

Part II: Interactions and Performance in Polycentric Governance

Chapter 5: Cooperation in Polycentric Governance Systems

Tomas M. Koontz

This material has been published in revised form in *Governing Complexity: Analyzing and Applying Polycentricity* edited by Andreas Thiel, William A. Blomquist, and Dustin E. Garrick, Cambridge University Press <http://dx.doi.org/10.1017/9781108325721.006>. This version is free to view and download for private research and study only.

Abstract: Cooperation is an important way that decision centres interact in a polycentric governance system. Cooperation in governance has been studied by numerous scholars in the field of “collaboration,” although such scholarship seldom explicitly sets it within the framework of polycentricity. Cooperation involves multiple decision centres working across boundaries to pursue shared goals, and it is especially prevalent for addressing complex socio-ecological systems. This chapter examines cooperation in the Puget Sound basin, USA, for ecosystem restoration. Against a backdrop of multiple federal, state, local, and tribal jurisdictions making decisions about various ecosystem components, the Washington State Legislature created the Puget Sound Partnership to foster cooperation for restoration efforts. Without comprehensive authority structures to direct restoration actions across system levels, the roles of information and resources are critical. This chapter describes how authority, information, and resources affected cooperation in formation of the Partnership and related Local Integrating Organizations, development of ecosystem recovery plans, and implementation of ecosystem recovery projects. It uses preliminary evidence to explore how we might assess polycentric governance performance in terms of outcomes and processes. Overall the Puget Sound ecosystem restoration efforts exhibit relatively high levels of coherence, representation, and adaptability; relatively low levels of efficiency and accountability; and mixed results on efficacy and network building.

I. Introduction

In polycentric governance systems, multiple centres of decision-making are formally independent of each other but interact within a system of overarching rules. These interactions can be grouped into three main types: (1) cooperation, (2) conflict and conflict resolution, and (3) competition (Ostrom, Tiebout and Warren 1961; V. Ostrom 1994, p. 225). The focus of this chapter is cooperation. A case study of one government agency working within a polycentric governance system reveals how a cooperative approach can encourage local organizations to develop plans and carry out actions in keeping with agency priorities. The performance of these arrangements across levels of action is measured to build theory about interactions in polycentric governance systems.

A. Cooperation and Collaboration

Cooperation is not unique to polycentric governance. A rich body of theory and practice describes cooperation across a variety of settings. In thinking about cooperation in environmental governance, a key thread of scholarship centres on what has been termed “collaborative governance” or, more simply, “collaboration,” which is an increasingly prominent form of cooperation. Collaboration scholarship, though vast, seldom explicitly situates collaboration within the framework of polycentricity. By so doing, we can better understand how features of polycentric governance affect collaborative performance and how cooperation plays out in a polycentric governance system.

Collaboration involves multiple parties working together to pursue a goal that none could achieve alone. Participants representing government, nonprofit, and industry organizations, as well as individual stakeholders, work across boundaries to plan and carry out actions. Collaboration is particularly prevalent in efforts to address problems in complex social-ecological systems such as watersheds. Scholars have examined key elements of collaboration including authority, information, and resources. These three elements are instructive for understanding how collaboration plays out and for analyzing its performance.

B. Authority, Information, and Resources

Authority structures are important both within collaborative efforts and in the larger political context. Within collaborative efforts, authority structures are marked by lack of vertical hierarchies, at least in theory. Multiple stakeholders should participate together and share power in a collaborative setting. Power imbalances within a collaboration can stifle dialogue (Innes and Booher 2010) and bias decisions towards participants with greater resources (Purdy 2012). Thus authority within a collaborative effort greatly affects its performance.

Authority structures in the larger political context can hinder or incentivize collaboration. For example, Wegerich (2007) argues that attempts to collaboratively manage water use in Uzbekistan were limited by the lack of horizontal authority structures in the country. This is because authoritarian, vertical power structures put different jurisdictions at the same level (e.g., cities) in competition with one another for scarce resources from the top, rather than encouraging their cooperation. Authority structures outside the collaboration can also hinder collaboration in contexts such as the U.S., where stakeholders may choose to pursue victory in alternative venues including courts and legislation (Koontz et al. 2004). In other words, the authority structures in

these alternative venues encourage stakeholders to engage in more conflictual rather than collaborative behavior. In contrast, sometimes the threat of outside regulatory authority can incentivize parties to come together and seek collaborative solutions instead (Prokopy et al. 2014; Thomas 2003). This threat is likely in governance systems with overlapping authority, as multiple sources of potential regulation may motivate participants to seek collaboration as an alternative. Thus authority structures that provide multiple alternative venues, such as polycentric governance systems, can both encourage and discourage collaboration.

Information is the lifeblood of collaboration, as many such efforts focus on planning and information gathering. Through deliberation, participants share values, beliefs, and goals to forge common understanding and interests (Innes and Booher 2010; Brunner 2002). Not only is information sharing a key component of collaborative processes, but it also generates an important type of benefit, social learning (Innes and Booher 2010; Koontz 2014). Information and learning have been described in polycentric scholarship as critical for the success of polycentric governance, allowing citizens to hold public officials accountable and press for more effective and efficient policies. But collaboration scholars have also identified a disadvantage of information sharing: it can lengthen the time required to come to a decision, criticized as “all talk and no action” (Lubell 2004). This is especially prevalent as more and diverse stakeholders are engaged.

Studies of information flows in collaboration have identified several obstacles. The first obstacle is related to representation. Collaborative efforts typically fail to include all perspectives, such as racial and ethnic minorities, women, and lower socioeconomic class (Koehler and Koontz 2008; Purdy 2012). This lack of inclusion can limit the amount and breadth of information considered in decision making. Another obstacle is the science-nonscientist divide. Many collaborative efforts task scientists or other experts with analyzing data to share with non-experts, rather than co-producing knowledge together. This practice can reduce information exchange and understanding (Koontz et al., 2004; Innes and Booher 2010).

