

INSTITUTIONS FOR INTERSTATE WATER RESOURCES MANAGEMENT<sup>1</sup>

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**ABSTRACT:** This paper evaluates alternative approaches to management of interstate water resources in the United States (U.S.), including interstate compacts, interstate associations, federal-state partnerships, and federal-interstate compacts. These governance structures provide alternatives to traditional federalism or U.S. Supreme Court litigation for addressing problems that transcend political boundaries and functional responsibilities. Interstate compacts can provide a forum for ongoing collaboration and are popular mechanisms for allocating water rights among the states. Federal-interstate compacts, such as the Delaware River Basin Compact and federal-state partnerships, such as the National Estuary Program, are also effective and complementary approaches to managing water resources. However, all of these approaches can only make modest improvements in managing water resources given the complicated and fragmented nature of our federalist system of government.

(KEY TERMS: water resources management; water policy; planning; rivers/streams; Federalism; estuaries.)

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## INTRODUCTION

Over the course of the past century, states and the federal government have struggled to create lasting and effective institutional arrangements to manage interstate water resources. Water and federalism are a complicated mix as water flows through the hydrologic cycle without regard to political boundaries. The physical boundaries of river basins do not coincide with the geographic boundaries of political jurisdictions. The management of interstate water resources is complicated by the multiple, conflicting, and overlapping functions and interests of federal and state governments, and is further complicated by conflicting regulatory

authority and policy priorities between different federal agencies.

In the dual sovereignty system of American federalism, primary responsibility for water management rests at the state level, while the federal government imposes regulations and manages resources under its Commerce Clause jurisdiction. Federal regulations, such as the Clean Water Act of 1972, can place heavy burdens on state and local governments to achieve compliance. Direct federal actions (such as flood control projects by the Army Corps of Engineers) can significantly impact state management of its own water resources. As a matter of coordinated federal policy, however, there is simply no coherent guidance for the management of transboundary water resources. While the federal government historically has

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deferred to states regarding allocation of water resources and has been reluctant to usurp state sovereignty, it still maintains a strong role in water resource regulation and development for federal purposes (Sherk, 2005).

The history of interstate water management policy demonstrates policy makers' attempts to negotiate a balance between conflicting federal and state interests and to establish successful state-state and federal-state relationships. Recent publications on federalism and the history of environmental policy (Wondolleck and Jaffee, 2000; Scheberle, 2004) and water policy (Gerlak 2006; Scholz and Stiffl, 2005) have documented an emergent pattern in federal policy-making away from command and control type regulation toward more pragmatic and collaborative processes. However, the research on water policy (Gerlak 2006; National Research Council 1999; Scholz and Stiffl, 2005) has continued to question the best organizational structure for implementing successful management of interstate water resources.

This paper contributes to ongoing research on water policy and interstate water resource management by examining institutional approaches to coordinating state and federal actions (as such, this paper leaves aside institutions such as the Tennessee Valley Authority – a federal agency, power authorities, and international commissions) and focusing on the effectiveness of each institutional arrangement at overcoming conflicting interests and limitations of fragmented governance. We explore alternative governance mechanisms for addressing the complications of federalism and different approaches to collaboration and dispute resolution. States have relied on United States (U.S.) Supreme Court (Supreme Court, Court) litigation, interstate compacts, and informal associations. The federal government's efforts have ranged from the ambitious Title II river basin commissions under the Water Resources Planning Act, to federal-state partnerships such as the National Estuary Program. Federal-interstate compacts provide a legally binding mechanism for managing water allocations and for the joint exercise of sovereign power by the federal government and the states. The federal-state partnerships and federal-interstate compacts offer complimentary approaches to solving interstate water management issues.

#### STATE APPROACHES TO INTERSTATE WATER MANAGEMENT

States historically have had three options to manage conflicts across state lines absent a congressionally

mandated allocation formula: litigation in the Supreme Court, formal interstate compacts, and informal associations. These options are not distinct; however, while litigation often has led to the creation of interstate compacts, it also has been used by western states to enforce compact provisions. The Supreme Court is the court of original jurisdiction in claims of one state against another (U.S. Const. art. III, §2, cl.2). Over the last 100 years, there have been a number of high profile water resources cases brought to the Supreme Court, including *New York v. New Jersey* (1921), *New Jersey v. New York* (1954), and *Arizona v. California* (1963). In the arid western states, Supreme Court litigation plays a continuing role in evolving water policy as in *Oklahoma & Texas v. New Mexico* (1991) and *Nebraska v. Wyoming & Colorado* (1995).

Supreme Court adjudication has evolved under the doctrine of equitable apportionment (Leitman 2005; Muys, 2001; Sherk, 2005). The Court consistently has affirmed that “the equitable apportionment of appropriated rights should turn on the benefits, harms, and efficiencies of competing uses” (*Colorado v. New Mexico*, 467 U.S. at 323, 1984). Even under the work of “special masters,” a Court appointed water expert, determination of a state's equitable share of water resources is fraught with complex technical, factual, legal and political considerations. For this reason, the Supreme Court consistently has urged parties to settle their disputes by “mutual accommodation and agreement” (Sherk, 2005; quoting *Oklahoma & Texas v. New Mexico* (1991)). In cases such as *Vermont v. New York* (1974) the Court specifically recommended that states proceed with an interstate compact.

