

Mapping Economic Diversity in the First World: The Case of Fisheries

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

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The development discourse inevitably contained a geopolitical imagination that has shaped the meaning of development for more than four decades... It is implicit in expressions such as first and third world, North and South, center and periphery. The social production of space implicit in these terms is bound with the production of differences, subjectivities, and social orders... (Escobar, 1995, p. 9).

INTRODUCTION

Fisheries across the globe are in critical condition and demand attention as well as solutions (McGoodwin, 1990). In both the first and third world can be found massive depletions of fish stock, disruptions and erosions of fishing communities, transformations of economies, and deep dissatisfactions that are leading to protest and a variety of struggles across scales.¹ In the Northeast of the United States, the case for this research, federal management, concerned with the problem of overfishing, implements effort controls that move the fishing industry away from an open access to a neoliberal rights based regime (cf. Mansfield, 2004). In this first world setting, there is a palpable discursive closure that restricts the future of fishing to privatized, rationalized, and corporate industrial practices (e.g. Hannesson, 1991; Symes and Crean, 1995). In third world settings, however, the future is less clear. There, a variety of discursive openings exist that suggest not only industrial but also community-based, cooperative, artisanal, or other futures. These alternative futures are not only discussed as already existent (e.g. Dyer and McGoodwin, 1994; Ruddle, 1998) but as forms of fisheries management to work toward (e.g. Community Fisheries Section, 2000). While fisheries across the first world/third world divide clearly share similar characteristics of overcapacity, overfishing, and environmental degradation, there is a very different imagination on either side of the divide in terms of the viability of particular solutions to the problems of fishing.

The spatial binary of fisheries management corresponds to a dominant imaginary of economy where the first world is inscribed as coextensive with a capitalist economy and the third world is its frontier where economic difference may exist albeit temporarily and as deficient relative to capitalism. In this imaginary, capitalism is unitary, singular, and totalizing (Gibson-Graham, 1996). In spatial terms, capitalism has a coherent center from which it expands and penetrates into the spaces of non-capitalism. Non-capitalism, insofar as it exists, is peripheral and in retreat, unable to challenge or replace the dominant capitalist formation. Gibson-Graham has made clear the power of capitalocentric discourse to reify this image of capitalism and to limit the possibility of recognizing and enacting non-capitalist formations and futures (see also Community Economies Collective, 2001; Gibson-Graham et al. 2000, 2001). New representations of economy as diverse (e.g. Lee et al. 2003) have, however, the potential to disrupt dominant economic discourses and suggest a variety of economic possibilities. Cartographic representation, as metaphor and as actual mappings, is here used as a method to investigate and deconstruct the dominant capitalocentric representation of the fishing economy (in the first and third worlds); in addition, maps will be the medium by which alternative economic futures will be imagined.

¹ While the term “third world” is somewhat standard within political ecology as a way to characterize and distinguish the bulk of political ecology work (e.g. Bryant and Bailey, 1997), here I use the term “third world” to emphasize an economic and developmental binary (first and third world) where one term (i.e. the first world) is dominant and the other (i.e. third world) is subordinate.

Fish harvesting highlights well the processes and mechanisms that are deployed to produce and maintain the (ever expanding) first world as everywhere capitalist. That is, fisheries are stubbornly resistant to adopt relations of production that are typically associated with capitalism, and an enormous effort is needed to rein in and discipline fisheries such that they too mirror the singular and hegemonic image of the capitalist economy. The dominant discourse of fisheries suggests that this difference from capitalism is the source of fisheries recurring economic and resource crises (Anderson, 1986; Charles, 1988; Rees, 1985), that it is an essential flaw that must be corrected through the imposition of (first and foremost) private property (e.g. Keen, 1988; Scott, 1988). Fisheries in the Northeast U.S., and indeed across the globe where millions of people rely upon non-industrial fish harvesting (www.fao.org), are, however, sites where private property, wage relations, the primacy of a market system of exchange, the alienation of communities from common resources, and top down regulation of resources are not easily implemented and are actively debated and struggled over. The fish harvesting industry and representations/mappings of it in both the first and third world offers insight into the discursive production of capitalism (e.g. via ontologies of fisheries and fishermen,² methodologies of data collection, the institutionalization of particular forms of analyses, and a host of performance sites) such that privatization, rationalization, and capitalism itself seem the natural and inevitable solution to the problems of fishing.

Fisheries scientific and management discourse provides a location within which can be embedded a particular understanding and implementation of the inevitability of capitalism. This paper explores this discourse for the roots of its capitalocentric logic and how this logic is manifest in binary and divergent mappings of fisheries within the first world and the third world. It is hoped that a deconstruction of this binary logic will not only open first world fisheries to new managerial and economic solutions but will constitute the first world more generally as a site for a critical political ecology. That is, representing/mapping the first world as economically diverse rather than homogenously capitalist undermines the essential divide which separates the first world from the third world and political ecology from first world application. This paper seeks to contribute to the move within political ecology toward the first world (see also McCarthy, 2002; Robbins, 2002; Walker, 2003) by focusing on the simultaneous social construction of capitalism and the binary logic of natural resource management.

The paper has three main sections and a conclusion. The following section offers a brief deconstruction of fisheries discourse in order to excavate the way that the particular spatial binary of first and third world has been constituted, how it relates to other binaries, and how these have been institutionalized within this discourse. The second section explores the implications of a global binary and how it constitutes different local spatial imaginaries. The third section suggests a methodology for re-imagining the first world as the site of a variety of processes traditionally banished to the third world and therefore impossible as foundations for proximate alternative forms of natural resource management and/or economy.

² Here I use the term 'fishermen' to signify the imagined individual, independent, and competitive fisher of fisheries bioeconomic theory. The term *fisher*, used throughout this paper, refers to all people who work as harvesters of fish within commercial enterprises regardless of their position and assumes nothing about their relationships with each other (e.g. cooperative or competitive). A fisher may be any one of several crew members (e.g. captain, mate, engineer, deckhand) and may or may not own a fishing boat.

FISHING IN A BINARY WORLD

Political ecologists are recently interested in discourses of natural resource use and are critical of them in terms of power and representation (e.g. Demeritt, 2001; Robbins, 1998). While there is often an implied link between the power of such discourses and an assumed global capitalist system, there is less often an examination of these discourses to see the degree to which they actually constitute a spatially expanding capitalism. In what ways do they conceive of nature, society, and their interrelationship such that capitalism seems natural, inevitable, and logical? How do they construct landscapes (e.g. in the third world) as open to an invasive capitalism? How do they erase non-capitalist processes and spaces (e.g. in the first world)? The following deconstruction begins the work of answering these questions.

