Collaborative Water Governance in the Colorado River Basin: Understanding Coalition Dynamics and Processes of Policy Change

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COLLABORATIVE WATER GOVERNANCE IN THE COLORADO RIVER BASIN:
UNDERSTANDING COALITION DYNAMICS AND PROCESSES OF POLICY CHANGE

by

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B.A., Arizona State University, 2010
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A thesis submitted to the
Faculty of the Graduate School of the
University of Colorado in partial fulfillment
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Doctor of Philosophy

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This thesis entitled:

Collaborative Water Governance in the Colorado River Basin: Understanding Coalition Dynamics and Processes of Policy Change

written by Elizabeth Ann Koebele

has been approved for the Environmental Studies Program

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The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

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ABSTRACT

Koebele, Elizabeth (Ph.D., Environmental Studies)

Collaborative Water Governance in the Colorado River Basin: Understanding Coalition Dynamics and Processes of Policy Change

Thesis directed by Professor Deserai A. Crow

Over the past three decades, collaboration has become a foundational tenet of modern environmental governance. By encouraging diverse stakeholders to interact repeatedly, explore complex issues in depth, and develop consensus on management actions, collaborative environmental governance processes have the potential to positively impact the environment and increase resource sustainability while also expanding citizen participation in policymaking. This dissertation investigates the role of collaboration in governing water resources in the Colorado River Basin, located in the western United States and Mexico. In this region, predictions for a warming climate and a rapidly growing human population make the effective management of limited freshwater one of the most critical challenges of our time. Although narratives abound of future “water wars” over a largely desiccated Colorado River, the Basin has become a test bed for processes that experiment with new ways for users to collaboratively govern the river in order to increase benefits across sectors.

Using a mixed-method approach, this project examines how stakeholders interact, learn, and produce policy change in three ongoing “landmark” cases of collaborative water governance in the Colorado River Basin. It begins by suggesting how a well-tested policy process framework, the Advocacy Coalition Framework (ACF), can be adapted to rigorously evaluate collaborative processes in a way that ultimately facilitates comparisons across multiple governance arrangements (Chapter 3). The chapters that follow test ACF hypotheses that have
been modified for collaborative contexts on cross-coalition coordination and the connection between learning and policy change. Findings indicate that while collaborative processes foster coordination across coalitions and facilitate the creation of multi-benefit policy outputs, they fail to breakdown boundaries among existing coalitions, a step presumed necessary for legitimizing collaborative approaches to policymaking (Chapter 4). Furthermore, specific institutional features of collaborative processes were found to increase individual learning, a variable that significantly predicts an actor’s perception of collectively-produced policy change (Chapter 5). These findings are presented in hopes of informing both the theoretical study of collaborative environmental governance processes and improving the efficacy of such processes in practice.
ACKNOWLEDGEMENTS

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I could not have asked for a more caring, driven, and thoughtful advisor and mentor than Deserai. Thank you for treating me like a colleague from the very beginning, advocating on my behalf at every roadblock, mentoring me through the process of getting an academic job, and responding to hundreds of emails with good advice and kindness. Your friendship is invaluable.

Thank you to all of the individuals who shared their perspectives and opinions with me through interviews, surveys, phone calls, and meetings, including participants in Colorado’s Basin Roundtables/IBCC, the System Conservation Pilot Program, and the Minute 319 process. This work would not have not been possible without your insight. I sincerely appreciate everything you do to protect the rivers and the region that I love.

I would also like to thank Karen Schlatter and the Sonoran Institute for making my trip to the Colorado River Delta possible; Elizabeth Albright for contributing to my training as a researcher; Jason Neff for supporting me as a teacher-scholar; Greg Johnson for his tremendous help with my survey data collection; Amanda Carrico for aiding in the survey data analysis process; the members of my research group for their intellect and sympathy; and the friends I have made through the CU Cycling Team for their support of my unexpected foray into college athletics during the course of writing this dissertation.

Finally, I would like to thank my partner, Callum O’Neil Ingram. Fortunately, this work led me to meet you in a casino in Las Vegas. Since then, you’ve given me the encouragement to persevere professionally and personally. Thank you for supporting me through the tough times and reminding me to celebrate the good ones.

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CHAPTER 1

Introduction

In the Colorado River Basin, located in the western United States and northern Mexico, predictions for a warming climate and a rapidly growing human population make the effective management of limited freshwater resources one of the most critical challenges of our time. From the complex legal regime allocating the Colorado River’s flows to the multiplicity of competing demands on an increasingly variable water supply, this challenge is steeped in both historical conflict and modern-day uncertainty. Indeed, scholars have grappled with whether the Colorado has become “a river no more” for decades (Fradkin 1981; Kenney 2009), and citizens and practitioners alike reiterate Mark Twain’s apocryphal quote that while “whiskey is for drinking,” water in this region is simply “for fighting” (United States Bureau of Reclamation 2017).

Fortunately, however, a number of water professionals, academics, journalists, and river enthusiasts have begun to propose a new mechanism for river governance—one that moves beyond the conception of impending “water wars” over a dying Colorado River that has been forged into the collective American West mindset.¹ While individual notions of this mechanism may vary in shape, size, and feasibility, they hold a core tenet in common: that any good solution to this complex problem requires that people share, collaborate, and negotiate creatively rather than resorting to violent conflict.

¹ This narrative has become so popular that it was even used as the central premise of an award-winning 2015 dystopian fiction novel entitled The Water Knife by Paolo Bacigalupi. The novel opens with a scene in which employees of the Southern Nevada Water Authority blow up a treatment plant owned by junior water users in Arizona to ensure that their water rights are protected in a moment of extreme scarcity.
than divisively (Fleck 2016; Limerick 2016). It is from this hopeful line of thinking that this dissertation project arose.

At its core, this project investigates the role of collaboration in governing the Colorado River. It draws data from three on-going collaborative processes in the Colorado River Basin to test theoretical assumptions about how collaboration works and what it might mean for the Colorado River’s future. The nature of the inquiry that follows, however, is perhaps more deeply grounded in policy process scholarship than it is in literature on water law or natural resource management. Similarly, the findings inform questions of governance broadly, moving beyond the realm of the natural environment to describe how policy actors work together, how they learn, how they produce policy change—and how we can better study the collaborative institutions that may foster such behaviors. Yet, there should be no doubt that the Colorado River remains at the heart of this project. Spending time around the people who manage it, study it, write about it, and work to protect it provided the initial inspiration for this dissertation and continue to motivate it today. I hope that the ideas and evidence put forth here can provide a bit of inspiration in return.

A Very Brief Synopsis of the Colorado River “Problem”

Colorado River management is grounded in “The Law of the River,” a “shorthand reference” for the “longstanding and complex body of legal agreements governing the Colorado River” (United States Bureau of Reclamation 2012, 3). We now know that the lawmakers who composed the centerpiece of this body of law, the 1922 Colorado River Compact, based their predictions of available Colorado River water—and consequently, their decisions about how to allocate that water among users—on a hydrograph that reflected a number of relatively wet years in the basin at the start of the 20th century (Getches 2003; Kenney 2009). In other words, since
the beginning of intentional Colorado River management, the river has been over-allocated: more water has been promised to users than actually exists in most years.

In addition to the complex legal constraints that have come to govern the “who,” “when,” and “for what” of water use in the Colorado River Basin, water decisionmakers and managers face issues of seasonal and inter-annual water supply variability as well as short- and long-term droughts—issues that will be exacerbated by climate change (Christensen et al. 2004; Jacobs 2011; United States Bureau of Reclamation 2012). As regional temperatures rise, more precipitation is expected to fall in the form of rain rather than snow, resulting in a smaller mountain snowpack that melts earlier in the year (Clow 2010; Fritze, Stewart, and Pebesma 2011). Although the complex system of dams and reservoirs sited throughout the Colorado River Basin helps to store this runoff, a warmer and drier climate means that less water is available to fill these reservoirs each year, and a larger percentage of stored water is lost to evaporation (Clow 2010).

This picture is further complicated as the population of the region continues to grow rapidly (Henderson 2016), creating the potential for increased demands and heightened conflicts among water users, especially in times of scarcity. Such threats are felt across sectors: municipal providers seek additional supplies through a diversity of methods to ensure that they can meet their customers’ demands, including those of major industries; agriculturalists contemplate if they will receive enough water to bring the year’s crops to fruition and whether fallowing their fields, or even selling their water rights, might be a more promising option; river-dependent businesses, such as recreational outfitters, calculate their losses from shorter business seasons caused by lower stream flows, especially in the late season; and numerous fish and riparian species, including a number of endangered species, face threats in the form of critical habitat loss.
throughout the basin (United States Bureau of Reclamation 2012; Fleck 2016). Finding ways to sustainably manage the Colorado River system that meet the needs of each of these sectors—particularly in the face of over-allocation, hydrologic uncertainty, and the possibility of greater disagreement among users—is crucial.

**Research Goals**

The research that follows seeks to investigate one proposed solution to meeting these water management challenges: collaborative environmental governance. By engaging diverse stakeholders from public and private realms to develop mutually-acceptable resource management actions (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Gerlak, Heikkila, and Lubell 2013), collaborative environmental governance processes may foster trust and learning among stakeholders, create legitimate and implementable management actions, and produce positive environmental outcomes (Sabatier et al. 2005a). At the core of this approach is the recognition that even though stakeholders hold a multiplicity of competing values about a resource and its management, through collaboration they can create governance strategies that lead to increased sharing of the resource, changes in individual users’ behavior, and greater resource sustainability with widespread benefits.

Specifically, this dissertation seeks to answer the following question: *how do collaborative water governance processes shape the ways in which stakeholders interact with one another and produce policy change in the context of the Colorado River Basin?* In order to answer this question, it is necessary to describe the current state of various collaborative water governance processes, understand how they work and why, and speculate on how they affect Colorado River management broadly. The findings produced through this investigation not only build theory by explicitly testing the assumptions of a popular policy process framework (the
Advocacy Coalition Framework) in collaborative contexts, but they also inform the development of more effective collaborative environmental governance processes, especially in relation to fostering greater collaboration and learning among participants with diverse values and policy goals.

**Primary Theoretical Foundations**

This dissertation draws from a broad range of literature on the policy process, governance, learning, and environmental and natural resource management, to name a few areas. However, there are two major bodies of literature that provide the theoretical foundation for the project as a whole: the collaborative governance literature and the Advocacy Coalition Framework literature. This section provides a brief introduction to each of these literatures by describing some of their major lines of scholarly inquiry relevant to this project. In the chapters that follow, the areas of these literatures most relevant to the specific research goals will be presented in greater detail.

**Collaborative Environmental Governance**

Over the past three decades, collaborative environmental governance processes have been widely implemented at a variety of scales (Ansell and Gash 2008; Gerlak, Heikkila, and Lubell 2013; Koontz 2016), especially in the realm of water resources. As part of a broad “government-to-governance shift” (Matti and Sandström 2011, 386), collaborative environmental governance processes engage a wide variety of stakeholders across public and private spheres to develop and implement mutually-beneficial environmental management actions (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Gerlak, Heikkila, and Lubell 2013; Koontz and Newig 2014). Because collaborative processes may address some of the failures of top-down, command-and-control management, these processes may produce solutions that are more
feasible, widely accepted by stakeholders, and easier to implement (Ansell and Gash 2008; Pahl-Wostl et al. 2007; Sabatier et al. 2005a)

Scholarship on collaborative governance has addressed questions about the benefits and tradeoffs of collaborative approaches (Blomquist and Schlager 2005; Leach et al. 2014; Sabatier et al. 2005a; Trachtenberg and Focht 2005), what factors make collaborative processes more successful (Bidwell and Ryan 2006; Kenney 2000; Leach and Pelkey 2001), how to best evaluate collaborative processes and their effects on relevant social and natural environments (Conley and Moote 2003; Koontz and Thomas 2006; Lubell, Gerlak, and Heikkila 2013), and what factors foster the implementation of collaboratively-developed solutions (Ananda and Proctor 2013; Koontz 2005; Koontz and Newig 2014), among other topics. More recently, scholars have begun developing extensive typologies (Margerum 2008; Moore and Koontz 2003) and detailed theoretical frameworks (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Sabatier et al. 2005a) in order to more holistically understand and analyze collaborative process dynamics.

While scholarship on collaborative governance has become increasingly sophisticated by advancing the identification and measurement of key concepts and variables, it has remained somewhat disconnected from the broader policy process literature, thereby stunting research that compares the processes, products, or effectiveness of various governance arrangements. In order to begin addressing this gap, this dissertation investigates the collaborative governance literature alongside scholarship on a well-known and rigorously-tested policy process framework—the Advocacy Coalition Framework.

The Advocacy Coalition Framework

Originally developed by Sabatier and Jenkins-Smith in the 1980’s and revised by numerous scholars since, the Advocacy Coalition Framework (ACF) has been touted as a useful
tool for analyzing policy processes dealing with “wicked” problems, which involve “substantial goal conflicts, important technical disputes, and multiple actors from several levels of government” (Sabatier and Weible 2007, 189). According to ACF scholars, such processes are best understood by organizing participants in a policy subsystem—“defined by a policy topic, territorial scope, and the actors directly or indirectly influencing subsystem affairs”—into advocacy coalitions based on their shared beliefs and coordination patterns (Jenkins-Smith et al. 2014, 189). Analysts then examine how these coalitions attempt to translate their beliefs into policy, often focusing on topics such as interactions among coalitions, the information and strategies coalitions use to achieve their goals, and how policy outputs feed back to affect subsystem dynamics.

While ACF scholarship assumes that coalitions with different beliefs will be generally adversarial, it also recognizes the existence of “collaborative subsystems,” in which coalitions share beliefs and decisionmaking power and coordinate with one another to develop consensus on “win-win and voluntary solutions” (Weible and Sabatier 2009, 197-8). While collaborative subsystems remain a largely underexplored area of the ACF (Weible, Sabatier, and McQueen 2009), scholars have begun to test a number of the ACF’s assumptions in collaborative contexts (Weible and Sabatier 2009) and explicitly theorize about how the ACF could be modified for studying watershed partnerships and other collaborative institutions (Sabatier et al. 2005b; Sabatier and Weible 2007).

This dissertation capitalizes on the proposition that “the ACF is best thought of as a framework supporting multiple, overlapping theoretical foci” (Jenkins-Smith et al. 2014, 188). It begins from the assumption that the ACF, as a framework, provides a common vocabulary and set of concepts through which scholars studying different governance arrangements can build
connections and comparisons. Yet, it also suggests that the specific theoretical tenets of the ACF can and should be modified to better characterize the idiosyncrasies of these different governance arrangements. Specifically, this dissertation works to adapt the assumptions underlying each of the ACF’s core theoretical foci for use in better analyzing collaborative contexts, expanding both the ACF and collaborative governance literature in the process.

**Structure of the Dissertation**

Following this brief introduction is a chapter on research design that provides an overview of the methodologies and case studies used in this dissertation. After this, there are three “data-chapters” that tackle the central question of this project using various approaches. The first of these, Chapter 3, suggests how the Advocacy Coalition Framework can be adapted to rigorously evaluate collaborative processes and facilitate comparisons across multiple governance arrangements. This chapter outlines nine “modified ACF hypotheses” and illustrates them using qualitative data from one collaborative water governance process in Colorado. Chapter 4 tests Hypotheses 1-3 from Chapter 3, which focus on cross-coalition coordination, using qualitative data from three collaborative water governance processes at different scales across the Basin. Chapter 5 tests Hypotheses 4-6 from Chapter 3, which focus on cross-coalition learning, using longitudinal qualitative and quantitative data from one collaborative process. While this dissertation does not explicitly test Hypotheses 7-9, which focus on policy change in collaborative governance processes, the exploration of the link between learning and policy change in Chapter 5 begins to shed light on this historically difficult topic to define and measure, providing a foundation for testing these hypotheses in future research. This dissertation culminates in a chapter that outlines overarching conclusions and future research plans.
Below are the abstracts for the three data-chapters (Chapters 3-5). Note that because each of the data-chapters was composed as an independent manuscript, there is repetition of and expansion on the foundational theory (Chapter 1) and methodological/case study information (Chapter 2) to the degree necessary for each chapter to stand alone when published independently.

**Chapter 3 – Using the Advocacy Coalition Framework to Understand Collaborative Policy Processes**

As environmental policymaking and governance processes increasingly utilize collaborative approaches, evaluating whether these approaches are more effective than traditional, top-down governance is crucial. While generalized policy process theories often fail to capture the idiosyncrasies of collaborative approaches, emerging theories of collaborative governance are often too specific to apply in comparisons of multiple governance arrangements. In response, this paper proposes how the Advocacy Coalition Framework (ACF), a well-tested policy process framework, can be adapted to rigorously evaluate collaborative processes while retaining a common language and set of variables that facilitate comparisons of multiple governance approaches. Specifically, this paper develops hypotheses about the ACF’s key theoretical foci in the context of collaboration, and then provides a preliminary exploration of them using data from a multi-level collaborative environmental governance process. This study broadens the ACF’s applicability to collaborative contexts and introduces a new tool to the growing field of comparative policy process scholarship.

**Chapter 4 – Cross-Coalition Coordination in Collaborative Environmental Governance Processes**
Collaborative environmental governance processes utilize strategies such as face-to-face interaction, open deliberation, and resource-sharing to facilitate the development of trust and consensus among policy actors with different beliefs. Ideally, this leads actors to engage in some degree of cross-coalition coordination in order to produce mutually-beneficial environmental management actions. This study examines cross-coalition coordination in three collaborative environmental governance processes at different scales (statewide, multi-state, bi-national) nested within a common policy subsystem (Colorado River water governance) to understand why actors engage in this behavior and what effects it has on policy outputs and coalition stability. Data from process documents and interviews with key actors are used to examine three hypotheses derived from the Advocacy Coalition Framework and collaborative governance literatures about cross-coalition coordination. The findings indicate that collaborative processes indeed foster cross-coalition coordination and the development of mutually-beneficial management actions, but they fail to promote the realignment of coalitions presumed necessary for legitimizing collaborative approaches to policymaking. This work develops theory about coalition dynamics in collaborative environmental governance processes and provides insight into why such processes may succeed or fail at producing desired policy change, information that can be used to improve such processes as they continue to flourish across regions, scales, and resource contexts.

Chapter 5 – Linking Policy-Oriented Learning to Policy Change in Collaborative Environmental Governance Processes

Collaboration has become an increasingly popular mechanism for natural resource and environmental governance over the past three decades. The success of collaborative approaches, however, is often premised on the assumption that stakeholders will learn—about the resource
itself, relevant policies, other stakeholders’ values, and other aspects—as they interact with one another, thereby fostering the development of creative, mutually-beneficial management actions that increase resource sustainability. Despite the centrality of this assumption to the promotion of collaboration as a modern environmental governance tool, gaps remain regarding how to best measure learning or determine what factors promote learning, as well as whether more learning leads to a greater degree of policy change. This study uses data from two rounds of interviews and a survey of participants in a statewide, multi-level water governance process in Colorado in order to analyze the relationship between the procedural features of a collaborative process, policy-oriented learning, and policy change. The findings indicate that certain procedural features, alongside one’s innate proclivity toward collaborative decisionmaking processes, predict policy-oriented learning, and that one’s individual learning significantly predicts their perception of collective policy change. These findings help to develop a theory of policy learning in collaborative processes and inform the creation of policy processes that more successfully mitigate conflict through cooperation.

References


CHAPTER 2

Research Design: Methodology and Case Studies

This dissertation uses a mixed-method, comparative case study design (Yin 2003) to explore three collaborative water governance processes. Each individual case serves as a unit of analysis within the common context of the Colorado River Basin (see Figure 1). The three cases, which will be explained in greater detail below¹, include the following:

- **The Basin Roundtable and Colorado’s Water Plan (CWP) process**: a statewide water analysis and planning process in Colorado that began in 2005 and was central to producing the state’s first ever statewide water plan

- **The Colorado River System Conservation Pilot Program (SCPP)**: a multi-state pilot program that began in 2014 to financially incentivize water conservation on the U.S. portion of the Colorado River Basin

- **Minute 319 (M319)**: a bi-national agreement signed between the U.S. and Mexico in 2012 that has begun to restore water to the Colorado River Delta for the benefit of numerous endangered species and native people.

¹ Detailed case study summaries are presented after the methods because the summaries were composed from a variety of primary and secondary data sources collected for this dissertation.
² In the chapters that follow, this multi-level governance process is examined at different levels and time points; it is therefore referred to by the name that makes the most sense in the context of the specific analysis, which is clearly delineated in each chapter. For example, Chapter 3 uses data collected prior to the release of Colorado’s Water Plan and focuses on interactions among individual stakeholders, so the process is referred to as the “Roundtable process.” Chapter 4, which uses data collected after the release of Colorado’s Water Plan and focuses on the major policy output of each process, uses the name Colorado’s Water Plan (CWP). Chapter 5 uses “Roundtable process” once again to signify an examination of individual actors’ learning processes and perceptions of the collaborative process as a whole.
Figure 1: Approximate areas of the collaborative processes in the Colorado River Basin (background map of “Colorado River” by Shannon1 [2013]; author desaturated map and added lines/text for case studies).

In terms of the Advocacy Coalition Framework (ACF), this research design may be viewed as examining multiple policy processes or decisionmaking venues nested within a broader policy subsystem, defined as a network of policy actors bounded by both geographic and topical dimensions (Sabatier et al. 2005). Here, the policy subsystem is defined as Colorado River Basin water governance. Although each process studied in this dissertation functions at a

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3 Only the Western Slope of the state of Colorado technically falls within the hydrologic boundaries of the Colorado River Basin. However, the state of Colorado is a Colorado River headwaters state, and Colorado River water is transferred to the Eastern Slope of Colorado
different scale within the subsystem (statewide, multi-state, and bi-national) and has varying degrees of independent decisionmaking authority, studying multiple processes that share the same broad context helps to hold constant some of the major geographic or institutional factors that may influence water governance decisions (e.g., drought patterns and legal regimes).

This chapter provides an overview of the data collection and analysis methods used across the three empirical chapters presented in this dissertation, as well as in-depth case study summaries of the three collaborative water governance processes examined for this project. As mentioned in the introduction, because the chapters that follow are written as independent manuscripts that examine various combinations of the cases using different sources of data, each chapter details the relevant case background and methods used for that portion of the broader study. Thus, some of the information provided here is repeated where necessary, but repetition is kept to a minimum.

**Methods: Data Collection and Analysis by Source**

Multiple sources of data were collected about each case in order to triangulate case phenomena (i.e., dates, events, and outputs) as recommended by Yin (2003). This mixed-method approach allows the researcher to understand the cases in multiple ways and from various perspectives (e.g., how a decision is explained in a public document vs. how it is described narratively in an in-depth qualitative interview vs. how it is viewed by a larger population through a complex network of transmountain diversions. Therefore, water management across the state of Colorado is often discussed in terms of the broader Colorado River Basin. This is similar to the importance of the Colorado River in Southern California’s water management regime despite lying outside of the hydrologic Colorado River Basin. Therefore, while Colorado’s Basin Roundtables focus on water governance issues across the state of Colorado, including on rivers that are not tributaries to the Colorado River, the management of the Colorado River itself is deeply tied to all of these water management issues.
through a quantitative survey). Moreover, this approach allows for the quantitative testing of ideas developed through qualitative data (as is done in Chapter 5). Here, each data source and the relevant analysis methods used for this dissertation are described briefly. See Table 1 for a breakdown of each data source by case.

**Process Documents**

Key process documents, including enacting and related legislation, interim progress reports, major press releases, and final public documents that are outputs of the process were collected and archived. While these process documents were not formally analyzed, they were used to understand process timelines, identify key informants for interviews, and build the in-depth case study summaries that follow this section. Note that these process documents do not include peer-reviewed research by other scholars relating to these processes.

**Process Observations**

The researcher attended a number of meetings and site visits related to the three collaborative processes studied here. While these participatory experiences were not formally documented, they allowed for further triangulation of information and served as opportunities to build trust with process participants. Within the chapters that follow, these experiences are referred to as “process observations,” as they did not consist of the sustained, in-depth interaction required by the more common “participant observation” methodology (O’Reilly 2005). However, they did provide an opportunity for the researcher to better comprehend “the social and physical scene” of each process, which “provides important data for understanding social relationships” (DeWalt and DeWalt 2002, 70) that may influence policy negotiations and outputs.
Table 1: Data Sources by Case

<table>
<thead>
<tr>
<th>Case</th>
<th>Process Timeline</th>
<th>Process Observation</th>
<th>Document Collection Examples</th>
<th>Interviews b</th>
<th>Survey</th>
</tr>
</thead>
</table>
| Basin Roundtable/Colorado’s Water Plan    | Process officially began in 2005, but a smaller and more insular “roundtable” process started in 2002 | 12 public meetings (2013-2016)  
Preliminary (2015): n = 1  
Round 2 (2016): n = 12c | n = 111 (response rate = 32.6%), 95 complete surveys |
| System Conservation Pilot Program         | Pilot program began in 2014 but was being developed informally in prior years | Remote participation in webinars with process participants (2015-2016) | Enacting legislation for the process, Powerpoint presentations given by participants in the process at professional meetings, memoranda from participating organizations and agencies, requests for project proposals to be funded through the program, select news media including press releases | Preliminary (2015): n = 3  
Round 2 (2016): n = 10 | N/A |
| Minute 319                                | Agreement was passed in 2012, but solutions were being developed by participants in various degrees of formality since the 1990’s | Tour of restoration sites in the Colorado River Delta in Mexico (2016)  
Remote participation in webinars with process participants (2015-2016) | Text of the agreement and previous related agreements, Powerpoint presentations given by participants in the process, documents and “fact sheets” released by participating organizations and agencies, environmental monitoring reports, select news media including press releases | Preliminary (2015): n = 2  
Round 2 (2016): n = 6 | N/A |

aThese dates are provided a general guide; see the case study summaries below for detailed process timelines.
bNote that each case is quite different in size as measured by number of participants, with the Roundtable/CWP case vastly exceeding the others with 300+ regular participants. Coupled with the fact that the political environment surrounding the SCPP and Minute 319 cases is significantly more restricted (for example, these processes have no formal web presence, though relevant documents tend to be posted by participating agencies), this size disparity contributed to the difference in total number of interviewees across cases.
cNone of the individuals interviewed during the first round were re-interviewed in 2016; instead, the researcher shifted focus to key actors in the production of the statewide water plan (still representative of various stakeholders groups) as opposed to key stakeholders within individual Basin Roundtables.
Interviews

Two rounds of semi-structured interviews (2013-2014 and 2016) were conducted with participants in the collaborative processes according to the methodology prescribed in Rubin and Rubin (2005). Key participants for each round of interviews were initially identified through public process documents and, for the second round, during a series of preliminary interviews with key participants across the cases with whom the researcher had a pre-existing relationship as a part of the broader Colorado River water resources community. The initial sample for each round was expanded over time using a version of snowball sampling (Auerbach and Silverstein 2003) in which interviewees are asked to identify other key participants in their process. Any new participants mentioned were considered potential interview subjects. The researcher then selected subjects to represent all relevant stakeholder groups in each case. Formal questions in these interviews focused on participants’ perceptions of and roles in the processes, interactions with other stakeholders, and outputs/outcomes of the processes.