Because Supreme Court decrees are static they can become unworkable and unable to meet changing conditions. For example, the Supreme Court decree of 1954 in *New Jersey v. New York* fixed the rate of New York City's diversion of water from the Delaware River Basin (DRB) at an average rate not exceeding 800 million gallons per day (mgd), conditioned upon compensatory releases to maintain downstream flow-rates during periods of low flow in the Delaware River. According to the decree, the flow of the Delaware River at Montague, New Jersey must be sustained at no less than 1,750 cubic feet per second (cfs) in order to protect instream uses, control salinity in the Delaware Estuary, and provide for municipal and industrial water supply for downstream users. However, since the 1960s, the terms of the 1954 decree can no longer be met during drought periods. Fortunately, the Delaware River Basin Commission (DRBC), a federal-interstate compact commission, has as one of its purposes addressing these changing water needs and conditions. The compact

authorizes the DRBC to declare a drought emergency and to modify the terms of the 1954 decree (Featherstone 1999).

Interstate compacts have advantages over Supreme Court litigation, and often result in solutions that focus on states' mutual interests. Interstate water compacts can include the establishment of a commission responsible for negotiating and administering the allocation. The commission also can provide a forum for ongoing collaboration and negotiation and allow its parties to adapt to changing water needs and political and social concerns. Interstate compacts are contracts between two or more states to join in conducting one or more operations in which the states have interests, and are popular mechanisms for allocating rights and responsibilities among participating states. The U.S. Constitution requires Congressional consent to all interstate compacts (U.S. Const. art. I, §10, cl.3), and Congressional consent makes a compact federal law (Sherk, 2005). Compacts between states cover nearly every conceivable policy arena, and the Council of State Governments (2005) counted at least 200 active interstate compacts. Notable examples include the Northeast Dairy Compact, the Port Authority of New York and New Jersey, and the many bridge and tunnel authorities between states.

In terms of interstate water compacts, the U.S. Fish and Wildlife Service (2005) counted 38 [for clarification, the U.S. Fish and Wildlife Service include in its count of interstate compacts the four Federal-Interstate Compacts. The Alabama-Coosa-Tallapoosa (ACT) and Apalachicola-Chattahoochee-Flint (ACF) are included in the Interstate Water Apportionment category and the DRBC and Susquehanna River Basin Commission (SRBC) are included in the Water Resources and Flood Control category. In addition the interstate compact for the Connecticut River is included in the Interstate Water Apportionment category; however, the purpose of the Connecticut River Atlantic Salmon Compact (Public Law 98-138 passed by Congress in October 1983) is the restoration of Atlantic Salmon in the Connecticut River Basin and not water allocation.] interstate compacts dealing with allocation, pollution control, flood control, and management of water resources. McCormick (1994) indicated that 22 compacts apportion the waters of the western states. Generally, compacts among western states concentrate on water allocation issues, while those among eastern states focus on water quality or flood control.

Most compacts in the west set allocation formulas for limiting storage or flow. In the storage allocation approach, limitations are placed on the amount of water that can be stored by an upstream state. The downstream state assumes the risk of water supply,

as it will receive only what is in excess of the upstream storage allowance, plus water originating between upstream demands and the state boundary (McCormick 1994). The other approach involves dividing the actual flow of a river system, which is carried out primarily through allocating water based upon percentage of flow. Once the states have agreed on the percentage and the points at which the flow is to be measured, the risk of a dry year is borne proportionately (McCormick 1994).

Litigation has been relied upon to enforce compact provisions in the western states. The experiences of the compacts for the Pecos River in New Mexico and Texas, and the Republican River in Colorado, Nebraska and Kansas are noteworthy examples (Stein, 2007).

Many, but not all, compacts involve compact commissions to administer the terms of the agreement and not all compact commissions are structured the same. For example, the Colorado River Compact does not utilize a commission, while the Upper Colorado River Basin Compact does (Kenney 1995). Historically, western states have been less willing to cede authority to third-party commissions (McCormick 1994). A notable exception is the Tahoe Regional Planning Agency (TRPA), a compact commission of California and Nevada. The TRPA Compact (1980) gives the agency the authority to adopt environmental quality standards, issue permits, and enforce land-use ordinances to meet these standards to protect the Lake Tahoe Basin.

The structure of most compact commissions is comprised of state commissioners, the participating state governors or their appointees, and often features a federal commissioner or advisor. Within this framework the structure of compact commissions vary wildly ranging from one to five representatives from each state (Utton Center for Transboundary Resources, 2005). Voting is usually based upon unanimity provisions with the federal commissioner as a nonvoting member (Kenney 1995).

