

Assessing Transboundary Governance Capacity in the Great Lakes Areas of Concern

Thomas J. Greitens

Central Michigan University, Department of Political Science & Public Administration
Email: greit1t@cmich.edu

This case evaluates transboundary governance across the Great Lakes “Areas of Concern” (AOC). Designed with an emphasis on decentralization to sub-national institutions and the activation of citizen-led groups, the AOCs represent a unique approach to environmental governance. Traditionally examined with case study research, the individual AOCs are idiosyncratic with environmental and political challenges that are not always germane to other AOCs or broader theoretical concepts surrounding environmental governance. However, by examining the AOCs underlying transboundary governance architecture in terms of functional intensity, nature of compliance mechanisms, stability and resilience, and legitimacy a more comprehensive theoretical understanding of the successful governance processes used, as well as the gaps in governance responses observed, can be realized. The results presented here show that the AOCs can have significant transboundary governance weaknesses in terms of compliance mechanisms and notions of stability and resilience, but noteworthy strengths in terms of functional intensity and legitimacy. As a result, transboundary governance has a tendency to degrade over time in the AOCs, even though initial governance responses are initially effectively designed with high levels of stakeholder input.

Keywords: Areas of concern, Networks, Collaborative governance, Transboundary governance, Implementation

The effective management of the waters of the Great Lakes has been a concern among citizens and policymakers for over one-hundred years. Perhaps due to its distinctive physical feature as the largest group of freshwater lakes on the planet, its unique location on the border between two countries, and its diverse levels of biodiversity spread across different ecosystems, policy innovations regarding the management and protection of the Great Lakes routinely occur. For instance, in the early part of the 20th century, the United States and Canada agreed to the 1909 Boundary Waters Treaty to help better manage the waters of the Great Lakes. That treaty established the notion of cooperation between the countries on a variety of issues and formed the International Joint Commission which to this day remains the primary institution in the environmental governance of the region. With increasing levels of ecosystem stress leading to severe environmental problems such as the “Death of Lake Erie” by the late 1960s (Hartman, 1973), newer policy innovations such as the Great Lakes Water Quality Agreements emerged which emphasized new processes for public participation from citizens and advocacy groups in the region (Botts & Muldoon,

2005). Additional innovations in the 1980s focused on remediating beneficial uses across the ecosystems of the Great Lakes and led to the formation of the Great Lakes Areas of Concern (AOCs) and specific governance processes that reflected community values and specific environmental conditions (Krantzberg, 2012a).

The implementation of these types of policy innovations in the Great Lakes Basin is challenging for a variety of reasons. First, the large geographical size of the area makes policy coordination difficult. While the lakes are connected physically, their ecosystems, local political systems, and specific policy problems can diverge. What works in the western part of Lake Superior, for example, may not be appropriate in the eastern part of Lake Ontario. Nonetheless, since they are interconnected, environmental problems in the Great Lakes are diffuse as witnessed by the spread of invasive species throughout the basin since at least the 1800s (Mills, Leach, Carlton, & Secor, 1993). The Great Lakes also straddle an international border between two countries. This makes effective policy responses impossible without some type of over-arching institutional architecture to resolve disputes and enforce appropriate policy responses. Eight American states and one Canadian province, with numerous local governments throughout, increase the legal and cultural complexity of this policy environment. Many of these local governments also now comprise the North American “Rust Belt” where past industrialization efforts have faded resulting in economic stagnation, population loss, and a legacy of environmental pollution and ecosystem degradation. Successful policy actions to help solve such programs, thus become of prime importance.

Recognizing these types of challenges, the AOCs have been used for close to thirty years to help remediate areas in the Great Lakes Basin. The AOCs have a unique approach to environmental governance that emphasizes decentralized collaboration between citizens, advocacy groups, and governmental institutions. In addition, due to the nature of the Great Lakes, the AOCs have intra-state (the matter can be solved within one American state or one Canadian province), inter-state (the matter has to be solved by multiple American states or multiple Canadian provinces), and bi-national (the matter has to be solved across the American-Canadian border) governance implications. Consequently, the role of institutions throughout the AOCs, and the role of networks within the AOCs, becomes foundational to an understanding of the overarching transboundary governance framework at work in this region that is defined by complex policy challenges.

In the following analysis, the four indicators of transboundary governance introduced in this special issue (i.e. functional intensity, nature of compliance mechanisms, stability and resilience, and legitimacy) are used to evaluate both the general process of transboundary governance used across the AOCs and the differences in governance responses documented in different AOCs. Specifically, the indicators are used to analyze four different research questions: 1) What is the process of transboundary governance in the Great Lakes AOCs; 2) Did transboundary governance result in policy successes in the Great Lakes AOCs; 3) What are the weaknesses in transboundary governance in the Great Lakes AOCs; and 4) What are the strengths in transboundary governance in the Great Lakes AOCs. Answering these questions with analysis should provide a better understanding of the governance process in the Great Lakes AOCs and should result in findings that could be applied to other complex policy environments. In this way, effective

governance strategies are discerned and should result in more informed policy prescriptions in the future (Teisman, Van Buuren, Edelenbos, & Warner, 2013). The analysis proceeds in the following four sections. In the first section, a short policy history of the AOCs is presented, which is followed in the second section by an overview of the governance institutions and networks operating within the AOCs. These institutions and networks are then analyzed according to the indicators of transboundary governance to determine strengths and weaknesses in capacity. The last section links the discovered strengths and weaknesses in transboundary governance capacity in the AOCs to improvements in governance across the Great Lakes Basin and beyond.

1. Overview of the AOCs

The Great Lakes Areas of Concern currently represent thirty-six geographic locations within the Great Lakes Basin with significant ecosystem quality problems caused by human activities at the local level that contributed to the impairment of beneficial uses or the degradation of aquatic life. Formally established in the 1987 amendments to the 1972 Great Lakes Water Quality Agreement (most recently amended in 2012), the AOCs represent a conscious effort by policymakers to establish a governance architecture that can better manage ecosystem health in the Great Lakes and help solve some of the persistent environmental challenges in the region. Reflecting the disparate environmental conditions and governance capabilities across the AOCs, the 1987 agreement establishes a very decentralized governance process, with citizens and sub-national governments taking charge of remediation efforts that emphasize restoring beneficial uses to bodies of water (Sproule-Jones, 2002).

