

Addressing Cross-scale Governance in the Alignment of Marine Fisheries Harvest
and Conservation Objectives within a U.S. Community

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Abstract

Marine EBM in the U.S. calls for moving from sector-based governance to integrated governance. Integration at large scales reduces the potential for collective action because transaction costs may exceed the benefits of participation in an integrated regime. Community-based approaches have been recognized and promoted throughout the world as a means of controlling scale and transaction costs, and achieving the goals of marine EBM. Such approaches are rare in the U.S. where governance of the marine environment is top-down and uncoordinated between sectors. I used participant observation and elite interviews to examine issues related to the design and performance of a community based governance regime for marine fisheries in a multi-scaled, sector-based institutional setting typical of the U.S. An innovative project led in part by the Nature Conservancy in Morro Bay, California was selected as a case study. I asked how the present institutional setting facilitates or impedes governance at the local level; and, how integration at the local level is affecting perceptions of empowerment and self-determination of local stakeholders? In addition, I identified obstacles and opportunities for locally scaled governance of the marine environment to be deployed in the U.S. I found that, while limited to a single sector (i.e. fisheries), the case study exhibits integration across interest groups and governance scales. Prior to integration efforts, the subject community experienced dis-empowerment due to shifting institutional goals, top-down governance, scientific legitimacy issues, and regulatory uncertainty. Increased empowerment resulted from integration, collaboration, and the capacity to effectively participate in governance regimes across governance scales. The project appears to demonstrate the potential for local governance to be an improvement over the status quo; however, finer scaled resource assessments and a re-alignment of the institutional setting may be necessary to empower local communities and foster community-based approaches. A critical institution that

may be a long-term obstacle to community-based approaches in the U.S. is the Public Trust Doctrine. The Public Trust Doctrine ensures local resources are open to non-local appropriation and allows for free-riding. Integrated governance is central to Marine Ecosystem-based Management; however, integration at coastal scales can be expected to increase transaction costs and reduce the potential for beneficial collective action. This research suggests that binding governance to human communities in the U.S. may successfully control transaction costs and foster an integrated approach. For community-based approaches to succeed however, it will be necessary to push back a thick institutional structure that was not established to support local governance.

1 Introduction

New approaches to the governance of marine resources have been called for by scientists (e.g. Hilborn 2007(b), Kitner 2007, Crowder et al. 2006, McLeod et al. 2005), resource managers (e.g. USCOP 2004, Tallis et al. 2010, Murawski et al., 2006), and stakeholders including environmentalists, fishermen, and coastal communities (e.g. Gleason et al. 2009, Weber & Iudicello 2005). These calls are based on the recognition that marine resources, and especially fishery resources, provide critical food security to the nation and cultural and socioeconomic benefits to coastal communities that must be sustained for future generations. At the same time, the need to ensure the persistence of resilient marine ecosystems has been recognized (Leslie & Kinzig 2009). These two objectives---maintaining access to marine resources and preserving resilient marine ecosystems---sometimes have been perceived as competing goals. Consequently, new approaches to governance that have the potential to reconcile these two objectives have been sought. Among these approaches is the use of integrated governance scaled to human communities. Integrated governance is “the structure of formal and informal relations to manage affairs through collaborative approaches which may be between government agencies, or across levels of government (local, State, and Federal) and/or the non-government sector (IPAA 2002).” Although rare in the U.S., this type of governance structure has the potential to sustain access to marine resources while at the same time preserving marine ecosystem function (Weber & Iudicello 2009). That community-based approaches are rare in the U.S. may be attributable to the top-down and disintegrated nature of the institutional setting characteristic of the marine environment. Legal institutions have been found to be “uncoordinated, incoherent, and unfocused” (USCOP 2004, Appendix 6) and the top-down nature of coastal governance, especially federal fisheries management, has been found to be an obstacle in addressing local concerns (e.g., Ostrom 1990; Kitner 2007; Gleason et al. 2009).

A central question in marine resource management concerns potential utility of integrated, localized governance to promote local stewardship and achieve the goals of marine ecosystem-based management (marine EBM). The substantive goal of marine EBM is to “maintain an ecosystem in a healthy, productive and resilient condition.” The procedural goal of marine EBM is to integrate governance so that the substantive goal can be realized (McLeod et al. 2005). Integration can occur along a continuum from enhancing communication across sectors to breaking down walls or “stovepipes” between sectors and including all interested parties in decisions (Watt 1990). Integration concepts encompass the sum of processes that influence behavior including “private enterprises, civic organizations, communities, political parties, universities, the media, and the general public” (Chuenpagdee 2009). Miles summarizes integrated policy as “unified according to conceptual notions of the whole range of interests involved (Miles 1992).” Marine EBM seeks to replace the narrow focus of current management approaches (e.g., single sector), with a more holistic approach through integrated governance (McLeod & Leslie 2009). Factors that confound integration include different levels of authority within a multi-scaled hierarchical structure (e.g., individual, communities, national); the presence of multiple actors, voices, and knowledge cultures within civil society, government, and industry; and, the presence of multiple sectors and issues (Parkes 2010).

