

# Assessing Adaptive Transboundary Governance Capacity in the Great Lakes Basin: The Role of Institutions and Networks

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## 1. Introduction

The Great Lakes St. Lawrence River Basin is the largest freshwater basin on earth, containing roughly 20 percent of the world's surface freshwater. The Great Lakes is a highly complex ecosystem, composed of interrelated open water, shoreline and upper watershed systems, which support a high level of biological diversity. Collectively, the five lakes and their draining river systems span two provinces, eight states, more than forty 'First Nations/Tribes' and hundreds of municipalities. The Basin has played a major role in the economic development of the United States and Canada. It continues to provide water for domestic consumption, industry, transportation, power, recreation, and a host of other uses. However, the Great Lakes Basin is under siege. Invasive species, climate change, economic decline, urban sprawl, and chemical and biological contaminants threaten the health and vitality of this ecosystem. Despite numerous initiatives to remedy these varying threats, the environmental sustainability of the basin remains an important public policy and transboundary governance challenge.

The problems confronting the Great Lakes Basin are not unique. Some 40% of the world's population lives in transboundary river and lake basins (United Nations Task Force on Transboundary Waters, 2008, p. 2). Neighbouring countries must cope on an ongoing basis with the economic, social and environmental interdependencies created by intense hydrological connections. This task is made more difficult as shared water bodies

are impacted by similar trends worldwide, including population growth, changes in consumption and production patterns, global economic cycles, and climate variability. From the Pecos River Basin in southwestern U.S.-northern Mexico to the Murray-Darling Basin in Australia and from the Rhine River Basin in Europe to the Niger in Africa, states are attempting to manage these trends both through national water policy regimes and across borders through transboundary institutions. Indeed, the primary challenge, according to every major international body studying water, is one of “governance”; as the Organization for Economic Cooperation and Development [OECD] (2011, p. 17) has stated: “the current water ‘crisis’ is not a crisis of scarcity but a crisis of mismanagement, with strong public governance features.” Similarly, Biswas and Tortajada (2010, p. 131) argue that it is not the “physical scarcity of water” that is the major problem, but rather “the past and current poor to very poor governance practices . . . used in nearly all developing and developed countries.” The proliferation of academic and policy work on water governance has been remarkable, highlighting the continuing search for effective institutions and processes for creating and maintaining sustainable water regimes.<sup>1</sup>

Transboundary governance in the Great Lakes began over 100 years ago with the ratification of the 1909 Boundary Waters Treaty (BWT) and the establishment of the International Joint Commission (IJC). In response to new scientific information about serious pollution impacts in the Basin from industrialization and urbanization, the 1972 Great Lakes Water Quality Agreement (GLWQA) put in place additional transboundary mechanisms to address water pollution. Renewed in 1978, 1987 and 2012, this “non-binding, good-faith agreement between the two levels of government” resulted in a focus on 43 Areas of Concern (AOC) and the implementation of Remedial Action Plans to clean up and delist polluted waters. Collaborative infrastructure was established to control chemical inputs and nutrient enrichment, to foster research and monitoring, and most recently, to understand and mitigate impacts of invasive species. Further, under the IJC’s umbrella, a panoply of boards, commissions and task forces have been put in place to monitor and study shared watersheds, to provide scientific advice to the governments on particular problems, and to engage in coordinated management efforts. Other Basin-wide mechanisms, such as the Great Lakes Fisheries Commission, were created to manage particular shared resources.

These transboundary institutions were touted early on, by practitioners and analysts, as a governance model and successful policy outcomes were attributed to their activities—including phosphorous reductions in the lower lakes, the return of species on the brink of extinction across the Basin and lower levels of some toxic chemicals (Botts & Muldoon, 2005, p. 137). However, the late 1990s witnessed a decline in efforts and progress stalled (Bails et al., 2005; Botts & Muldoon, 2005; Environment Canada and U.S. Environmental Protection Agency, 2014; Sproule-Jones, 2002). While the regime regulating water “takings” and water levels provides a relatively clear set of procedures for shaping the behaviour of actors around the Basin, protecting the *quality* of the water has been a tougher nut to crack.

<sup>1</sup> For an exhaustive review of the water governance literature, please see Peter P. Molinga and Daphe Gondhaleker, “Theorizing Structured Diversity: An approach to comparative research on water resources management” ICCWaDS Working Paper No.1. Available at: <http://www.soas.ac.uk/water/publications/iccwads/file76157.pdf>

For example, after three decades, only five AOCs have been de-listed (Botts & Muldoon, 2005; IJC, 2013; Johns, 2009, 2010; Sproule-Jones, 2002). More generally, as Bails et al. (2005) argue, the lakes appear to be at an ecological tipping point, with new chemicals posing novel difficulties, continued species invasions and accelerating climate change. Despite the many cooperative mechanisms already in place to address water quality and quantity issues in the Basin, the governance framework in the Great Lakes has been only modestly successful, as noted by international observers (see, for example, Verweij, 2000).

Clearly, the manner in which Great Lakes governance challenges are diagnosed and addressed is of interest to those seeking to protect the sustainability of transboundary waters in other regions in the face of similar challenges. What is needed, we believe, is a deeper understanding of the conditions which promote effective transboundary governance, in order that we might identify the appropriate means to tackle these “wicked problems” and fill capacity gaps in current governance frameworks. While we acknowledge that there are a full range of attributes associated with measuring what we term “Transboundary Governance Capacity” (Friedman, Johns, Krantzberg, & VanNijnatten, 2013; Johns, 2013)—including high levels of leadership; necessary and sufficient participation; shared discourse and mutual understanding; sustainable resources; and a strong institutional basis—we focus in this Special Issue on the final attribute. We argue that the presence of a strong institutional basis, while not necessarily *more* important than the other attributes, is foundational in terms of Transboundary Governance Capacity (TGC), as institutions act to channel policy discourse, structure policy choices and resources, and provide opportunities or constraints for policy actors. In this special issue, we seek to examine the roles of both formal and informal institutions as sets of rules and practices influencing the behaviour of actors in Basin-wide governance, and networks that link agency officials, civil society and experts through relational channels of information exchange and discussion, in a transboundary context. Our contributing authors all apply a set of specific indicators (with appropriate measures) that are designed to assess the role of institutions and networks to support TGC; these indicators include the nature of compliance mechanisms, functional intensity, stability and resilience as well as degree of legitimacy.

We adopt a comparative, multi-level case study approach to investigating institutions and TGC. The Great Lakes Basin serves as the core reference, providing the basis for comparative investigations of TGC proceeding step-wise from the intra-Basin, to the inter-Basin and, finally, to the international level. The Great Lakes Basin, with its well-articulated transboundary governance architecture, features both formal and network elements. The extensive experience in the Basin with all aspects of water governance (quality, quantity, invasives, etc) and also its place in the water governance literature at the centre of “leader vs. laggard” debates (see, for example, Bulkley, Nyambe, & Kirchhoff, 2009; Newig & Fritsch, 2009) make it a valuable grounding for our comparisons. In addition, the Great Lakes case, given the high levels of policy and administrative capacity of jurisdictions around the Basin (relative to the global picture), provides insights into the “range of the possible” in terms of shared water governance.

We are interested here in identifying TGC gaps in the case of the Great Lakes Basin; if the governance architecture for some issues has been more successful than others, what

institutional factors have contributed to this success? By then placing the Great Lakes in an inter-Basin comparative context, we seek to test the application and interaction of our institutional/network indicators across different water basins (at other places along the Canada-U.S. border, on the U.S.-Mexico border and in Australia) and to bring to the fore general lessons about indicators that contribute to transboundary governance success and may run across multiple levels of analysis. Our goal with this Special Issue is to promote a multi-faceted understanding of the way that institutions and networks in water basins contribute to effective transboundary governance and, ultimately, the sustainability of these highly-valued ecosystems.

## **2. Understanding transboundary governance capacity (TGC)**

Biswas and Tortajada (2010, p. 130) have noted that, “water governance has to change more in the next 20 years than it has in the past 2000 years if societal needs for water-related activities, including environmental requirements, are to be met successfully. . .” But what does governance refer to here, and how do we go about changing (i.e., strengthening) it, particularly in a transboundary context and especially for the purpose of achieving sustainable water resources? In this section, we tease out the main messages of relevant studies in the literatures on governance (especially water governance), international relations and comparative politics, and then combine these with insights from the public policy literature, in order to flesh out our concept of Transboundary Governance Capacity. We then move to a more specific focus on institutions and networks.

