

Multi-Scale Fisheries Management in St. Croix, United States Virgin Islands: What Influences Participation?

Cynthia A. Grace-McCaskey

This manuscript examines marine resource users' perceptions of, experiences with, and responses to federal and territorial fisheries management processes in St. Croix, United States Virgin Islands. Drawing on anthropological critiques of common pool resources (CPR) institutions and political ecology, I describe the historical, social, and political factors that influence how fisheries management occurs at multiple scales and how it is experienced by fishers, managers, and other stakeholders. This multi-scale approach is both timely and important, as resources and communities throughout the world are increasingly globalized and inter-connected; it is virtually impossible to find an example of a CPR being managed at the local scale, devoid of the influence of external factors. As a result, it is becoming more common for resources and resource users to be subject to regulations and management regimes at multiple levels and scales (such as federal and territorial). For this reason, it is critical to examine how management institutions across scales impact one another and influence key elements of management, such as stakeholder participation. Fisheries management in St. Croix provides an opportunity to explore how the complexities of multi-scale resource management occur at the local level and how resource users and other stakeholders experience and perceive those processes. Specifically, this manuscript describes whether and how fishers and other marine resource stakeholders participate in management processes and how factors such as demographic heterogeneity, historical patterns of social group interactions, and the complexity of management processes influence participation.

Key words: fisheries management, stakeholder participation, Caribbean, common pool resources, political ecology

Introduction

Management of common pool resources (CPRs), such as fisheries, pastures, and forests, has attracted the attention of scholars for decades. Initial warnings described resource exhaustion resulting from CPRs that were neither publicly nor privately owned (Gordon 1954; Hardin 1968; Scott 1955). According to these theories, in the absence of private ownership, it is logical for resource users to increase their exploitation limitlessly without worrying about the negative effects of such use. Therefore, overexploitation of CPRs could only be prevented by two state-established institutional arrangements—centralized government and private property. These theories greatly influenced the formation of fisheries management regimes in industrialized countries such as the United States throughout the 1960s and 1970s, and it was

assumed that all the world's fisheries, regardless of location or the way in which local fishers used them, were doomed by overexploitation and that collapse was inevitable. By the early 1980s, however, fisheries anthropologists had made important contributions to the study of CPRs by providing numerous case studies describing a variety of agreements and institutions used by societies throughout the world to successfully control access to and utilization of fisheries resources (Acheson 1979, 1981; Andersen 1972; Forman 1967; Johannes 1977; McCay 1980).

Throughout the 1980s and 1990s, commons scholars worked to synthesize these case studies and determine the conditions or characteristics that contributed to successful management. Most influential among these efforts was (and continues to be) Ostrom's (1990) eight "design principles," which included the presence of well-defined boundaries around the resource and the ability of individuals affected by the rules of resource use to participate in changing the rules. In addition, reflecting global trends that emphasized the ecological and social benefits of decentralized, participatory, and/or community-based natural resource management initiatives, many CPR studies focused on local scale institutions. The design principles were used to assess or explain resource management structures and conditions, and the focus on local-scale commons makes the processes of self-organization and self-governance easier to observe (Ostrom 1990).

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By the early 2000s, while some scholars suggested that relative consensus had been reached regarding the resource and community conditions that are likely to lead to successful management arrangements (Ostrom et al. 2002), others felt this approach of simply identifying conditions related to successful management institutions was insufficient (Agrawal 2002; Berkes 2009; McCay 2002). The large number of “conditions” proposed by scholars has been deemed problematic (Agrawal 2002 identifies between 30 and 40 variables that have been linked to robust common property institutions), and some suggest such an approach lacks the appropriate attention to the larger context in which resource management arrangements develop and in which they either thrive or fail. Specifically, Agrawal (2002) felt more importance must be placed on factors such as demography (e.g., the heterogeneity of user groups) and the role of the state, and McCay (2002) advocated a move toward historically grounded, ethnographic examinations of fisheries management initiatives.

Scholars have also used a social-ecological system (SES) framework to characterize and analyze resource management systems, including fisheries. The framework emphasizes the concept of resilience and the close links between humans and nature, since humans are viewed as a part of nature and not external to and dominant over it (Berkes and Folke 1998). Agreement has increased that environmental outcomes depend upon interactions among a variety of social, ecological, and institutional factors (Cinner et al. 2012; Gutierrez, Hilborn, and Defeo 2011; Liu et al. 2007), and scholars have used a SES framework to explore how management institutions influence behavior and environmental outcomes (Ostrom 2009). Indeed, SES studies of small-scale fisheries have emphasized the importance of factors such as leadership, enforcement, social capital, and protected areas (Gutierrez, Hilborn, and Defeo 2011), participatory rulemaking (Cinner et al. 2012; Cinner et al. 2016), and the existence of community incentives to invest in long-term management (Ayers and Kittinger 2014; Basurto and Ostrom 2009; Cinner et al. 2016) in helping groups to overcome collective action problems to more effectively manage fisheries resources (Jupiter et al. 2017).

Despite the popularity of the SES framework approach in recent years, critiques point to the model’s weak theorization of the “social” elements and the model’s tendency to define people’s interests and livelihoods as concerned primarily with the environment (Fabinyi, Evans, and Foale 2014). As a result, the role of other motivations and social institutions is minimized, and the importance of social diversity and power is diminished. Therefore, while the design principles and even Ostrom’s (2007) associated SES framework for institutional analysis offer important insights into collective action and CPR management institutions, prominent fisheries anthropologist and commons scholar James Acheson (2011) still insists that anthropology’s case study model makes a critical contribution to the field. Formal models are not likely to capture all that needs to be considered, particularly in formulating policy in management, and the power and utility of

multi-method investigations should be emphasized (Acheson 2011; Janssen 2011; Poteete, Janssen, and Ostrom 2010).

Inherent to anthropological research examining the historical, political, and sociocultural context in which resource management institutions exist is the recognition that how natural resources and human-environment relationships are perceived varies across individuals and social groups. Utilizing a political ecology perspective, one can examine how differences in power, influence, and access to resources across social groups affect various aspects of resource management, including how and by whom resource degradation problems are defined, which manners of use are considered acceptable and legal, and how management processes are carried out (Blaikie and Brookfield 1987; Gezon and Paulson 2005; Robbins 2004; Zimmerer 2006). Such an approach allows one to analyze how unequal social and political power due to differences in gender, ethnicity, and other elements of identity influence the dynamics of resource management systems. Further, political ecology’s emphasis on social group interactions across scales lends itself well to this type of analysis (Cumming et al. 2015; Fabinyi, Evans, and Foale 2014; Kull, de Sartre, and Castro-Larranaga 2015; Neumann 2014).