Interviews were conducted, recorded digitally, and transcribed in intelligent verbatim. Interview transcripts were then coded using QSR NVivo 10 qualitative analysis software. Codes were developed *a priori* from the relevant literature on the ACF and collaboration. For example, the supercode COORDMOTV, used in coding the second round of interviews, captures descriptions of actors’/groups’ motivation for coordinating with other actors/groups; subcodes include examples of specific motivations for coordination derived from the literature such as holding shared beliefs, having a pre-established trust, recognizing a common opponent, or

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4 The preliminary interviews were unrecorded and informal in nature, allowing the researcher to build trust with key informants, get a sense of their perspectives on how the processes were currently functioning, and identify important actors for semi-structured interviews. Two of the preliminary interviewees were formally re-interviewed in Round 2.
believing another actor/group has important resources. The researcher then analyzed the coded data by hand and using code queries in NVivo to detect commonalities and differences related to the hypotheses within and across cases (Miles and Huberman 1994). Note that the procedure for citing interview quotations varies across chapters based on what data are being used for that specific chapter’s dataset. In each chapter, these conventions are clearly laid out before any interview data is presented.

**Survey**

In 2016, the researcher conducted a survey of the participants in the Basin Roundtable/Colorado’s Water Plan process. The researcher conducted a survey of this collaborative process for a number of reasons: it has the broadest scope of participation, has been on-going for a longer time period in its formal/current form than the other processes (potentially allowing for more reflection on collaboration and learning by participants), and is the most “public” of the three collaborative processes (including having publically available contact information for participants, a regularly updated website with process documents, and an open invitation for public participation in meetings).

The survey questionnaire was developed based on major themes identified through the qualitative interviews, as well as the relevant literature on collaborative environmental governance. It included questions about who stakeholders collaborate with, what they learned through their participation in the collaborative process, and what effects they believe the process has had on the state’s water management, as well as demographic questions. The survey sample included 341 current participants in the process, and the survey was distributed to this population mainly via emails from the state agency that manages the process (the Colorado Water Conservation Board). The response rate for the survey was 32.6%, with 111 respondents
completing some portion of the content-based survey questions (i.e., beyond the initial consent question). Ninety-five surveys were fully completed. Broadly, the data were analyzed using SPSS statistical software and a number of analysis techniques including correlation, factor analysis, and regression. Please see Chapter 5, which presents findings from the survey data, for more information on the sampling and distribution of the survey, details on the demographic breakdown of the respondents, and the analyses relevant to specific research questions.

**Case Studies**

This section provides a brief introduction to the hydrologic context of the Colorado River Basin, followed by in-depth summaries of the three major collaborative governance processes that were used as case studies in this dissertation. These case study summaries were initially developed in order to trace important moments within each collaborative governance process— from the initiation of each process to the production of major policy products. Each summary was composed based on primary and secondary process documents, as well as insights from process observations and interviews. Here, interview quotations are cited using an alphanumeric code that combines the acronym for each process (presented in the following section) and an interview number to demonstrate that quoted information is derived from different interviews (ex: CWP_10). All quotations pertaining to the statewide process come from the second round of qualitative interviews. Select portions of the information included in these summaries are repeated in the chapters that follow in order to introduce relevant case context as necessary.

**Collaborative Governance in the Colorado River Basin**

The Colorado River, which has been called “the most legislated, most debated, and most litigated river in the entire world” (Reisner 1993, 120), begins in the Rocky Mountains
(Colorado, USA) and drains into the Gulf of California (Mexico). It provides water for 40 million municipal users, 5.5 million acres of irrigated farmland, 22 tribes, 7 National Wildlife Refuges, 4 National Recreation Areas, 11 National Parks, and 4,200 megawatts of hydropower generating capacity in 7 U.S. states (United States Bureau of Reclamation 2012), in addition to extensive agriculture and municipal uses in 2 Mexican states. Its waters are apportioned through the “Law of the River”—a “useful shorthand reference to describe [the] longstanding and complex body of legal agreements governing the Colorado River” (United States Bureau of Reclamation 2012, 3). This includes the 1922 Colorado River Compact, which allocates 15 million acre feet (maf) of the river’s annual flow among the Upper and Lower Basin states in the U.S., as well as the 1944 Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande Treaty, which allocates 1.5 maf to Mexico. Overlaying these laws is “complex web of fragmented and piecemeal authorities and institutions” involved in modern-day Colorado River operations (Gerlak, Zamora-Arroyo, and Kahler 2013, 33).

Due in part to the historical over-allocation of the Colorado River (Getches 2003), and in part to sustained drought and population growth in the region in recent decades (United States Bureau of Reclamation 2012), the construction and careful management of a complex system of storage reservoirs on the river have been crucial for avoiding major water shortages throughout the Basin. As demands on the system continue to increase and more attention is paid to negative environmental impacts associated with the current management regime (such as the fact that the river no longer reaches its delta in Mexico in most years), policymakers and river managers have begun to seek novel solutions to these challenges. As a result, the Colorado River Basin has

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6 Upper Basin states include Colorado, New Mexico, Utah and Wyoming. Lower Basin States include Arizona, California, and Nevada. See Figure 1 for a map that includes relevant state and national boundaries in the Colorado River Basin.
become a test bed for processes that experiment with new ways for users to collaboratively govern the river in order to increase benefits across sectors. This study examines three of these collaborative processes, each of which is detailed below. While other important collaborative water governance processes in the Basin have certainly occurred (e.g., the 2014 Lower Basin “MOU,” the 2012 Colorado River Basin Water Supply and Demand Study, the 2007 Interim Shortage Sharing Guidelines process), the processes selected for this study are on-going and widely recognized as landmark examples of collaboration. The most current information on the status of each process (e.g., as of February 2017) is provided in the concluding chapter of this dissertation since data collection for this dissertation was conducted between 2013-2016.

**The Roundtable Process and Colorado’s Water Plan (CWP): Statewide Collaboration**

Following a catastrophic drought in Colorado in 2002, Colorado’s main water governance entity, the Colorado Water Conservation (CWCB) board, began “the most comprehensive analysis of Colorado water ever undertaken” through the Statewide Water Supply Initiative (State of Colorado 2015). While this initial process did include some degree of stakeholder involvement, the 2005 Colorado Water for the 21st Century Act (HB05-1177) established a more robust, multi-level stakeholder process to “facilitate discussions on water management issues and encourage locally driven collaborative solutions” (Colorado Water Conservation Board 2016a). This process has since involved over 300 Colorado citizens in water discussions through Basin Roundtables, or groups of diverse stakeholders from each of the state’s eight hydrologic river basins plus the Denver Metro area, that work to assess each basin’s water needs, values, and potential solutions to existing and future gaps. The Roundtables also fund a variety of different types of projects that help meet their Basin’s water-related needs using funding allocated to them by the CWCB. For example, these projects may include making
improvements to a reservoir to increase storage or removing a retired in-stream diversion structure that negatively impacts aquatic life or recreation. Simultaneously, a 27-member Interbasin Compact Committee (IBCC) was established “to facilitate discussion across Colorado’s river basins and to address statewide water issues” (Colorado Water Conservation Board 2016b).

Although the Roundtables and IBCC had a number of interim goals such as creating assessments of various water use sectors and funding basin-specific projects as described above, their largest task arose in March 2013 when Colorado’s governor John Hickenlooper issued an executive order that called upon the CWCB to develop Colorado’s first statewide water plan (referred to herein as “Colorado’s Water Plan” or CWP). The creation of this plan was designed to be “a grassroots effort drawing upon eight years of unprecedented work, dialogue, and consensus building” through the IBCC and Roundtable process (Colorado Water Conservation Board 2014) to outline the current state of water in Colorado and plan for future needs. The Roundtables were tasked with providing data and insight for the statewide plan through “Basin Implementation Plans” (BIPs) that integrated the data they had gathered since their inception with actions that could help meet each basin’s water supply needs. The information from the BIPs, along with broader policy recommendations created by the IBCC, became the centerpiece of Colorado’s Water Plan. After releasing two drafts of the plan and soliciting extensive public feedback, a final draft of the plan was delivered to the governor in November 2015. The head of the CWCB, James Eklund, argued that the “boldest thing this water plan does is injecting collaboration into the water conversation” (Estabrook 2015).

This dissertation focuses on different levels of this multi-level statewide collaborative process across the following chapters. For instance, Chapter 3 is primarily concerned with
interactions among stakeholders within individual Roundtables (using data from interviews before the Roundtables produced BIPs), whereas Chapter 4 focuses on interactions among process participants across decisionmaking levels to create the CWP (further detailed in the next paragraph). Chapter 5 pairs survey data from participants in individual Roundtables from the time period after the CWP was produced with interviews with participants across decisionmaking levels before and after the production of the CWP to understand learning in the collaborative process.

Although the CWCB staff was primarily responsible for the final draft of Colorado’s Water Plan, it was crucial that they worked collaboratively and iteratively across decisionmaking levels during this process. This includes collaborating with those at the Colorado Department of Natural Resources, the state agency that houses the CWCB, and with key stakeholder group leaders involved in the Roundtables and IBCC to determine what content was included—and emphasized—in the final plan. For instance, the CWCB regularly “checked in” with Roundtable participants in order to provide a “sneak peak of where [the CWCB] was headed” so stakeholders “were not surprised” and had opportunities to respond to misgivings (CWP_5). The CWCB had to then take “very seriously the comments that had come out of the Roundtables and the IBCC” (CWP_1), often relying on IBCC leaders “to really be a gauge with their [respective] stakeholders” (CWP_12). This approach allowed the CWCB to create a plan that is accepted as legitimate by most process participants as opposed to being seen as product of the agency’s staff.

Fortunately, the fact that the collaborative IBCC and Roundtable process had been ongoing for nearly a decade at this point proved useful, as it fostered relationships that allowed for stakeholders across levels to trust that their voices were heard by policymakers, even if they did
not have a formal “say” in the final product. Policymakers reinforced this by committing to extreme transparency as they created the final plan:

“The most critical thing is that it wasn’t actually behind the scenes. Typically that’s how state government works: we’ll take a bunch of input if we’re doing our job somewhat right and try and pull that together and bake a cake in the kitchen out of that and then bring the cake out and say ‘isn’t this wonderful? We used your flour, we used your eggs, and your milk, and everything is great.’ What was clear about this process was that we were basically going to do that—get the ingredients from all the different basins—but we were going to [bake the cake] in a glass fishbowl. We were going to do it in complete transparency: anybody with an internet connection had access to our drafts, they had access to input forms that they could fill-out and submit” (CWP_5).

This transparency created buy-in from process participants “because they could see us the entire way” (CWP_5).

Even in the early stages of the implementation phase of the CWP, there remains the expectation that decisionmakers will consult with their relevant constituencies and deliberate with one another: “IBCC members will take [new] ideas back to their Roundtables to have some additional discussion there because if we’re going to change the way we raise funds or do things on financing water plans in the state, it’s got to be done on a non-partisan, broad scale, from rural to urban and parts in between” (CWP_1).

**Colorado River System Conservation Pilot Program (SCPP): Multi-state Collaboration**

Due to prolonged drought in the Colorado River Basin, water providers have become increasingly dependent on withdrawing water stored in the system’s major reservoirs to meet demand. Low reservoir levels reduce hydropower production, a major source of federal revenue,
and negatively affect recreational opportunities and the environment. In response, the U.S. states in the Colorado River Basin and the U.S. Bureau of Reclamation have begun drought contingency planning efforts (Colorado River District 2016). As part of these efforts, the United States Bureau of Reclamation and major water utilities from four Basin states (Arizona, California, Colorado, and Nevada) signed “a landmark water conservation agreement” in July 2014 to jointly fund a pilot program that supports “voluntary, compensated measures for reducing water demand” (Central Arizona Project et al. 2014). The System Conservation Pilot Program (SCPP) funds conservation projects proposed by water users across sectors and states in order to increase water levels in reservoirs. These projects are selected based on criteria such as the amount of damage to third-party users, length of time required for implementation, and cost (Waage 2013). Funded projects are then administered by the Bureau of Reclamation (in the Lower Basin) or the Upper Colorado River Commission and individual states (in the Upper Basin) with the goal of augmenting the system as a whole rather than benefitting any one entity. The initial joint press release for the program argues, “Without collaborative action now, water supplies, hydropower production, water quality, agricultural output and recreational and environmental resources are all at risk, in both the upper and lower basins” of the Colorado River (Central Arizona Project et al. 2014).

The program “was slated as a historic agreement” according to one interviewee, for two reasons: “for the first time that I’m aware of, funding partners from both the Lower Basin and the Upper Basin and Reclamation came together to pool their financial resources… to see, in a pilot program, whether there are some different approaches to conserving water that might work out to be applied on a broader scale” (SCPP_2). This quotation first emphasizes the unique and somewhat controversial joint funding approach of this program for system benefit, especially
among entities that have historically aimed to earmark conserved water for their own use: “this is the first time where municipal agencies have come and implemented this sort of program where conservation is occurring but it’s not directly for water supply” (SCPP_6). It also highlights the experimental, collaborative nature of the program: agencies are more focused on collectively determining if such a program is feasible, especially if it is to be scaled up, than ensuring that reservoir levels are raised by a specific amount. In other words, “this whole program is more about testing concepts rather than creating a lot of water” (SCPP_2).

This dissertation focuses on collaboration among the participating entities in developing and implementing the pilot program (as opposed to collaboration between the funders and the proponents of the projects they fund). This includes the five funding entities (Central Arizona Project, Denver Water, Metropolitan Water District of Southern California, Southern Nevada Water Authority, and the U.S. Bureau of Reclamation) as well as entities that administered the program (Upper Colorado River Commission and U.S. Bureau of Reclamation). Importantly, a number of environmental NGOs working in the region were identified as having played a key role in establishing the relationships necessary to carry out the program; thus, they were also consulted about the process as part of this study.

Early in the development of the SCPP, participating entities committed to making decisions based on consensus. To achieve this, they communicated regularly and deliberated issues openly, which often required “very lengthy negotiation… months and months of back-and-forth” and “a lot of debate amongst the stakeholders” (SCPP_3). To develop the criteria for proposals, “we locked ourselves in the room for two days and hashed it out… when you’re locked in a room with folks, coming to that relatively simple criteria requires a great deal of dialog about what the hot buttons are” (SCPP_5). Interviewees mentioned that in addition to
talking with one another, they frequently reported back to their agencies and constituents, and iteratively integrated this input into deliberations:

“There’s just a lot of discussion that goes on for a long period of time and it’s not necessarily things that are formal and that’s why it’s really hard to document. We talk in the room, but you know, when there’s a group [that has come] together about what we want to do, then there’s a lot of going back to our own offices, our own constituents, doing some homework, getting feedback, and then it’s a very iterative process for a long period of time that’s coming up with a program that we think has a chance for success” (SCPP_6).

Fortunately, interviewees expressed that even when face-to-face contact among entities is not possible, “it’s just really easy to get on the phone and talk things through.” (SCPP_4). As a result, participants in the collaborative process are able to “have disagreements and conflicts but in a professional way that doesn’t escalate” (SCPP_7).

The policymakers continue to utilize consensus-based decisionmaking rules as they implement the program: “a lot of the pilot program was set up basically on everyone being unanimous on everything… we have to work the implementation agreement out with the project beneficiary, but [also] each of the funding partners were involved in every moment of review” (SCPP_2). In other words, “five funding agencies, the [Upper Colorado River] commission, and the state [in which the project will be located]… at least seven entities… all have to review, approve, and sign-off” on each project (SCPP_3). While multiple interviewees commented on the fact that reaching this degree of consensus makes the program “not very efficient or streamlined” (SCPP_10) and hence “very difficult to administer” (SCPP_3), especially due to lack of funding dedicated to program administration, others argued that involving all participants
in all decisions “leads to a higher success rate in the long term for the program” (SCPP_6). Similar to the development stage of the program, interviewees cited “consistent communication from the moment the projects were really being concretely developed all the way through the implementation work” (SCPP_4) as a key to collaborative success. Response to the first call for proposals, which offered a total of $11 million in funding, exceeded expectations, and the program was granted additional funding in 2016 from the Bureau of Reclamation.

**Minute 319 (M319): Bi-national Collaboration**

The Colorado River Delta, where the Colorado River meets the Gulf of California in northern Mexico, was once described as a landscape composed of hundreds of green lagoons (Leopold 1986). Now, due to numerous water diversions, “as few as 40,000 acres are all that remain of 1.8 million acres of functioning wetlands in the historic delta” (Birdsong 2011, 143). This has resulted in a reduced and fragmented vegetation mosaic, biodiversity loss, the costly loss of fisheries, and the devastation of native culture (Getches 2003; Glenn et al. 1996; Hinojosa-Huerta et al. 2008; Hinojosa-Huerta et al. 2013; Kowalewski et al. 2000; Muehlmann 2009; Pitt 2001; Stromberg 2001). As the regional decisionmaking authority, the International Boundary and Water Commission/Comisión Nacional de Límites y Aguas (IBWC/CILA), experienced conflict and stagnation over Delta issues, a “transnational network” of bi-national NGOs emerged with a “renewed interest in this ecosystem” in the 1990s (Gerlak 2015, 105). The network began to generate scientific information and broad stakeholder interest in restoring the region.
Despite U.S.-Mexico relations surrounding the Colorado River reaching “new lows” during the mid-2000’s (King, Culp, and de la Parra 2014, 76), a core group of network participants preserved, coalescing around the “recognition that [promoting the need for] environmental flows [to the Delta] would not be enough to get decisionmakers to the table” (Gerlak 2015, 107). They began to organize meetings with a broader group of stakeholders (King, Culp, and de la Parra 2014), a dialogue was eventually institutionalized and extended by the IBWC/CILA (as the 2008 Joint Colorado River Cooperative Process) and catalyzed early collaborative Delta management. Additionally, following an earthquake that devastated Mexican water infrastructure in 2010, the U.S. passed an addendum to the 1944 Treaty called Minute 318, which allowed Mexico to delay deliveries of their Colorado River allocation by storing it in U.S. reservoirs—a management mechanism devised earlier by NGOs (King, Culp, and de la Parra 2014) that furthered bi-national collaboration.

Building on this history, the U.S. and Mexico signed a landmark agreement in 2012 known as Minute 319 (M319). It outlines “a series of agreements, operational measures, and cooperative projects” pertaining to water sharing over a five-year pilot period (King, Culp, and de la Parra 2014, 41-2). Specifically, Minute 319 developed guidelines for sharing water in times of surplus and shortage, extends Mexico’s ability to delay water deliveries, outlines plans for bi-national conservation projects, and commits 158,088 acre-feet of “environmental flows” to the Delta ecosystem, two-thirds of which was released as a “pulse flow” in spring 2014 (Flessa, Kendy, and Schlatter 2014). These provisions began reversing “a long historical legacy of border and water conflict, power asymmetry, and environmental damage in one of the world’s most

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7 Conflicts include the development of 2001 Surplus Sharing Guidelines, the operation of the Yuma Desalting Plant, and the lining of the All-American Canal, among other global political issues such as the U.S.’s invasion of Iraq.
water-stressed regions” (King, Culp, and de la Parra 2014, 102) through the recognition of shared responsibility of the river, the joint dedication of water specifically to the environment, and the unprecedented involvement of non-federal stakeholders, especially NGOs.

Within this dissertation, the primary focus is on collaboration among participants in the “core negotiating group” that developed Minute 319, as well as their interactions with the “environmental work group,” a bi-national team created to look specifically at environmental issues in the Delta. Together, these groups include federal representatives from the U.S. and Mexico (IBWC/CILA, the U.S. Bureau of Reclamation, Mexico’s national water commission), representatives of the U.S. basin states and/or state water agencies, bi-national NGOs, and scientists. However, it is crucial to recognize that the environmental flows component is one of many interacting pieces of Minute 319 and should be considered in such a context.

Participants in these groups met face to face in various configurations throughout the Minute 319 process: “…we spent years doing field trips, sitting in conference rooms, and sitting around in the evening drinking beer, getting to know each other and overcoming this intense economic, language, and cultural barrier that had been built on the border…” (M319_4). One interviewee cited “the element of warm bodies in the room to get familiar with each other and begin to start creating trust and confidence” (M319_6) as an integral component to promoting collaboration. These repeated face-to-face meetings created a space for deliberation and “back-and-forth” among bi-national stakeholders at various levels: “sort of a funnel of ideas and concepts being hashed out at the technical level and a little more policy and then to the decisionmaking body” (M319_5). During these meetings, stakeholders participated in exercises

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8 This “dedication of water to the river was shared among… Mexico, the US, and… the environmental organizations. So it wasn't just [the NGOs] who provided the water. It was important that Mexico and the U.S.…share that kind of responsibility” (M319_2).
that allowed them to define organizing “terms of reference” (“What are we here talking about? What does the US want to talk about? What does Mexico want to talk about?” [M319_1]), “exchange ‘best effort’ comprehensive proposals” for Minute content (King, Culp, and de la Parra 2014, 90-1), breakdown misconceptions about technically-complex topics, and “frame out roughly points of broad consensus” that could then be communicated “to the federal governments, the formal IBWC and CILA process, and get something sort of jumpstarted that way” (M319_4).

While formally “reaching consensus [on this type of agreement] in the bi-national context actually means for the Mexican commissioner and the U.S. commissioner, and probably the Bureau of Reclamation Commissioner, to reach agreement” (M319_6), there was broad recognition that all stakeholders needed to consent to some degree: “You can’t really roll anyone today. You really have to have a very firm and almost a unanimous approval of ideas, of concepts,” even if that is sometimes “begrudging consensus” (M319_5). One interviewee explained that “at the end of the day, it’s much less time consuming to make sure everybody’s with you moving forward” (M319_1) than to proceed on your own and risk losing any buy-in you may have already created. Another recounted an instance during which stakeholders threatened to abandon the negotiations in frustration, but “nobody would get up and leave. It seemed to be like there was some sort of an element that had been created over the course of the years that made it very clear that there was no other option but to finish up with a win-win” (M319_6). According to one interviewee, this unusual “direct stakeholder involvement in international diplomacy… was really necessary in this case in order to overcome that sort of 150 year broken border-water relationship” (M319_4). Extensive monitoring of the hydrological and biological effects of the environmental flows to the Delta continue as the U.S. and Mexico
negotiate the next addendum to the 1944 Treaty, currently referred to as “Minute 32X” (Spener 2016).

References


CHAPTER 3

Using the Advocacy Coalition Framework
to Understand Collaborative Policy Processes

Abstract

As environmental policymaking and governance processes increasingly utilize collaborative approaches, evaluating whether these approaches are more effective than traditional, top-down governance is crucial. While generalized policy process theories often fail to capture the idiosyncrasies of collaborative approaches, emerging theories of collaborative governance are often too specific to apply in comparisons of multiple governance arrangements. In response, this paper proposes how the Advocacy Coalition Framework (ACF), a well-tested policy process framework, can be adapted to rigorously evaluate collaborative processes while retaining a common language and set of variables that facilitate comparisons of multiple governance approaches. Specifically, this paper develops hypotheses about the ACF’s key theoretical foci in the context of collaboration, and then provides a preliminary exploration of them using data from a multi-level collaborative environmental governance process. This study broadens the ACF’s applicability to collaborative contexts and introduces a new tool to the growing field of comparative policy process scholarship.
Introduction

As changes in climate and a growing human population intensify demands on finite natural resources, the need for appropriate scientific knowledge and the number of people who hold a stake in resource governance outcomes both increase. Concurrent with the realization that existing top-down governance mechanisms are often a poor fit for managing modern environmental problems due to issues of cost, politicization, and implementation failures (Ansell and Gash 2008; Gerlak, Heikkila, and Lubell 2013), environmental governance processes are increasingly utilizing approaches that require collaboration among governments, organizations, and individuals (Kenney 2000; Koontz and Newig 2014; Koontz et al. 2004; Margerum and Robinson 2015; Sabatier et al. 2005a). While various “contours of collaboration” exist (Benson, Jordan, and Smith 2013), collaborative environmental governance processes generally engage actors from public and private realms to govern resources in ways acceptable to all participants (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Gerlak, Heikkila, and Lubell 2013). Such processes ideally foster trust and knowledge-sharing, create legitimate and implementable management actions, and produce positive environmental outcomes (Sabatier et al. 2005a).

Despite these potential benefits, collaborative governance processes have many tradeoffs, particularly because “[s]uccessful collaboration requires a substantial commitment of time and resources: it is a costly undertaking and its payoff in terms of outcomes is unclear” (Trachtenberg and Focht 2005, 75). Although scholars have argued that collaborative processes reduce the transaction costs of governance by encouraging participants to share resources and

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1 Ansell and Gash (2008) define governance as that which “applies to laws and rules that pertain to the provision of public goods,” specifically relating to “collective decision making that includes both public and private actors” (545).
responsibilities, such costs may actually be higher in processes that require lengthy deliberation and extensive trust-building (Gerlak, Heikkila, and Lubell 2013). Ensuring representation of relevant interests and avoiding “lowest common denominator” solutions (Kenney 2000; Leach and Pelkey 2001; Sabatier et al. 2005a) are also consistent challenges. Furthermore, if the management actions developed through such processes are implemented, appropriately evaluating their environmental outcomes can be difficult (Conley and Moote 2003; Koontz and Thomas 2006; Lubell, Gerlak, and Heikkila 2013).

In response to these issues, and to the dearth of existing studies of collaborative processes that deeply engage or test theory (Sabatier et al. 2005a), scholars have begun developing theoretical frameworks and typologies to analyze collaborative processes (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Margerum 2008; Moore and Koontz 2003; Sabatier et al. 2005a). These increasingly-sophisticated tools have advanced the identification and measurement of variables central to the evaluation of collaborative approaches; yet, they often remain disconnected from the broader policy process literature, thereby stunting research that compares the processes, products, or effectiveness of various governance arrangements. For instance, Sabatier et al. (2005b) find that while the collaborative governance framework proposed by Sabatier et al. (2005a) is useful for “guiding our understanding of the factors affecting the performance of collaborative watershed arrangements in the United States” (173), it lacks generalizability and a clear sense of process—issues that the authors resolve by supplementing the framework with concepts from several broader policy process frameworks. Similarly, tenets of well-known policy process frameworks such as the Advocacy Coalition Framework and Institutional Analysis and Development, have been utilized on a case-by-case
basis in examinations of collaborative processes,\(^2\) indicating that some of their components are indeed useful for studying collaboration while others require refinement in order to accurately characterize its idiosyncrasies. Thus, specialized collaborative governance frameworks and generalized policy process frameworks each serve important purposes in furthering studies of governance and policy development, but understanding and evaluating collaborative governance processes requires theoretical elaboration at their points of intersection.