Fisheries scientific discourse emerged during the first half of the twentieth century and became widely institutionalized in the post-war era (Cushing, 1988; Smith, 1994); today it is widely performed at all scales of economy (Garcia et al., 1999; Gulland, 1984). While the scientific discourse of fisheries is but one of many discourses that continually produce and reify the dominant global binary, it illustrates well the deeply embedded nature and extensive institutionalization of a binary world where the first world or center of economic development is ruled by capitalism and the third world or periphery into which capitalism is moving (albeit unevenly) remains not fully capitalist.

Before turning to the particulars of fisheries scientific discourse, it is worth noting that fisheries themselves have served and continue to serve a symbolic function within economic debate. During the nineteenth century they were central to debates ending customary rights to access of resources and bounty laws protecting particular industries (O'Leary, 1996; Thompson, 1983). Repealing such rights/laws was part of a general insistence upon a laissez-faire approach to economy. In the case of fisheries, however, there were not yet developed systems (e.g. legal, scientific, cartographic) that might make enclosure and privatization of this marine resource possible. The development of such technologies was to take several more decades and their institution/implementation even longer. As a result, most fisheries are not yet fully privatized in terms of access to the resource and, therefore, continue to play the role of a flawed industry, a system based on common property and a share system of compensation (as opposed to wages) that can only result in an eventual tragedy. The common-property-and-its-enclosure story is, of course, reminiscent of the origins of capitalism and debating it continues to serve as an origination and capitalist legitimating myth (and counter-myth of the benefits of common property). The story of fisheries is the story of economic transformation from pre-capitalism to a fully realized capitalism.

Fish as Capital, Fisheries as Capitalist

During the formative years of fisheries science one can trace within the seminal texts of the discourse the evolution of a compatibility with capitalism and the production of a space for its enactment (St. Martin, 1999). Like much of modern science, fisheries science grew out of the needs of the industrial revolution to understand and inscribe natural resources as inputs into production. Supported from the beginning by industry, either directly through industrial funding of research or indirectly through industry lobbying of government to fund research, fisheries science sought to make clear the relationships between fish populations, the environment, and the potentials for industrial harvest (Smith, 1994). Large-scale fishing enterprises (particularly

those of England and New England that emerged in the 19th century) were searching ever more distant waters of the North Atlantic for a constant and/or predictable supply of fish.

The demands of an industry facing rising costs and declining catches due to distance served to focus fisheries science on quantitative understandings of individual fish species and their relationship to fishing effort (Cushing, 1988). This understanding of nature and society was markedly different than initial (pre-industrial) understandings of fisheries that were grounded in the experiences of individual fishers and a conception of environmental determination of fish populations. In addition, early fisheries science relied upon essentially qualitative methods of research that included interviewing fishers and mapping fishing grounds (Smith, 1994). The demands of industry, however, resulted in the development of key understandings of fisheries and new methods for knowing them that were continuous with the interests of capitalism.

The desire to quantify, to constitute fisheries resources as stocks of individual species, was translated into a basic ontological understanding of fishers' subjectivity and space. Fishers, once local informants intimately connected to the environment, were now thought of strictly in terms of aggregated and quantified effort. The space of fishing, once mapped as a heterogeneous landscape of fishing grounds and a variable environment, became an abstract and gridded space for the statistical sampling of fish populations. Fish mortality, recruitment, and fishing effort could then be modeled as variables in an equation, a general version of which was published in 1931 (i.e. Russell 1931) and is often cited ever since as a milestone in fisheries science.

Like simple economic input/output models, the parameters of Russell's model of fish stocks can be quantified and used for assessment and prediction, and his insights would become foundational (Smith, 1994). The basic equation

$$S_2 = S_1 + (A + G) - (C + M)$$

expressed stocks in terms of their total weight at the beginning of the year (S_1) and at the end of the year (S_2). The factors that determine change from S_1 to S_2 are A (fish large enough to catch or recruitment), G (increase due to growth), C (fish captured by the fishing industry), and M (fish that have died due to natural mortality). These variables exist within some region that has been statistically sampled using a regular reference grid to determine quantities and size by species. This basic approach to defining and knowing fisheries is utilized with little change to this day (Cushing, 1977; NRC, 1998; Pierce and Hugl, 1979). And, today as then, the equilibrium nature of the equation leaves little room for variables other than fishing effort (e.g. pollution or climate) to be the cause of change (Caddy, 1996; Wilson et al., 1994).

The relationship to capitalism is clear insofar as this sort of modeling was a response to the needs of industry to predict quantities of fish by species and to do so across a space conceived of by all as the container of resources. Russell's equation, however, belies a discursive similarity between a particular understanding of fisheries biology and that of the economy. That is, calculating fishery abundance is, as Russell himself states, analogous to calculating the profits of a corporation.

Coming back now to our starting point, we may say that the formula stated... represents a balance-sheet. We start with a working capital S_1 ; to this is added in the course of a year $(A + G)$, and from it is taken away $(C + M)$. At the end of the year our working capital is S_2 , which will be greater than, equal to, or less than S_1 , according as income $(A + G)$ has exceeded, equaled or fallen below expenditure $(C + M)$. S_2 is what is carried over as capital from one year to the next (p. 9).

The numerical/mathematical approach championed by Russell is shaped and influenced by the history of fisheries science and its foundational connections with industry. The metaphor of a balance sheet reveals a conceptual continuity; it assumes that the entire stock can be bounded and inventoried, that control and ownership over it is centralized or individual (see also Scott, 1955, 1957), and that the stock of fish is working capital to be at least maintained and preferably maximized. In addition, the point of financial balance is equated with the point of ecological equilibrium; to be out of financial balance would constitute a state of either over or under fishing, biological measures of carrying capacity. Finally, the metaphor of a balance sheet implies that control over fisheries is possible.

By the 1930s the ontological ground for fisheries science (in terms of fish, fishing effort/fishermen, and space) is clearly established and expressed in a quantitative language of rational use that, no doubt, sounded familiar to industrialists. In this conceptualization, fishing effort was the sole determinant of change in fish populations enumerated within an abstract space. The rate and direction of change due to fishing effort remained, however, un-theorized and therefore troublesome to industry. While fishing effort explained change, what explained fishing effort?

Later that decade Graham (1939) offered a unifying theory of fisheries that would explain the reasons for increases in fish catch and their subsequent decline. More importantly, he would also explain how there was an optimal level of harvest that would match recruitment such that a maximum sustainable yield (MSY) could be predicted and established. This point of MSY could be calculated by fisheries scientists who saw it as an elegant and indisputable natural law.

[T]he theory that has emerged is so simple and in consonance with so many known facts that it is fair to think of it as a natural law that serves to summarize observations, rather than as a product of scientific imagination (p. 17).

Graham's article is often cited as the moment when fisheries science was established as a discipline, when its central legitimating model and logic were coherently summarized (Smith, 1994). The celebrated moment of academic cohesion was also the moment when fisheries science could finally declare its usefulness to industry as the holders of the remedy for overfishing.