To meet the procedural goal of marine EBM, marine governance outside the U.S. has tended towards the devolution of management authority from centralized agencies to individuals and communities (Jentoft et al. 2005), and community-based governance has been developed as a means to control the variables that affect collective action potentials in an integrated regime. Whereas the 1977 Law of the Sea effectively removed authority from communities (Pascual-Fernandez et al. 2005), more recent agreements such as the United Nation’s Code of Conduct for Responsible Fisheries (FAO 1995), the European Union’s Green Paper (CEC 2006), and others seek reversal by “re-embedding” authority closer to the source (Apostle

et al. 1998). This trend is based on: (1) the observation that integration compounds governance problems and reduces the potential for collective action unless steps are taken to bound and simplify problem statements (Underdal 1980; Miles 1992); and, (2) vesting authority and self-determination with communities empowers stakeholders and incentivizes the development of resilient institutions, economic return on conservation investments, and sustainable management policies (Ostrom 1990). These two assertions can be used to test the performance of local governance.

Governance regimes are mechanisms of cultural expression nested within the political, social, and economic dynamics of society (Chuenpagdee 2009). Their basic mission is to facilitate and implement collective actions where unorganized action would be sub-optimal (Olson 1965). Rationally motivated citizens participate in government (e.g., voting, lobbying, etc.) if they perceive an opportunity to further their interests in proportion to their transaction costs (i.e. costs of participation in governance processes) (Koremenos et. al 2004, p 768). There is an inverse relationship between transaction costs of participation and problem definition that influences the functionality of a regime. Large, complex regimes are more unwieldy than those with fewer members and more tightly defined problem statements. Conversely, the potential for collective action is higher in smaller regimes with narrowly defined problems (Underdal 1998 and Miles 2006). The challenge in regime design, therefore, is to find the sweet spot between transaction costs and both membership and problem definition (Underdal 1980; Miles 1992).

The sectoral or “stovepiped” regime common to U.S. oceans management can lower transaction costs by simplifying the problem definition and limiting the number of actors at the table. While stovepipe regimes fail to integrate cross-sectoral concerns, they do so in exchange for narrow problem definition and relative agility. In an integrated regime that does not allow for stovepiping, geographic or social scales can be manipulated to influence the functionality of the regime. Community-

based approaches impose boundaries on a governance regime and thereby simplify the problem statement while still allowing for holistic, integrated governance.

The community emphasis goes by many names that for purposes of this research approximate the same thing – managing primarily by decisions at the community level – with different emphases. “Community-based Management” emphasizes the distribution of power across scales with “pure” community based approaches excluding mandates from the top (Weber and Iudicello 2006). “Sustainable Community Development” emphasizes self-determination of the community, citizen empowerment, integration across community sectors, social justice, and economic resiliency through diversification (Hamstead and Quinn 2005). “Co-management” maintains goal-orientated legislation from the top (e.g. economic and ecological goals) but empowers communities with self-determination in achieving those goals (Pascual-Fernandez et al. 2005). Co-management arrangements are assumed to enhance government legitimacy through shared authority, citizen empowerment, and meaningful participation by diverse stakeholders (Jentoft 2004). A fundamental challenge to community-based approaches is how regime design accommodates linkages across governance scales (e.g., municipal, state, national scales) to ensure community governance is integrated into, and supported by, regional or national policy.

Empowerment of citizens to effectively participate in governance processes is a consistent theme in the literature on regime design and community-based approaches (e.g., Jentoft 2005; Weber & Iudicello 2005; Ostrom 1999). Empowering citizens to have meaningful participation in political processes that affect them is an important element of integrated management and EBM that is expected to improve by scaling regime design to the community. Empowerment is a psychological and cultural property that describes the potential for meaningful participation in political processes and “mastery” over public affairs. Empowerment does not

necessarily equate to getting one's way as much as an understanding of political dynamics and ability to be influential (Jentoft 2005).

Here I use an innovative project in co-management of a U.S. fishery as a case study to examine the dynamics that affect institutional change given the novelty of community-based approaches in the U.S. I intentionally narrow the scope of this research to focus on issues related to the design and perceived performance of a community-based governance regime within the context of the multi-scaled, dis-integrated governance regime that typifies a federally-managed fishery on the U.S. west Coast. I ask how the present institutional setting facilitates or impedes community governance at the local level. In addition, I ask how integration at the local level is affecting perceptions of empowerment and self-determination of local stakeholders. By addressing these questions, I seek to identify obstacles and opportunities for locally scaled governance of the marine environment to be deployed in the U.S.