To address this gap, this research lies at the nexus of collaborative governance studies and one of the most rigorously-tested policy process frameworks: the Advocacy Coalition Framework (ACF). Its goal is to suggest how the ACF can to be adapted to appropriately study collaborative governance processes while retaining a common language and set of variables to facilitate comparisons of multiple governance approaches. This paper introduces the ACF, argues why it is particularly well-suited for studying collaborative processes, and develops a set of testable hypotheses that allow scholars to investigate the ACF’s key theoretical foci—advocacy coalitions, policy-oriented learning, and policy change—in collaborative contexts. A preliminary examination of these hypotheses is then conducted using data from 28 interviews with participants in a multi-level collaborative environmental governance process in Colorado. This preliminary study broadens the ACF’s applicability to collaborative contexts and contributes to the growing field of comparative policy process scholarship by developing a new tool for comparing various governance arrangements (Gupta 2012).

\(^2\) For example, Weible and Sabatier (2009) compare ACF hypotheses about belief change in adversarial and collaborative subsystems; Leach et al. (2013) test ACF-related theories about learning in a collaborative context; and Koontz (2005) applies the IAD in a study of the policy impacts of collaborative farmland preservation groups.
The Advocacy Coalition Framework

Originally developed by Sabatier and Jenkins-Smith in the 1980’s and revised by numerous scholars since, the ACF is one of the most robust and rigorously-tested policy process frameworks. It has been touted as a useful tool for analyzing policy processes dealing with “wicked” problems, which involve “substantial goal conflicts, important technical disputes, and multiple actors from several levels of government” (Sabatier and Weible 2007, 189). Because these difficulties lie at the heart of many modern environmental issues, it is unsurprising that the ACF has been frequently used to study complex environmental governance processes. Moreover, because the ACF encompasses “multiple, overlapping theoretical foci” (Jenkins-Smith et al. 2014, 188), it is considered both a framework, which bounds inquiry by focusing on specific variables, and a set of theories, which specify relationships among the variables (Schlager 2007). This structure allows researchers to systematically examine a process using the ACF as an organizing tool while also testing and refining theory, with the goal of reforming both the theories and the framework to better reflect the true state of policymaking.

Foundational to the ACF is the idea that “stakeholder beliefs and behavior are embedded within informal networks and that policymaking is structured, in part, by the networks” (Sabatier and Weible 2007, 196). Formally called policy subsystems, these networks are bounded “by both a functional dimension (e.g. water) and a territorial one (e.g., California)” (Sabatier et al. 2005b, 189). Actors within a subsystem “can be aggregated into a number of advocacy coalitions composed of people from various organizations who share a set of normative and causal beliefs and who often act in concert” to further policies that align with their beliefs (Sabatier 1988, 133). While the ACF scholarship assumes that coalitions with different beliefs will be generally adversarial, it also recognizes the existence of “collaborative subsystems,” in which coalitions...
share beliefs and decisionmaking power and coordinate with one another to develop consensus on “win-win and voluntary solutions” (Weible and Sabatier 2009, 197-8). Collaborative subsystems are predicted to arise from hurting stalemates, or situations in which all coalitions are dissatisfied with the status quo and are unable to change it independently, thus providing an incentive to negotiate (Sabatier and Weible 2007). While this remains a largely underexplored area of the ACF (Weible, Sabatier, and McQueen 2009) scholars have begun to test ACF hypotheses in collaborative subsystems (Weible and Sabatier 2009) and explicitly theorize about how the ACF could be modified for studying watershed partnerships and other collaborative institutions (Sabatier et al. 2005b; Sabatier and Weible 2007) by integrating the ACF and the alternative dispute resolution (ADR) literature.

Many of the ACF’s other core assumptions can also be capitalized upon to study collaborative processes, including its emphasis on the centrality of scientific and technical information and the inclusion of a broad range of actors in a policy subsystem (Weible, Sabatier, and McQueen 2009). Additionally, the ACF assumes that the broader institutional context in which a policy process takes place can affect policy change. To reflect this, variables such as the “degree of consensus needed for major policy change” have been introduced to the framework over time, increasing its applicability to cases in which the national political context designates stronger consensus norms (Fischer 2014; Gupta 2012; Sabatier and Weible 2007), much like the consensus norms superimposed on collaborative processes. Initial research in these areas provides the foundation for more holistically adapting the ACF for use in collaborative contexts.
Adapting the ACF for Collaborative Contexts

The most recent revision of the ACF (Jenkins-Smith et al. 2014) outlines the framework’s three major theoretical foci (advocacy coalitions, policy-oriented learning, and policy change), evaluates the traditional hypotheses within each of these areas, and highlights existing knowledge gaps. This section reviews the most recent literature that specifies each of these foci, with an emphasis on empirical studies that employ one or more of the ACF’s components in collaborative contexts. While many of these studies exist, their findings have not been gathered with the goal of examining the ACF’s applicability to studying collaborative processes and its potential to be used as a comparative public policy analysis tool. Table 1 lists the traditional ACF hypotheses, as well as those developed below in relation to collaborative contexts.

Advocacy Coalitions

Applying the ACF in collaborative contexts presents unique challenges for scholars seeking to identify coalitions based on these criteria, however. Because collaborative approaches emphasize the achievement of mutually-agreeable actions that serve the goals of many participants simultaneously, collaborative subsystems are “expected to be associated with more moderate beliefs rather than extreme beliefs and with more agreement rather than disagreement among rivals” (Weible and Sabatier 2009, 198). This may result in greater belief overlap among actors than would be observed in a more adversarial subsystem and more frequent coordination among actors who do not share beliefs.

In this vein, scholars have suggested that shared beliefs may not necessarily be the primary driver of coordination among actors in collaborative contexts. For example, Calanni et al. (2015) find that stakeholders in the marine aquaculture partnerships more often decide to coordinate with others whom they trust or perceive as having valuable resources, even if they do
### Table 1. A Comparison of Traditional and Modified ACF Hypotheses

<table>
<thead>
<tr>
<th>Theoretical Focus</th>
<th>Traditional ACF Hypothesis (from Jenkins-Smith et al. 2014)</th>
<th>Modified ACF Hypothesis for Collaborative Contexts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy Coalitions</td>
<td><strong>On major controversies within a policy subsystem when policy core beliefs are in dispute, the lineup of allies and opponents tends to be relatively stable over periods of a decade or so.</strong>&lt;br&gt;• Actors within an advocacy coalition will show substantial consensus on issues pertaining to the policy core, although less so on the secondary aspects.&lt;br&gt;• An actor (or coalition) will give up secondary aspects of her (its) belief system before acknowledging weakness in the policy core.&lt;br&gt;• Within a coalition, administrative agencies will usually advocate more moderate positions than their interest group allies.&lt;br&gt;• Actors within purposive groups are more constrained in their expression of beliefs and policy positions than actors from material groups.</td>
<td><strong>H1:</strong> Actors in a collaborative process will coordinate for reasons in addition to holding shared policy core beliefs.&lt;br&gt;<strong>H2:</strong> Actors in a collaborative process are more likely to coordinate on actions that serve the beliefs of multiple coalitions simultaneously as opposed to actions that strongly align with only one coalition’s beliefs.&lt;br&gt;<strong>H3:</strong> Actors in a collaborative process are more likely to pursue temporary coordination with actors from other coalitions, resulting in a lineup of allies and opponents that is not stable over time.</td>
</tr>
<tr>
<td>Policy-Oriented Learning</td>
<td><strong>Policy-oriented learning across belief systems is most likely when there is an intermediate level of informed conflict between the two coalitions. This requires (1) each have the technical resources to engage in debate and (2) the conflict between the secondary aspects of one belief system and core elements of the other, or alternately, between important secondary aspects of the two belief systems.</strong>&lt;br&gt;<strong>Policy-oriented learning across belief systems is most likely when there exists a forum that is (1) prestigious enough to force professionals from different coalitions to participate, and (2) dominated by professional norms.</strong>&lt;br&gt;<strong>Problems for which accepted quantitative data and theory exist are more conducive to policy-oriented learning across belief systems than those in which data and theory are generally qualitative, quite subjective, or altogether lacking.</strong>&lt;br&gt;<strong>Problems involving natural systems are more conducive to policy-oriented learning across belief systems than those involving purely social or political systems because, in the former, many of the critical variables are not themselves active strategists and because controlled experimentation is more feasible.</strong>&lt;br&gt;<strong>Even when the accumulation of technical information does not change the views of the opposing coalition, it can have important impacts on policy—at least in the short run—by altering the views of policy brokers.</strong></td>
<td><strong>H4:</strong> Policy-oriented learning across belief systems is more likely in collaborative forums with stronger institutionalized collaborative norms (e.g. requiring a high degree of consensus) than in forums with weaker collaborative norms.&lt;br&gt;<strong>H5:</strong> Policy-oriented learning across belief systems is more likely in collaborative forums that require repeated face-to-face interactions over time, especially when facilitated by strong leaders, than in forums where actors are not required to participate in such interactions.&lt;br&gt;<strong>H6:</strong> Policy-oriented learning across belief systems is more likely in collaborative processes that incorporate diverse information sources and opportunities to openly deliberate on this information.</td>
</tr>
<tr>
<td>Policy Change</td>
<td><strong>Significant perturbations external to the subsystem, a significant perturbation internal to the subsystem, policy-oriented learning, negotiated agreement, or some combination thereof are necessary, but not sufficient, sources of change in the policy core attributes of a governmental program.</strong>&lt;br&gt;<strong>The policy core attributes of a governmental program in a specific jurisdiction will not be revised as long as</strong>&lt;br&gt;<strong>H7:</strong> Collaborative processes with dedicated financial resources are more likely to implement negotiated agreements than those without such resources.&lt;br&gt;<strong>H8:</strong> Collaborative processes that are formally or informally incorporated into broader planning networks are more</td>
<td></td>
</tr>
</tbody>
</table>
the subsystem advocacy coalition that instated the program remains in power within that jurisdiction—except when the change is imposed by a hierarchically superior jurisdiction.

likely to implement negotiated agreements than those working independently.

- H9: Collaborative processes that lack implementation authority are more likely to produce informal, operational-level policy change than changes codified in formal policy.

Not share beliefs. Other studies (Henry, Lubell, and McCoy 2011) argue that coalitions may be “shaped more by shared opponents than by shared beliefs” (Jenkins-Smith et al. 2014, 196). This motivation may be particularly applicable in collaborative subsystems, as actors may find it more palatable to coordinate with others who at minimum share a common opponent, even if they do not share beliefs. Collaborative processes may also promote learning (Leach et al. 2014), improve actors’ perceptions of their opponents (Leach and Sabatier 2005; Weible, Siddiki, and Pierce 2011) and even encourage some degree of belief convergence over time (Weible and Sabatier 2009), further encouraging coordination among actors who the ACF would assume to behave as adversaries.

Furthermore, because collaborative processes generally require actors to reach some degree of consensus, a coalition that promotes an action that only serves its own homogenous beliefs risks losing support from other actors who can veto the action. As a result, actors may coordinate across coalition boundaries to develop mutually-beneficial actions that garner broad support from actors with different policy core beliefs. In other words, actors in a collaborative process are incentivized to engage in varying degrees of cross-coalition coordination in order to achieve their own policy goals. While some actors may indeed develop consistent patterns of coordination, such as those expected of actors within a traditional coalition, others may pursue temporary coordination with other actors or coalitions when it best suits them. As a result, the
ACF’s assumption that “the lineup of allies and opponents” within a policy subsystem “tends to be relatively stable over periods of a decade or so” (Jenkins-Smith et al. 2014, 195) may not be observed in collaborative subsystems as actors strategically seek allies to achieve specific goals. It is indeed this breakdown of long-standing coalitions that will be decisive for the legitimacy of collaborative policymaking processes in the long-term (Matti and Sandström 2011).

Because of the circumstances unique to collaborative processes, ACF scholars wishing to examine how actors interact within and across coalitions may need to adapt their expectations about coordination patterns. In response, the following hypotheses about advocacy coalitions in collaborative processes are posed:

**H1:** Actors in a collaborative process will coordinate for reasons in addition to holding shared policy core beliefs.

**H2:** Actors in a collaborative process are more likely to coordinate on actions that serve the beliefs of multiple coalitions simultaneously as opposed to actions that strongly align with only one coalition’s beliefs.

**H3:** Actors in a collaborative process are more likely to pursue temporary coordination with actors from other coalitions, resulting in a lineup of allies and opponents that is not stable over time.

**Policy-Oriented Learning**

The ACF’s second major focus concerns learning in a policy process. The ACF posits that actors may experience policy-oriented learning, or “relatively enduring alterations of thought or behavioral intentions that result from experience and/or new information and that are concerned with the attainment or revision of policy objectives” (Sabatier and Weible 2007, 123). These alterations may be related to a participant’s knowledge about the relevant issue or about strategies for achieving one’s goals in a specific political arena. The ACF assumes that learning is most likely to occur when certain criteria are present, including 1) an intermediate level of informed conflict (wherein coalitions have the technical resources to engage in debate), 2) a
professional forum in which to resolve the conflict, and 3) accepted quantitative data about natural systems (rather than qualitative data about social or political systems), though there has been mixed empirical evidence to support these claims (Calanni et al. 2015; Jenkins-Smith et al. 2014). Across these situations, learning is theorized to be an important strategy for creating shared knowledge, overcoming collective action issues, and promoting belief convergence among actors and coalitions (Leach et al. 2014; May 1992; Muro and Jeffrey 2008). However, policy-oriented learning is perhaps the most understudied focus of the ACF (Jenkins-Smith et al. 2014) and is in need of further theoretical elaboration (Weible, Sabatier, and McQueen 2009), especially in collaborative contexts that explicitly encourage actors to learn with and from one another.

Building on the assumption that the institutional arrangement of a forum can affect the extent to which learning occurs (Gerlak and Heikkila 2011, 2006), Weible and Sabatier (2009) argue that collaborative policy subsystems “provide an optimal setting for learning from science and for learning across coalitions,” as actors “cooperate, develop trust, and work with scientists in joint fact-finding to develop a shared knowledge base” (208). Importantly, however, collaborative processes do not necessarily create institutional structures that incentivize high levels of learning. For instance, in their study on collaborative research, Raadgever, Mostert, and Van de Giesen (2012) find that only very intensive collaborative forums promote cognitive learning from model results and the development of consensus, particularly by increasing trust and understanding among stakeholders who are willing and ready to learn. Similarly, Sabatier and Weible (2007) specifically note that “the higher degree of consensus required [in a collaborative forum], the more incentive coalitions have to be inclusive (rather than exclusive), to seek compromise and share information with opponents, and generally to minimize the devil
shift” (200), or the tendency for actors to exaggerate their opponents’ power and maliciousness.

Additionally, the ACF recognizes that the attributes of individual actors working within the forum (such as their belief systems, resources, strategies, network contacts), and relatedly, the degree of pre-existing conflict among actors, can influence how learning occurs (Jenkins-Smith et al. 2014). Since actors in collaborative subsystems are generally expected to hold more moderate beliefs and exhibit more agreement, they may be more “primed” to learn from one another. Relatedly, a number of studies concerning learning in collaborative processes (Gerlak and Heikkila 2011; Leach et al. 2014) find that trust among participants, typically associated with the extent of social interactions over time, make learning more likely. Other factors related to attributes of individuals, such as participants’ perceptions of fairness or strong leadership within a process, have also been linked to increased learning (Gerlak and Heikkila 2011; Leach et al. 2014; Muro and Jeffrey 2008). Crucially, the institutional arrangement of a process can serve to amplify or dampen these individual attributes; thus, interactions between attributes of forum and attributes of individual actors must be taken into account when studying learning.

Finally, the ACF recognizes that the information and experience participants have access to (“attributes of the stimuli”) may also affect the likelihood of policy-oriented learning. More intractable issues, characterized by uncertainty, poor data, and widespread disagreement, are expected to foster lower levels of learning (Jenkins-Smith et al. 2014), whereas processes utilizing clear, certain information backed by reliable data should provide a common foundation upon which actors can learn. However, Leach et al. (2014) found that high levels of scientific certainty surrounding an issue may actually impede learning in collaborative processes. Greater certainty may leave less room for participants to deliberate or “keep an open mind to new interpretations of the available data” (22)—practices necessary for promoting creative solutions
and reducing biased assimilation of information (Heikkila and Gerlak 2013)—especially for participants with very high levels of technical or scientific competence related to the issue. Similarly, (Gerlak and Heikkila 2011) find that actors may be more likely to learn in a decentralized process that incorporates diverse sources of knowledge (while also maintaining actors who link groups and can authoritatively disseminate information), and in forums that promote experimentation (but in which there is also a shared technical platform through which to access and disseminate information)—attributes which may be more common in collaborative than top-down governance processes.

Based on the above information, the following hypotheses regarding policy-oriented learning in collaborative processes are posed:

**H4**: Policy-oriented learning across belief systems is more likely in collaborative forums with stronger institutionalized collaborative norms (e.g. requiring a high degree of consensus) than in forums with weaker collaborative norms.

**H5**: Policy-oriented learning across belief systems is more likely in collaborative forums that require repeated face-to-face interactions over time, especially when facilitated by strong leaders, than in forums where actors are not required to participate in such interactions.

**H6**: Policy-oriented learning across belief systems is more likely in collaborative processes that incorporate diverse information sources and opportunities to openly deliberate on this information.

**Policy Change**

The ACF was intended to be “a clear, conceptual framework of policy change over time” (Sabatier 1988, 130); thus, the third theoretical focus concerns how policy change occurs. Because policy processes are often evaluated based upon the changes they eventually produce, understanding and defining policy change is crucial to studying their effectiveness. Sabatier (1988) argues that the “end result” of negotiations among coalitions in a policy subsystem is “one or more governmental programs, which in turn produce policy outputs at the operational
level (e.g. agency permit decisions). These outputs – mediated by a number of other factors – result in a variety of impacts on targeted problem parameters (e.g. ambient air quality) as well as side effects” (133). Policy outputs and their impacts may then feed back to influence system parameters and other variables, such as the strategies coalitions use to attempt to influence change. Following from this, the ACF defines two types of policy change: 1) major policy change, or changes to the core components of a governmental program that significantly deviate from previous policy; and 2) minor policy change, or changes in secondary aspects of programs, such as administrative rules or budgetary allocations (Jenkins-Smith et al. 2014).

The ACF suggests that in collaborative subsystems, policy change is most likely to occur through the creation of negotiated agreements, as opposed to other potential pathways to change such as internal and external shocks and policy-oriented learning (Jenkins-Smith et al. 2014). Sabatier et al. (2005b) argue that the “the raison d’etre of many multistakeholder partnerships is to craft agreements among actors who have been fighting for years” (194), highlighting the need for a policy change pathway that captures the effects of such processes. While hypothesized factors that may lead to effective negotiated agreements have been outlined, primarily by drawing on the Alternative Dispute Resolution literature (Sabatier et al. 2005b; Sabatier and Weible 2007), this pathway to policy change remains one of the “rarely explored areas” of the ACF (Weible et al. 2011).

Negotiated agreements are simply a pathway to policy change, however, and do not constitute policy change on their own, particularly due to problems associated with implementation. In contrast to the decisions made in more traditional policy processes, those developed through collaborative processes typically “do not have the force of the law” (Koontz and Newig 2014, 422). This creates the potential for negotiated agreements to become “feel
good” symbols of collaboration that languish during the implementation process. Because of this, “[t]he success of collaborative approaches largely depends on the institutional configurations that support them” (Ananda and Proctor 2013, 105). For instance, Koontz (2005) found that agreed-upon recommendations from collaborative farmland planning groups were more likely to be implemented when the collaborative process was incorporated into a broader land use planning process. Similarly, Koontz and Newig (2014) found that the provision of funding specifically linked to collaborative recommendations, as well as collaborative leaders who can cultivate necessary relationships and foster network-building within the broader institutional structure, were necessary for the implementation of negotiated agreements.

Furthermore, even if negotiated agreements are implemented, whether implementation alone qualifies as policy change is debatable.³ Collaborative processes occur at many levels with different goals—from adapting on-the-ground operations to overhauling state, national, or multi-national policy (Margerum and Robinson 2015)—resulting in agreements that vary drastically in scope and content. Relatedly, while some collaborative processes produce one comprehensive negotiated agreement (e.g., a multi-year stream restoration plan), others negotiate a series of smaller agreements over time, exacerbating the difficulty of measuring change due to its potentially incremental nature. Finally, inherent in the definition of collaborative governance is that stakeholders work across multiple jurisdictions and traditional public-private sector divides to create negotiated agreements. As a result, it is unlikely that a negotiated agreement will affect clear and measurable deviation from previous policy in a single governmental program. Instead, participants may return to their home organizations and deviate from the norm in their daily

³ Importantly, even if the implementation of a negotiated agreement changes policy, this will not necessarily create desired environmental outcomes. While a discussion of the link between policy change and environmental change in collaborative contexts is beyond the scope of this paper, it is a burgeoning area of study (see Biddle and Koontz 2014; Scott 2015).
operations in ways consistent with the negotiated agreement but difficult to observe or measure across the subsystem (Korfmancher 1998).

Thus, to examine the ACF’s assumptions about policy change in studies of collaborative processes, it is necessary to both expand and more clearly define “policy change,” as well as to develop “‘best practices’ for documenting and explaining policy change while accounting for context” (Jenkins-Smith et al. 2014, 204). Particular attention must be paid to determining what factors foster the implementation of negotiated agreements, whether the implementation of a negotiated agreement constitutes policy change on its own, and how an agreement affects the policy subsystem at large. Answering these questions requires a more thorough assessment of the types of negotiated agreements produced by collaborative processes (Margerum 2008), especially in light of the ACF’s major/minor policy change dichotomy. Specifying the ACF’s definitions of policy outputs and impacts using the literature on outputs and outcomes in collaborative processes (Koontz and Thomas 2006; Mandarano 2008; Siddiki and Goel 2015) would also be a fruitful avenue through which to adapt the ACF for collaborative contexts.

In light of these recognized knowledge gaps, the following hypotheses regarding policy change in collaborative processes are posed:

**H7:** Collaborative processes with dedicated financial resources are more likely to implement negotiated agreements than those without such resources.

**H8:** Collaborative processes that are formally or informally incorporated into broader planning networks are more likely to implement negotiated agreements than those working independently.

**H9:** Collaborative processes that lack implementation authority are more likely to produce informal, operational-level policy change than changes codified in formal policy.
Applying the ACF in Collaborative Contexts

Next, this paper employs data from a case study of a collaborative environmental governance process in Colorado to explore the nine modified hypotheses developed above. The case study was conducted by the author during 2013-2014. Like the majority of ACF applications explored by Weible, Sabatier, and McQueen (2009) in an effort to “take stock” of the ACF, it used the ACF as a framework to structure its major areas of inquiry but did not formally test existing ACF hypotheses. Moreover, the study shifts the primary unit of analysis from an entire policy subsystem (as recommended by the ACF) to a collaborative governance process that is part of a larger policy subsystem. In alignment with other ACF studies that focus on individual policymaking process or venues (Calanni et al. 2015; Matti and Sandström 2011), this shift makes the deep analysis of a complex, multi-level collaborative process manageable and provides insight into the micro-level processes that comprise subsystems—an analysis that can then be “scaled-up” to understand subsystem level processes. For instance, in order to characterize subsystems as broadly collaborative, it is necessary to understand how collaborative coalitions engage in different processes within a subsystem. The lessons learned from this empirical application of the ACF in a collaborative context, therefore, are ripe for use in exploring how the framework and its theories can be applied to studies of collaborative subsystems more broadly.

Case Study: The Basin Roundtable Process

In response to drought and future threats to freshwater supplies as a result of climate change and population growth, the Colorado legislature passed the Colorado Water for the 21st

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4 Note that this is the same case that is referred to elsewhere in this dissertation as “Colorado’s Water Plan” (CWP). Because the focus of this chapter is on pre-CWP collaboration among individuals participating in the Roundtables (and data was collected prior to the development of the CWP), the case is referred to here as the “Roundtable process.”
Century Act in 2005 (HB 05-1177), which created “Basin Roundtables” that represent each of the state’s eight major river basins plus the Denver Metro area (Colorado Water Conservation Board 2016). A diversity of stakeholders are required to participate on each Roundtable with the goal of working together to assess existing water supplies and gaps, and to achieve consensus on actions that may help address the state’s looming water challenges. Simultaneously, an umbrella group called the Interbasin Compact Committee (IBCC) was created to facilitate dialogue and collaboration on statewide water issues. Although the Roundtables and IBCC had a number of interim goals such as creating assessments of various water use sectors, their largest task arose in 2013 when Colorado’s governor issued an executive order mandating the creation of Colorado’s first statewide water plan. The Roundtables were tasked with providing data and insight for the statewide plan through “Basin Implementation Plans” (BIPs) that integrated the data they had gathered since their inception with actions that could help meet each basin’s water supply needs. The information from the BIPs, along with policy recommendations created by the IBCC, became the centerpiece of Colorado’s Water Plan. For the remainder of this paper, this case will be referred to as the “Roundtable process.”

Methods: Data Collection and Analysis

Data on this process was collected through 28 semi-structured interviews (Rubin and Rubin 2005) with key participants from the variety of stakeholder groups and geographical areas encompassed by each Roundtable (Table 2). All interviews were conducted after the governor’s executive order (a key moment that catalyzed collaboration among stakeholders in each Roundtable) but before the Roundtables produced their individual BIPs (the formal documentation of such collaboration). Interviews were digitally recorded, transcribed verbatim, and coded qualitatively (Auerbach and Silverstein 2003) using QSR NVivo 10 qualitative
analysis software and an a priori codebook derived from the study’s major research foci and the relevant literature on collaborative processes and the ACF. The researcher also coded for emergent themes that appeared across transcripts during the analysis process. Summaries of the coded data were then created and used to examine patterns across Roundtables (Miles and Huberman 1994) related to the nine hypotheses. Interviewee quotes used in this paper are listed with the name of the Roundtable in which the interviewee participates (e.g., Arkansas Basin Roundtable) to demonstrate that information was gathered from a variety of respondents across different groups.

Table 2. Interview Subjects by Basin and Stakeholder Group (adapted from Koebele 2015)

<table>
<thead>
<tr>
<th>Basin Name</th>
<th>Agriculture</th>
<th>Environment/Recreation</th>
<th>Industrial/Water Provider</th>
<th>Local Government</th>
<th>Other</th>
<th>Stakeholder Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Colorado</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Gunnison</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Metro</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>North Platte</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Rio Grande</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>South Platte</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Southwest</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Yampa/White</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Stakeholder Totals</strong></td>
<td><strong>5</strong></td>
<td><strong>9</strong></td>
<td><strong>5</strong></td>
<td><strong>7</strong></td>
<td><strong>3</strong></td>
<td><strong>29</strong></td>
</tr>
</tbody>
</table>

Footnote: One interviewee refused to be recorded; thus, the interview could not be formally analyzed with the other 28.

Findings

Findings related to each of the hypotheses developed above will be presented in the following sub-sections.

Advocacy Coalitions

In the Roundtable process, a number of coalitions were identified based on shared beliefs.