The 1987 agreement recognizes beneficial use impairments (BUIs) as the primary mechanism of ecosystem degradation in the Great Lakes. BUIs are identified as changes “. . . in the chemical, physical, or biological integrity of the Great Lakes System sufficient to cause any of the following: 1) restrictions on fish and wildlife consumption; 2) tainting of fish and wildlife flavour; 3) degradation of fish and wildlife populations; 4) fish tumours or other deformities; 5) bird or animal deformities or reproduction problems; 6) degradation of benthos; 7) restrictions on dredging activities; 8) eutrophication or undesirable algae; 9) restrictions on drinking water consumption, or taste and odour problems; 10) beach closings; 11) degradation of aesthetics; 12) added costs to agriculture or industry; 13) degradation of phytoplankton and zooplankton populations; and 14) loss of fish and wildlife habitat” (International Joint Commission, 1987, 2012). To help correct these types of impairments, the agreement establishes Remedial Action Plans (RAPs) for each AOC and Lake Wide Management Plans (LAMPs) for each Great Lake.

The use of RAPs in the AOCs is unique in terms of transboundary governance and reflects the importance of decentralized, local action in the Great Lakes. In each AOC, stakeholders of citizens, businesses, governments, and other interested parties form a Public Advisory Committee (PAC) that provides a sustainable forum for deliberation of topics and formulations of remediation strategies. Under the 1987 amendments, these remediation strategies follow a three-stage Remedial Action Plan (RAP) process that eventually

leads to each identified BUI being monitored and restored. Once all identified BUIs are restored, the AOC can be 'delisted' from the AOCs. In the first stage of the RAP process, participants delineate the causes and range of environmental damage in the AOC that contributed to impaired beneficial uses of water bodies. Once that occurs, participants proceed to the second stage. The second stage focuses more on implementation and leads to the identification of explicit remediation goals as well as recommendations of specific solutions that should lead to the restoration of beneficial uses in the area. Achievement of goals and solutions are then demonstrated in the third stage which also includes active measurement of the restoration process.

For each stage, the AOC completes an official report and submits it to the International Joint Commission (IJC). Formed in 1909 by the United States and Canada, the IJC is a permanent, quasi-judicial, bi-national organization that helps to write policies and laws for the Great Lakes, solves water conflicts between the two countries, and regulates construction projects that could influence water levels and flows in the Great Lakes (Crane, 2012; International Joint Commission, 2006; MacKenzie, 1996). If the IJC approves of the AOC report, then the AOC progresses to the next RAP stage in order to achieve the ultimate goal of delisting from the AOC as an area with impaired beneficial uses. However, it should be noted that the act of delisting AOCs is reserved to the respective national governments.

In the late 1980s, forty-three AOCs were identified across Canada and the United States (see Table 1). At least initially, these AOCs began the RAP process with effective engagement across the policy, governmental, non-profit, and private sectors. Public Advisory Committees (PACs), also called Citizen Advisory Committees in some areas, were started and diverse sets of stakeholders, many of them policy non-elites, deliberated and formulated initial strategies to progress through the RAP stages. However, by 2013 only five AOCs (two in the U.S., three in Canada) had been delisted. While almost every AOC experienced some progress on remediation and the implementation of the RAP process, most of them could not move to the third stage of the process. Consequently, the 2012 amendments to the Great Lakes Water Quality Agreement moved away from the three stage RAP process in favor of a process that emphasized periodic updating and implementation of the RAP in each AOC (International Joint Commission, 2012).

There are a multitude of factors that help to explain this lack of progress in delisting AOCs. Many of the causes are directly related to the existing environmental damage and unique transboundary governance capacity challenges that exist in each AOC. For instance, some AOCs had extremely harsh environmental problems that could only reasonably be solved by national governments. Unfortunately, the national governments often lacked the political and financial capacity necessary to solve the AOC problem (Rabe & Gaden, 2009). Additionally, in Michigan, home to many of the American AOCs, decentralized decision-making and governance-building faced significant hurdles due to concerns over the cost and legal responsibility of environmental clean-up at the local level, and distrust over the role of policy elites in the process (MacKenzie, 1996). Other factors such as a lack of specific direction from the IJC regarding the implementation of RAPs

Table 1

<i>Canada</i>	<i>United States</i>	<i>Bi-National</i>
Bay of Quinte	Ashtabula River, OH	Detroit River, MI
Collingwood Harbour*	Black River, OH	Niagara River, NY
Hamilton Harbour	Buffalo River, NY	St. Clair River, MI
Jackfish Bay	Clinton River, MI	St. Lawrence River, NY
Nipigon Bay	Cuyahoga River, OH	St. Marys River, MI
Peninsula Harbour	Deer Lake, MI*	
Port Hope	Eighteen Mile Creek, NY	
Severn Sound*	Grand Calumet River, IN	
Spanish Harbour	Kalamazoo River, MI	
Thunder Bay	Lower Fox River / Green Bay, WI	
Toronto and Region	Manistique River, MI	
Wheatley Harbour*	Maumee River, OH	
	Menominee River, WI	
	Milwaukee Estuary, WI	
	Muskegon Lake, MI	
	Oswego River / Harbor, NY*	
	Presque Isle Bay, PA*	
	River Raisin, MI	
	Rochester Embayment, NY	
	Rouge River, MI	
	Saginaw River and Bay, MI	
	Sheboygan River, WI	
	St. Louis River and Bay, MN/WI	
	Torch Lake, MI	
	Waukegan Harbor, IL	
	White Lake, MI*	

The Original Forty-Three Great Lakes Areas of Concern (AOC) Identified in the 1987 Amendments to the *Great Lakes Water Quality Agreement*. * signifies AOCs that have been delisted.

