

Defining “Fishing Communities”: Vulnerability and the Magnuson-Stevens Fishery Conservation and Management Act¹

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Abstract

As populations of many fish species worldwide have declined, the price of fuel has increased, and coastal development has mushroomed, fishing communities have suffered economic and social vulnerability. Since its 1996 re-authorization, the Magnuson-Stevens Fishery Conservation and Management Act (which governs U.S. marine fisheries) has included a definition of “fishing community” as “substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs” and a requirement (National Standard 8) to minimize economic impacts and sustain participation in fisheries in these communities. These initiatives are being implemented in conjunction with a worldwide move towards ecosystem-based management. These legal and policy requirements add a new layer to theoretical discussions of “community” and “vulnerability.” We review key themes and issues from the literature on ecological anthropology, vulnerability, disasters, ecosystem-based management and fishing communities in the context of applied anthropological work in the U.S. Critical factors for understanding vulnerability in fishing communities are discussed and put in the context of more inclusive and holistic forms of management.

Keywords: fishing, policy, community, vulnerability, ecosystem, resilience

Introduction

Vulnerability, risk, sustainability and resilience: these concepts define the contours of fisheries management for stakeholders around the world. As many fish populations have declined (FAO 2004), fuel prices have increased, and coastal development has mushroomed, fishing communities have increasingly suffered economic and social disruptions (Apostle et al. 1998; McGoodwin 1990; Johnson and Orbach 1990; Heinz Foundation 2000; Acheson 2000). Dyer and Mc-

Goodwin (1999, 214) see fishing communities as particularly vulnerable to the combination of natural and technological⁴ disasters because fishing utilizes resources in a natural environment under little human control. Yet the human experience of disasters may be primarily in terms of social disruption (Oliver-Smith 1999, 22; Barton 2005, 126),⁵ including the social disruptions that fishery regulations can engender (Fowler 2001; Fowler and Etchegary 2007).

In this article we delineate ways in which the idea of community, and in particular “fishing community,” comes to play in our understanding of, and fisherfolks’ experiences of, vulnerability and resilience, especially in the context of fisheries and fishery regulations in the U.S. The primary legislation governing marine fisheries in the U.S., the Magnuson-Stevens Fishery Conservation and Management Act or MSA (16 U.S.C. B 1801 et seq.),⁶ includes a legal definition of “fishing community” and a requirement to mitigate impacts to fishing communities.⁷ It further makes frequent use of the term “ecosystem” and in its 1996 re-authorization required development of “recommendations to expand the application of ecosystem principles in fishery conservation and management activities” (MSA Section 406(a)-(f)),⁸ which has implications for the delineation of boundaries and the analysis of interactions between and within social and ecological units. Here the seemingly straightforward requirement to consider impacts to communities has generated a multiplicity of methodological approaches to understanding regulatory impacts on communities (Ingles and Sepez 2007). These various methodologies further involve deep-seated theoretical issues relating to the definition of fishing community (Clay and Olson 2007) and the role of human communities within the ecosystem.

More on the MSA

For anthropologists working on fisheries management and policy in the U.S., concerns about vulnerability, risk, sustainability and resilience are thus structured by a context of

legal exactness. This context can fit awkwardly with an anthropological emphasis on situated meaning, for there is a presumption of universal standards and applicability. MSA Section 303(b)(6) on limited entry requires examination of current and historical involvement in fishing, economic, social and cultural factors, and “the capability of fishing vessels used in the fishery to engage in other fisheries.”⁹ Section 303(a)(9) on preparation of Fishery Impact Statements requires description of impacts of any regulation to both “(A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas . . .” National Standard 8 (NS8) provides for the sustained participation in fishing of communities and the minimization of adverse economic impacts.¹⁰ Agency regulations that flesh out the requirements of NS8 further define a fishing community as “. . . substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.”¹¹ In addition, managers are to seek the “optimum yield” from a fishery, defined in Section 3(33) as “the amount of fish which—(A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed as such on the basis of the maximum sustainable yield¹² from the fishery, as reduced by any relevant economic, social, or ecological factor; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery¹³.”

With regard to ecosystems, the MSA is less prescriptive, but utilizes the term throughout in a variety of key passages which are often tied also to the needs and practices of fishing communities. It, for instance, requires that Fishery Management Plans (FMPs) implemented to rebuild overfished stocks take into account “the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem . . . [and] allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery.”¹⁴ The National Marine Fisheries Service (NMFS—the federal agency charged with regulating U.S. marine fisheries, including through implementation of the MSA), has in fact been moving toward ecosystem management for many years (NOAA¹⁵ 1987; EPAP 1999; Busch et al. 2003;¹⁶ Murawski and Matlock 2006). This move towards ecosystems has important ramifications for social scientists and fishing participants. While the long history of ecological anthropology provides many

points of entry for a critical stance towards understanding ecosystems, as we describe below, this shift in management thinking has the potential to integrate communities and other groups into the management process in a more complex and culturally rich relation (St. Martin et al. 2007). The links, then, between community, ecosystem, and resilience are complex, yet their continued exploration promises the potential for alternative management processes and strategies, and a renewed focus on sociocultural relations and practices.

Understanding Vulnerability, Resilience, and Human Communities

Research on vulnerability and resilience crosses multiple disciplines, including anthropology, sociology, human geography, economics and disaster research. Given limitations on space it is impossible to fully cover all the existing literature. Here we wish to target work that specifically discusses the links between social and ecological systems, given our desire to discuss vulnerability and resilience within the context of the MSA and its emphasis on both communities and ecosystems.

As Hilhorst and Bankoff (2004, 1) write, “Vulnerability is the key to an understanding of risk that attempts to break from the all-too-technocratic attitudes that have characterized relationships between human societies and their environments over previous centuries.” Vulnerability and resiliency highlight the role of people, in relation to each other and to the environment, in creating and coping with risk. In a broader sense, this recalls anthropology’s long history, particularly in ecological anthropology and human ecology, of exploring relations between humans and their environment, and parallels early social science research on disasters (e.g., Fritz 1961, 655) that emphasized both physical and social structures.