“Governance” might best be understood as the ability to wield and coordinate resources from public and private actors, generally in a more informal manner than “government” and with the participation of a wider range of actors. Governance often entails a shift from formal, top-down modes of interaction to more informal, nonhierarchical arrangements, thus creating new “sites” of interaction for actors from the public and private sectors as well as civil society (Healy, VanNijnatten, & López Vallejo, 2014). Governance thus reflects a form of political steering that is not necessarily dependent on formal-legal regulation or other interventions by the nation-state; instead, it can be more participatory and collaborative, involving a wider range of interests. The “new governance” literature does not derive from a single legal or socio-legal theory and, as Holley and Cunningham (2011) summarize, other terms used to describe the new governance are “experimentalism”, “modular regulation”, “collaborative governance”, “network governance”, and “regional collaboration”. The significant commonalities include a focus on collaboration, participation, deliberative styles of decision-making and flexibility.

Governance is also profoundly boundary-spanning in nature, connecting interest communities, sectors, issues, levels and scales (Bressers & Lulofs, 2010). At the core of the shift from “government” to “governance” has been a recognition that the focus must be on addressing public policy problems, rather than the authoritative allocation of resources itself; indeed, Görg (2007, p. 954) argues that the study of governance has become synonymous with problem-oriented, interdisciplinary research. It follows, then, that all actors able to contribute to the problem-solving exercise should be at the table, whether they are government

officials, members of the private sector or civil society representatives (Jessop, 2002). While the governance literature acknowledges the continuing key role of governments in this exercise (Görg, 2007; Jessop, 2002; Raustiala, 2002), the problem-driven nature of associated processes opens the doors of decision-making considerably. In the water management literature, there is broad agreement that effective water governance requires participatory, collaborative and decentralized processes (Biswas & Tortajada, 2010, p. 132). The benefits of inclusiveness and empowerment of place-based stakeholders in watershed planning, decision-making, and implementation are oft-touted, and these echo the arguments made for decentralized decision-making more generally (Cohen & Davidson, 2011).

Further, within the governmental sphere itself, the conventional understanding of public decision authority as being neatly divisible amongst levels of government—national, subnational or local—is recognized as no longer being an accurate portrayal of the varying layers of agents within governance or the cross-disciplinary nature of current policy problems (Eilstrup-Sangiovanni, 2006, p. 19). The multi-level nature of governance “directs attention to increasingly complex vertical and horizontal relations between actors” (Bache, 2008, p. 38). Brenner (2004) highlights the simultaneous phenomena of “up-scaling” and “down-scaling”; as he explains, “[t]he most striking feature of the current situation is not so much the existence of decision-making processes at the various spatial levels as such; rather, it is the increased significance which is being attributed to the levels below and above the national levels, and hence, the shifts occurring in the relationships of the levels to one another.”

Moreover, as Slaughter (2004) has pointed out, since there are policy problems—most prominently, environmental degradation—that individual governments (at whatever level) cannot by themselves fix due to spillover effects, there is a need for governance mechanisms that can also operate across borders. Yet, as Friedman and Foster (2011) emphasize, governance across an international boundary is difficult, as deliberating on and effectively managing issues requires navigating and finding common purpose within two or more political, legal, social, cultural, and fiscal regimes. Collaborating across international boundaries means that every process, policy, decision, and action must plot a course through at least two national, subnational, or local systems, all with different priorities, resources, laws, and policies (Friedman & Foster, 2011, p. 6). To make matters even more complex, the picture that we draw of such collaboration must include the possibility of diagonal relationships across borders (e.g., binational to subnational or subnational to trilateral) (Osofsky, 2008).

But, what kind of institutions can function effectively in this context, to achieve governance which is collaborative and inclusive, flexible and boundary-spanning? There are voluminous literatures in international relations, comparative politics and public policy which investigate the role of institutions in governance processes and outcomes. Although the term is defined in a great variety of ways,<sup>2</sup> many analysts in the international relations literature adopt Knight’s straightforward definition of “institutions” as rules (or sets of rules) that structure social interaction by shaping and constraining actors’ behavior (Knight, 1992). The public policy literature views institutions in a similar manner, with an emphasis

<sup>2</sup> For a thorough overview of how institutions are defined in the international relations literature, see Duffield 2007.

on how they influence the behaviour of actors within and beyond them (see: Peters, 1999, p. 165). Both the international relations and public policy literatures differentiate between institutions, which are formal entities, vested with public authority and possessing a “legal personality”, and more informal entities which exercise public authority outside of formal-legal structures. Another way of understanding this distinction, according to Helmke and Levitsky (2003, pp. 7–8), is to regard formal institutions as “openly codified, in the sense that they are established and communicated through channels that are widely accepted as official” while informal institutions are “socially shared rules, usually unwritten, that are created, communicated, and enforced outside of officially sanctioned channels”.

Within states, the formal institutional framework includes state bodies such as legislatures, the courts, and bureaucracies, as well as state-enforced rules derived from constitutions, laws and regulations. At the international level, the formal institutional framework rests on such entities as inter-state agreements or treaties (United States-Canada Air Quality Agreement), courts or tribunals (International Court of Justice) and international commissions or organizations (e.g., United Nations Framework Convention on Climate Change and the Council for Environmental Cooperation) as well as customary international law (Law of the Sea). This framework provides a basic starting point for interactions among actors; for example, the Boundary Waters Treaty, the Great Lakes Water Quality Agreement and the International Joint Commission together set out the responsibilities of governments along the shared border, and provide rules of conduct for their deliberations.

However, observers of international relations, in a manner similar to the governance and public policy literatures, place increasing analytical emphasis on relational channels of cooperation, rather than rules embodied in institutions. Slaughter (1997, 2004) has argued for the increasing importance of “transgovernmental networking”, which occurs among “separate, functionally distinct parts” of the state, including courts, regulatory agencies, executives, and even legislatures” (Slaughter, 1997, 2004). These networks are operationalized through peer-to-peer, horizontal relations between discrete, specialized agencies or departments to which transnational governance activities have been devolved in a particular regulatory area. They do not involve any formal delegation of authority to a supranational entity, and they tend not to have a distinct legal personality nor any permanent supporting infrastructure. The network itself has no ability to bind members; rather, cooperative results are arrived at through deliberation and persuasion (Kirton & Guebert, 2010). For Slaughter and others, transgovernmental networks offer much promise for international governance outside of formal, legalized institutions, as they offer a means to harmonize standards, share information, and cooperate on enforcement, creating flexible solutions to global governance problems. There is also room here for cooperation with non-state actors.

It is evident that the kind of collaborative governance discussed above—which includes actors inside and outside government, and is carried out through institutions and networks that are often less formal, more flexible and also boundary-spanning—will be heavily reliant on shared discourse and the development of mutual understanding. In the absence of clear lines of authority or hierarchical processes, leadership becomes more difficult to produce and sustain, and progress occurs primarily through peer-to-peer

interactions (VanNijnatten & Craik, 2013). As Ostrom (2009) argues, trust and reciprocity (the belief that others are trustworthy reciprocators who will bear their share of the costs of overcoming a dilemma) among cooperating groups has been shown to be an important feature of successful collective action. She argues that there is a set of implicit relationships among individuals that can foster collective will and contribute to the successful resolution of shared problems, particularly regarding the protection of environmental resources. Friedman and Foster (2011, p. 7), in their examination of what it takes to start and sustain a collaborative governance venture, note the importance of having a clear purpose that can contribute toward shared political will on the part of participants.

Significantly, in the Great Lakes Basin there has been a proliferation of institutions and networks at all levels to manage shared resources; they represent a wide array of both formal and informal mechanisms, and many would be characterized as collaborative and inclusive. Yet, close observers of the Great Lakes have pointed to the decline of “capacity” in the Great Lakes (Botts & Muldoon, 2005; Johns, 2009; Krantzberg, 2008). Here, the focus is on the ability to “get things done”. Capacity in a transboundary governance context might be regarded as having multiple dimensions: state capacity; institutional capacity; cooperative capacity; regulatory capacity; implementation capacity; agency capacity; network capacity and boundary-spanning capacity. Until the early 2000s, the available literature on policy capacity focused primarily on the domestic context, often within a given level of government. Only more recently have analysts begun to stretch the policy capacity concept such that it can be applied across borders.

In this vein, much of the literature has focused quite narrowly on domestic departments and agencies as being at the heart of policy capacity; in fact, early literature on policy capacity argued that, “[a]ny review of policy capacity must start with departments because they are the principle focus of policy work in government” (Canadian Centre for Management Development, 1996). Here, analyses have concentrated on “policy analytical capacity”, or the ability to acquire and utilize knowledge such that high quality policy decisions result (Howlett, 2007, 2009; Tiernan, 2007); and “policy management”, or the skills necessary to manage large, complex organizations in order to make and implement policy (Peters, 1996). Both of these place a high premium on personnel and process. However, in 2005, Painter and Pierre emphasized the complexities of a contemporary multi-layered, multi-scaled, multi-actor world of state-societal interaction and extended the conceptualization of policy capacity in the comparative public policy literature. They defined policy capacity—in a manner entirely consistent with definitions of “governance”—as “the ability to marshal the necessary resources to make intelligent collective choices about and set strategic directions for the allocation of scarce resources to public ends . . .” (Painter & Pierre, 2005, p. 2).