Resources are a key element in collaboration. Resources provide capacity for collaborating organizations and individuals to do their work together. The lack of resources to accomplish a desired goal on their own can incentivize stakeholders to join collaborative efforts, and the promise of funding can catalyze the formation of collaborative groups (Prokopy et al. 2014). In a review of the empirical literature on factors for success in collaborative watershed partnerships, Leach and Pelkey (2001) found the most frequently cited factor for success was adequate resources, a theme supported by a number of subsequent studies (Yaffee & Wondolleck 2003; Ryan & Klug 2005; Lurie & Hibbard 2008; Koontz and Newig 2014). Similarly, actors in polycentric governance systems cooperate in large part by sharing resources for joint production or to contract for services. In the U.S., millions of dollars are spent each year under the Clean Water Act for states to address nonpoint source water pollution through collaborative efforts (Hardy and Koontz 2008).

The source of resources is a crucial factor affecting collaborative partnerships. If resources come from just one or a few sources, collaborative partnerships are more fragile and susceptible to disbanding (Koontz and Sen 2013). Also, if a collaborative organization becomes beholden to one or a few sources, then it might face “mission creep” to align with the funders’ approaches rather than generating more creative solutions (Bidwell and Ryan 2006).

Taken together, authority, information, and resources shape cooperative efforts. This chapter examines cooperative interactions in a polycentric governance system, to explain how

authority, information, and resources affect cooperation across levels of governance. Moreover, it explores how we might measure the performance of such a system across several criteria.

II. Methods and Study Context

This chapter examines a complex case of collaborative watershed management, the Puget Sound Partnership. It focuses on key elements of polycentric governance systems including authority, information, and resources. Cooperative interactions occur across vertical and horizontal levels of government, as well as among special purpose and multiple purpose jurisdictions (Hooghe and Marks 2003). Analysis using the Institutional Analysis and Development (IAD) framework brings these elements into focus.

As described in the preceding chapter (Introduction to Section 2), the Institutional Analysis and Development (IAD) framework focuses attention on operational, collective choice, and constitutional levels of action (Ostrom 1990; Ostrom Gardner, and Walker 1994). The operational level is where actors carry out actions on the ground that directly affect people and the natural world. The collective choice level is where actors craft the set of rules that will steer operational level actions and develop plans that identify, prioritize, and strategize implementation of actions to improve environmental and social conditions. The constitutional level is where actors constitute the decision making body that will collectively make rules and develop plans.

Data for the analysis come from reports, guidelines, plans, meeting minutes, and interviews with key informants in the Puget Sound Partnership (Koontz and Thomas 2018), as well as a separate study of collaborative networks in the region (Scott and Thomas 2015).

A. Background: Puget Sound Partnership

Located in the state of Washington, The Puget Sound is one of the United States' largest estuaries, covering over 2,600 square kilometers. The broader Puget Sound Basin includes over 35,000 square kilometers of land draining into the Sound. Over 4.5 million people live in the basin, and the population is projected to grow to nearly 6 million by 2025. The health of the Puget Sound is threatened primarily by nonpoint-source pollution from stormwater runoff and urban development that alters natural habitat. In addition, stream flows and structural barriers threaten wildlife such as the iconic Chinook salmon.

The Puget Sound is governed within the context of the U.S. federal system. Water management is governed by the federal Clean Water Act, which gives states primary authority for regulating nonpoint-source water pollution. Two state agencies, the Washington Department of Ecology and the Washington Department of Fish and Wildlife, have regulatory authority related to the Puget Sound ecosystem. In addition, federal authority is important to water resources in the region through regulation of endangered species (including some salmon populations) and their habitat, as well as hydroelectric dam construction and licensing. Local jurisdictions are also involved, including county and municipal health departments, utility and wastewater special districts, conservation districts, and local ordinances regulating building construction, housing density, and impervious surfaces. Native American tribes also have jurisdiction and treaty rights relating to certain land areas as well as to salmon and other fish and shellfish in the Puget Sound.

Given the complexity of jurisdictions and actions affecting the health of the Puget Sound, the Washington State Legislature established The Puget Sound Partnership agency in 2007 to foster cooperation for Puget Sound recovery efforts. These efforts focus on improving ecological conditions for salmon, shellfish, and other marine wildlife as well as human well-being. One goal was to implement the Puget Sound Chinook Recovery Plan under the federal Endangered Species Act. The Puget Sound Partnership (PSP) develops biannual reports on the state of the Puget Sound, creates and monitors progress on indicators of ecosystem and human health, guides local organizations carrying out planning and actions, and updates its Action Agenda every two years to promote recovery of the Puget Sound ecosystem. It has given grants to 34 different organizations pursuing collaborative watershed restoration efforts (Scott and Thomas 2015). As a state agency, the PSP is funded by the State of Washington (\$7.5 million for 2015-2017) as well as the U.S. EPA National Estuary Program (\$9.9 million for 2015-2017) and the National Oceanic and Atmospheric Administration (\$1.4 million for 2015-2017).

B. Overlapping Authority and Multiple Decision Centres

By definition a polycentric governance system has decision centres with formal independence at the same time as overlapping authority. This does not mean that all centres have equal power, and thus it is important to examine which centres have jurisdiction over which actions.

As a coordinator and facilitator, the PSP does not have formal authority over other jurisdictions. Rather, it fosters cooperation by developing plans and funding strategies to incentivize others to undertake particular actions. PSP operates within an existing institutional landscape of federal, state, local, and tribal jurisdictions. These jurisdictions deal with endangered species protection (especially with regard to salmon), water pollution control, hydroelectric power production, water quantity planning, and northwest Puget Sound recovery. Their existence predated the Puget Sound Partnership efforts, and their authority overlaps with PSP authority, as described below.