Resilience, Vulnerability, and Anthropology

Works in ecological anthropology¹⁷ like Rappaport (1967) and Netting (1981) relied on adaptation and homeostasis to theorize how populations maintained themselves in an ecosystem through varying cultural practices. Such a focus on both homeostasis and the population as the unit of analysis was criticized by scholars interested in how individuals responded to environmental perturbations (Vayda and McCay 1975; see also Lees and Bates [1990, 249]). This actor-centered approach sought a more dynamic understanding of social and material conditions, resulting in a more nuanced notion of resiliency (see also McCay 1978)¹⁸ and a recognition that vulnerability and resilience operate at many different scales.

The predominant models that emphasized stable and distinct ecosystems and societies were also criticized by structural approaches emphasizing political economic forces, as communities could no longer be seen as isolated from global processes (Wallerstein 1974; Wolf 1982). These were reinforced by critiques within ecological anthropology of reified and bounded ecosystems. Rappaport (1971, 238 and 251), for example, initially defined ecological populations as “groups exploiting resources entirely, or almost entirely, within certain demarcated areas from which members of other human groups are excluded,” and the ecosystem as “the total of living organisms and non-living substances bound together in material exchanges within some demarcated portion of the biosphere,” though he did recognize “regional exchange systems.” But these definitions only worked for small, isolated groups and had little practical application in complex societies (Moran 1982, 10-11; Kottak 1999). Moreover, the reification of bounded ecosystems tends to neglect “processes by which systems transform themselves in response to either external or internal dynamics” (Moran 1990, 17), including shifts in the very boundary definitions.

At the same time, notions of community within anthropology in general became more fluid, marked more by broadly conceived interactions and less by physical boundaries (see Clay and Olson 2007 for a fisheries-specific review). Political ecological approaches have sought to meld human ecology with political economy through analyses linking spatial levels and by developing multiple concepts of marginality (Blaikie and Brookfield 1987; Greenberg and Park 1994). Challenged by post-structuralist understandings of power and the ways in which we create shared meaning, such approaches also interrogated more thoroughly the concept of Nature (Escobar 1996), the nature of politics (Paulson et al. 2003), and their embedded geographies (Schroeder et al. 2006). Thus notions within anthropology of both community and its connections to the environment began to take into account broader concepts and greater variation.

Ecology, too, began placing more emphasis on spatial and temporal variability and on scaling in temporal, dynamic processes (Scoones 1999, 483). Following these new insights from ecology and building on previous anthropological work, ecological anthropology has branched into historical ecology (Crumley 1994; Winthrop 2001), chaotic systems (Wilson et al. 1994; Acheson et al. 1998), complex systems theory (Berkes et al. 2003a) and investigations of differing levels of analysis, their implications and intersections (Moran 1984; Kottak and Colson 1994; Boucek and Moran 2004; Sepez et al. 2006). These movements toward a “new ecology” understand that equilibrium points of systems (when they exist) can change over time,¹⁹ and that such changes may best be captured by concepts like vulnerability, resilience and resis-

tance (see also Fisher and Feinman 2005).

Vulnerability Research

Vulnerability research, though interdisciplinary in scope, owes much to this intellectual legacy. Classic works in the social sciences of natural hazards also focused on human adaptation to change (Kates 1971), and on such questions as individual perception of risk (Burton and Kates 1964; Kempton et al. 1995) and individual vulnerability and adjustment (White 1945; see also Mederer’s [1999] psycho-sociological work on fishing-family resilience). Confronted by concerns about differential political and economic power, these researchers too developed new theses on structural causes of vulnerability (e.g., Blaikie et al. 1994) that highlighted marginality as a key explanatory factor (Susman et al. 1983). Escobar’s (1995, 155-159) caution against simply assuming vulnerability, however, draws attention to how communities can be represented as “victim subjects” by outside agencies that lack community involvement (see also Brosius et al. 1998, 165). Without active involvement and agency, vulnerability studies easily slip into persistent geographies that construct “Us” as safe and “Them” as victims (Bankoff 2001). Speaking specifically to environmental justice issues (with their focus on particular subsets of vulnerable groups), Williams (1999) argued in a related vein that we must be sensitive to the politics of scale: localizing the existence of—and responsibility for—solving problems precludes consideration of global political-economic processes (see also Baker and Refsgaard 2007).

Scale in human systems is after all fundamentally a social construction, concerned with multiple social relations (Marston 2000). Moreover, particular scales and vantage points affect understandings and representations of community (Brosius 2006). Even within biophysical systems, the choice of where to divide one ecosystem from another, or which scale to use, has sociocultural dimensions. And connecting the social to the biophysical is more complicated still, given the frequent mismatch in scales between human and natural components and “the complexity of the governance system,” involving intersecting and sometimes competing jurisdictions (Sutinen et al. 2005, 28; see also Creed and McCay 1996 and Hennessy 1998). It is thus critical to examine and “understand the dynamics of social and economic systems and their relation to ecosystem management” (DeMaster et al. 2006, 23; see also Ohl et al. 2007). Finally, for fishing communities in particular, there is also the question of whether community resilience is always the same as fishing-community resilience; might a community best retain its overall resilience by letting go of the fisheries connection, and who should decide (Robards and Greenberg 2007)?

Studies of Risk

While natural resource communities, including fishing communities, are often represented as the victims of resource shortages or global economic vagaries, this “exhibits an incomplete understanding of community life [. . .] While community vulnerabilities are real and of consequence, so too are the abilities of communities to act” (Flint and Luloff 2005, 400; see also Brookfield et al. 2005 and Perry and Sumaila 2007). In part, this raises the question of how groups of people, or communities, actively engage with and understand the risks to which they are subject. The classic work of Douglas and Wildavsky (1982) focused on the cultural bases of risk perception, and though criticized for their derision of grassroots activism (e.g., Kaprow 1985), they raised the important question of multiple sources of knowledge about risks. So too, Beck’s (1992) influential *Risk Society* argued that the very constitution of contemporary society and reflexive modernity is through risk, where risk is both a product of modern society and a threat to be managed. Engaging these “meta-theories” of risk, Zaloom (2004, 365) argues that ethnographies have neglected “active, voluntary engagement with risk” and instead have “represented [risky behavior] as critical contestations of the modern rather than as constitutive elements of contemporary power and economic practice.”

