

Discourse, political argumentation, and institutional development in a changing coastal commons

Alejandro García Lozano, Hillary Smith, Xavier Basurto

Abstract

In the coming decades of accelerating climate change, drastic declines and species distribution shifts are expected to impact global fisheries. These changes will have complex repercussions for small-scale fisheries, which play a crucial role in supporting livelihoods and food security throughout the world. In Mexico, the impacts of climate change on coastal small-scale fisheries are increasingly salient and intersect with contentious histories of state intervention and market liberalization. Fishing cooperatives in Mexico organize into regional-level federations, which in turn form national-level confederations—these are multi-level, nested organizations for collective action and political representation. In this paper, we examine how fishing organizations and government actors interact in the general assemblies of one confederation, the Mexican Confederation of Fishing and Aquaculture Cooperatives (CONMECOOP), which represents 338 cooperatives from 25 regional federations. This analysis is grounded in discourse analysis and ethnographic observation of the 2016 and 2017 general assemblies of CONMECOOP. The general assemblies serve as political spaces for open, democratic participation, involving discussions between fishers and federal government representatives. We demonstrate how representatives of fishermen use these assemblies to mobilize political will and to amplify the voices of small-scale fishers. We also examine how climate change and other key problems are co-constructed in these political arenas through discourse and discursive practices. Insights from this case are used to extend conversations about the role of discursive practices in shaping institutional change.

1. Introduction

In the coming decades, accelerating processes of climate change are likely to exacerbate ongoing problems in the governance of the world's marine fisheries. Predicted declines in productivity and species distribution shifts portend significant impacts on local and national economies, food security, and ecological communities (Perry et al. 2005; Allison et al. 2009; Sumaila et al. 2011; Golden et al. 2016). Understanding impacts on small-scale

fisheries is especially important because they generate the majority of global landings, fisheries jobs, and seafood for human consumption (FAO & WorldFish 2008). Small-scale fisheries tend to be characterized by relatively low capital investment, high labor intensity, and usually small boats targeting a variety of species with variable gear types (Salas et al. 2007). However, most definitions of small-scale fisheries emphasize technological dimensions and labor performed at sea, in effect obscuring other important social-ecological relations in which fisheries are embedded (Smith et al., forthcoming).

In Mexico, the small-scale fishing sector is a significant producer, accounting for approximately 97% of all vessels and involving hundreds of thousands of fishers (Salas et al. 2011). The perceived impacts of climate change, linked inextricably to other issues (e.g., illegal fishing, declining stocks), are becoming increasingly salient for coastal small-scale fishers in Mexico. These dynamics also intersect with specific histories of centralized management and state-led economic reform. In the 1970s, the Mexican government initiated a political and economic project to ‘develop’ the nation’s fisheries, which remained relatively unexploited until then, to promote economic growth (Hernandez & Kempton 2003). These efforts formed part of an ongoing trajectory of interventionism by the state. Initially, state initiatives involved promoting small-scale production through infrastructure investments, exclusive access rights for cooperatives, and incentivizing exports (Young 2001). In the 1990s, the state reduced its own capacities through neoliberal economic reforms (i.e., reducing subsidies, promoting private investment, trade liberalization), while simultaneously retaining centralized control of fisheries permits and access rights (Young 2001; Hernandez & Kempton 2003). The capacities of two federal agencies serve this latter purpose: INAPESCA (the National Institute of Fisheries and Aquaculture) is responsible for conducting scientific research necessary for the management of fisheries, while CONAPESCA (the National Commission of Fisheries and Aquaculture) is the regulatory body that assigns fishing permits and concessions, and administers subsidy programs, among other tasks.

Historically, cooperatives have been a key organizational model for small-scale fishers in Mexico, where they have been defined as social organizations formed by individuals with

common interests, “based on the principles of solidarity, individual efforts, and mutual aid for the purpose of satisfying individual and collective needs, through the realization of economic activities of production, distribution, and consumption of goods and services.”¹ The history of cooperativism in Mexico is also embedded in the context of state intervention. Since the 1920s, post-revolutionary governments influenced by socialism incentivized the formation of fishing cooperatives by granting exclusive access rights over certain species to fishers organized into cooperatives (McCay et al. 2014; COBI 2015). This practice waned over time, but reemerged in policy changes of the 1970s along with other incentives such as technological subsidies (i.e., funding for vessels and gear) and capacity building programs (McCay et al. 2014; COBI 2015). Cooperativism is an important form of collective action, not only for allowing fishers to access government benefits and fishing rights collectively, but also for the provision of other services (e.g., freshwater, road infrastructure) in coastal communities (Basurto et al. 2013). Cooperative firms in Mexico have also been able to overcome high transaction costs associated with commercialization of landings (Basurto et al. 2013).

Additionally, fishers have harnessed the cooperative model to form nested, multi-level organizations for political representation and collective action. That is, cooperatives have unified into regional federations, which in turn form national-level confederations. The first national confederation, CONACOOOP (National Confederation of Fishing Cooperatives), was created in 1973 and represents approximately 20% of all fishing cooperatives in Mexico (COBI 2015). In 2014, several federations departed from this group and formed a new confederation, CONMECOOP (Mexican Confederation of Fishing and Aquaculture Cooperatives), which represents 25 federations, 338 cooperatives and approximately 10,578 individual members (M. Nenadovic, *pers. comm.*). Organizing into confederations has allowed small-scale fishers to gain a voice in policy decisions, for instance, by gaining representation in national policy councils (Espinosa-Romero et al. 2014).

¹ Translated from Mexico’s General Law of Cooperative Societies (<http://www.diputados.gob.mx/LeyesBiblio/pdf/143.pdf>)

The purpose of this paper is to examine the kinds of exchanges taking place in political spaces created by confederations, wherein fishers interact extensively with government representatives. Specifically, we examine the general assemblies of CONMECOOP as forums for political exchange in which actors enact discursive practices that aim to shape policy processes. We use critical discourse analysis to examine these dialogues, focusing especially on discussions of climate change and its impacts on small-scale fisheries, but also other key governance problems. Our work demonstrates how social actors position themselves in relation to other actors through discursive practices; how actors make argumentative claims through narratives and rhetorical devices; and how certain narratives and discursive elements are deployed to reify or establish common understandings of fisheries problems, influencing the kinds of solutions that emerge. From a theoretical standpoint, this paper aims to catalyze greater dialogue about the influence of discursive practices on policy and institutional change, particularly in commons scholarship.

