

## Environmental Policy in the Great Lakes Region: Current Issues and Public Opinion

a report from the Energy and Environmental Policy Initiative

### Introduction

The Great Lakes are an iconic natural feature of the boundary between Canada and the United States. In addition to their striking size and ecological importance, they also have great economic and cultural importance for the Great Lakes Region. Historically, the Lakes provided a means for regional trade, giving rise to outposts that now constitute the Region's largest cities, Chicago and Toronto. An abundance of fresh water was also crucial for industrialization, and led to the construction of the many factories and power plants that line the shores of Lakes Michigan, Erie, and Ontario. Additionally, the Lakes serve as the backdrop of innumerable family photos of the vacationers who flock to them in the summer to splash in the waves or cast a fishing line.

Despite their importance and iconic status, the Great Lakes have seen their fair share of challenges. Prime among these are environmental concerns, from localized pollution in the 19th century, to the fishery collapses of the 1950s, to current concerns over algal blooms and the potential introduction of Asian carp. While these concerns are not unique to the Great Lakes system, the scale of the Great Lakes Basin does make the Great Lakes a special case. Not only do the Lakes collectively hold 20% of the world's fresh water, but the Basin (see *Figure 1*) includes two sovereign nations, eight US states and one Canadian province, thousands of local governments, more than 40 tribes and First Nations, and is home to more than 33 million residents<sup>1</sup>. As a result, setting policies to regulate and protect these shared waters is a highly complex endeavor.

**Figure 1**  
Map of the Great Lakes Basin



Source: Great Lakes Information Network. (2014). *The Great Lakes*. Retrieved from <http://www.greatlakes.net/lakes/>

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This report reviews historical and current environmental problems in the Great Lakes and discusses attempts to address them through both joint (Canada-US) and unilateral policy. It then presents the results of a telephone survey of 1,247 residents in the Great Lakes Basin conducted in November and December 2013. The survey aimed to gauge public opinion on the value, current health and success of efforts to manage this shared resource, as well as measure residents' support for a number of policy options to address issues ranging from invasive species and pharmaceutical contamination to climate change and energy. While more than 65 public opinion studies related to the Great Lakes have been conducted over the past three decades,<sup>2</sup> few have included significant numbers of both American and Canadian respondents to allow for cross-border comparison. Moreover, few have covered such a wide range of topics as are included in this report. The findings in this paper allow us not only to provide a representative sample of opinion throughout the Basin, but to also note where national differences exist. Two companion reports, also utilizing data from this survey, delve more deeply into the issues of wind energy and hydraulic fracturing in the Great Lakes Region.<sup>3</sup>

## The Great Lakes Basin

Throughout this report, we intentionally distinguish between the Great Lakes Basin and the Great Lakes Region, primarily because our survey was limited to the former while environmental policies are largely made within the latter. The Great Lakes Basin, in a geological sense, is the land area over which surface water drains into one of the five Great Lakes. Thus, it encompasses the watersheds of all rivers that flow into the Lakes. As seen in *Figure 1*, it is substantially smaller than the Great Lakes Region, which includes the eight US states and one Canadian province (Ontario) which touch at least one of the Lakes. Since all Great Lakes water ultimately drains into the St. Lawrence River before reaching the Atlantic Ocean, the watershed for the St. Lawrence River includes not only the tributaries that directly drain into the River, but also all of the land within the Great Lakes Basin. As a result, land within Quebec is included when discussing the combined Great Lakes/St. Lawrence Basin. Note that for this study, we look only at the land within the Great Lakes Basin, not the combined Basin.

## Key Findings

1. Residents in the Great Lakes Basin are strongly connected to the Lakes, mostly through recreational activities, and believe that the Lakes significantly impact their local economy as well as their everyday lives.
2. The majority (86%) of residents believe the Lakes are in at least fair condition, but not necessarily improving.
3. Pollution or contamination is by far the most widely-cited environmental concern, mentioned by 74% of residents as one of their top three concerns regarding the Lakes.
4. Residents are also concerned, though to a lesser extent, about Asian carp (21%), water levels (16%), and invasive species (11%).
5. Residents express the most overall support for policies that directly reduce pollution, including rebuilding sewers and regulating the release of pharmaceuticals. Policies with the least support include enforcing restrictions on out-of-Basin water diversions and increasing the cost of water to encourage conservation.
6. Ontarians are significantly more supportive of phasing out coal-fired power plants than Americans who reside in the Basin.
7. Residents throughout the Basin overwhelmingly support increasing energy production from renewable sources in the region, including both on- and offshore wind energy. There is significantly less support for offshore oil and gas drilling, nuclear energy, and natural gas and oil drilling through hydraulic fracturing (fracking).
8. There is near-unanimous agreement among residents in the Basin that responsibility for protecting the Great Lakes should be widely shared by all levels of government, business and industry, and individual citizens. Ontarians support a larger role for federal, state/provincial and local governments than do Americans.



## Main Environmental Issues and Threats Facing the Great Lakes

The Great Lakes have been affected by a variety of environmental issues since the human population of the area began to grow rapidly in the 19th century. However, it is primarily since the mid-20th century that these issues have been widely recognized and large-scale efforts to address them have been undertaken. Our survey does not cover all current issues described here to the same degree; rather, this background information is intended to provide context for the areas of public focus and awareness revealed by the survey.

The primary environmental issues facing the Great Lakes both historically and today include:

### Water Quality

Water quality has been a problem for the Great Lakes since the late 19th century. At that time, the city of Chicago became concerned about its drinking water supply, drawn from Lake Michigan, becoming contaminated by the city's sewage, which flowed from the Chicago River into the Lake. By building the Chicago Sanitary and Ship Canal and thus reversing the flow of the Chicago River so that it flowed out of Lake Michigan and into the Des Plaines River, Chicago redirected a large source of Lake Michigan water pollution. Even so, over a century later, many other cities throughout the Basin—such as Detroit, Cleveland, and Toledo—have sewer overflows that pollute the Great Lakes.

Contamination with toxic chemicals is another pollution problem in the Lakes. Some of the top chemicals of concern include mercury (much of which is dispersed by air from coal-fired power plants in the Region), pharmaceuticals (which arrive in treated waste water), PCBs and pesticides. Excess nitrogen and phosphorus fertilizers also cause water quality problems such as algal blooms and oxygen depletion when they run off of farms and residential yards. Fertilizers, along with storm water runoff from urbanized areas (which carries pollutants such as sediment, debris, bacteria, and motor oil), are examples of “non-point source” pollution, i.e. pollution that arrives in a dispersed fashion rather than from a “point source” such as a pipe. With point source pollution fairly well controlled by US Clean Water Act regulations, non-point source pollution is now the leading cause of water quality impairments in the US, including in the Great Lakes. Canada has followed a somewhat similar pattern, as non-point sources have become an increasingly prominent focus of its own water quality management efforts.

Although point source pollution has decreased substantially, another source of poor water quality in the Lakes is contaminated sediment, which is often “legacy contamination” from past industrial activity. The 1987 binational Great Lakes Water Quality Agreement (described in the next section) included the designation of 43 Areas of Concern in the US and Canada that suffered from “significant impairment of beneficial uses,” often due to contaminated sediment (see box on AOCs on p. 5).

Impaired water quality has negative impacts on the health of Great Lakes species and the ecosystem as a whole, as well as on economic activity and recreation. Some specific outcomes with direct human impacts include fish consumption advisories, drinking water concerns, and beach closures.

### Invasive Species

As of 2012, over 180 non-indigenous aquatic species lived in the Great Lakes. A few of these species are the cause of major concern due to their competitive dominance and the subsequent loss of or decrease in native species populations, as well as the significant economic costs they can impose.

The first discovery of an invasive species in the Great Lakes was the sea lamprey, an aquatic vertebrate that resembles an eel and parasitizes native fishes, which was found in the upper Great Lakes in the early 20th century. The sea lamprey arrived from the Atlantic Ocean and St. Lawrence River via shipping canals and was responsible for the collapse of several commercially important Great Lakes fisheries in the mid-20th century. Ongoing efforts to control the lamprey have been quite successful, but require continued maintenance to prevent the population from rebounding.