Fisheries resources present a critical CPR problem because humans are highly dependent on fish throughout the world. In 2013, fish accounted for nearly 17 percent of the world population’s animal protein consumption and close to 7 percent of all protein consumed (FAO 2016). Additionally, in 2014, approximately 56.6 million people were engaged in the primary sector of fisheries and aquaculture (FAO 2016). Many of those can be characterized as small-scale fishing operations, which play a critical role in supplementing and supporting livelihoods, contributing to food security, and combating poverty. While these numbers are expected to increase in coming years as the global population increases, fisheries production is not increasing at the same rate. In 2013, the Food and Agriculture Organization of the United Nations (FAO 2016) estimated that nearly one-third of the world’s fish stocks are fished at biologically unsustainable levels, although these conclusions are the subject of debate. Serious concerns continue to be raised regarding the sustainability of coral reef fisheries, particularly in light of the large-scale degradation of reef ecosystems due to coral bleaching and other climate change related impacts, overfishing, and large-scale tourism (DeMartini et al. 2008; Jackson et al. 2014; Paddock et al. 2009). In the United States Caribbean, where coral reefs are considered highly degraded, scientists are particularly concerned about the long-term effects of the overfishing of large, highly valued predatory species, such as snappers and groupers, and of herbivores, such as parrotfish (Adam et al. 2015; Kadison et al. 2017).

This article analyzes the results from more than twenty months of ethnographic research in St. Croix, United States Virgin Islands (USVI), during which I examined marine resource users’ perceptions of, experiences with, and responses to federal and territorial fisheries management processes. Drawing on research in political ecology and anthropological

critiques of CPR institutions, I describe the historical, social, and political factors that influence how fisheries management occurs at multiple scales and how it is experienced by fishers, managers, and other stakeholders. This multi-scale approach is both timely and important as resources and communities throughout the world are becoming increasingly globalized and inter-connected due to the globalization of markets and economies, the increasing use of rapid communication technologies such as cell phones and the Internet, and the growth of large-scale migration patterns (Griffith and Valdés-Pizzini 2002; Randhir 2016; Shimada 2015). In light of this, it is virtually impossible to find an example of a CPR being managed at the local scale, devoid of the influence of external factors. As a result, it is becoming more common for resources and resource users to be subject to regulations and management regimes at multiple levels and scales (such as federal and territorial). For this reason, it is critical to examine how management institutions across scales impact one another and influence key elements of management, such as stakeholder participation. Fisheries management in St. Croix provides an opportunity to explore how the complexities of multi-scale resource management occur at the local level and how resource users and other stakeholders experience and perceive those processes. Specifically, this article identifies whether and how fishers and other marine resource stakeholders participate in management processes and how factors such as demographic heterogeneity, historical patterns of social group interactions, and the complexity of management processes influence participation. In doing so, it provides fisheries managers, policymakers, and other marine stakeholders valuable information that can inform the development of management processes better suited to small-scale fisheries and more sensitive to the social, political, and economic contexts of island-based fisheries subject to multiple management regimes.

Research Setting

St. Croix is the largest of three main islands that make up the USVI, which lie in the subtropic Caribbean. St. Croix has a land area of 215 km² and is located 145 km east of Puerto Rico. Of its approximately 50,000 residents, about 74 percent are Black or Afro-Caribbean, most of whom are native to the USVI or other Caribbean islands (United States Census Bureau 2017). About 14 percent are White, most of whom are not native to the USVI but rather were born in the continental United States and relocated to St. Croix. Twenty-four percent identify as Hispanic or Latino, reflecting the large number of Puerto Ricans who migrated to St. Croix in the 1940s when the United States Navy expropriated Vieques. Only half of the population was born in the USVI, which reflects the large-scale migration both into and out of St. Croix throughout the last century. As with most of the United States Caribbean, local government is the largest employer, along with tourism, oil refining and other industry, and small-scale farming and fishing (USVI BER 2017).

St. Croix's commercial fishery is a small-scale, multi-gear, multi-species fishery (Grace-McCaskey 2012; Valdés-Pizzini et al. 2010). Fishers often use several types of fishing gears and target several species on any one trip. Generally, they use boats smaller than twenty feet, which are stored at home and trailered to the island's various launching sites. Additionally, nearly all of the landings are sold and consumed locally, instead of exported (CFMC 2014). Only one makeshift fish market exists, which the fishermen built themselves. Some sell fish there, and others sell on the side of the road, door to door, or directly to restaurants. In 2011, there were 177 licensed commercial fishermen, seventy of whom were considered to be full time (USVI DPNR, personal communication).

The ocean around St. Croix is divided into territorial and federal waters for management purposes. The territorial waters, from the coastline out to 3 miles, are managed by the USVI Department of Planning and Natural Resources (DPNR). In addition, the St. Croix Fisheries Advisory Committee (FAC) is comprised of up to fourteen members that represent different marine resources stakeholders in St. Croix, such as commercial fishers, marine scientists, dive shop owners, and DPNR employees. They make recommendations to the DPNR Commissioner regarding fisheries regulations, who then can either take their advice or ignore it. The federal waters, which stretch from 3 to 200 miles from the coastline, are managed jointly by the Caribbean Fishery Management Council (CFMC) and NOAA Fisheries. The CFMC initiates and develops management measures for the fisheries in federal waters, such as fishing seasons, bag limits, quotas, and closed areas. Proposed regulations are reviewed by expert panels of scientists, stakeholders, and the public before the Council makes a final decision. After adoption by Council vote, these measures are subject to review and approval by the Secretary of Commerce, regulatory implementation by NOAA Fisheries, and enforcement by the United States Coast Guard, NOAA, and other authorities (US RFMC 2016). The CFMC is made up of voting and non-voting members from territorial and federal agencies, commercial and recreational fishers, and other stakeholders. Interested individuals may also volunteer (or may be asked) to serve on the CFMC's advisory panels or other ad hoc committees that assist in the development of regulations. Opportunities for general public participation in the United States Fishery Management Council system include attending and making "on-the-record" statements at public meetings and sending in written comments to the council (GFMC 2012).

