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Environmental Research Letters

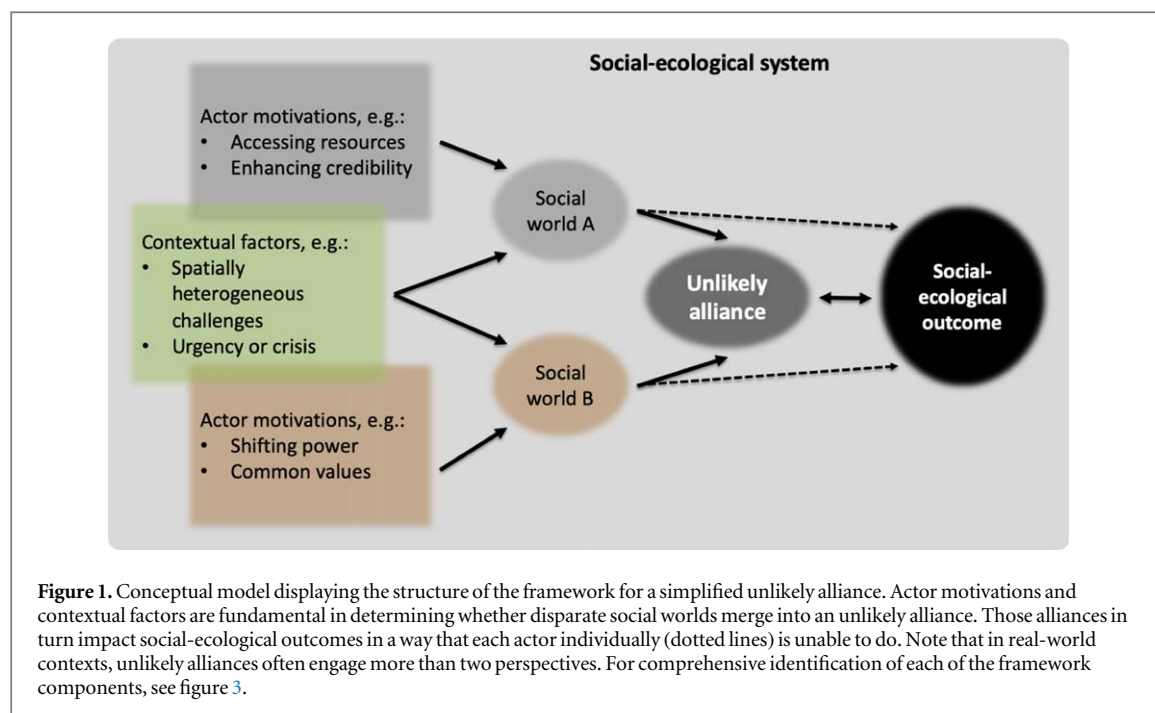# Unlikely alliances and their implications for resource management in the American West

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Abstract

Collaborative, or participatory governance is an increasingly common means of addressing natural resource issues, especially in the American West where patchworks of public, private, and tribal interests characterize the region's resources. In this context, unlikely alliances, or partnerships among diverse actors who have historically been at odds, have a growing potential to shape social and ecological outcomes, for better or worse. While these unlikely alliances have received greater attention in recent years, relatively little research has worked to synthesize the concept across diverse contexts and disciplines. Based on a review of the literature on unlikely alliances in natural resource governance, we develop a framework that synthesizes the individual motivations and contextual factors that influence their formation, as well as the social and ecological outcomes that they create. We use this framework to analyze six illustrative cases of unlikely alliances. Our analysis of these cases suggests that unlikely alliances in the American West are likely to arise in the presence of a crisis, when appropriate leadership is present, when some of the actors have interacted effectively in the past, and when actors need to pool resources. The cases also illustrate some common outcomes, including environmental improvement, transformation of social networks, policy change, and shifts in power relationships. We discuss the implications of unlikely alliances for the social-ecological future of the American West. Our paper highlights the role of unlikely alliances in shaping patterns of natural resource governance, and provides a focus for further research in this realm.

1. Introduction

Some argue that given the patchwork of public, private, and tribal resources in the American West, the best way to protect working landscapes and conserve broad-scale ecological function is through collaborative conservation (Charnley *et al* 2014) and participatory governance (Newig and Fritsch 2009). Yet collaborations are costly, management resources are limited, and not all collaborations yield similar impact (Bodin 2017). Thus, understanding how collaborations form and what makes them successful has been a longstanding objective in the scholarship of natural

resource governance. In this paper, we focus on a specific aspect of collaborative governance: the phenomenon of unlikely alliances. Unlikely alliances are partnerships among diverse actors who have historically been at odds. They typically work together to take advantage of the perceived benefits of building bridges across traditional divides, often uniting around common ground and taking advantage of changes in the balance of power or evolving institutional arrangements. As unlikely actors interact in novel ways, the associated processes of cultural production and negotiation, and subsequently their impacts, become increasingly complex (Robbins *et al*

Figure 1. Conceptual model displaying the structure of the framework for a simplified unlikely alliance. Actor motivations and contextual factors are fundamental in determining whether disparate social worlds merge into an unlikely alliance. Those alliances in turn impact social-ecological outcomes in a way that each actor individually (dotted lines) is unable to do. Note that in real-world contexts, unlikely alliances often engage more than two perspectives. For comprehensive identification of each of the framework components, see figure 3.
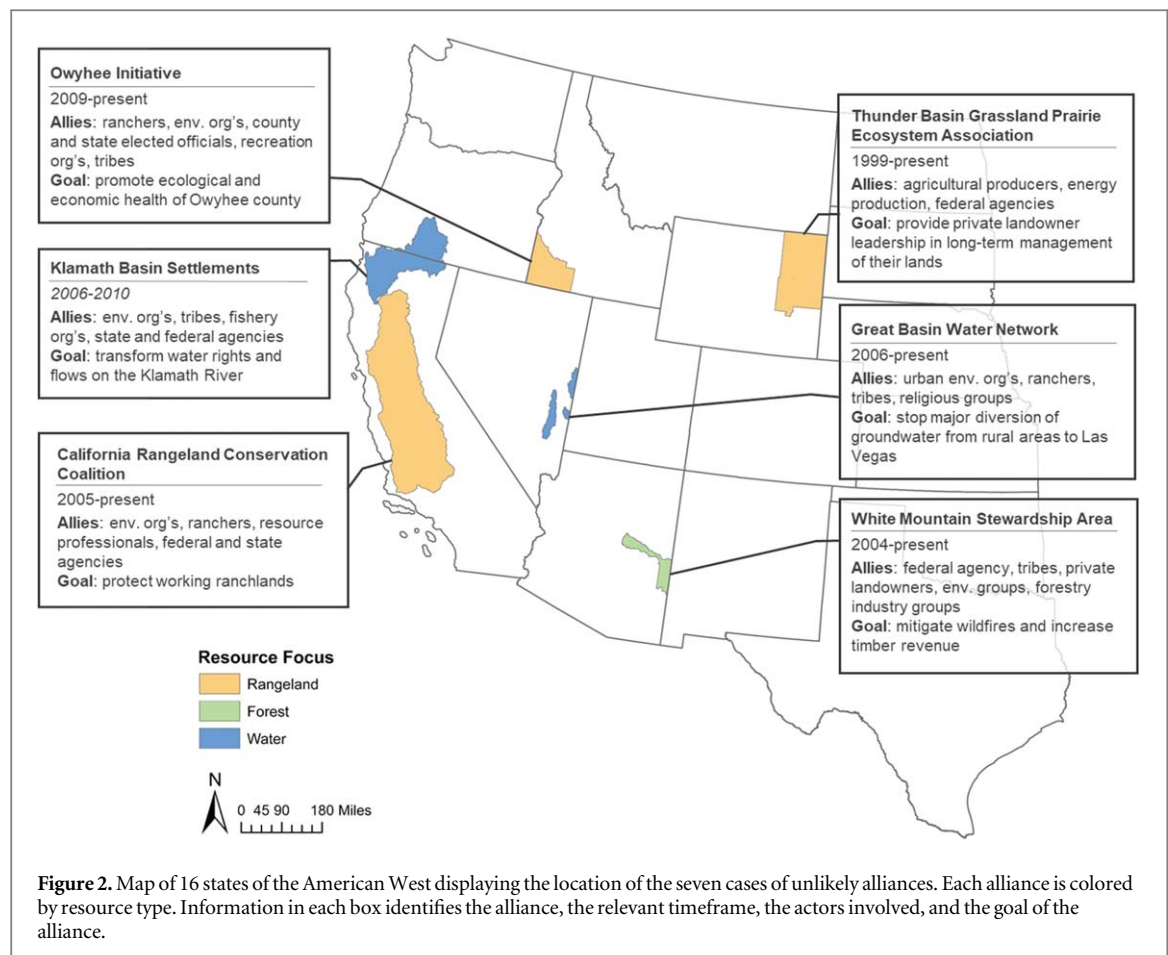
2009). We are thus motivated by the need to move beyond simple acceptance of collaborative processes and the mantra of participatory governance as meeting all manner of objectives (Huffman 2009, Berry and Mollard 2010) to consider what novel aspects of collaboration occur when unlikely partners come together. In particular, we explore how these unlikely alliances are driven by the motivations of various actors, the broader context in which they occur, and the positive and negative social and ecological outcomes they produce. In short, we are responding to Koebele's (2019b) call to examine the changing landscapes of coalitions associated with collaborative and participatory governance.