(Sproule-Jones, 2002), uneven interest and support from sub-national governments in the RAP process (Botts & Muldoon, 2005), and deficiencies in meaningful support from staff at national agencies (Landre & Knuth, 1993) contributed to the lack of long-term progress seen in many AOCs. However, even with these documented problems, some AOCs enjoyed success. The first delisted AOC, Collingwood Harbour in Canada, experienced great success in the facilitation of community members and groups impacted by the ecosystem health of the area. A key tenet of their success was the identification and integration of beneficial uses into the overarching plans for the entire area (Krantzberg, 2012b). In this way, engaging citizens, advocacy groups, and local governments from the “bottom-up” in collective actions driven by notions of a ‘sense of place’ seemed to drive success in the AOCs (Newig & Fritsch, 2009; Slocombe, 1993).

However, when examining the AOCs across the Great Lakes Basin, it becomes clear that such networks are activated and sustained by the sub-national state and provincial governments that assign AOC coordinators in the area to help facilitate engagement and education actions. Additionally, sub-national institutions such as American states and especially

Canadian provinces can also possess some degree of regulatory power for pollution prevention and remediation, and development. For example, in the Hamilton Harbour AOC the Ontario Ministry of Environment and Energy had significant regulatory powers over water quantity and quality, and the Ontario Ministry of Housing and Ontario Ministry of Natural Resources also had significant authority over zoning and navigable waters respectively (MacKenzie, 1996). Recent research on delisting progress in the St. Louis River, Milwaukee Estuary, and St. Marys River AOCs even suggests that educational efforts by these types of actors helped to create a shared “sense of place” among a variety of different local stakeholders that then helped build cooperation and trust that ultimately should lead to successful remediation in the future (Williams, 2015). While these types of efforts influence remediation efforts, it should be noted that ultimate success in remediation is also dependent on funding, either private or public, available to activate these networks (Williams, 2015) and existing institutional arrangements that reinforce existing regulatory and enforcement policies (Sproule-Jones, 2002). Thus, the role of local, sub-national, national, and international institutions within the AOC policy framework deserves analysis.

2. Institutional Framework of the AOCs

The institutional arrangements that have been created for the AOC's are, as noted above, quite decentralized and, specifically, empower local and sub-national institutions over international and national institutions. Nonetheless, an international institution, the International Joint Commission (IJC), does play a significant governance role in the AOCs. As a bi-national organization, the IJC helps to formulate policies for the Great Lakes, and also provides a mechanism for conflict resolution between the United States and Canada on Great Lakes and border issues (Donahue, 1987). The IJC is composed of three members from Canada and three members from the United States with each member being appointed by each country's respective Prime Minister or President. The governance ability of the IJC includes: 1) designing frameworks for cooperation and action between the two countries on Great Lakes and border issues; 2) issuing approvals (or disapprovals) for projects that could impact flows or levels of transboundary waters; 3) investigating problems in these transboundary areas; and 4) resolving disputes occurring in the transboundary areas (Crane, 2012). The IJC uses these type of governance powers to approve specific guidelines developed by stakeholders on listing and delisting AOCs and to describe the current status of remediation in each area (International Joint Commission, 2012). The national governments of Canada and the United States also play a significant role in the governance of the AOCs. Specifically, the national governments are required to cooperate and consult with sub-national institutions to develop and implement an ecosystem based RAP to restore beneficial uses in the AOC (MacKenzie, 1996). The national governments should help to publicize RAPs to the IJC and the public at large. But more importantly, the national governments and their agencies are in charge of removing BUI designations and delisting AOCs once all ecosystem concerns have been addressed (U.S. Environmental Protection Agency, 2001).

However, the primary governance authority in the case of AOCs resides with sub-national domestic institutions rather than international or national institutions. As mentioned in the previous section, sub-national institutions in Canada (i.e. the provinces) can routinely play a regulatory role in Great Lakes governance. And at a minimum, these American states and Canadian provinces help to activate the governance network within the AOCs by facilitating engagement events and educational outreach.

These sub-national institutions will vary according to the AOC in question, but can include local governments, state/province governments, and First Nations/Tribal governments. Joining these sub-national institutions are networks of citizens and interest groups. Public Advisory Committees (PACs) of sub-national governments and networks of citizens and interest groups play an especially significant role in transboundary governance in the AOCs, as they are the primary mechanism for crafting an ecosystem-based RAP for the environmental problems in specific areas. In this way, transboundary governance in the AOCs follows the models of effective environmental governance suggesting that decentralized intergovernmental and intersectoral networks are more important than centralized national governments when seeking to solve complex policy problems (Agranoff, 2007; Agranoff & McGuire, 2003; Kettl, 1997). However, it should be noted that these types of decentralized, network-based solutions can be difficult to implement. Given the different backgrounds, attitudes, and abilities of each of these institutions, some type of joint capacity building has to occur that emphasizes repeated interactions, collaborations, and sharing of knowledge and values (Ostrom, 1990; Ostrom, Gardner, & Walker, 1994; Weber & Khademian, 2008a; Weber & Khademian, 2008b). Without this type of investment, the success of any decentralized approach can be difficult to achieve.

Actions taken by these actors in the RAP process follow a typical pattern. First, the sub-national institutions at the state/provincial level empower local stakeholders to identify environmental values important to the AOC and which environmental problems currently impair beneficial uses of the environment that maximize those values. These values, and their corresponding beneficial uses emerge from these local stakeholders with the sub-national institutions either being actively involved to help facilitate meetings or entirely delegating the process to the stakeholders. In comparison, support from national institutions is minor and applicable only to possible financial and technical support, and guidance about appropriate legal frameworks. This decentralized process results in a plethora of planning documents that identify BUIs, appropriate monitoring techniques, and pathways to eventual restoration and is dependent on a strong network of local stakeholders activated and supported by sub-national and national institutions.

3. Analyzing Transboundary Governance Capacity Across the AOCs

It is important to acknowledge that an analysis of transboundary governance capacity across the AOCs is challenging for a number of reasons. First, the AOC governance process is extremely decentralized. While basic guidelines exist for all AOCs in terms of BUIs and RAPs, the mechanisms of remediation, engagement with stakeholders, and

collaboration across institutions and networks is dependent upon the specific conditions in each AOC. Second, the ecosystem problems in each AOC can vary widely. Some AOCs have complex environmental contamination problems that cannot easily be solved, while other AOCs have problems that are complex but easier to remediate. For instance, Collingwood Harbour was the first AOC to achieve delisting. When compared to other AOCs, its environmental problems were minor and were solved by updating sewage treatment, decreasing agricultural runoff, and dredging contaminated sediments (Great Lakes Water Quality Board, 1991; Sproule-Jones, 2002). Third, the economic and social conditions in each AOC also differ in significant ways. Some AOCs with more positive economic and social conditions have engaged governance actors from the private and public sectors, while other AOCs with significant economic and social challenges face considerable participation problems from their citizens and institutions. For example, the Oswego, New York AOC witnessed local governments and business leaders using the RAP process to help reinvigorate economic development opportunities in the area (New York Department of Environmental Conservation, 2006).