Methods

Ethnographic data were collected over a period of twenty months, from March 2009 to November 2010. This included eighty-seven semi-structured interviews with fishers and other marine resource stakeholders (e.g., dive shop owners, local NGOs, and fisheries managers) and observations of thirty territorial and federal fisheries management meetings. A

Table 1. Comparison of Fishers and Non-fishers on Demographic Variables

Variable	Test Used	Test Statistic	Sig. Level
Age	WMW	U=590.5	p=.026 *
Number of years living in St. Croix	WMW	U=471	p=.001 **
Highest level of education completed	WMW	U=55	p<.001 **
Ethnicity	chi-square	X ² (3, n=86)=62.639 ^a	p<.001 **

WMW=Wilcoxon-Mann-Whitney two-sample rank-sum test
^a=test violated assumptions, so results may not be meaningful
 *=significant to .05
 **=significant to .005

mix of purposive and snowball sampling methods (Bernard 2011; Schensul, Schensul, and LeCompte 1999) were used to identify participants from the various marine resource stakeholder groups who were most knowledgeable about fisheries management in St. Croix. These sampling strategies and interview format are widely used in fisheries anthropology research (Blount 2007; Kitner 2006; McClanahan, Maina, and Davies 2005; Olson 2006). Additionally, extensive participant observation occurred throughout the fieldwork period in numerous settings, such as hanging out at the fish market or other places where fishers sold their fish, going on fishing trips when they pulled their fish traps or scuba dived, attending meetings, and visiting for social occasions. Informal interviews also occurred during these times.

As is often the case in natural resource management contexts, discussions about fisheries management were considered highly controversial by participants (especially the fishers), and many expressed concerns regarding the recording of interviews. Therefore, in order to dispel their fears that the research was aimed at further regulation and to encourage their open and honest participation, the interviews were not recorded. All interviews were conducted in locations of the participants' choosing, such as the fish market, dive shops, restaurants, or in private homes. The interview guide included a mix of open-ended and closed-ended questions to allow for both qualitative and quantitative analyses even in the absence of interview transcripts. Although the author resided in St. Croix and interacted with participants on a regular basis for nearly twelve months prior to conducting interviews, many participants were uncomfortable with the formality of an interview and provided only short responses at that time. For this reason, data resulting from participant observation and informal interviews proved critical by allowing those interview data to be contextualized in the larger fisheries management environment in St. Croix.

Although the original research design included analysis of differences in perceptions of and participation in the fisheries management process among stakeholder groups, this was not possible due to the small number ($n < 5$) of individuals in several stakeholder groups and because several individuals were

members of multiple groups (e.g., commercial fisher and FAC member). Because the commercial fishers were the primary focus of the research, the total number of interviewees ($n=87$) were divided into two groups for analysis—fishers ($n=52$) and non-fishers ($n=35$)—which allowed for an examination of whether fishers as a group were unique to other stakeholders. Responses to open-ended interview questions (e.g., *Who do you think should be responsible for fisheries management in St. Croix?*) were coded based on emergent patterns and themes (Bernard 2011; LeCompte and Schensul 1999). Along with responses to closed-ended interview questions (i.e., demographic questions, questions regarding prior participation in CFMC management processes), these data were analyzed in SPSS using descriptive statistics, frequencies, crosstabs, and other non-parametric tests. Fieldnotes from participant observation and meeting observation were coded based on similar themes and used to complement the results described below.

Results and Discussion

Demographic Differences

Linked to St. Croix's complex history of colonialism, migration, and United States territory status, demographic differences among social groups continue to be salient today. Simple observation reveals fishers are primarily Hispanic and Black/West Indian, while other marine resource stakeholders are White. Table 1 shows fishers and non-fishers differ significantly in terms of age, how long they have lived in St. Croix, education level, and ethnicity. Fishers are younger and have lived longer on the island than non-fishers. While close to 70 percent of fishers did not complete high school, nearly 80 percent of non-fishers completed college and/or graduate school. Additionally, while nearly 80 percent of non-fishers are White, fishers are primarily Hispanic, Crucian, or Black/West Indian (Figure 1).

Significant demographic differences between fishers and non-fishers are not surprising, reflecting general patterns of ethnicity, island tenure, occupation, and education found in St. Croix. Many fishers were either born in St. Croix or born

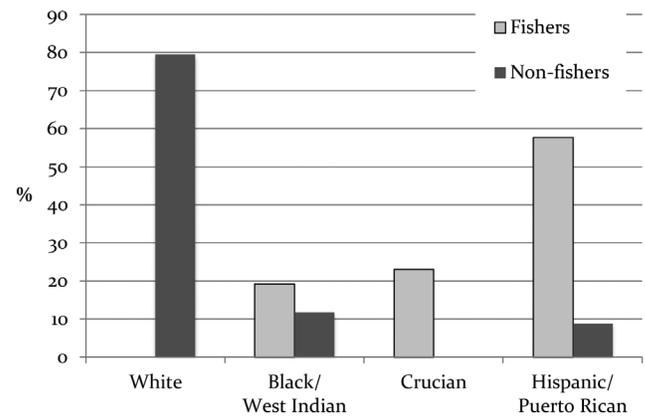
on a nearby island such as Puerto Rico or Vieques and moved to St. Croix with their parents at an early age. Often, they learned to fish from their fathers or grandfathers, who were fishers before coming to the island. Other fishers arrived in the late 1960s, part of the wave of immigrants who moved to the island to work as tradesmen in the building of the HOVENSA or Harvey Alumina industrial complexes, then moved into fishing when construction ended. While many fishers practice occupational multiplicity (Comitas 1962; Griffith and Valdés-Pizzini 2002), they persist in their practice of commercial fishing, and most of them indicate they plan to fish until they are no longer physically capable of doing so. Their reasons for continuing to fish are plentiful and reflect similar sentiments expressed by fishers in communities throughout the world, including the desire to be one's own boss, and the independence, joy, and therapeutic benefits being on the ocean provides them (Acheson 1981; Griffith and Valdés-Pizzini 2002; Pollnac and Poggie 1988, 2006). Despite being continually frustrated by what fishers consider to be the constant bombardment of additional regulations from the federal government, they continue to use commercial fishing as a primary source of income.

