Finding Common Ground:
How Advocacy Coalitions Succeed in Protecting Environmental Flows

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Abstract: This paper reviews several recent case studies where states or countries have strengthened their protection for environmental flows to explore the key policy, stakeholder and scientific elements that contributed to these advances in water management. A conceptual framework is developed which helps to describe the actions of interest groups and individuals, how the environmental flow issues become part of the formal agenda of decision-makers, the events which precipitate this attention, the role of science and scientific uncertainty, and how interactions and dialogue among individuals and groups with different interests leads to changes in state and national statutes. In general, the review found that changing policies is a result of actions of informed groups of interested parties using science and information to inform both the public and decision-makers about the need for action and about the specific action needed. In almost all cases, environmental flow issues make it to the formal agenda of institutions through one or more focusing events, often legal challenges that call into question the existing legal framework for water management. Significantly, in almost all cases the engagement between advocacy coalitions with different and often opposing views results in reframing the issues to provide an approach or solution upon which the competing coalitions can agree.

Introduction

New policies do not develop in a vacuum nor are they implemented anonymously. They are the result of concerted efforts of numerous people acting within both legal and social frameworks. This paper looks at several states and countries where governments have recently improved the protection of environmental flows. The term environmental flows is used as a synonym for instream flows – that is, water reserved or allocated to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems (Brisbane, 2007). The review focuses on situations that resulted in modification or creation of

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state and national statutes pertaining to environmental flows as these legal changes provide evidence of a tangible change in the water management framework.

The public policy process associated with developing and passing new laws involves various stages of and venues for the public dialogue that surrounds policy changes. Public dialogue is defined as a conversation between two or more people in order to exchange ideas or opinions pertaining to, or being in the service of a community or nation' (Houghton Mifflin Company, 2004). This paper offers a conceptual framework for describing the public policy process and associated public dialogue which helps to explain how agendas, events and interactions lead to meaningful changes in protection of environmental flows.

Background

This review of the public policy process associated with improving environmental flow protections uses several key concepts from the fields of political science and public affairs. These concepts are used to build a conceptual framework (see Figure 1) to review each case study in a consistent manner and to help identify key elements which help to explain why changes to environmental flow protection statutes do or do not take place.

Public Policy Terminology

1) **Advocacy Coalitions** – Paul Sabatier described the Advocacy Coalition Framework (ACF) of public policy formation. Instead of focusing on individual actors or institutions, the ACF describes the loose associations of like-minded individuals and groups who work together and in parallel in both formal and informal ways to pursue a common goal as a primary way to view interactions between competing public policy agendas (Sabatier, 1988). Advocacy coalitions are not formal coalitions (though these may emerge) but rather describes the loose association of individuals both inside and outside of agencies who share common core beliefs and begin to work, either formally or informally, to advocate for specific policy changes in order to realize their beliefs. The ACF also describes the process by which different, and often competing, groups of advocacy coalitions engage with each other and with governing institutions to achieve their goals.

2) Policy-Oriented Learning – Sabatier describes how policy-oriented learning occurs both within advocacy coalitions as they seek evidence and information to support their positions and between different coalitions as they 'compete' with each other to promote or discourage specific changes. He describes how this policy-oriented learning between different advocacy coalitions and can lead to changes in some aspects of the position of each coalition (Sabatier, 1988). He notes that problems involving natural resources are more conducive to policy-oriented learning