1.1. Methods and Data Preparation

We audio-recorded and transcribed the proceedings of the annual general assembly of CONMECOOP, which took place in Mexico City during March of 2016. We analyzed transcripts inductively and created a coding structure using NVivo, a computer-assisted qualitative data analysis software, which allowed us to organize the textual data according to emerging themes in the dialogue. We also attended and recorded the 2017 annual assembly, which took place March of this year in Mexico City, and conducted ethnographic observation during both assemblies. We revisited the audio during analysis to examine emphases or other contextual cues in the discussion. The general assemblies have several functions, such as reviewing the confederation's activities during preceding years and providing democratic space for determining future activities or electing leadership positions. Here we focus especially on parts of the 2016 assembly that involved open forums for questions and discussion between fishers and representatives of the federal government.

2. Bridging ontological divides: Discourse, power, and institutional change

Fisheries can be conceptualized as common-pool resources (CPR), in which one user's appropriation subtracts from the total resource pool, and from which it is costly to exclude unauthorized users (Ostrom 1990). The field of CPR or commons scholarship emerged partly in response to influential ideologies like bioeconomics and Malthusian demographics, which draw a linear relationship between population growth and resource depletion. Hardin's 'tragedy of the commons' emerges as the most emblematic metaphor for this line of thinking, which proposes centralized control or privatization as the only solutions to resource degradation (Ostrom 1990). Several commons scholars have critiqued the assumptions of this tragedy narrative (e.g., Feeny et al. 1990), and demonstrated how resource users can communicate to develop institutions (i.e., rules and norms), therefore avoiding tragedy and giving rise to enduring institutional systems for governing resources (Ostrom 1990). This field has made significant contributions to the study of common property, social-ecological systems, and factors that influence governance and institutional change (Agrawal 2001; Berkes et al. 2003; Ostrom 2005).

One key contribution of commons scholarship is the Institutional Analysis and Development (IAD) framework, a conceptual tool intended to foster a common 'metatheoretical language' for analyzing diverse institutional situations and integrating different theories and models (Ostrom 2011, p. 8). The IAD framework situates social actors within action situations, which are shaped by various contextual elements (e.g., the biophysical world, existing institutional arrangements), in order to analyze various interactions and outcomes. The framework is useful because it allows us to envision multiple spaces for decision-making by actors in action situations, and to theorize the actions they take in different ways. Some scholars have theorized policy change as driven by coalitions of actors making use of objective knowledge to further their interests (Sabatier 1988); others as driven by the influence of interest groups on bureaucratic processes (Moe 1995). As Moe (1995) demonstrates for the United States, public

bureaucracies are not designed for efficiency, effectiveness, or because they lead to the most equitable outcomes. Rather, they are shaped by the interests and actions of multiple actors. One key mechanism through which actors assert their interests and actively shape policy processes is their use of discourse, which is itself constitutive and constituted by prevailing narratives and discursive patterns (Dryzek 2005; Clement 2010).

Institutionalists and other scholars of the commons have acknowledged the role of language and ideas in constituting social realities, identities, and the social order (Aligica & Boettke 2009). Yet paradoxically, despite explicit efforts to engage with language and linguistic elements (e.g., Crawford & Ostrom 1995; Basurto et al. 2010), there has been relative inattention to the ways discursive practices mediate the material force of ideas (i.e., their effects on the material world). In addition, the work of commons scholars has been critiqued as largely ahistorical and apolitical (Cleaver 2000; Clement 2010), and therefore also somewhat disengaged from the political influence of the core ideas it represents—for instance, how work on the global commons can reinforce Western notions of development and modernization (Goldman 1997), or how some contributions of the field have coalesced into a prescriptive management discourse, premised on decentralization as a normative goal (Bresnihan 2016).

Partly at the root of these critiques are ontological and epistemological differences. Institutional approaches are useful for understanding the incentives actors face in policy settings, or mechanisms available for deliberation. However, because these analyses often depart from an individualistic epistemology (i.e., methodological individualism, Aligica & Boettke 2009), premised to varying degrees on economic rationality (i.e., self-interested, utility maximizing actors), they can obscure the relational and performative dimensions of policy making and institutional change. By relational we mean that all seemingly concrete or structural phenomena are constituted from relations rather than discrete entities with determinate properties (Barad 2007; Moore 2015). Performativity entails examining the practices through which particular realities are enacted, embodied, and reproduce—a concept for which we are heavily indebted to the work of feminist scholar Judith Butler (Barad 1998, 2007). Relational ontologies differ drastically from more anthropocentric

positions that reflect dualistic understandings of ‘social’ and ‘natural,’ or that conceive of such categories as separable, inherent, or essential (Castree 2003).

Accordingly, here we depart from a more relational ontological perspective and argue that fisheries and policies to govern them are (1) co-produced by the intertwined agencies of human and more-than-human natures (Bresnihan 2015; Moore 2015; Barad 2007; Haraway 2008), and (2) constituted partly through discursive practices and their relations to the material world (Hajer 1995; Fairclough & Fairclough 2012; Barad 2007). By more-than-human natures, we mean that non-human components of world-ecological systems directly shape the possibilities for human action, and that societal processes (e.g., resource extraction, capital accumulation) do not act *on* nature, but *through* nature (Moore 2015). So-called ‘bio-physical elements’ are therefore not ‘exogenous variables,’ as suggested even in more politicized analyses using the IAD framework (e.g., Clement 2010), but integral actants shaping action situations. Moreover, we understand discourse as an “ensemble of ideas, concepts, and categorizations that are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities” (Hajer 1995, p. 44). This definition, which reflects the importance of practices through which issues acquire meaning and come to matter (Barad 1998, 2003), is useful for examining the performative and embodied nature of political relations that constitute policy processes and institutional change.

In this analysis, we draw from social-interactive discourse analysis, rooted in the work of theorists like Davis & Harré (1990) and Billig (1987), but extended by Hajer (1995) for the study of environmental discourse. Several kinds of environmental discourses have been studied using this approach, and critical discourse analysis more generally, including acid rain, soil degradation, and deforestation issues (Hajer 1995; Forsyth 2001; Hajer & Versteeg 2005; Dryzek 2005). A major emphasis of the social-interactive approach is the argumentative nature of political struggles, or how actors produce and shape discourse through argumentation. According to this perspective (which is also influenced by Michel Foucault’s theories of power and subjectivity; e.g., Foucault 1980), human interaction and reality are constituted through the exchange of arguments and people acquire certain

subject-positions through the discursive practices and techniques available to them, which they employ tactically. Regarding these strategic positionings, Hajer emphasizes Anthony Giddens' concept of *duality of structure*: "Social action originates in human agency of clever, creative human beings but in a context of social structures of various sorts that both enable and constrain their agency" (Hajer 1995, p.58). A key objective of this paper is to examine how actors position themselves in relation to specific socio-environmental problems and to other relevant actors in order to influence fisheries policy in Mexico. We focus on discursive practices, as well as some material ones (e.g., creating political and collaborative spaces), through which actors' agency comes to shape the representation of crises, problems, and other phenomena (Fairclough and Fairclough 2012; Barad 2007).