Unlikely alliances, sometimes called strange bedfellow coalitions (Phinney 2017), are intended to take advantage of bridging traditional divides. But exactly what sort of diversity is involved in an unlikely alliance? In a study of unlikely alliances where tribal organizations partnered with non-Native organizations, Grossman (2005) understood an unlikely alliance specifically in terms of the affiliation of participants. In addition to participant affiliation (or professional identity), Phinney (2017) also found that diversity extending across policy domains, geographic origins, and based on differences in ideologies (or belief systems) occurred within such alliances. Further, unlikely alliances can target various situations and venues. For example, unlikely alliances may develop in response to litigation, as an alternative to litigation, as a means to change policy, or as a means to reformulate implementation of policy. While recognizing that diversity is multifaceted, that differences exist not only among groups but also within groups, and that alliances may shift rapidly or be characterized by highly fluid interactions (Koebele 2019a), we focus here on unlikely

alliances that encompass partners who fundamentally differ in some respects but still choose to ally with one another to achieve some end. By their nature, then, unlikely alliances incorporate a diversity of interests, identities, belief systems, and/or experiences. Whatever the source of the actors' differences, as diverse partners work together towards common ends an unlikely alliance is forged, along with a shared recognition that traditional boundaries have been spanned.

The American West is a unique setting for exploring the role of unlikely alliances. This region possesses a cultural tradition of independence and liberty (Kitayama 2010) and is made up of a mosaic of jurisdictions organized around varying, even contradictory, missions and mandates (Sheridan 2007) These features create divides among natural resource owners, managers, and other stakeholders. Nevertheless, large amounts of public land are dedicated to multiple use and have a mandate of public participation that requires distinct groups to interact. Additionally, many of the most pressing resource challenges in the West require coordination across landscapes and boundaries (Rickenbach *et al* 2011, Burr 2013). These lands support 75 million people, and are currently under an existential threat from wildfire, unstable water resources, and invasive species. Thus, the region serves to both create a context for the formation of unlikely alliances, as well as to elevate their potential to impact communities, ecosystems, and livelihoods.

Based on a review of the literature on unlikely alliances in environmental governance, we developed a framework (figure 1) for characterizing these alliances focused around three critical questions: (1) What are actors' motivations in forming an unlikely alliance? (2) What contextual, or situational factors are associated with the formation of unlikely alliances? (3) What are

Figure 2. Map of 16 states of the American West displaying the location of the seven cases of unlikely alliances. Each alliance is colored by resource type. Information in each box identifies the alliance, the relevant timeframe, the actors involved, and the goal of the alliance.

the social-ecological outcomes of unlikely alliances? In what follows, we first provide a brief overview of our framework and a brief introduction to a number of cases in western natural resource governance (figure 2) that we use to illustrate this framework. We then explicate the framework in more comprehensive detail (figure 3), interspersing specific examples from the cases throughout (sections 2–4). We conclude with a discussion of the role of unlikely alliances in future social-ecological systems of the American West (section 5).

1.1. Framework and cases

Frameworks have been used in the literature on social-ecological systems to specify variables of interest to researchers and the relationships among them. Frameworks attempt to specify major relevant concepts needed to understand the broader topic of interest (Emerson and Nabatchi 2015) The purpose of our framework is to provide an organizing structure for scholars of collaborative and participatory governance interested in particular in the role of unlikely alliances, both with respect to synthesizing previous scholarship as well as identifying areas of future research. Our framework was constructed directly from our review of the literature on unlikely alliances, and is thus intended to be a reflection of how the literature has treated unlikely alliances to date, rather than

demonstrate our own priorities as researchers. The framework is organized around three fundamental aspects of unlikely alliances. The first component explores the motivations of actors that drive formation of alliances. The second component of our framework examines the contextual factors that impact whether or not unlikely alliances form. We identify a range of both social and ecological contextual factors that predispose the formation of unlikely alliances. Finally, our third framework component relates to outcomes of unlikely alliances. We consider a broad range of potential outcomes, acknowledging that as actors with varying motivations come together in novel arrangements, a variety of outcomes are possible. These outcomes might impact both the environment and social structures in both positive and negative ways, and impacts to different actors may differ substantially. In the section about implications we discuss various challenges involved in assessing outcomes, that arise from issues of case selection, causal identification, and accurate measurement of outcomes.