Zebra mussels and quagga mussels, both native to Eastern Europe, were first found in the Great Lakes in the 1980s. They are presumed to have arrived in larval form in the ballast water of cargo ships originating in Europe. The mussels' main economic impact is through their colonization of water pipes for power plants and other facilities, which can significantly constrict the flow of water and diminish performance. Additionally, their heavy consumption of phytoplankton and other suspended material has cascading and serious effects on the ecosystems they inhabit. Efforts are being made to control the mussels but success has been mixed.

The invasive species receiving the most attention currently in the Great Lakes Region is the Asian carp, a group comprised of several species introduced to the US through fish farms located outside the Basin in the 1970s. The carp outcompete native fishes for food, affecting both the ecosystem and the commercial and sportfishing industries. Asian carp have been making their way up the Mississippi River system and in fall 2013, evidence was found of Asian carp reproducing in a Lake Erie tributary, the Sandusky River in Ohio, as well as possible carp presence in Lake Michigan.<sup>4</sup> Efforts have been underway to identify the best means of preventing Asian carp from becoming established in the Great Lakes, with a focus on the Chicago Sanitary and Ship Canal which connects Lake Michigan to the Mississippi River watershed. The canal has several electric carp barriers outside Chicago, but these are a short-term solution and have not proven entirely effective. The US Army Corps of Engineers has reported that the wake from barges may push carp past the barriers, and small carp may also be able to pass through when swimming in schools.<sup>5</sup> Environmentalists as well as some politicians are calling for the physical re-separation of the Great Lakes and the Mississippi River watershed as the necessary solution, for both environmental and economic reasons. However, politicians in Illinois and Chicago as well as barge and tourist boat companies in the Chicago area argue that a physical barrier is unnecessary, too expensive, and would be highly detrimental to important local industries.

### Loss and Degradation of Shoreline and Nearshore Habitat

The natural shoreline of the Great Lakes—including wetlands, beaches, and nearshore waters—provides crucial habitat for many of the Lakes' species throughout all or part of their life cycles. Water quality in these areas is an important component of habitat quality, as is the physical habitat. Development along Great Lakes shorelines has led to loss of wetlands, dredging, habitat fragmentation, and shoreline hardening (e.g. construction of seawalls), all of which negatively impact or remove plant and animal species. These structural changes also degrade water quality, as does the development of houses and roads near the shoreline, as more impervious surface cover leads to increased storm water runoff with its attendant impacts.

Although shoreline development provides human benefits in the form of housing, industrial uses, and economic opportunities, its effects on water quality and habitat also negatively impact other shoreline and nearshore uses of human interest, such as beaches, drinking water sources, and fishing. This conflict of human interests (in addition to the environmental impacts) complicates the issue, but habitat restoration projects, especially for wetlands, are a component of many Great Lakes protection efforts.

### Climate Change Impacts

Climate change has begun to impact the Great Lakes in a number of ways that in some cases are interconnected. One impact is the decrease in the extent of winter ice cover when examined over a long time horizon; over the past 40 years, ice cover on the Lakes has decreased by over 70%. Though the winter of 2013-2014 brought near-record ice cover on the Great Lakes,<sup>6</sup> this overall downward trend is expected to continue,<sup>7</sup> along with a year-round increase in water temperatures, which is further exacerbated by the lack of ice cover. Water levels in the Lakes are also expected to change; although some natural variation occurs, most predictions indicate that water levels will be lower in the future. This expectation is based on increased evaporation due to the warmer water temperatures and diminished ice cover, as well as expected warmer air temperatures.

Consistently lower water levels brought on by climate change will impact human activities, as well as Great Lakes species.<sup>8</sup> Low water levels are already causing problems for recreational boating and commercial shipping when waters recede too far from docks and shipping channels become too shallow. Dredging deeper channels in response creates additional problems, disturbing habitat and often re-suspending contaminated sediment. Low water levels also change the habitat available for organisms, as does changing water temperature. Water temperature change impacts also include changes in the timing of seasonal events and effects on species' growth rates and metabolisms.



## Water Quantity

Unlike the other Great Lakes environmental issues discussed here, water diversions out of the Great Lakes Basin are not a current problem, as they are not occurring at any substantial scale except for the long-standing diversion in Chicago.<sup>a</sup> However, plans for large-scale diversions have been proposed since the mid-20th century, most commonly aimed at sending Great Lakes water to growing water-poor southwestern states. Although no such plans have proven economically feasible, water diversion has been a topic of concern for many Great Lakes residents and elected officials.<sup>9</sup> This concern led to the passage of the Great Lakes Compact in 2008, discussed in the next section.

## Major Legislation and Initiatives Addressing Great Lakes Environmental Issues

Many federal, state, and local-level laws and policies contribute to the environmental protection and restoration of the Great Lakes. However, there are several major national and international efforts that represent large-scale responses to the Lakes' environmental issues.

### Boundary Waters Treaty

The United States and Canada signed the Boundary Waters Treaty in 1909 to “prevent and resolve conflicts over shared waters,” including the Great Lakes. The Treaty addresses water pollution but was primarily motivated by disputes over diversions from transboundary waters. It set the stage for binational management of the Great Lakes, including through the creation of the International Joint Commission (IJC), an oversight body of shared water sources with representatives from both countries.

### Great Lakes Water Quality Agreement (GLWQA)

This second major binational agreement between the US and Canada regarding shared waters was signed in 1972, amended in 1987, and most recently updated in 2012. The IJC, the US Environmental Protection Agency (EPA), and Environment Canada lead the effort to reach the common water quality objectives established in the agreement. The initial focus of the agreement was on pollution control, research, surveillance, and monitoring; later versions expanded the focus beyond an emphasis on water chemistry to the health of the entire Great Lakes ecosystem. In 1987, the GLWQA initiated the process of designating Areas of Concern (AOCs) (see box below, as well as *Figure 2*) and creating Remedial Action Plans (RAPs), as well as calling for the creation of Lakewide Management Plans. Successes of the GLWQA include reducing phosphorus levels, identifying new environmental concerns, and demonstrating an ability for binational cooperation. Highlights of the 2012 version of the agreement include a focus on the nearshore environment, aquatic invasive species, habitat degradation, and the effects of climate change; however, this most recent iteration has been criticized by some Canadian experts for lacking the numerical targets seen in previous versions.

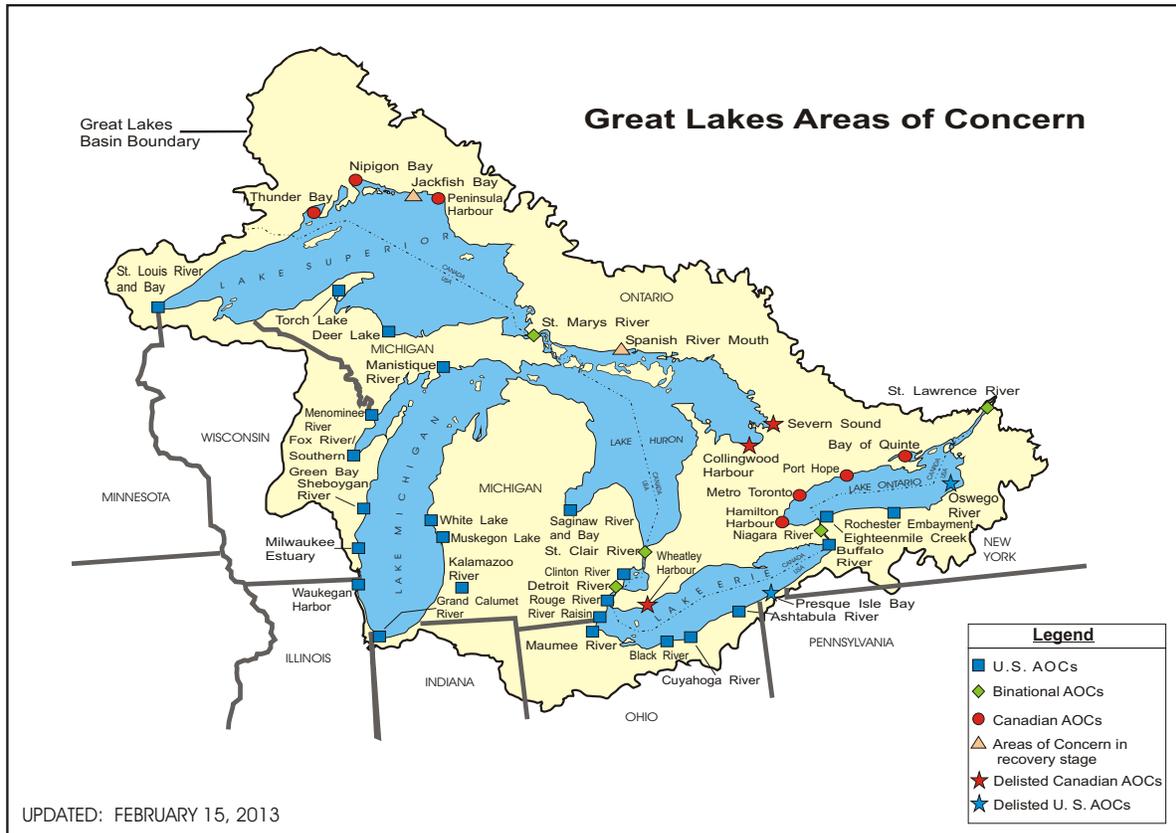
#### Areas of Concern (AOCs):