Indeed, there has been growing interest in conceptualizing policy capacity *across* jurisdictions. A critical contribution in this regard is the concept of Intergovernmental Policy Capacity (IPC), formulated by Inwood, Johns, and O’Reilly (2011), with the aim of capturing the ability of national and subnational governments in a federal system to work together to address public policy problems. Based on interviews with 140 intergovernmental officials across federal, provincial and territorial jurisdictions in Canada in four policy

areas (environment, health, trade and finance), they identify a set of political and administrative factors that are key determinants of IPC across jurisdictions and across policy areas including: institutional indicators, resource indicators (budgets, personnel and information) and several indicators related to individuals and relationships such as leadership, turnover and trust (Inwood et al., 2011). This model may be particularly useful if one is trying to compare Transboundary Governance Capacity across several policy/issue areas in the Great Lakes region.

The literatures on governance (and water governance), international relations, and policy capacity, then, bring us some distance towards identifying what attributes are necessary for effective TGC, in the Great Lakes and, indeed, any transboundary water basin. Here, “attribute” refers to a property or characteristic used to describe the object of study, in this case, optimal levels of governance capacity in the transboundary water basin. The governance literature encourages us to think about problem-solving and decision-making as an ongoing process which is **inclusive of actors inside and outside government**, in such a way that participation is sufficient and appropriate to the issue under discussion, and is also collaborative in nature. Such a conception of governance also places a high premium on **shared discourse and mutual understanding**, although clearly a steering mechanism is necessary. **Leadership** is required in order to manufacture and maintain political will for decision-making and implementation (United Nations Task Force on Transboundary Waters, 2008, p. 3). Meanwhile, the transgovernmentalism and public policy literatures remind us that governments and their agencies still matter very much, as they provide **sustainable resources** for governance, i.e., authority and inputs in the form of personnel and budgets. The policy capacity literature provides more detail on the kind of resources that are required for effective decision-making and implementation, with more recent contributions reflecting on how these requirements might be adapted to the transboundary context.

Finally, as the international relations and comparative politics literatures show us, such governance increasingly takes place within institutions and networks that tend to be less formal and more flexible, yet they operate alongside and within existing formal-legal frameworks (constitutional constraints, federalism) and state sovereignty. For example, domestic legal frameworks that provide environmental agencies with some degree of autonomy from political leaders are better able to engage in independent problem-solving across borders; by contrast, where domestic frameworks allow agencies little discretion, officials are more tightly bound by executive and legislative masters at home and they will be more constrained in their ability to engage in more ambitious transboundary cooperation (Craik & VanNijnatten, 2016). Farrell and Hèritier (2003, p. 580) refer to this relationship between more informal, flexible mechanisms such as transgovernmental networks and formal institutions as “recursive” in nature.

In summary, we identify a matrix of five major attributes of TGC (see Figure 1): high levels of leadership; necessary and sufficient participation; shared discourse and mutual understanding; sustainable resources; and strong institutional basis. For each of



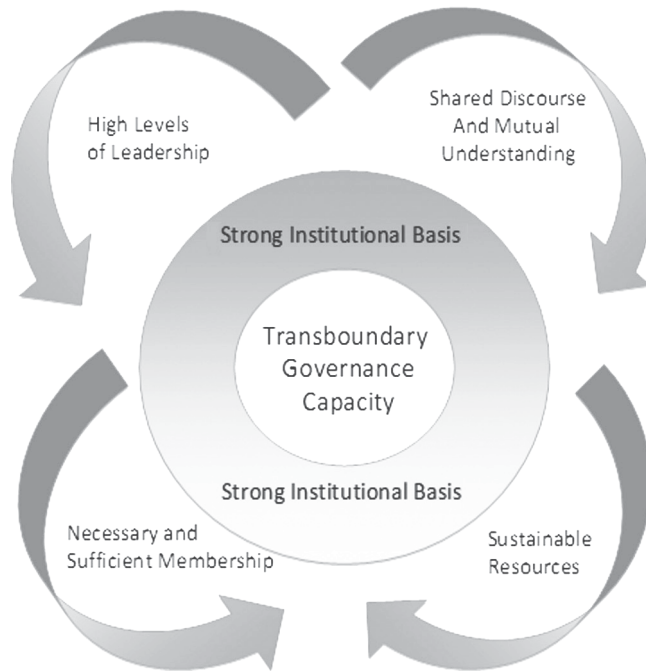


Figure 1. Matrix of Attributes for Transboundary Governance Capacity

these attributes, one can delineate indicators (i.e., something observed which shows the presence or state of an attribute), as well as proposed measures (i.e., showing the size or extent of an indicator, generally by comparison with a standard). Certainly, an examination of these indicators cannot be conducted independent of an understanding of the broader socio-political or legal context in a particular case, as well as across cases.

We note here that our matrix of attributes is animated by a somewhat different set of assumptions from Ostrom's now famous "design principles" for the management of common pool resources (Ostrom, 1990), which has since been refined by Cox, Arnold, and Villamayor Tomás (2010) after extensive empirical testing. At its base, Ostrom's design principles were originally intended for application at the micro (community) level, while our matrix is intended for the regional/basin level. Indeed, Cox et al. (2010) have cast doubt on the utility of Ostrom's model at higher scales (although she originally argued for management systems which can be organized at multiple levels of nested enterprises). The Asia Water Governance Index, launched by Ostrom herself in 2009, reflects a focus on "within-state" provisions of policy, legal and accountability frameworks, rather than the nature and scope of transboundary management mechanisms. Other studies focused on Asia have adopted a similar approach (Araral & Yu, 2013; Saleth & Dinar, 2005). The OECD's Water Multi-level Governance Framework (OECD, 2011) provides a closer

approximation of our approach, highlighting as it does the “mapping” of interactions through a focus on governance roles, responsibilities and interdependencies, as well as identifying challenges to integration, collaboration and capacity-building—all within the contours of governance arenas which straddle formal jurisdictional divisions.

The basic hypothesis underpinning our model is that Great Lakes policy regimes, which exhibit high levels of leadership, necessary and sufficient participation, shared discourse and mutual understanding, sustainable resources and a strong institutional basis (which may include both institutions and networks) are more likely to exhibit high transboundary governance capacity. In the next section, we argue that the latter attribute in particular—strong institutional basis—is foundational.

### 3. Examining the critical role of institutions in transboundary governance capacity

We do not claim here that institutions are *more* important than other indicators; rather, we make several contentions about the critical role of institutions in *shaping* the nature and extent of TGC (see Figure 2). One might regard the relationship between the attribute of strong institutional basis and the other attributes much like Figure 1 turned on its side to reveal an institutional “vessel” which contains the other four attributes.

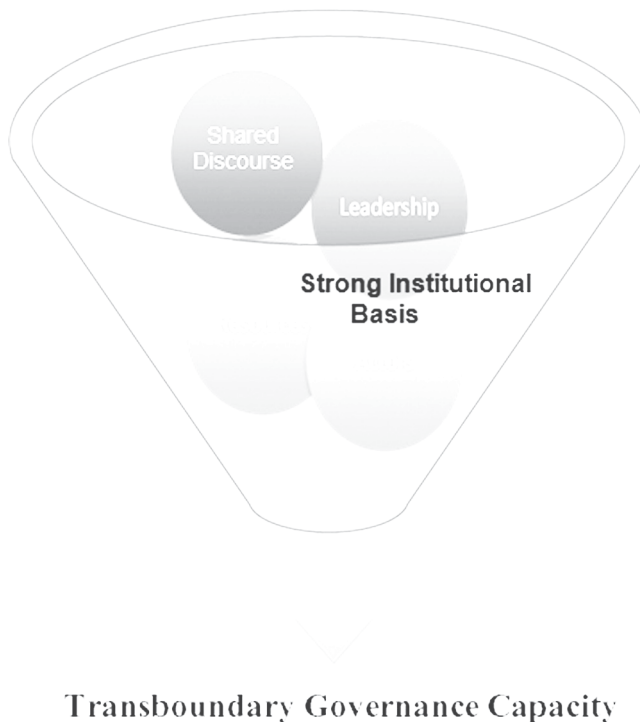


Figure 2. The role of institutions in Transboundary Governance Capacity (TGC)

Institutions represent the natural place to start, analytically speaking, when examining governance potential. Certainly, those who have studied the design of common pool resource management (e.g., Blomquist, Heikkila, & Schlager, 2004; Ostrom, 1990, 2003), transboundary environmental governance (e.g., Biermann, Pattberg, & Zelli, 2010; Keohane & Victor, 2011) and water governance (e.g., Global Water Partnership; OECD, 2011) are focused on the potential of institutional arrangements to realize those qualities considered important in terms of effective environmental governance. In addition, the socio-ecological systems literature demonstrates that institutions are significant determinants of the trajectories of linked systems of humans and nature (Berkes, 2002; Berkes, Colding, & Folke, 2003; Berkes, Folke, & Colding, 1998; Young, 2008). Finally, in an immediate analytical sense, institutions are capable of structuring policy choices and resources, channeling policy discourse and thus providing opportunities and constraints for policy actors (Lowndes & Roberts, 2013). As we argue below, institutions both precondition and shape TGC.