For many of these reasons, previous research on the AOCs focused on in-depth analyses of one AOC or a few similar AOCs. These types of studies provide a rich understanding of the governance, political, economic, and environmental challenges present in each AOC. However, a review of those cases indicates that the AOCs are often idiosyncratic with unique challenges, successes, and opportunities that may not always be applicable to other AOCs. Thus, in this analysis the AOCs are evaluated together to determine if any transboundary governance patterns can emerge. The transboundary governance indicators used in this special issue are applied below to the AOCs in order to provide insights into transboundary governance capacity in the Basin. The functional intensity indicator evaluates the depth of collaboration in the AOCs, and can range from basic interactions like information sharing and consultation, to more formalized interactions involving cooperation, harmonization, and integration. The compliance indicator allows for an exploration of the type of compliance mechanisms used and the likelihood they will be followed or ignored. The stability and resilience indicator, in turn, assesses the capacity for these institutions and networks to sustain themselves over time by learning and adapting to changing circumstances. And, the legitimacy indicator evaluates how stakeholders view and participate in the institution or network.

Data for this type of analysis originates from secondary sources produced by each AOC such as RAP planning documents, RAP status updates, and PAC newsletters. These materials are either archived or indirectly available via the USEPA's AOC website (<http://www.epa.gov/greatlakes/aoc/>). Additional data emerged from the policies and statutes guiding the AOC process and other research studies on the AOCs which are cited in-text when appropriate. These materials were analyzed to determine the strengths and weaknesses of the major types of governance actors identified in the AOC RAP process: the IJC, the national institutions, sub-national institutions, and PACs. In addition, specific BUI data from a select number of AOCs in the United States is analyzed to help determine whether this process resulted in successful environmental outcomes and governance actions.

3.1. *Functional Intensity*

Functional intensity is a measure of the strength of intergovernmental and intersectoral (i.e. government, non-government, and for-profit organizations) collaborations in the AOC governance framework. Strength is measured along a continuum from rather weak forms of collaboration (e.g. just information sharing) to comprehensive integration of values and policies between all of the actors in the governance system (VanNijnatten, 2006). In between those extremes, the intensity of collaboration can increase with consultations, more explicit cooperative efforts, and harmonization of values (VanNijnatten, 2006).

When analyzed only on the governance framework explained in the first two sections, the AOCs have strong forms of collaboration. Since the AOCs are so decentralized, a process exists through the use of Public Advisory Committees (PACs) to develop RAPs that emphasizes formal linkages between interested institutions and networks in each AOC. In this process, state governments/provinces, with some help from the national government, initiate a series of meetings about the challenges and opportunities in each AOC. Ideally, these meetings allow local support to build from the ground-up, and eventually reach a point where the PACs can take charge of the RAP process. Sometimes, these local PACs even join together in statewide PACs to help further the sharing of information and build support for each other. Reports generated from the PACs are then shared with the state and national governments as well as the IJC.

Functional intensity in the AOCs is also strengthened by institutions such as the Great Lakes Commission. Formed in the United States in 1955 by the Great Lakes Basin Compact, the Great Lakes Commission works with American states, Canadian provinces, and the PACs in each AOC to help promote important issues in the Great Lakes. For the AOCs, the Great Lakes Commission and the US EPA help AOCs in the American states learn from one another by scheduling annual meetings of the PACs and other interested parties in each AOC. The purpose of these meetings is to review new ideas and developments affecting the AOCs, share information on approaches for remediation, and build capacity across the AOCs so that implementation is ultimately successful. Typically at these meetings, survey responses from the chairs of the PAC in each AOC are publicized as a type of information exchange endeavor. In 2011, the survey questions included the following questions (Great Lakes Commission, 2011) that show the depth of learning exchanges that occur at this meeting:

1. Summarize the activities underway in your RAP to restore beneficial uses and make progress toward delisting. Which beneficial use impairments do you expect to remove over the coming year? Has your AOC completed its Stage 2 RAP (or equivalent)?
2. Did your AOC receive funding under the Great Lakes Restoration Initiative (GLRI) for a restoration project? What are the key challenges you anticipate to implement your restoration project(s) and what type of advice or technical assistance do you need (e.g. hiring contractors, securing permits, construction oversight, etc.)?
3. What are the key obstacles that you face and how could you benefit from the experiences of other AOCs?

4. What key successes have you had in your AOC? How can they be applied or replicated in other AOCs?
5. How can the GLRI best address impairments in your AOC? What types of resources or assistance do you need to take advantage of funding under the GLRI?
6. Please provide any other comments or information about your RAP that you feel is important.

These types of opportunities allow the PACs, and the networks of institutions and subnational governments that comprise them, to move from simple information sharing to a more consultative role where learning, or consultation, is exchanged across AOC boundaries. However, it should be noted that higher forms of collaboration are also observed in the AOCs through the PACs themselves. The PACs are networks that allow citizens and interest groups, local governments, subnational governments, national governments, and international governments to come together to craft a specific RAP that should achieve a variety of tangible outcomes. As observed in Figure 1, this process of work helps the institutions and networks work toward a common goal, thereby promoting harmonization of environmental values but not quite full integration of policies since ultimate remediation and restoration efforts will differ in each AOC.

The ultimate outcome of all of these linkages should be the removal of BUIs from each AOC and the eventual delisting of the AOC. However, as noted previously the vast majority of AOCs are still listed as of 2015 with most BUIs still present. However, this should not indicate that the collaborative efforts within each AOCs have failed. Especially with the emergence of the 2010 Great Lakes Restoration Initiative by the U.S. federal government, new funding streams and new levels of collaborations have emerged that should lead to more BUIs removed and more AOCs delisted by 2019 (Great Lakes Restoration Initiative, 2010). In this way, collaborations in the AOCs may become more integrated in the future since specific management plans for each type of BUI have now been identified and integrated into a cohesive plan. Because of these types of integrations, at least three additional AOCs (Sheboygan River, St. Clair River, Muskegon Lake) are expected to become delisted by 2018 (Great Lakes Commission, 2015).