AOCs are specific locations within the Great Lakes Basin that have been identified as especially environmentally degraded. Degradation is measured by “beneficial use impairments” (BUIs); there are 14 BUIs, which address a range of interests and include impairments such as loss of fish and wildlife habitat, beach closures, and restrictions on dredging activity. The clean-up process for AOCs is governed by Remedial Action Plans (RAPs), which are developed for each area in a locally-led process. There are 43 AOCs total: 26 in the US, 12 in Canada, and five that are shared. As of February 2013, two US and three Canadian AOCs had been remediated and de-listed.

Progress toward AOC de-listing has been slow, although many AOCs have delisted at least some of their BUIs. Work toward delisting of BUIs and AOCs has increased significantly in the US in recent years, however, due to an influx of funding through the Great Lakes Restoration Initiative (discussed below).

<sup>a</sup> It is worth noting that the Chicago diversion is more than matched in quantity by a diversion in Ontario that sends water destined for Hudson Bay into Lake Superior.

**Figure 2**  
Great Lakes Areas of Concern (AOCs)



Source: US Environmental Protection Agency. (2013). *Great Lakes Areas of Concern*. Retrieved from <http://www.epa.gov/glnpo/aoc/images/aoc-glbasin-map-20130215.pdf>

## Great Lakes Compact

The Great Lakes Compact is a legal agreement between the eight Great Lakes states and the US federal government, which came into effect in 2008. The Compact focuses on water quantity and seeks to manage use and promote conservation within the Basin, as well as to drastically limit the possibility of diverting Great Lakes water outside the Basin. The Compact stipulates that any requests to divert water outside the Basin be decided by the Great Lakes-St. Lawrence River Basin Water Resources Council, made up of the eight Great Lakes state governors, and that decisions be made in consultation with Ontario, Quebec, and the Canadian federal government. To date, one diversion has been approved for New Berlin, WI, a community that straddles the Basin, and a more controversial request for a diversion has been made by the city of Waukesha, WI, on the basis of its location in a straddling county.

## Great Lakes Restoration Initiative (GLRI)

The GLRI is not an agreement but rather an initiative running from fiscal years 2010-2014 that has provided \$300-\$475 million in US federal funding annually to address a targeted set of Great Lakes restoration issues. Implemented by a group of federal agencies in cooperation with many state and local organizations, the GLRI is notable for representing the largest allocation of US federal funds for Great Lakes restoration in several decades. The five focus areas that have been funded include: toxics and AOCs, invasive species, polluted runoff, wetland restoration, and partnerships and monitoring. There has been no comparable increase in Canadian federal or provincial funding for these areas. It is currently unknown whether funding for the initiative will continue past FY 2014, especially given the declining influence of the Region in Congress and recent federal budgetary stringency.



In addition to these fairly broad-based efforts and agreements, more focused efforts have also been made to address specific Great Lakes environmental health issues. Examples include the binational Convention on Great Lakes Fisheries (1954), which was prompted by the collapse of fisheries due to problems such as the invasive sea lamprey; the Great Lakes Binational Toxics Strategy (1997), which outlined a strategy for the elimination of “persistent toxic substances,” and the Great Lakes Legacy Act (2002), which focused on expediting the cleanup of contaminated sediment in AOCs.

## Great Lakes Governance Structure

Great Lakes environmental governance efforts form a complex web of binational, federal, state and provincial, local governmental, and tribal/First Nations activity. Rather than attempting to be comprehensive, the descriptions here are meant to provide some prominent examples of how different levels of government are involved with these issues.

As noted in the previous section, governance of the Lakes is shared at the international level between the United States and Canada, based on the provisions of the Boundary Waters Treaty and the Great Lakes Water Quality Agreement. At the national level, 10 US federal agencies are involved in Great Lakes protection and restoration efforts, either through programs specifically focused on the Lakes (e.g. the Fish and Wildlife Service’s Great Lakes Lake Sturgeon Rehabilitation Program) or that apply to the Lakes (e.g. the National Oceanic and Atmospheric Administration’s Coastal Zone Management Program). Similarly, Canada has seven federal departments and one agency that work on Great Lakes environmental issues. Federal-level activities range widely, from setting regulatory standards to conducting scientific research to allocating grant funding for restoration projects.

Eight US states and the province of Ontario border the Great Lakes. Work done at the state/provincial level also varies widely; however, in the US, states are usually responsible for the implementation of water quality regulations and standards that are set at the federal level, while in Canada provinces and local jurisdictions tend to have greater independence from Ottawa.<sup>10</sup>

Municipal policies are part of Great Lakes management as well; in Michigan and other home rule states, for example, land use is regulated at the municipal level, so factors such as storm water runoff and shoreline construction are determined locally. Local governments and communities in both the states and Ontario participate in the development of RAPs, and can play a central role in implementing regulations (e.g., permitting for municipal storm water discharge) as well as in receiving funding for restoration projects.

Tribes (in the US) and First Nations or Metis communities (in Canada) with land or treaty rights to hunt and fish in the Great Lakes Basin are also significant actors in Great Lakes management. A number of these primarily Anishinaabe communities assert jurisdiction in the Great Lakes, with obligations to speak on behalf of the land and water. This jurisdiction derives from Indigenous law, ancient treaties, and recent legal victories in Canadian and American courts.<sup>b</sup> However, Canadian and American governments often overlook this asserted jurisdiction and even accrued rights, preferring to see Indigenous communities as non-governmental stakeholders in matters of Great Lakes management. Indigenous peoples nonetheless participate through land and resource management practices in their territories as well as collaborative work on restoration projects and Lakewide or Regional Management Plans.

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<sup>b</sup> In Canada, the federal and provincial governments have constitutional obligations to consult and accommodate First Nations communities with asserted or established treaty rights. In the Great Lakes, these treaty rights originate in confederation-era treaties and can provide communities with significant influence on decisions about land management. While some Indigenous Nations in Canada have created modern self-government agreements with constitutionally protected land management rights, none are in the Great Lakes Basin, which makes recognition of rights in this area more complex.

The US currently has 566 federally recognized American Indian and Alaska Native tribes and villages, which are legally recognized as having government-to-government relationships with the United States and individual states. Primarily Anishinaabe nations in Minnesota, Wisconsin, and Michigan—communities on the perimeter of the Great Lakes—are among those considered as sovereign under US federal law and continue to exercise quasi-state power in the region.

## Survey Findings

The findings included in this report are drawn from a telephone survey conducted between November 6 and December 5, 2013. Random digit dialing, including both landlines and cell phones, was used to reach a representative sample of 1,247 residents in the Great Lakes Basin. Because the boundaries of the Basin do not map to political boundaries—or telephone exchanges—our sample was based on estimation. For Ontario, we included all provincial landline and cell phone exchanges since the vast majority of the province’s residents live within the Basin. For the US, we included all households with landlines in a county that is at least partially within the Great Lakes Basin, as defined by the US Environmental Protection Agency. To sample cell phone numbers of individuals in the US, we included area codes that were in counties at least partially within the Basin, and then asked respondents to confirm their county of residence as part of the survey, since cell phone numbers are particularly portable.

As a result of this sampling scheme, the number of respondents in each state/province varies widely, from 408 residents in Ontario to only 17 residents in the small portion of Pennsylvania within the Basin (see *Table 1*). Consequently, the margin of error for the entire population is 3 percent, calculated at a 95 percent level of confidence, while the margins of error for the American and the Canadian subsets are 3.5 and 5 percent, respectively. All data summarized in this report are weighted by state/province, age, gender, and educational attainment to reflect population estimates in the Great Lakes Basin. Percentages throughout this report are rounded upward at the 0.5 percent mark.