5 Examples of codes relevant to this study include the following: COALIT (mentions of coalition building or cooperation on a specific initiative or in general), STRATEGY (mentions of strategies used by a coalition to further their goals), OUTCOME (identified outputs/outcomes), and POWER (discussion of the Roundtable’s decisionmaking authority).
and general patterns of coordination, as expected by the ACF. For example, a common coalition in each of the Roundtables is the “nonconsumptive water users” coalition, which includes actors representing environmental and recreational interests who share the policy core belief of preserving environmental quality by keeping water in rivers. In order for this coalition to achieve their goals in a consensus-based collaborative process, however, they need to gain the support of other Roundtable actors—primarily “consumptive water users” such as those representing agricultural, municipal, and industrial interests that have a general preference for diverting water out of a stream for other uses. One strategy the nonconsumptive coalition used to do this was to highlight how their proposed actions (such as water conservation efforts or the allocation of water for recreational purposes) are mutually beneficial to other users, particularly in an economic sense:

_I think the reason we’ve been able to get a lot more people across the board to do conservation is to really recognize that there’s an economic component to this… (Rio Grande)_

_And that’s why I feel lucky in the Colorado Basin, because there is such a recreation-environmental-economic component and need. (Colorado)_

_[H]ere in Chaffee County…[other users] see a great economic benefit to having a state recreation area and a voluntary program. (Arkansas)_

In other words, the nonconsumptive coalitions were able to help actors from consumptive coalitions realize a benefit from supporting nonconsumptive projects, even if such projects did not directly align with their own policy core beliefs.

Nonconsumptive coalition members also developed projects that explicitly served multiple actors’ beliefs simultaneously and strategically sought out temporary coordination with others to promote these projects, even if they were likely to oppose such groups on other projects. For instance, in the Colorado River Basin Roundtable, the nonconsumptive coalition
sought the support of downstream agricultural water users (who typically support consumptive use projects) on projects that preserve upstream water quality because they recognized the potential for a mutual benefit:

*I think the [downstream agricultural water users], particularly because of [the] fruit and vineyards [they grow], support high quality water coming from the headwaters... [so] they’re really supportive of nonconsumptive projects to protect water quality. (Colorado)*

Similarly, participants across coalitions in the Roundtable process also described “Roundtable-wide” collaboration on “multi-benefit” projects that simultaneously benefit a variety of groups who hold divergent values:

*So kind of underneath it all is it if you get collaboration to happen, all those different representatives looking at it from each other’s perspective, you basically have the whole group working toward common solutions versus having to fight over [proposals] and see if you can get the votes... (Rio Grande)*

*[P]eople don’t change their core values and it’s not realistic to expect that out of a process like this. But I think there definitely is a better understanding. And probably part of why you hear so much from people about these multi-purpose projects is that’s one of the places where we’ve really been able to find a common interest... (Metro)*

Importantly, the Roundtable process was initiated with the norm of consensus-based decisionmaking, which ideally encourages all participants to work together on mutually agreeable solutions instead of forming adversarial coalitions that attempt to gain individual “wins.” Thus, the formation of strongly coordinated, formal coalitions that appear to be working against the consensus norm may be limited in favor of strategic, temporary coordination among stakeholders on any points of belief overlap.

While Roundtable participants sought to coordinate with actors from other coalitions for a variety of reasons, one often cited motivation was to successfully oppose a common enemy:
[The participants] are very respectful... of each other [perhaps because they] direct all their disrespect to somebody in another Roundtable. And maybe there’s something to that... having a common enemy. (Colorado)

You’ve probably heard the history of threats of water exportation out of the valley... so those threats... in a really interesting way, coalesced the community... and pulled those [diverse] interests together. (Rio Grande)

[T]here’s really a kind of coalition between the nonconsumptive and the consumptive users. You know, we all recognize that we don’t want to get in a situation where there’s a water call. So, what benefits the consumptive users also, for the most part, benefits the nonconsumptive users. (Arkansas)

Based on these actions, it is evident that actors indeed coordinated with others beyond those with whom they share policy core beliefs (H1) for reasons such as sharing a common opponent. Furthermore, they promoted multi-benefit projects (H2) using strategies such as emphasizing the economic benefits of a project, and strategically sought temporary coordination (H3) with others who would likely share in those benefits in order to achieve their goals. Participants also highlighted that the development of multi-benefit projects allowed them to find some consensus among participants and therefore earn consensus from the Roundtable as a whole.

Policy-Oriented Learning

Roundtable participants described a number of “learning experiences” that shaped the way they participated in the process. Although a small number of interviewees indeed mentioned that learning was very slow or non-existent in the process, most explained that, as a result of their participation, they learned about relevant problems, other stakeholders’ values, and possible solutions that shifted their prior beliefs and understandings, in addition to learning strategies to better achieve their goals in collaborative contexts:

I’ve learned how agriculture contributes significantly to late season water in a river and I didn’t really think about that in the past—the importance of, especially, how we flood our fields for hay development for cattle. You know, from an environmentalist [standpoint], you look at [flood irrigation] and say, “god, that’s
such a waste of water”… [but] a lot of it runs off…. and fills the water table that serves the recreational season later. (Yampa White)

Oh, I’ve certainly made some progress in my understanding of [consumptive users’ values], and I think there’s been progress made in them understanding an individual of environmental concerns that isn’t, you know, wild-eyed and threatening lawsuits at every turn. (North Platte)

I’ve learned how to do [collaboration] better. Without the opportunity to… participate in some kind of… consensus-based mechanism with this level of complexity and these problems, I don’t think you get very good at it. (Yampa White)

Although specific attributes of the forum were not directly asked about in relation to learning in the Roundtable process, participants implied that the organized Roundtable forum was crucial for stimulating learning among process participants:

This Roundtable process is about people. It’s not about projects… it’s about the willingness of getting people to the table and to learn from each other and to educate each other… and this is… what I think is the huge success about the Roundtables: the [state] provided the forum and the mechanism for people to be able to participate. (Rio Grande)

Very few people had either the experience or the time or the interest in learning all these things about their neighbors [before the forum to do so was created]. (Gunnison)

While Roundtable participants held a wide variety of conflicting beliefs and goals, many mentioned that building trust with others through repeated interactions over extended time periods allowed them to circumvent these differences and eventually learn from one another:

I think that [when] you spend this much time together, you get to know each other and… you develop trust between people. Even if they have different agendas and different goals, they tend to be able to have a… worthwhile civil discussion on how we meet those different agendas and goals. (Metro)

I think over time, you… see more and more people come to the table not thinking about their own selfish interests. You see them thinking about broader issues… taking a… bigger look at the water picture. (Southwest)

The Roundtable was intended to… build relationships, build some trust, build common ground, and to [consequently] minimize—hopefully minimize—some of the
opposition… When I think about the Roundtable process [in those terms], it’s been a huge success here… (Rio Grande)

[T]hat’s a big part of why the Roundtable process was created… to create familiarity not only of the facts but of the people involved. And so, any good negotiation is always more successful when there is agreement on the facts and… familiarity and friendships with people involved. Doesn’t mean you’re always going to agree on the solution but that certainly… helps create the possibility that you can get to that goal. (Colorado)

The presence of strong leaders was particularly important in some Roundtables because these leaders were able to influence which ideas other participants chose to support, perhaps even regardless of the participants’ individual knowledge or beliefs:

Amongst thirty people, there [are] definitely probably five or six really respected leaders who do most of the talking and people kind of trust their opinions… (Gunnison)

Finally, participants in the Roundtable process often highlighted the importance of different types of information for helping them learn and ultimately collaborate. In particular, Roundtable participants frequently mentioned that learning about their physical river basin (primarily “fact-based” information), as well as the socio-cultural phenomena underlying other participants’ goals (primarily “value-based” information) encouraged them to work together to find points of mutual agreement. This signals that learning occurred both about a “natural system” (assumed to be more conducive to learning) and socio-political aspects (assumed to be less conducive to learning) concurrently:

I think every one of us has learned a lot about other areas of the basin and how the water is used and why the water is used this way, and where the shortages exist and how they could be solved… and that’s why we act so cohesively on behalf of the basin, because we’re all linked together through it… (Gunnison).

We’ve got to the point where we understand people, each other… I’m much more cognizant of agricultural water needs and the agricultural tradition and culture, and, and much more, you know careful how I deal with it, because these are important values. (Colorado).
The people who were there to protect their interests now have to acknowledge—and I think this has been the growth within the Roundtables—that we really do need to look at it as a basin. We’re all in this together... maybe I need to give a little bit so you can solve your problem. (Arkansas)

Crucially, when Roundtable participants paired these fact- and value-based information sources, all of which were viewed as legitimately relevant information in discussions, they often realized that the different water uses they valued were linked together and even interdependent in some cases. This encouraged “basin-scale” deliberation and reinforced the need for solutions that benefitted multiple stakeholders.

In sum, through the establishment of highly collaborative norms such as consensus-based decisionmaking (H4), the creation of opportunities for individuals to build trust over time through repeated interactions, especially in the presence of strong leaders (H5), and the legitimization of diverse sources of information and deliberation as part of the decisionmaking process (H6), collaborative forums can help promote policy-oriented learning.

Policy Change

When asked about their ability to affect policy change, many Roundtable participants recognized that even if the various stakeholders were able to reach a negotiated agreement, implementation was typically restricted by a lack of formal authority or funding, or a disconnect with other entities or processes (perhaps even outside of the water governance subsystem) needed to bring about large-scale change:

What more [the Roundtable process] will accomplish is questionable I think because the Roundtable has no legal authority to do anything except present nice plans, so that’s been the disconnect from the very outset... this is just an exercise in futility because even if you come up with the best plan, you still can’t implement it—you have no authority. (Gunnison)

When you separate decision-making authority... and the [state agency] has authority and funds and they have to make decisions and do stuff, and the IBCC isn’t as clear [in its role]... that makes it challenging in a new way. (Rio Grande)
If we’re really going to solve some of these issues, we really need to get some of the other local governments that are involved in land-use planning much more attuned to water and understanding the importance of how their decision-making process... feeds into our ability to meet—or not—our future water needs. (Metro)

Other participants, however, cited an important component of the Roundtable process as a legitimate source of implementation authority: the ability of each Roundtable to allocate small amounts of state-provided funds to projects they collectively viewed at meeting their basin’s needs:

[T]he Roundtables themselves have money and authority—to a pretty good degree—to spend their own basin funds. (Rio Grande)

I do think the Roundtables have a lot of power because they have complete decision-making [authority]... as to how they spend their money... In some ways I think they do have a lot of power and, and never before have we had this big bucket of money in our basin for water projects... (Southwest)

While some participants see this ability to fund projects as insignificant, either because the amount of funding is relatively small or because the “change” it contributes to is an operational-level action rather than a decision codified in formal policy, the process of allocating financial resources indeed empowers some process participants.

Although the Roundtables lack large amounts of dedicated financial resources and deep connections with broader planning networks, both of these were cited as factors that could improve the implementation of agreements that could affect large-scale policy change (H7 and H8). Despite their lack of formal implementation authority, however, the Roundtables are able to make operational-level changes (H9) that help meet the process’s overall goal of enhancing water sustainability in Colorado.
Conclusion

Through the theoretical development and empirical exploration of hypotheses, this paper demonstrates how the ACF—and specifically, the assumptions implicit in the framework’s three major theoretical foci—can be adapted for analyzing collaborative policymaking processes. As a policy process framework, the ACF is uniquely suited to study collaborative processes due to its dynamic conception of individual belief systems, its recognition of collaborative subsystems and negotiated agreements, and its core assumptions about the influence of scientific information, broad stakeholder participation, and institutional arrangements on policymaking. By adapting the ACF’s assumptions to capture the idiosyncrasies of collaborative processes while maintaining a common language and set of variables that can be used to assess multiple governance arrangements, this study expands our comparative public policy analysis toolbox. While the empirical analysis presented here does not directly compare multiple governance arrangements, it provides a preliminary illustration of adapted ACF hypotheses in a collaborative context and develops previously under-elaborated aspects of the framework. This section will summarize the lessons learned about each of the ACF’s theoretical foci in the context of collaborative processes.

While ACF scholars typically group actors into advocacy coalitions based on shared beliefs and coordination, coalition dynamics in collaborative processes may look quite different than those in more traditional policy processes. Collaborative norms, such as consensus-decisionmaking rules, encourage actors with different beliefs to find areas of agreement and act to achieve goals in those areas in a coordinated manner. As a result, actors may strategically coordinate with others who hold different beliefs, compromise in order to achieve multi-benefit policy solutions, and seek new allies when it best suits their goals. Understanding when and why actors with different beliefs decide to coordinate can help scholars better analyze the types of
decisions that arise from collaborative processes.

Actors in collaborative processes may also experience **policy-oriented learning**, particularly across belief systems. Collaborative forums are expected to be ripe for such learning, especially when participants co-create a shared knowledge base about an issue. Learning may help actors overcome collective action dilemmas and encourage belief-convergence, which can foster collaboration among actors with diverse values. While learning is certainly not guaranteed to occur in collaborative processes, forums that institute highly collaborative norms such as consensus-based decisionmaking, create opportunities for individuals to build trust over time through repeated face-to-face interactions, and legitimize diverse sources of information (as well as opportunities to deliberate), can promote policy-oriented learning. The development of methods to more objectively assess learning, as suggested by Muro and Jeffrey (2008) and Heikkila and Gerlak (2013) will aid in more rigorously testing learning-related hypotheses.

Finally, although the ACF’s focus on **policy change** already prescribes a pathway through which collaborative processes can affect change (negotiated agreements), this is perhaps the least developed connection between the ACF and existing studies of collaborative processes. However, developing theory in this area is crucial if scholars are to use the ACF as a comparative public policy analysis tool to evaluate the effectiveness of multiple types of governance arrangements and their divergent outcomes (Gupta 2012). Scholars can begin using the ACF to understand policy change in collaborative processes by examining what factors influence the implementation of negotiated agreements and by clarifying the ACF’s definitions of major and minor policy change.

The hypotheses derived in this study are only the beginning of a comprehensive adaptation of the ACF for studying collaborative policy processes, especially if one wants to use
the ACF as a tool to compare processes across institutional arrangements. Importantly, they require further refinement through empirical testing in a wider variety of collaborative policymaking settings—especially outside of the environmental realm where many studies of collaborative governance have focused thus far. Moreover, to begin the challenging task of determining if collaborative processes are indeed more effective than other types of governance arrangements, the hypotheses must be employed and refined within rigorous comparative research designs. Because it is difficult to identify comparable cases that use different governance arrangements while holding other factors constant, utilizing theoretically-similar elements to standardize comparisons becomes even more important. Finally, following Gupta (2012), scholars should take up the task of comparing policy process frameworks to one other in empirical settings to determine “which theories are better suited to answer which kinds of questions” (18) by attempting to adapt other general policy process frameworks such as the IAD to appropriately study alternate governance arrangements such as collaborative processes while retaining elements that are broadly comparable among institution types.

References

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CHAPTER 4

Cross-Coalition Coordination in Collaborative Environmental Governance Processes

Abstract

Collaborative environmental governance processes utilize strategies such as face-to-face interaction, open deliberation, and resource-sharing to facilitate the development of trust and consensus among policy actors with different beliefs. Ideally, this leads actors to engage in some degree of cross-coalition coordination in order to produce mutually-beneficial environmental management actions. This study examines cross-coalition coordination in three collaborative environmental governance processes at different scales (statewide, multi-state, bi-national) nested within a common policy subsystem (Colorado River water governance) to understand why actors engage in this behavior and what effects it has on policy outputs and coalition stability. Data from process documents and interviews with key actors are used to examine three hypotheses derived from the Advocacy Coalition Framework and collaborative governance literatures about cross-coalition coordination. The findings indicate that collaborative processes indeed foster cross-coalition coordination and the development of mutually-beneficial management actions, but they fail to promote the realignment of coalitions presumed necessary for legitimizing collaborative approaches to policymaking. This work develops theory about coalition dynamics in collaborative environmental governance processes and provides insight into why such processes may succeed or fail at producing desired policy change, information that can be used to improve such processes as they continue to flourish across regions, scales, and resource contexts.
Introduction

Over the past three decades, collaboration has become a foundational tenet of many modern environmental governance processes (Ansell and Gash 2008; Koontz and Newig 2014; Koontz et al. 2004; Wondolleck and Yaffée 2000). As part of a broad “government-to-governance shift” (Matti and Sandström 2011, 386), collaborative environmental governance processes engage a wide variety of stakeholders across public and private spheres to develop and implement mutually-beneficial environmental management actions (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Gerlak, Heikkila, and Lubell 2013; Koontz and Newig 2014). While the difficulties of studying the effectiveness of collaborative processes are well documented (Koontz and Thomas 2006; Lubell, Gerlak, and Heikkila 2013), collaborative approaches continue to be lauded for their ability to overcome challenges associated with traditional, top-down policymaking processes and resulting command-and-control implementation, such as high cost, politicization, and adversarialism (Ansell and Gash 2008; Gerlak, Heikkila, and Lubell 2013). Scholars argue that collaborative processes can increase learning and shared understanding of problems (Leach et al. 2014), tackle issues involving multiple and overlapping jurisdictions (Gerlak, Heikkila, and Lubell 2013), lead to beneficial environmental outcomes (Biddle and Koontz 2014; Scott 2015), and promote democratic ideals (Leach 2006). Collaborative processes can also help to address some of the complexities specific to governing modern environmental issues, such as the need for better science, input from a broader set of stakeholders, and scale-appropriate solutions, typically within a high-conflict context involving the distribution of limited resources (Gerlak, Heikkila, and Lubell 2013; Margerum and Robinson 2015).
Collaborative environmental governance processes utilize strategies such as extensive face-to-face interaction among participants, open and transparent deliberation of controversial issues, and the sharing of resources such as money and knowledge to facilitate the development of trust and consensus among policy actors with different beliefs (Ansell and Gash 2008; Gerlak, Heikkila, and Lubell 2013; Kenney 2000; Leach 2006; Leach and Pelkey 2001; Weible 2008). These strategies shape interactions among actors in both the decisionmaking and implementation phases of collaborative processes, ideally leading them to engage in some degree of cross-coalition coordination to produce and execute mutually-beneficial environmental management actions. While rules dictating who participates in a collaborative process have been shown to affect a process’s policy outputs (Siddiki et al. 2015), research has also found that those who do participate in collaborative processes coordinate their actions to varying extents and with different motivations (Calanni et al. 2015), resulting in different degrees and patterns of cross-coalition coordination. Following from these findings, it is not simply who participates, but also how participants interact with one another, that can affect a process’s policy outputs.

Building on this work, this study asks the following research question: what are the motivations for and effects of cross-coalition coordination in collaborative environmental governance processes? Data collected from process documents and interviews with key actors in three collaborative environmental governance processes at different scales (statewide, multi-state, and bi-national) within a common policy subsystem (Colorado River Basin water governance) are used to examine three hypotheses derived from the Advocacy Coalition Framework and collaborative governance literatures about cross-coalition coordination. These hypotheses, which were initially developed through an exploratory case study of a collaborative water governance process in Colorado (Koebele Under Review, see dissertation Chapter 3), are
briefly described below and analyzed across each of the three collaborative processes. Through comparative analysis, this study develops theory about coalition dynamics in collaborative environmental governance processes by clarifying the link between participants, process, and policy change. It also provides insight into why collaborative processes may succeed or fail at producing desired policy change, information that can be used to improve such processes as they continue to flourish across regions, scales, and resource contexts.

The Advocacy Coalition Framework and Collaboration

The Advocacy Coalition Framework (ACF) is a well-known policy process framework that suggests that complex policy processes can be better understood by organizing participants in a policy subsystem—“defined by a policy topic, territorial scope, and the actors directly or indirectly influencing subsystem affairs”—into advocacy coalitions based on two criteria (Jenkins-Smith et al. 2014, 189). The first criterion is that actors in a coalition share beliefs, particularly at the policy core level. Policy core beliefs are essentially translations of an actor’s “fundamentally normative values and ontological actions” (i.e., “deep core” beliefs) to the bounds of the subsystem in which they are participating (Jenkins-Smith et al. 2014, 191). The second criterion is that actors with shared beliefs then “engage in a nontrivial degree of coordination” in order to “translate their beliefs into actual policy before their opponents can do the same” (Sabatier and Weible 2007, 196).

The ACF recognizes that some policy subsystems may be more collaborative in nature than others, meaning that they are composed of coalitions that are somewhat cooperative, have an intermediate level of belief compatibility, and are expected to foster “more cross-coalition interactions” than adversarial or unilateral subsystems (Weible 2008, 623). In studies of actors’
coordination patterns in collaborative policy subsystems, some scholars have indeed found policy-core belief correspondence to be the fundamental driver of coordination among actors (Matti and Sandström 2011), supporting the ACF’s assumption that actors are more likely to coordinate with those with whom they share beliefs. However, other scholars have found that “beliefs appear to be one of the least important factors” shaping coordination patterns in collaborative contexts (Calanni et al. 2015, 917). In these cases, coordination among actors who do not share beliefs or historic coordination patterns (i.e., those who would not be assigned to the same advocacy coalition) may be motivated by factors such as pre-established trust with other actors, the perception that another actor has access to important resources, or the mutual identification of a common opponent (Calanni et al. 2015; Henry, Lubell, and McCoy 2011; Leach and Sabatier 2005; Weible, Siddiki, and Pierce 2011). Additionally, the procedural strategies employed in collaborative processes (e.g., face-to-face interaction, resource sharing) may promote learning (Leach et al. 2014) and improve actors’ perceptions of their opponents (Weible, Siddiki, and Pierce 2011), factors that can further facilitate coordination among actors from different coalitions and potentially even lead to belief convergence among opposing coalitions over time (Weible and Sabatier 2009).

Thus, in contrast to the ACF’s assumption that actors are more likely to coordinate with others with whom they share beliefs, the following hypothesis regarding motivations for coordination in collaborative processes is posed:

**H1: Actors in a collaborative process will coordinate for reasons in addition to holding shared policy core beliefs.**

In addition to investigating actors’ motivations for coordinating with others outside of their own coalition in a collaborative process, it is also crucial to understand how these patterns
of interaction potentially influence the policy outputs of a process. Thus, scholars must also examine the effects of cross-coalition coordination within a collaborative process.

As mentioned above, the ACF assumes that each coalition in a policy subsystem will attempt to create policies that align with their beliefs before other coalitions can do so. However, collaborative processes often utilize consensus-based decisionmaking approaches, thereby encouraging actors to develop policy actions that provide (or appear to provide) a benefit to multiple coalitions simultaneously. Some processes may even offer shared financial resources for the implementation of projects to which all actors consent (Leach and Pelkey 2001), further incentivizing the development of “win-win” solutions. Importantly, actors may use different strategies to create these types of solutions. For example, actors may identify a single belief that is shared among multiple coalitions (despite diverging on other beliefs) and pursue a specific policy action that aligns with that shared belief. Alternatively, actors may pursue a broad scope policy action that fulfills multiple coalitions’ unrelated beliefs simultaneously. Both of these strategies result in the production of policy actions that serve multiple coalitions’ beliefs at once rather than the beliefs of one coalition who is able to “win” over the others.

Therefore, in contrast to the ACF’s assumption that coalitions will competitively pursue policy actions aligning with their own beliefs, the following hypothesis regarding the effects of cross-coalition coordination on policy outputs in collaborative processes is posed:

**H2:** Actors in a collaborative process are more likely to advocate for actions that serve the beliefs of multiple coalitions simultaneously as opposed to actions that strongly align with only one coalition’s beliefs.

A second way in which to examine the effects of cross-coalition coordination on a policy process is to determine if these new coordination patterns re-shape the process itself. In other
words, do actors continue to engage in cross-coalition coordination over time? The ACF traditionally assumes that that “the lineup of allies and opponents” within a policy subsystem “tends to be relatively stable over periods of a decade or so” (Jenkins-Smith et al. 2014, 195), implying that even if actors do engage in some degree of cross-coalition coordination, the membership and/or ideology of each independent coalition will remain fairly consistent over time. Collaborative processes, on the other hand, incentivize coalitions to coordinate repeatedly to achieve mutual benefits. Ideally, this encourages actors from different coalitions to find strategic points of consensus that they continue to work together on over time, potentially resulting in the continual adjustment of traditional coalition boundaries as policy priorities shift.

In this vein, Matti and Sandström (2011) argue that while short-term success in collaborative institutions depends “upon the actors’ ability to negotiate, to learn, and to form a common ground for action across coalitions holding opposite positions,” in the long-term, such “adjustments in coalitions will be decisive for the legitimacy of policymaking” (386). In other words, the legitimacy of collaborative approaches to policymaking depends on the destabilization of traditional coalitions through repeated, strategic acts of cross-coalition coordination.

Thus, dissimilar to the ACF’s hypothesis that coalitions will remain stable over time, a second hypothesis is posed regarding the effects of cross-coalition coordination in collaborative processes:

**H3: As a result of regular cross-coalition coordination, the lineup of allies and opponents within a collaborative policy subsystem will not be stable over time.**
Research Design and Methods

This research investigates the three hypotheses outlined above using a multi-case study approach (Yin 2003) that examines three on-going collaborative environmental governance processes touted as landmark examples of collaboration. The three processes, which are described in more detail in the following section, include 1) a statewide water analysis and planning process in Colorado, 2) a multi-state pilot program that financially incentivizes water conservation, and 3) a bi-national process that has begun to restore water to the Colorado River Delta for the benefit of numerous endangered species and native people. Each process is nested within the broader policy subsystem of Colorado River water governance and functions at a different scale (statewide, multi-state, and bi-national). Selecting multiple processes within the same subsystem constrains the broad geographic and institutional context and holds constant numerous external factors that can influence major changes in water governance (e.g., drought patterns, legal regimes, etc.).

The following multiple sources of data were collected about each case in order to triangulate case phenomena (i.e., dates, events, and outputs) as recommended by Yin (2003). First, key process documents were collected from the websites of organizations and agencies associated with each process to determine process timelines and identify key actors. Examples of documents include enacting and related legislation, interim progress reports, final public documents that are outputs of the process, and select media such as press releases. Second, informal, unrecorded preliminary interviews were conducted with key participants in each case that the researcher had an existing relationship with (n = 6) in order to confirm basic information about processes, identify key actors, and refine a formal interview questionnaire. Third, in-depth semi-structured qualitative interviews (Rubin and Rubin 2005) were conducted with key
participants across the processes (n = 28; statewide case, n = 12, multi-state case, n = 10, bi-national case, n=6). The difference in number of interview subjects across cases is due in part to the difference in total number of participants per case (with the statewide case vastly exceeding the others with 300+ regular participants), and in part to significantly restricted political environments of the multi-state and bi-national cases (these two processes do not have formal websites, regular public meetings, or publically-available lists of participants). Additionally, the researcher attended 12 public meetings related to the statewide case, traveled with process participants to observe important environmental restoration sites related to the bi-national case, and participated remotely in webinars related to all three cases in which key participants were also present. While the researcher did not formally document these participatory experiences, they allowed for further triangulation of information and served as opportunities to build trust with process participants.