Acknowledging the role of argumentation in environmental politics, Hajer's (1995) work draws attention to rhetorical or persuasive devices, particularly the Aristotelian rhetorical elements of *Ethos*, *Pathos* and *Logos*. *Ethos* refers to the character of the speaker, whose authority, reputation or credibility are invoked in the making of an argument. *Pathos* refers to emotional appeals, while *Logos* is related to the logical or rational basis for the persuasiveness of an argument. Additionally, the Sophist rhetorical concept *Kairos* refers to persuasion through the timeliness or appropriateness of an argument or author (Hess 2011). *Kairos* is a useful concept for examining emerging discourses about climate change and the ongoing preoccupation with environmental crises (Nicotra & Parrish 2010). Attending to these rhetorical elements can help discern how factors such as credibility, trust and acceptability influence the use and uptake of certain discourses. They are also useful for examining how discourses coalesce into narratives or storylines.

Narratives and storylines depend partly on the possibility for multiple interpretations (which Foucault referred to as the 'tactical polyvalence' of discourses)—they allow actors to draw meaning from independent events, such as fish mortality in the case of acid rain discourse (Hajer 1995). At issue here is not whether storylines are 'true' but rather the way actors employ them to construct particular issues. Attending to these discursive elements, in addition to the social and historical context, can be useful for determining how environmental problems are constructed and how regulations come to take shape.

Narratives can become structured and influential when actors' credibility depends on their use of specific discourses, and they can become institutionalized (i.e., incorporated into formal policy or legislation; Hajer 1995, Dryzek 2005). Storylines or narratives are adopted by emergent *discourse coalitions*, groups of actors united in their attraction to and deployment of particular narratives. According to Hajer, discourse coalitions form "if a common discourse is created in which several practices get a meaning in a common political project" (1995, p. 65). These differ from Sabatier's (1988) policy coalitions in that actors need not have the exact same interests or belief systems to share in the tactical use of common storylines (Hajer 1995).

The Mexican fishers' confederation (CONMECOOP) can be considered a type of interest group with incentives to position itself advantageously in relation to government representatives and other bureaucrats. Following Moe (1995), government actors' responses to fishers are likely also shaped by their own incentive structures, such as length of office tenure. Examining discourse in the context of the CONMECOOP assembly opens the possibility of understanding how fishers and government officials attempt to influence the policy processes—not under the assumption that they share exactly the same interests or beliefs—but by examining their respective interests in relation to the discursive practices they employ.

The production of meanings and knowledge through discourse is inherently political because some actors have greater power in determining which knowledge is legitimate, and accordingly what is understood as truth (Foucault 1994). At the same time, the use of power is diffuse and manifests itself in the micro-level practices of actors, including the strategic use of discursive elements (Hajer 1995; Foucault 1980). In the context of our case study, fishermen enter conversations with government with unequal footing. The ultimate decision-making authority resides with central agencies. Collective action, particularly in the form of national level confederations, is a key mechanism for fishers to navigate and contest the state's institutional structures. Through our analysis in the following sections, we seek to demonstrate how actors co-produce understandings of climate change and other problems at the CONMECOOP assembly. We also examine how discursive patterns

and practices reify certain kinds of knowledge, as well as the ways actors position themselves in relation to one another and within particular narratives.

4. 'Problemáticas' and subject positioning: representing problems and solutions

In the general assemblies of CONMECOOP, there is a specific structure for engagement between fishers and government actors. One confederation member is elected as moderator for the assembly. The conversation with government representatives is a relatively open forum in which any fisherman can ask a question or make a comment, followed by response from the representative, or sometimes followed by additional comments from other fishermen before the response. Argumentation is therefore a central element of these discussions. Fishermen first welcome and address the representative from CONAPESCA, the Director of Organization and Development. After speaking with him at length, a separate dialogue takes place between fishermen and a researcher who represents INAPESCA. The question-answer structure of the dialogue allows actors to position themselves in particular ways, bring up issues they want to discuss, and engage answers to questions directly. This structure lends itself to the study of discursive elements, argumentation, and problem framings.

Throughout the assembly, both fishers and government officials address specifically several problems related to the management of fisheries. Some of the major problems included: subsidies programs through CONAPESCA, illegal fishing and poaching, monitoring and enforcement, and climate change (we examine the latter in detail in the following section). The overall tone of the assembly indicates both a preoccupation with these problems and a focus on producing strategic and direct action to solve them. In the words of one fisherman, this is not an “assembly of lamentations. We want this to be [...] an assembly of proposals”. For most actors, the focus on problem-solving is evidently related to making concrete plans for addressing different issues. Both fishermen and CONAPESCA’s representative emphasize the need to create a strategic plan document during the assembly, one that can be used as leverage and evidence of collaboration to higher levels of

government. Other actors place emphasis on demanding that things are done with immediacy and urgency (invoking *Kairos*), that neglected segments of the fishing sector be brought to the attention of the central government, or that fishers take matters into their own hands.

Generally, fishers in the assemblies make several kinds of rhetorical appeals that serve to reinforce their credibility and the urgency of the problems they face. Key arguments are summarized in Table 1 and include: (1) appeals to historical experience, or to the importance of the 'social sector'; (2) appeals to the high productivity of the small-scale sector, as well as declines thereof; (3) conflicts with the industrial sector or foreign fleets; and (4) implicit threats of violence or resistance. These kinds of arguments are related both to the speakers' subject-positions and to the kinds of rhetorical language they use. An appeal to *pathos* or emotion is evident in fishers' implicit threats to promote resistance, potentially violent in nature, if problems are not addressed. For instance, one fisherman references past conflicts in Yucatán over illegal sea cucumber in which local fishermen set fire to cars and vessels of Chinese fishers and drug cartels (see Table 1[4]). Another fisherman speaking on behalf of federations in the state of Chiapas positions the sector in relation to the federal government while also appealing to *pathos* in the audience: "More than anything this is a cry for help from the fishing sector of Chiapas [...] We are fishermen who need our federal government." Asking for the federal government's aid, this fisherman also positions fishers relative to regional and local governments, which he describes as 'avoidant' and 'lazy' in responding to fishers' issues: "The social sector has hope. We can't do it alone. With provincial governments, with some there is respect, but with others there is total avoidance. So, our only option is the federal government. We must face the issues together in a pragmatic way."

A distinct kind of positioning occurs when fishers invoke the importance of small-scale fisheries as a productive and important social sector, rather than simply a commercial or technological sector. This particular positioning might reflect histories of how small-scale fishers see themselves in relation to labor, rights, and their role in society, which differs from dominant definitions of small-scale fishing sectors based on technology (Smith et al.

forthcoming). Adopting this position might serve to evoke ethical and moral considerations from the audience (government actors), urging them to consider explicitly the human dimension of fisheries. This kind of argument also works to position them in contrast to the industrial sector, with whom they express having conflict at least nine distinct times in this discussion.