We illustrate our framework using examples from a number of cases. While these cases are not intended to be exhaustively representative, we selected the cases to cover a range of geographic regions, resource types, issues related to those resource types, and variation with respect to the number and diversity of individuals involved. Some of these cases have been described in

WHY ALLY WITH DIVERSE PARTNERS? (motivations)	Enhance credibility
	Undercut power asymmetries
	Access resources (financial, organizational, informational, or political)
	Link disparate issues
	In response to previous failure or negative experience
	Demonstrate minimal progress
IN WHAT SITUATIONS ARE UNLIKELY ALLIANCES EXPECTED? (contexts)	When the situation is perceived as a crisis
	Associated with appropriate leadership
	When there is a history of an unlikely alliance with some of the same parties
	When there is ample time to build relationships
	In conflicts seen as widely relevant
	Associated with uncertainty about outcomes
	When boundary spanners are present
	Associated with polycentric and / or multi-layered institutions
	When identity issues can be put to the side
WHAT ARE THE OUTCOMES OF UNLIKELY ALLIANCES? (outcomes)	Environmental improvement
	Improved trust / social network ties
	Policy or regulatory change
	Pooling of resources and information
	Changes in beliefs or behavior
	Change in power relations
	Greater use of science
	Lost time, money and/or resources
	Social learning
	Economic improvement
	Lower common-denominator solution

Figure 3. Framework identifying the motivations, contexts, and outcomes of unlikely alliances.

peer-reviewed literature. For other cases, our descriptions are based on personal experience (often deep or prolonged) with the alliance. The purpose of presenting the cases is to help explicate our framework and its range of application using concrete examples. Combined with the literature review underpinning our framework, we think that the cases serve to illustrate some of the claims we make about unlikely alliances. While we do not intend an in-depth examination of each case, based on the application of the framework to our set of cases, we draw some initial conclusions of the broader implications of unlikely alliances on social-ecological systems in the West. Below we briefly introduce each case, organized by resource management type.

We include three cases from rangeland systems. The first involves the California Rangeland Conservation Coalition (CRCC), which in 2005 brought together environmentalists, regulators and ranchers who were typically at odds regarding land use and livestock grazing to protect working ranchlands for their value to both ranching communities and wildlife. Our second rangeland case is the Owyhee Initiative (OI), which tackled previously intractable public land conflicts, such as motorized recreation, cattle grazing, and wilderness designation, through active participation of more than 40 organizations with a history of opposing viewpoints on these debates. The Initiative resulted in a consensus agreement among local, regional, and national groups that 'promotes the ecological and economic health of Idaho's Owyhee County.' Finally, the Thunder Basin Grasslands Prairie Ecosystem Association (TBGPEA) in eastern Wyoming, formed in 1999, is a landowner-led non-profit with the stated purpose 'to provide private landowner leadership in developing a responsible, common sense, science-based approach to long-term management of their lands.' Over two decades, TBGPEA worked proactively with federal agencies, conservation groups, and scientists to develop a progressive, habitat-based approach to the conservation of multiple wildlife assemblages on private lands. The alliance surrounding TBGPEA's efforts

incorporates a diversity of participant affiliations, in particular including both private and public actors with energy, rangeland, and conservation interests that have traditionally held divergent goals and viewpoints.

We include two cases related to water resources. In the late 2000s more than 45 organizations and agencies from northern California and southern Oregon came together as a result of an unusual opportunity to remove a dam and transform water rights and water flows in the Klamath River. The Klamath Basin settlements (KBS) were developed by an unlikely alliance involving a broad array of participant affiliations, policy domains, and ideologies, but jointly they were able to develop and sign two agreements on water management for the bi-state river. The second water-oriented unlikely alliance is the Great Basin Water Network (GBWN), which is united by a shared opposition to a proposed project that would divert major amounts of groundwater in rural areas to Las Vegas. Actors within the network vary based on geographic origins (some are urban, others rural, some are from Nevada, others from Utah), by ideologies (some are oriented toward ranching as a means of economic preservation, others have basic interests in environmental preservation, and still others in social and environmental justice), and by participant affiliation (some are Indian tribes, others are religious groups, others are rural groups, and still others are environmental groups).

We include one case involving forest resources, from the White Mountains in eastern Arizona. This case follows the White Mountain Stewardship Project (WM), a group of national agency employees, tribes, private landowners, environmental non-profits, and forestry industry groups. This collaboration came together, bridging disparate objectives, ideologies, and economic and environmental platforms, in order to prepare for and mitigate damage from increasing wildfires.

2. Why ally with diverse partners?

Our literature review uncovered several factors that motivate individual actors to engage in unlikely alliances (figure 3). One specific motivation is to enhance credibility; this can take a number of forms. It might involve projecting a signal of strength to other actors, creating an aura of legitimacy (Phinney 2017), or be intended to gain access to decision-making authority (Weible and Sabatier 2009) some cases, actors choose to join alliances to undercut existing power asymmetries, thereby enhancing their credibility. This might entail allying to avoid or confront a common enemy (Grossman 2017, Koebele 2019a), or attempting to break stalemates where the opposition is viewed as especially strong (Phinney 2017). Alternatively, alliances can also serve to reduce uncertainty for policymakers about the potential consequences of a decision, thereby improving the credibility of the outcome (Phinney 2017). Interestingly, credibility enhancement may also be directed inward—alliances can enhance an actor's own sense of credibility, especially when allying with partners who do share some, but not all, beliefs (Weible *et al* 2018).

Credibility enhancement and undercutting existing power asymmetries played an important role in several cases (table 1). In the creation of the GBWN, where diverse allies with relatively less power and influence banded together in opposition to more powerful governmental institutions—the Southern Nevada Water Authority and the Las Vegas Valley Water District. In the Klamath Basin settlements, actors with more to lose, or those considered to have skin in the game, had enhanced credibility, which turned out to be significant to the negotiation process as well as to the outcomes (Horangic *et al* 2016). In the case of the Owyhee Initiative, local actors with less power in certain national policy processes were motivated to align with actors that had more power in those spheres in order to enhance their own credibility and be included in the process. Our findings align with conclusions by Schlager and Blomquist (2008) and Berry and Mollard (2010) that political conditions and power relations are implicit in decisions made about participation. More specifically we find that allying with diverse partners has been used as a means of enhancing credibility and undercutting existing power asymmetries. Another motivation for engaging in unlikely alliances is related to accessing scarce resources, whether to secure access to the other party's valuable resources (Koebele 2019a), or to stake a claim to general resources that are limited (Weible *et al* 2018), or to collaboratively access shared resources. The alliance can support the use of resources to achieve common objectives, such as the use of public or private funds to conserve privately-owned resources through deed restrictions or enhancement projects (Barry *et al* 2007). Resources can promote organizational capacity in alliances that support research or policy that could not be maintained alone (Huntsinger *et al* 2014), to gain access to professional competence (Weible *et al* 2018), to extend the range of tactics or activities available to an actor (Phinney 2017), or to streamline permitting processes (Huntsinger *et al* 2014). Finally, resources can serve informational or educational purposes, such as creating access to information or information pools (Wondolleck and Yaffee 2000, Heikkila and Gerlak 2019) or promoting learning (Heikkila and Gerlak 2019, Koebele 2019a).

Given the various forms that resource-based motivations can take, unsurprisingly, it was one of the more commonly observed motivations in the cases we examined. For example, ranchers and energy producers worked together in Thunder Basin to pool resources in their efforts to proactively approach the potential ESA listing of sensitive species. Very similarly, environmental groups in California realized that

Table 1. List of framework components for each case. 'X' indicates the case provides evidence of that framework component. (Note that, due to space constraints, not all evidence is discussed within the text.) TBGPEA—Thunder Basin Grasslands Prairie Ecosystem Association. OI—Owyhee Initiative. CRCC—California Rangeland Conservation Coalition. KBS—Klamath Basin Settlements. WM—White Mountain Stewardship Agreement. GWBN—Great Basin Water Network.