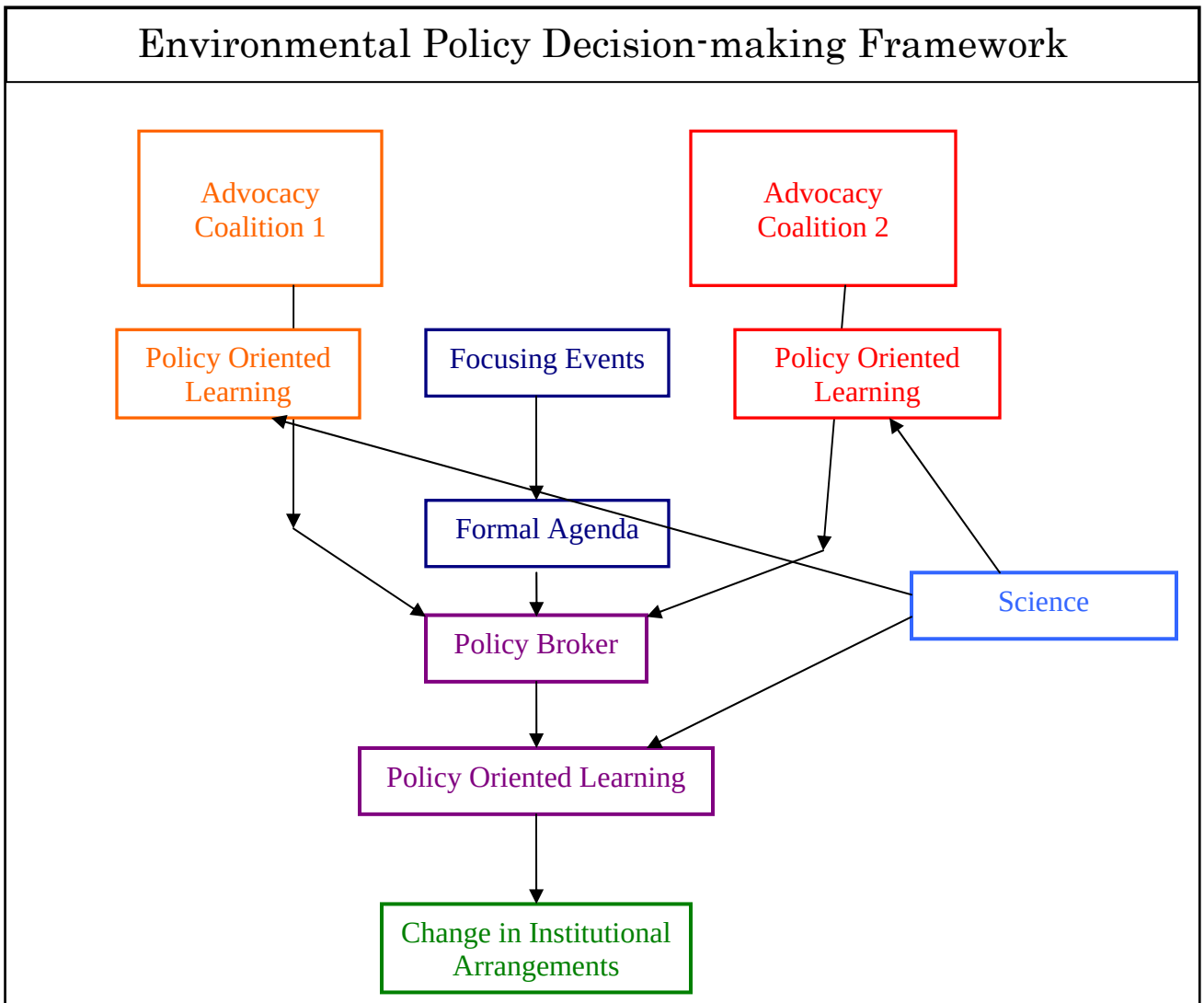

Figure 1: *Conceptual framework for public policy decision-making: Competing Advocacy Coalitions develop their own position through policy-oriented learning primarily within their coalition. A focusing event provides the opportunity to move the issue onto the formal agenda of decision-makers. The competing advocacy coalitions are often brought together by policy broker to inform the decision-makers leading to across-coalition policy-oriented learning. For environmental issues, science often plays an important role in the policy-oriented learning process. The result of this effort leads to changes in existing institutional arrangements.*

because many of the critical variables are questions of an analytical nature where all parties can agree on empirical evidence and this may inform their specific policy goals (though unlikely to change their core beliefs). As competing advocacy coalitions engage over specific issues, key 'policy brokers' often emerge who are in a position to resolve or minimize differences between coalitions. He also mentions how this process of learning and modifying beliefs through experience, negotiation and trail and error is a process that tends to occur over the period of a decade or more.

3) Agenda Setting – A key element of whether any particular issue moves forward is whether the issue gets on the 'agenda' of the decision-makers. Cobb et al., (1976), describe two types of agendas: public agendas and the formal agendas. The public agenda is defined as issues which are the subject of widespread public attention or awareness and are perceived by the public to require action by some unit of government. The formal agenda consists of those issues which will receive serious attention from decision-makers. The authors note there are also 'pseudo-agenda items' that appear on the agenda of institutions but which are not seriously considered. For example, while many bills get filed in Congress and therefore are on the official agenda, only a few will be given serious consideration.

4) Focusing Events – Thomas Birkland (1998) describes these as certain external events that place items onto the formal agenda. These events can trigger action by crystallizing certain conditions, or to highlight policy failures or certain points of view to allow for swift movement on an issue (Birkland, 1998). He defines these events as sudden; relatively uncommon; can be reasonably defined as harmful or revealing the possibility of potentially great future harms; has harms that are located in a particular geographic area or community; and becomes known to policy makers and the public simultaneously. They provide advocacy coalitions with the opportunity to expand their perceptions of policy failures to a broader audience and to move issues from the public agenda to the formal agenda.

5) The Role of Science – Science plays a critical role in the environmental policy-oriented learning process of advocacy coalitions and decision-makers. Decision-makers and the public look to scientists to explain the natural world, the ways human activities affect the environment,

and the consequences of these changes on human health and the environment. Yet scientific knowledge always includes a level of uncertainty. This is especially true with environmental science and management. Ludwig, et al., (1993), went so far as to suggest there will never be scientific consensus concerning natural systems that are being exploited. How the science and the associated uncertainty are brought into the policy-oriented learning and to the public can affect whether the issue makes it onto the formal agenda of decision-makers.

Case Studies

A review of the states and countries which have recently approved new protections for environmental flows suggest some common themes about how and why these changes do or do not occur. In general, the review found that changing policies is a result of actions of informed groups of interested parties (advocacy coalitions) using science and information to inform both the public and decision-makers about the need for action and about the specific action needed. In almost all cases, environmental flow issues make it to the formal agenda of institutions through one or more focusing events, often legal challenges that call into question the existing legal framework for water management. Significantly, in almost all cases the engagement between advocacy coalitions with different and often opposing views results in reframing the issues to provide an approach or solution upon which the competing coalitions can agree. This turning point appears to be a typical and perhaps necessary condition for new statutory frameworks to emerge.

Michigan

Background: In June, 2008 the Michigan legislature passed a package of 12 statutes implementing a new water withdrawal assessment and management program in order to protect environmental flows. These statutes for the first time provided a comprehensive legislated water management framework for the state and established a standard of 'no adverse impact' for certain large water withdrawals. Adverse impact is defined by water body type and by specific thresholds of changes to summer base flows and the associated modeled expected changes to fish population characteristics (Michigan EHB 5073, 2008). The statutes also fulfilled Michigan's obligations under the Great Lakes Charter Annex (2001) and subsequent Great Lakes Agreement

(2005) and Compact (2005) to manage water resources and, in particular, develop a system to regulate diversions of water outside of the Great Lakes basin (Great Lakes Agreement, 2005).