2 Methods

I selected Morro Bay as a case study to investigate the dynamics that affect institutional change and identify obstacles and opportunities for locally scaled governance to be deployed within a sector-based, multi-scaled governance regime. The co-management process in Morro Bay involves a broad spectrum of actors and institutions working to improve the economic and ecological sustainability of groundfish harvest practices. Principal actors are The Nature Conservancy (TNC), namely TNC's Central Coast Groundfish Project (CCGP), the Environmental Defense Fund, and Morro Bay groundfish fishermen, including the Central Coast Sustainable Groundfish Association. Critical support roles emerged from across formal government, academic, industry, and NGO institutions at local, regional, and national scales.

The institutional setting for the marine fisheries management on the Central Coast of California where Morro Bay is located includes formal governance regimes at local, state, regional, and national scales. NMFS and the Pacific Fishery Management Council (PFMC) manage the groundfish fishery primarily on a coast-wide basis in federal waters (3-200 nm offshore) from the U.S.-Mexican border in the south to the U.S.-Canadian border in the north. Monterey Bay National Marine Sanctuary (MBNMS) has federal regulatory authority within a specified sanctuary area off Monterey, California. The California Department of Fish and Game manages groundfish fisheries in California state waters (0-3 nm offshore). Each of these entities has various planning committees associated with them and there are additional high-level planning groups such as the West Coast Governor's Agreement (Gregoire et al. 2006) and Congressional committees with legislative powers. In addition there are local governance authorities (e.g., cities and harbor districts) that address infrastructure necessary to support fisheries. There are over 90 species of groundfish of which approximately 30 have been assessed (PFMC 2008). In a pattern typical of many U.S. fisheries, the groundfish fishery was over-capitalized during the 1980s leading to overfishing, depletion of commercially important species, and economic collapse of fishery-dependant coastal communities (NOAA 2000; Weber 2002).

Collaborative relationships among the key actors and institutions in Morro Bay began to form in roughly 2003 and led to a private buy-out by TNC of trawl permits and vessels in exchange for federal regulatory establishment of conservation areas that prohibited bottom trawling in 3.8 million acres of marine habitat (see Gleason In prep.). Rather than retire the purchased permits, TNC established a conservation-leasing program for fishermen in the community to continue to harvest groundfish subject to specified conservation provisions that were privately agreed upon and not subject to regulatory implementation. The collaborative relationships that led to the buy-out and conservation leasing resulted in improved business planning and organization (e.g., establishment of a Community-Based

Fishing Association), joint harvest planning, improved accountability through on-board monitoring, and improved economic performance (Salomon et al. 2011).

The selection of Morro Bay as a case study allowed me to take advantage of previously developed entrée and rapport and utilize a focused participant observation/interviewing methodology. I worked with the subject community in a professional capacity from 2002-2009 to support fisheries management efforts. This experience provided advanced knowledge of the political dynamics, actors, and institutions that set the stage for focused research to be conducted between April 2010 and August 2011.

As a participant observer, I participated in a two-day internal TNC strategic planning session in May 2010 and several follow-up conference calls. I traveled to Morro Bay during June 2010 where I observed staff meetings and collaborative planning meetings between TNC and local fishermen. During that time, I met with fishermen and community members involved in the project. In August 2010, I participated in a “fishermen’s exchange” in which fishermen from Morro Bay were flown to New England to meet and exchange ideas with fishermen there. These experiences gave me access to individuals from a broad spectrum of interests including fishermen from throughout the Central Coast and beyond, community and business leaders, members of federal, state, and local governance, and environmentalists.

Elite interviews were used to supplement and refine participant observations. Interviews were conducted on a second trip to Morro Bay in July 2011 with key informants from across relevant sectors while maintaining a logistically practical sample size. Specifically, I recruited key informants that were not in the direct employ of TNC’s CCGP. The participant observation research was conducted entirely in the presence of TNC staff who possessed considerable political influence. To control for a potential bias, I selected key informants without direct affiliations to

TNC and interviewed them in settings of their choosing. I interviewed fishermen and community leaders in Morro Bay and a key informant from the nearby community of Monterey to provide for a limited contrast with a community not directly involved in the Morro Bay efforts.