Key participants for interviews were initially identified through process documents and during preliminary interviews. This sample was expanded over time using a version of snowball sampling (Auerbach and Silverstein 2003) in which interviewees are asked to identify other key participants in their process. Any new participants mentioned were considered potential interview subjects. The researcher then selected subjects to represent all relevant stakeholder groups in each case. Formal in-depth interviews were conducted with these subjects (10 = in person, 18 = via phone/Skype), recorded digitally, transcribed, and coded using QSR NVivo 10 qualitative analysis software. Codes were developed a priori from the relevant literature on the ACF and collaborative governance. For example, the supercode COORDMOTV captures descriptions of actors’/groups’ motivation for coordinating with other actors/groups; subcodes include examples of specific motivations for coordination derived from the literature such as
holding shared beliefs, having a pre-established trust, recognizing a common opponent, or believing another actor/group has important resources. The researcher then analyzed the coded data using code queries in NVivo to detect commonalities and differences related to the hypotheses within and across cases (Miles and Huberman 1994). Interview quotations are cited using an alphanumeric code that combines the acronym for each process (presented in the following section) and an interview number to demonstrate that quoted information is derived from different interviews (ex: CWP_10).

These data sources are then used in tandem to 1) develop detailed case study summaries of each process (presented next), and 2) investigate the hypotheses regarding the motivations for and effects of cross-coalition coordination in collaborative environmental governance processes.

**Collaborative Governance in the Colorado River Basin**

The Colorado River, which has been called “the most legislated, most debated, and most litigated river in the entire world” (Reisner 1993, 120), begins in the Rocky Mountains (Colorado, USA) and drains into the Gulf of California (Mexico). It provides water for 40 million municipal users, 5.5 million acres of irrigated farmland, 22 tribes, 7 National Wildlife Refuges, 4 National Recreation Areas, 11 National Parks, and 4,200 megawatts of hydropower generating capacity in 7 U.S. states (United States Bureau of Reclamation 2012), in addition to extensive agriculture and municipal uses in 2 Mexican states. Its waters are apportioned through the “Law of the River”—a “useful shorthand reference to describe [the] longstanding and complex body of legal agreements governing the Colorado River” (United States Bureau of Reclamation 2012, 3). This includes the 1922 Colorado River Compact, which allocates 15 million acre feet (maf) of the river’s annual flow among the Upper and Lower Basin states in the

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1 These case study summaries are condensed versions of those included in Chapter 2 that have been edited for the purposes of publishing this chapter as an independent manuscript.
U.S., as well as the 1944 Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande Treaty, which allocates 1.5 maf to Mexico. Overlaying these laws is “complex web of fragmented and piecemeal authorities and institutions” involved in modern-day Colorado River operations (Gerlak, Zamora-Arroyo, and Kahler 2013, 33).

Due in part to the historical over-allocation of the Colorado River (Getches 2003), and in part to sustained drought and population growth in the region in recent decades (United States Bureau of Reclamation 2012), the construction and careful management of a complex system of storage reservoirs on the river have been crucial for avoiding major water shortages throughout the basin. As demands on the system continue to increase and more attention is paid to negative environmental impacts associated with the current management regime, policymakers and river managers have begun to seek novel solutions to these challenges. As a result, the Colorado River Basin has become a test bed for processes that experiment with new ways for users to collaboratively govern the river in order to increase benefits across sectors. This study examines three of these collaborative processes, each of which is detailed below. While other important collaborative water governance processes in the Basin have certainly occurred (e.g., the 2014 Lower Basin “MOU,” the 2012 Colorado River Basin Water Supply and Demand Study, the 2007 Interim Shortage Sharing Guidelines process), the processes selected here are on-going at the time of this study and have been recognized as landmark examples of collaboration.
Colorado’s Water Plan (CWP): Statewide Collaboration

Following a catastrophic drought in Colorado in 2002, Colorado’s main water governance entity, the Colorado Water Conservation (CWCB) board, began “the most comprehensive analysis of Colorado water ever undertaken” (State of Colorado 2015). In 2005, a formal stakeholder process component was established to “facilitate discussions on water management issues and encourage locally driven collaborative solutions” (Colorado Water Conservation Board 2016a). This process has since involved over 300 Colorado citizens through “Basin Roundtables” that represent the state’s eight hydrologic basins and the Denver Metro area. Simultaneously, a 27-member Interbasin Compact Committee (IBCC) was established “to facilitate discussion across Colorado’s river basins and to address statewide water issues” (Colorado Water Conservation Board 2016b). The data developed through this process later formed the basis of Colorado’s first statewide water plan. Released in 2015, Colorado’s Water Plan (CWP) outlines the state of water in Colorado and begins the difficult task of addressing future needs. The director of the CWCB, James Eklund, argues that the “boldest thing this water plan does is injecting collaboration into the water conversation” (Estabrook 2015).

The analysis that follows focuses on collaboration during the production of Colorado’s Water Plan itself, the most recognized product of the ten-year multi-level collaborative process.3

2 Note that this is the same case that is referred to elsewhere in this dissertation as the “Roundtable process.” However, because this chapter analyzes cross-coalition coordination on specific policy products and used data collected after those policy products were produced, the cases are named for their major policy product to improve clarity when the paper is presented as an independent manuscript.

3 The exploratory case study used to develop the hypotheses explored in this study (Koebele Under Review) examined collaboration between members of individual stakeholder groups within Roundtables (agriculture, municipal, industrial, environment, and recreation) during the earlier years of the process. See (Koebele 2015) for an analysis of the policy outputs and outcomes created by each Roundtable, as well as the barriers they faced, prior to the production of the state water plan.
Even though the CWCB staff was primarily responsible for drafting the final plan, it was crucial that the agency worked collaboratively and iteratively across decisionmaking levels during this process. This includes collaborating with those at the Colorado Department of Natural Resources, the state agency that houses the CWCB, and with key stakeholder group leaders involved in the Roundtables and IBCC to determine what content was included and emphasized in the final plan. For instance, the CWCB regularly “checked in” with Roundtable participants in order to provide a “sneak peak of where [the CWCB] was headed” so stakeholders “were not surprised” and had opportunities to respond to misgivings (CWP_5). The CWCB then had to then take “very seriously the comments that had come out of the Roundtables and the IBCC” (CWP_1), often relying on IBCC leaders “to really be a gauge with their [respective] stakeholders” (CWP_12). This approach allowed the CWCB to create a plan that is accepted as legitimate by most process participants as opposed to being seen as product of the agency’s staff.

**Colorado River System Conservation Pilot Program (SCPP): Multi-State Collaboration**

Due to prolonged drought in the Colorado River Basin, water providers have become increasingly dependent on withdrawing water stored in the system’s major reservoirs to meet demand. As part of drought contingency planning efforts (Colorado River District 2016), the U.S. Bureau of Reclamation and major water utilities from four Basin states (Arizona, California, Colorado, and Nevada) jointly developed and funded the System Conservation Pilot Program (SCPP) in 2014. The SCPP supports “voluntary, compensated measures for reducing water demand” (Central Arizona Project et al. 2014), and consequently raising reservoir levels, by funding conservation projects proposed by water users across sectors and states. Projects are selected based on criteria such as the amount of damage to third-party users, length of time required for implementation, and cost (Waage 2013). Funded projects are administered by the
Bureau of Reclamation (in the Lower Basin) or the Upper Colorado River Commission and individual states (in the Upper Basin). The SCPP “was slated as a historic agreement” due both to its joint funding approach to conserving water for system benefit and to its experimental nature: “this whole program is more about testing concepts [that can be scaled up later] rather than creating a lot of water [now]” (SCPP_2).

The focus of analysis in this case is on collaboration among the SCPP’s funding and administrative entities. These entities developed the program and implementation structure through a consensus-based process: “a lot of the pilot program was set up basically on everyone being unanimous on everything” (SCPP_2). Despite the diverse priorities of the individual entities, they “locked [themselves] in the room for two days and hashed [the program criteria] out” (SCPP_5). While multiple interviewees explained that achieving such a high degree of consensus on the selection criteria and each subsequent funding decision makes the program “not very efficient or streamlined” (SCPP_10) and hence “very difficult to administer” (SCPP_3), others argued that requiring all participants to collaborate on all decisions “leads to a higher success rate in the long term for the program” (SCPP_6). Response to the first call for proposals, which offered a total of $11 million in funding, exceeded expectations, and the program was granted additional funding in 2016.

Minute 319 (M319): Bi-national Collaboration

The Colorado River Delta in northern Mexico was once described as a landscape composed of hundreds of green lagoons (Leopold 1986). Now, numerous water diversions have lead to a significantly reduced and fragmented vegetation mosaic, biodiversity loss, the costly loss of fisheries, and the devastation of native culture in the Delta (Birdsong 2011; Getches 2003; Glenn et al. 1996; Hinojosa-Huerta et al. 2008; Hinojosa-Huerta et al. 2013; Kowalewski et al. 2002; Montenegro et al. 2013; Parra et al. 2013).
As the regional decisionmaking authority, the International Boundary and Water Commission/Comisión Nacional de Límites y Aguas (IBWC/CILA), experienced conflict and stagnation over Delta issues, a “transnational network” of bi-national NGOs emerged with a “renewed interest in this ecosystem” in the 1990s (Gerlak 2015, 105). They began a broad, collaborative dialogue about the region that was eventually institutionalized by the IBWC/CILA in 2008. Stemming from this process, the U.S. and Mexico signed a landmark agreement in 2012 known as Minute 319 (M319). It outlines “a series of agreements, operational measures, and cooperative projects” pertaining to water sharing over a five-year pilot period (King, Culp, and de la Parra 2014, 41-2)—including a commitment of 158,088 acre-feet of “environmental flows” to the Delta ecosystem, two-thirds of which was released as a “pulse flow” in the spring of 2014 (Flessa, Kendy, and Schlatter 2014).

The analysis presented here focuses on collaboration among participants in the “core negotiating group” that developed Minute 319, including federal representatives from the U.S. and Mexico (IBWC/CILA, the U.S. Bureau of Reclamation, Mexico’s national water commission [CONAGUA]) and representatives of the U.S. basin states and/or state water agencies, as well as their interactions with the “environmental work group,” a bi-national team of NGOs and scientists that look specifically at environmental issues in the Delta. These individuals “spent years doing field trips, sitting in conference rooms, and sitting around in the evening drinking beer, getting to know each other and overcoming this intense economic, language, and cultural barrier that had been built on the border” (M319_4). Their repeated face-to-face meetings created a space for deliberation among bi-national stakeholders at various levels on crucial components of a potential agreement: “sort of a funnel of ideas and concepts being
hashed out at the technical level and a little more policy and then to the decisionmaking body” (M319_5).

While “reaching consensus [on this type of agreement] in the bi-national context actually means for the Mexican commissioner and the U.S. commissioner, and probably the Bureau of Reclamation Commissioner, to reach agreement” (M319_6), there was broad recognition that all stakeholders needed to consent: “You can’t really roll anyone today. You really have to have a very firm and almost a unanimous approval of ideas, of concepts,” even if that is sometimes “begrudging consensus” (M319_5). According to one interviewee, this unusual “direct stakeholder involvement in international diplomacy… was really necessary in this case in order to overcome that sort of 150 year broken border-water relationship” (M319_4). Extensive monitoring of the hydrological and biological effects of the environmental flows to the Delta continue as the U.S. and Mexico negotiate the next addendum to the 1944 Treaty, currently referred to as “Minute 32X” (Spener 2016).

**Results**

In order to understand *the motivations for and effects of cross-coalition coordination in collaborative environmental governance processes*, data from each case pertaining to each hypothesis are presented below.

First, to determine if H1 (coordination among actors motivated by reasons in addition to shared beliefs) is supported, it is necessary to establish the traditional makeup of coalitions within each process. While the ACF typically defines coalitions at the subsystem level, which would result in having the same coalitions in each of the three cases examined here, these broad groupings often fail to represent scale-level complexities and historic coordination patterns in
ways that are meaningful to individual policy debates or process. Furthermore, ACF scholars have recognized that subsystems are often “nested and interdependent”; for instance, “a water policy subsystem at the local level will likely be nested in a regional policy subsystem which is nested within a national policy subsystem,” and these subsystems may overlap or interact with other related subsystems (Weible and Nohrstedt 2012, 126). Following from this, each collaborative process studied here is considered a semi-autonomous process that is nested in a broader common policy subsystem (Colorado River Basin water governance), and coalitions are defined as they are relevant to each collaborative process based on descriptions provided by interviewees (Table 1).

Importantly, the process of aggregating diverse interests into coalitions is coarse in this analysis. For example, in the M319 case, the U.S. Basin States and water providers are grouped into a coalition. While these stakeholders share some similar beliefs in the context of bi-national water negotiations (primarily that the U.S. federal government should not be the sole decisionmaker about water that the states/providers directly use), interviewees were quick to point out that each entity brings a different perspective to the table: “[State X]’s interpretation of the [Colorado River] Compact and [State Y]’s interpretation of the compact are not the same. They are not going to be the same. Our positions are different. We can either harp on that or we can try to find a way to navigate around that” (M319_5). In the CWP case, interviewees described two different ways actors typically coalesced over water issues within the same process: either by interest group (e.g. recreation, municipal use, etc.) or by geographic region of

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4 Whether a state or municipal provider participates in negotiations depends on which entities contract with the federal government for Colorado River water. For instance, both the Arizona Department of Water Resources (a state agency) and the Imperial Irrigation District (a district serving one area of California) contract directly with the federal government, and thus they both participate in the negotiations.
<table>
<thead>
<tr>
<th>Case</th>
<th>Coalitions</th>
<th>Relevant Quotations (descriptions of stakeholders with shared beliefs or historic coordination)</th>
</tr>
</thead>
</table>
| CWP  | Interest-based:  
• Agriculture  
• Municipal  
• Industrial  
• Environment  
• Recreation  
| or geographically-based (relative to the Continental Divide):  
• East Slope  
• West Slope | “I think there certainly has always been a lot of conflict within the water community between different geographic regions and among different interest groups. We’ve got one hundred years of history of building up...” (CWP_2)  
“I mean, the two biggest conflicts you’re going to have any time are going to be between competing interests.... The other big conflict that’s always going to come up in Colorado water is East versus West [Slope].” (CWP_9)  
“And so there’s more than just the sets of stakeholders [by interest]. There’s also, of course, the Continental Divide.” (CWP_12) |
| SCPP | Geographically-based (by major basin):  
• Upper Basin entities: Denver Water, Upper Colorado River Commission (UCRC)  
• Lower Basin entities: Central Arizona Project (CAP), Metropolitan Water District of Southern California (MWD or MET), Southern Nevada Water Authority (SNWA), Bureau of Reclamation | “The Lower Basin, you just round up the usual suspects – MET, CAP, Southern Nevada, [and] Reclamation. We’re on the phone...weekly or every two weeks about the issues we face.” (SCPP_8)  
The Lower Basin entities “have an urban coalition and we get together to coordinate operations. We fund some things [jointly].” (SCPP_7)  
The Lower Basin entities have “struggled [to coordinate] with our Upper Basin counterparts who have wanted to avoid highlighting [the perception that] that significant money from the Lower Basin... is drying up farms in the Upper Basin.” (SCPP_5)  
“Some people in the Upper Basin... don’t want the Lower Basin involved in the Upper Basin.” (SCPP_10) |
| M319 | A mix of interest- and geographically-based:  
• Mexico (federal/state): CILA, CONAGUA, Mexican states  
• U.S. (federal): IBWC and Bureau of Reclamation  
• U.S. (state): relevant Basin states and water providers  
• Environmental (bi-national NGOs) | “For Mexico, it had been about U.S. economic imperialism and one-sidedness of the border relationship and the U.S. making unilateral relationships that had dammed their river and diverted 90% away from them. The U.S. thought about Mexico as not contributing very much, taking advantage of this amazing dam system, but not really contributing to help maintain it and being somewhat… wasteful of the use of water.” (M319_4)  
“[The U.S. Basin States] may not agree on specifics, but as long as we had a common goal, we were headed in the right direction.” (M319_5)  
“NGOs, we share the same kind of mission and overall goals... each one has more emphasis on, for example, the estuary or the riparian or the areas, but overall we all share the same general goals.” (M319_2) |

Colorado. Yet, others noted that, depending on the context, both methods of categorizing actors into coalitions miss important details. For example, regarding the “municipal interests” coalition, one stakeholder explained, “municipalities in the [Denver] Metro area have a long history of both fighting with each other as well as collaborating on projects and programs where it makes...
sense. They’re suing each other for water and at the exact same time they’re collaborating” (CWP_2). This provides insight into the complexity of aggregating actors into coalitions within a singular process, much less seeking to define common coalitions across a policy subsystem.

As described above, the ACF traditionally assumes that stakeholders in a policy process are more likely to coordinate with actors inside their coalition to further actions that align with their shared beliefs, as opposed to coordinating across coalitions to further actions that serve multiple coalitions’ beliefs. Across the collaborative processes studied here, however, examples abound of coordination among actors from different coalitions based on motivations other than shared beliefs, supporting Hypothesis 1. Table 2 presents examples of cross-coalition coordination in each case. While this is not a comprehensive list, these examples emphasize that shared beliefs are not the sole driver of coordination among actors in these processes.

In addition to the examples of cross-coalition coordination in Table 2, actors frequently discussed coordination with “auxiliary actors,” or actors “peripheral to a coalition’s network” (Weible 2008, 623) such as NGOs (SCPP case) and academic scientists (M319 case). Despite being uninvolved in formal decisionmaking structures, auxiliary actors provided resources such as information or implementation manpower that are crucial for primary actors to achieve their goals:

*My assessment is that without Trout Unlimited and The Nature Conservancy, [the funding agencies] wouldn’t have a pilot program... the projects that came out of both rounds [of RFPs] in the Upper Basin in my opinion are primarily a result of the relationships that [the NGOs] have built with [potential participants] over the years. (SCPP_4)*

*Bi-national [environmental] monitoring... was made possible by the fact that [there were] long-standing collaborative efforts between NGOs and academics on both sides of the border well before Minute 319 was a gleam in anybody’s eye. (M319_3)*
<table>
<thead>
<tr>
<th>Case</th>
<th>Coalitions Involved</th>
<th>Motivations for Coordination</th>
<th>Relevant Quotations (descriptions of acts of cross-coalition coordination and how the collaborative process fostered this)</th>
</tr>
</thead>
</table>
| CWP  | Actors from multiple interest groups or multiple geographic regions that historically disagree | Participants identified common goals or a **common opponent** (e.g., the East Slope or a “call” on the river—a situation in which senior water rights holders curtail junior water rights holders’ water use until senior rights are fulfilled) | “There were still some areas of high-level conflict [among interest groups] but what I did see is some self-management that wasn’t always there... If you see two or three stakeholder groups, they often worked on initiating their own areas of intersection and discussion in those areas.” (CWP_4)  
“...having sat at the table for a while, if you’re an [agriculture] producer on the West Slope and you’re an [environmentalist] on the West Slope, you both want the water to stay on the West Slope... for different reasons, but there’s a natural alliance there.” (CWP_8)  
“I think it has become abundantly clear that people on the East [Slope] were equally concerned [as those on the West Slope] about any potential call on the Colorado River because that would impact their junior water rights. And so it really ties us together.” (CWP_1). |
| SCPP | Actors from Lower Basin & Upper Basin entities | The Lower Basin entities’ momentum and experience with similar conservation programs was seen as an **important resource** for Denver Water to meet their own goals that was not available in the existing Upper Basin processes; all entities recognized a **common opponent** (low reservoir levels/shortage) | “Denver Water was uncomfortable with the [slow] pace of the consensus-building approach [to demand management in the Upper Basin].… [and as a result] they wanted to participate in a conservation program with... the Lower Basin, which has been working with some urgency.” (SCPP_1)  
“I think the funders—the major municipalities and water providers [in both Basins]—were the ones feeling the most threatened by low reservoir conditions.” (SCPP_3)  
“Sitting at the same table trying to achieve a common goal has allowed us to invite [Upper Basin] folks down so they can better understand our systems and constraints. Through [the SCPP] we are working more closely together and building collaborative rather than defensive relationships.” (SCPP_5) |
| M319 | Actors from NGOs and multiple other coalitions | NGOs, who were historically excluded from negotiations, established trust with other individual coalitions through long-term involvement, the provision of **important resources** (funding, organization), and the identification of a common goal (Delta restoration). | “We still have some of the same faces from 10, 15 years ago [at our NGO]. I think that’s important because people know me and know the organization, they know what we do… they know us, and they trust us.” (M319_2)  
“The NGOs in many ways were the genesis of the bi-national negotiations… they played a pretty key role in getting the negotiations put together in the first place and also assisted materially in helping the two countries coming to consensus.” (M319_4)  
“Mexico was really pushing or emphasizing the need for an environmental component [related to restoring the Delta]... so [the NGOs] interacted a lot with [CILA], so by that time we had a pretty good relationship with them... so a lot of the shared information happened in the conversations.” (M319_2) |
Additional factors that catalyzed collaboration among actors that were identified in the coding process include the presence of deadlines set by process leadership, fear of one’s values being left out of the final plan or agreement, or an external shock to the system, such as an earthquake that destroyed Mexico’s water delivery infrastructure and prompted bi-national collaboration; however, there is no evidence that these factors lead to specific acts of cross-coalition coordination as opposed to heightened engagement with the process in general.

Next, in order to understand the effects of cross-coalition coordination on the policy outputs from these processes, data related Hypotheses 2 and 3 are presented below. To examine H2 (whether actors advocate for actions serving the beliefs of multiple coalitions), the major policy product in each case (for which each case is named in this study) is analyzed in relation to the coalitions’ beliefs it serves.

As described in the CWP case study, Colorado’s Water Plan was primarily drafted by the CWCB using data produced by the Roundtables and IBCC. Actors in this process described the plan in numerous ways:

_A ‘State of the State’ regarding water._ (CWP_9)

_An encyclopedia of everything we know in Colorado historically and from an engineering standpoint... this is not a novel, this is a textbook, so you need to include all your science, you need to have the best bibliography in the world, you need to footnote everything, you need to have it all in one place._ (CWP_11)

_A compilation, a compendium of all the various water issues in the state and the challenges that we face._ (CWP_3)

_A framework for a discussion that needed to occur and needs to continue._ (CWP_8)

_All the different actions we’re taking – we’re not just taking one action... Instead [the CWCB] ended up with a very extensive list of things that are going to be done... and identified which of those are administrative, executive branch items, and which ones need legislation, and which ones are really for local water providers or local stakeholders._ (CWP_2)
According to multiple actors, the plan used a “catch-all” approach that served all participating coalitions’ beliefs by deliberately avoiding the prioritization of some actions over others. Because water is such a controversial topic in Colorado, decisionmakers saw this strategy as crucial for increasing stakeholder support and legitimacy of the final plan:

*The way to consensus is making sure everyone can find themselves in the final product... seeing their own words and their own ideas actually being reflected... gave people some confidence and got a lot more buy-in. (CWP_9)*

*[The plan helps people] start from the same place and then have the same set of facts behind us, the same history so that our discussion is equally informed. Only when you do that can you have successful decisionmaking by collaboration. All of that is what the state water plan is for... and if we do that... it will become a terrifically powerful document. (CWP_11)*

*[It was] an attempt to strike that balance of having enough basin-level and grassroots input and control and direction and ability for the local Basin Roundtables to do things that they saw fit, but then also have some cohesion as a state because we’re one state after all, not nine independent basins. (CWP_2)*

*[It is an] identification of common denominators if you want to call it that. Common denominators that may lead to opportunities. (CWP_7)*

*I think that’ll be one of the hallmarks of the water plan – the people’s creativity and the state’s willingness to be a partner rather than mandating certain types of behavior. (CWP_1)*

However, some participants viewed the somewhat ambiguous and potentially-conflicting plan as a failure to meet the goals set out by the collaborative process:

*[It is] the next step in a plan of action. It’s not really a plan of action. (CWP_7)*

*I think that it’s been a struggle to have the plan actually be a meaningful document and direction and achieve the vision for what the governor laid out of creating a path forward for how we’re going to accommodate five million more people in this state in the face of climate change. (CWP_3)*

In the SCPP case, the major product is the pilot program itself. During the development of the program, most of the actors—particularly those providing implementation resources—
identified a common “opponent” (i.e., a shortage on the river). They consequently defined a set of common goals to defend against this opponent, which became the foundation of the program:

[The water providers] were looking at hydrology and trying to figure out strategies... [1] to develop a series of projects that address some of the current imbalance between supply and demand... [2] to get on a path to begin to address the structural deficit... in the Colorado River basin... [3] to evaluate and test... rapid response actions to address critically low reservoir elevations... Out of these informal discussions, we felt that a pooled funding approach to explore collaborative demand management would be something that would address and inform those three goals in different ways. (SCPP_5)

[Providers wanted] to evaluate and identify [whether there was] some type of system conservation or demand management, voluntarily reducing consumptive use in the Upper Basin for the benefit of propping up levels at Lake Powell or water banking of some sort [that] is even feasible... Then [evaluate] whether there would be interest and what obstacles might be there—legal or practical—that we might encounter along the way. And then [learn] from that... (SCPP_10)

As a result, policymakers were able to develop a focused programmatic agreement targeted at meeting these goals that simultaneously served the beliefs of all of the stakeholders involved:

[The funders] then developed a framework of the agreement ...then we worked with Reclamation as they, in the Lower Basin, set up their request for proposals, and the UCRC in the Upper Basin; [the funders then] reviewed those proposals, made sure they met our goals—our collective goals, then approved funding for the various projects. (SCPP_7)

In the M319 case, the final Minute served multiple coalitions’ beliefs simultaneously by including various provisions under one broad agreement (i.e., provisions for shortage and surplus water sharing, delayed water deliveries, conservation projects, and environmental flows). While the multi-faceted nature of Minute 319 resembles the “catch-all” approach taken in the CWP case to some degree, this agreement more clearly defines specific actions, as well as who will fund them, in a way that allows the components to complement one another rather than potentially conflict. It also limited the timeframe of the agreement to five years, which served as a strategy to create buy-in for the agreement from a broader set of actors:
The only way we’re going to be able to break off such a big bite is to do it for a very short amount of time... and then it’s like not too scary for anybody... It’s like ‘oh, it’s five years... whatever happens, happens. We’ll check back in. If we did something that we really don’t like, we have a chance to fix it.’ (M319_1)

So you could end up with a very lasting or potentially quite small agreement or a very broad and comprehensive and necessarily short-term and somewhat experimental agreement. And we deliberately opted for that because it seemed like the best way to really move the bi-national process forward. (M319_4)

We wouldn’t get a long-term agreement. We just didn’t have the consensus for that. We conceded a bit to sort of get something in place. (M319_5)

As mentioned in the case study, the participating NGOs recognized early on that they would have to create a solution that simultaneously targeted the beliefs of other groups who were not necessarily concerned about the environment in order to foster cross-coalition coordination despite a long-standing history of conflict in the region:

NGOs have always proactively tried to... advance not only the environmental agenda but... it has been more than that. Water use, water conservation, how the two countries can do better... we’re always looking for ways to improve the way US and Mexico use or manage the resource—water, and by doing that, [we] find ways in which water can be used for the environment. So we were very proactive in creating the proposed solution to issues that didn’t have to do directly with the environment. (M319_2)

My overarching goal is to keep the US and Mexico working together. And to keep the two countries from reverting to where we were...with unilateral management and failure to address impacts with your bilateral partner... We need collaborative approaches to sustainable management as the precursor to making environmental progress because if we’re litigating or making decision in a crisis, there’s no win for the environment because then it goes to the political level and then... the environment is done. (M319_1)

A lot of it became about building trust relationships across the border that would help the two countries construct a narrative that was built around the notion of partnership and a relationship of sovereign equals in which all of these good things would happen. (M319_4)

While actors in each case engaged in cross-coalition coordination and produced policy outputs that served multiple coalitions’ beliefs simultaneously, supporting Hypothesis 2, the degree to which this affected the stability of coalitions going forward is less clear. This final
concept is investigated through H3, which examines if and how the lineup of allies and opponents began to change in each case as a result of cross-coalition coordination.