Endangered species protection falls under the Federal government. Starting in 1991, 17 distinct population units of salmon in the Pacific Northwest were listed as endangered or threatened under the federal Endangered Species Act. Under the Endangered Species Act, the National Marine Fisheries Service (within the National Oceanic and Atmospheric Administration) must create conservation plans for species recovery. The State of Washington took action to recommend recovery plans involving local and regional stakeholders. The state Salmon Recovery Planning Act of 1998 created Lead Entities: watershed-based organizations funded to develop and manage salmon habitat protection and restoration projects. Each Lead Entity is comprised of a coordinator from a county, conservation district, tribe, or regional organization plus a technical advisory group and a citizens committee. Lead Entities recommend projects for funding to the Washington State Salmon Recovery Funding Board. The 25 Lead Entities are nested within eight geographical salmon regions across the state.

Water pollution control is regulated under the Clean Water Act of 1972. This federal law established U.S. Environmental Protection Agency regulatory authority over point sources of water pollution throughout the country, such as factories and wastewater treatment plants. It granted states authority to regulate nonpoint sources of pollution, such as stormwater and runoff from agricultural lands. Section 319 of the Clean Water Act provided a mechanism for states to receive federal funding to clean up waterways, and this funding is often used by states to promote locally-based collaborative watershed management (Hardy and Koontz 2008).

The state of Washington generates 30% of the nation's total hydroelectric power from dams throughout the state. These dams are subject to Federal Energy Regulatory Commission (FERC) licensing and relicensing requirements. As a condition of approval, FERC requires dam owners and operators to demonstrate how they will reduce the environmental impacts of dams, including fish passage. Since 1992 FERC has encouraged license applicants to collaborate with resource agencies, non-governmental organizations, and tribes to determine environmental impacts and mitigation measures (Ulibarri 2015).

Local collaborative water quantity planning was established under the State Watershed Planning Act of 1998. Under the law, public and private stakeholders were encouraged to form collaborative partnerships to assess water quantity, develop watershed management plans, and carry out measures to address local water issues. The "initiating governments" in a given watershed (all counties, the largest city, and the largest water supply utility) constituted a Planning Unit, which applied for funding to support watershed assessment, planning, and implementation within a Water Resources Inventory Area (WRIA). A WRIA may include all or portions of one or more counties, cities, utility districts, and tribal lands. Planning Units are empowered to make plan recommendations, but county legislatures retain sole authority to enact or adjust local ordinances. As of November 2013, watershed management plans had been adopted in 39 of the state's 65 designated Water Resource Inventory Areas (WRIAs) (Ecology 2013).

Another jurisdiction for Puget Sound Partnership recovery efforts comes from an initiative to improve the northwest portion of the Puget Sound. In 1998 Congress established the Northwest Straits Marine Conservation Initiative. Under this program, the Northwest Straits Commission provides funding and training for Marine Resource Committees (MRCs) in seven counties in the northwestern part of Washington, including some in the Puget Sound region. MRCs are comprised of citizen volunteers appointed by local elected officials. They collaborate with diverse community partners for restoration, conservation, and education projects.

Finally, Native American tribal jurisdiction comes from a 1974 Federal court case reaffirming native tribes' treaty fishing rights. Tribes are recognized as natural resource co-managers with the State of Washington and entitled to half of the fisheries. Besides negotiating with the state to set annual salmon harvest limits, tribes undertake land use and restoration projects to improve fish habitat and reduce stormwater pollution.

Taken together, overlapping jurisdictions exemplify the complexity of polycentric governance systems for social-ecological systems. Within the Puget Sound system, they provide authority, information, and resources that shape cooperation and the performance of collaborative efforts. Cooperation takes place at constitutional, collective choice, and operational levels, as described below, as the PSP attempts to steer the behavior of local organizations.

III. Results

A. Constitutional Level: Creating Local Integrating Organizations (LIOs)

In 2010, the Puget Sound Partnership (PSP) began constituting 9 Local Integrating Organizations (LIOs) throughout the region. LIO geographic boundaries were based on seven ecosystem-based "action areas" specified in the PSP enabling legislation, with two action areas requesting to be subdivided into two separate LIOs based on social and community boundaries (Puget Sound Partnership 2014). Ideas for LIO establishment came from task force meetings

and a public workshop, and eventually the Puget Sound Partnership and U.S. EPA together established the LIOs by setting aside \$75,000 annually for each of 9 LIOs. The PSP Leadership Council received proposals from potential LIOs and decided which to approve based on recommended criteria of “strong support from the local community and are broadly inclusive” combined with a “strong capacity to execute roles, responsibilities, and the scope of work” (Puget Sound Partnership no date). LIOs could be newly formed or existing organizations.

LIOs were charged with advising the PSP on local priorities in the Puget Sound Partnership Action Agenda, providing assistance to local groups conducting restoration work, implementing strategic actions in the Puget Sound Partnership’s Action Agenda, and evaluating progress on such implementation. Following PSP guidance, the LIOs are comprised of a variety of organizations, some of which have authority to make and enforce laws, regulations, and programs outside the LIO. Typically LIOs are led by an executive committee comprised of one elected county government official and one Native American tribal representative from each county and tribe operating in the geographic location of the watershed. These leaders have formal authority over multiple government functions of their home jurisdictions, but they do not have jurisdiction over the watershed as a whole. Within the LIO they have authority to oversee implementation of the LIO’s workplan and fiscal matters.