The interviews were unstructured. To provide for a consistent method I initiated each interview with similar protocol. First, I explained the nature of my research and the purpose of conducting interviews. Second, I explained the privacy rights of each interviewee pursuant to human subjects research regulations and gained their informed consent to be interviewed. Third, I read a summary of Elinor Ostrom's design criteria for common-pool resource management to contextualize the interview (Ostrom 1990). Ostrom's institutional research findings on common pool resource management exemplify the utility of bounding governance regimes to human communities. The findings emerge from Ostrom's analysis of game theory and the observation that centralized governance becomes "leviathan" in nature and unresponsive to local conditions. In the Ostrom construct, a "game" is playable only when long-term sustainability of both businesses and resource productivity is incentivized in contrast to the unplayable tragedy of the commons scenario (Hardin 1968). Ostrom developed "design criteria" for sustainable management of common pool resources that rely on vesting authority and self-determination with communities. By bounding the governance regime to a community, the design criteria are intended to create a "playable game" where stakeholders are empowered and incentivized to develop integrated governance, resilient institutions, economic return on conservation investments, and sustainable management policies. Ostrom's design criteria are:

- Clearly Defined Boundaries – ability to exclude external agents from harvesting subtractable resources. Exclusion encourages long-term planning (e.g. sustainability) by ensuring conservation gains accrue to the community;
- Rules adapted to local conditions – institutions matched to locally scaled social-ecological systems;

- Most resource appropriators participate in the decision-making process – promotes integration and local empowerment;
- Effective monitoring – promotes compliance and avoids “prisoners dilemma” element of tragedy of commons;
- Scale of graduated sanctions for accountability within local groups;
- Conflict resolution cheap and easily accessed; and,
- For cross-scale common-pool-resources, smaller units identified for management (Ostrom 1990).

In each interview, this preliminary material led to a discussion of how local conditions compared with theoretical criteria such as those proposed by Ostrom.

I maintained detailed written notes throughout participant observation. Interviews were digitally recorded. I subsequently interrogated the data by reviewing my notes and listening to the recordings to isolate responses that pertained to my research goals. Responses were then collated and used to detect consistencies among subjects. Research methods that rely on participant observation and unstructured interviews inherently require the researcher to make informed but subjective determinations regarding the utility of information for research purposes. I made these determinations by comparing data to relevant literature and my perceptions of how specific data points fit the research.

3 Results

Collaboration across interest groups and scales suggests that integration is occurring in the Morro Bay process. For example, local fishermen participated TNC in the identification of conservation areas (Gleason et al. in prep). Municipal government supported the project and designed a business plan for the Morro Bay Harbor that incorporates long-term sustainability as a central theme (Lisa Wise Consulting 2008). State government provided financial assistance for the project

(OPC 2008), as did private foundations. Regulatory support has come from the regional and federal level (Gleason et al., in prep; Salomon et al. 2011; Federal Register 2006; NMFS 2004). This level of collaboration is functioning as a governance regime that integrates NGO and fisheries sectors at the local level and that is integrated across scales with state, regional, and federal government regimes. However, integration is limited in the sense that it does not involve non-fisheries sectors.

Empowerment

Empowerment, or the perception of mastery over public affairs, is a consistent theme in the data. Participant observation and interviews indicate that a sense of disempowerment, or the perception that efforts to change public policy are destined to be meaningless, drove a willingness to explore alternatives to status quo management and improved through integration. Subjects consistently indicated that disempowerment resulted from:

- shifting institutional goals
- top-down, dis-integrated governance
- scientific legitimacy issues
- regulatory uncertainty.

Conversely, subjects consistently indicated that empowerment increased due to:

- permit acquisition by TNC & collaboration at the local level
- increased capacity to participate in governance processes (transaction costs)
- the formation of an epistemic community of fishermen and community leaders.

Shifting Institutional Goals

A shift in institutional goals at both regional and national levels away from capitalization towards precautionary management confused fishermen and fishing communities and resulted in a sense of disempowerment. Prior to 1996, U.S.

fisheries policy was largely focused on increasing domestic fishing capacity and harvest. This changed with the Sustainable Fisheries Act of 1996 (SFA) and subsequent finding that certain West Coast rockfish species were overfished which triggered a rebuilding requirement and reduced harvest rates (Weber 2002; PFMC 2011). The SFA was part of a larger shift towards precautionary, ecosystem-based management including the establishment of Monterey Bay National Marine Sanctuary in 1992, and recommendations by the U.S. Oceans Commission that U.S. ocean management move from a sector based approach to an ecosystem-based approach (USCOP 2004). Furthermore, lawsuits by NGOs against the National Marine Fisheries Service resulted in Court mandates to rebuild overfished species and consider conservation of marine habitat (e.g., *AOC v. Evans*). Fishermen describe this period as a time in which new policies were continuously emerging that they did not agree with and over which they had no control. Fishermen articulate a sense that their business opportunities were being dictated by NGOs through the courts and national legislation that was perceived as coming from “behind closed doors.”

Top Down Disintegration

As described in the introduction and methods, the governance regime for the marine environment was found to be incoherent (USCOP 2004, Appendix 6). From the perspective of those interviewed, this is amplified by a lack of integration within even single sector management agencies where authority is distributed across multiple scales above the community. Authority is distributed at state and federal scales with the federal scale further distributed across several agencies including the National Marine Sanctuary Program, the National Marine Fisheries Service, the Pacific Fishery Management Council, and to some extent federal Courts.