Focusing Events: Two events forced water management and environmental flows onto the formal agenda of the Michigan legislature. The first was a legal ruling on a lawsuit concerning a proposed water bottling facility which put the existing legal framework for water management into question. By stating that groundwater uses which removed water from a watershed could not reduce the natural flow to a waterbody, the Court pitted the common law interest of property owners and their right to use the groundwater under their property (which is legally viewed as part of the bundle of rights owned by the property owner) against the interests of riparian owners and their right to 'reasonable use' of the surface waters passing through or along their property (Michigan Citizens for Water Conservation, et al., versus Nestle Waters of North America, 2007).

The second focusing event was the signing of the Great Lakes Charter Annex (2001) the subsequent successful conclusion of negotiations among the governors of the eight Great Lakes basin states and the premiers of the two basin Canadian provinces of the Great Lakes Agreement (2005) and Great Lake Compact (2005). The Compact, an agreement among the eight states and approved by the United States Congress, established a reciprocal arrangement to provide consultation and a joint decision-making process to prohibit most diversions out of basin and manage withdrawals in basin – actions that prior to the Annex and subsequent agreements could be taken by any single jurisdiction but could affect all jurisdictions. It is worth noting that the Great Lakes Charter Annex was itself the result of a focusing event – proposals to export bulk water from the Great Lakes via tanker ships (IJC 2000). The signatories of the Annex set out to ensure that state and provincial laws were adequate to regulate such transfers and require consent of the other Annex members.

Policy Broker/Policy Oriented Learning: State Representative Patricia Birkholz was the policy broker who initially called together select representatives of the key water user groups, including fishing & hunting interests, industry, mining, farm and business groups (Bowman, 2008). The meetings hosted by Rep Birkholz were a key opportunity for joint policy-oriented

learning by representatives of different interest groups (i.e. member of competing advocacy coalitions). Through this process they were able to agree on an approach that focused on helping water users locate in appropriate areas and thereby avoid adverse impacts to stream habitats.

The consensus approach required the development of new groundwater assessment tools. This resulted in new legislative mandates to the Groundwater Advisory Conservation Council to further explore the issues (Bowman, 2008). This Council also included a broad range of user groups and stakeholders and was another key forum in which joint policy-oriented learning took place. The Council developed a technical committee responsible for overseeing the development of the groundwater assessment tool. This tool integrated a scientific approach to defining 'adverse impact' with a stream classification approach to define degrees of protection by stream type.

Turning Point/Learning Moment: The turning point in this policy-oriented learning experience came when industry representatives stated that they did not want to be viewed by the public as degrading high quality trout-streams and wanted to know where they could responsibly locate water-dependent industries. The conservation-minded representatives realized it would be possible to develop a management framework to direct water uses to the most appropriate areas (Bowman, 2008). By changing the discussion from protection of environmental resources to finding areas for appropriate water use the competing advocacy coalitions found a common path to meet the objectives of both sides.

Role of Science: Science was a key factor in at least two points during this process. First, during the meetings chaired by Rep. Birkholz a respected scientist was brought in to educate the group on the fundamental concepts of environmental flows, thereby building a common understanding of the technical issues. The second point was in the development of the groundwater assessment tool by the technical committee. There was a need to achieve scientific consensus on how to describe and define impacts to streams and what would constitute an 'adverse impact.' The group of scientists was able to work together on a consensus approach, an approach subsequently

supported by an outside peer review. This consensus is viewed as a key factor in allowing the framework to be translated into statute and approved by the legislature (Bowman, 2008).

South Africa

Background: With the end of apartheid and the transition to a new government in 1994 and the adoption of a new constitution in South Africa in 1996, significant legal reforms were initiated in the mid-1990s. This included fundamentally reworking the legal framework for water management, including new provisions in the Bill of Rights in the Constitution giving individuals the right to sufficient water for basic human needs and the developing of a new national water law that includes the fundamental protection of water for both basic human use and for environmental sustainability (de Coning & Sherwill, 2004).

The concepts included in the national water law were developed through a series of government actions and documents, including the Water Law Principles in 1996, the 1997 White Paper on a National Water Policy (DWAF 1997) and culminating in the 1998 National Water Act. The National Water Act provides for the basic rights for 'reserves' of water to meet basic human needs (the highest priority) and "to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the relevant water resource" (1998 National Water Act). The Act also eliminates the private ownership of water and ended riparian water rights which tied access of water to the ownership of land (Mackay, 2003). The Act includes the protection of environmental flows as part of the definition of resource quality, which included the "the quantity, pattern, timing, water level and assurance of instream flow". This national legal framework drew heavily on preceding South African and international research related to determining environmental flow requirements, including the Building Block Method (BBM) and has since provided impetus to further science and innovation to inform how these principles and statutes are implemented, including the further development of BBM and the Downstream Response to Imposed Flow Transformation (DRIFT) method (Mackay, 2003).

Agenda Setting/Focusing Events: The focusing event in South Africa was the change in government and the drafting of a new constitution, which precipitated the opportunity to rewrite all national sectoral legislation, including water laws. The formal agenda of government is

described by MacKay: “the provision of basic water supply and sanitation to the majority of South Africa’s population, who were without these, and the need for equity in the allocation of water and the benefits of water use, were suddenly placed near the top of the political agenda” (Mackay, 2003). Because of some important research related to floodplains and the value of these natural systems to people who depend on subsistence livelihoods, it was understood that access to the ecosystem services provided by natural systems was a key equity issue in the new society (Mackay, 2003).