Since LIOs are situated within a polycentric governance system, the authority structures include some LIOs that fulfill roles in other decision centres, e.g., one LIO serves as the designated Lead Entity for salmon recovery under the state Salmon Recovery Planning Act, while another LIO is a Watershed Resource Inventory Area (WRIA) under the State Watershed Planning Act. Moreover, some LIO members represent other collaborative groups, which are themselves comprised of representatives from a variety of jurisdictions (for example, Marine Resource Committees).

At the constitutional level, the PSP’s authority in constituting the LIOs was based on cooperation rather than coercion. The PSP did not have the authority to require any LIOs to form, but it did have the authority to selectively award grants to proposed LIOs. In choosing which LIOs to create, the PSP also shaped how the LIOs structured themselves with regard to leaders and members. In other words, the PSP relied on resources (grants) to incentivize the voluntary formation of LIOs, who would cooperate with the PSP in ecosystem recovery planning.

B. Collective Choice Level: Ecosystem Recovery Planning

At the collective choice level, starting in 2015 the PSP encouraged LIOs to create 5-year Ecosystem Recovery Plans. Since polycentric governance systems like the one for Puget Sound recovery have multiple independent centres of decision making, plan creation was not accomplished by command. Rather it was incentivized by information and funding to steer LIOs to create Ecosystem Recovery Plans in the direction that PSP preferred. While LIOs rather than the PSP held the authority to develop their own plans, PSP influenced plan contents through information and resources.

Within each LIO, participants share information across local jurisdictions horizontally. This includes multiple purpose jurisdictions such as municipalities and counties, as well as special purpose districts such as marine resources committees, water resources committees, and salmon recovery Lead Entities. The inclusion of a wide range of stakeholders and

representatives in the LIOs who attend regular LIO meetings provides opportunities for such information exchange.

In addition, information flows vertically between the Puget Sound Partnership and the LIOs. In creating 5-year Ecosystem Recovery Plans, LIOs are guided by PSP to rely heavily on PSP-recommended documents to inform the plan (Koontz and Thomas 2018). This guidance is supported by workshops, meetings, and feedback on draft plans, with information flowing primarily top down (from PSP to LIOs) during plan creation. Subsequently, the completed local plans are sent up to the PSP, where the PSP intends to incorporate the information into basin-wide implementation plans, the action agenda, and regional scale adaptive management (Puget Sound Partnership 2016).

Resources, especially funding, were of critical importance for Ecosystem Recovery Plans. LIOs receive funds from the Puget Sound Partnership to support personnel. Each LIO receives \$75,000 annually for base coordination (e.g., hiring a coordinator). Also, each LIO received \$170,000 for one year (September 2015 to September 2016) to prepare Ecosystem Recovery Plans. These funds provided staffing for moving LIO planning forward as well as incentives for LIOs to follow PSP guidelines in crafting plans.

Overall, at the collective choice level, information and funding are powerful tools in shaping locally-created Ecosystem Recovery Plans. Across nine draft plans, each contained the same format, sections, and type of information, and each linked specifically to PSP priorities (Koontz and Thomas 2018). This kind of government-encouraged collaboration is common in collaborative watershed and other environmental management efforts (see Koontz, et al. 2004), and it fits the description of collaborative public management as steering rather than directing the actions of others (Keast et al., 2004; Milward et al., 1993). Without command authority, the PSP incentivized the creation of plans that reflected PSP priorities through its use of information and resources in cooperation with the LIOs.

C. Operational Level: Ecosystem Recovery Projects

At the operational level, LIOs are on the front lines of carrying out ecosystem recovery actions. They match resources with local actors to conduct project work ranging from data collection and monitoring to pollution cleanup and habitat improvement. Although LIOs lack authority to compel others to act, they encourage others through information use and resource sharing. In addition, the LIO itself carries out some activities such as outreach to local governments, holding public science forums, sending representatives to other collaborative efforts, and hosting workshops on restoration topics.

LIOs gather information to carry out restoration activities. This includes information about local contractors who can carry out the work, timelines, job specifications, and project monitoring. Meeting minutes indicate horizontal information sharing, such as between an LIO and several nearby watershed groups and a salmon Lead Entity group.

LIOs compete for grants to accomplish actions. In 2016 the USEPA National Estuary Program, working with the PSP, allocated \$100,000 for each LIO to fund local projects. In addition, the PSP recommends which LIO projects to fund towards regional goals, and guidelines indicate that the closer a grant proposal matches PSP goals, the more likely it is to receive funding. LIO meeting minutes indicate strategic positioning to frame their local priority actions in terms of PSP goals to increase funding chances.

In addition to funding through the PSP, LIOs seek funding from a variety of sources and help others seek funding for projects that align with LIO priorities. For example, the Snohomish Camano Eco Net organization funded by PSP notes that as Eco Net program funding phases out, they are considering how to integrate with a LIO in the region for funding. They foresee opportunities to partner with LIOs to apply for funding from the U.S. EPA National Estuary Program to implement strategic plan initiatives, as the U.S. EPA funding process shifts away from funding through the PSP and towards more funding directly to LIOs (Snohomish Camano 2015).

Overall, at the operational level, LIOs use information and resources to incentivize others to conduct ecosystem restoration activities. This parallels the PSP's use of information and resources to incentivize the LIOs to develop compatible ecosystem recovery plans at the collective choice level. Unlike the PSP, LIOs also conduct activities on the ground to restore ecosystem functions.

D. Summing Up: Authority, information, and resources across levels

In the Puget Sound case, the PSP develops an overarching mission and priorities for the broader region and cooperates with LIOs to encourage the creation and implementation of locally relevant plans to address these regional priorities. This cooperative approach involves authority, information, and resources across constitutional, collective choice, and operational levels.