In contrast, none of the White non-fishers were born in St. Croix. Instead, they grew up and were educated in the continental United States, then moved to the island as adults, pursuing a career in the diving industry or environmental conservation. Often, they first visited the island for vacation or scientific research then actively sought ways to relocate to St. Croix. However, even though many non-fishers have lived in St. Croix for twenty or thirty years, because of their skin color and the occupations they hold (i.e., scientists, dive shop owners), they are still perceived as "outsiders" by most fishers and other non-White island residents.

Fisheries Management Knowledge and Perceptions

Demographic differences between fishers and non-fishers in St. Croix relate to knowledge and perceptions of fisheries

Figure 1. Graph Comparing Ethnicity of Fishers and Non-fishers



management. How aware are fishers and non-fishers that there are different fisheries regulations for territorial and federal waters? Do they know which specific groups or individuals are responsible for developing the regulations? Further, do they believe St. Croix's fisheries need to be managed? Who should be responsible for management? The answers to these questions have important implications for fisheries management participation.

As shown in Table 2, although the two groups differed significantly on only two of the five knowledge variables, a greater percentage of non-fishers responded correctly to all five items. This suggests that non-fishers have a higher level of knowledge regarding whether there are separate regulations for territorial and federal waters as well as regarding which individuals or groups are responsible for making those regulations. The two groups also differed significantly in their responses to the following Likert scale question: "How knowledgeable are you regarding the federal fisheries management

Table 2. Results of Tests Comparing Fishers and Non-fishers on Fisheries Management Knowledge and Perceptions Variables

Variables-Knowledge	Fishers % correct	Non-fishers % correct	Sig. Level
Were aware that there are separate regulations for territorial and federal waters	63.5	81.8	p=.190
Were aware that territorial regulations are made locally	71.2	81.8	p=.267
Were aware that territorial regulations are made by FAC and DPNR Commissioner	7.7	27.3	p=.015*
Were aware that federal regulations are made by federal regulatory bodies	51.9	80.0	p=.008*
Were aware that federal regulations are made by CFMC	25.0	34.3	p=.348
Variables-Perceptions	% yes		
Do you believe USVI commercial fisheries should be managed?	77.1	100.0	p=.002**

*=significant to .005

**=significant to .05

process?” While 74.5 percent of fishers responded with either a one (“I don’t know anything”) or a two (“I know a little”), non-fishers’ responses were spread out much more evenly across all five options.

Non-fishers’ higher level of knowledge reflects their occupations, many of which require such knowledge (e.g., positions with DPNR). In addition, it also indicates greater familiarity with fisheries management in general, most of them having grown up in the continental United States where fisheries regulations such as mandatory commercial and recreational licenses are common and generally accepted by fishers and the public.

The fishers’ lower level of knowledge regarding fisheries management is a result of several factors. Most importantly, due to the lack of enforcement of fisheries regulations in St. Croix, it simply is not necessary for fishers to know what the regulations are or who is responsible for their development. During an interview, a fisher who frequently attends meetings and is highly involved in the management process at both the territorial and federal levels explained this relationship:

Most fishermen don’t even know what the laws are. They don’t care. I see them selling undersized fish, or they bring in lobsters that are berried [bearing eggs]. Well, most of them know about the lobster, but they don’t know about the sizes. And there’s no reason why they need to, since no one will catch them anyway.

If regulations regarding size limits, closed seasons, and prohibited species were effectively enforced, then knowledge of regulations would be required in order to be successful. Otherwise, they would constantly be caught, fined, and punished for breaking fishing laws. However, in St. Croix, the lack of enforcement means such a need for knowledge does not exist.

A second factor contributing to the fishers’ lower level of knowledge is a lack of familiarity with fisheries regulations. When compared with non-fishers, because most fishers were born and grew up in St. Croix, the concept of fisheries regulations is relatively new. Although commercial fishing licenses have been required in the USVI since 1974, the lack of enforcement of this (and every other) regulation meant that most fishers were not aware of many regulations until around 2001, when the moratorium on new commercial fishing licenses was implemented and enforced.

In addition, fishers intentionally avoid paying attention to or learning about fisheries management issues. This was especially true in regards to federal regulations, as several fishers stated that because they mostly fished for reef fish (which are typically caught within the 3-mile territorial water limit), they felt they did not need to know the federal regulations. For others, this dismissal reflected the belief that the White Continental “outsiders,” who did not grow up on the island and who do not make a living by consumptively using the resource, do not have the right to make those regulations. One fisher indicated, in reference to “the feds”:

You can’t manage from Washington. You can’t come down and pass blanket laws that are made without consideration of

the particularities here. We are more qualified than that piece of paper. We have the knowledge and skills to know what to do.

This suggests that fishers’ lower level of knowledge may reflect not only their lack of awareness and acceptance of the need for fisheries regulations in general but also an intentional decision to resist management being imposed upon them by White outsiders. This demonstrates how historical inequalities between groups due to ethnic or other demographic differences continue to impact how fishers and other stakeholders perceive current inequalities in the control of resource use and management today.

For other fishers, this lack of knowledge reflects their experiences with the complex federal management process. For example, one fisher who has held a commercial fishing license in St. Croix for over thirty-six years and who often attends CFMC meetings explained:

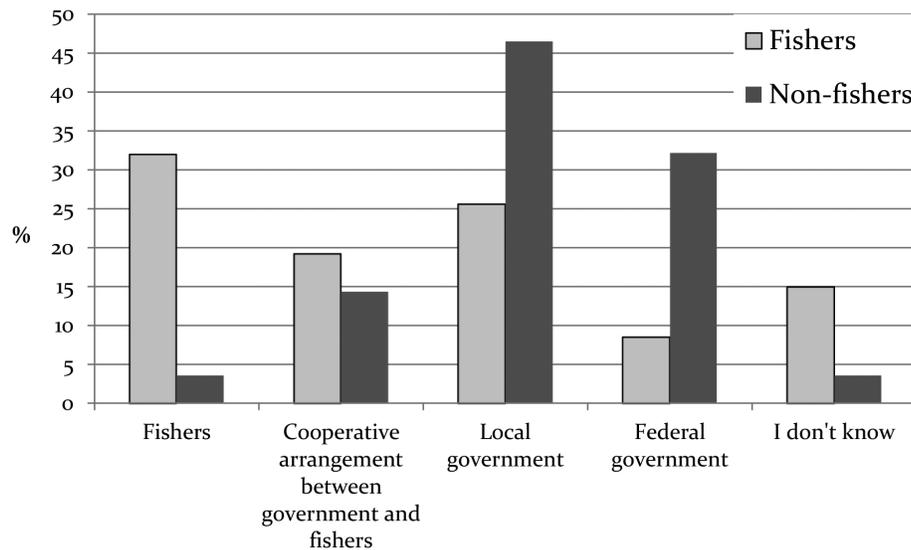
I don’t understand what they’re doing at those meetings. I’ve been to a bunch of ‘em, and they don’t make sense to me. That’s why I don’t talk. I let those other guys talk ‘cause they know better what’s going on.