These plans accelerate the strength of collaborations primarily with funding from both public and private sources. As part of the Great Lakes Restoration Initiative, the USEPA provides funding for projects that implement action plans for projects in the Great Lakes that emphasize at least one of five action areas: toxic substances and Areas of Concern; invasive species; nearshore health and nonpoint source pollution; habitat and

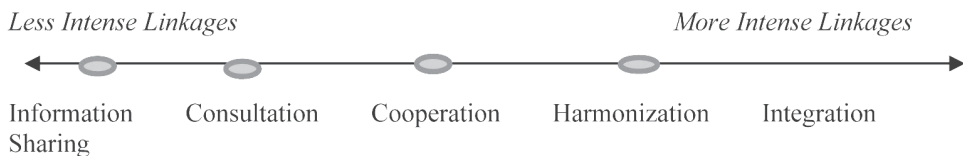


Figure 1. Functional Intensity Spectrum Applied to the Great Lakes AOCs Governance Framework
Source: VanNijnatten 2006

wildlife protection and restoration; and accountability, education, monitoring, evaluation, communication, and partnerships (Great Lakes Restoration Initiative, 2010). Showing the strength of functional intensity across the Great Lakes and the AOCs, those five areas of emphasis emerged from meetings with over 1500 stakeholders who created the Great Lakes Regional Collaboration Strategy. That strategy developed policy recommendations and restoration strategies across eight issue areas: aquatic invasive species, habitat, coastal health, AOCs and sediments, nonpoint source, toxic pollutants, indicators/information, and sustainable development (Great Lakes Restoration Initiative, 2010). Thus, functional intensity across the AOCs is strong and seems to be becoming stronger with additional funding opportunities available from national institutions. And while a majority of AOCs remain listed, collaborative actions are occurring in the AOCs that should eventually lead to more AOCs being delisted.

3.2. *Nature of Compliance Mechanisms*

In order for governance to succeed, compliance has to occur at some level. Compliance can be voluntary at one end and non-voluntary at the other end. Voluntary compliance occurs with no real enforcement necessary from higher level governance actors such as international or national institutions. Rather, enforcement is self-enforced and occurs because of the strength of shared values across the governance network.

Across institutions and networks in the AOCs, compliance is dependent on the reports issued through the RAP process. The 1987 and 2012 amendments to the *U.S./Canada Great Lakes Water Quality Agreement* do establish a formal reporting process for the AOCs, but the mechanisms available to enforce this formal reporting process are weak, especially at the transboundary level between the United States and Canada. The *U.S./Canada Great Lakes Water Quality Agreement* established the IJC as the institution that could govern bi-national environmental concerns between the two countries, but it is primarily an advisory body that analyzes data, publicizes information, and resolves disputes between the two countries. The IJC, while possessing the authority to approve of RAPs designed in the AOCs, does not possess any additional enforcement power. Instead, that power is reserved for the U.S. government and the Canadian government. For the AOCs, these national governments are the institutions with primary enforcement power. The U.S. and Canadian governments have the ability to use each AOC's RAP information to determine when to list an AOC in recovery or when to delist it (i.e. make a determination that beneficial uses have been restored in the area). In the AOCs, this type of action is the primary enforcement mechanism observed. Since their role focuses more on crafting remediation plans through Public Advisory Committees, the other institutions and networks involved at the local level more limited compliance mechanisms to use.

Informal mechanisms for compliance, often incentivized with funding opportunities, are more common in the AOCs. For instance, in 2002 the U.S. Congress passed the Great Lakes Legacy Act in an attempt to revitalize AOC remediation efforts with increased funding opportunities (Rabe & Gaden, 2009). Additionally, in 2010 the U.S. government

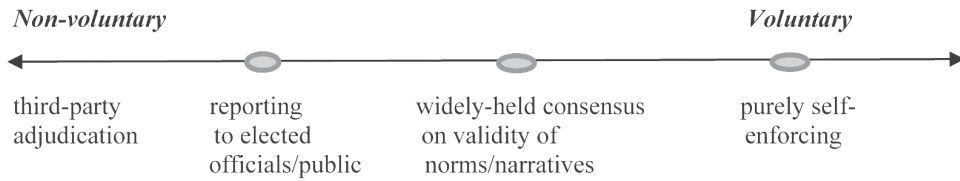


Figure 2. Compliance Spectrum in the Great Lakes AOCs Governance Framework

Source: VanNijnatten, Johns, Friedman and Krantzberg (2015), "Assessing the Adaptive Capacity in the Great Lakes Basin: The Role of Institutions and Networks," *International Journal of Water Governance*, this issue.

announced the Great Lakes Restoration Initiative Action Plan. This plan provided enhanced funding opportunities for a variety of initiatives in the Great Lakes, including potential funding for the AOCs. Short-term objectives in the plan included delisting five areas of concern; removing forty-six BUIs; remediating 94 million cubic yards of contaminated sediments; collecting/preventing release of 45 million pounds of electronic waste and 45 million pills of unwanted medicines; and maintaining an annual five percent decline in polychlorinated biphenyl (PCB) concentrations in lake trout and walleye (Great Lakes Restoration Initiative, 2010). In many ways, the Great Lakes Restoration Initiative Action Plan showcases the nature of compliance in the AOCs. National institutions establish the framework for action, subnational institutions and networks work within that framework to implement a remediation effort, and plans and reports are then shared with everyone involved, including the IJC. Reporting, then, is the primary mechanism for compliance; this is accompanied by various measures and forms of support for particular AOCs, but actual enforcement of these measures is lacking (see Figure 2).

The lack of enforcement in the AOCs can also be assessed by examining progress on BUI removal. For instance, when examining the RAP documents of the thirty AOCs that are primarily the responsibility of the United States, illuminating facts about compliance start to emerge.¹ Of those thirty AOCs, four have been delisted (as of August 2015). When comparing these delisted AOCs to the still-listed AOCs, the weakness of compliance across the AOCs becomes evident.