One might argue that anthropological work on risk in fishing societies actually does both. Many studies in different parts of the world (see Binkley 1995a; Pollnac this volume and references therein) have posited a distinct personality-type drawn to fishing as a way of life different from the “conventional.” Other studies have noted how fishermen²⁰ actively pursue “rituals of avoidance” (Poggie 1980, 123), taboos and rituals that enhance feelings of control over risky environments and so serve as psycho-cultural coping strategies (Binkley 1994; Poggie et al. 1995; Murray and Dolomont 1995; Poggie and Pollnac 1997). Acheson (1981) also described many common institutions and norms in fishing as risk coping mechanisms, e.g., crew shares,²¹ egalitarianism, information sharing, and fishery-switching. This focus on the individual and individual strategies of risk management arguably still calls for more attention to how such practices play out over time and in relation to resource use (see Moran 2000, 134). Indeed, Agrawal (2005) specifically calls for research on “environmentality”: how “subject formation,” or the culturally inflected ways in which people come to have particular senses of themselves, is tied to particular practices towards and ideas about the environment. In particular, he stresses that it is practices, including those engendered through particular management regimes and management strategies, that remake both environments and environmental subjects.

Connecting the MSA and the Literature to Fishing Communities

Understanding vulnerability and resilience then, involves such situational factors as specific historical paths, modes of engagement with risk, and structural factors including available social, cultural, economic and institutional resources for resistance or change at both the individual and the community level. It also invokes questions of scale and linking levels. How do the scales of events mesh with the responses available to community members and others? What are impacts to individuals, households and communities, and can responses be coordinated among and across levels up to the global? Does mitigation of those impacts require actions at levels above the local? Who defines the scope of the stress and the options for response, i.e., are local community members involved or is legitimate response defined as top-down? For fishing communities in particular, who defines the boundaries of the community and the inclusion of varying relations to multiple seascapes? Finally, is community resilience always the same as fishing community resilience, and who decides?

Defining Fishing Communities

The general prescriptions in the MSA regarding the assessment of social impacts (see 303(b)(6) and 303(a)(9)) allow examination of both communities of place and communities of interest, e.g., by gear type or target species or ethnicity. NS8, however, requires communities to be place-based,²² and dependent on fishing to some important, though unquantified, degree for meeting “social and economic needs.” As the guidelines for its implementation explain, “Further, dependence, engagement, and sustained participation are not measured solely in terms of the percent of fishing activity in relation to the entire economic base of the community; there are other social, cultural, and economic assessments specifically focused on the harvesting, processing, and fishery-support industries” (63 Fed. Reg. 24211, 24223 [May 1, 1998]). NS8 requires maintaining “sustained participation” (undefined) in fisheries and minimizing economic impacts to fishing communities when implementing regulations. Yet while this place-based definition of community speaks in general terms, policy prescriptions currently being crafted increasingly rely on more absolute and quantifiable metrics.²³ However, numbers cannot speak for themselves but rather must be put in context; what constitutes vulnerability at a community level requires, as we discuss, ethnographic understandings of the places and spaces of fishing (Flint and Luloff 2005), individual and sub-group characteristics, and institutions and practices as they have been shaped by historical processes (Wiegandt 2004).

In the U.S., ethnographic examples of fishing communities range from isolated, resource-dependent communities in Downeast Maine (Acheson 1988) or rural Alaska (Wolfe and Bosworth 1994), to occupational enclaves in more industrialized cities such as Gloucester (Miller and Van Maanen 1981) or Seattle (Bell et al. 1978), to virtual communities based on gear, ethnicity or other non-place-based ties (Maril 1983; Wilson and McCay 1998; Allen and Gough 2006; Kitner 2006; Blount and Kitner 2007). Some communities rely on small-scale, family-based fisheries; others may be involved in extensive regional linkages with other places. The present configuration in New England, for example, of large ports serving as regional hubs speaks to the geographic fluidity of fishing communities and the broader context in which questions of vulnerability unfold in practice (interview data: ongoing NEFSC Oral History Project; Robinson et al. 2003, 2005; Hall-Arber et al. 2001; Hall-Arber 2007; see also Robards and Greenberg 2007).

Just as “fish have tails,” as fishermen often remind regulators, community is a fluid concept with a critical basis in both social and ecological relationships not easily reduced to statistics on permits, landings and fishing-themed icons. To understand communities, then, “we need to examine community as a culturally contingent notion and document what it means to particular people in local and historical contexts” (Creed 2004, 57; see also Pálsson 1991, Apostle et al. 1998). Interestingly, research in New England suggests that fishermen themselves identify fishing communities on the basis of quite concrete signs, e.g., “number of boats, fishermen, or fishing businesses and infrastructure present”—though they also understand declining importance through more structural factors such as lack of supportive organizations, living inland and fishing elsewhere, and regional changes out of fishing due to tourism, development, or regulations (Olson and Clay 2001, 2). Similarly, Jacob et al. (2005, 379-381) noted interview references to numbers of boats, the visibility of traps and other gear, or levels of economic dependence on fishing, as well as the presence of specific last names associated with fishing families as an indicator of social structure.

For such fishermen, it is clear that the MSA’s mandate to consider the “sustained participation” of fishing communities must consider the interdependence of fishing with local support services, since these are also vulnerable to political-economic changes, and the strengthening of “civil society institutions at the community level” (Jentoft 2000, 53) that build community resiliency. Additionally, as discussed earlier, the MSA definition of a fishing community is based on recreational, subsistence and commercial fishing, related industries, and cultural dependence. In this context, vulnerability cannot be fully understood using Jacob et al.’s (2005) emphasis on economic dependence on commercial fishing, with-

out a broader notion of fishing or value. Thus a “heritage narrative” (Jacob et al. 2005) or “cultural biography” (Griffith 1999), which places a community in historical and situational context, can be a valid factor (though not the only one) for MSA fishing community status and may provide a more nuanced sense of what might be at risk in vulnerable fishing communities.

Yet, Jacob et al. (2005) also caution against a naïve acceptance of heritage narratives in their study of communities in Florida. They note that interests often opposed to commercial fishing—waterfront developers, tourism promoters, and recreational fishing interests—actively promoted images of fishing communities to their own advantage in ways that ironically hurt commercial fishing. This point is well taken: social relations within and between communities may be heterogeneous and antagonistic, including the elements that the MSA definition of a community requires managers to take into account. However, that notions of fishing communities are culturally constructed should not imply their dismissal *per se*, but rather call for their contextualization. As Nadel-Klein (1991, 501) has argued, while cultural constructions of fishing communities and vulnerability may or may not require fisheries dependence *per se*, such identities are “political ways of framing social variety. They are boundary-making devices that express and delineate hierarchy. As such, they must be situated in a context of power and of contests for control over identity.” Thus while Scottish fishermen have long experienced crises from “disaster at sea, empty nets, rapacious middlemen, the predations of seals and the vagaries of the market” (Nadel-Klein 2000, 365), the cultural importance of the particular crises of the 1980s was that they “pose[d] a threat not just to the livelihood of each individual fisher and fisher household, but to the collective way of life and self-regard of an entire stretch of coast” (Nadel-Klein 2000, 366). Thus, while Jacob et al. (2005) rightly call for caution in accepting historical narratives, their varied uses and users points more generally for the need to put fishing communities into an ethnographic context.