Other fishers echoed these feelings that the information usually presented by the CFMC and NOAA Fisheries scientists at public hearings and other regulatory meetings is too complex for them to understand, which accounts directly for their lack of knowledge. This is not to say that the fishers do not have the ability to understand what is being presented to them. On the contrary, it speaks to the complexity of the council process and of the information presented in council presentations and documents, which is not unique to the CFMC and has been described in reference to other United States regions (Eagle, Newkirk, and Thompson 2003). This point is also important in the discussion of how fishers participate in the council process.

Related to differences in the extent of fisheries management knowledge, fishers and non-fishers differed significantly in whether they believed St. Croix’s commercial fisheries should be managed (Table 2). While all non-fishers believed the fisheries should be managed, a significantly smaller percentage of fishers agreed. Many of the reasons offered by both groups supporting management reflected concerns that without regulations, St. Croix will suffer from the “tragedy of the commons,” with each fisher motivated to take as much as he can because if he does not, it will be taken by someone else. Several fishers and non-fishers mentioned that regulations were needed “because of greed,” “because it’s a free-for-all,” or “because without them, there’ll be nothing left.”

For the non-fishers, the strong belief that fisheries should be managed also reflects the Western scientific conservation ethic in which they were educated, which stresses the need to keep the environment “pristine” and untouched by humans (Berkes 2004; Cronon 1996). From this perspective, resource extraction such as fishing must be restricted and even prohibited. This opinion was expressed at a CFMC scoping meeting when a non-fisher suggested the implementation of a five-year moratorium on all reef fishing to prevent overfishing. Comments like this lead fishers to believe this individual has no regard for the economic and

Figure 2. Fishers' and Non-fishers' Beliefs Regarding Who Should be Responsible for Fisheries Management in St. Croix



social consequences such a moratorium would have on the fishers and the island's residents who depend on reef fish for food. Additionally, fishers who attend these meetings and hear comments like this generalize them to the entire White population who are involved with fisheries management (both territorial and federal) and any other environmental concerns. This contributes to and reinforces the lack of trust the fishers have for the non-fishers, even those working for the management agencies and who in no way support such a complete closure of the fisheries.

The main reason provided by fishers for why commercial fisheries should not be managed reflected the belief that no one, whether local or federal, has a right to regulate and control the manner in and extent to which fisheries resources are used. Several fishers provided the exact same statement: "Because they can't tell us what to do." As was mentioned regarding fishers' intentional dismissal of paying attention to fisheries regulations, for many fishers, this reflected a generalized "us" versus "them" mentality, where "them" primarily represented anyone involved with fisheries regulations at the territorial or federal levels and is connected to historical patterns of social inequalities based on ethnicity.

Fittingly then, most fishers felt they themselves, the local government, or a cooperative arrangement between the fishers and the local government should be responsible for fisheries management (Figure 2). Although responses varied in terms of the extent of fishers' involvement in management, most responses emphasized that because they are the ones who use the resource, they should be involved in management. As one fisher indicated:

It should be both DPNR and the fishermen. We have the knowledge about what's going on out there, and they know the science and the school-book learning about how to manage the fish. We should work together.

This statement indicates an understanding of the complexities of fisheries management and that neither the fishers nor the scientists and managers have all the skills and information they need to manage the resources. It also shows an understanding of the need to work together and willingness on the part of some fishers to do so.

Non-fishers' support for local or federal fisheries management reflected their belief that the fishers were unwilling or incapable of managing themselves and that fishers just want to take as much as they can with no regard for the future. However, more non-fishers thought the local government should be responsible as opposed to the federal government, indicating an opposition to federal control similar to that expressed by fishers. Moreover, several of the non-fishers who supported federal management were reluctant to do so but indicated they felt it might be the only option since the local government has been unsuccessful. A charter boat captain who was interviewed stated:

I'd love to say it should be DPNR because no one wants the feds coming down here. But, they're just not doing it. So, I guess it has to be the feds.

Other non-fishers shared his reluctance, stressing they would prefer it was handled locally, but because they believed effective management and enforcement from the territorial government is unlikely, the federal government should take over the responsibility for both territorial and federal waters. Additionally, non-fishers' beliefs that some form of government (either local or federal) should be responsible for managing the fisheries also indicates a certain level of "buy-in" regarding the centralized fisheries management model with which they are familiar.

Table 3. Percentage of Fishers and Non-fishers Participating in CFMC Management Process

Variable	Fishers % yes	Non-fishers	Sig. Level
Attended a CFMC meeting	54.9	43.8	p=.323
Spoke at a CFMC meeting	25.0	18.8	p=.506
Sent written comments to CFMC	1.9	3.3	p=1.000

Participation in Management Processes

The data discussed thus far are important to include in a discussion about participation because in St. Croix, the perspectives and beliefs individuals hold regarding their environment, fisheries, and the use of natural resources are influenced by factors such as ethnicity, education level, and the location in which they were born and raised. These perceptions and beliefs, then, influence how they perceive and interact with management processes.

Regarding the extent to which fishers and non-fishers participate in the federal fisheries management process via the main mechanisms the council system has established for that purpose (i.e., attending council meetings, speaking during public comment periods at council meetings, and submitting written comments to the CFMC), the two groups did not differ significantly, and the primary means of participation in the process is through meeting attendance (Table 3). While more than half of the fishers and about 40 percent of the non-fishers reported attending at least one CFMC meeting in the past, it is important to note that these numbers do not reflect regular or repeated attendance. Observation at CFMC meetings revealed that only three commercial fishers and even fewer non-fishers attend regularly. This has important implications for fisheries management in that the perspectives and opinions of all stakeholder groups are not provided to the CFMC on a regular basis, compromising its ability to make well-informed decisions.

