

Waters in Common

Protecting Water and Farming in the Great Lakes Basin

Great Lakes agriculture is among the most diverse and valuable in the country. Whether it is cherries, cranberries, dairy products or grain, area farmers produce multiple high value crops and farm products for consumption here and abroad. This diversity of production, which supports large processing and agribusiness sectors and employs millions of people, is possible thanks to a favorable climate, good soil quality and an abundance of water. Located on the largest freshwater system in the world, Great Lakes farmers and the agricultural economy are both dependent upon and contribute to the functioning of the Great Lakes ecosystem.



Once believed to be almost infinite, the region's water supply is currently under threat from development, pollution and water withdrawals. Wells have gone dry in several areas within the basin due to nearby groundwater pumping, the ability of aquifers to recharge continues to drop because of the spread of sprawl and pavement and there is increasing interest in the Lakes from dry areas near and far looking to meet their growing needs for water. In recognition of these threats—current, near-term and potential—governments of basin states and provinces have developed a regulatory framework called Annex 2001 to protect and improve the Great Lakes ecosystem and water resources. Such protection is crucial for guaranteeing the viability of the region's agricultural base for Great Lakes family farmers and agricultural industries now and in the future.

Agriculture and Forestry in the Great Lakes Basin

Agriculture and forestry are the primary land uses in the Great Lakes region and have always been among the most important components of the Great Lakes economy. The Great Lakes basin is a leading producer of fruits and specialty crops such as cherries, cranberries, apples and seed, as well as traditional farm products like milk, corn, soybeans and hogs. Agricultural

production, processing and related industries generate significant revenues for the regional economy and employ a large percentage of the basin's population.¹ Intensive agricultural production and forestry practices have also contributed to environmental degradation in the region through increased runoff, sedimentation and loss of wildlife habitat, although today many farmers and foresters are aware of and acting upon these environmental concerns. While the negative environmental impacts of these sectors get the most publicity, agriculture and forestry also provide many environmental, economic and social benefits to the basin that should be recognized, including:

- ▶ **Water quality:** Impervious surfaces are very harmful to water quality. Surfaces such as pavement divert water from replenishing underground aquifers, add petroleum and other contaminants and send the water to local streams and lakes. Land in crops and trees, on the other hand, acts as a natural filter, reducing contaminants and allowing water to percolate through the soil and recharge aquifers.

- ▶ **Wildlife habitat:** Sound agricultural and forest management can provide significant and needed habitat for diverse wildlife and plant species, many of which are under threat from increased development and loss of habitat.

- ▶ **Carbon sequestration:** Trees and agricultural soils store an enormous amount of carbon. Keeping carbon on the land not only provides the building blocks for healthy plant and microbial growth, it protects against further releases of carbon into the atmosphere. As carbon dioxide is the primary greenhouse gas, scientists and policymakers are recognizing terrestrial carbon sequestration as an important part of mitigating climate change.

- ▶ **Regional culture:** Regional pride plays an important role in community building, and much of this has a foundation in agriculture. Mention Wisconsin, and many immediately think of cheese and dairies. Traverse Bay, on the other hand, is known for cherries, while the

Agricultural water use in the basin: A look at Michigan

Farming consumes more water than any other sector in the Great Lakes basin. Yet little is known about how this water is used, how much is returned to the system and what other benefits farming provides to the Great Lakes hydrology and ecosystem. As the Great Lakes basin does not follow state and provincial boundaries, getting specific information on agricultural production and water use and consumption on a basin-wide level is nearly impossible. Therefore, data from Michigan, located in the very center of the basin and the only state or province entirely within the basin's boundaries, are used to provide some insight into Great Lakes agricultural production and water use.

Agriculture in Michigan is very diverse, second only to California in its variety of production. This is a key difference between the Great Lakes region's farm economy and that of other Midwest states, which rely almost entirely upon the production of two or three commodity crops. Michigan's agricultural commodity production in 2002 (Table 1) was valued at \$3.39 billion and exports totaled \$720 million. The Michigan Department of Agriculture estimates that the food and agriculture industry adds \$37 billion to the state's economy annually and over 11 percent of Michigan's residents were involved in farm and farm-related jobs in 2002.¹

In 2002, 5.8 percent of Michigan's farmland (384,828 acres) was irrigated, with 72 percent of the water from groundwater sources. While there are many farms that irrigate some of the time, most of the water is used on a concentrated number of operations. Less than half of the 3,752 farms that reported irrigating in 2001 account for 97.8 percent of the state's irrigated acres. Corn for seed and grain is the largest single crop being irrigated, accounting for 43 percent of the irrigated acreage and approximately 31 percent of water withdrawn. Other important irrigated crops include soybeans, alfalfa, small grains and high-value crops such as vegetables, potatoes, turf and ornamentals, which are almost entirely produced and/or managed under irrigation.²

Despite the normally plentiful rainfall in the basin, in some years irrigation is an important component of crop production, especially for high value crops and crops grown on soils with low water holding capacity. Managing the risk of adverse weather is the primary reason farmers incorporate irrigation. Even if irrigation equipment is only used once every few years, having the ability to sustain yields during drought conditions is an enormous economic benefit to farmers and can make the difference between profit and loss. The economic protection that irrigation allows provides Michigan farmers with the ability to diversify into high-value crops, to the benefit of Michigan's food and processing sector.