Looking up from the perspective of a Morro Bay stakeholder, there is a dis-empowerment effect due to the challenge in understanding the governance regime. Governance appears confusing and dis-integrated due to incoherence in the regime

design and multi-scaled single sector management with confusing lines of authority. Empowerment is related to “mastery” of affairs. Such mastery is made difficult by the multi-scaled, incoherent regime design for the West Coast. It is difficult to know where authority lies and where to invest energy in creating change. The unfocused, disintegrated nature of governance was manifest in confusion regarding lines of authority that was consistently raised by fishermen as contributing to a sense of disempowerment. Fishermen reported not knowing where to expend energy in working towards a sustainable future. For example, one fisherman described working with government agencies as a “waste of time.” Fishermen recognized PFMC as the primary governance regime affecting them; however, cited NMSP and the Courts as powerful entities that were “against” commercial fishing and over which they had no influence. While this may not reflect the motives of NMSP and the Courts, fishermen clearly experienced a sense of disempowerment and were less involved in political process than they otherwise would have been.

Scientific Legitimacy Issues

Scientific assessments such as fisheries stock assessments are cognitive institutions designed to express the status of a stock for management purposes (Scott 2008). A perceptual measure of scientific assessments is legitimacy – the extent to which institutions are perceived by people to be right. Regulations based on legitimate cognitive institutions tend towards higher levels of voluntary compliance (Johnson 2006; Tyler 2006). Regime design theorists place a high level of importance on legitimacy. Ostrom, for example, cites the importance of assessments matching local conditions in her design criteria for sustainable management of common pool resources (Ostrom 1990).

Compounding disempowerment issues in Morro Bay were conflicting interpretations of the scientific knowledge underpinning management decisions. One fisherman I interviewed said “fishermen never really bought the idea that

stocks were overfished in local areas. Maybe they believe overfishing occurred up north but not in local areas.” This is significant because of the role of overfishing and subsequent regulatory actions in changing the political dynamic and fishermen’s income.

Furthermore, fishermen and NGOs have had opposite interpretations of the role of marine protected areas in enhancing fisheries production (a finding supported by other studies such as Weible 2008). For example, NGOs were more likely to report that fishing activities produced impacts that were not environmentally sustainable, while fishermen were more likely to report the converse.

In all cases, subjects shared the perspective that the general state of knowledge is insufficient for management challenges. Examples cited include the low number of fish stocks for which assessments are available, the coarse spatial scale of fisheries stock assessments, the lack of knowledge regarding the relationship between ecosystem function and ecosystem services (including fish production), uncertainty regarding the spectrum of human impacts (e.g., fishing), a poor understanding of the socioeconomic value of fishing to individual ports (particularly the value of secondary effects such as infrastructure development), and a general inability to forecast ecological and socioeconomic responses to management scenarios (e.g., PFMC 2008). In sum, these issues led to a scientific legitimacy crisis among fishermen who felt that management decisions were being made based on questionable and insufficient knowledge. The sense that large-scale assessments were not reflective of local conditions had a particularly dis-empowering effect that continues to be present today.

Regulatory Uncertainty

Fishermen, as small business owners, anticipate possible futures in their deployment of strategic assets. Investment decisions are made in an environment of uncertainty that includes the potential for regulations that may impact their

business to change (Amit & Schoemaker 1993). Fishermen reported in interviews that they were uncertain how environmental regulations would change and affect their businesses as a result of the shifting institutional goals described above. In addition to the imposition of fish stock rebuilding requirements that resulted in reduced harvest opportunities, there was a sense that further restrictions were imminent and that fishermen had little power to ensure they were consistent with their business goals. Fishermen specifically cited potential regulations emerging from the Monterey Bay National Marine Sanctuary, the National Marine Fisheries Service, and the California Department of Fish and Game pursuant to California's Marine Life Protection Act as sources of uncertainty. From at least 2000 when rebuilding plans for overfished rockfish were first implemented, regulatory uncertainty was described as "killing investment in infrastructure and sustainable business models." Fishermen claimed that because regulations changed so frequently, they had little certainty that their businesses would be allowed to continue, or if they were, what harvest levels they would be held to. Some fishermen indicated that this uncertainty appeared to incentivize fast-paced resource scooping in order to capitalize on current allowable activities rather than investment in an uncertain future.