Given up-to-date and adequate estimates of growth-rate, mortality and rate of fishing, we can at any time detect overfishing. If the fisheries are to continue, we may be sure that sooner or later the remedy for overfishing will be called for. We may all agree that it would be better sooner than later (p. 20).

Like Russell, Graham suggested that controlling fishing effort was the route to sustainable profit. Built into the founding models of fisheries science was the assumption that effort was uncontrolled, that it was devoid of any social or communal forms of restraint, and that fishermen were utility maximizing individuals.

Everyone wants to joint [sic] in when there is a profit available and even those who are already in the industry are rarely content with what profit they have, but seek instead to increase it by expanding their activities (p. 20).

This unconstrained subject exists, of course, in the particular abstracted space of resources where society, culture, and community are not to be found. This narrative of sustainability based on the balance of quantities, instep with neoclassical economics, is produced by necessarily excluding other possible factors and other conceptualizations of space (cf. Meppem and Bourke, 1999). By

the end of the 1930's, particular notions of subject and space are constitutive and immutable elements of the natural law of fisheries.

In the 1950s, resource economists elaborated upon the insights of fisheries biologists and produced an economic interpretation of the problem of controlling fishing effort (Gordon, 1954). They, following the fisheries biologists, suggest that the central problem of fishing is the competitive behavior of individual fishermen, which is essentially attributable to the common property (equated with open access) nature of the resource. The elemental subject and space of fishing necessarily produces a dynamic that leads to overfishing and, in economic terms, the dissipation of rent and, hence, a relative impoverishment of society/nation.

We now come to the point that is of greatest theoretical importance in understanding the primary production phase of the fishing industry and in distinguishing it from agriculture. In the sea fisheries the natural resource is not private property; hence the rent it may yield is not capable of being appropriated by anyone. The individual fisherman has not legal title to a section of ocean bottom. Each fisherman is more or less free to fish wherever he pleases. The result is a pattern of competition among fishermen which culminates in the dissipation of the rent... (Gordon, 1954, p. 130).

Fishermen will remain impoverished and will waste resources that could be producing greater wealth for the larger society as long as resources are common. The solution for the problem of fishing, then, is the privatization of resources and the institutionalization of other mechanisms of capitalism (e.g. a wage relation). By the 1950's, the remedy suggested by Graham was being realized in terms of specific economic policy recommendations at national and international levels (e.g. An FAO and UN sponsored conference, see Turvey and Wiseman, 1957). In addition, the particular economic solution of privatization was seen as universal as the natural law upon which it rested and as, therefore, equally indisputable. Except for the implementation of private property and wage labor, all fishermen, in this economic reading of the problem of fishing, are clearly capitalist subjects constituted within capitalist spaces of enumerated resources.

Relegating Difference to the Periphery

The processes of essentializing and producing the singular economic identity of fisheries depend upon corresponding processes of alterity, however muted within the dominant discourse. These processes locate the other of fishing, the other relative to the dominant subject who is mobile, independent, and individual and relative to the dominant space of fishing that is an abstract container of quantities of resources for appropriation and possession by individuals. The economic space of fisheries is discursively enclosed, reduced to essential and homogenous understandings of fishermen and the space of fishing; within this enclosure there can be no room for difference or the possibility of an economic future different from that proscribed by the dominant bioeconomic discourse. Difference/alterity exists only outside the enclosure.

The parallel to literal historic enclosure, e.g. that of English common land, is perhaps useful. There, processes of alterity are equally evident. The enclosures of the 17th and 18th centuries, themselves a product of an emerging discourse of economy (Mingay 1997) and space (Delano-Smith and Kain 1999), produced a story of what came before as different and deficient relative to an emerging capitalist mode of production. What was prior was an inhabitation and use of the land marked by communal property rights that were seen as less efficient, pre-capitalist, and inevitably doomed (e.g. Marx 1976). Enclosures produced an imaginary of a pre-

enclosure subject (e.g. peasant, serf, community member, etc.) and space (e.g. commons) that could not share the same economic space as the emerging capitalist economy; this other economy could only exist in the historic past or in some as yet to be transformed/enclosed (and distant) location. The enclosures of common land literally cleared the land of pre-capitalist subjects and re-mapped the land as property to be appropriated and utilized within a capitalist mode of production; other economic subjects and spaces, post-enclosure, could only exist as such in locations not yet enclosed, not yet subject of capitalist forms of property and social relations.

This process of alterity as a result of conceptions of property is discursively produced within classical economics, in particular, through the deployment of a property historicism to understand the evolution of society/economy. Classical economic discourse produced not only a hegemonic notion of a particular economic space but also its outside where one might find essentially prior and geographically distant economic spaces and modes of production based on different forms of property rights (Callari, 2004). Classical economic texts suggest a

... narrative of the historically organizing function of property as a principle of social and cultural organization, and exemplify the historicist logic of alterity it sustains (the other as a bearer of modes of production that precede and fall short of the Western form of property) (Callari, 2004, p. 121).

Fisheries bioeconomics continued and continues this tradition with its insistent focus upon forms of property as the basis for a rational (and “responsible,” see OECD 2000) fisheries economic development. Where there are forms of property that deviate from the modern ideal of “sole ownership” (Scott 1955), there is located the deficient other. Indeed the earliest fisheries economic texts also noted the boundaries of that emerging discourse and suggested that the natural logic they were revealing might not apply in distant, as yet to be industrialized, societies.

For example, the article by Graham (1939) that declared fisheries science a discipline based upon a universal natural law also noted where fisheries science did not yet apply. In distant locations that were peripheral to industrialization/capitalism there remained fishing economies that were not yet reducible to the subject and space of capitalism.

In general, too, we know that, when there is a small fishery by primitive methods, it can be carried on indefinitely without any harmful change, as has been done for [sic] time immemorial in the Great Lakes of Africa. When, however, the enterprise that the industrial revolution has brought to the fisheries has scope, the history is, in all cases, similar (p. 19).

Gordon (1954), like Graham, points to examples of common property systems that, contrary to modern logic, continue to work, and also like Graham his examples are distant in either time or space and positioned within a continuum of progress and a spatial imaginary of developed and yet to be developed (e.g. he notes Trobriand islands fisheries and English pasturage). Hardin, in his “tragedy of the commons” article (1968), itself deeply indebted to Gordon (McEvoy, 1986), shares this view of common property as essentially archaic and/or spatially distant.

As the human population has increased, the commons has had to be abandoned in one aspect after another. First we abandoned the commons in food gathering, enclosing farm land and restricting pastures and hunting and fishing areas. These restrictions are still not complete throughout the world (Hardin, 1968, p. 1248).

The enclosure and privatization of the commons in time and space is a movement out from the center, developing, transforming, and consuming pre-modern economies on an ever shrinking periphery. To not pursue the capitalist solution of fisheries science is to condemn fisheries to either the poverty of under utilization as in primitive locations or, after the advent of industrial technology, the inevitable poverty of overfishing.