**Table 1**  
Survey frame population and number of respondents, by state/province

State/Province	Total Population (last census)	Number of Counties in Basin	Population in Sample Counties	Number of Respondents
Ontario	12,851,821	all	12,851,821	408
Illinois	12,830,632	2 of 102	5,943,719	138
Indiana	6,483,802	13 of 92	1,896,834	44
Michigan	9,883,640	all (83 of 83)	9,883,640	267
Minnesota	5,303,925	7 of 87	335,775	25
New York	19,378,102	31 of 62	4,315,025	110
Ohio	11,536,504	35 of 88	5,281,296	116
Pennsylvania	12,702,379	3 of 67	386,768	17
Wisconsin	5,686,986	37 of 72	3,703,871	122



The survey included several questions similar to those asked in previous surveys, allowing for potential comparisons with previous samplings of public opinion on the health of the Great Lakes. To limit the overall length of the survey, roughly half of the respondents (n=633) were randomly assigned to a supplemental survey that included 10 questions about wind energy, while the other half (n=614) were given 10 questions about hydraulic fracturing. These questions are analyzed separately in companion reports.<sup>11</sup>

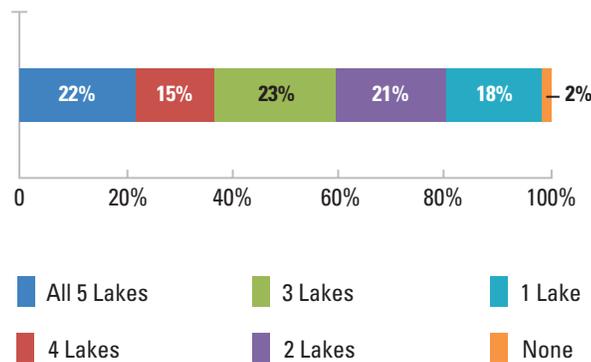
Funding for both the survey and these reports was provided by the Social Sciences and Humanities Research Council of Canada under the auspices of the Great Lakes Policy Research Network centered at Ryerson University in Toronto. Supplemental funds were provided by the Center for Local, State, and Urban Policy (CLOSUP) at the Gerald R. Ford School of Public Policy at the University of Michigan and the Muhlenberg College Institute of Public Opinion. The survey instrument was developed by Professor Christopher Borick of Muhlenberg College, Professor Christopher Gore of Ryerson University, and Professor Barry Rabe of the University of Michigan, and fielded by the Muhlenberg College Institute of Public Opinion.

### Strong Connection with the Great Lakes, Especially Through Recreational Activities

Residents in the Great Lakes Basin are quite familiar with the Lakes, mostly through recreational activities, and believe that the Lakes significantly impact their local economy as well as their everyday lives. Virtually all Great Lakes Basin residents (98%) have visited at least one of the Lakes, and the majority (81%) has visited more than one (see *Figure 3*). Half of all residents (54%) have been to a Great Lakes beach within the past year, and another 54% have eaten fish from one of the Lakes within the past year (see *Table 2*). Most residents (71%) agree that the Lakes have a significant impact on their daily life, and nearly all (94%) believe that the Lakes are a valuable economic resource for their state or province (see *Figure 4*). Notwithstanding the pervasive view of the Lakes as an economic resource, only 4% of residents report that their employment is directly related to one or more of the Great Lakes (see *Table 3*).

**Figure 3**  
Number of Great Lakes visited (over lifetime)

*“I’m going to list the five Great Lakes. Which ones have you visited during your lifetime?”*



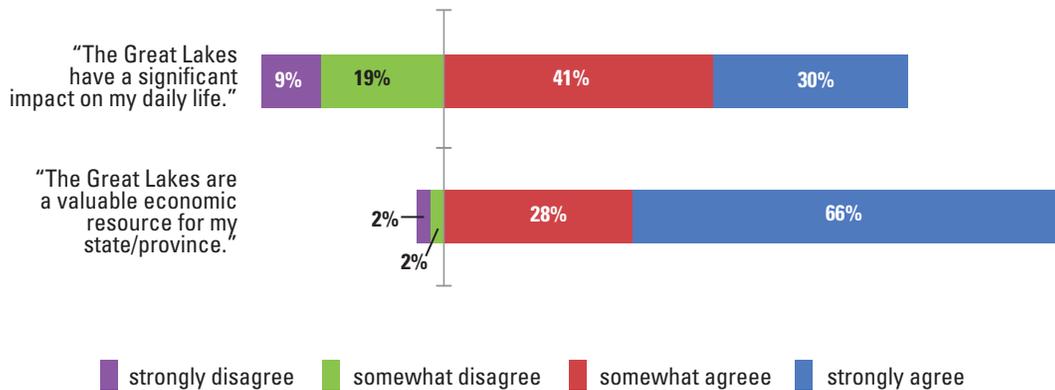
**Table 2**  
**Participation in Great Lakes recreational activities (in the past year)**

*“During the last 12 months, please indicate if you have done any of the following activities”*

	Engaged in Activity	Did Not Engage in Activity	Not Sure
“Went hunting in the Great Lakes Region.”	11%	89%	<1%
“Went fishing on one or more of the Great Lakes.”	29%	71%	<1%
“Ate fish from one or more of the Great Lakes.”	54%	42%	4%
“Swam in one or more of the Great Lakes.”	40%	60%	<1%
“Went to a beach on one or more of the Great Lakes.”	54%	46%	<1%
“Went boating on one or more of the Great Lakes.”	40%	60%	0%

**Figure 4**  
**Impact of Great Lakes**

*“To what extent do you agree with each of the following statements?”*



Note: “Not sure” responses not shown.



**Table 3**  
**Lake-related employment**

*“During the last 12 months, please indicate if you have done any of the following activities”*

	Engaged in Activity	Did Not Engage in Activity	Not Sure
“Held employment directly related to one or more of the Great Lakes.”	4%	96%	1%

### Lakes Perceived to be in Decent Shape, but Not Considered to be Improving

Most residents (86%) rate the condition of the Great Lakes as “fair” or better, although only 5% rated their condition as “excellent” (see *Table 4*). Similarly, few residents (9% total) describe their condition as “poor” or “very poor.” In our study, there are no significant differences between American and Ontarian perceptions of the Lakes’ overall current condition.

Because perceptions of the condition of the Lakes is one of the most commonly-asked questions in Great Lakes public opinion surveys over prior decades, we can compare our responses to previous studies. Our findings seem to indicate a change from the most recent comparable study, reported on by McAllister Opinion Research in 2007. The McAllister study compared the responses from its own telephone survey of residents of Ontario to a 2005 Belden Russonello & Stewart (BRS) telephone survey with residents in the eight US states bordering the Great Lakes.<sup>c</sup> In contrast to our finding that there is no difference between American and Ontarian views on the condition of the Lakes, the McAllister team found that Americans believed the Lakes to be in better health than their Canadian counterparts. Specifically:

Only 19% of Americans say the Lakes are in poor condition, while one third (39%) of Canadians think they are in poor shape. In the reverse, one third (37%) of Americans say the condition of the Lakes is “good” or “excellent,” and 16% of Canadians hold this view.<sup>12</sup>

In comparing the responses from our study and these earlier studies (see *Table 4*), we also find more positive feelings about the condition of the Lakes overall. Views that the Lakes are in poor or very poor shape have dropped from 19% to 8% among Americans and views that they are in good or excellent shape have risen slightly, from 37% to 45%. Among Ontarians, the change is even more dramatic: only 11% currently believe they are in poor or very poor shape, down from 39% in 2007, while 39% now believe they are in good or excellent shape, up from 16% in the previous study.

<sup>c</sup> Note: Unlike our study, which includes only residents within the Basin (see note on p. 2), the 2005 study, conducted by Belden Russonello & Stewart (BRS) and V.J. Breglio Consulting, included a sample of residents from the entirety of six of the eight states plus residents in Erie County, Pennsylvania and New York state outside of the New York City metropolitan region—effectively the “Region” rather than the “Basin.”