Permit Acquisition/Collaboration

TNC's emergence as a vested, collaborative leader with resources deployed at multiple scales, including at the local level, significantly affected perceptions of empowerment within Morro Bay. TNC's acquisition of permits initially led to fears among fishermen and the fishing community that their empowerment would be further eroded. While vestiges of that concern remain, TNC committed to sustainable use of the permits and catalyzed a collaborative effort at the local level that improved empowerment perceptions within Morro Bay. In particular, TNC leased fishing permits back to fishermen and engaged in collaborative planning with fishermen to determine the specific manner in which fishing would occur. This collaborative effort led to spatial fishing plans and harvest planning that incorporate

TNC's ecological goals and fishermen's business goals. For example, the no-trawl zones described in the methods section above were selected collaboratively to protect habitat as well as to leave open areas fishermen relied on to harvest groundfish. Some fishermen and community members who initially feared that TNC's control of permits would erode business opportunities in Morro Bay report an increase in empowerment when they realized TNC was committed to preserving the socio-economic contribution of fisheries to the local economy.

In addition, TNC's approach attracted attention and investment in Morro Bay by organizations interested in supporting innovation in fisheries management. The project has been the subject of national press coverage (e.g., Christensen 2006) and organizations such as the California's Ocean Protection Council and Moore Foundation have provided financial support for developing sustainable business plans. Due to this national attention, fishermen report a sense that what they were doing in collaboration with TNC was meaningful in a broader policy context.

It is important to note that resource control by an NGO is a concept that creates unease among fishermen. While TNC's ownership and utilization of permits clearly resulted in increased empowerment overall, there remains perceptible anxiety over how fishing rights will be distributed in the future and a potential loss of control by fishermen and disempowerment.

Governance Transaction Costs

A critical element in changing the empowerment dynamic in the Morro Bay fishing community was that TNC deployed resources at multiple scales to support the local effort in Morro Bay. Plans designed in collaboration with fishermen at the local level were supported by TNC at national, coastal, state, and local scales. Transaction costs for governance are compounded by the number and disintegrated nature of institutions with management authority or influence as described above. By working in collaboration with TNC, Morro Bay has been able to distribute resources

across these multiple scales and “pay” transaction costs associated with a disintegrated governance structure.

Transaction costs for governance of fisheries resources that I observed during the research include tracking and influencing agenda development, developing or participating in coalitions, performing literature review and analysis, reviewing or developing management options, lobbying and outreach, developing position statements, and traveling to meetings. Several subjects reported that investments of time and money were necessary for meaningful participation with any single decisionmaking entity. Community leaders reported that the high transaction costs inherent in this institutional structure dwarf the capacity of fishermen and their community. In contrast, TNC is strategically resourced to address each level of governance. By deploying resources at each level in support of the Morro Bay efforts, fishermen and the fishing community began seeing results coming from their local efforts and the empowerment dynamic shifted in a positive direction.

Epistemic Community

The literature on governance regime theory often describes the importance of informal networks of people for information sharing and creating momentum behind policy concepts. Referred to as epistemic communities, such networks are composed of recognized experts with authoritative knowledge and experience in a particular issue (Haas 1992). The experience of integrating NGO, fishing, and community goals in Morro Bay and gaining cross-scale support from government and private foundations has given participants unique experience when compared to the rest of the U.S. and led to the formation of an epistemic community that has improved perceptions of empowerment within Morro Bay. Evidence that Morro Bay fishermen are recognized for their expertise includes the Moore Foundations funding of a “fishermen’s exchange” that brought fishermen and community members from Morro Bay together with those from other areas of the East and West coasts to share ideas and experiences. The exchange exposed participants to

innovations in sustainable management from their communities that would have otherwise been unavailable to them. The exchange improved connections between fishermen who have experience and ideas for improving their businesses.

Ongoing Challenges

Path Dependency

Governance literature describes path dependency as an obstacle to institutional change that is a function of the present or preceding institution. In theory, for community-based efforts to succeed in a top-down regulatory environment, they will have to rely on existing organizational structures or create new ones in order to push back institutions that are resistant to change (Holm 1995; Jentoft 2004). For example, Cicin-Sain and Knecht (1998) note that coastal zone management agencies often become more concerned with guarding their “turf” than with solutions to societal problems. They note that agencies are more likely to attack competing ideas rather than consider them on their merits.

Path dependency issues were found to be obstacles to innovation at the local level. The distribution of authority for the West Coast marine environment was developed as a sector-based, top-down approach that consumes the attention of fishery managers and stakeholders. People involved in the Morro Bay effort report difficulty getting necessary attention from decision makers in a top down regulatory structure due to the sense that all of their energy was invested in making the current system work rather than exploring new, possibly better options. The disintegrated nature of marine governance appears to be a resilient condition that does not favor integration even at a local level. In some cases, interview subjects report that agencies with coast-wide authority appear to resent local efforts for taking time and attention away from their coast-wide mission.

Potential Free Riding

The “free riding problem” is the appropriation of managed common pool resources by those who did not pay the costs of management at the expense of those who did. While management of West Coast groundfish fisheries on a coastwide scale theoretically prohibits free riding, that may change if local conservation efforts begin to pay off by producing more harvestable fish. Free riding would occur if fishermen from other areas who did not forgo harvest or otherwise “pay” for effort that produced more fish, were to harvest the returns of local efforts. The examples below illustrate the potential for free riding to occur off Morro Bay.