In the CWP case, interviewees described the importance of a long-term collaborative process for identifying all relevant stakeholders and creating opportunities for them to collaborate. Many recognized that this type of inclusive collaboration is necessary for sustainable future water management in Colorado:

_I don't think any major water decision will be made in Colorado for a long time in the future without it being recognized as having a statewide interest and all of the constituencies will be included._ (CWP_11)

_The other fundamental thing that changed was prior to [CWP] process, the water community was extraordinarily small and extraordinarily—not only parochial, but insular. There was no connection with the rest of the state—very few people understood. So one of the true benefits... was expanding the discussion to a much larger group of people from various communities._ (CWP_8)

_We had people from each one of those sectors present... you had East Slope, West Slope... we could not have painted a better tableau of people to be behind the governor on this [agreement]... If anybody would have told you back when we were doing the first year that we were going to have those people behind the governor, I would have been like ‘no way.’_ (CWP_5)

Despite this, there is little evidence that major realignment of coalition membership has taken place. In fact, interviewees emphasized that long-standing coalitions were maintained regardless of increased cross-coalition coordination:

_I don't think the relative power positions changed because there’s nothing mandatory about this; however, I do think there was some good listening that happened and maybe, as a result of that listening, some increased understanding of the concerns and goals of the various partners around the table._ (CWP_10)

_I think we’re making incremental progress and building more collaboration among those stakeholders and among the different regions. It certainly isn’t happening as fast as everybody would hope, but I think it’s unrealistic to think we’re going to put in place a Roundtable process and within five years, one-hundred years of conflict has been erased._ (CWP_2)

In the SCPP case, while long-standing Upper and Lower Basin conflicts remain alive,
entities involved in the pilot program have continued to coordinate through a second round of project proposals—potentially signaling some adjustment in traditional coordination patterns:

*I think the conversations you’re starting, the avenues you’re starting to pave, are absolutely necessary. And maybe they will take different paths in the future, but you’re just paving new roads…* (SCPP_8)

However, a challenge that could derail the program involves scaling it up to a level where enough water is conserved to meaningfully impact reservoir levels. In addition to the difficulty of achieving this in a cost-effective manner, there are administrative hurdles, especially in the Upper Basin where tracking conserved water is difficult due to geographic and legal structures:

*The question in front of us now is scalability and I think we’ve got some serious challenges with the scalability issue.* (SCPP_1)

*I think one of the key things is that the pilot program initially had put aside no budget for administration or monitoring or any of that work. And that’s something that needs to be addressed going forward.* (SCPP_4)

*The mechanics of working in Upper and Lower Basin are wildly different… In the Upper Basin, each state administers their Colorado River water right separately and uniquely…and so that adds a significant level of complexity. The projects in the Lower Basin are generally orders of magnitude larger than projects in the Upper Basin, so we have a lot of transaction time in the Upper Basin projects for relatively small yield.* (SCPP_5)

*In the Upper Basin… water is conserved in certain locations, flows past many valid water rights – water users with valid water rights who would have the ability to take water if it’s present – and being able to get water from a location like that to the Colorado River is much more uncertain…* (SCPP_3)

Thus, more time is needed to see if the participating entities continue to work together to fund and administer the program as they face key hurdles.

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5 Colorado River Basin states are governed by the Prior Appropriation system, which allocates water based on seniority. Junior users technically have rights to water forborne by senior users as part of the SCPP, making it difficult to determine if water conserved in the Upper Basin is actually “shepherded” to the intended downstream reservoir for system conservation purposes. This is not an issue in the Lower Basin, as the major reservoir is located at the top of the Basin and water earmarked for system conservation is simply not released downstream.
In the M319 process, despite widespread cross-coalition coordination during the development of the agreement, long-standing divisions and differences in power among traditional coalitions remain, especially regarding actors who have not historically been involved in bi-national negotiations. For instance, initial hesitance expressed by federal and state groups to allow NGOs to participate in the decisionmaking process has reemerged in Minute 32X negotiations:

*One of the great ironies right now is that [for Minute 32X] ... the sort of core discussions are being held by mostly states and the federal government. And when you look at [Minute 319] and who paid for it all and helped to make it happen... [those people are no longer] really represented directly at the table... that reflects that sovereign-to-sovereign [country] relationship that was at the core of this thing and the beliefs and realities about who had power over water in the Colorado River Basin. (M319_4)*

*There is a core negotiating group and [the NGOs] are not at the table... [the core group needs the NGOs’] input because they need to figure it out and make the environmental piece work, but [the NGOs] can’t blow [the broader negotiations] up. So I feel like... the people that the [federal governments] brought to the table are the ones they have to bring because they’re the ones who can blow it up. (M319_1)*

Similar to the other cases, a major realignment of coalitions is not observed here, indicating a lack of support for Hypothesis 3. However, the success of the M319 process provided some reassurance to the NGOs that their views will continue to be integrated into future agreements:

*On the one hand, that can feel like we’ve lost power, and on the other hand it’s much more of a foregone conclusion this time that there’s going to be an environmental component in [32X]. And we’re having lots of behind-the-scenes conversations to bring the perspective that we need to it... (M319_1)*

*The Delta, I think, ended up as a decimated landscape because nobody could own it, but now the U.S. and Mexico own it together. The NGOs are helping be the stewards, but we’re working on it together... we’ve set up a framework that allows us to do that... (M319_1).*
Discussion and Conclusion

Based on the data above, H1 (coordination motivated by reasons in addition to shared policy beliefs) is supported. While levels of intra- and cross-coalition coordination were not quantified as part of this study, it is clear that actors across these processes frequently coordinate with others who hold different beliefs and with whom they have not coordinated historically. Motivations for cross-coalition coordination derived from the literature such as pre-established trust, the perception of another actor holding important resources, and the identification of a shared opponent were observed across cases. Additionally, coordination with auxiliary actors such as NGOs and academics was important for some primary actors to achieve their goals.

Reflective of these patterns of cross-coalition coordination, actors in each case produced a major policy output that served the beliefs of multiple coalitions simultaneously, supporting H2. Actors used different strategies to develop these multi-benefit outputs in each case, however. Actors in the CWP case created a broad plan that contains potentially-conflicting measures but fosters stakeholder buy-in and future collaboration, whereas the Minute 319 agreement includes multiple complementary operational measures that stakeholders consented to in part due to their experimental nature. In contrast to these multi-faceted approaches, actors in the SCPP case identified a shared goal and developed a targeted program to meet that goal. Importantly, entities involved in the SCPP generally have similar scopes of responsibility and resources at their disposal, perhaps influencing their ability to build consensus around a highly specified policy output, whereas the CWP and M319 cases involve a broader diversity of actors with historically asymmetrical political power and resources, making the possibility of creating an equally specific policy output less likely. These differences highlight the underlying relationship between
the institutional design of collaborative processes—including both the “rules of the game” for a process itself and how it fits into a broader institutional structure—and its policy outputs.

In contrast to H1 and H2, H3 (an unstable lineup of allies and opponents due to cross-coalition coordination) was not supported. While the data suggest that actors across cases saw collaboration as a necessary tool for improved decisionmaking going forward, historic coalitions in each process did not realign, even as their members engaged in various degrees of cross-coalition coordination. In other words, even when collaborative processes do foster cross-coalition coordination and multi-benefit policy outputs, the lineup of allies and opponents involved is still fairly predictable over time. This finding supports Weible (2008)’s assertion that “[c]ollaborative policy subsystems include cooperative coalitions who continue to disagree but who are able to find enough common ground to negotiate and work together” (p. 625, emphasis added), as well as the ACF’s assumption that coalitions will be fairly stable over the course of a decade or so. This finding also underscores the ACF’s assertion that policy processes “should be understood from a long-term perspective” (Jenkins-Smith et al. 2014, 192), even when evidence for extensive cross-coalition coordination and a general preference among actors for collaboration in the short-term exists.

Taken together, these finding provide insight into the overarching research question: what are the motivations for and effects of cross-coalition coordination in collaborative environmental governance processes? Collaborative processes may indeed foster cross-coalition coordination by creating conditions under which actors can build trust, develop shared understandings, and identify other actors with important resources or common opponents. While this enables actors to produce policy outputs that serve multiple coalitions’ beliefs simultaneously, evidence for adjustment of traditional coalitions—the outcome Matti and
Sandström (2011) argue is “decisive for the legitimacy of [collaborative] policymaking” in the long-term (p. 386)—is currently scarce. However, collaborative processes may encourage actors to view collaboration, as opposed to adversarialism and marginalization, as a more effective method by which to develop solutions to complex environmental issues. This can help to build greater potential for sustained collaboration among opposing coalitions, even if they do not become consistent allies, and provide an alternative avenue through which the legitimacy of collaborative approaches is established.

These findings have a number of implications for the study and practice of collaborative governance. On a theoretical level, they help to refine the ACF’s assumptions about why actors coordinate and what types of outputs they may advocate for under varying institutional arrangements. On a practical level, understanding the strategies used by actors in the three collaborative processes to create multi-benefit policy outputs can help organizers of future processes better conceptualize feasible process goals and design appropriate collaborative institutions to achieve them, especially in light of power and resource asymmetries among participating actors. This also helps to illuminate the mechanisms underlying the policy outputs produced in a collaborative process (e.g., we may see more or less specific policies produced depending on the diversity of coalitions involved and the procedural strategies used to foster collaboration), an area ripe for further study. Together, these findings can help both scholars and practitioners decipher what opportunities and constraints actors and coalitions face in attempting to achieve their desired policy goals through collaborative means.

Future research should test these hypotheses in collaborative governance processes across a wider variety of scales and topics (including outside of the environmental realm and in larger-N studies) in order to quantify acts of intra- and cross-coalition coordination and determine if
and how actors strategically engage in these coordination patterns. Scholars should also systematically map coordination patterns (among both primary and auxiliary actors) in order to investigate how cross-coalition coordination affects the policy outputs of a process, with an eye toward the influence of the process’s institutional design. Finally, scholars should continue pursuing the difficult task of finding cases that allow for comparison of coordination and output variables across processes governed by different institutional arrangements (Gupta 2012), a task in which these collaboration-oriented, ACF-based hypotheses can provide a useful tool for more systematic comparative policy analysis.

References


CHAPTER 5

Linking Policy-Oriented Learning to Policy Change in Collaborative Environmental Governance Processes

Abstract

Collaboration has become an increasingly popular mechanism for natural resource and environmental governance over the past three decades. The success of collaborative approaches, however, is often premised on the assumption that stakeholders will learn—about the resource itself, relevant policy, other stakeholders’ values, and other aspects—as they interact with one another, thereby fostering the development of creative, mutually-beneficial management actions that increase resource sustainability. Despite the centrality of this assumption to the promotion of collaboration as a modern environmental governance tool, gaps remain regarding how to best measure learning or determine what factors promote learning, as well as whether more learning leads to a greater degree of policy change. This study uses data from two rounds of interviews and a survey of participants in a statewide, multi-level water governance process in Colorado in order to analyze the relationship between the procedural features of a collaborative process, policy-oriented learning, and policy change. The findings indicate that certain procedural features, alongside one’s innate proclivity toward collaborative decisionmaking processes, predict policy-oriented learning, and that one’s individual learning significantly predicts their perception of collective policy change. These findings help to develop a theory of policy learning in collaborative processes and inform the creation of policy processes that more successfully mitigate conflict through cooperation.
Introduction

Collaboration has become an increasingly popular mechanism for environmental and natural resource governance over the past three decades (Gerlak, Heikkila, and Lubell 2013; Koontz 2016). By requiring diverse stakeholders to interact repeatedly, explore complex issues in depth, and develop mutually-beneficial environmental management actions, collaborative governance processes have the potential to positively impact the environment and increase resource sustainability while also expanding citizen participation in policymaking. By addressing some of the failures of top-down, command-and-control management, collaborative processes may produce solutions that are more feasible, more widely accepted by stakeholders, and easier to implement (Ansell and Gash 2008; Pahl-Wostl et al. 2007; Sabatier et al. 2005).

The “endurance and success” of collaborative approaches, however, is often premised on the assumption that stakeholders will learn as they interact with one another over time (Gerlak and Heikkila 2011, 620). In other words, as stakeholders gain new knowledge and understanding, potentially leading to revisions in their “professional beliefs regarding facts, values or policies,” they are better positioned to reach “political consensus on collective action” (Leach et al. 2014, 592). While learning is considered to be an important element in non-collaborative policy processes as well (May 1992), collaborative settings are expected to be particularly conducive to learning (Leach et al. 2014; Weible and Sabatier 2009). Learning, therefore, is frequently discussed as both an outcome of collaborative governance and an important condition for its success (Ansell and Gash 2008; Emerson, Nabatchi, and Balogh 2012; Koontz 2014; Leach et al. 2014; Pahl-Wostl et al. 2008). Yet, due to a lack of evidence on what conditions actually foster learning, as well as uncertainty surrounding metrics to measure
learning, “the theories and empirical evidence of how learning emerges in collaborative governance processes are still in their infancy” (Gerlak, Heikkila, and Lubell 2013, 425).

In response to these gaps, this study uses a mixed-method approach to add to the emerging literature on learning in collaborative environmental governance processes (Gerlak and Heikkila 2011; Heikkila and Gerlak 2013; Koontz 2014; Leach et al. 2014). In keeping with the “second generation” of scholarship on collaborative environmental partnerships, which focuses on developing and testing theories about how key variables interact (Koontz 2016), this study tests four hypotheses derived from the Advocacy Coalition Framework (ACF) and collaborative governance literatures about what procedural features increase policy-oriented learning in collaborative processes, and whether more learning leads to a greater degree of policy change. Exploring how the assumptions about learning embedded in a well-tested policy process framework such as the ACF may need to be adapted for collaborative contexts and then testing these adaptations explicitly builds theory about learning in collaborative contexts and provides the foundation for a method through which to compare learning in collaborative and traditional settings using a comprehensive policy process framework. Furthermore, the insights gleaned from such analysis can inform the creation of policy processes that more successfully mitigate conflict through cooperation among diverse actors.

The Learning Landscape: Who Learns What and How?

In collaborative environmental governance processes, learning can occur at multiple, interacting levels (Heikkila and Gerlak 2013). Individual actors may learn independently, for instance, by seeking external scientific information on a topic related to the process (e.g. what pollutants are present in a specific watershed and their effects). Actors may also learn alongside
others in the process, perhaps by listening to a presentation by an expert at a process meeting and discussing the implications of the information for the group (e.g., a presentation on what attempts have already been made by scientists and the local government to resolve water quality issues in a community). As actors work together to develop trust, come to consensus on a piece of information, or produce a policy output (e.g., a set of new voluntary guidelines on effluent quality for businesses in the community), they may be learning in a more “collective” or “social” fashion (Gerlak and Heikkila 2011; Koontz 2014; Pahl-Wostl et al. 2008).

Learning may also be conceptualized differently depending on the setting in which it happens. Referring to the public administration context, Leach et al. (2014) define learning as “the process by which people develop a more comprehensive and accurate understanding of the science, technology, law, economics, and politics that underlie the decisions they make or the recommendations they advance” (592). Specific to river management scenarios, Pahl-Wostl et al. (2008) focus on how actors come to understand “their interdependence and differences and [learning] to deal with them constructively… [resulting in] increased management capacity” (485). From the policy process literature, the ACF (discussed in more detail below) contributes the concept of “policy-oriented learning,” defined as “relatively enduring alterations of thought or behavioral intentions that result from experience and/or new information and that are concerned with the attainment or revision of policy objectives” (Sabatier and Weible 2007, 123). While policy-oriented learning links individual learning with the broader outputs of a policy process, its definition does not necessarily mean that such outputs will be collaborative or collectively-supported, as actors may simply learn to more strategically undermine others to achieve their desired policy goals.
Additionally, actors in a collaborative environmental governance process may learn about a variety of things, including the resource/environmental issue in question, the laws and policies relevant to governing the resource, other stakeholders’ values and needs, the social and political feasibility of various management actions, and how to more effectively participate in the collaborative process itself (Koontz 2014; Leach et al. 2014). However, actors may also learn things that are “wrong” by assimilating new information in a biased manner or embracing incorrect information, leading to more “entrenched positions, mistaken assumptions, or co-optation” of the views of less powerful actors (Leach et al. 2014, 594). Considering the variety of things actors may learn about, the possibility for them to learn incorrect information, and the complexities of connecting individual learning to collective learning and action, it is no surprise that defining and measuring learning in collaborative policy processes is a difficult task.

To address some of these issues, Heikkila and Gerlak (2013) “offer a theoretically grounded approach for policy scholars to define, understand, and measure learning in policy process research” (485) based on their previous work on learning in collaborative processes (Gerlak and Heikkila 2011). The authors attempt to understand learning in collective contexts broadly by focusing on learning processes (acquisition, translation, and dissemination of information across a group) and learning products (cognitive changes and/or changes in collective actions). However, there are a number of insights that may be particularly relevant for understanding learning in collaborative governance processes in particular. For instance, across learning process phases, dialogue and deliberation recur as important procedural mechanisms for linking individual and collective learning in settings where individuals work together. Regarding learning products, linking individual and group cognitive changes to collective action (i.e., behavioral learning products, such as policies and institutional changes) is crucial for
understanding how learning affects policy change. Moreover, because learning products include both “more immediate outputs, such as the development of a new project” and “longer term outcomes or impacts, such as the effects of a project on society and the environment” (Gerlak and Heikkila 2011, 622), understanding how to define and measure them can be particularly important to scholars interested in assessing the effectiveness of collaborative governance in contrast to more traditional governance regimes (Koontz and Thomas 2006).

**Learning in the ACF**

The ACF purports that complex policy processes can be better understood by grouping actors with similar beliefs and coordination patterns into advocacy coalitions. These coalitions compete with one another to create policies that reflect their beliefs before their opponents can do the same (Sabatier and Weible 2007). Within this framework, “policy-oriented learning” is characterized both as a major theoretical focus as well as one of the four conceptual pathways to policy change, alongside external shocks, internal events, and negotiated agreements. Policy-oriented learning is not limited to “understandings of the problem and associated solutions,” but may also include learning about “the use of political strategies for achieving objectives” (Jenkins-Smith et al. 2014, 198). This definition incorporates the concepts outlined by May (1992) of instrumental and social “policy learning” (concerned with problem definition/scope, others’ goals, and policy feasibility) with “political learning,” in which actors “learn about strategies for advocating policy ideas or drawing attention to policy problems” (p. 339).

The theoretical focus on policy-oriented learning in the ACF generally concerns learning *across* coalitions or belief systems. Indeed, actors may experience policy-oriented learning within their own coalition, potentially causing them to solidify their pre-existing ideas or develop
strategies to make their proposed policies more politically viable at the expense of others. However, in line with both the traditional focus of the ACF and the collaborative governance literature, policy-oriented learning across belief systems is the focus of this study. The ACF hypothesizes that this type of learning is most likely to occur under certain conditions: 1) when there is an intermediate level of informed conflict between coalitions, wherein coalitions have the technical resources to engage in debate and the major conflict is not between the coalitions’ core beliefs; 2) within a forum that is prestigious and dominated by professional norms; 3) when accepted quantitative data exists, as opposed to qualitative, subjective, or no data; and 4) when problems involve natural systems rather than social or political systems (Jenkins-Smith et al. 2014). Yet, there has been mixed empirical evidence in support of these claims, as well as a dearth of research on how policy-oriented learning is linked to policy change (Jenkins-Smith et al. 2014; Leach et al. 2014; Weible, Sabatier, and McQueen 2009).

According to Weible, Sabatier, and McQueen (2009), collaborative policy subsystems may alter some of the ACF’s expectations about learning: “coalitions will more likely use scientific and technical information for cross-coalition learning, professional forums will more likely be effective, coalitions will more likely rely on multidisciplinary sources of information, and belief change will more likely occur at both the policy core and secondary belief level” (135). As collaboration becomes an increasingly popular strategy in public policy processes, the need to understand exactly how the procedural features of a collaborative process affect learning is heightened. Three learning-related hypotheses were previously developed by the author as part of a broader exercise in adapting the ACF for collaborative contexts (Koebele Under Review, see dissertation Chapter 3); they were illustrated using a limited set of interview data from the same collaborative process that will be discussed in this paper. These hypotheses, which are briefly
outlined below, consider the four categories of factors that are proposed to explain learning in the ACF—attributes of the forum, level of conflict between coalitions, attributes of the stimuli, and attributes of actors (Jenkins-Smith et al. 2014)—in light of the literature on learning in collaborative governance processes.

**Forums:** While collaborative policy subsystems are expected to “provide an optimal setting for learning from science and for learning across coalitions,” as actors “cooperate, develop trust, and work with scientists in joint fact-finding to develop a shared knowledge base” (Weible and Sabatier 2009, 208), it is important to consider that the procedural features of collaborative forums vary widely. For instance, some collaborative forums require a higher degree of consensus among actors in order to create policy change than others. This feature is expected to incentivize coalitions “to seek compromise and share information with opponents” (Sabatier and Weible 2007, 200). Following from this, a forum that requires a greater degree of consensus among actors may also produce a greater degree of policy-oriented learning:

**H1:** Policy-oriented learning across belief systems is more likely in collaborative forums that require a high degree of consensus to produce policy change than in forums with weaker consensus rules.

**Conflict and Actors:** The ACF argues that the attributes of individual actors in a policy process (i.e., their beliefs, resources, strategies, networks) as well as the degree of pre-existing conflict among these actors (i.e., intermediate conflict as the most conducive to learning) may influence how learning occurs (Jenkins-Smith et al. 2014). Some actors may simply be more primed to learn when entering the process, potentially because they hold a higher personal preference for decisionmaking processes based upon consensus norms (Leach et al. 2014; Raadgever, Mostert, and Van de Giesen 2012). Others may develop greater confidence in the process and trust in other participants over time as a result of social interactions and the
facilitation of collaboration by strong leaders, thereby fostering their willingness to learn (Gerlak and Heikkila 2011; Heikkila and Gerlak 2013; Leach et al. 2014; Muro and Jeffrey 2008). While it is difficult to alter deeply-seated individual attributes such as one’s innate preference for collaboration over other approaches, collaborative processes may foster learning among even those who are resistant by encouraging actors to interact repeatedly in order to reduce conflict, as well as to build trust in the process and in one another:

H2: Policy-oriented learning across belief systems is more likely in collaborative forums that require repeated face-to-face interactions over time, especially when facilitated by strong leaders, than in forums where actors are not required to participate in such interactions.

Stimuli: The “attributes of the stimuli,” defined as “the type of information and experience coalition actors are exposed to” (Jenkins-Smith et al. 2014, 199), may also influence the degree to which actors learn. It has been traditionally assumed that when actors have more uncertain information that can lead to a broader variety of interpretations, they may be less likely to experience policy-oriented learning. In collaborative processes, however, high levels of scientific certainty surrounding an issue may actually impede learning by minimizing space for important deliberation (Leach et al. 2014). Such deliberative space may help diverse stakeholders “develop a shared vision and plan for moving forward” with an issue (Koontz 2014) and reduce assimilation bias in order to produce more innovative ideas (Heikkila and Gerlak 2013). According to Gerlak and Heikkila (2011), learning may also be more likely to occur when a process is decentralized, incorporates diverse sources of knowledge, and promotes experimentation. Thus, policy-oriented learning may be more likely to occur in processes that utilize these mechanisms, including convening diverse actors to work on complex issues that involve both scientific uncertainty and value conflicts, and providing incentives for these actors to seek consensus through deliberation:
**H3:** Policy-oriented learning across belief systems is more likely in collaborative forums that incorporate diverse information sources and opportunities to openly deliberate on this information.

In addition to its theoretical focus on policy-oriented learning, the ACF also defines policy-oriented learning as one of the major pathways to policy change. Policy change as a result of policy-oriented learning is expected to be incremental and gradual, resulting in only minor changes unless it happens “in conjunction with an external or internal shock” (Jenkins-Smith et al. 2014, 203). Moreover, ACF scholarship traditionally associates the “negotiated agreement” pathway to policy change with collaborative processes. However, in order to reach a negotiated agreement, actors must often create shared knowledge about the problem at hand, the universe of potential solutions, and the feasibility of a preferred solution. While such collective “cognitive change” among participants in a collaborative process may not be sufficient on its own to cause “behavioral change” in the form of new policies or institutional arrangements (Heikkila and Gerlak 2013), processes that promote greater individual and collective learning may also lead to a greater degree of policy change. From this, a fourth hypothesis that connects the concepts of policy-oriented learning and policy change is proposed:

**H4:** More policy-oriented learning among actors in a collaborative process will lead to a greater degree of policy change.¹

**Research Design and Methodology: A Case Study of Colorado’s Basin Roundtable Process**

Water resource governance, management, and planning has become a popular context for experimentation with collaborative approaches (Koontz 2014; Pahl-Wostl et al. 2008). This study tests the four hypotheses outlined above using a mixed-method case study design focused

¹ This hypothesis was not developed in Chapter 3; it is introduced here to flesh out the important connection between the theoretical concepts of policy-oriented learning and policy change.
on a statewide, multi-level collaborative water governance process in Colorado, U.S.A., referred to in this chapter as the “Roundtable process.”

Following a catastrophic drought in Colorado in 2002, Colorado’s main water governance entity, the Colorado Water Conservation Board (CWCB), began “the most comprehensive analysis of Colorado water ever undertaken” through the Statewide Water Supply Initiative (State of Colorado 2015). In 2005, a formal stakeholder process component was established through the passage of the Colorado Water for the 21st Century Act (HB-1177) to “facilitate discussions on water management issues and encourage locally driven collaborative solutions” (Colorado Water Conservation Board 2016a). The process has since involved over 300 Colorado citizens through “Basin Roundtables” that represent the state’s eight hydrologic basins and the Denver Metro area. Simultaneously, a 27-member Interbasin Compact Committee (IBCC) was established “to facilitate discussion across Colorado’s river basins and to address statewide water issues” (Colorado Water Conservation Board 2016b).