		TBGPEA	OI	CRCC	KBS	WM	GBWN
Motivations	Enhance credibility		X	X			X
	Undercut power asymmetries				X		X
	Access resources	X		X		X	
	Link disparate issues		X		X		X
	Previous failure or negative experience	X	X	X	X	X	
	Demonstrate minimal progress			X			
Contexts	Environmental or social crisis	X	X	X	X	X	X
	Appropriate leadership	X	X	X		X	
	Previous history of alliance	X	X				X
	Ample time to build relationships	X	X	X		X	
	Broadly relevant conflict		X			X	X
	Uncertainty about outcomes	X	X				X
	Boundary spanners		X				
	Polycentricity		X				
	Identity can be put to the side				X		
Outcomes	Environmental improvement	X	X	X	X	X	X
	Improved trust/social network ties	X	X	X		X	
	Policy or regulatory change	X	X	X	X		
	Pooling resources and information		X	X	X	X	
	Changes in beliefs or behavior				X		
	Change in power relations			X	X		X
	Greater use of science	X	X				X
	Lost time, money, and/or resources	X	X				
	Social learning			X	X	X	
	Economic improvement					X	
	Lower-common denominator solution						

they would have to work with ranchers in order to achieve their conservation goals, because so much of rangeland is ecologically important but privately owned in California. Thus, they were motivated to form the California Rangeland Conservation Coalition.

Another motive to join an unlikely alliance may result from understanding another actor's values in a novel way. When an actor finds a new way to understand another party's values that previously seemed conflicting, this can create an opportunity to forge new and common ground through an unlikely alliance by creating a linkage between seemingly disparate issues. In this way, when another actor's political, economic, or cultural values with respect to an environmental conflict are seen in a new light (Berry and Mollard 2010) or when resource values are convincingly communicated or demonstrated (Huntsinger *et al* 2014), there may be extra motivation to develop an unlikely alliance.

Actors involved in the Owyhee Initiative started to recognize the importance of developing common values, despite seemingly disparate interests at the outset of the process; this served as a motivation for maintaining their involvement after reaching consensus on an initial agreement. The Klamath Basin settlements provided a venue for formerly antagonistic actors to come together after a number of them understood one

another's values better through participating in a series of listening sessions and interacting in a small-scale restoration project (Gosnell and Kelly 2010). An important motivation behind the formation of the GBWN was the creation, use, and articulation of a common sense of place to create linkages between actors (Whear 2015).

In certain circumstances, previous negative experiences can act as an incentive to expand beyond one's usual allies and develop different alliances (Horangic *et al* 2016). For example, previous failures in resolving conflicts along the Klamath River changed some of the actors' strategic motivations, providing an incentive to participate with different actors in an unlikely alliance during the 2010 Klamath Basin negotiations (Gosnell and Kelly 2010, Horangic *et al* 2016).

One potential motivation that we uncovered in our literature review, that we found relatively little evidence of in our actual cases, involves the outcome-based importance of showing that some progress is possible. This might involve allying to signal to others that, in particular if a difficult stalemate exists, that at least a little progress can be made (Phinney 2017). It is notable that even if an actor might not think they can benefit directly from an alliance, or that the alliance will uncover a specific solution, they might be motivated to ally in some preliminary form out of a lack of any other viable alternatives. Likely, one reason we see

little evidence of this motivation in our set of cases is that it is difficult to assess in a retrospective review of cases, in particular in a set of cases that were successful, at least to some extent.

3. In what situations are unlikely alliances expected?

The second component of our framework examines the broader situational or contextual factors in which unlikely alliances are expected to form. In many cases, individual motivations and broader contextual factors are overlapping. For example, individuals might be motivated to engage in an unlikely alliance in order to reduce conflict. Similarly, the context of intense, protracted conflict might predispose an unlikely alliance as the only possible means of making some progress. Despite the potentially overlapping nature of motivations and contextual factors, we consider each separately since they represent different lenses and combinations of external and internal drivers.

One of the most important situational factors our review uncovered is the existence of an environmental or social crisis, or even an anticipated environmental or social threat (Olsson *et al* 2007). Such a crisis, or external threat, can often serve to transform alignments among actors in a conflict, turning previous enemies into allies. This crisis might be felt by all of the actors, when external pressures are generally high for all involved (Emerson *et al* 2012), but might also apply to only one actor, such that the impacted party feels that their best recourse is to ally (Grossman 2017). This type of situation is sometimes described as a hurting stalemate, as when stakeholders are dissatisfied with the status quo but also have no other venues for achieving their objectives (Weible and Sabatier 2009). In the Klamath Basin Settlements, for example, one of the actors said 'I'd be lying if I did not say that we were hurting. That was a factor, the fact that we were not winning. We had already tried everything else' (Horangic *et al* 2016, p 1428).

We found evidence of this factor in almost all of our cases, as many of them involved real or perceived imminent crises. Some were related to impending regulation, as in the case of Thunder Basin and the Owyhee Initiative (Crapo 2004). In Thunder Basin, the possibility of endangered species listings was a critical factor driving the formation of new alliances, and the product of the unlikely alliance directly addressed this potential threat. In other cases, alliances formed in response to ongoing threats or crises, as for the wildfires of eastern Arizona in the White Mountains, or conflict around water in Nevada. The impact of such crises or threats can be very strong and can serve to completely transform previous relationships. For example, the destruction wreaked by the recent Rodeo–Chediski Fire in Arizona, to that point the largest wildfire in state history, made evident the threat of future wildfires, bringing together actors that had previously held highly divergent views on how best to balance conservation and production of timber resources (Sitko and Hurteau 2010).

One example of a contextual factor involving the presence of a specific type of individual is that of appropriate leadership. When leadership emerges that recognizes the value of novel perspectives and encourages people to step outside their traditional boundaries by building trust, connecting people, by pursuing alternate ways of management, or by ensuring broad-based engagement, unlikely alliances are more common (Olsson *et al* 2006, Bohlen *et al* 2009, Walker 2018).

We found evidence of the importance of appropriate leadership in many of our cases, coming from a variety of sources or types of individual. The Owyhee Initiative was promoted in important ways by involvement from Senator Crapo and his office; the Senator personally believes in 'collaboration' as an approach to wicked problems and told individual actors he would support any legislation needed to implement a consensus agreement among diverse groups at the local level (Crapo 2004). Governmental representatives were also important to the California Rangeland Conservation Coalition. Steve Thompson, then US Fish and Wildlife Service Southwest Region Director, urged collaboration between ranchers and environmentalists (Shigley 2006). Thompson's guiding mantra to participants was to find the 80% of concerns that can be agreed upon and not to waste time arguing about the other 20%. Leadership also arises outside of formal governmental authority. For example, rancher Tim Koopmann hosted the first meeting of coalition partners and served as an example to other ranchers, having recently negotiated a mitigation easement with the California Department of Fish and Game (Huntsinger *et al* 2014, CCRC 2015). Similarly, leadership and long-term commitment by rancher Betty Pellatz was central to the formation and persistence of the alliance in Thunder Basin (Homes 2013).