As we explain in the previous section, institutions are understood more generally as rules (or sets of rules) that structure social interaction by shaping (constraining and enabling) actors' behavior (Ingraham, Moynihan, & Andrews, 2008; Knight, 1992). These literatures also distinguish between formal institutions, which are openly codified and vested with public authority, and informal institutions, consisting of "socially shared rules created, communicated, and enforced outside of officially sanctioned channels" (Knight, 1992). Informal institutions are obviously more difficult to locate and analyze. Lowndes and Roberts (2013, p. 47), drawing on Hall's (1986) concept of "standard operating procedures", argue that informal institutional rules can be identified as: specific to a particular political or governmental setting; recognized by actors; having a collective (rather than a personal) effect; and describable (to the researcher).

What is the difference between an informal institution and a network, given that networks as described above seem to operate much in the mode of informal institutions, i.e., through established interactions regulated by accepted norms, and the production of mutual understanding, consensus and reciprocity through debate? One way of approaching the distinction is to note that networks are composed of people who, as Hecló (1978) contends, "regard each other as knowledgeable" and work toward alternative policy options "though rarely in any controlled, well-organized way"; the methodological focus is on the ways in which these people are interlinked and interdependent. Institutions, by way of comparison, can usefully be seen as transcending individuals and intentions by mediating the rules that govern interactive behaviour.

In a political sense, institutions and networks constrain policy actors in different ways, some being more overt than others. In the most obvious sense, institutions constrain actors through rules that are formally recorded and officially sanctioned. These rules may appear in constitutions, in national or international law and in conventions or protocols, among others. They provide the conditions under which decisions are taken (Peters, 1999) and compliance is expected and enforced (Scharpf, 1997). In other words, institutions do not actually "produce behaviour"; rather they structure the situation in which policy actors

must make choices (Ostrom, 1990). In this institutionally influenced situation, some actors will be in a more beneficial position, privileged by decision rules, others in a weaker one. An example here is the role of subnational governments vis-à-vis interstate treaty negotiations or voting procedures in international organizations. Further, both institutions and networks can shape the ideas, beliefs and interests of policy actors, by putting in place incentives and influencing information flows. Relatedly, they are also capable of shaping behaviour through “frames of meaning” (Schmidt, 2006), where narratives link together ideas of explanation and persuasion to justify the status quo or advocate for change. Institutions and networks can channel policy discourse, whereby certain ideas and explanations are sanctioned and others ridiculed. Epistemic communities, as defined by Haas (1992, p. 3), operate in a similar fashion, whereby networks of “professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge” operate through a combination of shared beliefs and more subtle conformity pressures.

The institutional basis is thus able to shape the other four attributes in our model of Transboundary Governance Capacity, as portrayed in Figure 2. To a considerable extent, institutional rules and “standard operating procedures” will influence the degree to which governance processes are able to include the right actors—and accord them appropriate rights of participation—in a problem-solving exercise. They will also affect the conditions under which leadership may be exercised, and by whom. Further, institutions, through shaping and channeling policy discourse can influence the prospects for and direction of mutual understanding. Finally, institutions are very likely to influence the more tangible resources that are available to actors.

Some commentators have argued that the rapid growth of informal or “soft” processes such as networking, collaboration and “steering” has contributed to the “de-institutionalization” of governments and is less significant in terms of governance. Yet, as Lowndes and Roberts (2013, p. 3) argue, “political institutions have not become any less important; rather, they have changed”. They explain that one cannot assume that political life is determined by formal structures and frameworks alone; rather, “informal conventions can be just as binding as formal constitutions, and can be particularly resistant to change” (Lowndes & Roberts, 2013, p. 3). Thus, informal institutions and networks are capable of performing all of the functions that formal institutions may perform.

Institutions and networks are key in terms of how governance is conceived and conducted, and they play a significant role in the outcomes of social and ecological systems. The recent history of changing water quality in the Great Lakes and other water basins around the globe reflects this assertion, namely that institutions have figured both as causes of socio-ecological problems and as mechanisms for addressing those problems. The basic challenges in managing transboundary water resources in the Great Lakes region are mirrored in other transboundary water basins, and the Great Lakes region provides an excellent laboratory to contribute to knowledge related to designing governance approaches that reflect the complexity of linked economic, social and ecological systems (McLaughlin & Krantzberg, 2006).

#### 4. Indicators of institutions and networks for TGC

If we were to design the optimal institutions and networks to support Transboundary Environmental Governance, what would they look like? Given that institutions and networks come in different forms, and vary greatly in terms of the degree to which they are codified and how they actually work to shape political behaviour, the indicators that we choose need to be general enough such that they apply across the spectrum from officially sanctioned and easily identifiable rules, to standard operating procedures, and to socially sanctioned but unofficial rules in networks. The indicators also need to clearly show the presence or state of the attribute itself, in this case, “strong institutional basis”. Further, for each indicator, we need accurate measures which can describe the size or extent of an indicator, generally by comparison with a standard. For example, for two of our four indicators, we utilize spectrums which show the “range of the possible” for an indicator.

Biswas and Tortajada (2010, p. 136) have articulated a serious concern about water governance indicators, namely that “it may . . . not be possible to develop an all purpose water governance indicator even for one country. . . . Because governance requirements for different types of water uses are likely to be different.” Certainly, within-country legal and regulatory frameworks, as well as political, economic and social conditions can vary dramatically. The requirements of various water problems also present unique challenges. However, we argue that indicators aimed at assessing the *functions* and *operation* of institutional and network architecture, according to criteria derived from well-established comparative and environmental policy studies, can provide the means for generalizing across countries in a transboundary context.

##### 4.1. *Compliance*

To a considerable extent, earlier institutionalists—primarily those who focused on formal institutions—assumed that rules were followed (e.g., Carey, 2000), an assumption which is no longer accepted. Instead, compliance has become the focus of intense study, namely how one might put in place appropriate mechanisms which will encourage/ensure compliance (e.g., Maljean-Dubois & Richard, 2004). The act of compliance appears to have both “harder” and “softer” components. Formal definitions of compliance emphasize conformity without choice while those in the international relations literature highlight “a readiness for” or “agreement to” abide by rules, thus implying a higher level of voluntary consent. In the comparative politics literature, a primary indicator of strength—a very basic one—is the ability of the institution to enforce its own rules (Levitsky & Murillo, 2009). Institutions can be very valuable in terms of coordinating behaviour, reducing transaction costs and encouraging commitment to a specific enterprise, but they can do this only if actors regard these rules as binding (Buchanan & Keohane, 2006, p. 1).

As Lowndes and Roberts (2013, p. 51) note, all forms of institutional constraint are subject to some form of enforcement mechanism. However, the term “enforcement” is not able to convey the degree to which rules, practices and norms require or incent obedience,

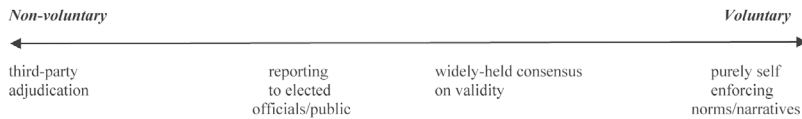


Figure 3. Spectrum of Compliance Mechanisms

particularly complex in a transboundary content. Compliance obviously differs across the range of institutional forms; key is discovering the constraining mechanisms in place, and whether actors care whether the rules are complied with or not. Clearly, compliance mechanisms can take different forms, ranging on a spectrum from third-party enforcement (interpretation and adjudication) and reporting, through to widely-held arguments as to why a given institutional status quo is valid, and to self-enforcing norms or narratives. The focus here is on identifying “the range of the possible” in terms of enforcement mechanisms, i.e., to what extent can transboundary institutions apply a wide range of compliance mechanisms, assuming also that “harder” compliance mechanisms most often serve as an effective support for collaborative activities.

One should not assume that informal institutions and networks are at a disadvantage here; as Goodin (1996, p. 41) explains, “the most effective enforcement mechanisms may be those that cultivate trust and embody a direct appeal to moral principles”. Thus, the degree to which compliance mechanisms are *voluntary* should not be conflated with the degree to which they *binding* in practice. We do not, however, determine the degree of actual compliance “on the ground” in this special issue.