Indeed while the previous study of New England fishermen found that most felt that they came from a fishing community, fewer than half felt their community was *dependent* on fishing²⁴ (Olson and Clay 2001, 2). And though the concept of the fishing enclave as community is directly rejected by Jacob et al. (2005, 383), it is affirmed by Bell et al. (1978) and was articulated by some New England fishermen: “[t]hose who considered their fishing communities to be dependent on fishing, tended to view other occupations—such as those in the tourism industry or with seafood restaurants—as themselves dependent on fishing” (Olson and Clay 2001, 2). Here heterogeneity marks the sociocultural production of community in multiple ways, with differing opinions of fish-

ing dependence often common among fishermen of the same community (see also Faasen and Watts 2007).²⁵ Thus fishermen, like researchers, differ in their understanding of what and who constitutes a fishing community, raising questions for further research into the connections between ideas about community dependence and vulnerability and the different practices and engagements with both fishing and fisheries management (cf. Agrawal 2005).

Of course communities and cultures have been marked by political and economic linkages with other cultures and places through centuries of trade, conquest, and migration (Bennett 1967; Wolf 1982; Kurlansky 1997). Understanding such linkages involves culturally nuanced and historically changing notions of place, economy and identity (Gupta and Ferguson 1992; Massey 1993; Appadurai 1995; Bestor 2001). In that sense, a traditional, small-scale and family-based fishing village becomes an “invented tradition” (Hobsbawm and Ranger 1983), for it is the product of a long period of economic transformation and resistance; it is not simply an anachronism outside of history. Sider (1986), for example, argues that the small-scale fishing villages of Newfoundland came to depend on inshore kin-based fisheries after a long history of migrant labor, coexisting and developing in tandem with merchant-based capital, and then became dependent on government receipts when the cod fishery was closed.²⁶ This notion of “invented tradition” does not deny the importance of locality, especially to residents, for lived experiences and senses of place. It does however, critically aim at assumptions of the “*a priori* existence of localities” (DeFilippis 1999, 977).

Thus, though scholars debate the definition of globalization and the import of changing intensities or qualities, the global political economy is neither a new factor in community vulnerability nor a homogeneous one. Apostle et al. (1998, 7-8) note that “[t]raditional ties between firms and communities appear to be breaking”; they also state that despite the present context of a globalizing political economy of fishing, “some small firms have been able to combine new opportunities in global markets with close ties to local communities.” Brookfield et al. (2005, 58), on the other hand, describe a “spatially detached fishing industry” where local vessels, in this case in the U.K., have been displaced by corporately-owned and distant-water fleets. They argue however that such spatial dislocation does not prevent identification as a fishing community *per se*. Rather, it requires communities to engage new strategies of accommodation: “a process of inter-community competition [. . .] to attract visiting vessels to land their catches and sell their fish in the local fish market.”

Yet what does such seeming competition imply about relations between and within fishing communities? Does the current climate of increasing global economic connections

and pressures, and the neoliberalization of the marine environment (see Mansfield 2004a, 2004b; St. Martin 2007), increase vulnerability and such competition? As DeFilippis (1999, 987) writes more generally about local control of resources, “even if local autonomy is realized in ways that are not oppressive to groups within the localities [. . .] it is not clear that the relations between places will be any more equitable because of it [. . .] there is the real possibility that local autonomy might simply move the inequities up a scale from the individual to the locality.” More than just a question of winner and losers, such issues have profound import for fisheries management as well. As Maurstad (2000) has argued in the case of Norwegian fisheries management, policies that assumed a certain kind of behavior—the self-interested rationalist—instead actually encouraged that behavior, against the prior norms of Norwegian small-scale fishermen. There is also the possibility that such norms of moral economy find current expression not in competition but in increased collective action that crosses borders and boundaries (Edelman 2005; cf. Scott 1976), a point to which we return later.

Defining Vulnerability in Fishing Communities

Vulnerability is a socially constructed set of conditions (Oliver-Smith 2001, 111), influenced by the “politics of its representation” and marked by the potential to redress or recreate extant power relations (Oliver-Smith 1996, 309-310). It is also path-dependent, where historical institutions and processes limit some options for resistance and adaptation (Wiegandt 2004; Berkes 2007, 15188). As we have discussed elsewhere (Clay and Olson 2007), the social construction of vulnerability within fishing communities is varied and can involve institutions (Apostle et al. 1998), gendered differences (Thompson 1985; Davis and Wagner 2006), ethnicity and class (LiPuma and Meltzoff 1997; Meltzoff and Schull 1999; Juravich n.d.; Allen and Gough 2006; Kitner 2006; Blount and Kitner 2007; Masozera et al. 2007; Aizenman 2007), and labor relations (Kaplan 1999). Even fishermen utilizing similar gear and targeting similar species often have heterogeneous practices, as Acheson (2003) describes for Maine lobstermen. Such differences make different groups of fishermen more vulnerable to particular forms of fishery regulations; lobster trap limits, for instance, can have very different impacts on fishermen from different harbor gangs due to wide variations in the standard number of traps in their respective territories (Acheson 2003, 98-99).

Fishermen using different vessel sizes are often subject to different regulations even within the same management plan for a fishery (FMP). In both Amendments 5 and 7 of the Northeast Multispecies (groundfish) FMP, small vessels (defined first as those under 45 ft. and then as those under 30 ft.) were subject to limits on pounds of fish landed per trip rather

than limits on total annual fishing days (Days-at-Sea or DAS). There were also initially two different categories of DAS, one for vessels who could document their fishing history and another for those (often smaller) vessels who could not. This second category of allocation sometimes awarded small vessels more days than they had traditionally fished. Simultaneously, specific areas were closed to fishing, including inshore areas that affected smaller vessels disproportionately since larger vessels were more able to steam out beyond the closures. Differential impacts were further compounded at the community level, since some communities had fleets composed of smaller vessels and some communities were more directly adjacent to closures.