Authority to act in Puget Sound restoration efforts is shared across multiple centres in the region. The existence of multiple jurisdictions (local, state, and Federal) and problems (water pollution, water quantity, endangered species, hydroelectric power) means no single centre can command compliance. At the constitutional level, the Puget Sound Partnership constituted 9 LIOs to be comprised of local actors representing diverse interests and organizations. The creation of LIOs was based not on authoritative coercion, but on incentives from grant funding. At the collective choice level, LIOs held the authority to develop their own plans to reflect local circumstances, but were incentivized through information and funding to follow PSP guidelines. At the operational level, LIOs lacked authority to compel others to carry out actions, but LIOs themselves carried out some restoration activities or incentivized others through grant funding recommendations.

Information flow differs across levels of analysis. At the collective choice level, LIOs engaged in ecosystem recovery planning using information shared horizontally among the organizations of their diverse membership, as well as vertically from the PSP. The influence of the PSP is particularly evident in comparing across the nine plans, which were similar in format and content, and which drew largely on the same three technical reports suggested by the PSP. At the operational level, LIOs gathered time- and place- specific information to carry out restoration activities. This information was routinely shared horizontally with other entities, but vertical information sharing was less prevalent; LIOs did not rely much on PSP as a source of information for conducting operational level activities.

Resources have been vital to encourage cooperation at all levels. At the constitutional level, the LIOs were established by approval of the PSP, which is funded by the State of Washington and two federal agencies, USEPA and NOAA. The PSP developed criteria, issued calls for proposals and awarded certain proposed LIOs funding to hire a coordinator. At the collective choice level, LIOs received funds from the PSP to develop an Ecosystem Recovery

Plan, as well as additional funds to hire consultants, collect data, and analyze data. These funds were crucial to planning efforts. At the operational level, funding from the PSP and other sources is critical for carrying out actions.

Incentives for cooperation in this case stem largely from resources. LIOs produce locally-relevant ecosystem restoration plans that are in sync with Puget Sound Partnership goals and priorities because they receive funding and training to do so. Moreover, LIOs whose proposed actions match Puget Sound Partnership priorities have a better chance to receive funding from the U.S. EPA. However, some LIO participants have expressed discouragement that there isn't more funding available for the projects they have planned and prioritized, feeling that the incentive to continue their participation is no longer worth their while (LIO 1 2016).

E. Performance

Governance systems can be assessed on a variety of performance criteria. Public policy scholars have long been interested in performance measures such as efficacy, efficiency, coherence, and accountability. Polycentricity and collaboration scholars have examined these and additional performance measures, including representation, social learning, adaptability and network building. These performance measures are described in more detail in chapter 8 and applied to the PSP case below.

Efficacy is a measure of the degree to which an effort achieves desired outcomes. This is perhaps the most important performance measure, and also the most challenging to obtain. Its measurement requires baseline data, the ability to control for confounding factors, and long time horizons for social and ecological processes that unfold over time (Koontz and Thomas 2006). For the PSP, while a number of restoration projects have been completed, it is too early to tell whether and how much the PSP's efforts in cooperation with LIO plans and actions cause Puget Sound recovery. The most recent biannual progress report from the Puget Sound Partnership, the *State of the Sound 2017*, finds that thousands of restoration projects have been completed since the agency's establishment. Nevertheless, most of the PSP's 25 ambitious human and environmental recovery goals set for 2020 are not likely to be met (Cochrane 2017). To date there have been gains in estuary, floodplain, riparian, and shoreline habitat, but forest habitat continues to be lost. Populations of orcas, Chinook salmon, and herring continue to decline. Shellfish harvest areas have increased but overall water quality continues to decline. The economic health of natural resource based industries remains strong. Overall, this is a mixed record of success compared to baseline values when the agency began, with some system components improving, others declining, and many remaining steady.

Cooperation in a polycentric system is characterized by the potential for high transaction costs, reducing efficiency. Compared to a centrally controlled governance structure, cooperation can occur both horizontally and vertically, which gives actors greater possibilities. This can increase search costs and take time to unfold, as actors navigate myriad sources of authority, information, and resources. It can duplicate collaborative interactions, when multiple forums are present to provide the same function in the same location. For example LIO 2 includes representatives from several organizations that are themselves collaborative forums. And it can reduce efficient use of resources and may lead to a zero-sum game of taking resources away from other collaborative forums (Scott and Thomas 2015; Scott 2016).

Although such cooperation can reduce efficiency, on the other hand it can foster adaptability and persistence of efforts in the system. One reason is that the absence of funding

from one source does not necessarily lead to collapse of the effort, but rather entrepreneurial groups can seek cooperation with other entities. LIO meeting minutes indicate interactions with a wide range of stakeholders and outside organization to help the LIOs accomplish their goals, adapting strategies and partners to pursue opportunities. This is in line with the Koontz and Sen (2013) finding that collaborative groups may persist beyond the end of program funding by seeking to align with other funding sources. Another benefit of bringing multiple decision makers together is that, although duplication of effort may occur, adaptability can increase as participants return to their home jurisdiction with different understandings (Korfmacher 1998), and they can find opportunities to work together with other jurisdictions as needs arise (Koontz and Newig 2014). The trade-off between economic efficiency and adaptability in systems has been highlighted by resilience scholars (Walker 1992; Korhonen and Seager 2008), who point out that having duplicate efforts in a system is not economically efficient but does provide redundancy in the face of system shocks. Cooperation in polycentric governance systems such as the Puget Sound recovery efforts exhibits this trade-off.