Policy Broker/Policy Oriented Learning: Kader Asmal was the policy broker who, as Minister of the Department of Water Affairs and Forestry (DWAF), convened the relevant experts from within the agency and various other institutions and provided the vision and leadership to craft both the water principles and legislative language in a manner consistent with the principles and values contained in the new constitution. He presided over a process undertaken by staff and other experts representing divergent views, including more traditional water engineers and water supply interest groups who generally viewed ‘unused’ water as wasted and by staff, NGOs and academicians knowledgeable in the ecology of freshwater systems and the value of natural flow regimes (MacKay, 2008).

Turning Point/Learning Moment: During the process Minister Asmal made it clear that the ecological reserve was not about ‘biodiversity’ or ‘green issues’ but rather was a critical component of the equity issue. As described by MacKay, the ecological reserve was part of a three part ‘equity package’:

1. Equity related to the water itself
    - simple equality for basic human needs, as expressed in the basic human needs Reserve;
2. Equity of access to water for beneficial uses
    - equitable allocation of water for offstream and instream uses;
3. Equity of access to ecosystem goods, services and benefits
    - Expressed as the environmental reserve and its intention to protect water resources and their associated ecological functions.

This reframing of the issues allowed the environmental flow reserve and associated regulatory language to be included in the National Water Act (MacKay, 2008).

Role of Science: Having a strong scientific foundation on the role environmental flows play in providing ecosystem services was a key element of shaping and informing the water management framework. Science, including social science research, had established the role of rivers and floodplains in providing important ecosystem services and thereby support subsistence livelihoods (Mackay, 2003). Additionally, work on understanding and protecting environmental flows in the Kruger National Park where flows had been highly altered by dams, as well as the growing international understanding of the importance of the natural flow regime, played an important role in shaping and informing the debate. Early research by the Water Research Commission was key in building the scientific consensus about the need for and ability to manage environmental flows (Mackay, 2003) and to be able offer a credible and transparent methodology for quantifying environmental flow needs using hydrologic parameters already in use in water resource planning in South Africa.

Montana

Background: In 2007 Montana passed legislation providing new protection of environmental flows from groundwater withdrawals in closed basins. Closed basins are those in which all available water has been allocated and the basins are statutorily closed (Pomnichowski, n.d.). The revised statute requires applicants seeking groundwater permits to develop groundwater mitigation plans or provide aquifer recharge to offset the adverse affect caused by their expected depletion of surface waters. The statute also removed from the definition of groundwater that groundwater was water not 'immediately or directly' connected to surface water (Montana HB831 2004). Since the statute prohibited the removal of water 'immediately or directly' connected to surface water (since the basin was closed) the state water agency interpret this language to mean all other groundwater sources were allowable (Williams, 2008).

Agenda Setting/Focusing Event: There were two focusing events in Montana. The first was a drought which increased the number of low and no flow events and associated fish kills, coupled with recognition that the increased use of new groundwater wells for spray irrigation systems

was exacerbating Smith River low flow problems. Anecdotal evidence of dry streams returning to flowing condition when nearby wells were turned off helped to highlight the role of groundwater wells in exacerbating the drought conditions (Williams, 2008).

The second focusing event was a series of legal actions, including an objection filed by the Montana Department of Fish Wildlife and Parks (FWP) claiming a new well in the Smith River Valley would adversely affect their existing instream flow rights. Another was a lawsuit by Trout Unlimited (TU), forcing the state water agency to undertake a cumulative hydrologic analyses of multiple recent and proposed groundwater wells for use in the permit review process. This assessment, once conducted, quantified the cumulative impact of these and thereby provided 'irrefutable' evidence of the impact of these wells on surface water flows and therefore their potential impact on the already appropriated water rights of both agricultural interests and of FWP, the agency which holds instream water rights in the public interest. TU also pursued a more comprehensive definition of the term 'direct or immediate' with the state Supreme Court which decided that intercepting groundwater which would ultimately reach a stream was part of the 'direct and immediate' definition (Williams, 2008).

Policy Broker/Policy Oriented Learning: In Montana there does not appear to be a clear policy broker that brought all parties together. The policy-oriented learning occurred in two key ways. First were hearings on objections filed in response to a groundwater withdrawal permit based on its impact to prior appropriated rights of the water held in public trust by the FWP. This was the forum in which the impact of the wells on adjacent surface waters was clearly articulated in a legally defensible way such that the applicant withdrew their permit application. The second was a strategic effort by TU to engage certain irrigation and hydropower interests and because one of the expert witnesses took the study conclusion 'on-the-road' to help spread the word on the relationship between groundwater use and surface water levels and flows (Williams, 2008).

Turning Point/Learning Moment: In the Smith River Valley, the turning point appears to have occurred when farmers and hydro-electric interests, both of whom owned senior surface water, realized their water rights were at risk from other farmers who were installing groundwater fed

spray irrigation and from other water uses who were planning to use groundwater. At this point, lead initially by one irrigator who spoke up against these new uses by other agricultural interests, the interests of a segment of the agriculture interests became aligned with those of the state agencies and conservation groups interested in protecting environmental flows (Williams, 2008). The agriculture community itself tried a legislative strategy to broaden the definition of 'direct or immediate' connection to surface water so that more groundwater withdrawals would be precluded (Williams, 2008).

Role of Science: In the Smith Valley a sound scientific study documenting the cumulative impacts of groundwater withdrawal and the ability of scientists to present the results in a clear and easily understood manner played important roles in changing the public perception of this impact of groundwater wells. In this small and tight-knit community this information quickly reached stakeholders in a relevant manner because it highlighted the potential risk to the more senior water rights.