Furthermore compact commissions' budgets and staffs are highly variable. Compact commissions with supporting technical and administrative staffs are generally found in eastern states: the Interstate Commission on the Potomac River Basin (ICPRB); Interstate Environment Commission (IEC, covers New York, New Jersey, and Connecticut); New England Interstate Water Pollution Control Commission (NEIWPCC); and the Ohio River Valley Sanitation Commission (ORSANCO). These four compact commissions concentrate planning efforts on water quality improvements and receive funding from the U.S. Environmental Protection Agency (USEPA). Table 1 presents a comparison of the staff and revenues of interstate commissions, indicating no clear

TABLE 1. Comparison of Interstate Commissions, Staff, and Revenues.

Interstate Commission	Commissioners	Staff	Revenues		
			Total (\$1,000)	All Federal Programs/ Grants (\$1,000)	EPA (\$1,000)
IEC <sup>1</sup>	3 states, 5 commissioners each	17	1,087	211	211
ICPRB <sup>2</sup>	4 states and the District of Columbia, 3 commissioners each and 3 federal commissioners	23	2,430	1,299	983
NEIWPCC <sup>3</sup>	7 states, 5 commissioners each	13	8,563	5,727	NA
OSANCO <sup>4</sup>	8 states and federal government, 3 commissioners each	25	4,283	2,323	2,323

Sources: <sup>1</sup><http://www.iec-nynjct.org>, *Annual Report 2005*, accessed May 16, 2006; <sup>2</sup><http://www.potomacriver.org>, *Compact Creating the ICPRB and Annual Report 2004*, accessed May 16, 2006; <sup>3</sup><http://www.neiwpcc.org>, *2004 Fiscal Annual Report*, accessed May 16, 2006. The annual report does not provide a breakdown of federal funding by source and amount; <sup>4</sup><http://www.orsanco.org>, *OSANCO Compact and Search for Solutions through Science, Annual Report 2004*, accessed May 16, 2006.

pattern or policy rationale for different staffing or funding levels.

While interstate compacts have become a favored means of resolving interstate disputes and achieving coordination, there are at least three factors that limit their ability to achieve comprehensive water resource management. First, the majority of compacts have only a single focus on water allocation and do not usually include water quality or habitat protection issues. Second, compacts that require unanimous agreement among the members often result in watered-down decisions (Donahue 1987). Consequently, most compact commissions concentrate mainly on the collection and dissemination of basin wide information among parties, and act as advocates in dealings with the federal government (Muys, 1971).

Finally, as Muys (2001) noted, many of the water allocation compacts are over 40 years old making it unlikely that they are able to address federal laws and federal programs, which have increased the federal government's involvement in and claims on water resources in the past 30 years (McCormick 1994; Muys, 2001). Furthermore, Sherk (2005) demonstrated that federal water and environmental regulations over the last 30 years make it nearly impossible for states to enter into workable allocation formulas to which the federal government could give consent.

"What are the water requirements of these species protection statutes?...What quantity of water is needed to fulfill hydropower generating and navigation requirements?...What quantity of water is needed to fulfill requirements of the Clean Water Act? What quantity of water is needed...to provide the assimilative capacity that was mandated when NPDES permits were issued?...these questions have not been answered. Until they are answered, it will not be possible for the Federal Commissioner to concur that any allocation formula is consistent with...federal laws and regulations" (Sherk, 2005: 807).

In short, the largest impediment to interstate compacts becoming the most effective institutional

arrangement for comprehensive interstate water resources management is integrating multiple federal government agencies and policies into the compact structure. The federal government is not a formal participant in interstate compacts, even though the compacts are approved by Congress and may have nonvoting federal representatives. When a compact is agreed to by Congress, it becomes part of federal law and binding on federal agencies. However, Congress retains the power to pass legislation which is inconsistent with, or has the effect of altering allocation formulas of interstate compacts. Although a compact can bind federal agencies to implement the compact agreements, they cannot bind the ability of Congress to pass inconsistent legislation, nor can they rewrite federal law.

Given the challenges posed by interstate compacts, many state efforts have focused on creating informal institutions such as interstate associations. Several states that participated in river basin commissions created under the Water Resources Planning Act, 1965 (WRPA) established informal associations after these commissions were eliminated in 1981. For example, the Missouri River Basin Association and Upper Mississippi River Basin Association have existed since 1982. These associations usually have limited budgets with minimal staff. In most associations, members are typically state officials and governor appointees with formal authorities and powers independent of the association or council. Federal agencies may participate in association or council activities, but have no formal representation.

As noted by Donahue (1987) and Kenney 1995, the functions of informal associations can be described as soft – e.g., coordination, research, and advocacy – with decisions being implemented, if at all, by state agencies. Informal associations may have limited monies available for conservation efforts, research or education. These organizations are easier to create because they do not confer any significant grant of

power, but their success depends upon member states' voluntary participation. When state governors and political leaders are actively involved in these associations, significant progress can be made in addressing regional issues or in lobbying the federal government for desired funding or regulatory change. However, dependence on the participation and political resources of association members can be a liability if leadership is lacking or if the members face opposition from their state legislatures.