Although the Roundtables and IBCC had a number of interim goals such as creating needs assessments of various water use sectors within each basin, their most comprehensive task arose in 2013 when Colorado’s governor issued an executive order mandating the creation of Colorado’s first statewide water plan. The Roundtables were tasked with providing data and insight for the statewide plan through “Basin Implementation Plans” (BIPs) that integrated the information they had gathered since their inception with proposed actions that could help meet each basin’s water supply needs. The BIPs, along with broader policy recommendations created

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2 This is the same case that is referred to elsewhere in this dissertation as “Colorado’s Water Plan” (CWP). Because the focus of this chapter is on learning by individuals throughout the entire collaborative process (including, but not restricted to, the production of Colorado’s Water Plan), the case is referred to here as the “Roundtable process.”
by the IBCC, became the centerpiece of Colorado’s Water Plan (CWP). The plan was finalized in November 2015 and then entered the implementation stage.

Multiple sources of data were collected on this case, as recommended by Yin (2003): 1) process documents including enacting and related legislation, interim progress reports, major press releases, and final public “output” documents from the websites associated with the CWCB and State of Colorado; 2) two rounds of semi-structured, qualitative interviews (Rubin and Rubin 2005) with process participants (n = 40); and 3) a quantitative survey of Roundtable process participants (n = 111), which allowed the researcher to determine if themes from the qualitative interviews were also seen across a broader sample of process participants.

**Interview Data Collection and Analysis Methods**

In 2013-2014, semi-structured interviews (n = 28) were conducted with key participants across the stakeholder groups and geographical areas encompassed by each Roundtable. These interviews occurred in the period the between the issuance of the governor’s executive order (a key moment that catalyzed collaboration among stakeholders in each Roundtable) and the production of individual BIPs (the formal documentation of such collaboration). Interview questions focused on stakeholders’ perceptions of the process and their roles in the process, interactions with other stakeholder groups, and outputs of the process. The data from these interviews were used in a preliminary qualitative examination of Hypotheses 1-3 (Koebele Under Review, see dissertation Chapter 3).

This qualitative data set was expanded through the inclusion of additional in-depth interviews (n = 12) that were conducted after the release of the CWP in 2016 (Table 1). Interviewees include key participants who helped finalize the statewide plan, including staff at the CWCB and the Colorado Department of Natural Resources, as well as key stakeholder group
leaders involved in the Roundtables and IBCC. While these interviews focused on similar topics as the previous round (e.g., process goals and how they were achieved, patterns of collaboration among stakeholders, and the implementation of outputs thus far), they sought to further specify themes that were broadly mentioned in the initial round of 28 interviews, including the types of learning that process participants experienced.

### Table 1. Rounds 1 and 2 Interview Subjects

<table>
<thead>
<tr>
<th>Interview Round (year)</th>
<th>Interviewee Group/Designation</th>
<th>Total Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (2013-2014)</td>
<td>Arkansas Basin</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Colorado Basin</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Gunnison Basin</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Metro Basin</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>North Platte Basin</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Rio Grande Basin</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>South Platte Basin</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Southwest Basin</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Yampa/White Basin</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>29</strong></td>
</tr>
</tbody>
</table>

| 2 (2016)               | Colorado Water Conservation Board (CWCB) | 6                |
|                        | Colorado Department of Natural Resources (DNR) | 1                |
|                        | Non-Consumptive Use Stakeholders | 1                |
|                        | Consumptive Use Stakeholder     | 4                |
| **TOTAL**              |                              | **12**           |

*aOne interviewee declined to be recorded; thus, the interview was formally analyzed with the other 28.
*bParticipants in Round 2 interviews are assigned to a category here based on their position during the final stages of development of the CWP, but a number of these individuals have worked in/across multiple of these categories over the lifetime of the IBCC/Roundtable process and contributed broader perspectives on the process as a result.

Prospective interview participants were initially identified through process documents (including publically available lists of names and contact information) and during preliminary background discussions with key informants who participated in the collaborative process. The research used a version of snowball sampling (Auerbach and Silverstein 2003), in which interviewees are asked to identify other key participants in their process, to expand the original sample. Subjects were selected from this list of names to ensure representation of all relevant stakeholder groups in both rounds. Interviews were conducted both in person (n = 17) and via
phone/Skype (n = 23), although the researcher met nearly all participants in person as part of the research project.

The interviews were digitally recorded, transcribed, and coded using QSR NVivo 10 qualitative analysis software. Codes for each round of interviews were developed \textit{a priori} from the relevant literature on the ACF and collaborative processes. In the first round of interviews, learning was coded for broadly as an outcome of the process as part of an examination of policy outputs, outcomes, and barriers to collaboration (Koebele 2015). In the second round of interviews, different aspects of learning were explicitly coded for in order to further specify this construct. For example, the supercode LEARN captured examples of self-described learning with subcodes for mentions of learning that occurred within a coalition, across coalitions, or by an external actor (i.e., the public). The coded data were analyzed by hand and using code queries in NVivo to detect patterns related to the hypotheses (Miles and Huberman 1994).

To demonstrate that the qualitative information used in this chapter was gathered from a variety of respondents, interview quotations from Round 1 interviews are designated by their Interviewee Group/Designation shown in Table 1 (i.e., Yampa-White Basin). Quotations from Round 2 interviews are designated as “CWP,” rather than by their specific Interviewee Group/Designation, followed by a randomly assigned number (1-12) in order to preserve anonymity of a smaller group of interviewees. While these interview data were primarily used to inform the development of survey items (more on this below), they also allowed the researcher to understand the case study in depth and gather information that is helpful in interpreting the quantitative results of the survey.
Survey Data Collection and Analysis

A survey questionnaire was then developed based on major themes identified through the 40 qualitative interviews (more below). The survey sample population included the 341 members of the IBCC and Roundtables in 2016. A link to the electronic questionnaire was distributed to the sample population via an email from the CWCB. Three reminders were sent via email from the CWCB to all members of the sample population using varying message content in order to maximize response rate, as suggested by Dillman, Smyth, and Christian (2009). Messages were kept as concise as possible and were delivered to recipients in the morning (between 6:45 and 10:15am) on varying days of the week. One additional reminder was sent directly from the researcher to the chair of each Roundtable, requesting that the chair personally invite his or her Roundtable’s membership to participate in the survey. This also established an avenue for the chair to ask any questions of the researcher if they arose from the Roundtable membership. Prior to dissemination to the sample population, the questionnaire was completed and reviewed by five individuals in the academic and public spheres who have extensive knowledge of the Roundtable process and Colorado water governance issues in order to ensure the language and concepts in the survey are consistent with those used by the sample population. They were not part of the sample population, nor are their responses included in the data set analyzed here.

The response rate for this survey was 32.6%, with 111 respondents completing some portion of the content-based survey questions (i.e., beyond the initial consent question). Ninety-five surveys were fully completed. This response rate is similar to that seen in previous surveys

3 The email was initially sent to 344 individuals, but 3 individuals indicated on the survey that they had not participated in the Roundtable/IBCC process and were thus removed from the sample.
of this population (Crow and Baysha 2013). The respondents were fairly representative of the population expected to participate in Western water policy negotiations (Table 2). Regarding political affiliation, respondents mirror Colorado’s fairly equal division between Democrats, Republicans, and Independents. More males participated in this process than females, reflecting the fact that water policymaking in Colorado has historically been male-dominated. The sample is highly educated and dominated by people who have worked in Colorado water matters for more than 11 years (i.e., longer than the process has existed), likely reflecting the fact that such a time-intensive governance process draws attention from professionals who are already interested in or involved in the topic. There is also a slight skew toward residents of the Western Slope versus other regions of Colorado, but this is unsurprising considering that 4 of the 9 Basin Roundtables are located within this region. Figure 1 depicts survey responses by Roundtable/IBCC membership, with the number of respondents listed next to each group name.

**Questionnaire Content based on Interview Data**

The survey questionnaire was broad in scope, asking respondents to answer questions about whom they collaborated with and how, what they learned, and what effects the process has had on water planning and management in Colorado thus far. The remainder of this section will describe in detail the specific items used for the analysis that follows, including the qualitative data that was used to develop the survey items. Respondents were asked to rate the statements listed below on a Likert scale, where 1 = strongly disagree to 5 = strongly agree. The items as they appeared in the survey, along with their means (M), standard deviations (SD), and internal reliability for multi-item variables (Cronbach’s α), are listed in Table 3.4

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4 Respondents’ scores on some of the items were re-coded in the process of forming composite variables. Information on re-coding is included in the description of each variable below. The
Table 2. Descriptive Statistics of Survey Respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Response Options</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Political Affiliation(^a)</td>
<td>Democrat</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Republican</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>Independent</td>
<td>30.8%</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>2.7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(30)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(30)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(28)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>78.1%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>22.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(75)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(21)</td>
<td></td>
</tr>
<tr>
<td>Education(^b)</td>
<td>High School</td>
<td>3.1%</td>
</tr>
<tr>
<td></td>
<td>Some College</td>
<td>10.4%</td>
</tr>
<tr>
<td></td>
<td>4-year College Degree</td>
<td>33.3%</td>
</tr>
<tr>
<td></td>
<td>Graduate Degree</td>
<td>37.5%</td>
</tr>
<tr>
<td></td>
<td>Professional Degree</td>
<td>15.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(3)</td>
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</tr>
<tr>
<td></td>
<td>(10)</td>
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</tr>
<tr>
<td></td>
<td>(32)</td>
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<tr>
<td></td>
<td>(36)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(15)</td>
<td></td>
</tr>
<tr>
<td>Years Worked in CO Water Matters</td>
<td>&lt;2</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>2-5</td>
<td>3.1%</td>
</tr>
<tr>
<td></td>
<td>6-10</td>
<td>9.4%</td>
</tr>
<tr>
<td></td>
<td>11-15</td>
<td>10.4%</td>
</tr>
<tr>
<td></td>
<td>16-20</td>
<td>12.5%</td>
</tr>
<tr>
<td></td>
<td>20+</td>
<td>63.5%</td>
</tr>
<tr>
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<tr>
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<td>(12)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(61)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(95)</td>
<td></td>
</tr>
<tr>
<td>Colorado Region Of Residence</td>
<td>W. Slope/ Central Mtns</td>
<td>47.9%</td>
</tr>
<tr>
<td></td>
<td>Metro Front Range</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>E. Plains/ NE CO</td>
<td>10.4%</td>
</tr>
<tr>
<td></td>
<td>S. CO/ San Luis Valley</td>
<td>14.4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>(46)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(24)</td>
<td></td>
</tr>
<tr>
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<td>(10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(96)</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) According to the Colorado Secretary of State (2017) tally of active registered Colorado voters as of January 2017, 31.8% are Democrats, 31.6% are Republicans, and 34.7% are Independent/Unaffiliated. The remaining ~2% are registered with other parties.

\(^b\) According to the U.S. Census Bureau (2017) statistics from 2011-2015, 38.1% of Coloradoans aged 25+ have a bachelor’s degree or higher.

Figure 1: Survey Participation by Group Membership. Western Slope Basin Roundtables include the Colorado, Gunnison, Southwest, and Yampa-White Roundtables.

means and standard deviations included in Table 3 are for the processed (re-coded, composite) variables.
Table 3: Summary of Variables

<table>
<thead>
<tr>
<th>Theoretical Concept</th>
<th>Variable</th>
<th>Item(s)</th>
<th>M (SD)</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedural Features</td>
<td>Consensus</td>
<td>My group makes decisions based on consensus.</td>
<td>4.23 (.07)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Face-to-Face Interaction</td>
<td>My group encourages face-to-face interaction.</td>
<td>4.08 (.07)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Strong Leadership</td>
<td>My group has a strong leader.</td>
<td>3.88 (.08)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Diverse Information</td>
<td>My group welcomes different types of information (scientific, experiential, personal values/perspectives) into our discussions.</td>
<td>4.04 (.08)</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Information Deliberation</td>
<td>My group creates ample opportunities to openly deliberate on the information that is brought to the table.</td>
<td>3.95 (.08)</td>
<td>N/A</td>
</tr>
<tr>
<td>Policy-Oriented Learning (Cognitive)</td>
<td>Individual Learning</td>
<td>I have a better understanding of water as a physical resource in Colorado. I have a better understanding of the laws and policies that govern water in Colorado. I have a better understanding of other stakeholders’ values and needs regarding water in Colorado. I have a better understanding of what actions are politically feasible. I am better prepared to effectively participate in other collaborative governance processes in the future.</td>
<td>6.19 (.23)</td>
<td>.818</td>
</tr>
<tr>
<td>Policy Change (Cognitive and Behavioral)</td>
<td>Collective Learning</td>
<td>The process has generated innovative solutions that would not have happened without the Roundtables and IBCC. The decisions/plans arising from the process contribute to increasing the sustainability of water resources in Colorado. The process has improved water planning in Colorado. The decisions/plans devised by the process fail to tackle the state’s major issues related to managing water resources. [reverse coded] The process has brought new perspectives into water discussions and planning in Colorado. The process has expanded the scope of participants (new stakeholders and the public) in the dialogue about water in Colorado. The decisions/plans arising from the process usually work in favor of one group of stakeholders more than others. [reverse coded]</td>
<td>5.98 (.34)</td>
<td>.860</td>
</tr>
<tr>
<td>Other Collaborative Preferences</td>
<td>It is positive to have a wide variety of stakeholders with different viewpoints at</td>
<td>16.06 (.24)</td>
<td>.719</td>
<td></td>
</tr>
</tbody>
</table>
the table in a water-related decision-making process.

A collaborative-type process is more useful than a top-down regulatory-type process for making decisions about water at the basin scale.

The time it takes to come to an agreement on decisions in a collaborative process is not worth the outcome. [reverse coded]

Collaborative decision-making processes end up too mired in conflict to actually make decisions. [reverse coded]

The first five items represent procedural features directly related to Hypotheses 1-3, including the presence of consensus-based decisionmaking (H1), face-to-face interaction (H2), strong leadership (H2), multiple information sources (H3), and opportunities to deliberate (H3). These factors were developed from both the literature and responses to interview questions about what features of the Roundtable process encourage collaboration among diverse actors. For example, participants explained:

The way the Roundtable process was set up is, ‘we will force you to sit together {face-to-face interactions}, you will not be all be of the same perspective, we will give you time to agree {reach consensus} on what your needs are across all of those different perspectives, we will help you experiment about what the tradeoffs are between the different solutions… we will expect that you will make your decisions based off of good information {information sources}. We will give you deadlines and we will promise that it’s really up to you to fill in the content once we’ve given you the structure and the deadlines.’ (CWP_12)

It is some of the nuances that I think that we’re able to kind of overcome with discussion {deliberation}. You can’t do it in one meeting, but over several years… (CWP_1)

I think well-facilitated meetings {strong leadership}… that was part of it too. They weren’t just thrown in a room and told to work things out… a lot of people made a lot of money facilitating these meetings, so it was a huge investment. (CWP_8)

A higher score on these items indicates that the procedural feature was present to a greater degree in the collaborative process that the respondent participated in. These items are designed
to measure mechanisms of learning processes (the acquisition, translation, and dissemination of information). Following Heikkila and Gerlak (2013), a hard distinction between procedural features influencing individual and collective learning is not made due to the assumption that learning occurs at multiple, interacting levels that are not truly separable in collective policy contexts.

The Individual Learning variable serves as a measure of an individual’s policy-oriented learning as a result of their participation. The items related to the Individual Learning variable attempt to capture the categories of knowledge that respondents gain as a result of their participation (i.e., individual learning products). These include learning about the resource, the relevant policy, other stakeholders’ values, the feasibility of various solutions, and how to more effectively participate in the process. These categories were informed by the literature and responses to interview questions about what individual participants have learned in the Roundtable process:

I think every one of us has learned a lot about other areas of the basin and how the water is used and why the water is used this way {resource and relevant policy}, and where the shortages exist and how they could be solved… (Gunnison Basin)

I think [the Roundtable process has] really been successful on…understanding the perspectives of other individuals {others’ values}, whether it’s [municipal and industrial], or [agriculture], or nonconsumptive uses and how we have to coexist and how we have to work together, and how can we best utilize the resource {resource}. (Arkansas Basin)

At least we know the people who are talking about that and we understand their needs. We understand, you know, what their [water supply] gap is {resource, others’ values}. And I think that’s going to improve the likelihood that we can come together on a balanced solution. (Colorado Basin)

I do think there was some good listening that happened and maybe some, as a result of that listening, some increased understanding of the concerns and goals of the various partners around the table {others’ values}. (CWP_10)
There’s probably a slight increase in the degree of realism and practicality that both sides realize {feasibility of solutions}. You’re not going to move a water project forward until you do address the environmental... And at the same time the environmentalists need to find ways that – maybe they can’t protect every mile of every stream but there’s some critical areas that they need to protect. Maybe there’s ways to operate a project that provides some additional benefits. (CWP_7)

And so I think what the Water Plan has done is give us a platform to talk about these ideas and figure out where the regulatory barriers {relevant policy and feasibility} to those are, because they’re significant. (CWP_3)

I’ve learned how to do it better {effective participation}. Without the opportunity to do—to participate in some kind of consensus-based… consensus-based mechanism with this level of complexity and these problems, I don’t think you get very good at it. (Yampa-White Basin)

Respondents’ scores on each item were re-coded so that strongly agree = 2, agree = 1, and all other responses = 0 in order to separate those who learned to some degree (about any of the individual categories of knowledge) from those who did not. Re-coded scores on the five items were summed, producing a variable (range 0-10) where a higher score indicates more individual learning in comparison to no learning.

The Collective Learning variable serves as a measure of policy change, broadly defined, resulting from a collaborative process. The items related to the Collective Learning variable represent respondents’ perspectives on both collective cognitive changes (i.e., ideas/beliefs) and collective behavioral changes (i.e., policies/institutional changes) that have arisen from the collaborative process (i.e., collective learning products). This category includes everything from new collective expectations about the decisionmaking process (e.g., including a broader scope of participants and perspectives) to plans/policies arising from the process and their impacts on relevant social/natural environments (e.g., improved planning, innovative solutions that tackle important issues and benefit multiple groups, increased resource sustainability). While it remains to be seen if the solutions proposed in the CWP can truly tackle the state’s biggest water issues, a
number of second-round interviewees commented on collective behavioral changes it had immediately provoked:

And you’ve got everybody talking about “multi-purpose projects,” which used to mean [agriculture] and [municipal], and now very clearly means ag, muni, and environment {solutions working in favor of more than one group}. So we’ve moved the needle on that to some extent. (CWP_10)

The other fundamental thing that changed was prior to [the process], the water community was extraordinarily small and extraordinarily—not only parochial, but insular. There was no connection with the rest of the state—very few people understood. So one of the true benefits of [the process] was expanding the discussion to much larger group of people from various communities {new perspectives and expanded scope of participants}. (CWP_8)

And so, we’re optimistic that the plan aims us at the right direction and that it does begin to paint a picture of what things should look like in terms of water management for our state. That would not—we didn’t have that before the plan {innovative solutions that would not have otherwise happened} and I think now we have a better one that could be improved on. (CWP_6)

Even if they’ve done it that way for twenty years, they’ve got to be able to change that… it shouldn’t just be unilateral decisions made by the Division about how we [make plans/policies] {improved planning}. (CWP_5)

Similar to the Individual Learning variable, respondents’ scores on each item related to Cognitive Learning were re-coded so that strongly agree = 2, agree = 1, and all other responses = 0 in order to separate those who perceived some degree of collective learning from those who did not. Re-coded scores on the seven items were summed, producing a variable (range 0-14) where a higher score indicates a greater perception of collective learning compared to those who perceived no learning.

Finally, the items related to the Collaborative Preferences variable gauge a respondent’s innate proclivity toward or preference for collaborative approaches to decisionmaking. This serves as a non-demographic control variable in the analyses that follow. Respondents’ raw
scores on the four items were summed, producing a variable (range 5-20) where a higher score indicates greater preference for collaborative approaches.

As can be seen in Table 3, responses to these items were generally positively skewed, except in the case of Collective Learning. This suggests that many of these items may fall victim to social desirability bias, a phenomenon in which respondents “admit to socially desirable traits and behaviors and also deny socially undesirable ones” (Krumpal 2013, 2028). In other words, respondents may be more inclined to “agree” with items such as their group coming to consensus, because this trait, for example, is often described as “not merely a logical and inevitable product of the search for truth, but is something with a strong social value” (Kenney 2000, 41). In other words, “consensus” is something that is *supposed to* result from collaborative processes, so respondents may be more inclined to say that their collaborative group does indeed achieve it. Due to the non-normal distribution of these variables, understanding variability at the high end of the data (i.e., between respondents who “agree” with certain items, perhaps simply conforming to a socially-desirable standard, and those who “strongly agree,” potentially emphasizing that the statement is truly representative of their process) is particularly important. Due to their high skew toward positive responses, items related to procedural features and individual learning (where respondents potentially feel more personally implicated) appear to be more prone to social desirability bias as opposed to questions related to the products of the process (where the collective is implicated more than the individual), which tended to have a less skewed distribution; however, it is possible that these products simply solicited a wider range of agreement and disagreement from survey respondents.
Results and Discussion

The survey data were analyzed using SPSS statistical software. Individual analyses pertaining to the hypotheses are presented in the following sections. For all analyses, pairwise deletion was used to deal with missing data, meaning that as long as a respondent answered all questions relevant to a specific statistical test, their responses were included in the analysis.

Bivariate Correlations

Table 4 displays the bivariate (Pearson product-moment) correlations among the study variables. Those who experienced a greater degree of Individual Learning tended to have higher innate Collaborative Preferences, stated that the collaborative procedural features asked were present to a greater degree, and perceive a greater degree of Collective Learning. Differences in learning between groups on a number demographic variables (gender, age, political affiliation, education, region of residence) were tested using ANOVA analyses, but none were found to be significant and were therefore not included in the analyses that follow. However, gender (which was not significantly correlated with any of the other study variables) was still included due to the theoretical assumption that men and women may have different interpersonal skills and preferences and may therefore experience learning differently.

<table>
<thead>
<tr>
<th>Table 4: Correlations Between Study Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Consensus</td>
</tr>
<tr>
<td>2. Face-to-Face Interaction</td>
</tr>
<tr>
<td>3. Strong Leadership</td>
</tr>
<tr>
<td>4. Diverse Information</td>
</tr>
<tr>
<td>5. Information Deliberation</td>
</tr>
<tr>
<td>6. Individual Learning</td>
</tr>
<tr>
<td>7. Collective Learning</td>
</tr>
<tr>
<td>8. Collaborative Preference</td>
</tr>
<tr>
<td>9. Gender (ref = male)</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>.482**</td>
</tr>
<tr>
<td>.242*</td>
</tr>
<tr>
<td>.452**</td>
</tr>
<tr>
<td>.516**</td>
</tr>
<tr>
<td>.277**</td>
</tr>
<tr>
<td>.264**</td>
</tr>
<tr>
<td>.176</td>
</tr>
<tr>
<td>-.149</td>
</tr>
</tbody>
</table>

**p ≤ .01, *p ≤ .05; a = variable is a composite of two or more items
Note: n’s range from 92 to 107 depending on missing data.
Collinearity Testing and Factor Analysis

All of the procedural feature variables (Table 3, variables 1-5), which would be the predictors in analyses testing H1-H3, are significantly correlated and most are strongly correlated (r ≥ .3), suggesting some of the constructs are not independent of one another. As a result, a collinearity test was conducted. Because all variables achieved a Tolerance greater than .1 (values = .512-.785), and relatedly, a VIF less than 10 (values = 1.273-1.953), multicollinearity among these variables was rejected.

To further understand the relationship among the predictor variables, a factor analysis was conducted using principal-axis factoring and an oblique (direct oblimin) factor rotation (due to the non-normal distributions of the variables and the expectation that multiple factors, if they exist, will be highly correlated with one another). The analysis produced only one factor with an eigenvalue greater than 1.0. Four of the five variables loaded onto the factor at a value ≥ .55 (Table 5), which is recommended by Hair et al. (1988) as the appropriate factor loading in studies where n = 100 (104 respondents answered all five of the items included in the factor analysis). When “Strong Leadership” is removed from the factor analysis, the factor explains 66.5% of the total variance in the items (eigenvalue = 2.66). A reliability analysis was then performed to examine the internal consistency of the four remaining items, which revealed that the items form a reliable scale (Cronbach’s α = .830).

Table 5: Principal-Axis Factor Loadings with Direct Oblimin Rotation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consensus</td>
<td>.605</td>
</tr>
<tr>
<td>FacetoFace</td>
<td>.784</td>
</tr>
<tr>
<td>StrongLeadership</td>
<td>.488</td>
</tr>
<tr>
<td>InfoTypes</td>
<td>.719</td>
</tr>
<tr>
<td>InfoDelib</td>
<td>.861</td>
</tr>
</tbody>
</table>
In response to these results, a variable called “Institutional Features” was created by summing respondents’ scores on the four procedural feature variables that loaded onto Factor 1. This factor reflects features inherent to the institutional design of a collaborative process (i.e., the rules and norms of the process). These features may exist whether or not the process has Strong Leadership, which remains its own unique predictor variable in the analyses going forward. See Table 6 for revised bivariate correlations using the Institutional Features (F1) variable.

| Table 6: Revised Bivariate Correlations Between Study Variables |
|---------------|---|---|---|---|---|---|
| 1. Institutional Features (F1) | -- | 2. Strong Leadership | .446** | -- | -- | -- |
| 3. Individual Learning | .363** | .218* | -- | -- | -- | -- |
| 4. Collective Learning | .356** | .243* | .643** | -- | -- | -- |
| 5. Collaborative Preference | .363** | .252* | .421** | .451** | -- | -- |
| 6. Gender (ref=male) | -.135 | .061 | .115 | -.021 | .156 | -- |

**p ≤ .01, *p ≤ .05, a = variable is a composite of two or more items

Note: n’s range from 91 to 107 depending on missing data.

In these revised correlations, Institutional Features and Strong Leadership are both correlated with Individual Learning (related to H1-3), and Individual Learning remains correlated with Collective Learning (H4). The fact that Institutional Features remains highly correlated with Strong Leadership, r (104) = .446, p ≤ .01, suggests that a respondents’ perception of leadership may not be uniquely important to understanding their learning in the presence of the other institutional features.

**Intraclass Correlation Testing**

Due to the clustered nature of the data (i.e., respondents belong to groups—either one of nine Basin Roundtables or the IBCC), it is necessary to determine if respondents’ scores on the two dependent variables (Independent Learning for H1-3 and Collective Learning for H4) are more similar within groups than they are across groups. An Intraclass Correlation (ICC) analysis produced a correlation coefficient near 0 (ρ = -.09) for both the Individual Learning and
Collective Learning variables, and design effects of .15 and .25 respectively. These scores fall below the threshold of a design effect of 2 that is commonly used to determine when multi-level modeling is needed to cope with cluster effects, allowing the researcher to proceed with regular multiple regression techniques to test the dependent variables individually.

**Predicting Policy-Oriented Learning (Hypotheses 1-3)**

A multiple linear regression was performed to understand how a respondent’s Individual Learning (suggested here to be representative of the theoretical concept of policy-oriented learning) is related to their scores on Institutional Features, Gender, and Collaborative Preference. A two-stage model was run in which Gender and Collaborative Preference (controls) were entered into Model 1. Institutional Features and Strong Leadership (predictors) were then entered into Model 2. The results are summarized in Table 7.