**Table 4**  
**Condition of the Lakes**

*“How would you rate the current condition of the Great Lakes?”*

		Excellent	Good	Fair	Poor	Very Poor	Not Sure
2013 Survey	Total (MOE ±3%)	5%	38%	43%	8%	1%	6%
	Ontario (MOE ±5%)	4%	35%	46%	10%	1%	4%
	United States (MOE±3.5%)	5%	40%	41%	7%	1%	7%
2007 <sup>i</sup>	Ontario (MOE ±3.1%)	1%	15%	38%*	32%	7%	7%
2005 <sup>ii</sup>	United States (MOE±2.5%)	4%	33%	34%*	16%	3%	10%

\*The previous studies used “OK” rather than “fair.”

<sup>i</sup> McAllister Opinion Research. (2007). *Great Lakes communication research: Analysis of public and policy-maker opinion on the Great Lakes & St. Lawrence ecosystem*. Vancouver: McAllister Opinion Research.

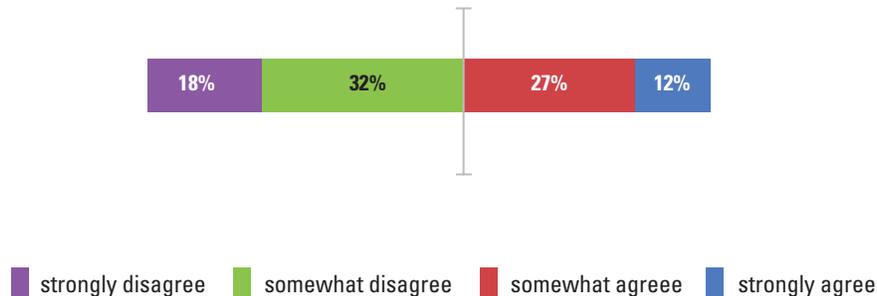
<sup>ii</sup> Belden Russonello & Stewart (BRS) and V.J. Breglio Consulting, as reported in McAllister Opinion Research (2007).

Does this change in public opinion indicate that Basin residents believe the condition of the Great Lakes is improving? When asked this question directly in our survey, the most common response is negative. Fifty percent of residents believe that the Lakes are not in better health today than 20 years ago, while only 39% believe that they are in better health today (see *Figure 5*).



**Figure 5**  
**Opinion on whether health of Lakes is improving**

*“Overall, the Great Lakes are in better health today than 20 years ago.”*



Note: “Not sure” responses not shown.

The difference between the previous studies and our own could therefore be due to a factor such as the latest news on the Lakes at the time this survey was conducted compared to previous surveys. The results may also be affected by the varied sampling strategies employed in the respective studies, with the inclusion of full populations from six states in the BRS study contrasting with this study’s inclusion of only residents from counties within the Basin. Finally, this study includes both cell phones and landlines within the sample while the previous studies included only landlines. We hope to revisit this topic in future studies in which we could provide identical sampling techniques and identical survey instruments to allow closer comparability, which has routinely been missing in the dozens of previous survey efforts in the Basin.

### **Pollution and Contamination are Top Concerns about Great Lakes Health**

When asked an open-ended question about which environmental issues are currently threatening the Great Lakes, pollution and contamination are by far the most commonly-cited, mentioned by 55% of residents as their top-ranked concern and by 74% of residents as one of their three top concerns (see *Table 5*). This emphasis is even larger if other categories which suggest or imply pollution or contamination are considered as well—e.g. sewage/waste, water quality, or garbage dumping. Asian carp is the next most commonly-cited concern, as the top concern for 8% of residents and among the top three concerns for 21% of residents.

**Table 5**  
**Top environmental concerns**

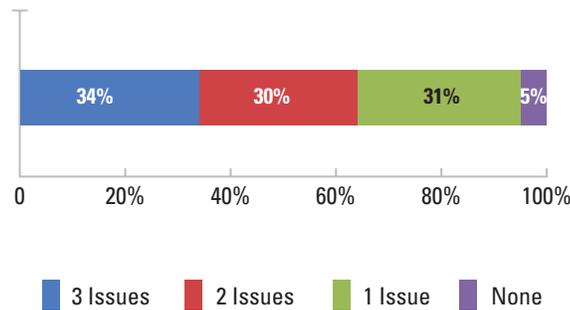
*“In your opinion, what are the three most important environmental concerns facing the Great Lakes today?” [Unaided.]*

Issue (grouped by category)	Rank 1	Total mentions (as rank 1, 2 or 3)
Pollution/Contamination	55%	74%
Asian Carp	8%	21%
Water Levels	5%	16%
Invasive Species	4%	11%
Water Quality/Maintaining Quality	3%	6%
Sewage/Waste	3%	7%
Industrial/Business Waste	2%	7%
Garbage Dumping	2%	6%
Zebra Mussels	2%	5%
Fish/Fishing Industry	1%	6%
Chemicals	1%	3%
Water Diversion/Drawdown	1%	2%
Hazardous/Toxic/Nuclear Waste	1%	2%
Runoff/Farm Waste	1%	4%
Algae	1%	1%
Global Warming/Climate Change	1%	2%
Shore/Beach Issues	<1%	2%
Pharmaceutical/Medical Waste	<1%	1%
Other	5%	17%

This question also reveals that although many people do not believe the Lakes are in better shape today than 20 years ago and rate them in only fair condition, many are unable to name specific issues facing the Lakes. A third of Basin residents (31%) named only one environmental concern, and only 34% named three concerns (see *Figure 6*). This trend holds true for both Americans and Canadians, who also showed few significant differences in their frequency of reference to any of the issue categories, with the notable exception being that Canadians were more apt to cite concern over water levels than Americans (see *Table 6*). This lack of national differences is also interesting, as media and other sources of information in the two countries might be expected to differ somewhat in their focus and coverage, leading to different levels of concern and awareness.



**Figure 6**  
Number of environmental issues respondents identified in open-ended question



**Table 6**  
Ontario / US comparison of environmental concerns

*“In your opinion, what are the three most important environmental concerns facing the Great Lakes today?” [Unaided.]*

Concern	Ontario		United States	
	Rank 1	Total mentions (as rank 1, 2 or 3)	Rank 1	Total mentions (as rank 1, 2 or 3)
Pollution/Contamination	60%	78%	52%	71%
Asian Carp	4%	16%	10%	23%
Water Levels	8%	25%	4%	12%
Invasive Species	3%	11%	5%	10%
Water Quality/Maintaining Quality	3%	6%	3%	6%
Sewage/Waste	4%	8%	2%	6%
Industrial/Business Waste	2%	8%	3%	7%
Garbage Dumping	1%	5%	2%	7%
Zebra Mussels	2%	8%	1%	4%
Fish/Fishing Industry	1%	7%	2%	6%
Chemicals	2%	2%	1%	3%
Water Diversion/Draw Down	1%	3%	1%	2%
Hazardous/Toxic/Nuclear Waste	1%	2%	1%	2%
Run Off/Farm Waste	1%	3%	1%	5%
Algae	<1%	1%	1%	1%
Global Warming/Climate Change	1%	3%	1%	1%
Shore/Beach Issues	0%	1%	<1%	2%
Pharmaceutical/Medical Waste	0%	1%	<1%	1%
Other	5%	20%	5%	16%

### Top Policy Priorities Relate to Concern about Pollution

The survey also asked about a number of policy options that have been suggested to address environmental concerns. In an attempt to minimize respondents' potential tendency to overestimate their support for a proposed policy, we also included a trade-off or "cost" with each option (see *Figure 7*). Even so, we found very high support for most policies, though a different result might occur if a specific plan went to the polls through some form of direct democracy. For example, all but one of the 10 policy options were supported by a majority of respondents, and 47% of respondents said that they would support 7 or more of the policies posed to them in the survey. As a result, it may be more telling to look not at the absolute level of overall support for any policy, but to compare support for the actions relative to one another, and the strength of that support or opposition.

Support is highest for policies directly related to pollution prevention, which might be expected since pollution is the prime concern for most residents in the Basin. Among the policies that aim to minimize pollution, reducing the release of pharmaceuticals and other contaminants is strongly supported by over half (52%) of residents (see *Figure 7*). There is also high overall support for rebuilding sewers to improve water quality and reducing agricultural run-off.