#### 4.2. *Functional Intensity*

While compliance capabilities can give us an indication of the likelihood that rules will be followed or relational ties will incent conformity, understanding the functional intensity of transboundary institutions serves as an indicator of the extent to which institutions and networks are engaged in deeper forms of collaboration, those which require greater engagement and commitment from state and non-state actors. VanNijnatten (2006) measures the functional intensity of transboundary institutions on a spectrum ranging from less intense activities such as information sharing and consultation, to more intense activities such as cooperation, harmonization and even integration. Intensity as measured here should not be viewed as a proxy for the degree to which institutions are formalized; while more intense linkages may be more likely to be formalized, this is not necessarily the case. In the same way, information-sharing arrangements can be either formal or informal in nature. Instead, this indicator is intended to uncover the aims and nature of transboundary institutions.

According to VanNijnatten (2006), *information sharing* represents the least intensive form of cross-border interaction, based only on the exchange of verbal or written information on common issues. *Consultation* includes those activities which involve soliciting input or advice from a neighboring jurisdiction on policy measures. *Cooperation* includes



Figure 4. Functional Intensity Spectrum

actions leading to mutual benefits beyond information sharing or soliciting advice; here the focus is on actually working together. *Harmonization* is based on action leading to a compatibility of actions based on a shared objective or set of objectives. Finally, the most intense form of cross border linkage is *integration*, which involves the adoption of objectives and similar actions or policies to implement them under the auspices of the cross-border agreement or organization itself. Those transboundary institutions characterized as being closer to the “integration” end of the spectrum are also understood to provide actors with the opportunity to engage in deeper collaboration, while those characterized as being at the “information sharing” end of the spectrum would provide minimal opportunity in this regard. For this indicator, scrutiny of the mandates and activities of particular transboundary institutions, as well as secondary analyses of these institutions can aid in categorizing institutions on the functional intensity spectrum.

#### 4.3. *Stability and Resilience*

Stability is also considered significant in assessing institutional strength in the comparative politics and public policy literatures. Stability reflects not only the ability of an institution or set of institutions to survive the passage of time, but also to endure despite changing conditions—whether political, economic (budgetary) or environmental (Levitsky & Murillo, 2009). The ability to endure is also at the root of the term “resilience”, drawn from the socio-ecological systems literature. When applied to an institution, a key element of resilience is the degree to which the institution is capable of adaptation (e.g., Berkes et al., 2003). Determining both the longevity of the institutions and networks in place, as well as their endurance in the face of changing conditions, are key measures for this indicator.

A principal concern for water governance studies is whether our institutions possess or can support cultures and behaviors capable of realizing opportunities and better learn from experience. Regardless of the extent of policy and governance reforms undertaken in relation to the renewed Great Lakes Water Quality Agreement or other initiatives, maintaining restored Great Lakes ecosystems and adapting to new problems as well as changing conditions in the Basin will require ongoing and improved governance capacities. For the resilience literature, the focus is also on understanding what mechanisms are necessary to cope with ongoing, variable, and unpredictable stresses. For transboundary institutions with mandates for restoration, for example, the complex challenges of protection and restoration are amplified, and can become overwhelming when those institutions fail to adjust to new knowledge and opportunities (Holling & Meffe, 1996). Instead,

transboundary institutions need to offer opportunities for sharing “lessons learned”. As Healy et al. (2014) note, “[d]ifferences in economic level and in government structures and practices should encourage policy actors to understand that there is more than one way to address a given problem, and that their own country’s approach may not be superior”. In this process, knowledge and experience from inside and outside government is valuable. The object here, of course, is to encourage policy learning, or what Kemp and Weehuizen (2005, p. 10) refer to as a conscious “change in thinking” about a problem and its associated policy. Out of information exchange and dialogue, the sharing of best practices and the learning process that follows, it is hoped that institutional resilience will be buttressed.

Recent critiques have argued that policy capacity research also needs to focus more on coordination, whether across government (Williams, 2012; Williams & McNutt, 2013, p. 110), or across conventional boundaries and functional definitions of policies (Peters, 1996). In the international relations literature, the degree of coordination across multiple institutions/networks operating on the same issue is seen as a key variable, which describes the potential of governance arrangements to achieve a common purpose. This can be operationalized in terms of assessing the degree to which different (and overlapping) institutions and networks in a given policy area are organized around achieving a common purpose, by analyzing responsibilities and relationships.

#### 4.4. *Legitimacy*

Legitimacy is a key concern among those who study institutions—whether from the perspective of international relations, governance, or water policy. Legitimacy is clearly a normative notion; an institution is regarded as legitimate if actors believe it has the right to promulgate and implement rules, even if those rules are not in the interests of all stakeholders—in other words, it is considered “worthy” of their support (Buchanan & Keohane, 2006, p. 2).

Beyond this general understanding, however, legitimacy can be approached from different angles. A key component of institutional legitimacy is accountability to elected officials and to the public. Grant and Keohane (2005) make a useful distinction between accountability to those (i.e., elected officials) who endow authority (through delegation) and accountability to those who are affected by decisions (and should have participatory rights), i.e., the public. With rules that are formally constructed and written down, it may be relatively easy for the analysts to locate and assess accountability mechanisms, which themselves are likely to be codified. Informal rules, however, offer an analytical conundrum, as these are not officially sanctioned but rather demonstrated or narrated, and their mechanisms of adoption and compliance are of murkier origin (Craik & VanNijnatten, 2016). These kinds of concerns have certainly been raised vis-à-vis networks; Slaughter has long warned that transgovernmental networks are not without cost, noting very real accountability issues associated with these networks (2001, 2003, 2004).

Another concern about legitimacy in a transboundary context is the degree to which non-governmental actors are involved in international decision processes. There is a real



Table 1  
Institutional indicators and measures for TGC

Institutional Indicator	Measure
Nature of Compliance	Characterization of compliance mechanisms on spectrum of voluntary to non-voluntary [what is range of possible in terms of “hard” and “soft” mechanisms; are there are binding mechanisms to provide “harder” support for compliance regime?]
Functional Intensity	Characterization of mandate and activities on spectrum from less intensive to more intense collaboration [how intense?]
Stability and Resilience	Determination of longevity [how long has institution been in place?] and endurance [despite changing conditions?] Characterization of learning opportunities [is there sharing of “best practices”?] Coordination across multiple institutions/networks operating on same issue?
Degree of Legitimacy	Determination of the degree to which institutions/networks are “widely regarded as legitimate” [accountability to elected officials or public? external vs. internal legitimacy?]

tension between traditional approaches that view the state as the only legitimate actor driving international relations and those that see non-state actors as policy drivers. The “informal nature” of the latter plus the fact that these “are often not founded on conventional legal instruments” serve as factors contributing to a lack of legitimacy (*Ibid*). This, among other factors, has led scholars to raise issues regarding whether transboundary networks are capable of operating in a democratic manner, and what might be done to facilitate this.

Given the range of definitions and understandings of legitimacy, we adopt an inductive approach to this indicator, whereby our case study authors provide a determination of the extent to which the institutions and/or networks under study are “widely regarded as legitimate” and why they believe this to be the case. This allows us to uncover the sources of legitimacy, which may differ across cases and may also differ from traditional understandings of process, policy and legal legitimacy. We also differentiate between self-defined and externally defined legitimacy.

Table 1 provides a summary of our four institutional indicators for TGC and their measures.

## 5. Towards a medium-N and multi-level comparative approach

Our TGC framework was designed such that it can be tested across a myriad of case studies. Certainly, the framework has been informed by our common grounding in the theoretical and empirical context of environmental policy, international relations and sustainability, as well as our substantive interest in water governance. The goal in this special issue is to test empirically the strength of institutional foundations to better assess those TGC attributes that are necessary and sufficient for better governance in water basins and identify gaps in current institutional frameworks. In keeping with our argument above regarding the foundational nature of institutions for TGC, we assume here that if institutions

fare well on our four indicators, other attributes—relating to leadership, membership, discourse/understanding and resources—are also more likely to be in place.

We have chosen a comparative approach that will help us to isolate broader patterns and/or common attributes at the basin level that are important for exploring the role of formal and informal institutions in effective TGC. Our approach is “Medium-N” qualitative; à la Levi-Faur (2004), we increase the number of cases in a “step-wise” fashion, changing the focus on specific variables to create contrast. Our case choice is informed by the inherently multi-level and globalized nature of water basin management; it occurs simultaneously at the subnational level (where water resources are territorially grounded), at the level of the nation-state (which remains the prime institutional framework), at the cross-border regional/basin level (e.g., Canada-U.S.) and at the level of the international system. As Mollinga and Gondhalekar note, one of the complexities of studying and understanding water governance is associated with a globalization of water policy (as a spillover of economic and political dynamics) which has had uncertain impacts on the enduring reality of water resource management as an “inherently localised practice (Mollinga & Gondhalekar, 2012, p. 2). This means that water policy and governance is “inhabited by many different actors, moving at and across different levels, deploying different strategies, triggering different mechanisms, with causalities running in multiple directions” (ibid, p. 1).