Maine

Background: In 2001 the Maine State legislature passed several statutes to establish a comprehensive water use reporting system for the state. The statutes included a requirement that the state Department of Environmental Protection (DEP) establish water use standards "protective of aquatic life and other uses" and "based on the natural variation of flows and water levels, allowing variances if use will still be protective of water quality within that classification" (Maine Statute, Title 38, §470-E) This statute lead to the drafting and promulgation of regulations in 2007 establishing environmental flow and lake level standards that include both presumptive standards and the ability to undertake site specific studies. As a result of the regulation drafting process the original environmental flow standards statute was amended to add an alternative compliance approach for a few public water suppliers not able to comply with the rule while meeting their public water supply obligations.

Agenda Setting/Focusing Events: There were three focusing events that help move environmental flows onto the formal agenda of state government. First, in late 1990s several cases of agricultural water use dewatering streams and a pond put the DEP in the position of

needing to consider enforcement action. Because of a prior agreement between DEP and the Department of Agriculture, violations of water quality standards put the cost-share funds for agriculture irrigation in jeopardy.

Second, droughts in 1995, 2000 and 2001 caused problems of low or no supply in many areas affecting agriculture. A number of coastal communities were experiencing significant population growth in areas of very limited supply.

Additionally, in 1999 the U.S. Fish and Wildlife Service listed certain populations of Atlantic salmon as endangered. The recovery plans would need to address altered flow conditions as many of the salmon rivers and streams were also areas of agricultural irrigation. By developing a state water use management system the state could assume responsibility for this aspect of the recovery plans (Courtemanch, 2008).

Policy Broker/Policy Oriented Learning: All interests were brought to the table as part of the Sustainable Water Use Policy Task Force co-chaired by the Department of Environmental Protection and Department of Agriculture, Food and Rural Resources (DAFRR). The Task Force worked for 2 years and was able to unanimously approve a joint proposal developed by the DEP and the DAFRR for a two-phase approach that included collecting data and then developing a management program (Richert, 2002).

Turning Point/Learning Moment: A key turning point in the relationship between the DEP and DAFRR occurred when the two agencies joined efforts on a key funding issue. The DEP agreed to attach funding for water management and storage infrastructure for farmers to an environmental bond bill. By developing a funding source for farmers needing to invest in water management and storage to meet new water management regulations the agencies were able to become allies and to focus on a joint solution. This changed the nature of the relationship and dialogue between two primary stakeholders (Courtemanch, 2008).

Role of Science: The stakeholder process included an "Instream Flow Issues Conference" in August, 2001 sponsored by the Aquatic Ecosystems Subcommittee of the Sustainable Water Use

Task Force which attracted approximately 100 people. As described in the report of the Task Force to the Legislature "Speakers from around New England and beyond gave presentations on the current state of the science of instream-flow, and on recent policy developments in other New England states. A key finding of this effort may be summarized as 'one size does not fit all.' The impact of various flow conditions on aquatic ecosystems depends on site specific aquatic resources and the timing or pattern of use. Working with 'flat-line' scenarios fails to describe what really happens in a stream" (LURC, 2002).

Some Other Examples

There are two other examples worth mentioning briefly. In 2005 the **Connecticut** legislature passed an act expanding existing environmental flow protection to all streams in the state (previously they covered only stocked streams) and required the Department of Environmental Protection (DEP) to establish flow regulations to "preserve and protect the natural aquatic life" and "be based, to the maximum extent practicable, on natural variation of flows and water levels while providing for the needs and requirements of public health, flood control, industry, public utilities, water supply, public safety, agriculture and other lawful uses of such waters" (Connecticut Statutes, Title 26, Ch.490, §26-141a).

In this case the joint advocacy coalition policy-oriented learning had occurred during a multi-year effort undertaken by the state Water Planning Council to address a broad range of water issues. A consensus approach which reflected a scientific consensus emphasizing the natural flow regime was outlined (CT Water Planning Councial, 2002). However, the Planning Council took no action on this or other recommendations, leading to widespread frustration among the stakeholders.

Subsequently, two focusing events occurred. A widely watched court case on the Shepaug River involving an upstream municipal water supply sued by downstream communities for not releasing enough water from their reservoir was resolved with a negotiated settlement. Though ultimately settled, the case heightened concern that expensive and time consuming legal actions could occur elsewhere. Also, during the case two DEP employees testified they were unaware of

any ecological foundation for the existing flow regulations (City Of Waterbury Et Al. *V.* Town Of Washington Et Al.(Sc 16509)).

Therefore, when a coalition of environmental groups began advocating for legislation requiring the DEP to update its flow regulations the objective was generally consistent with the recommendation of the Water Planning Council's technical subcommittee. Other advocacy coalitions, including the water supply community, while initially not favorable to the legislation, shared the frustration about inaction on water issues at the state level and hoped the new standards might increase the predictability of the regulatory process. The water suppliers and other interests were able to work with the DEP and members of the environmental advocacy coalition to include language ensuring other water uses were taken into account in the legislation and therefore did not oppose the passage of the bill.

Florida has passed two major water resource management acts providing some of the most comprehensive protection of environmental flows in the United States. The first was the Water Resources Act of 1972 and the second was the 1997 Water Act. The 1972 Act created the statewide system of five water management districts (WMDs) with broad powers to permit consumptive uses based on reasonable and beneficial uses and to establish Minimum Flows and Levels (MFLs) to protect water resources from significant harm (Munson, Delfino, & Leeper, 2005). However, it was the 1997 Water Act that provided the solid link between water development, allocation and environmental flow protection.