For instance, the average number of identified BUIs in the delisted AOCs was four, while the average number of identified BUIs in the still-listed AOCs is nearly twice that

¹These thirty AOCs are: the Ashtabula River, Black River, Buffalo River, Clinton River, Cuyahoga River, Deer Lake, Detroit River, Eighteen Mile Creek, Lower Green Bay and Fox River, Grand Calumet River, the Kalamazoo River, Manistique River, Maumee River, Menominee River, Milwaukee Estuary, Muskegon Lake, Niagara River, Oswego River, Presque Isle Bay, River Raisin, Rochester Embayment, Rogue River, Saginaw River and Bay, Sheboygan River, St. Clair River, St. Lawrence River at Massena, St. Louis River, Torch Lake, Waukegan Harbor, and White Lake. Only the American AOCs were analyzed in this specific part of the analysis since the RAP documents were easily available on the USEPA's AOC's website: <http://www.epa.gov/greatlakes/aoc/>. Information on the Canadian AOC's is obviously available, but it is typically more difficult to access for researchers who may want to try to replicate these findings.

Table 2
Comparison of Delisted AOCs to Still-Listed AOCs in the United States

	Average Number of Identified BUIs
Delisted AOCs n = 4	4.00
Current AOCs n = 26	8.12
t-test	2.54**

*** p < 0.000; ** p < 0.05; * p < 0.10

(see Table 2). A t-test comparison between these two groups reveals statistically significant differences in terms of BUIs identified in delisted versus still-listed AOCs.² In essence, the AOCs that have already been delisted had far fewer BUIs to begin with when compared to the other AOCs. This indicates that ultimate compliance within the AOCs is weak. If it was strong, than arguably more AOCs would be delisted and there wouldn't be a statistically significant difference in BUIs between delisted and still listed AOCs. Instead of compliance seemingly being associated with lower number of BUIs, compliance would occur wherever and whenever compliance was needed, no matter how difficult the restoration or remediation effort.

3.3. *Stability and Resilience*

In many ways, the final two indicators are the most difficult to generalize across the AOCs because stability/resilience and legitimacy are highly contextual and interlinked. A PAC in one AOC, for example, can have high legitimacy while a PAC in another AOC can experience diminished legitimacy because of differences in political conditions, socioeconomic factors, and environmental pollution. However, when examined in totality, the AOCs do reveal significant challenge that revolve around these final two indicators.

Stability and Resilience measure the operational status of both institutions and networks in the AOCs. This indicator determines whether institutions and networks sustain themselves long enough in order for policy collaboration and compliance to occur result in successful environmental outcomes. In the AOCs, institutions such as the IJC, the national environmental agencies, and sub-national institutions are stable in a very basic way since they have existed throughout the duration of AOC governance. Funding challenges and the changing nature of what is emphasized in overarching policy debates may dampen the resilience of these institutions, but over time the institutions seem to come back and help to facilitate successful governance outcomes in the AOCs. This was most recently observed

²The t-test for BUIs between the two groups had equal variances (Levene's F Test Value 0.288 with a significance value of 0.596). Additionally, the Cohen's d effect size was 1.42 with an r of 0.581 indicating a large effect size.

in the United States. With renewed funding from the Great Lakes Restoration Initiative in 2010, the USEPA helped to reinvigorate restoration activities in many AOCs. This was preceded by years in which restoration activities in the AOCs in terms of beneficial use restoration was inadequate (Williams, 2015)

While formal institutions such as the IJC, national governments, and subnational governments are stable as institutions, their financial commitment to the AOCs is not ensured. Even newer programs that impact the AOCs like the Great Lakes Legacy Act and the Great Lakes Restoration Initiative Action Plan face constant funding pressures that have led to partial implementation efforts which do not contribute to achieving the broader vision of particular AOCs. Governments and other actors want remediation to occur in the AOCs, but are often unwilling or unable to provide enough funding to ensure that remediation occurs. Without this type of tangible incentive, many AOCs experience positive launches by using their PAC to plan remediation efforts in the RAP process but, over time, as planning makes way for implementation and implementation changes to demonstrating results, the level of PAC activity often starts to decline or progress in remediation efforts slows. This is understandable given the complex remediation efforts that have to occur in many AOCs. Cleaning up the AOCs is extremely difficult and in order for the stability of the PACs to be ensured, additional funding incentives have to be realized in implementation.

To provide for a more objective analysis of stability and resilience across the AOCs, this analysis recorded the time between significant RAP achievements in the thirty AOCs in the United States.³ Using both RAP documentation archived at the USEPA website as well as milestones achieved in each AOC as determined by the USEPA, a comparison between delisted and still-listed AOCs could be made to determine if stability and resilience were associated with more delisting outcomes.⁴ Results are presented in Table 3 and reveal a surprising level of stability and resilience in each AOC. Over the last six years, perhaps as a result of the Great Lakes Restoration Initiative, the AOCs, on average, have been active and achieved some sort of milestone documented by the PAC and archived by the USEPA on its website. Delisted AOCs have more recent levels of activities, with those AOCs having on average achieved a RAP milestone within the last three years. This isn't too surprising given that the Deer Lake, Presque Isle Bay, and White Lake AOCs have all been delisted in the last two years (i.e. activity occurred in 2013 and 2014). In comparison, the currently listed AOCs have, on average, their last recorded milestones approximately six years ago (i.e. in 2009). But note that the differences between these two groups are not statistically significant.⁵ This indicates that much activity is still occurring in the currently listed AOCs. BUIs are being removed, monitoring is occurring, new plans

³These are the same AOCs used in the earlier part of this paper (see Table 1).

⁴Materials originated from the USEPA's AOC archive at: <http://www.epa.gov/greatlakes/aoc/>. Milestones were broadly construed and could include: restoration efforts, educational outreach, monitoring activities, and planning.

⁵The t-test for RAP milestones between the two groups had equal variances (Levene's F Test Value 0.043 with a significance value of 0.837).