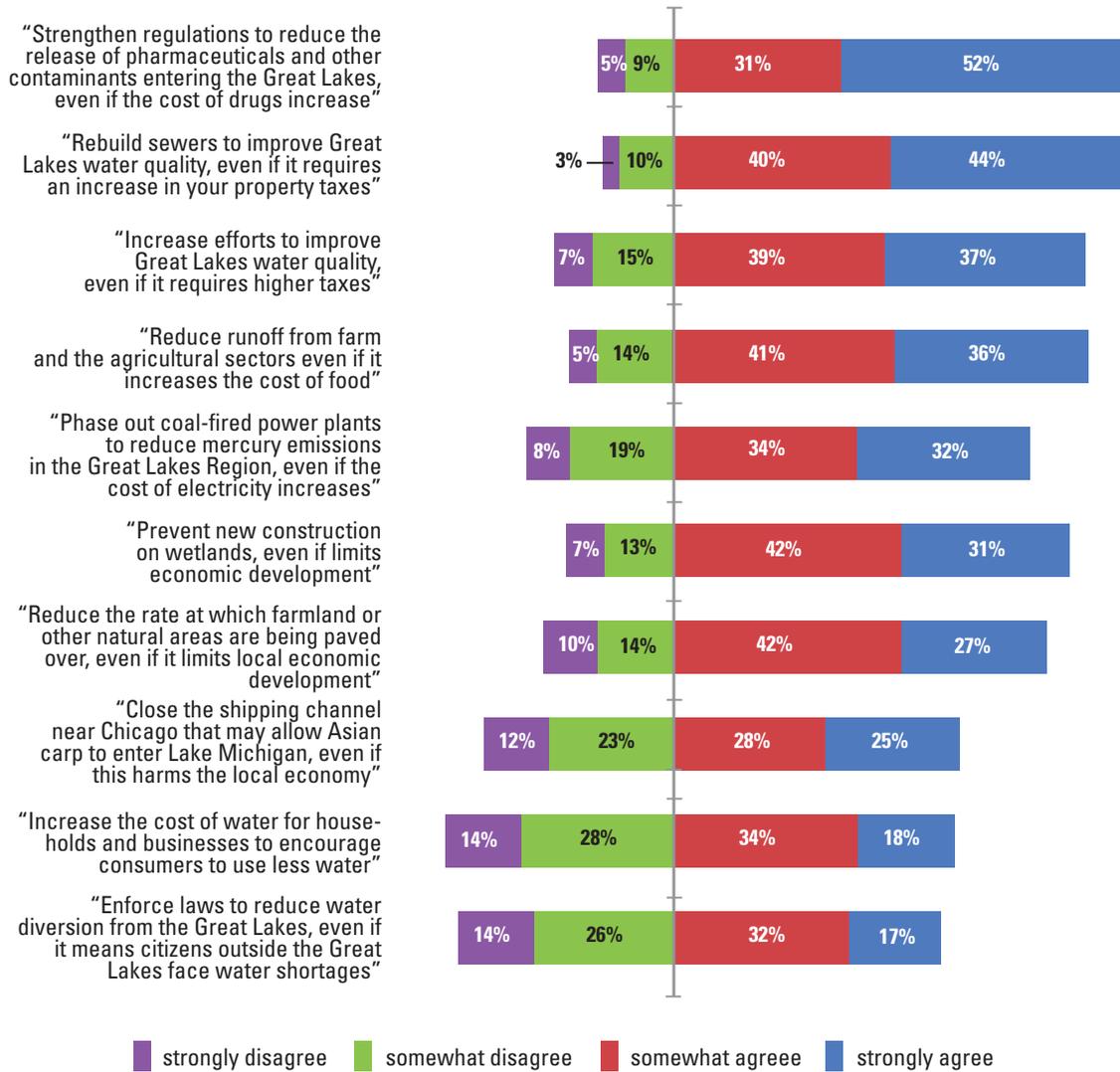
The least popular policies are those dealing with water drawdown or diversion, a concern raised by less than 3% of respondents (see *Table 5*). These policies include increasing the cost of water to encourage less water use and enforcing laws to reduce water diversions, both of which have the highest levels (14%) of strongly opposed residents.

Interestingly, closing the Chicago Sanitary and Ship Canal to prevent Asian carp from entering the Great Lakes has relatively limited support, and some of the highest uncertainty levels among residents, though it is a possibility that has received considerable press coverage in recent years. Just over half of residents (53%) say that they support the plan, but only 25% strongly support it (see *Figure 7*). Twelve percent are strongly opposed and just as many (13%) are not sure how they feel about the plan.



**Figure 7**  
**Support for Great Lakes policy**

*“I am going to list several actions that have been proposed to improve the condition of the Great Lakes. As I read each action, please let me know whether you strongly support, somewhat support, somewhat oppose, or strongly oppose the action.”*



Note: “Not sure” responses not shown.

In general, Ontarians are more supportive than Americans of all the actions proposed. However, the only significant difference in the relative priority of actions is in phasing out coal-fired power plants to reduce mercury emissions. Just under half (48%) of Ontarians surveyed strongly support the policy, ranking it among the top three priorities for Ontarians (see *Table 7*). In the US, it is strongly supported by only 24% of residents, and ranks in the lower half of priorities. This discrepancy in public opinion is likely the result of different policy directives in Ontario and the US regarding coal-fired power plants and of the amount of media attention air quality and renewable energy has received in the province in recent years. The health impacts of mercury released from coal plants has been of great concern in Ontario for the past several decades, and retiring coal-fired power plants has been debated in Ontario<sup>4</sup> since the early 2000s.<sup>13</sup> By the end of 2014, Ontario is expected to close the last two coal plants in the province, though many Ontarians still live downwind of coal plants in Michigan. Additionally, airborne mercury from power plants throughout the Basin leads to widespread contamination of water bodies and bioaccumulation in fish.

**Table 7**  
**Ontario / US comparison of policy support**  
**(arranged in same order as Figure 7)**

Actions list in order of support (greatest to least)	Ontario		United States	
	% Strongly Support	Rank by Strongly Support	% Strongly Support	Rank by Strongly Support
“Strengthen regulations to reduce the release of pharmaceuticals and other contaminants entering the Great Lakes, even if the cost of drugs increase”	63%	1	47%	1
“Rebuild sewers to improve Great Lakes water quality, even if it requires an increase in your property taxes”	54%	2	38%	2
“Increase efforts to improve Great Lakes water quality, even if it requires higher taxes”	48%	3	31%	3
“Reduce runoff from farm and the agricultural sectors, even if it increases the cost of food”	45%	5	31%	3
“Phase out coal-fired power plants to reduce mercury emissions in the Great Lakes Region, even if the cost of electricity increases”	48%	3	24%	7
“Prevent new construction on wetlands, even if it limits economic development”	40%	6	27%	5
“Reduce the rate at which farmland or other natural areas are being paved over, even if it limits local economic development”	34%	7	23%	8
“Close the shipping channel near Chicago that may allow Asian carp to enter Lake Michigan, even if this harms the local economy”	24%	8	25%	6
“Increase the cost of water for households and businesses to encourage consumers to use less water”	24%	8	15%	9
“Enforce laws to reduce water diversion from the Great Lakes, even if it means citizens outside the Great Lakes face water shortages”	20%	10	15%	9

<sup>4</sup> For more on this, see companion report on wind energy: Mills, S., et al. (2014). *Wind energy development in the Great Lakes Region: Current issues and public opinion*. Ann Arbor, MI: The Center for Local, State, and Urban Policy at the Gerald R. Ford School of Public Policy, University of Michigan. Retrieved from <http://closup.umich.edu/issues-in-energy-and-environmental-policy/8/>