The primary goal of the 1997 Water Act was to increase the volume of water available and to do so in a manner that avoided pitting consumptive users against each other and against natural systems. As described by Munson, the Act followed a period of several lawsuits and legislative actions to force WMDs to define minimum flows and water levels to prevent overexploitation of water resources (i.e. focusing events). The key elements of the 1997 Act were developed by a task force convened by the Governor which provided the joint advocacy coalition policy-oriented learning opportunity.

While it is difficult without a primary source to determine if there was a turning point/learning moment, the work of the task force, and therefore the resultant legislation, was based on the same key assumption, which was recognizing that the only way to meet the increasing water demands and to protect the environment, public health and quality of life was to increase the availability of water (Mathews and Nieto, 1998). This represents a fundamental shift in focus for the Water Management Districts from a role focusing solely on allocation to one of water supply development.

This assumption resulted in two key elements of how environmental flows were addressed. First, the legislation required districts to set 'realistic' MFLs by deemphasizing restoration of historic flows and levels and requiring WMDs to take into account modifications to water bodies (Mathews, 1998). Second, the negotiated outcome between the water supply interests and the environmental interests was the requirement that alternative water supplies had to be developed concurrently with any reduction in existing permitted withdrawals and these new supplies had to be allocated to existing users to offset these reductions (Mathews, 1998). Finally, the legislation requires the WMDs to give funding priority to projects that create dependable and sustainable supplies of water (as well as to projects that implement reuse, storage, recharge, or conservation of water). Further, if a priority project is meant to replace an existing source in order to implement an MFL (or implements a reuse project that helps eliminate discharge of domestic wastewater to an ocean outfall), it is given "first consideration" for funding assistance (Florida Statutes, Title XXVIII, §373.0831).

Yet Unsuccessful Examples

In addition examining cases where advocacy coalitions were successful in implementing new environmental flow protection statutes, two cases where such results have yet to occur were also reviewed. These were examined to see if the conceptual framework can help to explain why progress has yet to occur.

Apalachicola-Chattahoochee-Flint River

Background: Georgia, Florida and Alabama have been fighting over the waters of the Apalachiocola-Chattahoochee and Flint River since the 1970's (Metro Atlanta Chamber of

Commerce). While the fight is primarily about water supply for the City of Atlanta and for hydropower generation, environmental flows are a primary the interest of Florida and Alabama, including protecting natural variations in flows (Carriker, 2000). There have been numerous studies and attempts to negotiate or force settlement of the issues (see Carriker, 2000) the most significant of which was the formation of a congressionally sanctioned interstate compact agreement in 1997. This compact expired in 2003 without any agreement and litigation resumed.

Agenda Setting/Focusing Events: Droughts in the 1980's and 2000's have heightened water supply concerns for the city of Atlanta. In 2007 there was concern the City would run out of water in 90-121 days (Goodman, 2007). There have also been a handful of lawsuits, appeals and legal interventions which have served help move the issues onto the formal agenda of decision-makers. For example, a lawsuit by the state of Alabama to stop the proposed reallocation of water in Lake Lanier and Lake Allatoona led to a comprehensive study by the Army Corps and ultimately the formation of the Apalachiocola-Chattahoochee and Flint River Compact and resultant extensive negotiations.

Policy Broker/Policy Oriented Learning: As mentioned, both a comprehensive study of the River by the Army Corps and more importantly, the formal, congressionally authorized Apalachiocola-Chattahoochee and Flint Rivers Compact, provided extensive opportunity for joint policy-oriented learning by competing interests. While some progress was made, including agreement on a set of general principles for the allocation, fundamental differences remained. A primary difference was the position of Georgia, the upstream user, which argued for state sovereignty with no external limits to consumption, the need to deliver only minimum flows to the state line, and requesting that the federal reservoirs be constantly operated as if drought were imminent. Florida and Alabama held a different position, arguing the consumptive uses be defined and limited and that minimum flows at the state line occur only infrequently (Carriker, 2000).

Turning Point/Learning Moment: Despite years of negotiations it appears a turning point or learning moment never occurred and the fundamentally different positions never found a common goal or path toward resolution. There is speculation from one observer that the

negotiations under the Compact were always public and that this restricted candidness limited the ability to see compromise (Carriker, 2000). However, in this case the fundamentally different interests, with Georgia in a hegemonic position, result in the lack of a political desire or legal need to find of a common goal with the downstream states.

Role of Science: Scientific understanding played an important role in the policy-oriented learning. The comprehensive study undertaken by the Corps in 1992 addressed four broad topics: water resource demands, water resource availability, flood and drought management strategies, and coordination mechanisms. The study has since been referred to as "an unprecedented effort to develop the data necessary to fully address the water resource issues in the ACT and ACF" (Carriker, 2000).

Rhode Island

Background: In 2006 a group of non-governmental organizations focused on environmental and smart growth issues joined together to form the Coalition for Water Security (CWS) to develop and promote water management improvements, a group in which the author participated. Their agenda included environmental flow protection, demand management (particularly related to limiting seasonal peak uses), protecting land to protect water supplies, and a revised allocation system (Coalition for Water Security, 2007). In 2008 the Coalition worked with legislators to file legislation (RI H7787 & RI S2637) which addressed these issues. Also that year, other legislation related to water management was filed in the state Senate with different objectives. This other legislation focused on developing new water sources and included a new 'Water Supply Development Board' (RI – S2798). One part of this legislation allowed existing and potential new sources to be conclusively presumed to be in the public interest, a designation that could undermine existing environmental protections. Ultimately, no water legislation passed in the 2008 session.

Agenda Setting/Focusing Event: There were two focusing events. Like other states in New England, Rhode Island had experienced drought conditions in 2002. Though relatively short-lived and without major harm, the drought did heighten public awareness of the limited nature of the water resources of the state.