Table 1. Rhetorical arguments made by fishermen in the 2016 assembly

<i>Type of rhetorical argument</i>	<i>Example quotes</i>
(a) Historical involvement and challenges of the small-scale sector	<p><i>"I have been a fisherman since 1962."</i></p> <p><i>"Finally, some of us have been fishing for over 40 years and we struggle to come to this meeting, but here we are."</i></p>
(b) Productivity of the small-scale fishing sector	<p><i>"[...] for the particular case of Guerrero, Oaxaca and Chiapas, which are the states I represent here and have the most product in the country."</i></p> <p><i>"Here we produce an economic volume from fishing that in others, even if they have better numbers, they have a low volume of production [...] we have high value."</i></p>
(c) Conflict between the small-scale and the industrial sector	<p><i>"I come from the federation of Guasave to tell you we have a serious problem with tuna and sardine vessels [...] they come to the shores and they take everything."</i></p>

(d) Implicit threats of resistance

“We have to take very seriously what we are getting into, because people blow up and fishermen are very volatile, especially when they need money.”

“I said, friends, this is not going to get resolved. Let’s burn the damn boats. We burned the boats and it got resolved.”

“The sea cucumber [...] is protected [...] and we might open it up but for us, not for some bastards with goat horns to come threaten us. We ran them out and burned their car and they left.”

In response to fishermen’s questions and demands, both government representatives at the 2016 assembly make efforts to (1) reiterate and reinforce commitments by federal agencies (Table 2). Their stated commitments include continuing to work together with fishermen, to ensure ongoing collaboration, and to ensure intended benefits of fisheries policies go to the coastal or small-scale sector. Other responses by government officials included, (2) encouraging fishermen to exert their own organizational power and put demands on senators to increase the budget available for the fisheries agencies; (3) using scientific explanations of climatic or other environmental phenomena, thereby appealing to *logos*, asking fishers to be patient with scientific assessments; and (4) and otherwise shifting the responsibility over certain tasks to the fishing sector (e.g., arguing fishers must complete paperwork correctly for processes to be expedient). Examples of these responses can be found in Table 2.

Government actors solidify their stated commitments partly by positioning themselves in relation to ostensibly trusted and respected members of their broader agencies, as well as through rhetorical arguments. For example, the representative from CONAPESCA begins his introduction by positioning himself as a direct link to the National Commissioner of Fisheries and Aquaculture, saying the commissioner is a committed official who is always thinking about fishers and who sends them an affectionate greeting. This is a clear appeal

to *ethos*, but also signals the speaker’s allegiance to his organization. In addition, while he emphasizes his limited ability to take action on several issues given his position at CONAPESCA, he also positions himself as *vocero* (spokesperson) or *altavoz* (loudspeaker) to his superiors and to other departments in CONAPESCA, making himself synecdoche to the organization (i.e., a part that comes to represent the whole). Speaking for the broader institution, he tells the fishermen: “Take me as a loudspeaker to all the other directors to be able to transmit everything you have [...] We are here representing CONAPESCA in general, and any issue we can help facilitate, well here we are.” This discursive positioning gains momentum in the assembly, as fishermen uptake the same language to frame subsequent exchanges. For instance, one fisher begins his comment by saying, “I come from Yucatán [...] and I come to tell you about a problem we have here with fishing, since you said you want to be a spokesperson to your leaders in CONAPESCA.”

Table 2. Major types of responses by government actors to fishermen’s demands.

<i>Type of response</i>	<i>Example quotes</i>
(1) Reinforcing commitments to collaboration	<i>“As you can see, we are truly compromised with the sector [...] and now that we are working closely with the support of the secretary who knows well the issues of the sector [...] the work we are doing, and the basis and support of the studies comes directly from you. That is something we must acknowledge and thank you for.”</i>
(2) Encouraging fishermen to exert their power as citizens	<i>“The other thing I think is best, especially now that election time is coming in many states, I think that with you who are leaders, you who are always in contact with the legislative [government], and who are sometimes the ones who practically decide in congress what amounts go to each program, we have to seek a greater budget for the fishing sector”</i>

(3) Scientific, rational, or economic explanations of management problems

“Effectively, when we are talking about benthic resources like clams and conch, and the management of the fisheries is short-term, we have to do the studies to define under what conditions the populations are. And based on that, we can define the definite quota for the exploitation of that species.”

(4) Shifting responsibility to fishermen

“As government officials, we pay attention to the documents presented by fishermen [...] that say, I present this, I have this permit, I am part of this cooperative [...] In the face of this, there is little we can do.”

Similarly, the representative from INAPESCA invokes the character of his supervisor, whom he describes as a committed public official working “hand in hand” with fishers. This could be interpreted as demonstrating his reliability as a representative while reinforcing his agency’s commitment to collaboration. At one point, after referencing his supervisor, he says: “INAPESCA is an institution that works directly with you. We are working day after day, hand in hand with you. The studies and investigations we do, we couldn’t do without you, and we do it day in and day out, you all know it.”

The representative from INAPESCA never explicitly offers himself as loudspeaker of fishers’ issues to his broader agency, but fishermen refer to him in this way and urge him to play this role. One fisherman begins his public comment as follows: “Doctor, taking advantage that you are here as spokesperson to the institute [INAPESCA], there is something the official forgot about.” The speaker explains some issues of inequity in access related to the closure of shrimp fisheries, and concludes by saying, “Take this into account. Become our spokesperson if it is necessary.” These are moments in which actors call one another into being—the fishermen urge the representative to take on a particular role as advocate for the sector. Through synecdoche, these positionings also work as articulations of ongoing questions about the role of the state and the purpose of fisheries research in sustaining commodity production and promoting distributional justice.

Throughout this discussion, fishermen and government actors use the word *problemática* (which in Spanish refers to a set of problems) to invoke particular constellations of issues. Simplified names work as heuristics for complex management issues. For example, *furtivismo* refers to illegal fishing and poaching. Illegal fishing may be distinct from poaching (e.g., fishing without a license versus poaching valuable or protected species), and could refer to conflicts within the small-scale sector or with foreign vessels. Each of these problem framings invoke a particular storyline along which there are some patterns of convergence (e.g., all actors recognize there are enforcement problems), but differences are likely to exist in the ways fishers and government actors perceive these issues. Referring to *furtivismo*, one fisherman says, “Everyone knows the subject,” before going on to argue that illegal fishing is the reason all species are declining. Although illegal fishing is obviously a major issue, this fisherman’s use of hyperbole belies the likelihood that fisheries declines result from the interaction of multiple causal factors, and other actors in the assembly might disagree about which one is primarily to blame.