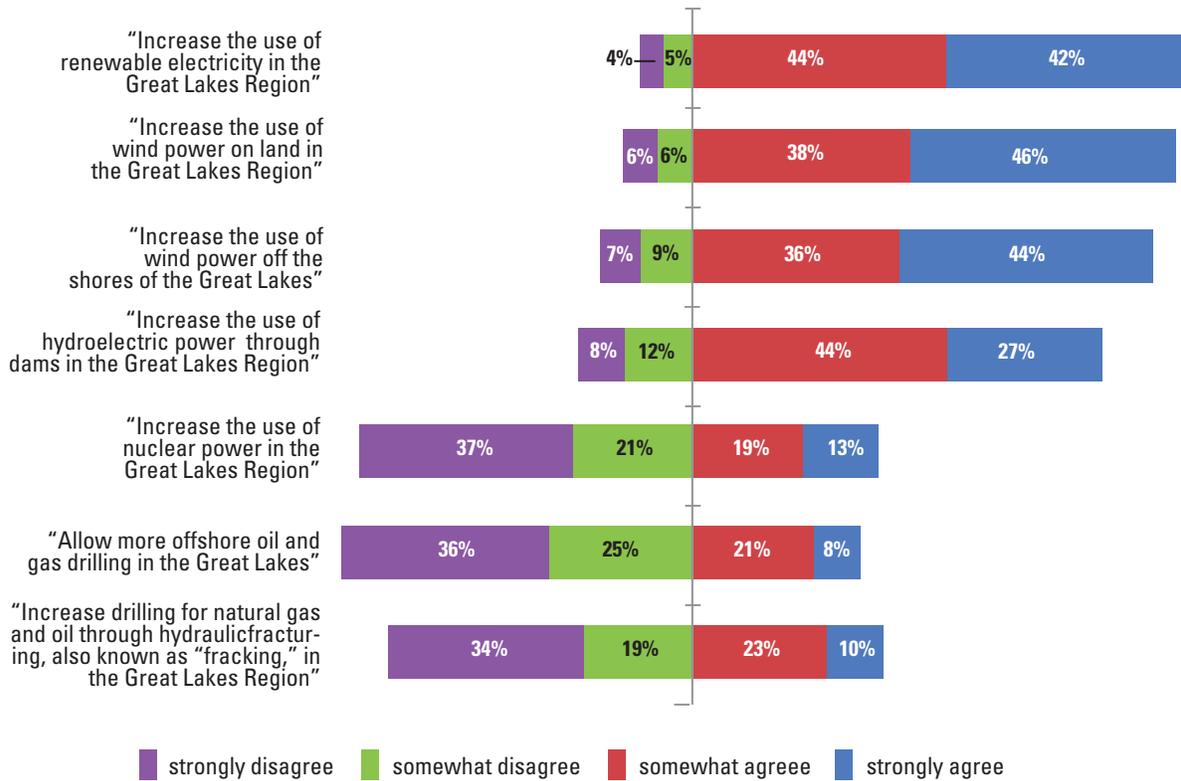


### Among Energy Strategies, Support is Strongest for Additional Renewable Energy

When asked about a range of energy policies, residents in the Basin are most supportive of increasing renewable energy sources (see Figure 8). Nearly half (46%) strongly favor increasing onshore (i.e., land-based) wind power in the Region, and nearly as many (44%) strongly support having wind turbines sited in the Lakes themselves. There is also generally positive opinion towards increasing the use of hydroelectric power (71% favor increases). In contrast, there is significantly less overall support for other energy developments. More than half (61%) of residents oppose allowing more offshore oil and gas drilling in the Great Lakes, with 36% strongly opposing this option. Similarly, 58% oppose increasing the use of nuclear power in the Region, and 53% oppose drilling for natural gas and oil through hydraulic fracturing (“fracking”).

**Figure 8**  
Support for energy policy options in the Region

*“As I read some possible government policies relating to [America’s/Canada’s] energy supply in the Great Lakes Region, please tell me whether you would strongly favor, somewhat favor, somewhat oppose, or strongly oppose the implementation of each in the Great Lakes Region.”*

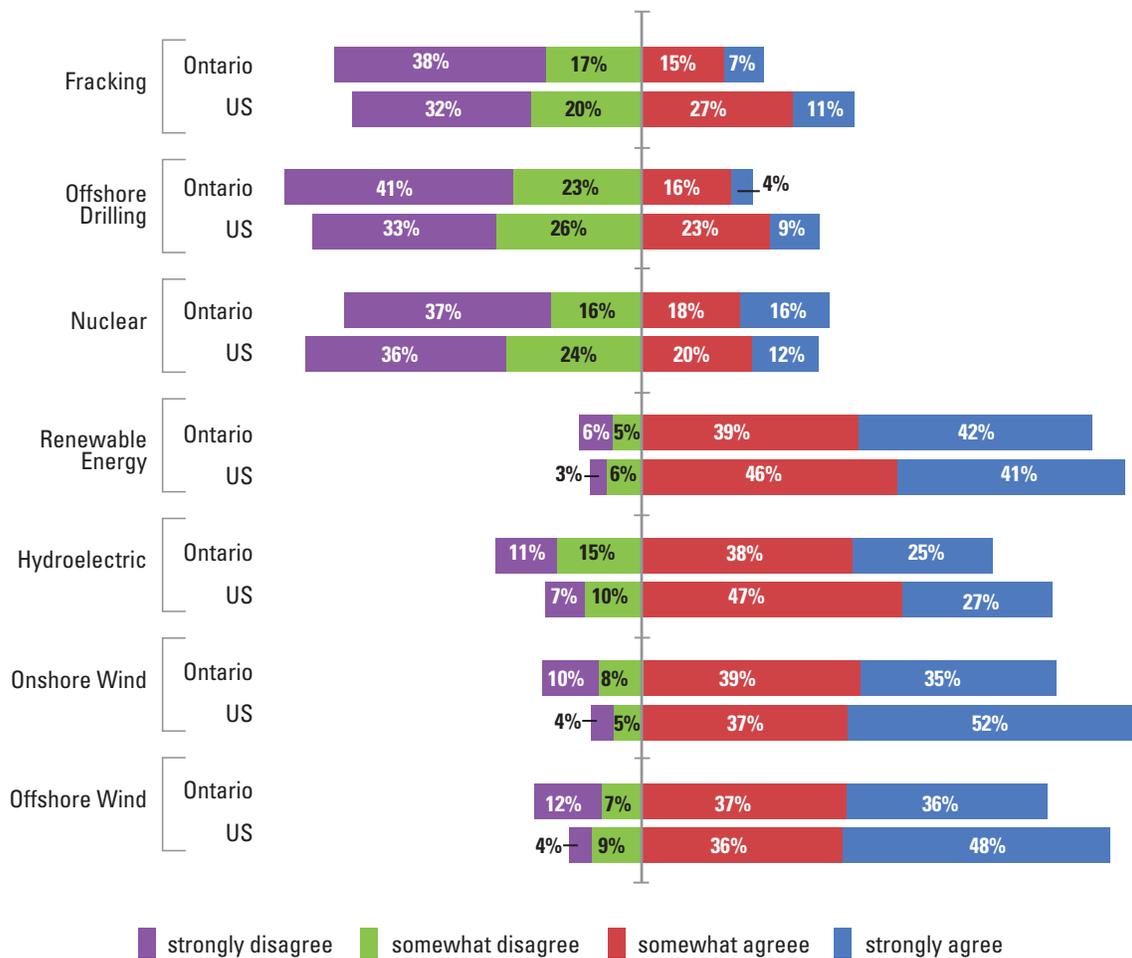


Note: “Not sure” responses not shown.

Because residents in Ontario are more supportive than their American counterparts of phasing out coal-fired power plants (see Table 7), one might expect that Ontarians would be more supportive of increasing electricity from alternative sources so that coal plants can be more easily retired.<sup>e</sup> Our survey finds the opposite to be true (see Figure 9). Though a majority of both countries' residents support increasing the use of renewable energy, Americans are more supportive than Ontarians of increasing the use of onshore and offshore wind energy and hydroelectric power by double-digit margins. Further, while only a minority of either country's residents support offshore oil and gas drilling in the Lakes or fracking in the Region, a higher proportion of Americans than Ontarians favor additional drilling (32% to 20%). It is only on support for nuclear energy wherein there are no statistically significant differences between Americans and Ontarians.

**Figure 9**  
**Ontario / US comparison of support for energy policy options**

*"As I read some possible government policies relating to [America's/Canada's] energy supply in the Great Lakes Region, please tell me whether you would strongly favor, somewhat favor, somewhat oppose, or strongly oppose the implementation of each in the Great Lakes Region."*



Note: "Not sure" responses not shown.  
Margin of error ±5% for Ontario and ±3.5% for US

<sup>e</sup> Ontario energy policy to phase out coal plants has involved increasing nuclear, natural gas, and onshore wind energy production in the province.