## FEDERAL APPROACHES TO INTERSTATE WATER MANAGEMENT

The long history of federal efforts to improve water resources planning and management of interstate river basins has oscillated between periods of centralization and decentralization, but with limited success. The two main challenges faced by the federal government in managing water resources are the need to respect state sovereignty and the difficulty in coordinating multiple federal agencies, programs, and constituencies. While the federal government began to take a lead role in water resources managements as early as the mid-1800s (Gerlak 2006), this paper focuses its evaluation on modern approaches by the federal government to manage interstate water resources such as the river basin commissions authorized by the WRPA and federal-state partnerships such as the National Estuary Program (Clean Water Act amendment 1987).

After more than a half century of efforts to obtain national water planning legislation, the WRPA purposed to provide for comprehensive water resources management through coordinated planning of water and related land resources. The WRPA provided for a national Water Resources Council (Title I), regionally based river basin commissions (Title II), and grants to states for water planning (Title III). The enactment of the WRPA was an outgrowth of the Senate Select Committee on Water Resources, which in 1961 recommended that the federal government, in cooperation with the states, prepare comprehensive water development and management plans for all major river basins in the country (Comptroller General of the United States, 1981).

Under Title II of the WRPA, the President was authorized to establish regionally based river basin commissions upon written request by the Water Resources Council (WRC) or by a governor of a state lying in whole or in part within the basin. Written concurrence from all affected states and the WRC was required before the President could establish a

commission. According to the WRPA, each commission was responsible for serving as the principal agency for coordination of federal, state, interstate, and local plans for development of water resources, and for preparing and updating a comprehensive, coordinated joint plan for federal, state, interstate, and local water resources. The commissions were to recommend priorities for data collection, for the investigation, planning, and construction of projects, and for undertaking studies necessary to prepare the comprehensive plans. However, Congress placed specific limits upon the commission's activities. Authority was limited to coordination and planning, not regulation, development, or management (Featherstone 1994).

Seven river basin commissions covering all or part of 32 states were formed pursuant to the WRPA: Great Lakes, Missouri, Ohio, New England, Pacific-Northwest, Souris-Red-Rainy, and Upper Mississippi. Each commission had both federal and state members and had professional staffs with funding primarily from federal sources (Featherstone 1994). However, as instruments of the federal government, the river basin commissions were viewed suspiciously by the states and were unable to secure states' political and financial support. Their organizational structure contributed to the problem (see Table 2 – Structure of River Basin Commissions). Federal representation often out numbered the states' interests and because all members had a single vote, these commissions were dominated by the federal government. For example, the Upper Mississippi River Basin Commission had 16 members, 10 of which represented federal agencies. In addition, the federal members represented various functional bureaucracies and no attempt was made to present a unified federal position (Featherstone 1994).

The experience of the WRPA proved to be short-lived. President Reagan dissolved the Title II river basin commissions by presidential executive order in 1981. As these organizations were created by executive orders instead of by Congress, they were easily abolished by the new administration. The demise of the activities of the WRPA was due in no small part to the inability of the WRC and the river basin commissions to meet their legislative objectives (Featherstone 1994). The WRC was never able to meet its primary objective of coordinating the water planning activities of federal agencies and was unable to develop a unified position on major national water policy issues. The river basin commissions failed to develop meaningful regional plans, hampered by their lack of authority to manage, regulate, and develop water resources. The WRC and the river basin commissions were thus often ignored by the federal agencies and failed to secure meaningful state participation. Further, states saw no benefit in

TABLE 2. Structure of River Basin Commissions.

River Basin Commission	Year Established	Commissioners
Pacific Northwest	1967	Chair, Presidential Appointee 8 Federal Agency Representatives <sup>1,3,5</sup> 5 State Representatives Chair, U.S. Entity for the Columbia River Treaty Interstate Compact Representative, if applicable
Great Lakes	1967	Chair, Presidential Appointee 8 Federal Agency Representatives <sup>1,3,4,5</sup> 8 State Representatives Interstate Compact Representative, if applicable
Souris-Red-Rainy <sup>2</sup>	1967	Chair, Presidential Appointee 8 Federal Agency Representatives <sup>1</sup> 3 State Representatives Interstate Compact Representative, if applicable
New England	1970	Chair, Presidential Appointee 8 Federal Agency Representatives <sup>1,3,4,5</sup> 7 State Representatives Interstate Compact Representative, if applicable
Ohio	1971	Chair, Presidential Appointee 10 Federal Agency Representatives <sup>3,4,5</sup> 10 State Representatives Interstate Compact Representative, if applicable
Missouri	1972	Chair, Presidential Appointee 10 Federal Agency Representatives <sup>3,4,5</sup> 10 State Representatives Interstate Compact Representative, if applicable
Upper Mississippi <sup>2</sup>	1972	Chair, Presidential Appointee 10 Federal Agency Representatives <sup>3,4,5</sup> 5 State Representatives Interstate Compact Representative, if applicable