Another contextual factor that our review uncovered is the degree to which there is a previous history of unlikely alliance in that same system and between the actors in question. A similar or identical alliance in the past that has worked on some other initiative can predispose actors to come together in alliance again (Whear 2015). In the case of the Owyhee Initiative, some actors had a previous history of working together on difficult land management challenges and conflicts. For instance, some environmental groups worked with community members to limit low-altitude flights over the region from a nearby Air Force base (Anon n.d.). Similarly, a number of the individuals involved in the GBWN had a history of unlikely alliance because, starting in the early 1980s, they worked together and formed a network to resist the siting of the MX Missile Project in central Nevada (Whear 2015).

Timing can be a critical factor in whether or not an unlikely alliance forms, and how effective it is. When there is ample time to develop relationships, or for working on the details of the particular problem at hand, then unlikely alliances are more possible (Horangic *et al* 2016, Walker 2018). Conversely, if there is too much time between the moment of decision-making and the implementation of the actual decision being made, this can instead act as a disincentive to the formation of an unlikely alliance (Horangic *et al* 2016). The alliance in Thunder Basin required nearly 20 years to come to a formal fruition—in this time, actors were able to develop close and trusting relationships that served as the foundation for the eventual formal agreement.

The breadth of the conflict is another critically important factor that can impact the formation of an unlikely alliance. If conflict is viewed as widely relevant to a range of interests (Mahoney 2007, Phinney 2017), or jurisdictions (Gerlak and Heikkila 2011), then an unlikely alliance may be more likely. The Owyhee Initiative resulted after conflict reached a breaking point—external pressure for a sweeping 2.7 million-acre National Monument that would cover half of the county's area created an imminent turning point in the region. This broadened the potential impact of the conflict to encompass a diverse range of stakeholders and brought them together in opposition to this new, external threat. The GBWN translated well beyond the immediate context and as such, brought a diversity of organizations together because the conflict was viewed as widely relevant.

Uncertainty about the outcomes of a situation can also be a motivating contextual factor in the development of an unlikely alliance. If the current strategies adopted in environmental governance appear to lead to ineffective approaches or uncertain outcomes, unlikely alliances may arise to mitigate these issues (Emerson and Nabatchi 2015). For example, in the case of the Owyhee Initiative, uncertainty about how a proposed National Monument would impact local decision-making and land use garnered regional interest to find a viable land tenure solution that would provide greater certainty about impacts to local stakeholders. Conflicts involving groundwater use generally involve uncertainty about the amount of groundwater available, the degree to which pumping in one area will impact water availability in another area, or how long an impact will last. Recognizing that impacts from the proposed project to pump and transfer groundwater were uncertain served to unite some of the project opponents within the GBWN, who believed that project proponents needed to provide greater certainty about the impact to groundwater so that local residents and the environment would not be left to suffer the consequences (Welsh *et al* 2013).

When present, boundary-spanning actors, or actors that create bridges between the boundaries of different social groups, can catalyze the development of unlikely alliances (Gerlak and Heikkila 2011, Koebele 2019a). Boundary spanners can serve a number of important specific functions. They can act as neutral intermediaries seen as apolitical or without a direct interest in a conflict in question, thus serving as catalysts to facilitate across governance interests (Barry *et al* 2007). Similarly, they can provide an arena for trust building, learning, collaboration, or conflict resolution (Hahn *et al* 2006). They can transform institutional capacities by making organizations more flexible and dynamic (Olsson *et al* 2004), creating space for institutional innovation and improving organizational capacity to deal with change (Olsson *et al* 2007). For instance, in the Owyhee Initiative, a conservation organization that had a history of working collaboratively with ranchers played an important role of bridging the interests of ranchers and environmental groups focused on wildlife or wilderness designation.

We found that polycentric, or multi-layered, institutions have been implicated in the formation of unlikely alliances. Polycentric policy arenas involve multiple centers of decision making at various scales of jurisdiction, operating independently (Ostrom 2010). This can create the need to coordinate management interventions within and across multiple scales of governance, predisposing actors to engage in unlikely alliances (Sabatier *et al* 2005, Benson *et al* 2013). Similarly, unlikely alliances may form when there are opportunities for understanding and servicing needs in spatially heterogeneous contexts (McGinnis 1999), when scale-dependent governance challenges as well as cross-scale interactions need to be addressed (Young 1994, Berkes 2002), or when, despite the challenges of coordination and administration, possibilities for moderating vertical interplay among institutions exist (Berkes 2002, Young 1994, Lebel *et al* 2006). In the review of our own cases, we did not uncover many explicit examples of polycentric governance. The Owyhee Initiative, however, did involve multi-layered institutions that had a history of allying with other unlikely parties at different scales of governance (e.g. local, state, national).

A final contextual factor in the formation of unlikely alliances are situations when the actors acknowledge, but then choose not to focus on big issues, such as identity, racism, sovereignty, ideology, etc, which might divide them if they became more central (Horangic *et al* 2016, Grossman 2017). In the case of the Klamath Basin settlements, the sovereignty of the four tribes was significant and was recognized (Gosnell and Kelly 2010), but did not become the focus. Nearly all the actors in the Klamath Basin settlements indicated that putting aside issues of identity, ideology, environmental ethics, and racism was necessary so they could emphasize and make progress on their common interests in the protection of and appropriate use of natural resources (Horangic *et al* 2016).

4. What are the outcomes of unlikely alliances?

The final component of our framework for understanding unlikely alliances involves the outcomes that arise from them. Here, we consider a range of potential impacts, both positive and negative, social and ecological, accruing to communities and individuals.

Given that any specific alliance is often motivated by a particular environmental problem, improvements to that issue are a natural possible outcome. Environmental outcomes are challenging to measure, and even more difficult to conclusively attribute to any particular process (Koontz and Thomas 2006, Thomas and Koontz 2011). Furthermore, environmental benefits often depend on the perspective of the actor, or on one's framing of the problem (Emerson and Nabatchi 2015). While some environmental impacts are plainly beneficial to all actors, many accrue disproportionately to specific actors. Notwithstanding these challenges, in all of our cases we found preliminary evidence of the importance of anticipated or perceived environmental improvements. For example, the Owyhee Initiative led to improved planning, regulation, and enforcement of motorized recreation use across the fragile sagebrush steppe ecosystem. The White Mountain Stewardship Project resulted in improved forest conditions and wildlife habitat in the region, along with increased songbird densities and understory herbaceous vegetation (Sitko and Hurteau 2010). Stewardship participants acknowledged that the long-term effects of treatments on forest structure could not be measured, but they did report reduced fire risk around communities. Conservation plans created by TGBPEA members in Thunder Basin included specific and measurable on-the-ground conservation actions. This diversity of environmental impacts demonstrates the potential range of unlikely alliances.

Unlikely alliances can impact the development of trust and social networks in important ways, for example, via an increase in the number or improvement in the quality of relationships actors have. This can involve meeting and developing relationships with actors from different backgrounds, thereby opening lines of communication which may have value in future conflicts (Rudeen *et al* 2012, Walker 2018). The diversified networks found in our cases led to an explicit recognition of improved trust and expanded social networks. For Thunder Basin, an increase in trust among the unlikely allies has resulted from sustained engagement and the multi-decadal development of networks of relationships among the actors. A similar process occurred in the Owyhee Initiative, where actors continue to remain involved and active a decade after the initial agreement.