The exception to coast-wide groundfish management is sablefish which is managed by separate quotas north and south of Morro Bay. In 2009, managers responded to an increase in the southern stock by increasing landings limits. Local fishermen report feeling that managers “finally got one right.” The increased landing limits coincided with strong market conditions that incentivized local fishermen to “gear up and go fishing.” Over the 2009-2010 time period, fishermen from outside the area were also incentivized to fish in the southern area around Morro Bay to take advantage of the increased landing limits and market conditions. Subjects report that the port and fishing grounds were “filled with non-local boats” and that catch rates plummeted as a response to the increased effort. Local perceptions shifted from a perception that the resource was “endless” to “maybe the stock assessment was wrong and there aren’t so many fish.”

A second observation of a pulse in local effort involves implementation of groundfish trawl Individual Transferrable Quota (ITQ) program in 2011. Permit holders in that program are allocated harvest quotas based on their catch history and are allowed to lease that quota rather than fish it themselves. One interview subject was fishing for a venture capital company that had leased a large amount of quota from fishermen in Oregon and Washington. Although the interview subject was local to the Morro Bay area, the quota he was harvesting was accrued through

catch history in non-local areas. The effect was a transfer of fishing effort from distant areas to the Morro Bay sablefish grounds.

These examples demonstrate that the Morro Bay fisheries are open to non-local appropriation. If fisheries production is increased in the local area due to stewardship initiatives, the extra fish may be harvested by fishermen who did not participate in such initiatives. To the extent stewardship comes at a cost (e.g. foregoing short-term harvest in favor of long-term sustainability), then appropriation by non-local fishermen is equivalent to free-riding on local efforts. It is clear that future efforts could be undermined if free-riding incentives are not addressed.

This observation is complicated by fishermen's perception of the Public Trust doctrine (i.e., freedom of the seas) as a cultural institution they would be loathe to change. While they recognized the potential for free riding to undermine sustainable business planning, they value the freedom to fish throughout the West Coast even if it means non-local fishermen have the same freedom to fish in their local areas. However, when the subject was explored during the interviews as a trade off between the freedom of the seas and local empowerment, the results were mixed.

Opportunities

The sections above largely point out obstacles to local management within a regionalized institutional structure; however, interview subjects pointed out numerous opportunities as well. First among them is a sense of optimism across interest groups that the experiences in Morro Bay are demonstrating that improved governance is possible by bounding management to a local geography in a co-management arrangement. One interview subject with considerable experience in local government indicated that while local politics are "extreme and often

dysfunctional, it can't get worse" than the status quo. The level of collaboration in Morro Bay is evidence that binding the problem at a local level can bring diverse groups together in a positive, problem-solving dynamic.

The most consistently reported opportunity for improving local management is to invest in local stock assessments. Consistent with Ostrom's research that regulation be designed to reflect local conditions, interview subjects reported that local stock assessments would remove communities from the coast wide dynamic and empower local decision-making. This is also reflected in perceptions throughout the west coast (e.g., PMCC 2007).

4 Discussion

The structure of governance regimes is a key variable for marine EBM. EBM case studies in the U.S. show that even in the presence of strong science and a top-down commitment to change, efforts may fail in the absence of strong bottom-up support (e.g., Boesch & Goldman 2009). Coastal areas face problems of such complexity that their governability is compromised without strong bottom-up support from across sectors (Chuenpagdee & Jentoft 2009). Due to the complexity of oceans and coastal issues, the responsibility of governance rests with society at large to develop appropriate institutions and opportunities for meaningful change (Kooiman et al. 2005). An important challenge inherent in integrated governance for marine EBM is to structure the governance regime to keep transaction costs sufficiently low as to empower cross-sectoral participation in decision-making processes without narrowing the problem such that fundamental connectivity issues go unaddressed (Underdal 1980; Zerbe & McCurdy 2000).

Open access to subtractable, common pool resources discourages collective action for the common good and promotes free riding and over-harvest by disincentivizing long-term stewardship (Hardin 1968; Ostrom 1990). Design theory

for community-based or co-management is premised on limiting access to individuals or communities in order to incentivize investment in the future productivity of a resource (Ostrom 1999). TNC has taken advantage of this by taking steps to anchor quota assigned to individual permits in Morro Bay and managing harvest through a collaboration of business, government, and environmental interests. Full realization of integrated governance to achieve sustainable and profitable fisheries appears to be dependent on integrating local governance across scales with regional and national governance.