Generally, the fishers and non-fishers indicated that attending meetings was a way for them to know what was going on with fisheries management but without having to be “too involved.” As one fisher explained:

I like to go so that I know what’s going on. But I just sit there and listen. I don’t want to get up there in front of everyone and say something. I wouldn’t know what I was talking about anyway.

Similarly, a non-fisher stated:

I go sometimes to hear what they’re talking about so that I know what they’re doing. But that’s all it is. I don’t want to say anything publicly.

In other words, these participants appreciated that they could attend meetings and listen but did not have to speak or interact in a public manner.

There were several reasons offered for why respondents did not participate at all in the federal fisheries management process. Several non-fishers specifically mentioned that their positions made it either inappropriate or undesirable to attend the meetings and participate. As one individual explained, his job requires cooperation from fishers, and he purposely does not attend meetings so that the fishers do not see him as aligned with federal government representatives:

I don’t go to meetings because I need to stay friendly with the fishermen. I can’t do that if they see me at meetings and view me as one of “them.” It’s also not part of my job.

Other territorial government employees indicated they have not attended meetings because they were specifically advised by their superiors not to attend or to speak. Often, these gag orders stemmed from the controversial nature of what was being discussed as well as the political nature of the appointed positions within territorial agencies.

Several non-fishers stated they do not attend or speak at meetings because they do not want to get involved in controversial issues, citing cases where individuals were threatened by fishers for supporting the passing of certain regulations. For example, when the FAC was considering banning gill and trammel nets, body and personal property threats were rumored to have been made by other fishers against those voting fishers. While none of these threats were followed through with (to my knowledge), their mere suggestion was enough to deter fishers and non-fishers alike from being openly involved in these issues. As one dive master and captain stated:

I have no desire to voice my opinions and get involved. I’m not a political person. I don’t want to get involved and deal with threats and everything else. Why should I put me and my family in danger when ultimately they’re still going to be able to do whatever they want regardless of the laws?

While it is certainly a valid concern to not want to become involved in a controversial issue, participant observation and informal interviews suggest this and other similar comments made by non-fishers (typically White mainlanders) reflect the racism and classism that exists on the island.

Prior unsatisfactory experiences with the management process also contribute to a lack of participation. Several non-fishers indicated they no longer attend fisheries meetings—whether territorial or federal—since a very controversial ban on gill and trammel nets was passed in 2006. Although the gill net ban was a territorial waters issue, their experiences with and participation in that process impacted the extent to which they currently participate in and perceive the management process overall. This is particularly the case for the dive shop owners and managers. The campaign to get gill nets banned unified the island’s dive shop owners, a group whose relationships are usually cordial but competitive. The group banded together in order to show fisheries managers and politicians that the dive industry was unified for this purpose. Although the campaign was eventually successful, the lengthy and political process resulted in negative opinions of fisheries management and ultimately discouraged them from participating again. As one dive shop owner indicated:

The whole thing was just so political. It wasn’t at all about what was best for the environment, for the reefs. It was just about what was best for getting the votes.

The overlap of environmental decisions with political concerns is certainly not unique to St. Croix, but what compounded feelings of frustration is the lack of transparency with which a subsequent net buy-back program was implemented and the lack of enforcement of the ban that followed. The two-year lag time between when DPNR received the buy-back funds in 2006 to the enforcement of the ban and the implementation of the buy-back program in 2008 led to accusations against DPNR officials regarding the use of the money. This further deflated non-fishers’ faith in local fisheries management, even in instances where the federal government steps in with assistance (providing the money for the buy-back in this case). Finally, the metaphorical “nail in the coffin” is that some fishers are still using gill and trammel nets with no negative repercussions. As one dive shop owner described:

So we spent all this time and energy trying to get this ban in place...and it finally works, which is great. But here we are, two years later, and I still see guys out there fishing with nets. We call Enforcement and either no one answers, or they don’t have a working boat, or all their officers are off doing something else. And even the guys who have been caught always get off! On some technicality, or the judge throws it out...so what’s the point? Why should we bother? Considering it doesn’t really matter what’s on the books....

Some non-fishers voiced slightly different opinions, stating that although there are still some fishers who continue to fish with nets, the ban has reduced the use of nets overall, which they believe has allowed some reef fish species to rebound. Even these individuals, however, emphasized that their experiences with the management process overall have only reinforced their beliefs that the process is ineffective.

Although the federal fisheries management process is described and promoted by NMFS and council staff as a “shining example of true, participatory democracy” (NMFS and Councils 2003:23), marine stakeholders in St. Croix do not experience it as such. Both fishers and non-fishers emphasized they do not think their participation has any influence on the management process or on the decisions being made, though the reasons behind these perspectives are different.

Several fishers do not attend CFMC meetings because they felt “the feds...already have their minds made up” before they arrive on the island to hold meetings. They believe that holding public scoping meetings and allowing for public comment at general CFMC meetings is just a formality and that the comments made are not taken into consideration during fishery management plan or regulation development. As one fisher said:

No, it doesn’t matter what we say. They already know what they’re gonna do before they get down here. They don’t care about what happens to us. Or, we tell them where the fish are to show that they’re not all gone, and the next thing we know that place is closed. That’s what happened to _____. So, we just don’t go anymore. Why should I waste my time? I need to fish.

Similar responses were repeated by other fishers. Another fisher commented:

I used to go to their meetings...and tell them what we thought. But all they do is close, close, close. They don’t care how it affects us or whether we can still make a living. They know what they want before they get here. So I just stopped paying attention.

These comments not only tell us why fishers choose not to attend CFMC meetings but also indicate how fishers judge whether or not their opinions and testimonies are taken into consideration by the CFMC. For the fishers, the fact that the CFMC implements a specific regulation even after they have voiced their opposition to that regulation at a meeting is evidence that the CFMC and “the feds” do not take their concerns into consideration. However, this perspective reflects a lack of transparency in the process and fishers’ lack of knowledge regarding the centralized nature of federal fisheries management, which means that the CFMC is often mandated by Congress to implement specific management strategies regardless of their suitability for the Caribbean region (i.e., annual catch limits).