The relegation of difference to either before or beyond (where beyond equals before, Callari, 2004) must be ongoing and requires enormous investments in particular forms of data collection that reify competing individuals; cartographic practices that construct an abstract space of resources devoid of social, cultural, or community processes; teams of biological and economic scientists solving the ‘problem of fishing;’ and government institutionalization of scientifically informed management regimes. These investments serve to homogenize and discursively close the space of first world fisheries and banish difference to the third world. Within each location a host of other binary understandings of fisheries has evolved that are understood as equally exclusive (Table 1).

The Binaries of Fisheries Discourse	
Industrial	Artisanal
Fisherman	Community member
Abstract space of resources	Territorial space of communities
Capitalism	Pre-capitalism
Hierarchy (wages)	Equality (shares)
Competitive	Cooperative
Scientific knowledge	Local knowledge
Commerce/Utility	Culture
Advancing	Retreating

Table 1. The terms on the left are those that are dominant and serve to define the first world while those on the right are subordinate and can only be imagined to exist in the third world.

This spatial imaginary does not, however, see each as contained and bounded. Rather, the processes of first world fisheries are seen to be expanding into the third world such that the dominant terms of the binaries listed above become increasingly relevant (e.g. industrial, fisherman/capitalist, abstract space, capitalism, etc.). As the home of difference, the third world is an ever-shrinking location. For example, so-called artisanal fisheries are located within ever more marginal locations within the third world while industrial fisheries (and their logics of competition, hierarchy, scientific knowledge, commerce, and capitalism) originate in the first world but encroach upon the third world both figuratively and literally as in the case of European factory trawlers pillaging the waters off the coasts of Africa and South Asia (Mutume, 2002). Conceptions of management possibilities follow from the binary logic imposed as in the following example from a World Bank policy document.

In the context of efforts in developing countries to put in place effective management regimes—comprising a fishery management system; a monitoring, control and surveillance system; and a fishery judicial system—and the privatization of parastatal fishery enterprises, a realistic policy mix of ITQs (for industrial fisheries) and integrated (horizontal) rural development (for artisanal fisheries) would be an effective approach (John, 1994, p. 19).

The latter approach suggests that:

Changes in the resource base and the heterogeneity of fishermen and fishing communities require projects that are ‘locale-specific’ and that recognize the needs that fishermen themselves identify (Smith quoted in John, 1994, p. 18).

It is clear that industrial and artisanal are but one set of binary associations and connotations. In the World Bank document, artisanal forms of production are imagined to be community-based (where both fishers and community are heterogeneous), locale-specific, and best addressed by participatory methods. This conflation of attributes is surprisingly consistent as a recurring counter image of fisheries, the constitutive outside of the modern and soon to be capitalist fishing enterprises in the first world. Inspired by empirical examples of existing or historical community-based, local, and participatory fishing regimes, it acts as the alternative that can never be realized within first world industrial fisheries. It represents a desire and imaginary that is necessarily displaced, relegated to beyond the domain of the hegemonic capitalist economy.

Industrial fisheries, on the other hand, are only made up of individuals, locale-independent/universal, and driven by the logic of capitalism rather than participants needs and desires. Advocating ITQs, or individual transferable quotas (an increasingly popular method for privatizing fish stock), clearly differentiates industrial fisheries from their artisanal other in terms of both economic subjectivity and understandings of space: ITQs are owned by individuals (which typically defaults to boat owners), they are transferable on the open market, and, as allocated quantities of fish by species, are redeemable anywhere within the statistical region that is the basis for quantification. While there are certainly industrial fishing operations in the third world (e.g. Hersoug and Holm, 2000) and artisanal fisheries in the first world (e.g. Freire and Garcia-Allut, 2000), through their association with capitalist development, they are conceptually distanced and spatialized along third world/first world lines. In particular, the attributes of the artisanal can never be ascribed to the industrial.

The dominant discourse of fisheries converges, constitutes, and is constituted by a discourse of capitalist economic development. They share the same notions of fishermen’s subjectivity, they share the same notions of an abstract space, and they share the same property historicism where other economic and fisheries management regimes must necessarily be beyond and before the hegemonic economy. The next section investigates the institutionalization of the resultant binary spatializations and how they are mapped in the first and third world. These spatializations constitute and are constituted by different ontological assumptions of subjectivity and space.

MAPPING SUBJECTIVITY, SPACE, AND ECONOMY

The dominant discourse of fisheries, and its attendant property historicism, produces industrial and artisanal fisheries and their associated attributes as mutually exclusive. The former are found in the first world while the latter are relegated to the third world. This binary logic is built upon ontological assumptions of subjectivity and space that necessarily vary from first world to third world. The subject of third world fisheries is a community member while that of first world fisheries is the individual fisherman. The spaces of third world fisheries are the territories of communities while that of the first world is an abstract space of objectified resources. Subjectivity and space, in both cases, are the discursive foundations for fisheries and fishing economies and limits how they are managed, at what scale, by whom, and to whose benefit. Seeing the foundations of natural resource management and economy in terms of these categories of discourse rather than as strictly a function of the absence or presence of particular (i.e. private) property rights suggests we examine how such categories are produced. By what mechanisms are they reified and mapped onto the first and third worlds? How is the boundary between both locations maintained?

Producing Third and First World Fishing Economies

For example, Aswani reports on a set of well-funded and comprehensive research and economic development programs in the Solomon Islands (Aswani, 2002; see also <http://www.anth.ucsb.edu/faculty/aswani/>) where artisanal fisheries and their assumed characteristics (e.g. community-based, local, participatory) work as initial ontological assumptions about fishing (see also Agbayani et al., 2000; Nikerson-Tietze, 2000; Pomeroy, 1995; Sanderson and Koester, 2000). In particular, the assumption of locale offers a spatial imaginary where community is embedded within a location and territory that extends beyond community residence to community resource areas (e.g. Aswani, 1999; similarly in terrestrial studies e.g. Fisher, 2000). This assumption of territory is integral to both research and development strategies where fisheries related projects are community-based and begin from a literal mapping of the community use of resources. That is, an important element of such research/development schemes is to cartographically establish resources and territories utilized by communities (e.g. Community Fisheries Section, 2000; Chuenpagdee et al. 2004; King and Lambeth, 2000; Nietschmann, 1995; Sanderson and Koester, 2000).

There are many such examples where mapping of community use of resources is happening due to the accessibility of mapping and geo-technologies such as GPS systems (Macnab, 1998; Nietschmann, 1995). These projects, typically located in distant non-industrial settings or within First Nations (Duerden and Kuhn, 1996) testify to the rapid adoption of GIS where alternative institutions and understandings of resources prevail (Lewis, 1995; Mohamed and Ventura, 2000; St. Martin, 2004). Such mappings inscribe local knowledge of the environment as emerging from community-based practices and community utilization of resources. Not only are resources themselves revealed through the mapping (e.g. their quality, location, seasonality, etc.) but they are revealed as integral to a community and, through participatory methods of mapping/inventory, they are revealed by communities themselves (see the special issue on Geomatics in *Cultural Survival Quarterly*, Vol. 19, No. 4, 1995).