Co-management is expected to reduce the transaction costs of governance in comparison to top-down management. The relatively tight regime design creates a “playable game” that balances the transaction costs of membership with the potential for mutually beneficial collective action such that citizens are empowered and there is an incentive for participation (Olsen 1965; Ostrom 1999). Transaction costs of governance are measured as expenditures of time and resources necessary for meaningful participation. Reduced transaction costs are often cited as a key rationale for community-based management as well as a key outcome (e.g., Eagle 2006; Evans & Klinger 2008; Imperial & Yandle 2005; Jentoft et al. 1998; Schmidt 2003; Wilson 2006).

Community-based or co-management approaches are significantly disadvantaged within the U.S. due to path dependence within the institutional setting. The challenge of re-designing present decision-making regimes is significant. Institutions are, by definition, the products of cultural patterns that may become hardened such that their survival takes precedent over function even when they are sub-optimal. A survival dynamic, where people vested in existing institutions resist change, is expected when new ideas such as community-based approaches are proposed (Jentoft 2004).

This current institutional structure sets up “path dependency” as a form of inertia whereby top-down institutions change marginally or incrementally. Institutions become bound to historical precedent such that decisionmakers are often limited to options that do not upset the status quo (Jentoft 2004; Cyert and March 1963). For Marine EBM to replace such patterns, and particularly for community-based efforts to succeed in a top-down regulatory environment, it will have to rely on existing organizational structures or create new ones in order to push back hardened institutions that are resistant to change (Holm 1995; Jentoft 2004).

The large number of collaborators that have been necessary in the Morro Bay project thus far is an indication of the effort necessary to push back a thick institutional structure. It has taken the focused efforts and high transaction costs of many organizations across many levels of society to implement a relatively modest program that integrates only one sector across governance and social scales. Each of the collaborators has an essential role to play and the absence of their contribution could jeopardize long-term success. This level of effort only addresses one sector and can be expected to quickly grow in a fully integrated scenario.

Collaboration is fundamental to achieving management success across multiple, cross-sector performance criteria (e.g., Elkington 1998) and community-based approaches have been shown to reduce the scope of problem statements through scaled down regime design and thereby make collective action more likely. Whereas top-down approaches seem to result in political polarization, working at the bottom can bring diverse sectors together with a shared purpose. Focusing on discrete marine spaces offers opportunities for integrating cross-sectoral concerns (Crowder et al. 2006). This is evident in numerous case studies from throughout the world (e.g., deVos 2010; Schmidt 2003; Hilborn 2007; Hilborn 2007(b); Gutierrez et al. 2011; Pomeroy & Rivera-Guieb 2006).

The project in Morro Bay has revealed opportunities to foster community-based approaches in an EBM context for the U.S. First is the recognition, particularly at national and regional scales, that community-based approaches are well-founded in the literature as a means of integrated, effective governance that is consistent with EBM. EBM literature should be expanded to more explicitly include governance topics such as regime design. Strong, bottom-up governance regimes can improve the legitimacy of EBM efforts and make effective changes in response to a wide range of sectoral concerns.

Second, due to institutional inertia, it is likely that the single-sector approach in Morro Bay is necessary as an iterative step towards integration and EBM. The sector-based, top-down institutional structure should not be expected to change quickly or easily. TNC's decision to engage primarily with a single sector is pragmatic based on high transaction costs of overcoming inertia and path dependence.

Third, spatially explicit information at local scales, most importantly stock assessments, would be immediately beneficial to community-based management efforts. Because fisheries rebuilding efforts are structured around a stock assessments as interpreted through decision control rules that drive quotas (Khan 2010), localizing stock assessments has the potential to bring management away from the top and closer to the affected communities. This has a strong potential to increase legitimacy - the extent to which management decisions and the underlying science are perceived within a social context to be "right" (Tyler 2006). In addition, a collaborative approach to scientific assessment - one that involves stakeholders - may improve scientific legitimacy (Johnson et al. 2006). In the case of scientific institutions, failure to achieve legitimacy of basic information results in polarization and greatly diminishes the potential to achieve collective action (Jentoft 2000; Pielke 2007) and is in evidence on the West Coast (e.g., Weible 2008).

Finally, perhaps the most challenging opportunity is to revise the Public Trust institution to discourage free riding. In the U.S., exclusion is prohibited by cultural and legal manifestations of the Public Trust doctrine that states certain resources such as fisheries are the common property of all citizens (Baur et al. 2008). The Public Trust doctrine is interpreted in fisheries law as allowing all U.S. citizens to access marine fishery resources wherever they available for harvest (MSA 2007 sec. 301(a)(4)). Public trust is a key issue but would be difficult to change due to the cultural institution of freedom; however, game theory suggests that communities may continue to face disincentives for conservation if free riders are permitted to harvest returns on their investment. Further, other case studies have demonstrated that fishermen have been willing to sacrifice freedom principles in exchange for limiting free-riding (e.g., Acheson 1998).

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