Vulnerability thus has spatial as well as temporal and social dimensions, for the “construction of space is central to claims of identity and relations of inequality” (Streiker 1997, 109). Massey (1994, 269) puts the point directly: “the spatial is integral to the production of history, and thus to the possibility of politics.”²⁷ Within fishing, this space involves not only the terrestrial community and multiple networks between places, but also intimate relations to seascapes (Clay 1996; McCay 2000, 209; St. Martin 2001; Olson 2005; Clay and Olson 2007; cf. Duxbury and Dickinson 2007 on land and sea in the coastal zone). This production of space and place, the practices of fishing, notions of identity, and other cultural, political-economic, and geographic processes all inhere in shaping a “fishing community” and in affecting understandings and experiences of vulnerability.

Instead of naturalized models of cross-cultural, cross-historical fishing societies, a more appropriate approach thus “emphasizes that the act of fishing . . . is inevitably embedded in social relations” (Pálsson 1991, 158). For example, the distinction between offshore and inshore fleets mentioned above, and the social relations in which these are embedded, is an important aspect of vulnerability that is often articulated by fishing participants in the Northeast U.S. (see also Binkley 1995b). Figure 1 maps the 2006 homeport location of small (white), medium (gray), and large vessels (black) that were federally permitted fishing vessels in the Northeast. These spatialized differences between and within ports correspond to different fishing grounds, as smaller vessels tend to fish closer to shore and larger ones offshore. But gear type, gear number, technological change, and a host of social and cultural factors also come into play into the use of particular fishing grounds (Clay 1996). Differential management regimes that assume homogeneous motivations and geographies, then, can lead to differential effects on these different sectors of the fishing industry (Olson 2006).

These kinds of differences, and the potentially inequitable and uneven relations within a fishing community, all show the limits of homogeneous conceptions of commu-

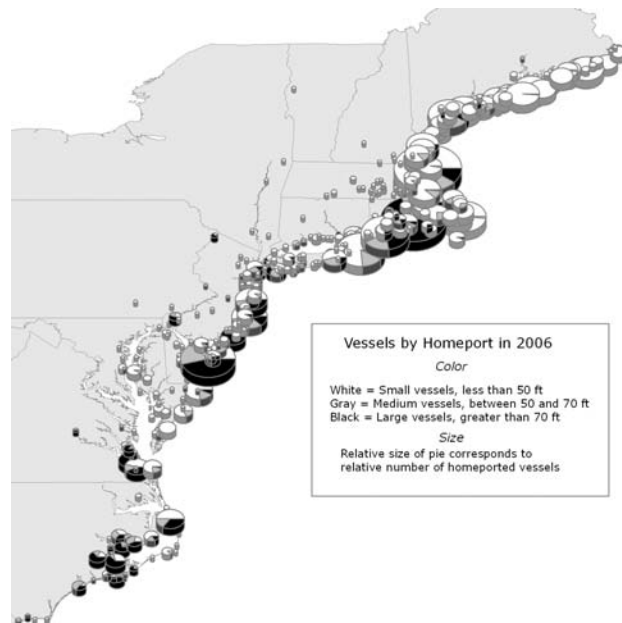


Figure 1. Northeast U.S. Fishing Homeports by Magnitude and Size Composition of Vessels

nity in analyzing vulnerability and resilience, and bring “situated knowledge” (Haraway 1991) to the fore. Different groups may be differentially affected by regulations and political economic processes (Neis 2000; Acheson 2003) as well as by rifts with non-fishing groups (LiPuma and Meltzoff 1997). This heterogeneity can lead to very different levels and types of community vulnerability to change, whether due to regulations, globalization, changes in fish stocks, or multiple other household, local, regional, national and global processes.

Resistance and Resilience in Response to Fishery Management

Tying these understandings of human community vulnerability to ecosystem vulnerability and fisheries management involves yet more variation and questions of scale, as previously noted. However, these connections are often loosely made or poorly researched. Ecosystem-based management (EBM) has highlighted a kind of holistic approach to nature and resource use, yet its dominant manifestations still echo prevailing approaches to fisheries management that do not fully account for the sociocultural (Jennings 2004; Sutinen et al. 2005, 27; FAO 2005; Field and Francis 2006; Agardy 2007). While the implications of chaos and disequilibrium challenge easy dualisms of nature versus culture (Cronon 1990), traditional top-down fisheries management has generally remained dependent on a fish stock assessment biology based on mathematical models and disconnected

from social processes (e.g., Hilborn and Gunderson 1996; Fogarty et al. 1997). As Fisher and Feinman (2005, 65) write, “most modern environments are the result of long-term, co-evolutionary symbioses that they shared with the human societies that helped create them.” Thus for a fuller understanding of vulnerability and resilience, both short-term and longer-term scales of analysis are required, for “one implication is that what appears to be a crisis at one temporal scale (one or two human generations) may seem like sustainable land management when viewed from a millennial lens” (Fisher and Feinman 2005, 66). This fuller appreciation of temporal scale and the human role in ecosystem change and resiliency includes the marine environment as well, as environmental historians and social scientists (Bolster 2006; Sanchirico 2005) and fisheries biologists (Smith 1994; Jackson 2001) are beginning to stress.

Humans are generally included in ecosystem planning, if only as causing impacts to the ecosystem (e.g., Frid et al. 2005; ICES 2005; Cury and Christensen 2005), but they are often assumed to be “both resilient and generally resistant to change” (EPAP 1999, 23). This leads to assumptions that any regulatory change is acceptable because fishermen can adjust, in ways that tend to seek the status quo. But there are limits to any group’s resilience, and while resistance is one normal part of coping (re. Davis et al. 2002), communities may also embrace change (re. Kitts et al. 2007). This again underscores the need for bottom-up understandings of community and resource use and community input to the management process (EPAP 1999, 23; Chuenpagdee et al. 2006).²⁸ Local ecological knowledge (LEK) in particular has been argued to be “the source of insights and information about ecosystem function and change that otherwise are unavailable to Western science, especially to resource management and [. . .] scientists attempting to understand properties of ecosystems such as nonlinearity, unpredictability, and complexity”²⁹ (García-Quijano 2007, 529). And with LEK and its “different systems of knowledge” (García-Quijano 2007, 534) come also, perhaps, differing values and hopes for the future. As Wallace et al. (1996, 22) write, ecosystem management potentially implies something far different than business as usual, fusing the political and social with the scientific: “Changes in scientific inquiry will require new methods and research questions and new roles for scientists [. . .] ecosystem management requires the examination of social values. It requires answers to questions such as: Does nature have an intrinsic value of its own? Do animals and plants have “rights?” Can species be chosen for extinction?”