The cartographic discourse of marine resources and community, founded on notions of the artisanal and its attributes, facilitates a community-based approach to resource management not only by simultaneously inscribing resources and community but also by producing a space

into which individuals can project themselves as community members through the participatory process (e.g. Johnson, 2000). There is little room in this discourse for the hegemonic attributes associated with first world industrial fisheries (e.g. competition amongst individuals, infinite mobility, or the necessity for external authority). The initial assumptions of community and territory and their explication through particular methods (e.g. community-based mapping) make it literally difficult to map or enumerate quantities of individual species of fish separate from communities themselves. The commons and community, in the third world discourse of fisheries, are mutually constituted (cf. Gudeman and Rivera-Gutierrez, 2002; similarly see Jentoft, 1999; also Kirby, 1996 on the mutual constitution of subject and space generally).

Artisanal fisheries and their attributes (e.g. local, community-based economies, participatory, etc.) are as much produced through research, development initiatives, and their discursive formations as they are pre-existing. In fisheries much attention has been given to claims of existing or historical systems of marine tenure based on territory (so called TURFs or Territorial Use Rights in Fisheries, Christy, 1982) that parallel the many complicated systems of rights to resources that exist on land in the third world. It is thought that the reality of existing systems of community and territory, which can only be found in the third world, make possible community-based forms of natural resource management and economy. This claim, however, belies decades of work by political ecologists and anthropologists that has revealed third world communities to often be complicated, contentious, and divided places rather than vessels of pre-modern traditions and forms of cooperation (e.g. Hodgson and Schroeder, 2001; Hughes, 2001; Kellert et al., 2000; and specifically in fisheries Crean, 2000; Foale, 1998; Hviding, 1998; Johnson, 2000). If artisanal fishing communities are not pre-given, or put another way, if barriers to community-based (and local, participatory, etc.) economic development exist in both the first and third worlds, then it is clear that what is happening is the constitution of artisanal communities through particular forms of mapping that establish them and their resource areas as the ontological starting points of research and economic development. The global spatial binary suggests such ontological possibilities in the third world, indeed relegates them to the third world, precisely because they must remain unimaginable in the first world.

In the first world, mappings of resources and fishermen begin from very different ontological assumptions and lead to very different prescriptions for research and economic development. There, resources are quantitatively assessed and imagined within an abstract and dehumanized space as discussed in the genealogy of fisheries science above. Fishermen are measured in terms of fishing effort alone and identified as individuals competing on an open access commons devoid of spatial or societal constraint (Palsson and Helgason, 1994). There exist no community use rights and no territories of use, mythic or otherwise, except in some very distant past. While there certainly are contemporary exceptions (e.g. Acheson, 1975 and 1987), artisanal community-based management systems located in the first world are arguably remnants of some third world past. Rather than simultaneously constituting artisanal communities and their territories, as in the third world, the dominant discourse of fisheries sees only individuals and acts to sever them from community and community from any identifiable territory.

Countering Capitalism... Elsewhere

Cartesian mappings of resources have always preceded the institutionalization of capitalism (Boelhower, 1988; Harley, 1988). They convert lived and locally experienced places into an inventory of abstract and objectified resources available for appropriation (see also Hansson and Wackernagel, 1999). Integral to the early development of capitalism in England, for

example, maps were used to document particular enclosures of commons and to produce a powerful imaginary where resources could be objectively seen as separate from the communities residing within them (Delano-Smith and Kain, 1999). The map, in this sense, produces the space where enumeration of resources, technologies of surplus extraction, and privatization can be implemented; it is a template for imagining the capitalist subject (the competing individual/corporation), capitalist relations of production, and a capitalist inevitability. But maps, of course, are not limited to this function and functionalism; their potential as rhetorical devices and instruments of resistance, as in the case of counter-maps, is equally clear (Peluso, 1995; Rocheleau et al., 1995; Sirait, 1994).

Counter-mapping is a rhetorically powerful movement to map community use of the land (and sea) and to visually constitute community presence and territoriality relative to a dominant state and capital driven mapping and subsequent appropriation of resources. This movement is vitally important to fishing communities (e.g. Nietschmann, 1995) where the 'landscape' and the fish resources within it are largely invisible and distant and, perhaps, more easily appropriated by the techniques of a formal and state sanctioned science and development. Counter-mappings work by not only countering the invasive processes associated with state and capitalism (i.e. creating boundaries across which capital cannot or should not be allowed to move with impunity), it counters the notions of subject and space upon which they rely. That is, it produces an imaginary not of individuals (or individual corporations) freed from spatial constraint and able to move from one resource location to the next but of communities embedded in territories of production, locations that they know and claim as a community. These qualitative knowledges and claims as employed in mapping are, of course, not without their own problems such as cooptation by one or another group (Hodgson and Schroeder, 2002) but they nevertheless counter a particular hegemonic image of subject and space.

While the examples from third world fisheries are not always counter-mappings in the sense of battling a particular move by outside forces to appropriate fisheries resources, they might be considered counter-mapping in a more general sense. That is, the mappings by local communities counter fundamental assumptions of capitalism: subjectivity, space, and capitalism's inevitable penetration of all spaces. This important countering of capitalism through mapping does not, however, alter the dominant spatial imaginary of a divided world. The (counter) map maintains a boundary between two distinct worlds (first and third) where one remains dominant and the other subordinate (outside of its newly defined domain). The periphery might be bounded and defended through new geo-technologies but it cannot compete with the processes of the center, it is not itself seen as expanding into or invading the spaces that have already been claimed for capitalism (c.f. Gibson-Graham, 1996 on non-capitalism generally).

The ongoing mappings of fisheries communities/territories in the third world and similar counter-maps reveal a space into which we can project difference albeit relegated to the periphery where their impact appears only local and tenuous. Can we free these maps from the binary of first and third worlds? Can we see their potential for concretizing alternative subjects and spaces elsewhere and everywhere?

LOCATING THE ARTISANAL WITHIN THE INDUSTRIAL

The valuation of the subordinate terms of the binary of first and third world is an important strategy if we are to imagine alternative solutions to the crises of fisheries. Their recognition and defense in the third world via counter-mapping and related forms of research is

an essential first step to destabilizing hegemonic discourses of economy and natural resource management. In fisheries, the valuation and near celebration of community-based, locale specific, and participatory approaches to understanding and managing fisheries have been a vital counter weight to the narrow neoliberal solutions to fisheries problems. We are allowed to imagine and indeed implement other futures for the millions of artisanal fishers who reside in the third world.