Power relations can change as a result of an unlikely alliance, including adjusting, manipulating, or upending of the existing power dynamics (Purdy 2012). In addition, policy and markets can shift in ways that allow local users to maintain access to resources and benefits in ways that shift power dynamics (Huntsinger *et al* 2014). In both of our focal cases involving water governance, power relations shifted with the formation of the unlikely alliances. The development of the GBWN facilitated a coalescence of legal, economic, and scientific expertise, which in turn influenced the power dynamics and allowed the project opponents in the unlikely alliance to achieve several of their key goals. Actors negotiating in the Klamath Basin Settlements were aware of the means through which all players exerted power as well as recognizing how parties who were not participating in negotiations exerted power. Simultaneously, many actors appreciated their involvement in an unlikely alliance that shaped the overall dynamics of power and made possible finding a mutually-acceptable solution (Horangic *et al* 2016). These examples demonstrate both how unlikely alliances can be produced by shifts in the balance of political power but also serve to transform that balance themselves.

Many unlikely alliances change regulation or policy. For example, some unlikely alliances can provide new legal protections and regulatory relief to actors, which result from agreements made by an unlikely alliance. Similarly, policy change can result, such as when parties from different coalitions engage in coordination towards common, complementary, or at least minimum, non-interfering policy goals (Jenkins-Smith *et al* 2018). Legal protections were particularly important in the case of Thunder Basin, where a primary motivation of rancher and energy industry participation was to gain protection from the threat of species being listed under the Endangered Species Act via enactment of Candidate Conservation Agreements. These agreements provide participating landowners with safe harbor from Endangered Species Act requirements in the event that a species is listed. In the case of the negotiated settlements in the Klamath Basin these were intended to guide federal agency actions as well as congressional legislation.

Another outcome involves changing the narrative used in interpreting policy issues in ways that appeal to a diversity of actors; this can lead to greater cohesion and influence (Wilson 2006, Lejano and Ingram 2009). Such social learning within unlikely alliances, which here we take to mean 'a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interaction,' (Reed *et al* 2010) can also subsequently facilitate exchange of information. These exchanges can be more impactful when more diverse actors are connected in an unlikely alliance (Gerlak and Heikkila 2011) and are often most pronounced when actors have different belief systems (Siddiki *et al* 2017). Indeed, transformational ideas may arise from a mix of ideas and sectors that occur within an unlikely alliance (Heikkila and Gerlak 2019). In our cases, the

California Rangeland Conservation Coalition created new narratives around conservation that recognized the health of California rangelands and the diversity of species they support as largely due to grazing and other land stewardship practices employed by the ranchers that own and manage these lands.

A related impact occurs when individuals change their beliefs or behaviors as a result of an unlikely alliance. Belief change can occur when previously divergent beliefs converge, somewhat or completely, as a result of interactions that take place during an unlikely alliance (Weible and Sabatier 2009). Furthermore, belief change may subsequently result in behavioral change, such as with the adoption of a new management practice or program. In particular, if a number of stakeholders agree to a specific recommendation or decision, that recommendation is subsequently more likely to be adopted by a broader range of people (Ulibarri 2015).

Greater trust in scientific information represents a specific type of belief change that individuals might experience (Weible and Sabatier 2009). In our cases, we found evidence of increased use of scientific information in alliances that had critical participation by scientists or those that prioritized the use of science in some way. For example, in Thunder Basin, actors placed a high priority on scientific information. This focus ultimately led to the formation of the Thunder Basin Research Initiative, a stakeholder-driven collaborative research program involving multiple university and federal research entities.

In many instances, pooling of resources or information can promote greater efficiency in achieving goals for unlikely alliances (Olsson *et al* 2004). For example, the Owyhee Initiative established a Conservation and Research Center that is able to collect landscape-scale ecological data and use it to inform decision-making in ways that were not previously possible.

Only one case explicitly reported economic improvement. This was the White Mountain Stewardship project, where a strong motivation for the project was to facilitate environmental health and economic opportunity simultaneously.

All of the impacts outlined above have been beneficial. Yet it is important to note that potential impacts of unlikely alliances can also be detrimental. One example of an important potential negative impact is a lowest-common denominator solution, or a form of group-think, whereby in order to agree with each other, all parties have to make sacrifices and the final result actually makes a situation worse than if the alliance had never existed. We did not find strong evidence of this type of lowest-common denominator solution in any of our cases. Another important negative impact of an unlikely alliance is the fact that by their nature, they require a substantial investment of time and resources on the part of the actors involved. This is an important consideration, in particular

because as alliances continue, the cumulative cost of time invested increases. For example, the multi-decadal process involved in TBGPEA cost actors a huge amount of time and money. Similarly, while the Owyhee Initiative is serving as a model of success in Idaho and beyond, some participants have indicated they would not have the capacity to recreate the Initiative in other regions, given the large time commitment it involved.

5. Implications for the American West

Our framework underscores the idea that unlikely alliances have important implications for social-ecological systems in the American West. The formation of unlikely alliances can bring a diversity of resources to bear on a problem and can spread the geographic extent of responses. Broad-scale environmental challenges, meanwhile create common threats that may bring formerly disconnected managers together. Ecological systems thus have the potential to both drive and respond to unlikely alliances. Understanding feedbacks between these social and ecological dynamics is important for predicting where unlikely alliances may form, and how they will impact management decision-making and ecological conditions. Our framework provides a systematic means of understanding those interactions.

While unlikely alliances are not a new phenomenon, few previous studies have attempted to synthesize information about unlikely alliances across disciplines and resource sectors. Our case analyses in particular indicate that unlikely alliances in the American West have led to novel environmental solutions, reductions in power imbalances, enhanced trust among diverse actors, and strengthened social networks. Our findings suggest that leadership, resource pooling, and long-term commitment in the face of real or perceived crisis are critical factors related to unlikely alliance formation. These results reveal broad commonalities across disparate fields and sectors and confirm that unlikely alliances have the potential to transform conflicts, environmental outcomes, and social relationships within the context of natural resource governance in the American West.

As illustrated by our example cases, unlikely alliances can reorganize social dynamics, in particular through building trust and social networks, facilitating social learning, and via changes to policy. Despite the fact that alliances are fluid and often narrowly focused on one policy process, they can succeed in building durable and trusting relationships among actors, even after the conclusion of the target policy process. Trust is an important forerunner to principled engagement among diverse actors that supports additional collaborative efforts in the face of future conflicts or crises (Emerson and Nabatchi 2015). These coalitions therefore could also assemble more quickly and efficiently

in the face of a new challenge. Long-term alliances may also shift who is thought of as an unlikely partner. After almost 15 years of working together, many in California no longer view the members of the CRCC as unlikely. The mechanisms by which unlikely alliances reorganize social relationships, and the durability of these changes, will shape their impacts on environmental governance.

The potential for social learning among unlikely alliances indicates that traditional ways of thinking about the West and the divides that those ways of thinking engender could also be reimagined through an unlikely alliance. For instance, the rangeland cases presented here suggest that alliances may play an important role in breaking down longstanding divides between environmentalists and ranchers. Does the prevalence of unlikely alliances in rural land management mean that this fifty-year history of conflict will come to a close? Or will rural actors align in new ways to form stronger and more frequent opposition to urban interests, intensifying polarization on a new axis? The answer probably depends on who is *not* allying, and how, if at all, the alliance has shifted where power resides. A key issue for future research, therefore, will be better understanding how alliances reorganize not only environmental relationship but conflicts, and the extent to which these reorganizations remain primarily local, or become situated in the broader landscape of the American West.