Table 3
Comparison of Activity in Delisted AOCs to Still-Listed AOCs in the United States

	Average Number of Years Since Last RAP Milestone (from 2015)
Delisted AOCs n = 4	3.25
Current AOCs n = 26	5.96
t-test	1.61

*** $p < 0.000$; ** $p < 0.05$; * $p < 0.10$

are being drafted, and additional educational outreach efforts are being scheduled. After two decades of work and numerous funding challenges, the fact that these AOCs are still active is a testament to their stability and resilience.

Stability and resilience occur due to the PACs. As detailed in the AOC overview section of this paper, the PACs are comprised of local stakeholders of citizens, advocacy groups, governments, businesses, and other interested parties. The PAC is the entity ultimately responsible for the success (or failure) of the RAP process in the AOC. They help identify the environmental values of the AOC that then translate into identified beneficial uses and BUIs. They also help design the RAP implementation and planning documents.

Decentralized environmental policies, such as the AOCs, can work very effectively in planning efforts and garnering stakeholder support. However, their weakness is in the implementation or action phase. Given the severe environmental problems in some AOCs, additional funding has to be provided in order for AOCs to remain active. In order for stability and resilience to occur, national and sub-national institutions have to provide funding for implementation. Without that, the PACs in the AOCs can start to fade.

3.4. Legitimacy

Legitimacy is an important indicator for transboundary governance since it measures whether the processes, institutions, and networks in any governance arrangement are viewed as genuine. When legitimacy is low, the processes of governance can start to deteriorate. For this reason, as governance arrangements become more numerous in all types of policy domains, renewed attention is focused on how performance measurements made transparent to all citizens and stakeholders can ensure better accountability and thus higher levels of legitimacy.

Institutions and networks within the AOCs generally view the governance process as legitimate. This is especially evident in the RAP process. All of the AOCs have made some type of progress on their RAPs either through restoration activities, monitoring, or planning. Citizens in at least one AOC initially viewed the entire process as illegitimate and that view eventually led to significant implementation problems (MacKenzie, 1996). However, this seemed to be caused by the specific actions of the state government and policy elites toward local governments and citizens. In other AOCs, the process was embraced by stakeholders as an opportunity for revitalization (New York Department of

Environmental Conservation, 2006). Thus, while it is difficult to make general observations on this indicator across the AOCs, at least theoretically, the AOCs engender a process that should lead to high legitimacy across all of the stakeholders.

The reason for this high level of legitimacy may rest with how the AOCs solicit stakeholder input. By involving subnational governments and networks of citizens and interest groups in the RAP process and the formation of PACs, the AOCs allow for stakeholders to identify with the process. The stakeholder's ideas can become a part of the RAP that should help improve the AOC. Thus, rather than having specific regulations crafted by national and international institutions thrust upon citizens of the AOC, the RAP process allows for a specific plan to emerge from the bottom-up. This bottom-up approach ideally reflects the concerns, ideas, and issues of the people who will be most affected by the RAP plan. Thus, the plan, and the process, has a high-degree of legitimacy.

4. Transboundary Governance Capacity in the Great Lakes Areas of Concern

This study presents an overview of the basic processes of transboundary governance in the Great Lakes AOCs. With an emphasis on decentralization and the activation of subnational policy actors (e.g. states and provinces, local governments, citizens, businesses, and other advocacy groups), transboundary governance in the AOCs has significant strengths in terms of functional intensity and legitimacy. This design helped to contribute to numerous policy successes across all of the AOCs in terms of the identification of BUIs and the restoration of BUIs, and full delisting in seven AOCs (as of August 2015). However, governance gaps in terms of stability and resilience and compliance are also present in the transboundary governance architecture of the AOCs. While institutions such as the IJC, the national governments, and states/provinces play important roles in compliance-based activities and can even rise to the level of enforcement for certain issues, the overarching trend in the AOCs is of a weaker type of compliance that is ultimately dependent on each AOCs ability to restore beneficial uses. In AOCs with numerous BUIs or more intense environmental challenges, this governance framework often results in a lack of substantial restoration action over time (even though PACs and advisory groups may continue to meet, monitor BUIs, and publicize information to stakeholders). Seemingly only with the activation of additional funding from national institutions does this change.

The results from this analysis also indicate that the institutional/network indicators explored in this special issue can be used to identify important areas for analysis of transboundary governance associated with the AOCs. In the AOCs, weaknesses in transboundary governance occur in terms of compliance and stability and resilience, yet they exhibit clear strengths in terms of their potential for functional intensity and legitimacy. These indicators show the challenges encountered and successes achieved by the decentralized governance process of the AOCs, and also confirm earlier research studies on the governance challenges of managing the AOCs in such a decentralized way (Greitens, Strachan, & Welton, 2013; Hartig & Zarull, 1992; Sproule-Jones, 2002).

Overall, the analysis indicates that in order for the AOCs to keep progressing, transboundary governance needs more centralized action in terms of enforcement and funding. Without these types of centralized actions, the AOCs can lapse into static, rather than dynamic, actions. Arguably, this happened in the United States where many of the AOCs experienced slow progress on RAP implementation and BUI restoration until the introduction of new funding streams with the Great Lakes Restoration Initiative of 2010. As a result of those actions, many more AOCs now stand on the cusp of being delisted or are on the path to delisting by 2019 (Great Lakes Commission, 2015). Yet, without continued actions by national governments in terms of funding and support, this path will ultimately not be achieved by most AOCs.