There are benefits to farmers from irrigation beyond crop water needs. Irrigation can be used to minimize yield reductions caused by heat stress, provide frost protection, germinate seeds and activate herbicides. Irrigation water is also sometimes used to apply fertilizers and chemicals ("fertigation" and "chemigation") and control soil erosion by wind. The state of Michigan has been working with farmers to improve their irrigation management through an innovative program that provides technical assistance and information in return for reduced exposure to litigation over potential future water disputes.³ Such programs can help to improve not only farm water efficiency, but also increase public understanding of the use and benefits of agricultural irrigation.

References

1. Data on Michigan agricultural production has been taken from the USDA Economic Research Service's *Michigan State Fact Sheet* located at: <http://www.ers.usda.gov/statefacts/MI.htm> and from ERS's *State Export Page*: <http://www.ers.usda.gov/Data/StateExports/totsx5yr.xls>
2. Information about irrigation and Michigan agriculture is taken from Michigan Department of Environmental Quality's *Water Withdrawals for Agricultural Irrigation in Michigan – 2001*, located at: <http://www.deq.state.mi.us/documents/deq-wd-wurp-Agriculture.pdf>
3. For more information, see Michigan Department of Agriculture's *Generally Accepted Agricultural Management Practices for Irrigation Water Use*, located at: http://www.michigan.gov/documents/MDA_GAAMPS_Irrigation_Public_Review_Draft_52803_66277_7.pdf

Table 1. Michigan's top five and total agricultural commodities and exports, 2002

Commodity	Value of Receipts (in million \$)	Percent of farm receipts	Exports	Value (in million \$)	Percent of exports
Dairy products	712	21.0	Soybeans and products	162	22.5
Greenhouse/nursery	544	16.1	Feed grains and products	127	17.6
Soybeans	364.9	10.8	Vegetables and preparations	100	13.8
Corn	364.5	10.8	Fruits and preparations	80	11.1
Cattle and calves	204	6.0	Other	66	9.2
TOTAL COMMODITIES	\$3,390 million		TOTAL EXPORTS	\$720 million	

Niagara region has developed a reputation for excellent wines. These identities provide economic benefits well beyond agricultural sales—they also provide a base for tourism and recreation.

► Landscape protection and improved quality of life: Next to native forest and prairie, well-managed agricultural land can provide some of the best ecological services to the basin. It provides the open space and diversity in the landscape that improves the quality of life for residents. A strong agricultural economy also provides a buffer to sprawl that surrounds many cities and can help protect valuable and highly productive farmland from development.

Agriculture and forestry are an integral part of the basin's landscape, and these sectors not only depend upon the Great Lakes water and ecosystem resources, but also contribute to their quality and long-term viability. For these reasons, it is clear that the agricultural and forestry sectors have much to lose if the Great Lakes are not adequately protected.

Decisions for water protection today and tomorrow

In recognition of the mounting and potential threats to the Great Lakes system, policymakers in the basin's eight states and two provinces have spent the last several years developing a regulatory framework to protect the Great Lakes basin against harmful water withdrawals. The result is two proposed agreements, referred to jointly as Annex 2001. These proposals update the Great Lakes Charter, an earlier guiding document for Great Lakes oversight, and were released for public comment in July 2004. Together they provide environmental standards for judging new water withdrawals and protect all of the waters of the Great Lakes, including streams and groundwater. The first proposed agreement, the Great Lakes Basin Water Resources Compact, would be a legally binding agreement between the states if approved by all eight basin states and the U.S. Congress. The second agreement, the similarly-named Great Lakes Basin Water Resources Agreement, would be a voluntary, good-faith agreement between the states and provinces that would set up a ten-member state-provincial body to review larger diversions and withdrawals, setting an important precedent in bi-national water management. In both agreements, registration would be required for most new water withdrawals, with conservation plans required from many of the larger new water users.

Warning signs:

Current water shortages in the basin

While most people have heard stories about water shortages in other parts of the U.S., particularly in the arid Southwest, for many it is almost inconceivable that this could happen in the Great Lakes basin, which holds 20 percent of the world's and 95 percent of the U.S.'s available fresh surface water. Yet this is exactly what is happening in some parts of the basin today. Shortages within the basin are still few, but they reinforce the idea that even in the most endowed area of America, water shortages can occur, severely impacting quality of life, business expansion and farming.