The question remains, however, how can we counter-map in the first world? In the case of fisheries, how is it possible to value and defend what has been ontologically erased by the dominant discourse? How to institute initial assumptions of alternative subjects and spaces (that might, for example, parallel the communities and territories of the third world) when all that can be seen to exist is competing individual fishermen on an open access commons? Both of which are reflected in and reified by the forms of data collected by governments, made evident in analyses of overfishing and its solution, and instituted in meetings, public forums, and regulations throughout the first world (on these issues relative to the Northeast U.S. see St. Martin, 2001; also Wilson and Degnbol, 2002). This process is, however, never complete. Even in the first world the subordinate terms of community, locale, and participation threaten always to emerge and require a constant disciplining and distancing (St. Martin, forthcoming). This is evident in the politics and practices of fisheries where fishers express what could be read as a variety of subject positions that diverge from that assumed by the dominant discourse. Similarly, fishers participate in a host of spatial practices that contradict the assumed mobility and open access nature of the first world fisheries.

Such processes were evident in a series of interviews conducted in 1997 with 24 fishers from Gloucester, Massachusetts.³ Most of the fishers interviewed were or had been fishing boat captains at some point in their careers. They ran large trawlers (boats greater than 45 feet that drag nets on the ocean bottom in search of groundfish such as cod or haddock) with several crewmembers on board that can reach virtually any location within the exclusive economic zone (EEZ or 200 mile limit) of the Northeast, U.S. Interviewees were asked a range of questions designed to assess their personal histories and their environmental knowledge; fishers were asked to annotate familiar charts to record the spatial aspects of their knowledge. The interviews revealed not only the extent and nature of fishers' environmental knowledge but also processes that contradicted the assumptions of the dominant discourse as to fishermen's behavior. While espousing independence and freedom, fishers spoke of cooperation, community, and mutual dependence rather than a strict competition and individuality (St. Martin, 2001). In addition, the interviews and maps suggested limitations on the mobility of these fishers. While they did travel to distant off-shore locations, their maps revealed considerable overlap and a shared knowledge of specific locations. Was this territoriality a common phenomenon in the industrialized fisheries of the Northeast U.S.?

Since then, federal data containing individual fishing trip locations (Vessel Trip Reports) has been acquired and analyzed for many ports in the Northeast U.S. Using GIS analysis, the thousands of trip locations recorded annually (data is available since 1994) show clear and relatively exclusive clusters. Clusters are a function of port of origin and/or gear type and, while

³ The interviews were part of an oral history project (S-K Grant 96-NER-166) belonging to the Gloucester Fishermen's Wives Association (GFWA). Angela Sanfilippo (director of the GFWA), Dr. Madeleine Hall-Arber (MIT, Sea-Grant Program), and Dr. Christopher Dyer (URI, Marine Affairs) were the principal investigators on the project. The author participated in the research design, interviews, and subsequent analysis.

many overlap, there are clear distinctions between clusters. To quantify the clusters, home range and a measure of 'fisherdays' were calculated. The former is a standard technique in wildlife biology while the latter is the number of days a boat spends in a given location multiplied by the number of fishers onboard the boat. Fisherday values by port were calculated for each year, smoothed using a kernel density function, and aggregated across years using a standard weighted linear combination technique (St. Martin, 2004). The result is a continuous surface of relative 'presence' of fishers from particular ports and/or using particular gear types.

Using data for the same profile fisher interviewed earlier (i.e. trawl boats, greater than 45 feet, originating in Gloucester) for the same time period (1990's) several maps were made including an aggregate map of overall fishing presence based on fisherdays (Figure 1). The result could be interpreted as areas that are consistently utilized by the trawl fishing community and as the resource areas upon which Gloucester depends. The hand drawn maps from interviewed captains depict the same areas that appear as consistent Gloucester fishing locations in the federal data. While no single drawn map covers all areas, most fall within the aggregate. The evidence of shared spaces of fishing amongst those interviewed was verified using the federal data. Similar fishing location clusters by port and gear type appear widespread throughout the Northeast U.S. The implication of shared fishing locations is that many of the other attributes often associated with territoriality, as are well documented in the third world, might also be present in the industrialized fisheries of the Northeast U.S. Indeed, the Gloucester interviews revealed evidence of processes such as shared environmental knowledge, cooperation, and a sense of and desire for community (St. Martin, 2001).

Based on this insight, a number of other projects that similarly seek to make visible those processes (e.g. related to community and territorial practices) that are denied by and disrupt the dominant discourse of fishing have been initiated. In particular, maps of fisheries resource areas by port and/or gear type (as opposed to the more typical maps depicting objectified resources) have been developed as part of a set of port profiles for the Mid-Atlantic region, a protocol for assessing recreational fishing communities (CMER grant # NA17FE1462), and several social impact analyses that were directly related to specific fisheries management initiatives (McCay et al., 2002a, 2002b). This work produces a presence of port communities at-sea, within the very domain thought to be devoid of a social 'landscape' and populated only by competing individual fishermen.

This ongoing work recognizes a community subjectivity and territoriality as resident in the first world and suggests an impossibility of drawing a line between artisanal fisheries and industrial fisheries insofar as the former is defined by the presence of community, territory, and other associated attributes. The homogeneity and binary opposition of both groups/places implied by such a mapping would contradict the experiences, sentiments, and spatial practices of many first world fishers. The methods of counter-mapping, of producing an imaginary of community spaces external to and separated from the logic and domain of capitalism, must be replaced by methods that blur rather than reinforce such bounding. To blur this line in fisheries would be to see even the most industrialized and mobile fishers (e.g. trawl fishers of Gloucester) as potentially participants in processes of community grounded in specific territories. Revealing this mixed subjectivity and its spatial analogue might, then, be another way to destabilize the dominant discourse.

Another and more potent deconstructive strategy is to blur the boundaries between the terms... showing how the excluded ‘other’ is so embedded within the primary Identity that its distinctiveness is ultimately unsustainable (Gibson-Graham, 2000, p. 99).

The work discussed above challenges the ontological foundations of the dominant discourse of fisheries and presents readers with an alternative understanding of both the subject and space of fisheries in the Northeast U.S. As such, it contributes to a blurring of the line that divides industrial from artisanal, first world from third world; it does not, however, directly provide a mechanism for fishers themselves to escape the disciplining of fisheries science and management discourse.