We thus approach our basin-level inquiry from three directions. First, this special issue begins with intra-Basin comparisons within the Great Lakes; here, the political and economic conditions are similar, but we can apply our institutional indicators across different issue areas, including fisheries (Gaden), designated Areas of Concern, or AOCs (Greitens), aquatic invasive species (VanNijnatten) and irrigation/water-takings (Heinmiller). The variation in case selection is thus in the policy issue, while the context is quite similar across the cases. We then move “up” to inter-Basin comparisons (Garrick, Krantzberg and Jetoo), whereby water quality management (nonpoint pollution) in the Great Lakes case is compared with water quality management in other water/river basins: first, on the same border (Columbia River Basin), a case with similar contextual and institutional conditions; and, second, on the U.S.-Mexico border (Colorado River Basin) and in the Murray-Darling Basin in Australia, both of which exhibit different contextual and institutional conditions. Here, then, the policy issue remains constant across cases, while conditions differ. Finally, we reach up to the global level to look at TGC in an explicitly international regulatory context: Arctic water management (Bryk Friedman).

## **6. Reflections across the cases**

Our goal with this Special Issue is to promote a multi-faceted understanding of the way that institutions and networks in transboundary water basins contribute to effective governance and, ultimately, the sustainability of these highly-valued ecosystems. Overall, the Great Lakes case studies (Gaden, Greitens, Heinmiller and VanNijnatten) paint a governance picture wherein the TGC potential of institutions and networks in this region is

relatively high. This is mirrored by the comparative basin-level cases on the Canada-U.S. and U.S.-Mexico borders and in Australia (Garrick, Krantzberg and Jetoo). Across these cases, we see a diverse array of formal and informal institutions and networks, interactions among which are complex yet clearly necessary for the effective functioning of these transboundary governance systems. These systems promote functionally intense interactions and utilize a full range of compliance mechanisms, though the cases also identify weaknesses in terms of stability and resilience, as well as legitimacy. What the comparative inter-Basin (Garrick, Krantzberg and Jetoo) and Arctic (Bryk Friedman) cases highlight, particularly as we reflect their findings back on the Great Lakes cases, are the ways in which the indicators are themselves intertwined; in particular, the legitimacy of governance arrangements appears to significantly impact the stability and resilience of these arrangements.

### 6.1. *Institution-network interactions*

As noted earlier in this paper, there has been a proliferation of institutions and networks across scales and sectors. The Great Lakes cases reveal variation in the balance between formal and informal institutions, as well as between institutions and networks; for example, while the regime governing water-takings (Heinmiller) consists primarily of formal agreements and bodies, as well as statutory provisions (on the US side), the aquatic invasives case (VanNijnatten) features a wide range of networks and informal processes with some formal mechanisms only recently established. Yet, it is also clear that the dominant trend is toward a formalization of provisions over time; this is consistent with the broader dynamic in transboundary governance of the Great Lakes Basin to formalize arrangements rather than leave them informal. Certainly, the existence of a well-articulated set of programs and objectives under a long-standing treaty (the Boundary Waters Act) and binational body (the International Joint Commission), as well as the decades-old *Canada-US Water Quality Agreement*, means that new challenges to the shared waters can be grafted relatively easily onto this strong spine. Indeed, the message looking across the cases in this volume is that one need not start “from scratch” in addressing a new problem in the Great Lakes. And, important to note here is that institutionalization and formalization has also increased at the subnational level, as can be seen in the irrigation/water-takings (Heinmiller), fisheries (Gaden) and invasives (VanNijnatten) cases. Further, these dynamics are consistent with the findings of the comparative basin-level cases (Garrick, Krantzberg and Jetoo).

The Great Lakes cases also highlight the significant, even critical, role played by networks. We would characterize the relationship between institutions and networks as “symbiotic”—each is essential to the functioning of the other and balance can only be achieved when they work together. The cases (see especially the invasives case by VanNijnatten and the AOCs case by Greitens) show the ways in which networks act as knowledge brokers, building consensus on the state of science, the urgency of action and the specific tasks that need to be undertaken. They are the agenda-setters and advocates in the

governance system. Institutions feed off this activity, setting specific objectives in response to the activities of networks, and coordinating or harmonizing implementation approaches. In the Great Lakes, then, binational institutions are strong, but networks play an important role in feeding fresh information and policy options into the system. Unfortunately, the cases also show that networks are more vulnerable than formal institutions to fiscal restraint, as the current context highlights. Budget reductions might discourage new initiatives under a treaty or formal commission but the infrastructure and requirements remain in place. Networks, however, rely on relationships among people and they are weakened when people are removed from the network, or reassigned to more pressing domestic files.

Finally, a common theme that emerges across the Great Lakes cases is the problem of institutional fragmentation and lack of coordination in governance arrangements. In fact, this is an aspect that our indicators may not adequately capture or measure. The proliferation of governance arrangements in the Great Lakes Basin raises the challenge of overlapping and even competing institutions, which can impact the degree to which the system works toward a common purpose. At the basin level, the problem of institutional incoherence is particularly acute where local actors play a primary role; building a coherent transboundary regime across the myriad levels and sectors involved is arduous indeed. In many ways (and at a higher scale), the Arctic case (Bryk Friedman) underscores the challenges of directing a “hyper-institutionalized” but fragmented governance system toward common ends.

## 6.2. *Indicators*

The findings across the cases bring to light considerable strengths in the institution-network arrangements for governance in the Great Lakes Basin but also specific weaknesses that must be addressed. Governance arrangements in the Basin are capable, in the sense of providing promising conditions for making and achieving objectives through fruitful interactions across borders. For our first indicator, we focus on the nature of compliance mechanisms associated with transboundary institutions and reflect on the “range of the possible” in terms of both incenting and forcing behaviour. Our understanding in this special issue is that a wide range of compliance mechanisms are needed and that these different forms of compliance reinforce each other, though “harder” compliance mechanisms serve as an effective support for cooperative activities. The most demanding compliance regime can be found in the irrigation/water-takings case (Heinmiller), wherein a binational agreement and a legally binding inter-state compact set out decision-making principles and regulatory thresholds. The other Great Lakes cases suggest that “softer” mechanisms can work well, but are perhaps best operationalized within the framework of a formal agreement or treaty. A good example here is the fisheries case (Gaden), where a webbing of regular procedures (via committees), an emphasis on consensus and peer pressure all work to incent compliance within the framework of a binational treaty that *requires* direct engagement on fisheries management. Where this “harder” framework is lacking, compliance is more difficult to attain, as can be seen in the AOCs (Greitens) case where the primary mechanism is reporting through the Remedial Action Plan process. This point is underscored by Bryk

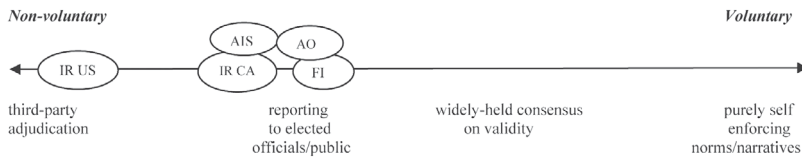


Figure 5. Spectrum of Compliance Mechanisms: Findings

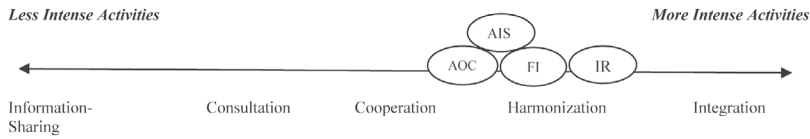


Figure 6. Functional Intensity Spectrum: Findings

Friedman in the Arctic case (this issue) where international and regional institutions in the Arctic are both simpler (a narrower range of compliance mechanisms used) and “softer”; she characterizes the regime as possessing low compliance potential.

All of the governance arrangements surveyed here are also functionally intense, with interactions across borders reaching past mere information-sharing and consultation into the realm of cooperation and harmonization. The nonpoint pollution cases (Garrick, Krantzberg and Jetoo) are the most intense, reaching integration in the Colorado and Murray-Darling basins. The sole exception to this general observation is the Arctic case (Bryk Friedman), where interactions have progressed only as far as cooperation. Further, the cases (including the Arctic case) suggest that the intensity of interactions continues to increase. Greitens (this issue) explains that the increase in functional intensity in his case of AOCs is primarily internally-driven, as participants build on, and learn from, early successes to undertake stronger collaborations.