Notes: <sup>1</sup>Executive Order 11613 (1971) adds a U.S. Environmental Protection Agency Representative; <sup>2</sup>Executive Order 11737 (1973) combines the Souris-Red Rainy RBC with the Upper Mississippi RBC; <sup>3</sup>Executive Order 11882 (1975) adds a Energy Research and Development Administration Representative to the Great Lakes RBC and the Atomic Energy Commission Representative with a Energy Research and Development Administration Representative on the Pacific Northwest, New England, Ohio, Missouri, and Upper Mississippi RBCs; <sup>4</sup>Executive Order 12038 (1978) replaces the Energy Research and Development Administration Representative with a Department of Energy Representative on the Great Lakes, New England, Ohio, Missouri and Upper Mississippi RBCs; <sup>5</sup>Executive Order 12148 (1979) adds a Federal Emergency Management Administration Representative to the Pacific Northwest, Great Lakes, New England, Ohio, Missouri, and Upper Mississippi RBCs.

active participation in the commissions' regional planning efforts because Congress did not mandate that grants by federal agencies be spent in conformance with river basin plans. Finally, Title II was hampered by insufficient funding (Featherstone 1994; Comptroller General of the United States, 1981). In contrast to the perception by states that WRPA represented a heavily centralized and federalized control of water resources, partnerships provide the opportunity for state participation based on mutual interests.

Federal-state partnerships can be initiated by the federal government or jointly by federal and state agencies. Federally sponsored partnerships typically are guided by legislation, while jointly initiated partnerships usually are governed by interagency memoranda of understanding or resolutions adopted by participating agencies. The most distinguishing characteristic of a partnership is that partners maintain total control of their programs, resources and authority, and there often is limited or no funding or staff for the partnership independent of participating agencies. "Partnerships are networks, not programs, designed to minimize bureaucracy while streamlining the solution-implementation process" (Tippie and Edwards, 1994). Partnerships have become popular because they are comparatively easy to establish and maintain, and because the structure encourages cooperation and innovative problem solving. Agencies participate because they maintain their autonomy while benefiting from cooperation.

The National Estuary Program (NEP) is an example of a federally initiated partnership between federal, state, and local governments and stakeholders. In the 1987 amendments to the Clean Water Act, Congress authorized the EPA to establish the NEP and modeled it after the success of the Great Lakes Program and the Chesapeake Bay Program. The NEP fosters collaborative planning on an ecosystem scale involving federal, state, and local governments as well as nongovernmental organizations, interest groups, academia and businesses. Upon acceptance into the program by the EPA, NEP partnerships (there are currently 28) prepared Comprehensive Conservation and Management Plans (CCMP), which involved scientific studies of the estuary and plans for comprehensive estuary restoration and protection, ranging from water quality to habitat protection.

The New York/New Jersey Harbor Estuary Program (NYNJ NEP), one of four [the four NEP partnerships responsible for planning and managing programs for interstate estuaries are the Delaware Estuary Partnership (NE, NJ, and PA) Long Island Sound Study (CT and NY), Lower Columbia River Partnership (OR and WA) and NYNJ HEP (NY and NJ)] NEP partnerships involving interstate estuaries, illustrates the potentials and challenges of

intergovernmental partnerships in interstate water management. Mandarano (2004) evaluated the effectiveness the New York New Jersey Harbor Estuary Program (NYNJ NEP) and in doing so documented the multitude of government and quasi-government agencies active in the NYNJ NEP (see Table 3 – NYNJ NEP Stakeholder Representation). As Table 3 highlights, participation on NYNJ NEP committees and working groups provides a balance of representation of federal and state interests and includes broad participation by regional and local nongovernmental institutions. Schneider *et al.* (2003) evaluated the communication networks of stakeholders involved in 12 NEP partnerships and 10 non-NEP partnerships and found that NEP partnerships “are more extensive, span more levels of governments, integrate more experts into policy discussions, nurture stronger interpersonal ties between stakeholders and create greater faith in the procedural

fairness...” (p. 155). These findings demonstrate that in comparison with commissions the NYNJ NEP and other NEPs successfully formed institutional arrangements that achieved a balance between federal state and local interests, which facilitated regional coordination and water resources management.

The NYNJ NEP published its CCMP in 1996 and continued to facilitate regional planning and management. The following two examples illustrate how this partnership fostered innovative solutions and improved interagency coordination and technical capacity. First, the Habitat Workgroup, one of NYNJ NEPs technical working groups, developed a policy paper that could substantially change compensatory wetland mitigation in the estuary and possibly the nation. The policy recommendations called for dramatically increasing current compensation ratios to account for wetland losses due to development, failure of wetland mitigation projects, urban stresses

TABLE 3. NYNJ HEP Stakeholder Representation.