For example, the ‘third world’ processes revealed in the Gloucester research were consistently characterized by fishers themselves as remnants of the past, as belonging to a ‘way of life’ that was rapidly disappearing. Processes of community, territory, and cooperation may have characterized the past but the future was clearly devoid of these characteristics. Fishers spoke of increased competition, lack of community, an end to family-owned fishing boats, etc. The logic of property historicism that relegates the artisanal and its attributes to the past or some distant third world location was reflected in the image of the industry’s future as articulated by fishers themselves. Indeed, fishers, despite a deep resistance to the management outcomes derived from the dominant discourse, described themselves as increasingly similar to the economic subject they are assumed to already embody. Regulations that emerge from the assumptions of individual mobile competitive fishermen eventually produce individual mobile competitive fishermen (Davis, 1991). The fishers of Gloucester seemed unable to imagine a future that was other than the neoliberal privatized and ultimately fully capitalist industry offered by the dominant discourse despite their deep dismay at the prospect of such a regime (see Figure 2).

The Atlas project⁴ is designed to address this issue by producing an alternative imaginary such that the space of fishing might be the location of a variety of subjectivities and possibilities. For several ports along the Gulf of Maine coast, maps (similar to Figure 1 but printed with a familiar chart background) will be made that depict the territories of groups of fishers from each port/community. Fishers from these ports will be asked to describe how they inhabit those spaces, how they know them, with whom do they work there, how is it a space of community, what are the connections between these spaces and on-shore communities, etc. (c.f. Hansson and Wackernagel, 1999). As part of a participatory methodology (e.g. Fisher, 1998), fishers (as community researchers) will present the maps to other fishers. Both interviewer and interviewee will have worked from the ports in question and will likely be very familiar with the spaces on the maps.

Following Jentoft (1999; 2000) but focusing on the spatial aspects of fishing communities, the goal of the project is to facilitate community and their territories rather than find pre-existing versions of either.

⁴ “An Atlas-based Audit of Fishing Territories, Local Knowledge, and the Potential for Community Participation in Fisheries Science and Management” is an ongoing project funded by NOAA via the Northeast Consortium.

Thus, a fisheries management system based on the truism that healthy fish stocks require healthy communities would develop institutions that foster cooperation and strengthen social bonds among fishers within the community and beyond (Jentoft 1999, p. 29).

This work also contributes to the project of the Community Economies Collective (2001; see also Gibson and Cameron, 2001; Graham et al., 2002) who uses participatory action research in an effort to re-imagine regional economies as locations of diverse rather than singularly capitalist economies. While their work focuses on the processes of resubjectivation necessary for such alternative imaginings and enactments, this work focuses on the potentials of a parallel respatialization.

If we are to learn from the third world then it is clear that counter-mapping (and related research) is as much a production of community and economic diversity as a discovery or documentation of it. Our work as political ecologists, anthropologists, or geographers should not be limited to locating existing communities or vestiges of some mythic past but should work to constitute communities through participatory methods and mappings that suggest community futures even, for example, in the most industrialized and technologically advanced fisheries of the first world. An alternative image of fisheries, an imaginary of a space that is something other than a template for capitalism and not relegated to the third world, will suggest a viability for alternative forms of economy and resource management.

CONCLUSION

Fisheries are understood within a binary frame that is both spatialized into the first and third worlds and founded upon a developmentalist discourse of fisheries that produces the conditions for capitalism. The result is an inevitable march toward privatization of resources abstractly understood and their utilization by individuals (or individual corporations) as capital. The third world is allowed to diverge from this inevitability due to its inherent characteristics of subject and space read as fisheries-based community and territory. These different imaginaries of subject and space produce very different prescriptions for economic development; the first world must choose capitalism while the third world might explore other options, albeit at a local scale.

This story of fisheries development evolved throughout the twentieth century. With its origins as a local discourse in the North Atlantic important to and closely associated with the expansion of capitalist/industrial fisheries, it blossomed into a global discourse employed by the United Nations and other organizations as a way to understand fisheries everywhere. At the global scale a binary and spatialized understanding of development is maintained through the separation (spatially and otherwise) of industrial (read first world) from artisanal (read third world) fisheries. The former requires systems that privatize natural resources and make access to them a market-based commodity (e.g. ITQs) while the latter allows for a range of community and locale specific solutions. Deconstructing the hegemony of the dominant discourse of fisheries such that alternative forms of fisheries management might be possible in the first world requires both a strategy of valuing that which has been relegated to the periphery (e.g. community, cooperation, participation, etc.) as well as a blurring of binary categories generally. The former is well underway by researchers in political ecology, anthropology, and geography. The latter is, I believe, much more problematic given the seemingly fixed space of resources that is constituted by the dominant discourse. This template for capitalism is not easily displaced by other spatial imaginaries borrowed from the third world. Undermining the presence of

capitalism, even in fisheries, and making space for that which has been excluded (e.g. community-based and territorial fisheries) requires, then, a new spatial imaginary.

The Atlas project and similar re-mappings of fisheries in the first world are not about finding remnants of a past third world in the first world but displacing a capitalocentric fisheries discourse (with its attendant spatial imaginary of first and third worlds of capitalism and non-capitalism). The goal is to produce a community/resource space into which can be projected a variety of potential economic subjectivities including those which might facilitate a community-based economy. Such work would borrow heavily from the lessons learned in the third world by political ecologists (e.g. common property systems, gender issues, local knowledge, etc.) and would employ them as ways to see and constitute non-capitalism. Let us bring a third world political ecology and fisheries social science to the first world and with it a desire to map non-capitalist systems of resource use, management, community, and commons.

ACKNOWLEDGEMENTS

I would like to thank Stephen Healy for inviting me to participate in the “Labors of Becoming” session at the *Marxism and the World Stage* conference (November 2003) where an earlier version of this paper was presented. I would also like to thank Richard Schroeder, James McCarthy, Marianna Pavlovskaya, and other, anonymous, reviewers who provided valuable comments on earlier drafts of this paper.

REFERENCES

- Acheson, James M. 1975. The Lobster Fiefs: Economic and Ecological Effects of Territoriality in the Maine Lobster Industry. *Human Ecology* 3, no. 3: 183-07.
- . 1987. The Lobster Fiefs Revisited: Economic and Ecological Effects of Territoriality in Maine Lobster Fishing. *The Question of the Commons: The Culture and Ecology of Communal Resources*. Editors B. J. McCay, and J. M. Acheson, ?? Tuscon: University of Arizona Press.
- Agbayani, R. F., D. B. Baticados, and S. B. Siar. 2000. Community Fishery Resources Management on Malalison Island, Philippines: R & D Framework, Interventions, and Policy Implications. *Coastal Management* 28: 19-27.
- Anderson, L. G. 1986. *The Economics of Fisheries Management*. Baltimore: Johns Hopkins University Press.
- Aswani, Shankar. 1999. Common property models of sea tenure: A case study from the Roviana and Vonavona Lagoons, New Georgia, Solomon Islands . *Human Ecology* 27, (3): 417-53.
- . 2002. Assessing the effects of changing demographic and consumption patterns on sea tenure regimes in the Roviana Lagoon, Solomon Islands. 31, no. 4: 272-84.
- Boelhower, William. 1988. Inventing America: A Model of Cartographic Semiosis. *Word and Image* 4, no. 2: 475-97.