Although cooperation can be effective in encouraging action, it requires the government to give up control. Unlike in a hierarchical structure where higher level authorities can demand compliance, a polycentric system involves different amounts of action across the landscape. This is a benefit in terms of allowing localities to tailor actions to local circumstances, and a drawback in that it can raise questions of accountability for failure to achieve system-wide goals. Moreover, some localities will not take effective actions to solve the problems, or may export harm to other localities. Local control without cooperation is also known as fragmentation, where individual entities do not take each other into account. For collective goods such as clean water and habitat, fragmentation runs the risk of not solving such problems. In contrast, cooperation in a polycentric system allows the possibility of coordination across spatial scales to bring coherence in addressing problems that are interconnected across localities. This is the function that the PSP attempts to fill by bridging the overall Puget Sound restoration efforts (Action Agenda) with local priorities for actions on a smaller spatial scale. Such bridging is not always successful, and different goals between the PSP and localities make an imperfect alignment. But cooperation as structured by the PSP does bring in information that is incorporated into plans to help align local actions with system-wide needs, increasing coherence across levels.

An important consideration for measuring the performance of cooperation is the representation of diverse interests at the collaborative table. Most collaboration scholars have found that including diverse stakeholders in a cooperative effort can bring more complete information for consideration, encourage stakeholders to support the plan, increase social learning, and build social capital that may be used for tackling other societal problems. At the same time, inclusion of more diverse interests can reduce process efficiency, lead to “lowest common denominator” recommendations that are agreeable to all but not dramatic enough to be effective, and delay action in the face of urgent problems. In the Puget Sound recovery efforts, the PSP worked with LIOs to create diverse representation. Most LIOs had at least a dozen members representing a wide range of organizations such as county elected officials, tribes, environmental nonprofit organizations, county public health departments, county natural resource departments, conservation districts, marine resources committees, salmon recovery Lead Entities, university researchers, Water Resource Inventory Areas, and municipal officials. This diverse representation was fostered by the PSP’s authority to provide resources to LIOs that agreed to include diverse representation.

Another performance measure for cooperation is social learning. Cooperation by its very nature features interactions among different stakeholders, and when these stakeholders work together to develop plans and take actions they are expected to learn about ecological, social, political, and process realities (Koontz 2014; Muro and Jeffrey 2012). This learning depends on information sharing, which is done vertically and horizontally in the Puget Sound system. Unfortunately learning data have not been collected for this case, so the level of social learning is not known.

Cooperation in polycentric governance in a given action arena, such as Puget Sound ecosystem restoration, is likely to exist alongside multiple jurisdictions, some of which may not be polycentric. In other words, the authority structure in these jurisdictions may be very different and this difference may affect interactions within the given jurisdiction. For example, much of the clean water efforts in the Puget Sound initially stemmed from an existing coercive governance authority for species protection under the Endangered Species Act (ESA). The listing of salmon and threat of additional listings in the future under the ESA spurred state level efforts to encourage local cooperation. The ESA is a hierarchical structure where an agency, backed by the courts, has the power to unilaterally prohibit state, local, and private actions that would harm a listed species. This co-existing jurisdiction can catalyze cooperation, as it has in the Puget Sound, by creating a less desirable (in the minds of participants) alternative to cooperation.

The overlapping decision centres can also affect network building. Scholars in the ecology of games have examined the relationship between old and new networks of individuals in a crowded field of network opportunities (Lubell et al., 2010; Berardo and Scholz 2010; Henry et al. 2011; Prell et al. 2009). A study of Puget Sound organizations collaborating through the Puget Sound Partnership indicated that such participation enhances network ties between organisations, but such enhancement diminishes for those organisations already interacting with each other in other collaborative venues (Scott and Thomas 2015). An implication for polycentricity is that the existence of multiple overlapping decision centres shapes cooperation, as polycentric systems presumably feature more interactions in multiple venues than do other kinds of systems. This likely leads to diminishing returns, where investment in new collaborative forums yields smaller returns when there are pre-existing collaborative forums and cooperative relationships. In fact members in one LIO have recently proposed to dissolve their LIO and instead allow their work to continue in alternate decision centres in order to avoid duplication and burnout (LIO 1, 2016).

The performance measures discussed above are shown in Table 2, which also summarizes the degree to which these measures were affected by authority, information, and resources. Results from preliminary data suggest the PSP has performed well on most, but not all, of these measures.

Table 2: Measuring Performance of Cooperative Interactions in the Puget Sound Case

Measure	Link to authority, information, and resources	Results ^a
Efficacy	<u>Authority</u> to coerce is weak but <u>resources</u> are available to incentivize some actions	Mixed results to date
Efficiency	<u>Resource</u> use is subject to duplication and transaction costs	Low

Coherence	<u>Information</u> leads to alignment between local actions and system-wide recovery goals	High
Accountability	Weak <u>authority</u> to coerce means it's hard to hold a centre accountable	Low
Representation	Constitutional level PSP <u>authority</u> to decide who gets resources	High
Social learning	Learning depends on <u>information</u> sharing	No data
Adaptability	Multiple sources of <u>resources</u> promotes ability of centres to pursue goals in the face of resource reductions from a given source	High
Network building	<u>Information</u> sharing across LIOs and <u>resources</u> given to local organisations increases networks for some centres, but little network building for centres with large existing networks	High for centres with few existing network ties, low for other centres

^aRated as high, low, or mixed from the available case evidence (e.g., reports, meeting minutes, plans, and published studies)

IV. Conclusion

This chapter has described how cooperation plays out in polycentric governance systems, focusing specifically on authority, information, and resources. Using the example of Puget Sound ecosystem restoration efforts, particularly the Puget Sound Partnership and Local Integrating Organizations, this chapter has examined constitutional, collective choice, and operational levels of action and discussed performance measures.