Organization	Policy Committee	Management Committee	Citizens Advisory Committee			Dredged Material			
			Habitat	Toxics	CARP	Management	Pathogens	Nutrients	
Federal Agency									
USEPA	X	X		X	X	X	X	X	X
U.S. Army Corps of Engineers	X	X		X	X	X	X	X	X
U.S. Geological Services						X			
National Oceanic and Atmospheric Administration		X							
U.S. Department of Interior		X							
NY State Agency									
Department of Environmental Conservation	X	X		X	X	X	X	X	X
Department of State		X		X					
NJ State Agency									
Department of Environmental Protection (DEP)	X	X		X	X	X	X	X	X
Department of Transportation						X			
NYC Agency									
DEP		X		X	X	X	X	X	X
Planning				X					
Parks and Recreation				X					
NJ Municipal Representation									
NJ Harbor Dischargers Group/Passaic Valley Sewerage Commission		X				X		X	
Elizabeth, NJ	X								
Other Stakeholders									
Academia		X	X			X			
NYNJ BayKeeper		X	X	X					
Coalition for the Bight		X	X	X	X		X		
Environmental Defense Fund							X		
Hudson River Foundation		X				X			
Interstate Environmental Commission		X						X	
Port Authority of NY and NJ		X		X		X	X		
Private Business						X	X	X	X

Source: Author modified the originally published table (Mandarano, 2004, p 61; Table 7) to include representation on Policy Committee and Management Committee.

and natural causes. Policy recommendations also included requiring the acquisition and protection of wetlands in conjunction with mitigation projects (Habitat Workgroup, 2002). The Management Committee endorsed this controversial yet innovative approach because it was collectively authored by state and city agency representatives and nongovernmental stakeholders and it was based on sound scientific evidence including habitat studies funded by the NYNJ NEP (Mandarano, 2004).

Secondly, the analytical and technical capabilities developed through the estuary program have improved scientific efforts and interagency collaboration in other areas. In response to New York State mandates separate from the estuary program, New York City developed two water quality models to evaluate the impacts of its discharges to estuary waters. Upon completion of the models, New York City donated the models to the NYNJ NEP. NYNJ NEP with funding from New Jersey oversaw the recalibration of the models to incorporate New Jersey's discharges to estuary waters; thereby, creating bi-state basin-wide water quality models. Recognizing the value of the basin-wide models, EPA's Regional Office and both state environmental departments asked the NYNJ NEP to coordinate technical analyses and to recommend indicators for New York's and New Jersey's Total Maximum Daily Load (TMDL) programs based on output from the basin-wide models and deliberations by the Management Committee (The NYNJ NEP Management Committee is comprised of 19 designated positions: Chair – USEPA Region II, New York State Department of Environmental Conservation, New Jersey Department of Environmental Protection, Interstate Environmental Commission, U.S. Army Corps of Engineers, National Oceanic and Atmospheric Administration, EPA Office of Research and Development, New York City Department of Environmental Protection, New Jersey Harbor Dischargers Group, NY local government, NY local government, Science and Technical Advisory Committee (2), Citizens Advisory Committee (4), U.S. Department of Interior and Port Authority of New York and New Jersey) (Mandarano, 2004). In this case, the collaborative regional partnership led to better coordination and innovation, whereas other institutional structures have led to ongoing conflict and nonparticipation.

Contributing to NYNJ NEPs effectiveness at addressing the challenges of interstate water resource management is its ecosystem scale (Mandarano, 2004). Planning at an ecosystem scale encouraged its participants to consider shared interests such as the ecological health of the estuary, instead of merely defending narrow administrative or jurisdictional interests as evidenced by recommendations

to change compensatory wetland mitigation policy discussions and creation of a bi-state basin-wide model. In this case, flexibility, cooperation and innovation were fostered when participating agencies were encouraged to consider larger issues outside of their jurisdiction or agency mandate, which enabled them to see avenues of cooperation.

Given the inherent difficulties in federal centralization of water resources, partnerships can create viable avenues for governance and management of resources; however, there are distinct limitations to the effectiveness of partnerships. Similar to other inter-agency approaches, NEPs faced limitations with respect to coordination and implementation. In seeking to develop consensus or unanimity in decision making, agency involvement can be time-consuming, expensive and result in watered-down agreements (Innes and Connick, 1999; Wakeman, 1993). Despite the consensus-driven process, participants unwilling to negotiate use external channels such as court suits and powerful alliances to force their position (Mandarano, 2004) and agencies that control funding often have the last word (Wakeman, 1993). Implementation is difficult because participants do not have direct authority or resources to implement initiatives (Mandarano, 2004). Perhaps the most significant limitation is federal funding (Mandarano, 2004). While Congress modeled NEP on the Great Lakes Program and the Chesapeake Bay Program, Table 4 – Congressional Appropriations to the EPA clearly demonstrates how underfunded the NEPs (28 local estuary programs) are in comparison.

#### JOINT APPROACHES TO INTERSTATE WATER RESOURCES MANAGEMENT

In contrast to the flexible and informal governance structures of partnerships, Federal-interstate compacts are formal contracts between the federal government and the states. Federal-interstate compacts provide for the joint exercise of sovereign powers over the water resources of their respective river basins by federal-interstate basin commissions. As laws of both levels of government, the compacts are enforceable and binding on federal agencies as well as on states. Four federal-interstate compacts have been enacted: the DRB Compact (DRBC, 1961); Susquehanna River Basin Compact (SRBC, 1970); ACT River Basins Compact (ACT, 1997); and ACF River Basins Compact (ACF, 1997).