Many of our cases resulted in new policy or regulation, suggesting that alliances could be an avenue to transform the context within which environmental policy has been mostly stagnant in the Western US since passing of 1970s environmental legislation. This avenue of using unlikely alliances to adapt policies could be important not only to create more relevant and effective strategies to address current environmental stressors, but could also play an important role in upending the intractable and polarized conflicts that have built up around this policy context. The extent to which unlikely alliances might transform national, rather than strictly local, policy debates remains an open question.

As landscape-scale environmental changes progress, contributing to cross-boundary challenges such as diminished water resources, wildfires, and biological invasions, landscape-scale management responses are increasingly necessary. Conditions and events on neighboring lands impact a jurisdiction's exposure to environmental stressors. This imposes limits on the effectiveness of efforts to restore, monitor, and protect ecosystem services and environmental functions if such activities stop at jurisdictional boundaries. As our framework and cases illustrate, unlikely alliances can extend management efforts across a landscape scale, matching them to environmental challenges and bringing the combined resources and knowledge of multiple actors to bear on common challenges. As environmental crises in the West become more

frequent, unlikely alliances may also become increasingly common.

There are a number of reasons to remain cautious about the conclusions we present here. One potential issue is that it is unclear whether our subset of cases is representative of the broader set of unlikely alliances in the American West and beyond. While most of the unlikely alliances we examined resulted in positive outcomes, the literature on unlikely alliances is sparse, and given the possibility that successful cases are more visible to researchers than unsuccessful cases, it may be that negative outcomes are much more common than our investigation of existing publications and case examples suggests. Another challenge involves accurately measuring both social and environmental outcomes, as well as understanding the long-term durability of those outcomes. Furthermore, the inherent complexity involved in systems of environmental governance means that multi-scalar, cross-jurisdictional feedbacks complicate our ability to cleanly identify causal relationships.

As a result of limited data availability, it is not yet possible to do a systematic or quantitative assessment of the effectiveness of unlikely alliances relative to other forms of collaboration. Given their potential for positive impacts, a fruitful avenue for future research could explore ways to enhance the formation and persistence of unlikely alliances in the American West. Future research could also work to compare the outcomes of unlikely alliances to those of more standard, 'likely' alliances in natural resource governance. Does the alliance facilitate or change the group's interest in and ability to resolve other outstanding issues or conflicts? If so, how long do these impacts last? Given the challenges and complexities outlined above in understanding unlikely alliances, key advances in our understanding will potentially be generated by scholars who use creative methods to overcome these challenges, particularly in light of the declining efficacy of survey-based research. Innovations in methodology may involve combining qualitative and quantitative methods in interesting ways, for example pairing ethnography with computational modeling (Koch *et al* 2019) or field experiments (Levy Paluck 2010).

In conclusion, we anticipate that unlikely alliances could become more prevalent as socio-environmental challenges continue to escalate. As the impacts of climate change progress, Western land managers are faced with increasingly complex problems and increasingly limited resources to address them. These challenges impact the individual goals and needs of a wide diversity of actors, but also cross boundaries and are larger in scope than any single jurisdiction. As a result, these difficulties spur cooperation and collaboration across jurisdictions, agencies, and sectors, suggesting that unlikely alliances will become more abundant as impacted actors seek tools and strategies. Developing a better understanding of how and when these alliances form, as well as their outcomes (both

positive and negative), is an important line of continued inquiry and may enable westerners and their allies to better shape, guide, and leverage unlikely alliances for mutually beneficial results.

Acknowledgments

Data availability

Any data that support the findings of this study are included within the article.

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References

Barry S, Schohr T K and Sweet K 2007 The California rangeland conservation coalition: grazing research supports an alliance for working landscapes *Rangelands* **29** 31–4

Benson D, Jordan A and Smith L 2013 Is environmental management really more collaborative? A comparative analysis of putative 'paradigm shifts' in Europe, Australia, and the United States *Environ Plan* A **45** 1695–712

Berkes F 2002 Cross-scale institutional linkages: perspectives from the bottom up *The Drama of the Commons* (Washington, DC: National Academy Press) ch 9

Berry K A and Mollard E 2010 *Social Participation in Water Governance and Management: Critical and Global Perspectives* (London: Taylor and Francis)

Bodin Ö 2017 Collaborative environmental governance: achieving collective action in social-ecological systems *Science* **357** eaan1114

Bohlen P J, Lynch S, Shabman L, Clark M, Shukla S and Swain H 2009 Paying for environmental services from agricultural lands: an example from the northern everglades *Frontiers Ecol. Environ.* **7** 46–55

Burr J L 2013 Burning across boundaries: comparing effective strategies for collaboration between fire management agencies and Indigenous communities *Occasion (Interdiscip. Stud. Humanit.)* **5** 1–16

CCRC 2015 Coalition Heritage—It all Started at a BBQ! (https://carangeland.org/2015/07/18/coalition-heritage-it-all-started-at-a-bbq/)

Charnley S, Sheridan T E and Nabhan G P 2014 *Stitching the West Back Together: Conservation of Working Landscapes* (Chicago, IL: University of Chicago Press)

Crapo M 2004 Collaboration as a means to formulating mutually beneficial environmental policy *Harv. J. Legis* **41** 351

Emerson K and Nabatchi T 2015 *Collaborative Governance Regimes* (Washington, DC: Georgetown University Press)

Emerson K, Nabatchi T and Balogh S 2012 An integrative framework for collaborative governance *J. Public Adm. Res. Theory* **22** 1–29

Gerlak A K and Heikkila T 2011 Building a theory of learning in collaboratives: evidence from the everglades restoration program *J. Public Adm. Res. Theory* **21** 619–44

Gosnell H and Kelly E C 2010 Peace on the river? Social-ecological restoration and large dam removal in the Klamath basin *USA Water Alternatives* **3** 362

Grossman Z 2005 Unlikely alliances: treaty conflicts and environmental cooperation between native American and rural white communities *Am. Indian Cult. Res. J.* **29** 21–43

Grossman Z 2017 *Unlikely Alliances: Native Nations and White Communities Join to Defend Rural Lands* (Seattle, WA: University of Washington Press)

Hahn T, Olsson P, Folke C and Johansson K 2006 Trust-building, knowledge generation and organizational innovations: the role of a bridging organization for adaptive comanagement of a wetland landscape around Kristianstad, Sweden *Hum. Ecol.* **34** 573–92

Heikkila T and Gerlak A K 2019 Working on learning: how the institutional rules of environmental governance matter *J. Environ. Plan. Manage.* **62** 106–23

Homes G F 2013 Obituary for Betty Louise (Lighthall) Pellatz (https://gormanfh.com/notices/BETTY-PELLATZ)

Horangic A, Berry K A and Wall T 2016 Influences on stakeholder participation in water negotiations: a case study from the Klamath Basin *Soc. Natural Resour.* **29** 1421–35