A significant finding with regard to the indicators is the way in which they interact with one another. In particular, the degree of legitimacy of a given set of governance arrangements appears to undergird, or detract from, the stability and resilience of those arrangements. VanNijnatten (this issue) notes that, in a transboundary context, what we refer to here as “process values”—transparency and inclusiveness, as well as the degree to which activities are consensus- and science-driven—take on added importance since international institutions and networks are not “constitutionalized” in the manner of domestic institutions. Indeed, Garrick, Krantzberg and Jetoo (this issue) argue that legitimacy is “crafted through multi-layered participatory decision-making processes and buttressed through formal conflict resolution”. Yet, as Greitens (this issue) notes, process values are highly context-dependent; he shows in his case study that one AOC can have high legitimacy while another has diminished legitimacy, largely because of how its public advisory committee has operated. Similarly, Garrick, Krantzberg and Jetoo (this issue) indicate that, across the four basins they compare, they observe the most variation on the legitimacy indicator, with these differences also linked to process values.

In the Great Lakes cases, it should also be noted that while arrangements at the Basin level seem to have relatively high levels of internal legitimacy vis-à-vis formal accountability relationships, there are myriad ways in which the presence or absence of process values impacts the way in which arrangements are viewed externally. Gaden's fisheries case emphasizes the high legitimacy under the Joint Strategic Plan, which rests on an inclusive and structured process involving the fisheries management community, though there is little broader participation. In the water-takings case (Heinmiller), the rigorous negotiation process for the creation of the binational agreement and inter-state compact has encouraged a high level of legitimacy for these institutions among participating governments and immediate stakeholders, yet "on-the-ground" water users have no direct means of participating or holding the institutions accountable.

### 6.3. *TGC Gaps—An agenda for action*

The increased attention given to governance functions in water basins across the globe has encouraged policy actors to reflect anew on the conditions that promote effective transboundary governance. The findings of this special issue suggest that additional attention—and concrete support—need to be directed to the functions of networks, as they play a key role in fostering and revitalizing the transboundary governance system. Critical in this respect will be enhancing the participative opportunities and capacities of stakeholders and local communities, and linking their combined capacities into Basin governance efforts in transparent ways. This further implies that the coordination of existing and new institutions and networks, in such a way that the whole system can take concerted aim at specific objectives, remains a continuing challenge.

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## References

- Araral, E., & Yu, D. (2013). Comparative study of water law, policy and administration. Evidence from 17 Asian Countries. *Water Resources Research*, 49(9), 5307–5316.
- Bache, I. (2008). *Europeanization and multi-level governance: Cohesion policy in the European Union and Britain*. Lanham, MD: Rowman & Littlefield.
- Bails, J., Beeton, A., Bulkley, J., DePhilip, M., Gannon, J., Murray, M., . . . Scavia, D. (2005). *Prescription for the Great Lakes ecosystem protection and restoration: Avoiding the tipping point of irreversible change*. White Paper supported by the Wege Foundation and Joyce Foundation. Retrieved from <http://www.healthylakes.org/wp-content/uploads/2011/01/Prescription-for-Great-Lakes-RestorationFINAL.pdf>
- Berkes, F. (2002). Cross-scale institutional linkages: Perspectives from the bottom up. In E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich, & E. U. Weber (Eds.), *The drama of the commons* (pp. 293–321). Washington, DC: National Academy Press.

- Berkes, F., Colding, J., & Folke, C. (Eds.). (2003). *Navigating social–ecological systems: Building resilience for complexity and change*. Cambridge, England: Cambridge University Press.
- Berkes, F., Folke, C., & Colding, J. (1998). *Linking social and ecological systems: Management practices and social mechanisms for building resilience*. Cambridge, England: Cambridge University Press.
- Biermann, F., Pattberg, P., & Zelli, F. (2010). *Global climate governance beyond 2012: Architecture, agency and adaptation*. Cambridge, England: Cambridge University Press.
- Biswas, A. K., & Tortajada, C. (2010). Future water governance: Problems and perspectives. *Water Resources Development*, 26(2), 129–139.
- Blomquist, W., Heikkila, T., & Schlager, E. (2004). Building the agenda for institutional research in water resource management. *Journal of the American Water Resources Association*, 40(4), 925–936.
- Botts, L., & Muldoon, P. (2005). *The evolution of the great lakes water quality agreement*. East Lansing, MI: Michigan State University Press.
- Brenner, N. (2004). *New state spaces: Urban governance and the rescaling of statehood*. New York, NY: Oxford University Press.
- Bressers, H., & Lulofs, K. (Eds.). (2010). *Governance and complexity in water management: Creating cooperation through boundary spanning strategies*. Enschede, Netherlands: University of Twentes, CSTM, Institute for Governance Studies.
- Buchanan, A., & Keohane, R. O. (2006). The legitimacy of global governance institutions. *Ethics and International Affairs*, 20(4), 405–437.
- Bulkley, J., Nyambe, I., & Kirchhoff, C. J. (2009). *Characteristics of integrated water management systems in the Zembezi River and Great Lakes Basin: A comparison of two approaches* (Publication No. CSS09-20). Ann Arbor, MI: University of Michigan Centre for Sustainable Systems.
- Carey, J. M. (2000). Parchment, equilibria and institutions. *Comparative Political Studies*, 33(6/7), 735–761.
- Canadian Centre for Management Development. (1996). *Strengthening policy capacity: Report of the task force on strengthening the policy capacity of the federal government*. Ottawa, Ontario, Canada: Author.
- Cohen, A., & Davidson, S. (2011). An examination of the watershed approach: Challenges, antecedents, and the transition from technical tool to governance unit. *Water Alternatives*, 4(1), 1–14.
- Cox, M., Arnold, G., & Villamayor Tomás, S. (2010). A review of design principles for community-based natural resource management. *Ecology and Society*, 15(4), 38.
- Craik, N., & VanNijnatten, D. (2015, in print). Bundled Transgovernmental Networks, Agency Autonomy and Regulatory Cooperation in North America. *North Carolina Journal of International Law* (XLI).
- Eilstrup-Sangiovanni, M. (Ed.) (2006). *Debates on European Integration: A Reader (The European Union Series)* (1st ed.). Gordonsville, US: Palgrave MacMillan.
- Environment Canada and U.S. Environmental Protection Agency. (2014). *State of the Great Lakes 2011*. Cat No. En161-3/1-2011E-PDF. EPA 950-R-13-002. Available at <http://binational.net>
- Farrell, H., & Hèritier, A. (2003). Formal and informal institutions under codecision: Continuous constitution-building in Europe. *Governance*, 16(4), 577–600.
- Friedman, K., & Foster, K. (2011). *Environmental collaboration: Lessons learned about cross boundary collaborations*. Washington, DC: IBM Center for the Business of Government.
- Friedman, K., Johns, C., Krantzberg, G., & VanNijnatten, D. (2013). *Transboundary governance capacity in the Great Lakes St. Lawrence River Basin: A conceptual framework*. Unpublished manuscript.
- Goodin, R. E. (1996). *The theory of institutional design*. Cambridge, England: Cambridge University Press.
- Görg, C. (2007). Landscape governance: The “politics of scale” and the “natural” conditions of places. *Geoforum*, 38, 954–966.
- Grant, R. W., & Keohane, R. O. (2005). Accountability and abuses of power in world politics. *American Political Science Review*, 99(1), 29–43.
- Haas, P. M. (1992). Introduction: Epistemic communities and international policy coordination. *International Organization*, 46(1), 1–35.
- Hall, P. (1986). *Governing the economy: The politics of state intervention in Britain and France*. Oxford, England: Oxford University Press.
- Healy, R. G., VanNijnatten, D. L., & López Vallejo, M. (2014). *North American environmental policy: Capacity, approaches and transboundary issue management*. Toronto, Ontario, Canada: University of Toronto Press.