The DRB Compact grew out of several decades of litigation among basin states (Delaware, New Jersey,

TABLE 4. Comparison of Congressional Appropriations to the EPA.

	FY 2002 (\$1,000)	FY 2003 (\$1,000)	FY 2004 (\$1,000)	FY 2005 (\$1,000)
Chesapeake Bay Program				
Environmental Programs and Management Fund	21,267	21,000		
Geographic Programs			20,788	20,817
Great Lakes Program				
Environmental Programs and Management Fund	15,500	15,500		
Geographic Programs			18,104	19,229
Great Lakes Legacy Act Funding			10,000	45,000
National Estuary Program				
Environmental Programs and Management Fund	22,533	23,521	24,500	19,299
NYNJ Harbor Estuary Program				
National Estuary Program Allocated Funds	500	500	NA	NA

Source: Mandarano (2004, p16 Table 3).

New York, and Pennsylvania) over water allocation. Attempts to resolve the conflict by interstate compact were unsuccessful. The Susquehanna compact originated with the states of New York, Pennsylvania, and Maryland and was patterned after the Delaware Compact. The ACT and ACF compacts also grew out of litigation among the basin states (Alabama, Florida, and Georgia). In contrast to the multipurpose DRB and SRB compacts, the ACT and ACF compacts concentrated on developing an equitable allocation of the basins' surface waters.

The DRB and SRB compacts are administered by commissions created as agencies that act for and only with the concurrence of their members. To that extent, they are not autonomous agencies. The commission members are the basin states' Governors and a Presidential appointee to represent all federal agencies. The Governors and the Presidential appointee typically appoint alternates to represent them at regular meetings. Each member has one vote, with a majority vote needed for most actions. Certain actions (e.g., the budget), however, require a unanimous vote. In the case of the ACF and ACT compacts, the federal commissioner was a nonvoting member even though the compacts contained provisions mandating that federal agencies exercise their powers consistent with the allocation formulas developed by the compact commissions (Sherk, 2005). These compacts were not administered by commissions and relied on agency staff from participating members.

Of the four federal-interstate compacts, the DRB compact grants the most extensive powers and most fully binds the federal government as a party. Both the Delaware and Susquehanna compacts provide their commissions with broad authority to engage in comprehensive, basin-wide water resources planning and management. Some of their more important responsibilities include planning, designing, funding, constructing, and operating facilities for water supply and pollution control; establishing water quality standards; regulating and controlling water withdrawals

and diversions from ground and surface waters; and reviewing projects to ensure that they do not impair or conflict with each commission's Comprehensive Plan. The Susquehanna compact places a greater emphasis on flood control and less emphasis on water quality than does the Delaware. The DRBC has a staff of about 45, while the SRBC has a staff of about 25.

The DRBC has been effective in meeting most of the objectives specified in its compact, such as securing interstate coordination, settling disputes over water allocation, and addressing severe pollution problems, including the clean up of the Delaware Estuary (Featherstone 1999). However, as an instrument of federal-state and federal interagency coordination, the DRBC has been only partly successful. The federal reservations included in the compact limit the authority of the DRBC to compel federal agencies to carry out its plans and enforce its standards. The DRBC can only prevent federal agencies from carrying out projects which are not approved as part of the DRBCs Comprehensive Plan, which only occurs when there is consensus among states and the political will to exercise this power.

The founders of the DRBC attached considerable importance to a single federal representative as the coordinator of federal action in the basin. This role did not materialize. The federal representative has not been able to speak authoritatively for the federal government, and the role has evolved into that of an ambassador reporting the various and conflicting positions of federal agencies without resolving them (Derthick 1974; Featherstone 1999).

In 1997, the federal-interstate compact commissions suffered a financial blow, as Congress through the Emergency Supplemental Appropriations Act deleted federal funding of the office of federal commissioner for the DRBC and SRBC as well as the federal government's financial contribution to the DRBC and SRBC and Congress has failed to restore this funding in subsequent years. The decision to cut the funding followed a change in policy to emphasize decentralization of

many federal functions (Featherstone 1999). Congress felt that the compact commissions served states interests more than the federal government and that river basin management should be predominately a state concern (Congressional Record 7/11/1995). Congress also changed federal participation by naming an officer of the Army Corps of Engineers, rather than an independent presidential appointee as the federal representative.

The demise of the ACF and ACT compacts has been described in detail by Sherk (2005) and Leitman (2005). The states, led by Florida's withdrawal from the negotiations, terminated the compact because they were unable to agree to an allocation formula. Furthermore, Sherk (2005) noted that the compact required the federal representative to determine that the proposed allocation formula was consistent with federal regulations, something the federal commissioner would find impossible to do. Negotiations under the compact provisions saw states attempting to alter or circumvent requirements of federal law because the states knew that the allocation formula agreed to under the compact would become federal law. Federal agencies and the federal representative were obviously unwilling to be bound by the decisions of the states. Without the implementation force of federal agreement, however, the allocation formula would be uncertain. Leitman (2005) argues that lack of stakeholder involvement, breakdown in trust and inadequate collaboration were the main reasons for the failure of the ACF compact. As a result, the Supreme Court may have to decide this interstate apportionment case.