In addition, although they are discussed discretely, *problemáticas* are interrelated. For instance, the perceived lack of aid received through CONAPESCA’s subsidy program (PROPESCA) is related to the fact that some fishers do not have permits for species currently being supported through compensation for closures (*vedas*). Permit allocation is itself influenced by scientific stock assessments carried out by INAPESCA to determine which fisheries are rentable (i.e., profitable), according to the representative from INAPESCA, in order to issue permits. Nonetheless, invoking these different *problemáticas* allows each actor to establish a relatively shared problem framing when addressing a government representative, responding to a question, or proposing a given solution. In the following section, we examine more closely how the problem of climate change is discussed and the narratives that emerge in this problem framing, as well as the solutions proposed. Discussions about climate change, which were especially central in the 2016 assembly, are useful for examining the narratives and arguments used by different actors, their similarities, and the formation of discourse coalitions.

4.1. Climate change discourse in the 2016 CONMECOOP assembly

Climate change discourse tends to be characterized by urgency, timeliness, and the pressing nature of the issue; epitomized by the rhetorical concept of *Kairos* (Nicotra & Parrish 2010). Understandably, the tone of many ongoing conversations can be summarized as follows: Climate change is happening now, so what are we going to do about it? However, in some cases there has been a sense of apocalyptic defeatism in describing climate change and other environmental crises, which tends to preclude the possibility of ‘staying with the trouble’ and actually engaging in the kinds of generative adaptations that emerge from relationships between unlikely actors, both human and non-human (Haraway 2016). Conversely, some strands of discourse about the climate crisis reflect what Dryzek (2005) refers to as administrative rationalism—this kind of political and environmental discourse positions experts and bureaucrats as the key actors for figuring out solutions and adaptations to environmental issues.

At the 2016 CONMECOOP general assembly, elements of urgency are evident in the discourse used to describe climate change, as well as fisheries crises more generally. The fisherman who acts as moderator of the assembly opens the entire discussion with government officials by expressing a sense of urgency, while simultaneously positioning himself in relation to the director of INAPESCA as a scientific authority: “And a message the director has always given us, that climate change, to use his words, is already here, although many of us don’t want to see it [...] So what are we going to do for our future? [...] the truth is we have lived it all firsthand this past year.” Throughout the assembly, fishermen draw direct associations between climate change and the declines of some fisheries or shifts in the spatial distribution of target species. Both government representatives agree with the fishermen that climate change is to blame.

These discussions of climate change at the 2016 assembly form a particular narrative, one that is deployed by both government representatives in what amounts to an appeal to *logos*, which centers scientific understandings and technological solutions. The representative from CONAPESCA makes the following explanation about climate change:

Even minuscule changes in temperature affect ‘cold-blooded organisms’ (e.g., when there is an El Niño event), and they are much more sensitive than ‘terrestrial or warm-blooded animals;’ yet, we do not react quickly to the changes of nature, which leads to the ‘*problemática*’ with salmon, sardines, and other commercial species; these events will favor some organisms but not others, and many ‘products’ (i.e., catch or resources) will disappear in some places, because the organisms are looking for their best ‘adaptation’ in the ‘substrate in which they live.’ He says mostly the effects so far have been negative, but he emphasizes the notion that, “There is a readjustment until fisheries return to a normal state in which there will be a prevalence El Niño/La Niña with little difference in temperature” and there will not be negative effects like the ones they have been experiencing. The direct conclusion to his argument is that, therefore, they “must rely heavily on science to guide us and see when we can begin and end a fishing season,” positioning both federal agencies and their activities as central to the dilemma posed by climate change.

Several inconsistencies are evident in this representative’s narrative about climate change. The uncertainties associated with climate change impacts are quite high, and asserting that the system will return to a normal state at some point may be inaccurate. Another issue here is the assertion that ‘we’ do not adapt to nature’s changes—it is unclear who is the ‘we’ to which he refers, or why he invokes issues with industrial fisheries like sardine to buttress this point. The claim that we must rely on science to answer all these questions suggests this discourse is rooted in ideological discourses like administrative rationalism (Dryzek 2005) and ecological modernization (i.e., implying that technological fixes will effectively address environmental problems; Hajer 1995; Dryzek 2005). While fishermen are assuaged by these kinds of responses, they fail to address some of their major concerns, such as justice in the distribution of funding or the allocation of permits. In addition, it is unclear exactly how fishermen are perceiving these explanations. However, there is some indication that (1) fishermen take up climate change discourse in order to explain broader trends and declines in fisheries, but (2) they disagree about the exclusivity of scientific knowledge. This duality is evident in one fisherman’s comment in response:

We do recognize the efforts, we do, but we should focus efforts in the most pragmatic way to resolve needs more short-term. I know investigations are done little by little, but I also know that science should be based on what you say, on daily observation, on the daily practices of fishermen [...] Because as you say about climate change, well, we all live it. We are seeing that fisheries are not what they were. It's time now.

Responses about climate change by the representative from INAPESCA converge with the representative from CONAPESCA. This representative agrees that the effects of climate change are increasingly evident in fisheries and aquaculture, and that scientific assessments they are conducting with the aid of research vessels from the United States will be a crucial means for making decisions. Describing their efforts with one such vessel, he says, "Climate change is happening, and we are monitoring it in real time aboard the vessel, and it's something very important, and we are looking at it and measuring it."

However, despite pleas to incorporate fishermen's experiences into research agendas, some of the interactions about climate change demonstrate inflexibility by government officials. When pressed to talk about the slow bureaucratic processes preventing fishers from acquiring permits to exploit cannonball jellyfish (the cnidarian *Stomolophus meleagris*), the representative from INAPESCA responds that permits are allocated by zones, and that zones are defined in relation to the resource. The jellyfish has become more abundant in certain areas recently and fishermen are urging the scientists to make assessments about the viability of the fishery. The representative argues they cannot give permits to everyone for this resource because it won't be profitable:

It would be as if we had a party every year and we each get a slice of cake, and the more guests we have, the thinner the slice of cake we each get. Until there will be a time when we wouldn't go to the party, because we wouldn't have enough. That is what happens with resources and that is why we are defining the correct effort for each resource so that it is truly profitable.

The colorful metaphor of the cake mirrors Hardin's (1968) pasture in tragedy of the commons, both in its quotidian simplicity and in terms of how this problem framing leads

to solutions like centralization and privatization. It centers government experts as the only actors determine the use of resources, and it prioritizes economic rentability in disputes over access. The exchange also begs several broader questions. If it is increasingly apparent that species are shifting distribution (whether or not it is in response to climate change), how can spatially fixed permits adequately address the allocation of resources? Conflicts with the spatial fixity of permits suggest a refusal of state agencies to see what deviates from the geographies or epistemologies they have already defined as legitimate. This kind of unwillingness to see (or conversely, fixation on a particular way of seeing; Scott 1998) seems at odds with ever-shifting ecological dynamics. It also obscures other kinds of knowledge that can exist about abstract phenomena like ecological populations, fish stocks or species ranges (St. Martin 2001).