- Heclo, H. (2009). Issue Networks and the executive establishment. In Richard J. Stilman II (Ed.) *Public Administration: Concepts and Cases* (9th ed) Boston, MA: Wadsworth Cengage Learning, 410–421.
- Helmke, G., & Levitsky, S. (2003, September). *Informal institutions and comparative politics: A research agenda* (Working Paper #307). Kellogg Institute. Retrieved from <http://kellogg.nd.edu/publications/workingpapers/WPS/307.pdf>
- Holley, C. & Gunningham, N. (2011). Natural Resources, New Governance And Legal Regulation: When Does Collaboration Work? *New Zealand Universities Law Review* 24, 311–336.
- Holling, C. S. & Meffe, G. K. (1996). Command and Control and the Pathology of Natural Resource Management. *Conservation Biology* 10(2), 328–337.
- Howlett, M. (2007). *Policy analytical capacity as a source of policy failure*. Paper presented at the Annual Meeting of the Canadian Political Science Association, Saskatoon, Saskatchewan.
- Howlett, M. (2009). Policy analytical capacity and evidence-based policy making: Lessons from Canada. *Canadian Public Administration*, 52(2), 153–175.
- Ingraham, P., Moynihan, D., & Andrews, M. (2008). Formal and informal institutions in public administration. In J. Pierre, B. G. Peters, & G. Stoker (Eds.), *Debating institutionalism* (pp. 66–85). Manchester, England: Manchester University Press.
- International Joint Commission. (2013). *Assessment of progress made towards restoring and maintaining great lakes water quality since 1987* (Sixteenth Biennial Report on Great Lakes Water Quality). Retrieved from [http://www.ijc.org/files/publications/16thBE\\_internet%2020130509.pdf](http://www.ijc.org/files/publications/16thBE_internet%2020130509.pdf)
- Inwood, G., Johns, C., & O'Reilly, P. (2011). *Intergovernmental policy capacity in Canada: Inside the worlds of finance, trade, environment and health*. Montreal/Kingston, Ontario, Canada: McGill-Queen's University Press.
- Jessop, R. D. (2002). Governance and metagovernance: On reflexivity, requisite variety, and requisite irony. In H. Heinelt, P. Getimis, G. Kafkalas, R. Smith, & E. Swyngedouw (Eds.), *Participatory governance in multi-level context: Concepts and experience* (pp. 33–58). Opladen, Germany: Leske and Budrich.
- Johns, C. (2009). Water pollution in the Great Lakes Basin: The global-local dynamic. In C. Gore & P. Stoett (Eds.), *Environmental challenges and opportunities: Local-global perspectives on Canadian issues* (pp. 95–129). Toronto, Ontario, Canada: Emond Montgomery.
- Johns, C. (2010). Transboundary water pollution efforts in the Great Lakes: The significance of national and sub-national policy capacity. In B. Rabe & S. Brooks (Eds.), *Transboundary environmental governance in Canada and the United States* (pp. 63–82). Washington, DC: Woodrow Wilson Centre for International Scholars.
- Johns, C. (2013, June 27). *Governance of the Great Lakes in North America and transboundary governance capacity*. Paper presented at the International Conference on Public Policy, Grenoble, France.
- Kemp, R., & Weehuizen, R. (2005). *Policy learning, what does it mean, and how can we study it?* (Innovation in the Public Sector: Report D15). Retrieved from <http://survey.nifu.no/step/publin/reports/d15policylearning.pdf>
- Keohane, R. O., & Victor, D. G. (2011). The regime complex for climate change. *Perspectives on Politics*, 9(1), 7–23.
- Kirton, J., & Guebert, J. (2010). Soft law, regulatory coordination, and convergence in North America. In M. Gattinger & J. Hale (Eds.), *Borders and bridges: Canada's policy relations in North America*. Don Mills, Ontario, Canada: Oxford University Press.
- Knight, J. (1992). *Institutions and social conflict*. Cambridge, England: Cambridge University Press.
- Krantzberg, G. (2008). The Great Lakes' future at a cross road. *Environmentalist*, 28, 301–305.
- Levi-Faur, D. (2004). Comparative research designs in the study of regulation: How to increase the number of cases without compromising the strengths of case-oriented analysis. In J. Jordana & D. Levi-Faur (Eds.), *The politics of regulation: Institutions and regulatory reforms for the age of governance* (pp. 155–187). Cheltenham, England: Edward Elgar Publishing.
- Levitsky, S., & Murillo, M. V. (2009). Variation in institutional strength. *Annual Review of Political Science*, 12, 115–133.
- Lowndes, V., & Roberts, M. (2013). *Why institutions matter: The new institutionalism in political science*. Hampshire, England: Palgrave Macmillan.



- Maljean-Dubois, S., & Richard, V. (2004). *Mechanisms for monitoring and implementation of international environmental protection agreements* (Global Governance Paper 9). Paris, France: Institut du Développement Durable et des Relations Internationales.
- McLaughlin, C., & Krantzberg, G. (2006). Toward a “better understanding” of the Great Lakes Basin ecosystem. *Journal of Great Lakes Research*, 32, 197–199.
- Mollinga, P. P., & Gondhalekar, D. (2012). Theorizing structured diversity: An approach to comparative research on the globalisation–localisation dynamics in water resources management (ICCWaDs Working Paper Series).
- Newig, J., & Fritsch, O. (2009). Environmental governance: Participatory, multi-level and effective? *Environmental Policy and Governance*, 19, 197–214.
- Organization for Economic Cooperation and Development. (2011). *Water governance in OECD countries: A multi-level approach*. OECD Studies on Water. Author. Retrieved from [http://www.waterforum.net/Content/Artikel/4000-5000/4243/OECD\\_rapport\\_water\\_governance\\_130220104537.pdf](http://www.waterforum.net/Content/Artikel/4000-5000/4243/OECD_rapport_water_governance_130220104537.pdf)
- Osofsky, H. M. (2008). *Is climate change “international”? Litigation’s diagonal regulatory role*. Retrieved from [http://works.bepress.com/hari\\_osofsky/3](http://works.bepress.com/hari_osofsky/3)
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge, England: Cambridge University Press.
- Ostrom, E. (2003). *Trust and reciprocity: Interdisciplinary lessons from experimental research*. (J. Walker, Ed.). New York, NY: Russell Sage Foundation.
- Ostrom, E. (2009). Building trust to solve commons dilemmas: Taking small steps to test an evolving theory of collective action. In S. Levin (Ed.), *Games, groups, and the global good* (pp. 207–228). New York, NY: Springer.
- Painter, M., & Pierre, J. (2005). *Challenges to state policy capacity*. London, England: Palgrave MacMillan.
- Peters, B. G. (1996). *The policy capacity of government*. Ottawa, Ontario, Canada: Canadian Centre for Management Development.
- Peters, B. G. (1999). *Institutional theory in political science: The new institutionalism* (2nd ed.). New York, NY: Continuum.
- Raustiala, K. (2002, Fall). Architecture of international cooperation: Transgovernmental networks and the future of international law. *Virginia Journal of International Law*, 43, 1–92.
- Saleth, R. M., & Dinar, A. (2005) Water institutional reforms: Theory and practice. *Water Policy*, 7, 1–19.
- Sangiovanni, S. E. (Ed.). (2006). *Debates on European Integration: A Reader (The European Union Series)* (1st ed.). Gordonsville, US: Palgrave MacMillan.
- Scharpf, F. W. (1997). *Games real actors play: Actor-centered Institutionalism in Policy Research*. Boulder, CO: Westview Press.
- Schmidt, V. A. (2006). *Democracy in Europe: The EU and National Politics*. Oxford, UK: Oxford Univ. Press.
- Slaughter, A.-M. (1997). The real new world order. *Foreign Affairs*, 47, 183.
- Slaughter, A.-M. (2001). The accountability of government networks. *Indiana Journal of Global Legal Studies*, 8(2), 347–367.
- Slaughter, A.-M. (2003). Global government networks, global information agencies, and disaggregated democracy. *Michigan Journal of International Law*, 24, 1041–1076.
- Slaughter, A.-M. (2004). *A new world order*. Princeton, NJ: Princeton University Press.
- Sproule-Jones, M. H. (2002). *Restoration of the Great Lakes: Promises, practices, performance*. Vancouver, British Columbia, Canada: University of British Columbia Press.
- Stilman II, R. J. (Ed.). (2009). *Public Administration: Concepts and Cases* (9th ed). Boston, MA: Wadsworth Centage Learning.
- Tiernan, A. (2007). *Power without responsibility: Ministerial staffers in Australian governments from Whitlam to Howard*. Sydney, Australia: UNSW Press.
- United Nations Task Force on Transboundary Waters. (2008). *Transboundary waters: Sharing benefits, sharing responsibilities*. Retrieved from [http://www.unwater.org/downloads/UNW\\_TRANSBOUNDARY.pdf](http://www.unwater.org/downloads/UNW_TRANSBOUNDARY.pdf)
- VanNijnatten, D. L. (2006). Towards cross-border environmental policy spaces in North America: Province–State linkages on the Canada–U.S. Border. *AmeriQuests: The Journal of the Center for the Americas*, 3(1).

- VanNijnatten, D., & Craik, N. (2013). Designing integration: The system of climate change governance in North America. In N. Craik, I. Studer, & D. VanNijnatten (Eds.), *Climate change policy in North America: Designing integration in a regional system* (pp. 5–34). Toronto, Ontario, Canada: University of Toronto Press.
- Verweij, M. (2000). Why is the river rhine cleaner than the Great Lakes (despite looser regulation)? *Law and Society Review*, 34(4), 1007–1054.
- Williams, R. A. (2012). Operationalizing “policy capacity”—A case study of climate change adaptation in Canadian finance agencies. *Canadian Political Science Review*, 6(1), 65–74.
- Williams, R. A., & McNutt, K. (2013). Climate change adaptation and policy capacity in the Canadian Finance Sector, a Meso Analysis. *Review of Policy Research*, 30(1), 91–113.
- Young, O. (2008). The Architecture of Global Environmental Governance: Bringing Science to Bear on Policy. *Global Environmental Politics* 8(1), 14–32.