**Table 7: Multiple Linear Regression Analysis Predicting Individual Learning**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>β</td>
<td>p</td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Gender (ref=male)</td>
<td>.285</td>
<td>.551</td>
<td>.051</td>
<td>.517</td>
<td>.566</td>
<td>.553</td>
</tr>
<tr>
<td>Collaborative Preference</td>
<td>.969</td>
<td>.229</td>
<td>.413</td>
<td>≤.01</td>
<td>.721</td>
<td>.244</td>
</tr>
<tr>
<td>Institutional Features (F1)</td>
<td>.600</td>
<td>.265</td>
<td>.256</td>
<td>≤.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong Leadership</td>
<td>.048</td>
<td>.250</td>
<td>.020</td>
<td>.849</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.161</td>
<td></td>
<td></td>
<td>.203</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F for Change in R²</td>
<td>9.651</td>
<td>≤.01</td>
<td></td>
<td>3.307</td>
<td>≤.05</td>
<td></td>
</tr>
</tbody>
</table>

Note: Standardized scores (z-scores) were used for Institutional Features, Strong Leadership, and Collaborative Preference.

Model 1 is significant, F(2, 88) = 9.651, p ≤ .01, revealing that Collaborative Preference contributes unique, positive variance to the model. Model 2 is also significant F (4, 86) = 6.732, p ≤ .01, revealing that Institutional Features also contributed unique, positive variance to the model. In other words, both Collaborative Preference and Institutional Features significantly and individually predict Individual Learning when all other variables are controlled for. The change
in $R^2$ between the models is significant at the $p \leq .05$ level, indicating that Model 2 explains significantly more variance in learning (about 4%) than Model 1.

Because the items representing Consensus, Face-to-Face Interaction, Information Diversity, and Information Deliberation were collapsed into a factor-based variable (Institutional Features) in order to conduct this analysis, the model does not allow for the testing of Hypotheses 1-3 individually. However, a respondent’s Institutional Features score significantly predicts their Individual Learning score, thereby lending preliminary support for the hypotheses, at least when a process implements most of the collaborative features simultaneously.

Importantly, a person’s innate Collaborative Preference also significantly influences how much they learn, supporting the assumption that some people may simply be more “primed” to learn when they enter a collaborative process than others, regardless of the procedural features used. Limitations of this analysis and suggestions for future research are discussed below.

A number of interaction terms were also tested to further explore the relationships among predictor variables (Table 8). The interaction between Institutional Features and Strong Leadership (Model 2a) was significant, as was the interaction between Collaborative Preference and Strong Leadership (Model 2b).

Table 8: Multiple Linear Regression Analysis Predicting Individual Learning with Significant Interaction Terms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 2a</th>
<th></th>
<th>Model 2b</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>$\beta$</td>
<td>$p$</td>
</tr>
<tr>
<td>Gender (ref=male)</td>
<td>.786</td>
<td>.545</td>
<td>.139</td>
<td>.152</td>
</tr>
<tr>
<td>Collaborative Preference</td>
<td>.681</td>
<td>.237</td>
<td>.290</td>
<td>$\leq .01$</td>
</tr>
<tr>
<td>Institutional Features (F1)</td>
<td>.764</td>
<td>.266</td>
<td>.326</td>
<td>$\leq .01$</td>
</tr>
<tr>
<td>Strong Leadership</td>
<td>.115</td>
<td>.244</td>
<td>.049</td>
<td>.472</td>
</tr>
<tr>
<td>Institutional * Leadership</td>
<td>.382</td>
<td>.154</td>
<td>.242</td>
<td>$\leq .05$</td>
</tr>
<tr>
<td>Preference * Leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.248</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F for Change in $R^2$ (from Model 2)</td>
<td>6.137</td>
<td>$\leq .05$</td>
<td>4.850</td>
<td>$\leq .05$</td>
</tr>
</tbody>
</table>

Note: Standardized scores (z-scores) were used for Institutional Features, Strong Leadership, and Collaborative Preference.
The Strong Leadership variable has a similar moderating effect on the relationship between both significant predictor variables (Institutional Features and Collaborative Preference) and the dependent variable (Individual Learning), as shown in Figures 2a and 2b. In both instances, when a respondent scores low on either predictor variable, participating in a process with Strong Leadership has a somewhat negative effect on their learning. One potential explanation for this is that person who does not inherently prefer a collaborative approach or does not feel that his or her group employs strong Institutional Features may be more hostile toward the process and the possibility of learning from it when a strong leader is goading them into collaboration. However, when a respondent scores high on either independent variable, Strong Leadership can increase the amount they learn. However, when both interaction terms are put into the same model, neither is significant.

While the interaction between Institutional Features and Collaborative Preferences is not significant (and is not shown in a model here), the results suggest that Institutional Features may moderate the effect of Collaborative Preferences on learning (Figure 2c). For instance, among those who have lower a Collaborative Preference, individuals who score higher on Institutional Features learn more. As suggested by one interviewee, many people enter collaborative processes such as the Roundtable process with the intent to defend their own interests rather than the desire to collaborate. This can lead to a hurting stalemate between traditionally conflicting sides where policy change is difficult to achieve. However, having a process with strong Institutional Features may help even those who have a low Collaborative Preference learn more and become engaged in finding productive solutions in this context:
Figure 2: Two-way Interaction Effects for Standardized Variables. Includes interactions between Institutional Features and Strong Leader (2a), Collaborative Preference and Strong Leader (2b), and Collaborative Preference and Institutional Features (2c).
Water is very much a personality-driven, personal relationship deal. If you have those [moments where people come together to talk], you have at least the chance of coming to consensus. If you don’t have those, you have no hope. There’s just no way it’s going to happen because people will automatically fall back to their personal interest of trying to get something out of it for their agency of their organization or them personally. If you play the game, you quickly fall victim to a prisoner’s dilemma where nobody comes out with the best alternative. (CWP_5)

Moreover, those with a high Collaborative Preference also learn more in the presence of these Institutional Features, suggesting that such features benefit all participants in the process. This interaction should be further tested in a study with a larger sample size to determine if the difference in Individual Learning is significant under varying strengths of Institutional Features.

**Predicting Policy Change (Hypothesis 4)**

Next, a second multiple linear regression was performed to understand if a respondent’s perception of Collective Learning (suggested here to be representative of the theoretical concept of policy change) is predicted by their scores on Individual Learning (policy-oriented learning), as proposed in Hypothesis 4. Control variables from the previous regression models (Gender, and Collaborative Preference) were maintained here. A three-stage model was run in which Gender and Collaborative Preference (controls) were entered into Model 3. Institutional Features and Strong Leadership (predictors) were entered into Model 4. Individual Learning (predictor) was then entered into Model 5. The results are summarized in Table 9.
Table 9: Multiple Linear Regression Analysis Predicting Collective Learning

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Gender (ref=Male)</td>
<td>-.749</td>
<td>.768</td>
</tr>
<tr>
<td>Collaborative Preference</td>
<td>1.549</td>
<td>.319</td>
</tr>
<tr>
<td>Institutional Features</td>
<td>.597</td>
<td>.373</td>
</tr>
<tr>
<td>Strong Leadership</td>
<td>.597</td>
<td>.373</td>
</tr>
<tr>
<td>Individual Learning</td>
<td>.194</td>
<td></td>
</tr>
<tr>
<td>Adjusted R²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F for Change in R²</td>
<td>11.809</td>
<td>≤.01</td>
</tr>
</tbody>
</table>

Note: Standardized scores (z-scores) were used for Collaborative Preference and Individual Learning.

Model 3 is significant, F(2, 88) = 11.809, p ≤ .01, and reveals that Collaborative Preference contributes unique, positive variance to the model. Model 4 is also significant, F(4, 86) = 7.255, p ≤ .01, but neither of the two added predictors contributes unique variance to the model, and the change in R² between Models 3 and 4 is not significant. Model 5, however, is significant, F (5, 85) = 15.300, p ≤ .01, and reveals that Individual Learning contributes unique, positive variance to the model. In other words, both Collaborative Preference and Individual Learning significantly and individually predict learning when all other variables are controlled for in the final model. The change in R² between the Model 4 and Model 5 is significant at the p ≤ .01 level, indicating that Model 5 explains significantly more variance (about 22.5%) in perceptions of Collective Learning than Model 4. The interactions between Collaborative Preference and Individual Learning, as well as between Institutional Factors and Individual Learning, were tested but are not significant and are therefore not shown here.
The results of Model 5 support Hypothesis 4, indicating that a greater degree of policy-oriented learning (i.e., Individual Learning) predicts greater policy change (i.e., Collective Learning). In the final model, Collaborative Preference remains a significant predictor of Collective Learning ($\beta = .211$), but to a smaller degree than Individual Learning ($\beta = .539$). This may be because Collaborative Preference is a strong indicator of Individual Learning, which strongly predicts Cognitive Learning. Importantly, people with a stronger Collaborative Preference may tend to rate the outcomes of a collaborative process more highly, a phenomenon known as the Halo Effect (Leach and Sabatier 2005); however, the greater variance and more normal distribution of scores on Collective Learning, as opposed to scores on Collaborative Preference with lower variance and a more skewed distribution, suggests that this may not actually be the case. Finally, Institutional Factors and Strong Leadership are not significant in any of the models predicting Collective Learning, suggesting that these procedural factors may influence Individual Learning, which appears to be an important precursor to Collective Learning, but do not influence Collective Learning directly.

**Conclusion**

Taken together, the results of this analysis speak to the study’s main research question: *what procedural features increase policy-oriented learning in collaborative processes, and does more learning lead to a greater degree of policy change.* Model 2 suggests that certain institutional features such as consensus-decisionmaking norms, face-to-face interactions, diverse information, and opportunities to deliberate increase policy-oriented learning on the individual level (i.e., individual learning products), but Models 4 and 5 suggest that they may not have the same effect on collective learning products. This underscores the need to understand if there is indeed a unique collective learning process that links individual learning products with collective
learning products and what procedural mechanisms may underlie or foster it. Additionally, while participating in a process with Strong Leadership was significantly correlated with both Individual and Collective Learning, it was not a significant predictor of either type of learning (Models 2 and 4), though it may have a moderating effect in some cases (Models 2a and 2b, Figure 2a and 2b). Furthermore, Individual Learning was a significant predictor of Collective Learning (Model 5). In other words, those who learned more individually perceived that their process produced greater collective cognitive and behavioral changes.

In light of these results, it is critical to note a number of drawbacks to this study that also serve as suggestions for future research. First, while the survey used in this study did achieve a satisfactory response rate from participants within a singular collaborative governance process, allowing the researcher to inherently control for important process-wide variables that would not be possible in a comparative case study, some of the analyses were constrained by both a relatively small sample size and highly skewed data on key items. This resulted in having to combine multiple predictor variables into one composite variable (“Institutional Features”) using factor analysis. Practically, this suggests that researchers must continue to find new ways to increase their sample size in studies of collaborative processes, even when their response rate is satisfactory. It also suggests that researchers studying collaborative processes must continue to refine their measures of these somewhat ambiguous concepts to be more sensitive while keeping in mind that survey questions related to both individual learning and the institutional features of a policy process may suffer from issues of social desirability bias.

On a theoretical level, these issues suggest that the ACF’s hypotheses about policy-oriented learning (and the adapted ACF hypotheses tested here) may over-specify the conditions under which a person or group may learn, and consequently, that learning may need to be
examined as a holistic consequence of multiple, interacting individual and institutional factors as opposed to being driven by a smaller number of separate, easily-specified features. In other words, it is possible that collaborative processes can do a number of different things to increase general “collaborativeness” of the process to a level that promotes learning, rather than using a specific “recipe” of institutional features that are each deemed “necessary” for learning.

Additionally, as alluded to above, while the construct of “collective learning” captures both collective cognitive and behavioral (i.e., institutional/policy) changes, the Collective Learning variable used here measures a respondent’s *perception* of these changes. It does not measure actual change in collective knowledge (which must be defined more clearly) or the degree of behavioral change from a past state, which could potentially be measured through an analysis of policy outputs and outcomes to arrive at more robust understanding of learning and policy change. Once again, this conclusion has both practical and theoretical implications. Scholars studying Collective Learning need to find ways to more objectively measure collective changes in addition to respondents’ perceptions of them. Additionally, for scholars interested in the ACF, work should be done to refine the ACF’s definition of policy change to determine whether it includes both cognitive and behavioral changes on the collective level. This will allow for the further specification and testing of mechanisms underlying the policy-oriented learning pathway to policy change.

**References**


CHAPTER 6
Conclusions

As this chapter is being composed early in 2017, the three collaborative processes studied in this dissertation are on-going. Colorado’s Basin Roundtables meet monthly to discuss issues of importance to each basin, and the Colorado Water Conservation Board has begun to implement various measures of Colorado’s Water Plan through actions such as hosting an Agricultural Water Summit and examining ways to increase efficiency in water supply permitting. The Colorado River System Conservation Pilot Program is currently processing a third round of proposals for conservation projects in the Upper Basin, while the Lower Basin is implementing projects from a second round of proposals in Spring 2016. Negotiators from the U.S. and Mexico continue talks regarding “Minute 32X,” a deal that would extend some of the Minute 319 provisions past their expiration date at the end of 2017.

Many people fear that water management approaches such as these will falter under a new U.S. federal administration that has already provoked tensions with Mexico and environmental advocates, among others. However, these processes and the collaborative tenets that underlie them have gained increasing support from Republicans and Democrats alike, especially as western reservoir levels continue to decrease and threats of water shortage are exacerbated. Upon her exit from office, Sally Jewell, former Secretary of the Interior under President Barack Obama, provided a directive outlining how the Department of the Interior can continue to move collaborative Colorado River deals forward. While her directive is not binding,
it stands as an assertion of two key ideas: that the Colorado River is in danger, and that collaborative solutions to mitigate that danger are possible.

Within this current context, the final chapter of this dissertation is intended to outline overarching conclusions drawn from the project as whole—regarding both the substantive material and the research process. It culminates with a brief description of three future research projects that have stemmed from this dissertation.

Substantive Conclusions

A number of theoretical and applied conclusions arise from this dissertation. Perhaps the one most central to the organization of this project as a whole is that the Advocacy Coalition Framework is indeed a useful framework for studying collaborative processes, with some modifications (Chapter 3). The ACF already includes variables and concepts important to studying collaborative processes such as the “degree of consensus needed” to move forward with policy change, the concept of a collaborative subsystem, and the “negotiated agreement” pathway to policy change. Yet, both the framework and its theoretical hypotheses fail to capture some of the idiosyncrasies of collaborative arrangements necessary to fully understand how and why they work. By introducing hypotheses tailored to these gaps—such as those addressing characteristics that encourage cross-coalition coordination or foster cross-coalition learning—this study provides new tools for ACF scholars to use in order to better understand collaborative policy processes. Similarly, by maintaining a common language and set of theoretical foci in these adaptations, this study expands our comparative public policy analysis toolbox by adding to a framework so that it may ultimately be used to compare the efficacy of collaborative and
traditional policy processes. However, challenges remain in finding relatively comparable cases of generally collaborative and generally adversarial processes.

A number of findings arise that inform both theory and the practical development of more effective collaborative governance processes. For instance, Chapter 4 concludes that collaborative processes can encourage stakeholders to work across coalitions and advocate for multi-benefit policy outputs, but they do not necessarily cause the realignment of coalitions. This finding highlights the importance of the broader institutional arrangements in which collaborative processes exist. It suggests that existing power structures and resource asymmetries still matter in highly collaborative contexts, affirming that practitioners must consider such dynamics when initiating and conducting such processes, and that scholars can not possibly understand the inner workings and outputs of collaborative processes in a vacuum.

In an exploration of the link between learning and policy change, Chapter 5 concludes that certain procedural features of a collaborative process, alongside one’s innate proclivity toward collaborative approaches to decisionmaking, predict policy-oriented learning among individual actors. Moreover, one’s individual learning “score” significantly predicts their perception of collective policy change, including both collective cognitive change and collective behavioral change. This implies that organizers of collaborative processes can introduce specific institutional features—such as the expectation of consensus decisionmaking, frequent face-to-face communication among participants, a diversity of information sources, and opportunities to deliberate openly—that help diverse stakeholders not only learn more about the various facets of the issue they are trying to solve, but also produce policy outputs that have a greater impact on collective knowledge, the decisionmaking process, and the natural environment. However, because these institutional features are difficult to measure independently, more research is
needed on which features have the greatest effect on learning or whether there is a threshold level of “collaborativeness” that a process must achieve to promote learning more effectively.

Together, these findings help address the overarching research question of this dissertation: how do collaborative water governance processes shape the ways in which stakeholders interact with one another and produce policy change in the context of the Colorado River Basin? The various approaches used to study collaborative governance processes in this dissertation point to the fact that in a region with already limited resources and threats of increased scarcity in the future, incentivizing diverse actors to find new ways to work together is crucial to increasing water sustainability and preserving the various ways of life in this region.

While it is nearly impossible to tell whether or not some of the policy outputs and immediate outcomes of these processes would have arisen in the absence of collaboration, it is clear that such processes encourage actors to work together in innovative ways to create novel solutions.

From this, I offer two broad reflections in the form of elaboration on terms central to the research question and the project overall.

**Shaping Stakeholder Interactions: Expanding the Definition of Who “Wins”**

Perhaps obviously, many collaborative processes tend to be most successful when they produce true “win-win” solutions for all of the actors involved. One example of this is the Colorado River System Conservation Pilot Program. In this program, water users are paid to not use water or to improve their water use efficiency in order to create “extra” conserved water. The water providers and governmental entities who collaboratively developed the program despite historical disagreements each benefit when this “extra” water raises the levels of crucial reservoirs in the region, helping to mitigate water supply vulnerability in the face of threats such as drought and long-term climate change.
However, by promoting cross-coalition coordination and collective learning, collaborative processes also have the potential to expand the idea of what a “win” is for many of the stakeholders involved. For instance, in the Roundtable process, stakeholders from historically-opposed interest groups have worked together to understand how irrigated agriculture produces return flows that benefit the environment and create recreational opportunities, or how investing in the protection of headwaters streams can increase water quality for a variety of downstream users. Similarly, in the case of the Colorado River Delta, the Mexican federal government began to recognize that restoring the Delta, an action initially advocated for by a group of environmentally-oriented stakeholders working for non-governmental organizations, could also benefit the country as a whole. Through these processes, stakeholders start to view some of the “wins” for other stakeholder groups as “wins” for themselves—and ideally, they increasingly support one another in the production of these previously-unrecognized, yet mutually-beneficial solutions.

**Shaping Policy Change: Expanding the Definition of “Policy Change”**

Understanding and assessing the policy changes that arise from collaborative processes is central to determining if they are effective; yet, Chapters 3 through 5 each highlight the complexity associated with defining and measuring policy change in these non-traditional policy contexts. Chapter 3 emphasizes the difficulties associated with implementing collaboratively-designed “negotiated agreements” and raises the question of what “counts” as policy change: the production of policy outputs (often with drastically different scopes), implementation, impacts on the environment (i.e., policy outcomes), or some combination thereof? Chapter 4 analyzes the major policy output of each of the three collaborative governance processes studied in this dissertation with respect to the coalitions it serves, but it does not begin to scratch the surface of
the innumerable interim decisions that preceded such outputs. Chapter 5 links policy-oriented learning to policy change using the learning processes and products framework proposed by Heikkila and Gerlak (2013). From this, however, it questions whether learning products such as cognitive learning at the collective level can be categorized as policy change and grapples with how to measure these potential types of change more objectively.

Moreover, this dissertation (Chapter 4 in particular) highlights that the process of creating collective policy change comes in many forms. Some processes, such as Colorado’s Basin Roundtables and IBCC, may devote themselves to transparency, inclusiveness, and policy outputs that are broad in scope in order to create buy-in from diverse stakeholders. While this can create challenges with immediate implementation of actions, it can also generate a new, common foundation from which future water-related decisions will be made in the state. Using a different approach, both the SCPP and Minute 319 processes developed time-limited “pilot” policies or programs that garnered widespread support in part through their inherent adaptability and experimental nature. The outputs of these processes may be more readily observable, but they face challenges such as the need to “scale up” smaller projects to have a greater impact or “scale forward” policies with a pre-defined expiration date.

These theoretical and empirical questions about what constitutes and motivates various types of policy change in collaborative contexts suggest that a more specific definition or typology of “policy change” is needed, particularly if scholars eventually want to compare what types of governance arrangements are more successful at producing such change. While some scholars have begun to define various types of change and the “levels” at which it may occur in collaborative contexts (for example, Margerum and Robinson 2015), these efforts should be continued and expanded in order to more comprehensively catalogue the “policy changes”
arising from collaborative governance processes—including changes that may be difficult to measure and easy to ignore (such as collective cognitive changes), but that may also be crucial precursors to more traditional, concrete policy outputs.

**A Brief Reflection on the Process**

In addition to providing reflections on the substantive nature of this dissertation, I also include a few procedural reflections, particularly because I ended up in a number of unexpected places while conducting this research. Some of these unexpected places where physical. For instance, I certainly did not expect to find myself carrying an augur across the Colorado River Delta to help take soil samples that would be tested for connectivity changes related to the 2014 pulse flow. It was my repayment to the team of scientists who brought me to the Delta—and while I faded faster than I would have liked in the 95 degree heat of May (and probably was not actually that much help), seeing evidence of the place where the Colorado River once flowed, if only briefly, was captivating. On the same trip, I toured various sites in an urban restoration project in Mexicali where Sonoran Institute scientists and staff were removing trash that was illegally disposed of in agricultural drains. I left the tour mentally and emotionally exhausted—in part from attempting to grasp the rapidly-spoken Spanish, and in part from visiting sites where trash was piled so high that it was impossible to see the water flowing beneath it. I hitched a ride across the Mexican border with a particularly brilliant and intimidating interviewee: we stumbled through awkward conversation as we ate at a Subway in the middle of the southern Arizona desert. Suddenly I had forgotten how to talk about the river that I thought about constantly. On some days, I sat in water managers’ offices wearing a suit and high heels. On others, I sat barefoot at the kitchen tables of negotiators and river advocates who lived in the Boulder area.
and invited me into their homes to talk about the processes in which they participated. And on one particularly good day, I got to raft the Arkansas River through one of my favorite towns (Salida, Colorado) surrounded by people who think about rivers even more than I do.

I also ended up on a number of unexpected intellectual paths during the course of writing this dissertation that are now reflected in the final product. Perhaps most importantly, the process of adapting the ACF for use in studying collaborative governance processes became a study in and of itself. After struggling to apply the ACF in a way that felt comprehensive and justified in my master’s research on collaborative processes, I had planned to take up this task again in my dissertation. I expected that I might try to do this in a brief introductory chapter, but as I wrote, I suddenly had forty pages of theoretical exploration that still felt incomplete. After many iterations, this work became Chapter 3 and culminated in a hypothesis-development exercise that provided structure to the entirety of the project. It also helped me clarify a particularly poignant comment that I received on my dissertation proposal (thanks, Tom): “is this project about the ACF or about collaborative governance?” It was about melding the two—I just hadn’t figured out how to do it yet.

A similar surprise arose when I set out to conduct a survey of the participants across the three collaborative processes studied here. Once I realized that I had interviewed almost every person involved in one of the processes, and that it was nearly impossible to get anyone to talk to me (much less answer a survey) in another, I had to shift approaches. I ended up surveying the participants in one case instead of three, which proved a challenge enough on its own. I struggled with indifference and skepticism from a group of people who had been (poorly) surveyed in the past and was fortunate that the staff at the Colorado Water Conservation Board was willing to go to bat for my study’s legitimacy. After beginning to examine my survey data, I learned that it
was highly skewed on some questions and practically useless on others, even though I had asked a number of highly intelligent and informed people to review and pilot test my survey instrument. This forced me to change my analysis strategy, thereby cluttering the intended structure of my dissertation. Luckily, I received a lot of help from some key professors and friends and was able to learn new quantitative techniques to examine and understand my data in the process.

Finally, I also learned that conducting good international research is really difficult. It requires a lot more flexibility with time and funding than I had as a graduate student. I could have used three trips to Mexico, a Spanish language refresher course, and the help of a few important contacts that I met months after my trip to Baja California. But I also learned that I find transboundary water governance fascinating, and that the struggle to do good, on-the-ground research on this topic pays off. I look forward to applying the lessons I learned here to future research projects.

**Future Research Directions**

As a result of the research conducted for this dissertation, many new questions about collaborative governance have emerged. This final section briefly outlines three potential future projects intended to address some of those questions, though I expect many more will arise as I interact with new colleagues and students. Each of these projects involves collaboration with scholars who have collected additional data on the processes examined here or on similar collaborative processes.
Measuring Stakeholder Belief Change over Time (with Deserai Crow)

Scholars often hail collaborative environmental governance processes as a panacea for failures associated with top-down modes of governance. Because these processes attempt to promote mutual understanding, trust, and agreement among stakeholders, they may “have greater legitimacy than traditional approaches that rely on the legal authority provided by bureaucracies by legislatures” (Sabatier et al. 2005) and consequently result in solutions that are more feasible to implement. However, building such trust and mutual understanding among stakeholders that hold differing—and often incompatible—beliefs can be a long and arduous process, especially since beliefs are expected to be a primary driver of the types of policy solutions advocated for by policy actors (Sabatier and Weible 2007). This study will use longitudinal data in the form of two surveys collected approximately eight years apart (including the survey conducted for this dissertation project) to understand the beliefs of stakeholders in a water governance subsystem and whether they have been affected as a result of participating in a collaborative water governance process.

The Role of Science in Fostering Collaboration (with Tom Koontz)

In order for collaborative governance processes to be successful, they must integrate sound scientific information alongside a host of other stakeholder considerations (Koontz 2016). While scholars have begun to investigate how science can become more “usable” for decisionmakers in general, unique opportunities and constraints arise for the integration of science in the context of collaborative approaches to governance. In response, I will seek to better understand the role of scientific information in collaborative environmental governance processes, including what factors influence the use of science, how process participants perceive scientific information, and whether the use of science can be correlated with improved
environmental outcomes. To do this, I will synthesize qualitative and quantitative data on the use of science in collaborative water resource management processes across six states and regions (including the three examined in this dissertation project) over two decades. The findings will aid in the development of recommendations for better integrating sound science into collaborative environmental governance processes and illuminate opportunities for improved collaboration between scientists and non-scientists on environmental policy and management issues.

**Mapping the Link between Learning and Policy Change in Collaborative Processes (with Tanya Heikkila)**

Directly building on the study of learning in collaborative governance processes included in this dissertation, I will further investigate the connection between policy-oriented learning and policy change in collaborative governance processes. Working from the model proposed by Heikkila and Gerlak (2013) that links learning processes to learning products and using the survey data presented in Chapter 5, this paper will use structural equation modeling to understand how the characteristics of a collaborative process are linked to individual cognitive learning, individual behavior change, and collective behavior change. The findings will further illuminate the mechanisms underlying the policy-oriented learning pathway to policy change and inform the development of collaborative processes that foster greater individual and collective learning in ways that lead to desired policy change.

**References**


REFERENCES