The PSP constituted nine LIOs to match local with basin-wide priorities, as a way to integrate restoration actions across scales. In order to promote restoration efforts that would be effective at local and basin scales, the PSP encouraged local planning tied to PSP priorities. Thus a polycentric governance system allowed dispersed authority to be steered by information and funding via cooperative interactions. Results thus far indicate that LIOs have created locally-relevant Ecosystem Recovery Plans tied to PSP's Action Agenda priorities, although it is too early to tell whether these plans will eventually translate into effective outcomes.

Examining the performance of cooperation in polycentric governance systems highlights several theoretical insights. First, cooperation is a means to navigate the complex array of decision centres to find appropriate information and resources, but it can incur high transaction costs. These transaction costs are likely increased in pursuit of diverse interest representation. At the same time, cooperation can provide adaptability in the face of change. In addition, cooperation is well-suited to certain biophysical contexts, such as nonpoint-source pollution, where biophysical systems don't align with political boundaries, and where coercion is politically infeasible. Also, cooperation entails government steering rather than controlling,

which can raise questions about accountability. Such steering includes the possibility that local efforts can be steered into alignment with system-wide goals.

The presence of multiple overlapping decision centres affects cooperation in polycentric governance systems, both positively and negatively. In the Puget Sound, the hierarchical authority of the Endangered Species Act sparked collaborative efforts, and multiple grant opportunities were available to fund restoration through federal, state and local programs. However, the existence of additional collaborative efforts outside the PSP reduced the network gains achieved among stakeholders participating in LIOs.

Policy makers seeking to reach goals via collaboration should consider the advantages and disadvantages of funding existing versus new local organizations. The PSP decided to include both types of groups. Funding an existing group to take on the LIO role could benefit the PSP by having existing organizations up and running more quickly (Sabatier et al. 2005), but a potential downside is that the existing organizations may not embrace the PSP's mission fully because they have pre-existing missions (e.g., Bidwell and Ryan 2006).

Measuring performance of cooperation in a polycentric system should include attention to multiple dimensions. These dimensions include some relevant for all forms of interactions in polycentric governance systems, and others particular to cooperation (as opposed to conflict and conflict resolution, and competition). Understanding how authority, information and resources affect actions and performance, and the trade-offs among performance measures, will better position policy makers to make decisions about which policy strategies to use in which circumstances.

Cooperation is likely more prominent in polycentric governance systems than in monocentric or decentralized systems because the shared authority and interconnectedness across multiple scales opens up more potential partners – both horizontal and vertical. In monocentric systems, cooperation is likely to be reduced due to fewer horizontal power centres and their tendency to compete with each other (Wegerich 2007). In decentralized systems, fragmentation may reduce opportunities for interactions conducive to cooperation. Polycentric governance systems occupy a middle ground, where both vertical and horizontal power centres exist, and these centres frequently interact with each other. Of course polycentric governance systems are not just about cooperation. Often they involve conflict and conflict resolution, and competition. It is to these types of interaction we turn to in the next chapters.

REFERENCES

- Berardo, R., & Scholz, J.T. (2010). Self-organizing policy networks: Risk, partner selection, and cooperation in estuaries. *American Journal of Political Science*, 54 (3), 632–649.
- Bidwell, R.D. and C.M. Ryan. 2006. Collaborative Partnership Design: The Implications of Organizational Affiliations for Watershed Partnerships. *Society & Natural Resources: An International Journal*, 19(9), 827-843.
- Biedenweg, K., A. Hanein, K. Nelson, K. Stiles, T. Wellman, J. Horowitz, & S. Vynne. 2014. Developing Human Wellbeing Indicators in the Puget Sound: Focusing on the Watershed Scale. *Coastal Management* 42:374-390.
- Bingham, Lisa Blomgren. 2009. Collaborative Governance: Emerging Practices and the Incomplete Legal Framework for Public and Stakeholder Voice. *Missouri Journal of Dispute Resolution*, no. 2: 269–326.

- Brunner, Ronald D. "Problems of Governance." In Brunner, Ronald D., Christine H. Colburn, Christina M. Cromley, Roberta A. Klein, and Elizabeth A. Olson (eds.) *Finding Common Ground: Governance and Natural Resources in the American West*. New Haven: Yale University Press. 1-47.
- Fiorino, Daniel J. 1995. Making environmental policy. Univ of California Press.
- Fraser, David A., Joseph K. Gaydos, Erik Karlsen, and Michael S. Rylko. 2006. "Collaborative Science, Policy Development, and Program Implementation in the Transboundary Georgia Basin / Puget Sound Ecosystem." *Environmental Monitoring and Assessment* 113:49-69.
- Hardy, Scott D. and Tomas M. Koontz. 2008. "Reducing Nonpoint Source Pollution through Collaboration: Policies and Programs across the U.S. States." *Environmental Management* 41(3):301-310.
- Henry, A.D.; Lubell, M.; & McCoy, M. (2011). Belief systems and social capital as drivers of policy network structure: The case of California regional planning. *Journal of Public Administration Research and Theory*, 21(3), 419–444.
- Hirschman, Albert O. 1970. *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Cambridge, MA: Harvard University Press.
- Hooghe, Liesbet and Marks, Gary. 2003. Unraveling the central state, but how? Types of multi-level governance. *American political science review*, 97(02), pp.233-243.
- Keast, R., Mandell, M.P., Brown, K., and Wolcock, G.W. (2004). Network structures: Working differently and changing expectations. *Public Administration Review*, 64 (3), 363-371.
- Kemmis, D. (1990). *Community and the politics of place*. Norman: University of Oklahoma Press.
- Koontz, T.M., Steelman, T.A., Carmin, J., Korfmacher, K.S., Moseley, C., and Thomas, C.W. (2004). *Collaborative environmental management: What roles for government?* Washington, D.C: Resources for the Future Press.
- Koontz, Tomas M. 2014. "Social learning in collaborative watershed planning: The Importance of Process Control and Efficacy" *Journal of Environmental Planning and Management* 57(10): 1572-1593. DOI: 10.1080/09640568.2013.820658
- Koontz, Tomas M., and Jens Newig. 2014. "From Planning to Implementation: Top Down and Bottom Up Approaches for Collaborative Watershed Management." *Policy Studies Journal* 42(3):416-442.
- Koontz, Tomas M. and Craig W. Thomas. 2006. "What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management?" *Public Administration Review* 66 (6 supplement): 111-121.
- Koontz, Tomas M., and Craig Thomas. 2018. "Use of Science in Collaborative Environmental Management: Evidence from Local Watershed Partnerships in the Puget Sound," *Environmental Science and Policy* 88:17-23.
- Korfmacher, Katrina Smith. 1998. Invisible successes, visible failures: Paradoxes of ecosystem management in the Albemarle-Pamlico estuarine study. *Coastal Management* 26: 191-211.
- Korhonen, J. and Seager, T.P., 2008. Beyond eco-efficiency: a resilience perspective. *Business Strategy and the Environment*, 17(7), pp.411-419.
- LIO 1. 10/3/2016. Memo: "A Proposal to Restructure"
- Lubell, Mark, Adam Douglas Henry, and Mike McCoy. 2010. Collaborative Institutions in an Ecology of Games. *American Journal of Political Science* 54(2): 287-300.