While it is beyond the scope of this report and survey to explain why Ontarians would be less supportive than Americans of nearly every type of additional energy development, two companion reports offer more details about energy policy throughout the Region, as well as providing further analysis on regional differences in support for energy policy. *Wind Energy Development in the Great Lakes Region: Current Issues and Public Opinion* provides additional analysis on survey questions related to wind energy and background information about wind energy policy in each of the states/provinces in the Region. The authors see lower support for wind energy among Ontarians as a possible consequence of the province’s energy policy. The companion report *Shale Gas and Hydraulic Fracturing in the Great Lakes Region: Current Issues and Public Opinion* includes more information on state- and province-level fracking activity and policy, and analysis of questions in this survey about the impact of fracking. Here, the authors note that the relatively less-developed shale oil and gas industry in Ontario may be contributing to more apprehension among Ontarians about fracking.

### Responsibility for the Lakes Should Be Widely Shared

There is near-unanimous agreement among residents in the Basin that responsibility for protecting the Great Lakes should be widely shared by all levels of government, business and industry, and individual citizens; 95% of residents say that each of these actors has at least some responsibility for lake protection (see *Table 8*). A majority of Basin residents (70% or more) believe that business and industry as well as federal and state/provincial governments should lead efforts to protect the Lakes, taking on “a great deal of responsibility.” Residents believe local governments should share in the responsibility, but are evenly split between whether they should have “a great deal” or only “some” responsibility. Lastly, 56% of residents say that individual citizens have “a great deal of responsibility” for protecting the Lakes, consistent with the 60% of residents who feel that their personal actions impact the Lakes’ health (see *Figure 10*).

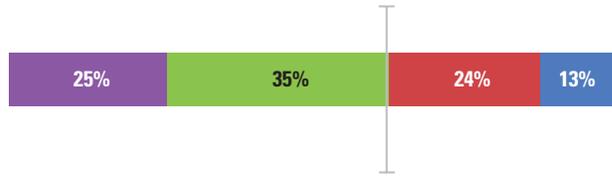
**Table 8**  
**Responsibility for taking actions to protect the Great Lakes**

*“For each of the following entities, please tell me how much responsibility it should have for taking actions to protect the Great Lakes.”*

	A Great Deal of Responsibility	Some Responsibility	No Responsibility	Not Sure
Businesses and industries	78%	20%	1%	1%
Federal governments of the United States and Canada	76%	20%	3%	1%
State/Provincial government	70%	28%	1%	1%
Your local government	49%	46%	4%	1%
Individual citizens	56%	40%	3%	1%

**Figure 10**  
**Personal impact on health of Great Lakes**

*“What I do in my life does not impact the health of the Great Lakes.”*



■ strongly disagree  
 ■ somewhat disagree  
 ■ somewhat agree  
 ■ strongly agree

Note: “Not sure” responses not shown.

Americans and Ontarians hold similar views on the level of responsibility of industry and individuals—the groups at either end of the responsibility spectrum. They also tend to believe that all levels of government should take responsibility for Great Lakes protection, but express greater support for federal as opposed to state/provincial or local responsibility (see *Table 9*). This support for federal assumption of responsibility is particularly strong in Ontario, an interesting finding given strong traditions of Canadian deference to provincial and local authority on many natural resource issues in Ontario and other provinces.<sup>14</sup> A similar assignment of responsibility was found in the 2007 survey of Ontarians by McAllister Research Opinion.<sup>15</sup> However, our survey found that when it comes to government responsibility, Ontarians are more likely than Americans to believe that government at every level has a great deal of responsibility, while Americans are more likely than Ontarians to believe that each level of government has only some responsibility.

**Table 9**  
**Ontario / US comparison of responsibility for care of the Great Lakes**

*“For each of the following entities, please tell me how much responsibility it should have for taking actions to protect the Great Lakes.”*

	A Great Deal of Responsibility		Some Responsibility		No Responsibility	
	Ontario	US	Ontario	US	Ontario	US
Businesses and industries	81%	76%	17%	21%	1%	1%
Federal governments of the United States and Canada	87%	72%	11%	25%	2%	3%
State/Provincial government	78%	65%	20%	32%	0%	2%
Your local government	59%	44%	38%	49%	3%	5%
Individual citizens	62%	54%	36%	42%	2%	3%

Note: “Not sure” responses not shown.  
 Margin of error ±5% for Ontario and ±3.5% for US



In terms of actual efforts to care for the Great Lakes, residents in the Basin generally believe that US and Canadian efforts have been at least somewhat effective. However, Ontarians are more critical than Americans of past efforts, with 24% of Ontarians but only 10% of Americans ranking Canada-US efforts as “not too effective” or “not effective at all” (see *Table 10*). Overall, 70% of residents want to see more collaboration between governments, a sentiment equally shared by Canadians and Americans (see *Figure 11*).

**Table 10**  
**Ontario / US comparison of effectiveness of binational collaboration**

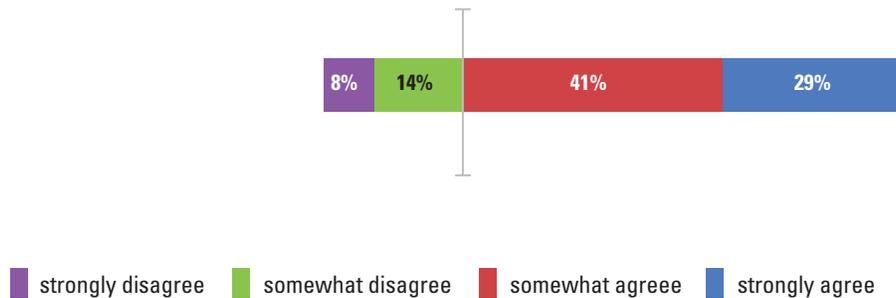
*“Canada and the United States work together to care for the Great Lakes. How effective do you think they are in this effort?”*

		Very Effective	Somewhat Effective	Not Too Effective	Not Effective at All
Nation	Canada	7%	61%	20%	4%
	United States	14%	66%	8%	2%
<b>Total</b>		<b>12%</b>	<b>64%</b>	<b>12%</b>	<b>3%</b>

Note: “Not sure” responses not shown.  
Margin of error ±5% for Ontario and ±3.5% for US

**Figure 11**  
**Support for increasing US-Canada coordination**

*“Increase coordination between states and provinces in the Great Lakes even if it requires giving up some of your (state’s/province’s) decision-making power.”*



Note: “Not sure” responses not shown.

### Conclusions

The results of this survey of residents in the Great Lakes Basin provide a useful overview of the current state of local public opinion regarding the health of the Lakes. Additionally, the survey provides an opportunity to assess support for a number of policy options to address environmental concerns. Most residents in the Basin feel that the Lakes are in only fair condition, and are primarily worried about water pollution and contamination. Consequently, Basin residents are also most supportive of policies that have a direct connection to pollution prevention.

Because the survey includes significant numbers of both American and Canadian respondents, it uniquely allows for cross-border comparisons. Our findings show that while some differences of opinion do exist between Americans and Ontarians within the Basin, these are differences of degree, rather than of kind. For example, though a larger proportion of Americans support increasing hydroelectric power and on- and offshore wind energy, the majority of Ontarians are also supportive of these policies. Similarly, though Ontarians envision a larger role for federal, state/provincial, and local governments in protecting the Great Lakes than their American counterparts, over 90% of Americans believe that all levels of government have at least some responsibility for caring for the Lakes. In sum, there are far more similarities than differences in the views and policy objectives of Basin residents.

There are a number of additional questions that this data could answer with further analysis. Because several of the questions in this survey were taken or adapted from previous public opinion polls, one valuable project would be to more thoroughly compare responses in this survey to past surveys and to evaluate the trends in public opinion. Another project could entail more in-depth analysis, utilizing demographic data collected through the survey to assess whether any interesting patterns emerge. Looking ahead, we also hope to replicate this survey in future years, assuring direct comparability with the 2013 findings, and to thus begin to systematize Great Lakes public opinion data collection in the Basin.

More immediately, the principals involved in this project intend to compare these findings with those of elected and appointed local government leaders in Michigan as well as in Ontario. Specifically, the Michigan Public Policy Survey conducted by CLOSUP in late 2013 asked a very similar set of questions of 3,655 local government officials in Michigan. Ryerson University will be asking similar questions in a survey of 444 Ontario municipal leaders in May or June 2014. Analysis of those findings and comparison between officials' and the public's views will be addressed in future publications.



## Notes

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Shale Gas and Hydraulic Fracturing in the Great Lakes Region: Current Issues and Public Opinion (April 2014)

Wind Energy Development in the Great Lakes Region: Current Issues and Public Opinion (April 2014)

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# The Center for Local, State, and Urban Policy

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