The second focusing event was a request in 2006 by Amgen Corporation seeking 800,000 gpd of water from the Kent County Water Authority (KCWA). KCWA, citing limited supplies especially during the summer said it was unable to meet this new need. The state legislature intervened and passed a bill requiring KCWA to provide this water as long as it did not interfere with basic residential and public health and safety water uses (RI – S2681). The inability of KCWA to supply the water moved water issues onto the formal agenda of the legislature with a primary goal being to prevent water from limiting opportunities for economic development.

Policy Broker/Policy Oriented Learning: Prior to 2006 there were two major forums in which different advocacy coalitions engaged in joint policy-oriented learning. The first was the Water Allocation Process Advisory Committee (WAPAC) process, a statewide water resource planning process. While final reports and recommendations reflecting numerous areas of consensus were produced, including the development of interim and watershed-specific environmental flow standards (WAPAC, 2004), the issues never moved onto the formal agenda of the legislature or the various state agencies and no substantial action resulted. Second, the RI Department of Environmental Management (DEM) had hosted a state Streamflow Task Force for several years. This task force reviewed and ultimately agreed to a document entitled "Modified Aquatic Base Flow for Rhode Island (RI-ABF)" which provide monthly flow statistics to help define 'natural flow conditions by basin not significantly altered by withdrawals' (Richardson 2005).

Third, in the process of pursuing its legislative agenda, members of the CWS reached out to key members of other advocacy coalitions, primarily the public water supplier and agricultural communities. In both cases the CWS found areas of substantial agreement. For example, the CWS agreed to include a 'revenue stabilization' requirement in their legislative package – a key need of water suppliers to ensure revenues would not be harmed by the reduced consumption resulting from demand management. With the agriculture community, agreement was reached to have farmers continue to be governed by existing requirements for demand management rather than the new elements intended to target seasonal water use on municipal systems.

Turning Point/Learning Moment: Though the CWS was able to identify common goals with at least two of the key other advocacy coalitions, they were unable to reach consensus with key Senators supporting for the 'Water Supply Development Board' approach. There was some agreement on issues such as demand management but there was no turning point on incorporating environmental flows requirements or even on ensuring the existing environmental standards were maintained. These legislators appeared to view the environmental agency as a stumbling block to developing new supplies of water. The CWS had as a top priority improving environmental flow protection so the two groups had fundamentally different core beliefs about the issues needing resolution.

Role of Science: The DEM undertook substantial scientific and technical work to develop its index flows report and later a state environmental flow policy. However, the work on the flow policy was undertaken with virtually no participation or review from stakeholders. Though the DEM did eventually present this work to some members of the CWS, they did not until much later do so to other stakeholder groups, particularly to public water suppliers who might be most affected by its use. Indeed, the agency used the new standards while reviewing an application for an expanded replacement well. When permit conditions were added to the elements of the expanded replacement wells in order to comply with the new, yet unannounced policy, the water supplier publicly rebuked the agency for its decision-making (Ward, 2008).

Discussion

The events in Michigan, South Africa, Montana, Maine, Connecticut and Florida have several features in common. We discuss these in relation to each element of the public policy process and dialogue.

Advocacy Coalitions: In all cases individuals and groups both inside and outside agencies who together represent informal advocacy coalitions that are working toward stronger protection of environmental flows can be identified. In addition, other advocacy coalitions with different interests are also present in all cases.

Agenda Setting/Focusing events: There is a consistent role that focusing events played in placing environmental flow issues onto the formal agenda of decision-makers. In a number of cases these events called into question the existing legal framework under which water was being managed. The uncertainty created by these changes, almost always legal challenges, brought about a desire by all parties to put in place a management system which would restore certainty and in which the various advocacy coalitions desired to have a role in its development and sometimes its implementation.

This was the case in Michigan, where a lawsuit called into question the common law property rights associated with groundwater and land ownership and how they related to the rights of riparian land owners. In Maine the listing of Atlantic salmon under the Endangered Species Act had the potential to give federal agencies the ability to review and intervene on water use decisions. In South Africa a new government and constitution underpinned a new legal framework. In Montana, a narrow legal interpretation of groundwater and its influence on surface waters led to a legal conflict between the property rights of new groundwater users and the water rights of more senior water rights. Only in Connecticut did new legislation pass where the existing legal framework was not fundamentally in question, though the potential for continuing legal challenges by downstream riparian owners created an ongoing uncertainty upstream water users.

This does not mean that the focusing event brought a new issue to the table for the first time. Quite the contrary. In all cases the individuals within the 'advocacy coalition' had been working, separately or together, for some time, usually years, to build the case for the needed change. The focusing event, whether a drought, a strategic legal action, or both, provided the impetus to move these issues onto the formal agenda of decision-makers.

Policy Broker/Policy Oriented Learning: Another common feature of almost all cases examined in this paper was the opportunity for advocacy coalitions with different agenda's to jointly be engaged in policy-oriented learning. In many cases these were forums created by policy brokers who brought the competing interests together and often provided leadership by articulating the common goal or approach. In Maine it was the managers of DEP and DAFRR

who formed the Sustainable Water Use Committee (Courtemanch, 2008). In South Africa, Minister Asmal convened the process that resulted in the drafting of key legislative language and he played a central role in framing the issues in terms of equity to users (MacKay, 2008). In Michigan it was the meetings held by Representative Birkholz (Bowman, 2008). Only in Montana was an explicit forum lacking. In this case, strategic outreach by the key agency and advocacy groups to communicate scientific information and explain the threat to existing water users, to stakeholders and to members of the general public provided the joint policy-oriented learning by various interests.