Sherk (2005) concluded from the ACF and ACT experiences that such compacts are doomed to fail unless Congress can act coherently and decisively to allocate interstate water resources. As described above, however, the experience of Congressional allocation and federal centralization of comprehensive water resources management has been problematic at best. Allocation of water resources between states can only occur through Congressional allocation, an allocation formula agreed to under a federal-interstate compact, or through litigation before the Supreme Court. The inability of Congress to agree on coherent allocation of water resources makes litigation more likely.

## CONCLUSIONS AND LESSONS LEARNED

Planning, coordination, and management of interstate water resources require unique forms of governance. The challenge of interstate water management stems from a complex array of issues such as lack of

a national comprehensive water resource planning and management policy, fragmented environmental regulations at the federal level and differences in regulatory implementation approaches at the state level, power struggles between federal governance and state sovereignty, impacts of population and economic growth, changes in attitudes and powers of political administrations, extreme weather events and a range of other factors. Hence interstate water resources planning and management call for a form of governance that is able to achieve collaboration amongst a multitude of federal, state, and local agencies in order to resolve complex problems crossing state boundaries and multiple administrative jurisdictions. The models of governance that have evolved – interstate compacts, partnerships, and federal-interstate compacts – have achieved modest but notable success in fostering coordination, dispute resolution, and improved water resources management. Although limited in scale and scope, these models of governance have many advantages over either centralized federal control or litigation in the Supreme Court.

In summary, we believe that there are several lessons learned from the success or failure of these alternative approaches to interstate water resources management. The following highlights participant and structural attributes that have contributed to the effectiveness of one or more of these inter-governmental approaches to interstate water management. First, the parties or members believe that significant water resources problems exist that require regional solutions. The absence of well-defined problems with resources interdependencies will adversely impact the support of and participation on the organizations. The early federal attempts to achieve regional coordination and management of water resources clearly failed in this regard, in particular the WRPA. Second, the participants are committed to supporting their programs through participation and funding. The mere existence of an organization with substantive powers does not assure that it will succeed if funding diminishes or membership atrophies. As the NEP demonstrates, in spite of limited funding, strong commitments to these partnerships and their goals have enabled their success.

Third, the participants and programs are flexible. This is necessary to meet the needs of changes in political leadership and shifting political ideologies at federal and state levels. The failure of the ACF and ACT compacts is due in no small part to this problem. Flexibility is also an important characteristic of agencies when it comes to adaptive implementation of both federal and state functions to achieve effective implementation of policies and to address complex intergovernmental problems and resources management issues. The success of the DRBC in settling

water allocation disputes and cleaning up the polluted Delaware estuary is such an example. Another example is NYNJ NEP role in coordinating technical analyses and recommending indicators for the TMDL programs.

Fourth, effective interagency collaboration requires a balance of power between federal, state, and local government agencies, a diverse representation of interests, and a mechanism for ongoing dialog. The lack of a balance of power between federal and state interests led to the demise of the WRPA river basin commissions. In contrast, the stakeholder participation in NEPs, as illustrated in Table 3, achieved an appropriate balance of federal, state, and local interests – one level of government or stakeholder interest did not dominate the decision making process, which facilitated collaboration and conflict resolution. Finally, successful collaboration and conflict management requires either a forum for ongoing dialog and negotiation or a mechanism to engage a mediator to aid with dispute resolution. In particular many interstate compacts commissions (e.g., ICRB, IEC, NEIWPCC, and ORSANCO), NEP partnership Management Committees, and the DRB and SRB federal-interstate compact commissions, have proven to be effective at arriving at agreements, improving interagency coordination and managing interstate water resources. As illustrated herein by the DRBC case, administrative commissions with an independent professional staff dedicated to a regional or basing-wide perspective have been effective as an alternative to federal, states and local agencies. This effectiveness however, is dependent on the political and financial support of the parties to the commissions. In contrast, interstate and federal-interstate compacts lacking administrative commissions have been unable to meet changing conditions.

This research demonstrates that these inter-governmental arrangements have made modest improvements in managing water resources given the complicated and fragmented nature of our federalist system of government. Through this research the authors have highlighted several attributes of institutional arrangements that have contributed to effective conflict resolution and to overcoming limitations of fragmented governance. These findings are important to policy makers, planners, and parties engaged in interstate water resources management. Although not an explicit inquiry of this study, the results indicate and confirm findings by others (Sherk, 2005) that cooperation and coordination apparently are more feasible when parties were brought together to manage multiple purposes such as water quality, flooding and water allocation than to manage a single purpose, water allocation. This raises an important

question for further research: are efforts for multi-purpose interstate water resource management more effective than for water allocation alone and what are the factors that contribute to success?

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