Huffman J L 2009 Comprehensive river basin management: the limits of collaborative, stakeholder-based, water governance *Nat. Resour. J.* **49** 117

Huntsinger L, Sayre N F, Macaulay L, Sayre N F and Macaulay L 2014 Ranchers, land tenure, and grassroots governance: maintaining pastoralist use of rangelands in the United States in three different settings *Governance Rangelands* ed P M Herrera, J Davies and P M Baena (London: Taylor and Francis) ch 4 pp 84–115

Jenkins-Smith H C, Nohrstedt D, Weible C M, Ingold K, Nohrstedt D, Weible C M and Ingold K 2018 The advocacy coalition framework: an overview of the research program *Theories Policy Process* (London: Taylor and Francis) pp 135–71

Kitayama S, Conway L G, Pietromonaco P R, Park H and Plaut V C 2010 Ethos of independence across regions in the United States: the production-adoption model of cultural change. *Am. Psychologist* **65** 559–74

Koch J, Friedman J R, Paladino S, Plassin S and Spencer K 2019 Conceptual modeling for improved understanding of the Rio Grande/Río Bravo socio-environmental system *Socio-Environment. Syst. Model.* **1** 16127

Koebele E A 2019a Cross-coalition coordination in collaborative environmental governance processes *Policy Stud. J.* accepted (https://doi.org/10.1111/psj.12306)

Koebele E A 2019b Integrating collaborative governance theory with the advocacy coalition framework *J. Public Policy* **39** 35–64

Koontz T M and Thomas C W 2006 What do we know and need to know about the environmental outcomes of collaborative management? *Public Adm. Rev.* **66** 111–21

Lebel L, Anderies J M, Campbell B, Folke C, Hatfield-Dodds S, Hughes T P and Wilson J 2006 Governance and the capacity to manage resilience in regional social-ecological systems *Ecol. Soc.* **11** 19

Lejano R P and Ingram H 2009 Collaborative networks and new ways of knowing *Environ. Sci. Policy* **12** 653–62

Levy Paluck E 2010 The promising integration of qualitative methods and field experiments *The Annals of the Am. Acad. Political Soc. Sci.* **628** 59–71

Mahoney C 2007 Networking versus allying: the decision of interest groups to join coalitions in the US and the EU *J. Eur. Public Policy* **14** 366–83

McGinnis M D 1999 *Polycentric Governance and Development: Readings from the Workshop in Political Theory and Policy Analysis* (Ann Arbor, MI: University of Michigan Press)

Newig J and Fritsch O 2009 Environmental governance: participatory, multi-level—and effective? *Environ. Policy Governance* **19** 197–214

Olsson P, Folke C, Galaz V, Hahn T and Schultz L 2007 Enhancing the fit through adaptive co-management: creating and maintaining bridging functions for matching scales in the Kristianstads vattenrike biosphere reserve, Sweden *Ecol. Soc.* **12** 28

Olsson P, Folke C and Hahn T 2004 Social-ecological transformation for ecosystem management: the development of adaptive co-management of a wetland landscape in Southern Sweden *Ecol. Soc.* **9** 2

Olsson P, Gunderson L, Carpenter S, Ryan P, Lebel L, Folke C and Holling C S 2006 Shooting the rapids: navigating transitions to adaptive governance of social-ecological systems *Ecol. Soc.* **11**

Ostrom E 2010 Polycentric systems for coping with collective action and global environmental change *Glob. Environ. Change* **20** 550–57

Phinney R 2017 *Strange Bedfellows: Interest Group Coalitions, Diverse Partners, and Influence in American Social Policy* (Cambridge: Cambridge University Press)

Purdy J M 2012 A framework for assessing power in collaborative governance processes *Public Adm. Rev.* **72** 409–17

Reed M *et al* 2010 What is social learning? *Ecol. Soc.* **15** r1 (https://research-repository.st-andrews.ac.uk/handle/10023/1624)

Rickenbach M, Schulte L A, Kittredge D B, Labich W G and Shinneman D J 2011 Cross-boundary cooperation: a mechanism for sustaining ecosystem services from private lands *J. Soil Water Conserv.* **66** 91A–6A

Robbins P, Meehan K, Gosnell H and Gilbertz S J 2009 Writing the New West: a critical review *Rural Soc.* **74** 356–82

Rudeen A K, Fernandez-Gimenez M E, Thompson J L and Meiman P 2012 Perceptions of success and the question of consensus in natural resource collaboration: lessons from an inactive collaborative group *Soc. Nat. Resour.* **25** 1012–27

Sabatier P A, Focht W, Lubell M, Trachtenberg Z, Vedlitz A and Matlock M 2005 *Swimming Upstream: Collaborative Approaches to Watershed Management* (Cambridge, MA: MIT Press)

Schlager E and Blomquist W 2008 Embracing watershed politics *Perspect. on Politics* **9** 149–50

Sheridan T E 2007 Embattled ranchers, endangered species, and urban sprawl: the political ecology of the new American West *Ann. Rev. Anthropol.* **36** 121–38

Shigley P 2006 Coalition Forms For Rangeland: Strange Bedfellows Agree To Protect Working Landscapes (http://cp-dr.com/articles/node-277)

Siddiki S, Kim J and Leach W D 2017 Diversity, trust, and social learning in collaborative governance *Public Adm. Rev.* **77** 863–74

Sitko S and Hurteau S 2010 Evaluating the impacts of forest treatments: the first five years of the white mountain stewardship project (The Nature Conservancy) (http://www.fs.fed.us/r3/asnf/stewardship/multi-party-monitoring.shtml)

Thomas C W and Koontz T M 2011 Research designs for evaluating the impact of community-based management on natural resource conservation *J. Nat. Resour. Policy Res.* **3** 97–111

Ulibarri N 2015 Tracing process to performance of collaborative governance: a comparative case study of federal hydropower licensing *Policy Stud. J.* **43** 283–308

Walker P 2018 *Sagebrush Collaboration: How Harney County Defeated the Takeover of the Malheur Wildlife Refuge* (Corvallis, OR: Oregon State University Press) (https://muse.jhu.edu/book/61943)

Weible C M, Heikkila T and Pierce J 2018 Understanding rationales for collaboration in high-intensity policy conflicts *J. Public Policy* **38** 1–25

Weible C M and Sabatier P A 2009 Coalitions, science, and belief change: comparing adversarial and collaborative policy subsystems *Policy Stud. J.* **37** 195–212

Welsh L W, Endter-Wada J, Downard R and Kettenring K M 2013 Developing adaptive capacity to droughts: the rationality of locality *Ecol. Soc.* **18** 7

Whear J C 2015 Fountains in a desert: place-making and collective action in snake valley, great basin against southern nevada water authority's groundwater development project *PhD Thesis* University of Missouri–Columbia

Wilson R K 2006 Collaboration in context: rural change and community forestry in the four corners *Soc. Nat. Resour.* **19** 53–70

Wondolleck J M and Yaffee S L 2000 *Making Collaboration Work: Lessons From Innovation In Natural Resource Managment* (Washington, DC: Island Press)

Young O R 1994 The problem of scale in human/environment relationships *J. Theoretical Politics* **6** 429–47

Young O R 1994 *International Governance: Protecting the Environment in a Stateless Society* (Ithaca, NY: Cornell University Press)