plumbing fixtures; metering; outdoor water use restrictions; reports on water use and unaccounted-for flow; publicity and consumer education; rate structures; wellhead protection plans; and leak detection and repair.

These practices provided initial guidance in developing the 15 recommended conservation measures in the following section of this chapter. Many of the above-mentioned conservation practices are implemented at the municipal/local level, where they are most effective, and further research is needed to assess the extent to which these water conservation efforts are presently employed. Research is also needed to determine the level of water conservation occurring in other water use sectors, such as industry and agriculture.

Several of the water conservation programs currently in place provide elements that should be considered in development of a regional initiative. Illinois' water conservation program is noteworthy for the fact that it provides specific conservation requirements and implements a year-round program. Knowledge gained and lessons learned from Illinois' program, as well as Minnesota's and Ontario's permit-related water efficiency requirements, New York's and Pennsylvania's water supplier conservation program requirements, and elements of the various drought plans, should be considered when assembling guidance for basin-wide water conservation. These programs focus primarily on the public supply sector; other elements will need to be integrated into a regional water conservation approach based on the outcomes of future research on other water use sectors. Jurisdictions without any water conservation program have a clear need to devote time and resources to plan and implement a program.

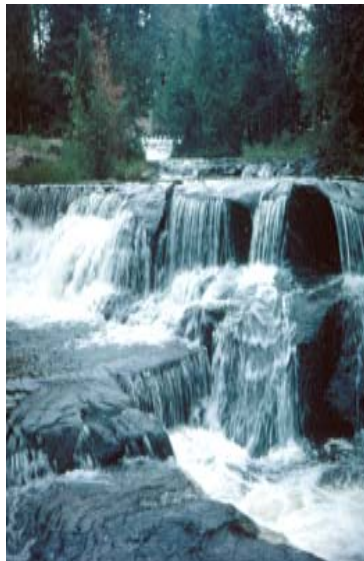
Existing drought contingency plans appear to provide an appropriate process for addressing emerging water shortage situations and are generally adaptable to varying needs over the course of the year. Jurisdictions without drought contingency

plans, including states, provinces and municipalities, should move expeditiously to develop them.

Developing Coordinated Conservation Programs

Water conservation programs and practices at the individual state, provincial and municipal levels suggest a growing awareness of water management needs as well as current/prospective water use conflicts in the region. Such measures, however, are limited in scope and geographic coverage, and are generally not coordinated with other jurisdictions. Consequently, the region lacks a basin-wide framework or over-arching plan, compromising the effectiveness of individual efforts and the region's ability to effectively demonstrate responsible use of its water resources.

The rationale for a coordinated approach to water conservation is compelling, and is found in the International Joint Commission's February 2000 report, *Protection of the Waters of the Great Lakes*, and the June 2001 Great Lakes Charter Annex. The IJC report recommends that:



Tahquamenon Falls, Michigan

“Sharing of conservation experiences among basin jurisdictions should be an integral part of the overall approach to conservation programs and practices. Jurisdictions may wish to adopt some common approaches, as appropriate, in their water conservation plans, including incentives to encourage water demand-management initiatives and the installation of best practicable water-saving technology.” In Directive #6 of the Great Lakes Charter Annex, the governors and premiers agree to “develop guidelines regarding the implementation of mutually agreed upon measures to promote the efficient use and conservation of the Waters of the Great Lakes

Basin within their jurisdictions.” Based on this provision and Directive #3, which stipulates that water conservation will be part of the decisionmaking standard, water withdrawal proposals will need to demonstrate appropriate water conservation efforts.

A challenge in implementing these directives will be developing guidance that recognizes the unique hydrologic and ecological characteristics associated with each prospective water withdrawal location and use.

Basic Guidance for Regional Water Conservation

Great Lakes states and provinces will benefit from guidance in developing regionally consistent and coordinated water conservation programs. Basic guidance focusing on public water suppliers is provided in this section; additional research is needed to provide more comprehensive guidance for other water use sectors.

As outlined in the section on state and provincial water use programs, several basin jurisdictions currently require or encourage water suppliers to pursue specific water conservation practices. These should be a foundation in the development of any model programs or guidance to be considered at the regional level. Based on these practices and other reference materials,¹ Table 4-2 has been compiled to present 15 water conservation measures that can be implemented by state, provincial and regional decisionmakers as well as municipalities, water suppliers and other water users. Measures are categorized as Financial, Programmatic, Technological and Informational.

Financial

In the residential water use sector, programs offering financial incentives can be used to encourage water conservation. Some of the most common entail paying for, or subsidizing, retrofits and replacement of older plumbing fixtures, measures that provide instant reductions in water use. Also, metering and submetering allow for the establishment of rate structures with incentives for reduced water use and give end users the ability to track such use. Similarly, industrial facilities can install their own meters to monitor water use at various points in a production process so that potential conservation savings can be identified.

¹ See, in References section, AWWA, 1969, AWWA, 1991; AWWA, 1995; CUWCC, 2002; 17 Ill. Adm. Code 3730; 42 USC 13385; USEPA, 1998; Vickers, 2001.