At the same time, fishermen at the assembly are directly asking for more scientific assessments, and their language tends to echo the emphasis on rentability. One fisherman makes direct links between the need for research, the major issue of illegal fishing (*furtivismo*), and the need to secure economic gains for small-scale fishers:

We also need studies to see in which ways illegal fishing has already affected this species, which let's say, is not a species that can develop quickly. [Conch] is a species that cannot run, does not walk. So we want to know how you can support us and have studies done, and know how this fishery doing. That fishery, if we are able to regulate it and care for it well, believe me we would have good capture and economic outpouring for fishermen.

This comment illustrates how scientific assessments (i.e., so-called 'technical opinions' emitted by INAPESCA) are centered and prioritized by both government actors and fishermen. Through argumentative claims, both sets of actors form a discourse coalition that prioritizes scientific knowledge production. The technical opinions being produced are hybrid legal-scientific documents in which INAPESCA makes policy recommendations (e.g., prohibition, closures, size limits). The opinions are objects constituted by articulation or translation across different knowledge realms (Robertson 2006)—i.e., scientific knowledge comes to gain political meaning through the production of these technical opinions. For

fishermen, the stated interest is to gain access and be able to capture economic rent, whereas for INAPESCA, the production of recommendations positions the agency as an indispensable actor.

Nonetheless, demands made by fishermen for greater investment in scientific research differ from the views directly expressed by government officials. Fishermen are asking partly for greater participation and involvement opportunities in research, for example, (1) in terms of taking fishers' observations and daily experiences in greater consideration, and (2) allowing fishermen to establish laboratories for testing the safety of bivalve mollusks and thereby expedite certification processes. Government agencies in Mexico have been receptive to some initiatives for participatory research, notably the creation of fisheries refugia through collaboration with fishermen and NGOs.

Fisheries refugia are small marine areas in which fishing restrictions are placed to protect target organisms during important life-stages (e.g., spawning sites, nurseries), with the goal of preventing population declines and increasing resilience to pressures like overharvest and climate change (Paterson et al. 2013). With legal recognition from the federal government, fishermen are now collaborating with NGOs (e.g., Niparajá) to establish networks of refugia throughout Mexico. Fishermen are directly participating in the collection of ecological data and participating in knowledge co-production in a novel sense. In this way, local knowledges are also being constituted through the national logic of scientific assessments, which are the most readily legitimized and recognizable for management. The NGOs participating in these processes can be conceptualized as boundary organizations, facilitating articulation between particular forms of knowledge and negotiating different interests (i.e., between fishers and the federal government; Gray et al. 2014, Gray 2016).

Fisheries refugia are also sites for the contestation of rights over access and appropriation of different species. In the context of the CONMECOOP assembly, fishermen make different arguments to bolster claims about resources, as well as to attempt to secure or extend their access over certain species or geographic areas. One fisherman identifies coral platforms in

the coastal areas of Zihuatanejo as important refuges or nurseries for valuable and declining target species (e.g., the red clam, *Megapitaria aurantiaca*), arguing they should be protected. Another fisherman from Baja California references a refuge that has existed for almost 5 years, and presents the issue of spillover. The refuge was created for preventing the exploitation of certain finfish, but other species are proliferating there (e.g., lobster), and fishers would like to gain access to harvest them. This fisherman argues that, although other fishermen in the area are interested in forming more refugia, they will lose interest if government does not produce opinions and permits for relevant target species. Government officials respond in anticipation to this kind of argument, emphasizing that they do not want to create false expectations that any given fishery will open. These exchanges illustrate significance of refugia as sites for political contestation in which fishermen are positioned as interested in extending their extractive activities while government actors are positioned as agents of enclosure in a commons that was partly created through state intervention.

5. Discussion

The range of discursive strategies used by fishermen and government actors at the general assemblies of CONMECOOP demonstrate how climate change and other problems come to be represented, and the kind of work these representations do when enrolled in political argumentation. Our analysis has examined the ways actors position themselves in relation to one another, partly through rhetorical elements of their speech. Some of these positionings are related to sectorial or class identities (e.g., small-scale versus industrial sector), while others reveal tensions regarding the role of the state and the production of scientific knowledge for resource management. Indeed, part of what is at stake in these conversations is a negotiation over what the role of the state should be. Fishermen have a clear idea about the kinds of support they expect from government agencies—budget and personnel constraints notwithstanding. Meanwhile, federal government actors reason with fishermen and come to be positioned as allies to the sector, as spokespersons committed to amplifying the voices of fishers. In the future, it will be important to examine how these

positionings take shape given histories of state intervention, shifts in state responsibility to fishers, and the increasingly salient role of NGOs.

Moreover, although it is useful to examine incentives and institutional structures in management dilemmas (e.g., Moe 1995), the study of institutions and outcomes is often divorced from the relational processes through which they form, which are political and discursively enacted in decision-making forums (Campbell et al. 2014). Drawing on discursive tools can enhance our understanding of institutional change and the governance of complex commons issues. For instance, while the IAD framework includes categorization of different actor's positions, there has been less emphasis on the micro-political moments and discursive maneuvering that co-construct action situations. In addition, purely quantitative or meta-analytic approaches tend to reduce causal factors to variables and homogenize certain aspects of management (e.g., property rights regimes) or activities (e.g., illegal fishing) that might be perceived differently by different actors. Attending to discursive practices offers one possibility for examining how actors might use similar discourse for different ends. More generally, attending to discourse within institutional analysis could shed light on key issues of interest to commons scholars such as conflict resolution, marginalization, and social dilemmas.

The narratives or storylines that emerged during CONMECOOP's assemblies, along with discursive positionings, were influential for the formation of discourse coalitions around shared problem framings or *problemáticas*. Importantly, a discourse coalition emerged around climate change and its effects on fisheries. Narratives and understandings of climate change were related to both access over resources and the role of the federal government. Their deployment served partly to reify the role of scientific knowledge production in managing imminent and ongoing crises. Both fishermen and government officials find scientific framings of climate change useful for the arguments they present to one another, but their particular interests are different. Partly, this is because multiple meanings can be derived from common narratives and framings (i.e., they exhibit tactical polyvalence), and because policies and institutions are actively contested and co-constructed by actors with differing degrees of power. Fishermen are participating in this

political space to increase their influence and raise issues that threaten their access. Examining discursive elements sheds light on the specific negotiations through which actors contest access to resources and influence policy outcomes. Ultimately, climate change is about the distribution of risks and hazards that increase vulnerability, as well as access to resources that ballast against it (Ribot 2014; Ribot and Peluso 2003).