- Lurie, S. and M. Hibbard. 2008. Community-Based Natural Resource Management: Ideals and Realities in Oregon Watershed Councils. *Society & Natural Resources: An International Journal*, 21(5), 430-440.
- Mettler, Suzanne. 2016. The Polyscape and the Challenges of Contemporary Politics to Policy Maintenance. *Perspectives on Politics* 14(2): 369-390.
- Milward, H. B., Provan, K. G., & Else, B. A. (1993). What does the hollow state look like? Public management: The state of the art. San Francisco: Jossey-Bass, 309-32.
- Muro, Melanie, and P. Jeffrey. 2012. "Time to talk? How the structure of dialog processes shape stakeholder learning in participatory water resources management." *Ecology and Society* 17(1):3. <http://dx.doi.org/10.5751/ES-04476-170103>
- Prell, C., Hubacek, K., & Reed, M. (2009). Stakeholder analysis and social network analysis in natural resource management. *Society and Natural Resources*, 22(6), 501–518.
- Provan, K.G., & Wegerich. (2007). Chapter 14: Multiplatform platforms in Uzbekistan. In J. Warner (Ed.), *Multi-stakeholder platforms for integrated water management* (pp. xvi, 281). Aldershot, England: Ashgate.
- Puget Sound Partnership. No date. "Working Together in Action Areas: Structure and Roles, Agenda Item #04." http://www.psp.wa.gov/downloads/LC2010/0310/04_Action_Areas-structureandroles.pdf accessed 6/23/16.
- Puget Sound Partnership. March 2014. Briefing Memo: "LIO Organization History".
- Puget Sound Partnership. 10/16/2016. "Puget Sound Partnership Understanding of the Value of Local Integrating Organizations Regarding LIO Ecosystem Recovery Plans."
- Cochrane, Cathy (ed). *State of the Sound 2017*. Puget Sound Partnership. Olympia, WA.
- Purdy, J. M. (2012). A Framework for Assessing Power in Collaborative Governance Processes. *Public Administration Review*, 72(3), 409–417. <http://doi.org/10.1111/j.1540-6210.2011.02525.x>
- Ryan, C.M. and J.S. Klug. 2005. Collaborative Watershed Planning in Washington State: Implementing the Watershed Planning Act. *Journal of Environmental Planning and Management*, 48(4), 491-506.
- Salamon, Lester M. 2002. The New Governance and the Tools of Public Action: An Introduction. In Salamon (ed.) Salamon, L.M. and Elliott, O.V., *The tools of government: A guide to the new governance*. Oxford University Press. pp. 1-47.
- Scott, Tyler A. 2016. "Analyzing Policy Networks Using Valued Exponential Random Graph Models: Do Government-Sponsored Collaborative Groups Enhance Organizational Networks?." *Policy Studies Journal* 44(2):215-244.
- Scott, Tyler, and Craig Thomas. 2015. "Do Collaborative Groups Enhance Interorganizational Networks?." *Public Performance & Management Review* 38(4): 654-683.
- Snohomish Camano. 2015. ECO Net Quarterly Meeting notes from May 28.
- Ulibarri, Nicola. 2015. Collaboration in Federal Hydropower Licensing: Impacts on Process, Outputs, and Outcomes. *Public Performance & Management Review* 38(4): 578-606, DOI:10.1080/15309576.2015.1031004
- Walker, B.H., 1992. Biodiversity and ecological redundancy. *Conservation biology*, 6(1), pp.18-23.
- Weber, E. P. (1998). *Pluralism by the rules: Conflict and cooperation in environmental regulation*. Georgetown University Press.
- Wegerich, K. 2007. Against the conventional wisdom: why sector reallocation of water and multi-stakeholder platforms do not take place in Uzbekistan. *Multi-stakeholder platforms*

for integrated water management, pp.235-244. In Warner, Jeroen (ed.), *Multi-Stakeholder Platforms for Integrated Water Management*. Bodmin, GB: Ashgate.

Wondolleck, J. M., and Yaffee, S. L. (2000). *Making collaboration work: Lessons from innovation in natural resource management*. Washington, DC: Island Press.

Yaffee, S.L. and J. Wondolleck. 2003. Collaborative ecosystem planning processes in the United States: Evolution and Challenges. *Environments*, 31(2), 59-72.