In seeking strategies to connect the natural with the social and deal with the problem of scale relative to management, Sutinen et al. (2005) delineated 12 steps for monitoring

and assessing human components of a Large Marine Ecosystem (LME) and suggested property rights as a potential “framework . . . to design LME resource management policies for long-term economic growth and resource sustainability” (Sutinen et al. 2005, 68). This conforms to “new institutionalist” emphases within economics on the key nature of property rights (North 1990) as an institution that influences “investment, conservation and efficiency” (Acheson 2003, 6).

But property rights can be construed and constructed in numerous ways, some more supportive of community resilience than others, as political ecological approaches have stressed (e.g., Brosius 2006; see also Von Wieszaecker et al. 2005). Quotas, for example, can be owned by individuals or groups. Access can be based on buying an individual license, buying into a co-operative, or being a legal resident of a community. Quota belonging to an individual is easy to buy and sell, though some fishermen fear disruption of community ties through share accumulation—whether by local residents (Pálsson and Helgason 1995) or outside investors (Bernier 2000; Simpson 2006). Quota belonging to a community may be allocated in perpetuity, yet this raises the question of how to handle in and out migration. Berkes et al. (2003b, 1), in fact, describe property rights in the form of individual allocations as flawed management tools. Rather, they see the need for complex systems thinking, integrative approaches that see process and change as the norm. As such, they prefer the concept of “social-ecological systems,” (see also Ostrom et al. 2007) arguing elsewhere that during periods of change, “resilience can be enhanced or lost, depending on such factors as diversity, redundancy and memory in the system. Conventional resource and environmental management is ill-equipped to deal with the challenges of these complexities” (Berkes et al. 2003c, 31).

Moreover, there is “an unfortunate tendency to conflate ‘community’ to whatever folk management system . . . restricts access to a common pool resource” (McCay 2000, 209).³⁰ Fishing practices, whether occurring directly offshore or in more distant fishing grounds, are shaped by ecological characteristics as well as by the social interaction and information sharing that occurs within them (Stiles 1972; Palmer 1991, Gatewood 1984, St. Martin 2001). Fishing territories may or may not be adjacent to living spaces, and may or may not include fishermen from multiple land-based fishing communities (see Faris 1973; Miller and Van Maanen 1981, 34; Davis 1984; Ruddle and Akimichi 1984; Acheson 1988; Clay 1996, 112-113; McCay 2001, 259-261; St. Martin 2001). While the land and the sea are critical components of the fishing community’s sense of itself,³¹ linking the land and the sea are varying networks of social interaction, and institutions related to resource use, work and household organization, and resource management.

Thus property rights are not the only institution that can serve as an organizing principal for social action over time and space. Families and kinship networks, for example, or labor movements and political movements can also compensate for what new institutionalists would see as market failures (Bates 1994; Alcorn et al. 2003 on political movements and ecological resilience). While one should indeed be wary of simplistic associations that posit non-market economies with the community or with the family (Asad 1987, Dudley 1996, Olson 2005), this is not the same as saying that there are no modes of anchoring social relations alternative to market relations. The processes that have led many of the family-based, small-boat fisheries of Atlantic Canada to a more industrial model (Davis 1991; Davis and Wagner 2006), are part of a long history of capitalist involvement (Sider 1986) that includes resistance to such change (Davis et al. 2002). Regional and national identities inhere strongly in livelihoods like fishing when “labor in its full capitalist form has not totally replaced kinship and community as the means of organizing production” (LiPuma 1992, 49). Poggie and Gersuny (1974), Doeringer et al. (1986) and Miller and Van Maanen (1981) similarly found that kinship remained a critical component of crew selection in many New England ports,³² positively impacting the resilience and sustainability of both fishing operations and fishing communities, as disaster studies have shown more generally (e.g., Bolin 1976).

Sepez et al. (2006; 2007) connect the social and natural through a nested analysis involving both the use of quantitative indicators for broad context and ethnographic detail for groundtruthing. They also “advocate slipping the chains of the bounded community to analyze locations in a porous nested-scale framework that recognizes intra-community heterogeneity and attends to the manifestations of large-scale social, economic and ecological forces within communities” (Sepez et al. 2006, 291; see also Ostrom 2007). This method responds to some of Williams’ (1999) concerns regarding environmental justice issues, by recognizing the local but also contextualizing within the global (re. Wallerstein 1974; Wolf 1982). St. Martin et al. (2007) argue further that the movements towards greater appreciation of fishing communities in management is a complement to the increasing emphasis on ecosystems. They argue that greater attention to local knowledge systems and cooperative research programs, among other forms of community involvement, are the foundations upon which new approaches to management, and in particular ecosystem-based management, can develop.

The Question of Local Control

When global markets alter or climate changes, individual communities may seem to have little influence on such processes (Perry and Sumaila 2007; Robards and Greenberg

2007, 22). However, they may be able to adjust their fishing practices or the market they sell to in order to cope with such changes. One traditional pattern in New England and many other small-scale fisheries has been switching species according to climate and market conditions. However, increasing regulatory trends in the Northeast U.S. and elsewhere toward limited access fisheries with effort or catch limitations may mean that certain fisheries are no longer available to some fishermen—or at least they cannot easily increase or decrease their catch according to local or global conditions.³³ And even when choices exist, they are not the same for all members of the fishing community. Marginal or less powerful groups, especially those that in the U.S. fall under provisions of the Environmental Justice Act (E.O. 12898),³⁴ will have less room for action (e.g., Kitner 2006; Blount and Kitner 2007).