Turning Point/Learning Moment: In all cases the joint policy-oriented learning process resulted in a particular learning moment and/or turning point where the parties found a way to frame the issues so they reflected new, common goals. In South Africa this was framing issues as equity issues – the fundamental principal of the new constitution and government. In Michigan it was reframing the discussion around finding appropriate locations for water use – a way to steer large users away from high value streams and toward areas where there would be less resistance to industry and other water uses. In Maine the turning point was agreeing to help fund solutions for agricultural interests so that the cost of compliance was manageable. In Florida it was in reframing the issue to focus on developing new supplies to meet both economic and environmental needs and to develop funding solutions. In Montana it was the understanding by hydro-electric plant operators and by some traditional surface water irrigators that they, like the Fish, Wildlife and Parks Department, had water rights at risk from new and changing uses in closed basins.

Role of Science: In almost all cases the development of a scientific consensus or common understanding was critical to moving these processes forward and to presenting decision-makers with specific policy recommendations. In Michigan this involved both the education of stakeholders on environmental flow principles during the initial meetings hosted by Rep. Birkholz. More importantly, it was the consensus among the scientists on a framework for defining impacts to surface waters (Bowman, 2008). In Maine the scientific consensus emerged from a conference at which national and regional experts provided a consensus review of the state of the science and the importance of natural variations in flow (LURC, 2002). In South

Africa, a long history of investment in research allowed the socio-economic relevance of environmental flow issues to be understood and be presented in a dispassionate and technical manner (MacKay, 2008). In Montana an analysis done by the water agency and the FWP provided evidence of the potential impacts of the cumulative impact of existing and new groundwater uses on surface water as part of an administrative hearing (Williams, 2008). In Connecticut, it was the work of Technical Subcommittee B of the Water Planning Council to reach a consensus on a short and long-term plan for developing environmental flow protection standards (CT Water Planning Council Technical Management Subcommittee B, 2002).

Finally, in several cases outside peer review of key science products played or plays an important role in building a strong science base for decision-making. In Michigan the outside peer-reviewed provied confidence in the groundwater assessment and management tool. In Florida, the MFL statute includes a provisions allowing for peer review of minimum flows and levels before they are issued (Florida Statutes, Title XXVIII, §373.042).

Discussion of Yet Unsuccessful Cases

In the cases where changes to statute have yet to take place at least one of these key factors did not occur. In Rhode Island while there were several forums in which joint policy learning opportunities occurred these did not result in a turning point/learning moment between the different advocacy coalitions. Even with a concerted campaign in the media by the Coalition for Water Security and an opposing campaign by competing water supply interests there was not a focusing event that moved environmental flows onto the formal agenda. On the contrary, a focusing event about the inability to provide a potential major new industry with water moved water development onto the formal agenda – a key element of which was to potentially override existing environmental protections. Also, no broad scientific consensus has developed on how to define environmental flow standards.

In the ACF, there were several forums in which policy-oriented learning occurred and two long-term droughts provided focusing events that put the issue on the formal agenda of numerous agencies. There has yet to be a turning point which has allowed the issue to be reframed into a common goal. This may be because of the lack of a need, either politically or legally, for the

state of Georgia to compromise with downstream states. Even the challenge to the fundamental legal framework through challenges to the Supreme Court has not resulted in the emergence of a common goal. The lesson from this conflict may be more about absolute power (in this case of sovereign states) than the substance of environmental flow issues and water management.

Conclusion

In every case reviewed where laws protecting environmental flows were improved the final statutory language was the result of a consensus reframing of the issues that satisfactorily addressed multiple interests. These consensus outcomes were the result of joint policy-oriented learning between competing advocacy coalitions. The forums in which the dialogue and learning occurred were usually the result of a focusing event and the subsequent convening of different interests by policy brokers. These consensus outcomes were occasionally the result of strategic engagement of competing advocacy coalitions by advocates seeking to strengthen existing management frameworks. These few examples suggest that people seeking to strengthen existing legal frameworks need not wait to be convened by a policy broker.

With only few exceptions, environmental flows only became part of the formal agenda for decision-makers after one or more focusing events created new legal uncertainties or highlighted shortcomings of existing management frameworks -- often the inability to assure fair and adequate water supply during times of scarcity.

Importantly, sufficient scientific input to the public policy process to build a consensus or common understanding of the science of environmental flows and its relevance to the particular situation has been a key element of successful policy advances. Such scientific consensus prevented the scientific uncertainty from stymieing decision-makers. Peer review is often an important element of reaching this consensus.

One question that arises from this review is whether a focusing event is a necessary condition of getting environmental issues onto the formal agendas of agencies and decision-makers. While the evidence suggests that it is, it is worth noting the model developed by the United Nations Intergovernmental Panel on Climate Change (IPCC). The work of the IPCC is an unprecedented

and successful effort to bring about policy action as a result of a concerted efforts to reach scientific consensus on climate change and its impact on society. While much has been written on the work of the IPCC it is worth noting the elements that the IPCC deemed key to its success: "One of the most important principles of the IPCC is to be policy relevant but not policy prescriptive. Other important factors are scientific integrity, objectivity, openness and transparency, achieved through a rigorous review process for all IPCC reports and an adoption and approval process that is open to all member governments" (IPCC, 2004) In the United States and Canada, the Instream Flow Council has, to a degree, played such a role in working to bring about a broader understandingn of the scientific and technical issues associated with environmental flows.

Therefore, advocacy coalitions, focusing events, joint policy-oriented learning, and scientific consensus can lead to turning points that change the nature of the discussion and reframe the issues so as to unify, if briefly, broadly divergent interests. These examples provide hope the continuing efforts around the globe to balance human and environmental water needs will continue to lead to improved water management frameworks.

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