The reasons provided by non-fishers for why they felt their participation did not influence the management process were slightly different and often linked to their knowledge of the complex and lengthy decision making process and the lack of accurate fisheries data available to scientists and managers in the Caribbean region (see SEDAR 2009). Reflecting their aforementioned higher level of fisheries management knowledge and familiarity with federal management systems, several non-fishers felt that without the necessary data, such management decisions were political in nature and, therefore,

not likely to be influenced by individual statements provided by the public at meetings. Several further stated that unless that changed, they were not inclined to become more involved in the management process. This suggests that the centralized nature of United States federal fisheries management, which mandates the CFMC use management strategies for which they do not have the necessary data, actually decreases the likelihood of stakeholder participation.

Observation at CFMC meetings reveals important connections between how stakeholders participate in management processes and the extent to which they influence management decisions. While there are rarely more than ten fishers at any given meeting, the fishers that participate often do not do so in the manner preferred by the CFMC. In other words, the federal fishery management council system allows for public participation through public statements at scoping meetings and by accepting written statements regarding proposed regulatory actions. To achieve this, they encourage attendees to testify “on the record” by first stating which particular amendment or regulatory action they are referring to, then describing which of the proposed alternatives they support or do not support and why. To encourage this kind of participation, the council system has funded social scientists to develop guides that help explain the process and keys to “successful” participation in laymen’s terms (McCay and Creed 1999).

At all CFMC meetings I attended that were open for public comment, very few testimonies followed these guidelines. Instead, they generally described the unfairness of fisheries regulations, often focusing on regulations already implemented, in some cases referring to decisions that were made many years prior. Additionally, they often discussed their discontent over regulations passed at the territorial level, which are not formally under the jurisdiction of the CFMC. In most cases, it was clear they had not reviewed the documents provided in advance by the CFMC and so were not aware of the meeting’s purpose. The statements were often very emotional, and the fishers’ tones were heated, indicating their anger over fisheries regulations in general. In a few cases, fishers’ comments and behaviors became antagonistic, even to the point of waging personal verbal attacks on members of the CFMC or DPNR that had nothing to do with the items on the agenda.

Occasionally non-fishers provided comments. Although these individuals—typically local politicians or their representatives—were much more formal in their statements, they similarly did not address the particular items on the agenda or offer recommendations regarding the proposed regulatory actions. Instead, they often made very general statements regarding their support for local fishers. On the rare occasions that other non-fishers testified, such as members of the FAC, they frequently referred to the particular actions that were supposed to be addressed and provided recommendations on how they could be improved.

Several points must be made regarding the manner in which members of these groups testify. First and foremost, as noted regarding other fishery management councils (Eagle,

Newkirk, and Thompson 2003), the documents the CFMC provides to the public are often written in a highly technical manner and are very difficult to understand by anyone other than fisheries scientists. Additionally, many presentations given by the CFMC or federal scientists at meetings were presented in a similar manner. Although question-and-answer periods are typically provided during the meetings after the presentations, very few questions are asked. One of the few fishers involved in management explained that many fishers are too embarrassed to ask questions, so they remain silent without understanding what is being discussed. With the information they need to participate effectively being available to them only in inaccessible terms and them unwilling to ask questions to the CFMC and federal scientists, they end up testifying in the only way they know how—by speaking frankly as fishers about how they feel the regulations are negatively affecting their livelihoods in a generalized manner.

Because generalized testimonies do not provide constructive feedback regarding specific proposed regulations, the CFMC often has very little information about how the specific alternatives of the proposed amendments would likely impact the fishers and the island’s communities. Moreover, when the most common suggestion offered by fishers is to do away with all regulations (which is not even legally possible), it becomes clear why the fishers feel the CFMC does not take their opinions into consideration. Several CFMC voting members and staff stated this was a concern for them. All past or present CFMC members who were interviewed ($n=8$) indicated quite emphatically that they take very careful consideration of the public comments provided by all individuals when developing regulations and when voting. However, as one scientist noted:

Fishermen should definitely be involved [in the management process]. They are the main resource users—it’s in their best interest to participate. And their knowledge is invaluable. I always like to start with what the fishermen say and try to prove it scientifically.... We do a good job of listening, what people request, we look into it. But there’s lots of things that come into it—politics, local issues—that are well out of the CFMC’s purview. A lot of times the fishermen don’t speak to the points either. They talk about things that are local and have nothing to do with the federal side, or things that happened many years ago.

Other CFMC staff and voting members voiced similar frustrations, suggesting they face great difficulty in developing regulations that take stakeholders’—especially fishers’—concerns into consideration when they receive little constructive feedback on the specific impacts resulting from proposed regulations, and no suggested alternatives.

Conclusions

The purpose of this study was to describe the broad range of factors that affect marine resource users’ perceptions of, experiences with, and responses to fisheries

management processes in a small-scale, artisanal fishery. The results indicate that as a group, St. Croix's fishers differ significantly from other marine resource stakeholders on a variety of demographic characteristics, including ethnicity, age, education level, and length of residence in St. Croix. The fishers are primarily Black/West Indian or Puerto Rican, less educated, and native to the USVI or another Caribbean island. Mirroring the island's colonial history and status as a United States territory, the non-fishers, who are primarily White, highly educated, and recent residents of the island, are perceived as outsiders by the fishers and the island's other non-White residents.

Fishers' and non-fishers' knowledge of and perceptions toward fisheries management are linked to demographic differences. For example, the non-fishers' higher level of knowledge partly reflects having grown up and having been educated in the continental United States where fishing licenses and regulations are common and generally accepted. Related to this, many of the non-fishers interact with the island's marine and fisheries resources in a non-extractive way, such as a dive shop owner whose business is dependent upon clients diving on the coral reefs and observing (not catching) fish. Therefore, non-fishers are not only more familiar with fisheries regulations in general, but their educational backgrounds and economic livelihoods make it likely that they would stay informed about and support fisheries regulations and that they would be likely to participate in management processes.