Here the role of fishing associations and other related groups becomes key. Not only fishermen’s organizations but fishermen’s wives’ organizations have been important in the Northeast U.S., both in resisting regulations and in providing new options to replace existing management proposals. For fishermen in certain ethnic fishing groups with limited English fluency (such as the Sicilians in Gloucester and the Portuguese in New Bedford) their wives, who have gained fluency through holding shoreside jobs, have often become the community’s spokespeople. In this way, even when no longer involved in fishing-related occupations, women remain critical to the fishing enterprise. In other cases, fishermen themselves become very vocal in proposing regulations. The Cape Cod Hookfishermen’s Association³⁵ in Massachusetts was instrumental in the creation of a sector allocation³⁶ for cod in the Northeast groundfish fishery (the Georges Bank Hook Sector³⁷)—an entirely new type of allocation in the Northeast. The Montauk Tilefish Association in New York was one of the early proponents of an Individual Fishing Quota FMP³⁸ currently under consideration by the Mid-Atlantic Fishery Management Council³⁹. And global alliances between small-scale fishermen, such as the International Collective in Support of Fishworkers, are also working to create alternative visions for fisheries management to sustain artisanal fisheries in the face of industrialization.⁴⁰

Conclusions

Many natural resource regimes are diverse and redundant, yet we tend to assume governance regimes should be singular and uniform. However multiple local systems may in fact be more effective than one over-arching system (Low et al. 2003, 86; see also Ostrom et al. 2007). Within this broader concept there may be room for individual or common property rights, but they are not the only management system.

As Berkes (2007, 15189) notes, management systems, even community-based management systems, often have only one goal: conservation or development. Different communities may have different goals, as well as socio-political-economic structures: "What states are desired or not, and who decides, is a question of equity and justice" (Robards and Greenberg 2007, 22; see also EPAP 1999, 24; and Paavola 2007 on the importance of social justice rather than efficiency in new institutionalist approaches). Until we move toward multi-objective models such as those described in the Millennium Assessment Model (Brown et al. 2005), we will never truly integrate the socio-economic with the biophysical.

Key then both to defining communities and to evaluating vulnerability and resilience are political, social and economic relationships. Those with more social, political or economic power have more options in dealing with change. This is true of fishing and non-fishing communities alike, yet key differences in fishing communities include, for example, the importance and variability of kinship and gender relations; the importance of a resource base that extends beyond the terrestrial community; the vulnerability of interrelated infrastructure and community supports; and the commitment to fishing often times as a way of life and livelihood and not simply a job (see also Clay and Olson 2007). All these will be critical areas to examine when assessing impacts.

Documenting impacts of course is different from minimizing them (as required in NS8, to the extent practicable) or reversing them (as some communities and other groups in the U.S. and elsewhere are attempting through visioning projects⁴¹) or from sorting out the difficult but real political question of winners and losers as DeFilippis (1999) noted. Issues like infrastructure, for example, may be the most immediately vulnerable element given gentrification and development onshore (Maiolo and Tschetter 1982; Gale 1991; NOAA 1997a, 1997b; Jacob et al. 2002; Robinson et al. 2003, 2005) and aging fleets⁴²—due fishermen say, to postponed upgrades during stock downturns and ensuing restrictive regulations (Hall-Arber et al. 2001, 54). Yet the MSA can only conceivably address the fleet side of this vulnerability, as shoreside infrastructure is governed primarily by local zoning laws.

So the problem of vulnerability and resilience goes far beyond fishery regulations and must encompass a more holistic approach to fishing communities (Jentoft 2000). Such a holistic approach, moreover, demands that social concerns be integral to the management process in its initial stages (Kaplan and McCay 2004). Jepson and Jacob (2007) stress the importance of overall community well-being and available alternative employment, and NOAA recognizes that there are "ecological, human, and institutional elements of the ecosystem which most significantly affect fisheries, and are outside

Council/Department of Commerce (DOC) authority" (EPAP 1999, 4). The upcoming 2008 issue of the NMFS publication *Our Living Oceans* will provide some measures of well-being as well as fishery dependence for fishing communities nationwide, by utilizing both census and NMFS data. Sepez et al. (2006) also provide guidance on how to combine quantitative data on large numbers of communities involved in fishing with ethnographic data for selected exemplars. So progress is being made in finding ways to understand the status of the community as a whole. However, coordination among all the federal, state and local agencies responsible for the multiple issues related to fishing community vulnerability and resistance, as well as ways to include real conversations and coordination with local groups and fishing participants at all stages of management, is a needed and ongoing effort.

Endnotes

1. Opinions expressed are those of the authors, and do not represent NMFS policy.
2. Author to whom correspondence should be directed:
E-mail: Patricia.M.Clay@noaa.gov
3. E-mail: Julia.Olson@noaa.gov
4. Technological disasters result from human error such as faulty engineering.
5. Solomon (1985, 107) notes disruption to social networks is the most damaging aspect of a disaster.
6. The MSA was originally enacted as the Fishery Conservation and Management Act of 1976 (P.L. 94-265), and subsequently amended and/or reauthorized in 1981, 1983, 1989, 1991, 1996 and 2006.
7. See section on "More on the MSA," below.
8. These required recommendations were made in EPAP (1999) and updated in Murawski and Matlock (2006).
9. The full text is: (6) establish a limited access system for the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account—
(A) present participation in the fishery;
(B) historical fishing practices in, and dependence on, the fishery;
(C) the economics of the fishery;
(D) the capability of fishing vessels used in the fishery to engage in other fisheries;
(E) the cultural and social framework relevant to the fishery and any affected fishing communities;
(F) the fair and equitable distribution of access privileges in the fishery; and
(G) any other relevant considerations (16 U.S.C. § 1853(b)(6)).
10. The full text is: "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C. § 1851(a)(8)).
11. 50 C.F.R. § 600.345(3)