- In parts of Saginaw County, Mich., household wells regularly go dry during peak irrigation periods in the summer.
- Within 30 miles of Lake Erie in Monroe County, Mich., groundwater tables have dropped dramatically due to drought and large, unregulated water withdrawals, particularly by heavy rock mining operations.
- St. Joseph's River, which passes through Indiana and Michigan on the way to Lake Michigan, has had sharply reduced water levels due to drought and excessive pumping, impacting fishing, recreation and other water users.
- Groundwater levels in some areas of Wisconsin are now falling at nearly 17 feet per year and have fallen as much as 450 feet in the Milwaukee region and 900 feet in the Chicago area.
- The flow of the Cuyahoga River in Ohio, which flows into Lake Erie, has decreased due to increased water use by surrounding communities, endangering dependent wildlife and reducing water quality.

For more info on these and other examples of water concerns in the Great Lakes basin, see the *Code Red in a Blue Water Basin Fact Sheets* located at <http://www.mlui.org/landwater/fullarticle.asp?fileid=16526>

Focusing the agreements on ecosystem protection and restoration provides a basis for modifying or denying withdrawal proposals, especially diversions, which could endanger Great Lakes ecology.

New withdrawals would be regulated depending upon the size of the total withdrawal, the amount actually consumed and where the water would be used. In all cases, new large-scale withdrawals would only be allowed after the applicant has shown that the need for water cannot reasonably be avoided through conserva-

tion of existing water supplies. For farmers, the fact that withdrawal amounts would be calculated over a 120-day period means that all but the very largest new agricultural water uses will in effect be exempt from these regulations. This differentiation shows awareness on the part of the negotiators that, while agricultural water use needs to be accounted for, it is not the same as industrial use and cannot be regulated on the same basis. Despite this recognition, many farm groups in the region remain opposed to the introduction of any water regulations, seeing them as additional and unneeded barriers for an agricultural industry in a water-rich region.

This blanket opposition ignores real facts and issues of which farmers need to be aware when it comes to water availability, use and protection. Policymakers are following constituent concerns and scientific evidence in creating this framework. Some area residents are already suffering from the lack of protection for this invaluable and at-risk resource (see box on the previous page). A recent poll in Michigan showed that 79 percent of the respondents favored action to protect water resources.² Introduction of new regulations and laws in many of the basin states—including Michigan, one of the last regional hold-outs to enact water withdrawal guidelines—should be a clear sign that, one way or another, water regulations will be coming. Rather than merely opposing legislation, farm groups would do better to participate in the deliberations to assure that agricultural interests are considered.

Beyond public pressure and concern, farmers and those involved in the agricultural sector have clear reasons for promoting conservation of the region's water resources. A successful new water policy will work to increase the efficiency of all water users, including the industrial and municipal users who in some cases are or may be in competition with farmers for access to water supplies. As has been shown, the advantages that adequate water resources provide to regional agriculture are essential to sustaining a diverse and resilient regional farm economy. This is just as true for businesses and industry, as dependable and protected water resources provide a competitive advantage over other regions, enabling and encouraging continued economic development in the region. As agriculture needs these value-added industries to remain viable, farmers and urban and rural communities alike need to support not only a strengthened regional water policy as outlined in the

Compact, but also work to improve the efficiency and value of their water use. Actions that could help meet these goals from the agricultural side include:

- ▶ Utilization of the most economic and efficient irrigation systems, and focusing irrigation on the highest value crops.
- ▶ Incentives and other assistance to producers for replacing less efficient equipment and modifying irrigation systems.
- ▶ Increased outreach on water efficiency and technical and financial assistance targeted at Great Lakes farmers and agricultural industries.
- ▶ More accurate weather forecasting and monitoring to lessen application of water when not needed.
- ▶ Rainwater harvesting approaches that provide an alternative to groundwater pumping.

Conclusion

The proposed Great Lakes Compact and Agreement provide a framework that can help protect the water resources that regional agriculture is built upon without burdening area farmers with undue regulations or restrictions. It is up to those representing farmers and agricultural industries to make sure that the final versions of these regulations support a profitable and sustainable agricultural sector, and that farmers in turn do their part to protect the Great Lakes system by promoting responsible water use and management.

For More Information

To find out more about the relationship between agriculture and Great Lakes water quantity, see iatp.org/waterquantity. For further information about Annex 2001, including information about hearings on the proposed Great Lakes Basin Water Resources Compact and what you can do to help protect Great Lakes water, see speakongreatlakes.org.

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REFERENCES

- ¹ For more information about Great Lakes agriculture and water, see IATP's report, *The Impacts of Agriculture on Water Quantity in the Great Lakes-St. Lawrence River Basin*, available at: <http://www.iatp.org/waterquantity>
- ² Based on a March 31, 2004 poll conducted by the Lansing-based Marketing Resource Group as reported by the Michigan Land Use Institute: <http://www.mlui.org/landwater/fullarticle.asp?fileid=16691>