References

- Agranoff, R. (2007). *Managing within networks: Adding value to public organizations*. Washington, DC: Georgetown University Press.
- Agranoff, R., & McGuire, M. (2003). *Collaborative public management: New strategies for local governments*. Washington, DC: Georgetown University Press.
- Botts, L., & Muldoon, P. (2005). *Evolution of the Great Lakes water quality agreement* (1st ed.). East Lansing, MI: Michigan State University Press.
- Crane, T. R. (2012). Great Lakes—Great responsibilities: History and lessons in participatory governance. In V.I. Grover, & G. Krantzberg (Eds.), *Great Lakes: Lessons in participatory governance* (pp. 13–43). Boca Raton, FL: CRC Press/Taylor & Francis Group.
- Donahue, M. J. (1987). *Institutional arrangements for Great Lakes management: Past practices and future alternatives*. Michigan Sea Grant College Program, USA.
- Great Lakes Commission. (2011). *Celebrating progress; confronting challenges; moving forward: Survey responses on remedial action plan activities in the U.S. areas of concern*. Retrieved from <http://www.glc.org/rap/aocconference.html>
- Great Lakes Commission. (2015). Cleaning up the areas of concern. *Great Lakes Advisor*, July 2015.
- Great Lakes Restoration Initiative. (2010). *FY2010-FY2014 Great Lakes initiative action plan*. Retrieved from http://greatlakesrestoration.us/pdfs/glri_actionplan.pdf
- Great Lakes Water Quality Board. (1991). *International Joint Commission review of remedial action plans for the Great Lakes areas of concern*. Windsor, ON: International Joint Commission.
- Greitens, T. J., Strachan, J. C., & Welton, C. S. (2013). The importance of multilevel governance participation in the great lakes areas of concern. In D. Cepiku, D. K. Jesuit, & I. Roberge (Eds.), *Making multilevel public management work: Stories of success and failure from Europe and North America* (pp. 159–182). Boca Raton, FL: CRC Press/Taylor & Francis Group.
- Hartig, J. H., & Zarull, M. A. (1992). *Under RAPs: Toward grassroots ecological democracy in the Great Lakes Basin*. Ann Arbor, MI: University of Michigan Press.
- Hartman, W. L. (1973). *Effects of exploitation, environmental changes, and new species on the fish habitats and resources of Lake Erie* (Technical Report No 22). . Ann Arbor, MI: Great Lakes Fisher Commission.
- International Joint Commission. (1987). *Great lakes water quality agreement of 1978; agreement, with the annexes and terms of reference, between the United States and Canada signed at Ottawa November 22, 1978; and phosphorous load reduction supplement signed October 16, 1983; as amended by protocol signed November 18, 1987*. Ottawa, ON and Washington, DC: Author.
- International Joint Commission. (2006). *13th biennial report on Great Lakes water quality*. Washington, DC: Author.
- International Joint Commission. (2012). *Great Lakes water quality agreement of 1978; Agreement, with the annexes and terms of reference, between the United States and Canada signed at Ottawa November 22,*

- 1978; and phosphorous load reduction supplement signed October 16, 1983; as amended by protocol signed November 18, 1987; amended by protocol signed September 7, 2012. Ottawa, ON and Washington, DC: Author.
- Kettl, D. F. (1997). The global revolution in public management: Driving themes, missing links. *Journal of Policy Analysis and Management*, 16(3), 446–462.
- Krantzberg, G. (2012a). The remedial action plan program, historical and contemporary overview. In V. I Grover, & G. Krantzberg (Eds.), *Great Lakes: Lessons in participatory governance* (pp. 245–256). Boca Raton, FL: CRC Press/Taylor & Francis Group.
- Krantzberg, G. (2012b). First off the list: The Collingwood Harbour story. In V. I Grover, & G. Krantzberg (Eds.), *Great Lakes: Lessons in participatory governance* (pp. 257–267). Boca Raton, FL: CRC Press/Taylor & Francis Group.
- Landre, B. K., & Knuth, B. A. (1993). The role of agency goals and local context in Great Lakes water resources public involvement programs. *Environmental Management*, 17(2), 153–165.
- MacKenzie, S. H. (1996). *Integrated resource planning and management: The ecosystem approach in the Great Lakes Basin*. Washington, DC: Island Press.
- Mills, E. L., Leach, J. H., Carlton, J. T., & Secor, C. L. (1993). Exotic species in the Great Lakes: A history of biotic crises and anthropogenic introductions. *Journal of Great Lakes Research*, 19(1), 1–54.
- Newig, J., & Fritsch, O. (2009). Environmental governance: Participatory, multi-level and effective? *Environmental Policy and Governance*, 19(3), 197–214.
- New York State Department of Environmental Conservation, Division of Water.. (2006). *Oswego river remedial action plan stage 3-delisting*. Albany, NY: Author
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. New York, NY: Cambridge University Press.
- Ostrom, E., Gardner, R., & Walker, J. (1994). Cooperation and social capital. In E. Ostrom, E. Gardner, & J. Walker (Eds.), *Rules, games, and common-pool resources* (pp. 319–329). Ann Arbor, MI: University of Michigan Press.
- Rabe, B. G., & Gaden, M. (2009). Sustainability in a regional context: the case of the Great Lakes Basin. In D. A. Mazmanian, & M. E. Kraft (Eds.), *Toward sustainable communities: Transition and transformations in environmental policy* (2nd ed., pp. 289–314). Cambridge, MA: MIT Press.
- Slocombe, D. S. (1993). Environmental planning, ecosystem science, and ecosystem approaches for integrating environment and development. *Environmental Management*, 17, 289–303.
- Sproule-Jones, M. (2002). *The restoration of the Great Lakes*. Vancouver, British Columbia, Canada: University of British Columbia Press.
- Teisman, G., Van Buuren, A., Edelenbos, J., & Warner, J. (2013). Water governance: Facing the limits of managerialism, determinism, water-centricity, and technocratic problem-solving. *International Journal of Water Governance*, 1, 1–11.
- U.S. Environmental Protection Agency. (2001). *Restoring United States areas of concern: Delisting principles and guidelines*. Washington, DC: Author.
- VanNijnatten, D. L. (2006). Towards cross-border environmental policy spaces in North America: Province-state linkages on the Canada-U.S. Border. *AmeriQuests*, 3(1), 1–19.
- VanNijnatten, D. L., Johns, C., Friedman, K., & Krantzberg, G. (in press). Assessing the adaptive capacity in the Great Lakes Basin: The role of institutions and networks. *International Journal of Water Governance*.
- Weber, E., & Khademian, A. (2008a). Wicked problems, knowledge challenges, and collaborative capacity builders in network settings. *Public Administration Review* 68(2), 334–349.
- Weber, E., & Khademian, A. (2008b). Managing collaborative processes: Common practices, uncommon circumstances. *Administration & Society* 40(5), 431–464.
- Williams, K. C. (2015). *Relationships, knowledge, and resilience: A comparative study of stakeholder participation in Great Lakes Areas of Concern* (Theses and dissertations, paper 936). Milwaukee, WI: University of Wisconsin-Milwaukee.