12. "MSY is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions." NOAA Fisheries Strategic Plan, <http://www.nmfs.noaa.gov/om2/glossary.html> (September 6, 2007).
13. 16 U.S.C. § 1802(33)
14. The full text is "(4) For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations prepared pursuant to paragraph (3) or paragraph (5) for such fishery shall—(A) specify a time period for rebuilding the fishery that shall—(i) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem; and (ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise; (B) allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery; and (C) for fisheries managed under an international agreement, reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States" (16 U.S.C. § 1854(e)(4)).
15. NMFS is located within NOAA (the National Oceanic and Atmospheric Administration) and is sometimes referred to as NOAA Fisheries.
16. This report is prepared for the Marine Fisheries Advisory Committee (MAFAC). MAFAC was chartered under the Federal Advisory Committee Act, 5 U.S.C. App.2, on February 17, 1971, to provide advice to NOAA Fisheries. Information concerning MAFAC can be found at: <http://www.nmfs.noaa.gov/ocs/mafac/> (September 13, 2007).
17. Ecological anthropology was not the first anthropological attempt to understand this relationship. It built on precursors like cultural ecology (Steward 1955) and parallel theories like cultural materialism (Harris 1979).
18. Ostrom 1990 and Wilson et al. 2007 also discuss the interactions of individual and collective action in cases of resource governance.
19. Vulnerability has been slower in responding to these changes, e.g., defining coping as "the ability to continue to function within a normal range despite perturbation and the ability to recover from perturbations that substantially disrupt the normal functioning of the system" (Kasperson et al. 2001, 25).
20. We will refer to "fishermen" rather than "fishers", as most U.S. men and women who fish commercially prefer this designation. A "fisher" they note is a weasel—actually a marten (*Martes pennanti*).
21. McCay (2001, 255) agrees that shares serve to spread risk, though McConnell and Price (2006) posit they serve more to avoid shirking.
22. In the original legislative debate over fishing communities, both the House version emphasizing "local coastal communities" and the Senate version referencing "any place where vessel owners, operators, and crew or US fish processors are based" were firmly place-based (NOAA Office of General Counsel 1997: sec. 102).
23. Clay and Abbott-Jamieson (2006) discuss an analysis process in development by NMFS for defining an MSA fishing community, using 23 indicators (primarily quantitative) and multivariate statistics. This strategy reflects the need for a national scope and comparative formats, and raises questions of the relative weight attached to qualitative and quantitative data in policy settings, the need for better socio-cultural data collection by government agencies, and how to create multidisciplinary assessments.
24. Among fishermen who declared themselves to live in a fishing community, the number believing the community was also dependent on fishing varied from 25% to over 90%.
25. "Yet, the survey respondents from Gloucester, in particular, showed a remarkably consistent sense of being a fishing community, focusing on both a history of fishing and a strongly articulated sense of an entire community dependent on and supportive of fishing, in contrast to respondents from other towns who wrote of how the greater community now works against them" (Olson and Clay 2001, 2). This sense of community may be related to the strong kinship structures still in place within the Sicilian community, where kin and capitalist relations co-exist (Miller and van Maanen 1981).
26. Smith and Hanna (1993), for example, argue that the face-to-face sharing of ideas in relatively isolated fishing communities affected fishing behavior more than occupational identity.
27. See for example Cutter's (1996) integration of social and biophysical vulnerabilities into a specific "hazards of place" model, the vulnerability index of the Research Assessment Systems for Sustainability Program (Turner et al. 2003; see also <http://sust.harvard.edu> (September 27, 2007) or the nested framework described in Ostrom (2007).
28. In some ways this parallels NOAA's (2004, 7) Performance Objectives to increase general population knowledge of (and the number of coastal communities) "incorporating ecosystem and sustainable development principles into planning and management." More generally it echoes the increasing emphasis on public participation and interaction between science and society (Jasanoff et al. 1997). Although space does not permit exploration of this here, the idea that community involvement should lead to better management is the main thrust of co-management, in which management responsibilities are shared between user groups and governmental entities (see Pinkerton 1989).
29. NMFS has sponsored a pilot LEK project (called LFK for Local Fisheries Knowledge). See <http://www.st.nmfs.noaa.gov/lfkproject/> (October 9, 2007).
30. The growth of the Community-Based Natural Resource Management movement (see useful summary in Brosius et al. 1998) is one cause of this conflation.
31. Amith (2005, 162) similarly calls for a multiscale ethnography to understand migrants, who "experienced and produced a sense of place at both their points of origin and destination." The "unit of analysis" must embrace all the relevant locations and place-makings.
32. Gloucester kin also cooperate to purchase vessels (Miller and Van Maanen 1981, 34). Likewise in many cases of worker resistance to postmodern labor conditions, "[t]he interest defended, or the solidarity built, through such acts are more often linked to kinship and gender than to class" (Ong 1991, 280-281).
33. Individual Transferable Quotas can sometimes be a way around this problem by allowing vessel owners to buy or lease quota from other vessel owners, or conversely to sell quota when they wish to move into other fisheries. One problem, of course, is that if conditions are favorable or unfavorable for the fishery then likely many vessels owners will want to either buy or sell at the same time.

34. See <http://www.epa.gov/fedrgstr/eo/eo12898.pdf> (August 30, 2007).
35. See <http://www.ccchfa.org/> (September 27, 2007)
36. See p. 8 of the Executive summary for Amendment 13 to the Northeast Multispecies FMP, available at http://www.nefmc.org/nemulti/planamen/final_amend13_dec03_section_1.pdf (September 27, 2007).
37. See the most recent sector report to the New England Fishery Management Council as a Word document, linked to <http://www.ccchfa.org/pages/4/25/> (September 27, 2007).
38. See Kitts et al. (2007, 195-197) for a description of the origins and structure of the Montauk Tilefish Association, and for a description of their reasons for desiring the amendment (ibid., 197-199).
39. See <http://www.mafmc.org/mid-atlantic/mafmc.htm> (September 27, 2007).
40. <http://www.icsf.net/icsf2006/jspFiles/icsfMain/about/english/aboutIcsf.jsp> (September 26, 2006).
41. See <http://www.gfwa.org/aboutUs/know.html> (September 20, 2007); http://www.fish-news.com/cfn/editorial/editorial_10_05/Fleet_visioning_workshops.html (September 20, 2007); <http://www.fleetvision.org/index.php> (September 20, 2007); <http://www2.dpi.qld.gov.au/far/9107.html> (September 20, 2007); <http://www.glf.dfo-mpo.gc.ca/fam-gpa/herring-hareng/vision/report-rapport-johnstone.pdf> (September 21, 2007); http://www.deltavision.ca.gov/docs/externalvisions/EV8_Allied_Fishing_Group_Vision.pdf (September 20, 2007); http://www.panda.org/about_wwf/where_we_work/europe/where/ukraine/news/index.cfm?uNewsID=16581 (September 20, 2007).
42. http://news.bbc.co.uk/2/hi/uk_news/politics/412197.stm (March 12, 2007); <http://www.greenfacts.org/fisheries/1-3/02-fishers-farmers-fleet.htm#3> (March 12, 2007).

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