What this study shows, however, is that in St. Croix, several factors contribute to an environment in which all stakeholders—fishers and non-fishers—feel they do not need to pay attention to or participate in the federal management process. These include a real and perceived lack of enforcement, a highly technical and complex council process, the formal mechanisms through which stakeholder participation is encouraged, and participants' perceptions that the CFMC does not take their comments and opinions into consideration when developing regulations and making management decisions. These results speak to the wide range and large number of factors that impact stakeholder perceptions of and participation in natural resource management processes. Even in cases in which management processes are designed to be participatory and perceived by managers as transparent (such as the United States federal fisheries management system), there can be a variety of factors that affect participation, including many that are specific to a particular site, stakeholder group, or individual experiences (e.g., the aforementioned experiences with the gill net buy-back program). While it is certainly not possible for managers or the governance institutions involved to be aware of or to consider every single potential factor when designing management processes, this case does highlight that a one-size-fits-all approach to management—even one that provides opportunities for public participation—does not guarantee the effective and useful participation of local resource users and other stakeholders.

The results suggest that to more fully understand the complex web of interactions among resource users, managers, and other stakeholders in multi-scale resource management systems, researchers must continue to employ a two-pronged approach, combining case studies with large *n* synthesis studies and/or modeling, network, and system approaches. Per Acheson's (2011) recommendation, this case study contributes to our overarching understanding of the larger context in which fisheries management institutions thrive or fail and provides a more critical examination of how social diversity and power influence multi-scale management processes (Fabinyi, Evans, and Foale 2014). When combined with other methods, such as more formalized SES model approaches, this kind of in-depth, ethnographic approach can greatly advance our understanding of the important role local factors play in influencing SES interactions and outcomes. In particular, as illustrated with this case, drawing from political ecology theory provides a more nuanced analysis and interpretation of how and why management processes and outcomes differ across sites and scales and how and why they may be perceived and experienced differently across social groups (e.g., stakeholder groups, ethnic groups).

Although management agencies and/or communities do not have the resources necessary or desire to develop individual management strategies for every utilized resource globally, we cannot continue to ignore cases like the small-scale fisheries in the United States Caribbean, where management processes are not effectively engaging those individuals most dependent on the local resources. The challenge, then, is figuring out how to provide, promote, and encourage opportunities for meaningful stakeholder participation in multi-scale management processes, such as the one described here in St. Croix. One important, though likely unrealistic, recommendation is for St. Croix to be granted greater autonomy regarding the management of its fishery resources. As the data suggest, a mismatch exists between St. Croix's small-scale fishery and the federal fishery management system to which it is subject. Because the federal system is based on the characteristics and needs of large-scale, industrialized fisheries, many aspects—such as the formality of stakeholder participation modes and the management mechanisms Congress mandates the regional councils to use—are not well-suited to the small-scale fishery of St. Croix. If St. Croix was granted autonomy over the management of its fishery, then more appropriate regulatory mechanisms could be put in place. Critical to the success of St. Croix managing its own fishery resources would be an increase in the capacity of local scientists and managers to perform their duties. USVI DPNR currently lacks the funding and resources needed to carry out management as it is now legislated; without additional funding that can be devoted to the necessary scientific, enforcement, and policy activities, they will not be able to take on the increased management responsibility and effectively manage their resources.

This recommendation is idealistic, however, because of the very nature of multi-scale management regimes. In this case, it is highly unlikely that Congress would grant St. Croix the autonomy to control its fishery. The regional fishery management council system has been in place since the first version of the Magnuson-Stevens Fisheries Conservation and Management Act (MSA) was passed in 1976, and such a major change to the law would require a great deal of upper-level legislative support. Additionally, doing so would represent a major shift in United States fisheries policy from a centralized system to a more decentralized system that allows for more local-level and adaptive management strategies. There is currently little indication that such a shift would even be considered by United States legislators. In light of the unlikelihood for this kind of major change in policy approaches to fisheries management, it is important for scientists and managers to continue focusing on how cooperative and collaborative management opportunities can be established within the United States federal fisheries management framework as dictated by the MSA.

Another important policy and research focus identified by this study is the need to encourage the organization of St. Croix's commercial fishers into a more formal, cohesive group. The data presented here as well as case studies from other regions (primarily the Northeast region of the United States) (Hall-Arber 2005; Pinto da Silva and Kitts 2006) suggest that a more cohesive, active fishers' organization could assist St. Croix's commercial fishers in participating in the CFMC process more effectively and, therefore, could allow them to have more influence over management decisions. Additionally, if key leaders were identified within the organization who could devote greater time and energy to working with NMFS and CFMC scientists and staff to not only understand the Congressional mandates to which they are subjected but to also help integrate fishers' recommendations and opinions into proposed management actions, the transparency of the process could be increased and fishers could feel more positively about how their opinions were being considered by managers. Moreover, this can lead to perceptions of increased legitimacy of the management process as well as the regulations, which can further increase the likelihood of participation and compliance.

A great challenge associated with this policy recommendation is how to encourage fishers to organize and participate in management processes. An associated question is regarding whose job it is to encourage greater organization, or even if it is morally acceptable for managers or scientists to "encourage" or "help" Crucian fishers to become better organized. These are important applied anthropology questions and ones that are not unique to the case study described here. If we move beyond the question of ethical acceptability, however, there are many possibilities that can be explored toward the effort of encouraging organization. It may be possible to use organizational models from small-scale fisheries from other locations throughout the world to help educate and train fishers and managers in St. Croix about the benefits of such organization. Further research

towards this end should focus on identifying other locations with fishery and management institution characteristics that are similar to those in St. Croix. Additionally, further research that focuses on understanding whether and how Crucian fishers are organized could help identify and build upon effective local organizational strategies.

From a more practical standpoint, this study identified a few discrete steps that could be taken that may increase stakeholder participation in management processes and may contribute to more effective fisheries management in St. Croix. For example, because the lack of enforcement was cited by fishers and non-fishers as reasons for their lack of participation, federal funding that is currently being used for the development of new federal fisheries management regulations could be refocused and put toward better enforcement of current territorial and federal regulations. Effective training of environmental enforcement officers to fully understand the regulations is critical to this effort so that they understand the impetus behind the laws and that in many cases the commercial fishers themselves support the regulations. Although maintaining high levels of enforcement is generally quite costly and not practical in the long run, a temporary redirection of funding and increase in enforcement presence could reap short-term benefits. For example, increased enforcement could send the message to fishers that regulations will be consistently enforced and that illegal fishing activities will have negative consequences for them. This may be a key factor that will trigger fishers to develop an active fishers' organization that may be able to more effectively participate in the federal fisheries management process.

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