Table 4-2
Fifteen Suggested Water Conservations Measures

	Water Conservation Measure
Financial	<ul style="list-style-type: none"> • Incentives to improve water conservation, including retrofits • Conservation pricing/rate structures • Metering and submetering for industrial uses • Universal metering/submetering with commodity rates for public supply water
Programmatic	<ul style="list-style-type: none"> • Reports on water use and unaccounted-for flow • Leak detection and repair; reductions for water utility operations • Integrated resource planning • Water system pressure management to reduce volume of water used • Water recirculation and reuse in industrial processes
Technological	<ul style="list-style-type: none"> • Low-flow plumbing fixtures and other water-efficient appliances • Efficient equipment for industrial/commercial facilities and agriculture
Informational	<ul style="list-style-type: none"> • Promoting efficient practices in industrial/commercial facilities and agriculture • Encouraging efficient water use and equipment for landscapes, including graywater • Public information and school education programs • Advocating use of native and drought-tolerant turf and plants

Programmatic

Many conservation measures implemented by a water supplier or large end user require extensively planned and executed programs. Reliable information and regularly scheduled reports on water use and unaccounted-for flow help identify areas for system improvement, and can prompt follow-up action, such as system maintenance or repair. Public water suppliers may initiate other internal conservation programs that reduce water used for operations, such as mains flushing and filtration plant backflushing (Ellison, 2002). Integrated resource planning employs a comprehensive process to consider supply alternatives and to ensure that the most efficient water supply approach is implemented. Other programmatic approaches include altering water system pressure to control water volumes and recirculating and reusing water in industrial processes.

Technological

Technological advances create new options for increased efficiency. In the public water supply sector this can be accomplished through the increased use of low-flow plumbing fixtures and appliances. Industrial, commercial, and agricultural equipment can also be made more efficient through technological improvements. The choice of technology largely depends on the needs of the individual water user, but can be as simple as replacing an older toilet with a low-flow model. For example, the U.S. Energy Policy Act of 1992 requires a maximum manufacturing standard of 1.6 gallons (6 litres) per flush for toilets.

Informational

Information campaigns targeting all sectors of the basin community can be effective in promoting water conservation practices. For example, domestic users can turn off faucets when they are not in use and agricultural users can monitor climate and temperature to irrigate with a goal toward reduced losses to evapotranspiration. Appropriate adoption and use of landscape equipment also can reduce water use, as can planting of native and drought-tolerant vegetation. Industrial and commercial facilities can often find ways to alter operations or procedures to reduce unnecessary water consumption.

Findings and Recommendations

Findings

A commitment to “environmentally sound and economically feasible water conservation measures,” as stated in the Great Lakes Charter Annex, is critically important if the region is to demonstrate it can responsibly manage its own resources.

This growing emphasis on water conservation signals a significant shift from past water management practices that viewed Great Lakes water as a virtually limitless resource that can accommodate all current and anticipated in-basin demands. Water conservation is now considered a viable solution to current shortages in some communities experiencing water supply problems, and as a means of reducing costs and providing ecological benefits in areas with abundant water. In particular, areas of

unique ecological and hydrological characteristics – and associated sensitivities – will benefit from targeted water conservation efforts.

Several Great Lakes-St. Lawrence states and provinces have the authority to implement basic water conservation programs, but these programs vary widely in scope and content, and are usually part of a drought contingency plan. Many conservation programs are in place at the local level but programs and models to promote region-wide coordination are lacking.

Based on current programs and several consulted guidelines, a list of 15 water conservation practices ranging from financial incentives to improvements is provided in Table 4-2 of this chapter as basic guidance.

Recommendations

1. **Develop and apply water conservation models that foster a coordinated regional approach and address the Charter Annex standard of “environmentally sound and economically feasible.”**

A coordinated regional approach to water conservation needs to be developed and implemented to demonstrate the region’s commitment to responsible water management. The region, including each state and province, must remain committed to a new “environmentally sound and economically feasible” water conservation standard. This will avert potential water shortages while providing economic and technical efficiencies and ecological benefits. Regional goals could be developed for “environmentally sound and economically feasible” water conservation by water use sector.

Development of models at the basin level based on jurisdiction conservation experiences will assist the states and provinces in developing their own programs and contributing to basin-wide initiatives. Elements of current state and provincial water conservation programs, including the list of 15 best management practices in this chapter, should be used in conjunction with other research to provide this guidance. The Great Lakes Commission’s water conservation project, funded by the Great Lakes Protection Fund in 2002-03, will help in developing these models.

2. **Establish an information clearinghouse to publicize best management practices pertaining to individual sectors of water use.**

Information within this chapter, including the list of 15 suggested water conservation measures, needs to be followed with more research: surveys of water suppliers (largely at the local level) that provide profiles of existing programs; case studies of effective programs in other regions of North America and beyond; and identification of appropriate measures that should be included in a decisionmaking standard. This research should outline which water conservation practices are most applicable to each water use sector and special local conditions, such as ecological sensitivities. A clearinghouse that details this research should be developed and maintained to provide water users and decisionmakers with the information.

3. **Develop and update state/provincial drought contingency plans to ensure adequate attention to water conservation.**

As a basic step toward regional water conservation, drought contingency plans need to be adopted at the state and provincial levels. Increased understanding is needed on the range of natural variation of the resource and how to plan for the extremes. Jurisdictions (including states, provinces, municipalities and agricultural districts, among others) that have no drought contingency plan should develop them so they can address future water shortage situations.

4. **Develop specific water conservation provisions as part of state/provincial water management programs.**

All states and provinces should develop water conservation provisions within their water management programs. Jurisdictions without any such program should devote the time and resources needed for plan development and implementation.

5. **Undertake an economic analysis to identify the financial benefits of water conservation, and use results to promote adoption of such practices at the local level.**

An economic analysis needs to be undertaken to demonstrate the economic benefits of various water conservation measures. This analysis should build upon previous efforts and help define which conservation approaches are “economically feasible” for the region.

6. Develop a regional information/education program to promote the adoption of water conservation practices.

An information/education program at the regional level is needed to promote water conservation priorities and explain their benefits. This will help address the misperception that the Great Lakes basin’s abundant water is readily available, without limit, as a supply source to all in-basin interests. The program should encourage water users to adjust consumption habits to minimize pressure on the resource. A variety of publicity tools should be employed, and the program should track performance over time and be regularly updated to reflect evolving needs.

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