Moreover, problem framings at these assemblies are not merely representations. Problems like climate change and its impacts are constituted through a complex web of material and discursive elements, woven through the agencies and effects of different actors (both human and non-human). The objective here is not to over-theorize discourse at the expense other types of practices that shape policy and institutional change. However, attending to discursive practices is important because of the interpersonal and political interactions that shape policy. There are substantial impacts on the way fishermen come to be understood by government actors when they participate politically in this way. Through the confederation, fishermen have gained a seat at the table for important negotiations. They have a presence many small-scale fishers do not and their actions and presence are bearing tangible fruits. Specifically, as a result of the strategic plans developed in the 2016 assembly, the confederation has been granted a large sum of funding (approximately \$1.9 million) to distribute to member cooperatives for coping with environmental variables like hypoxic zones and El Niño events. For the fishermen of CONMECOOP, this represents an unprecedented achievement, as well as a gain in terms of economic efficiency—direct distribution by the confederation will bypass the bureaucratic structures normally in place for the allocation of funding. According to one officer of the confederation, funding will be more efficiently allocated by the confederation because its constituents have more situated knowledge about the needs of specific cooperatives. In the future, it will be important to examine how the confederation distributes resources to its constituents, as well as the relationship between these flows of financial resources and adaptation to climate change.

Lastly, a major issue associated with dominant narratives about fisheries in Mexico and the solutions proposed is that they might de-legitimize alternative kinds of knowledge that might be crucial for ensuring adaptation and resilience in the face of climate change's worst

impacts (Riedlinger & Berkes 2001; Nyong et al. 2007). A possible direction forward might be a more meaningful co-production of knowledge about fishery resources and consideration of local knowledges in management decisions, beyond the role of simply informing areas for scientific research. Fishers are the first to experience shifts in species distributions, and as such are likely well equipped to participate in research related to spatial changes (St. Martin 2005). Fishers have unique, situated knowledges (Haraway 1988) about the spatial distributions of species and their abundances, which can help gain greater knowledge about fisheries and their ecological dynamics. However, these possibilities would necessarily entail a shift from rigid epistemologies that privilege scientific assessments or pre-determined territorial practices (e.g., permits allocated rigidly by geographic zones) as the only means of managing fisheries. The move towards the formation of fisheries refugia may be a fruitful step in this direction, since the areas are neither temporally nor spatially fixed, and involve knowledge co-production by fishers and NGOs. It will be important to monitor and learn from these efforts in the future.

Acknowledgments

We would like to thank all participants and members of CONMECOOP, as well as its president Jesús Camacho, for welcoming us into their space and allowing us to understand the institutional processes facilitated by their organization. We would also like to thank the research team at Niparajá, Comunidad y Biodiversidad (COBI), and Duke University. We especially thank Amy Hudson Weaver and Mateja Nenadovic for their assistance and insights.

References

Agrawal, A. (2001). Common property institutions and sustainable governance of resources. *World Development*, 29(10): 1649-1672.

Aligica, P. D., & Boettke, P. J. (2009). *Challenging institutional analysis and development: The Bloomington school*. Routledge, New York.

Allison, E. H., Perry, A. L., Badjeck, M. C., Neil Adger, W., Brown, K., Conway, D., ... & Dulvy, N. K. (2009). Vulnerability of national economies to the impacts of climate change on fisheries. *Fish and Fisheries*, 10(2): 173-196.

Barad, K. (1998). Getting Real: Technoscientific Practices and the Materialization of Reality. *Journal of Feminist Cultural Studies*, 10(2): 87-128.

Barad, K. (2003). Posthumanist performativity: Toward an understanding of how matter comes to matter. *Signs: Journal of women in culture and society*, 28(3), 801-831.

Barad, K. (2007). *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*. Duke University Press, Durham, NC.

Basurto, X., Bennett, A., Weaver, A. H., Rodriguez-Van Dyck, S., & Aceves-Bueno, J. S. (2013). Cooperative and noncooperative strategies for small-scale fisheries' self-governance in the globalization era: Implications for conservation. *Ecology and Society*, 18(4), 38.

Basurto, X., G. Kingsley, K. McQueen, M. Smith, and C. M. Weible. (2010). A systematic approach to institutional analysis: Applying Crawford and Ostrom's grammar. *Political Research Quarterly*, 63: 524-537.

Berkes, F., J. Colding, C. Folke, eds. (2003). *Navigating social-ecological systems: Building resilience for complexity and change*. Cambridge University Press, New York.

Bresnihan, P. (2016). *Transforming the Fisheries: Neoliberalism, Nature, and the Commons*. University of Nebraska Press, Lincoln, NE.

Billig, M. (1987). *Arguing and thinking: A rhetorical approach to social psychology*. Cambridge University Press, New York.

Campbell, L. M., S. Hagerman & N. J. Gray (2014) Producing Targets for Conservation: Science and Politics at the Tenth Conference of the Parties to the Convention on Biological Diversity. *Global Environmental Politics*, 14, 41-63.

Castree, N. (2003). Environmental issues: relational ontologies and hybrid politics. *Progress in Human Geography*, 27(2): 203-211.

Cleaver, F. (2000). Moral ecological rationality, institutions and the management of common property resources. *Development and Change*, 31(2): 361-383.

Clement, F. (2010). Analysing decentralised natural resource governance: proposition for a "politicised" institutional analysis and development framework. *Policy Sciences*, 43(2), 129-156.

COBI (Comunidad y Biodiversidad, A.C.). (2015). Estudio Diagnóstico del Sector Cooperativo Nacional Orientado a la Generación y Fortalecimiento de las Cadenas de Valor. CONAPESCA, COBI, 63pp.

Crawford, S. E., & Ostrom, E. (1995). A grammar of institutions. *American Political Science Review*, 89(3): 582-600.

Davies, B., & Harré, R. (1990). Positioning: The discursive production of selves. *Journal for the theory of social behaviour*, 20(1), 43-63.

- Dryzek, J. S. (2005). *The Politics of the Earth: Environmental Discourses*, 2nd ed. Oxford University Press, Oxford, UK.
- Espinosa-Romero, M. J., Rodriguez, L. F., Weaver, A. H., Villanueva-Aznar, C., & Torre, J. (2014). The changing role of NGOs in Mexican small-scale fisheries: From environmental conservation to multi-scale governance. *Marine Policy*, 50: 290-299.
- Fairclough, I., & Fairclough, N. (2012). *Political discourse analysis: A method for advanced students*. Routledge, New York.
- Fairclough, N. (1992). *Discourse and Social Change*. Polity Press, Oxford, UK.
- FAO & WorldFish Center. (2008). Small-scale capture fisheries: A global overview with emphasis on developing countries. A Preliminary Report of the Big Numbers Project. FAO, Rome.
- Feeny, D., Berkes, F., McCay, B. J. & Acheson, J. M. (1990). The tragedy of the commons: twenty-two years later. *Human Ecology* 18(1): 1-19.
- Forsyth, T. (2001). Critical Realism and Political Ecology. Pages 146-154 in Stainer, A. and Lopez, G. (eds.) *After Postmodernism: Critical Realism?* Athlone Press, London.
- Foucault, M. (1980). *Power/knowledge: Selected interviews and other writings, 1972-1977*. Pantheon Books, New York.
- Foucault, M. (1994). Truth and Juridical Forms. Pages 1-89 in Faubion, J. D., (ed.). *Michel Foucault: Power*. The New Press, New York.
- Golden, C., Allison, E. H., Cheung, W. W., Dey, M. M., Halpern, B. S., McCauley, D. J., Smith, M., Vaitla, B., Zeller, D., & Myers, S. S. (2016). Fall in fish catch threatens human health. *Nature*, 534: 317-320.
- Goldman, M. (1997). 'Customs in common': The epistemic world of the commons scholars. *Theory and Society*, 26(1), 1-37.
- Gray, N. (2016). The role of boundary organizations in co-management: examining the politics of knowledge integration in a marine protected area in Belize. *International Journal of the Commons*, 10(2): 1013-1034.
- Gray, N. J., R. L. Gruby, and L. M. Campbell. (2014). Boundary Objects and Global Consensus: Scalar Narratives of Marine Conservation in the Convention on Biological Diversity. *Global Environmental Politics*, 14(3): 64-83.
- Hajer, M. A. (1995). *The politics of environmental discourse: ecological modernization and the policy process*. Clarendon Press: Oxford, UK.
- Hajer, M., & Versteeg, W. (2005). A decade of discourse analysis of environmental politics: achievements, challenges, perspectives. *Journal of Environmental Policy & Planning*, 7(3): 175-184.
- Haraway, D. (1988). Situated knowledges: The science question in feminism and the privilege of partial perspective. *Feminist Studies*, 14(3): 575-599.

- Haraway, D. (2008). *When Species Meet*. Posthumanities, Vol. 3. University of Minnesota Press, Minneapolis, MN.
- Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Duke University Press, Durham, NC.
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162: 1243-1248.
- Hernandez, A., & W. Kempton. (2003). Changes in fisheries management in Mexico: Effects of increasing scientific input and public participation. *Ocean & Coastal Management*, 46: 507-526.
- Hess, A. (2011). Critical-Rhetorical Ethnography: Rethinking the place and process of rhetoric. *Communication Studies*, 62(2): 138.
- McCay, B. J., Micheli, F., Ponce-Díaz, G., Murray, G., Shester, G., Ramirez-Sanchez, S., & Weisman, W. (2014). Cooperatives, concessions, and co-management on the Pacific coast of Mexico. *Marine Policy*, 44: 49-59.
- Moe, T. (1995). The Politics of Structural Choice: Toward a Theory of Public Bureaucracy. Pages 116-153 in Williamson, O. E., ed. *Organization theory: from Chester Barnard to the present and beyond*. Oxford University Press.
- Moore, J. W. (2015). *Capitalism in the Web of Life: Ecology and the Accumulation of Capital*. Verso Books, New York.
- Nicotra, J., & Parrish, J. T. (2010). Rushing the cure: Temporal rhetorics in global warming discourse. *Journal of Advanced Composition*, 215-237.
- Nyong, A., Adesina, F., & Elasha, B. O. (2007). The value of indigenous knowledge in climate change mitigation and adaptation strategies in the African Sahel. *Mitigation and Adaptation Strategies for Global Change*, 12(5), 787-797.
- Ostrom, E. (1990). *Governing the Commons*. Cambridge University Press, Cambridge, UK.
- Ostrom, E. (2005). *Understanding institutional diversity*. Princeton University Press, Princeton, NJ.
- Ostrom, E. (2011). Background on the institutional analysis and development framework. *Policy Studies Journal*, 39(1): 7-27.
- Paterson, C. J., Pernetta, J. C., Siraraksophon, S., Kato, Y., Barut, N. C., Saikliang, P., ... & Yunanda, T. (2013). Fisheries refugia: A novel approach to integrating fisheries and habitat management in the context of small-scale fishing pressure. *Ocean & Coastal Management*, 85: 214-229.
- Perry, A. L., Low, P. J., Ellis, J. R., & Reynolds, J. D. (2005). Climate change and distribution shifts in marine fishes. *Science*, 308(5730): 1912-1915.
- Ribot, J. (2014). Cause and response: vulnerability and climate in the Anthropocene. *Journal of Peasant Studies*, 41(5): 667-705.
- Ribot, J. C., & Peluso, N. L. (2003). A theory of access. *Rural Sociology*, 68(2): 153-181.

Riedlinger, D., & Berkes, F. (2001). Contributions of traditional knowledge to understanding climate change in the Canadian Arctic. *Polar Record*, 37(203), 315-328.

Robertson, M. M. (2006). The nature that capital can see: science, state, and market in the commodification of ecosystem services. *Environment and Planning D: society and space*, 24(3): 367-387.

Sabatier, P. A. (1988). An advocacy coalition framework of policy change and the role of policy-oriented learning therein. *Policy Sciences*, 21(2-3): 129-168.

Salas, S., Chuenpagdee, R., Charles, A. T., & Seijo, J. C. (eds.). (2011). *Coastal fisheries of Latin America and the Caribbean*. FAO Fisheries and Aquaculture Technical Paper No. 544. FAO: Rome, Italy.

Salas, S., Chuenpagdee, R., Seijo, J. C., & Charles, A. (2007). Challenges in the assessment and management of small-scale fisheries in Latin America and the Caribbean. *Fisheries Research*, 87(1): 5-16.

Scott, J. C. (1998). *Seeing Like a State: How certain schemes to improve the human condition have failed*. Yale University Press, New Haven, CT.

St Martin, K. (2001). Making space for community resource management in fisheries. *Annals of the Association of American Geographers*, 91(1): 122-142.

St. Martin, K. (2005). Mapping Economic Diversity in the First World: The Case of Fisheries. *Environment and Planning A*, 37: 959-979.

Sumaila, U. R., Cheung, W., Lam, V., Pauly, D., & Herrick, S. (2011). Climate change impacts on the biophysics and economics of world fisheries. *Nature Climate Change*, 1(9): 449-456.

Young, E. (2001). State Intervention and Abuse of the Commons: Fisheries Development in Baja California Sur, Mexico. *Annals of the Association of American Geographers*, 91(2): 283-306.