- Bryant, R. L., and S. Bailey. 1997. *Third World Political Ecology*. New York: Routledge.
- Caddy, J. F. 1996. Regime Shifts and Paradigm Changes: Is There Still a Place for Equilibrium Thinking? *Fisheries Research* 25: 219-30.
- Callari, A. 2004. Economics and the Postcolonial Other. *Postcolonialism Meets Economics*. Editors E. O. Zein-Elabdin, and S. Charusheela. New York: Routledge.
- Charles, A. T. 1988. Fishery Socioeconomics: A Survey. *Land Economics* 64, no. 3: 276-95.
- Christy, F. T. 1982. *Territorial use rights in marine fisheries: definitions and conditions*. *Fisheries Technical Paper* 227. Rome: Food and Agriculture Organization.
- Chuenpagdee, Ratana, Julia Fraga, and Jorge I. Euan-Avila. 2004. Progressing Toward Comanagement Through Participatory Research. *Society and Natural Resources* , no. 17: 147-61.
- Community Economies Collective. 2001. Imagining and Enacting Noncapitalist Futures. *Socialist Review* 28, no. 3+4: 93-135.
- Community Fisheries Section. 2000. *Fisheries Management by Communities, A manual on promoting the management of subsistence fisheries by Pacific Island communities*. Noumea, New Caledonia: Secretariat of the Pacific Community.
- Crean, K., and S. J. Wisler. 2000. Is there the will to manage fisheries at a local level in the European Union? A case study from Shetland. *Marine Policy* 24: 471-81.
- Cushing, D. H. 1977. *Science and the Fisheries*, Studies in Biology no. 85. London: Edward Arnold.
- . 1988. *The Provident Sea*. New York: Cambridge University Press.
- Davis, Anthony. 1991. Insidious Rationalities. *Maritime Anthropological Studies* 4, no. 1: 13-31.
- Delano-Smith, C., and R. J. P. Kain. 1999. *English Maps: A History*. Toronto : University of Toronto Press.
- Demeritt, D. 2001. Scientific forest conservation and the statistical picturing of nature's limits in the Progressive-era United States. *Environment and Planning D: Society and Space* 19: 431-59.
- Duerden, F., and R. G. Kuhn. 1996. The Application of Geographic Information Systems by First Nations and Government in Northern Canada. *Cartographica* 33, (2): 49-62.
- Dyer, C. L., and J. R. McGoodwin, Editors. 1994. *Folk Management in the World's Fisheries*. University Press of Colorado.
- Escobar, A. 1995. *Encountering Development*. Princeton, NJ: Princeton University Press.

- Fisher, J. E. 2000. Creating Common Spaces: Natural Resource Management in Fuuta Jalon, Guinea. *Society & Natural Resources* 13: 567-77.
- Foale, S. 1998. Assessment and management of the Trochus Fishery at West Nggela, Solomon islands: an interdisciplinary approach. *Ocean & Coastal Management* 40: 187-205.
- Freire, J. and A. Garcia-Allut. 2000. Socioeconomic and biological causes of management failures in European artisanal fisheries: the case of Galicia (NW Spain). *Marine Policy* 24, (375-384).
- Garcia, S. M., K. Cochrane, G. Van Santen, and Francis Christy. 1999. Towards sustainable fisheries: a strategy for FAO and the World Bank. 369-98.
- Gibson-Graham, J. K. 1996. *The End of Capitalism (As We Knew It): A Feminist Critique of Political Economy*. Basil Blackwell.
- . 2000. Poststructuralist interventions. Chapter 7 in *A companion to economic geography*. eds E. S. Sheppard, and T. J. Barnes, 95-110. Blackwell.
- Gibson-Graham, J. K., S. Resnick, and R. Wolff, Editors. 2001. *Re/Presenting Class: Essays in Postmodern Marxism*. Durham, NC: Duke University Press.
- Gibson-Graham, J. K., S. A. Resnick, and R. D. Wolff, Editors. 2000. *Class and Its Others*. Minneapolis: University of Minnesota Press .
- Gibson, Katherine, and Jenny Cameron. 2001. Transforming Communities: Towards a Research Agenda. *Urban Policy and Research* 19, no. 1: 7-24.
- Gordon, H. Scott. 1954. The Economic Theory of a Common Property Resource: The Fishery. *Journal of Political Economy* 62: 124-42.
- Graham, Julie, Stephen Healy, and Kenneth Byrne. 2002. Constructing the Community Economy: Civic Professionalism and the Politics of Sustainable Regions. *Journal of Appalachian Studies* 8, no. 1: 50-61.
- Graham, Michael. 1939. The Sigmoid Curve and the Overfishing Problem. *Rapports Et Proces - Verbaux Des Reunions. Conseil International Pour L'Exploration De La Mer* 110: 15, 17-20.
- Gudeman, S., and A. Rivera-Gutiérrez. 2002. Neither Duck Nor Rabbit: Sustainability, Political Economy, and the Dialectics of Economy. *The Spaces of Neoliberalism: Land, Place and Family in Latin America*. Editor Jacquelyn Chase, 159-86. Bloomfield, CT: Kumarian Press, Inc.
- Gulland, J. A. 1984. Fisheries: Looking Beyond the Golden Age. *Marine Policy* 8, no. 2: 137-50.
- Hannesson, Rognvaldur. 1991. From Common Fish to Rights Based Fishing. *European Economic Review* 35: 397-407.

- Hansson, C. B., and M. Wackernagel. 1999. Rediscovering place and accounting space: how to re-embed the human economy. *Ecological Economics* 29: 203-13.
- Hardin, Garret. 1968. The Tragedy of the Commons. *Science* 162: 1243-48.
- Harley, J. Brian. 1988. Silences and Secrecy: The Hidden Agenda of Cartography in Early Modern Europe. *Imago Mundi* 40.
- Hersoug, B., and P. Holm. 2000. Change without redistribution: an institutional perspective on South Africa's new fisheries policy. *Marine Policy* 24: 221-31.
- Hodgson, Dorothy L., and Richard A. Schroeder. 2002. Dilemmas of Counter-Mapping in Community Resources in Tanzania. *Development and Change* 33, no. 1: 79-100.
- Hughes, D. M. 2001. Cadastral Politics: The Making of Community-Based Resource Management in Zimbabwe and Mozambique. *Development and Change* 32: 741-68.
- Hviding, E. 1998. Contextual flexibility: present status and future of customary marine tenure in Solomon Islands. *Ocean & Coastal Management* 40: 253-69.
- Jentoft, Svein. 2000. The community: a missing link of fisheries management. *Marine Policy* 24, no. 1: 53-60.
- Jentoft, Svein. 1999. Healthy Fishing Communities: An Important Component of Healthy Fish Stocks. *Fisheries* 24, no. 5: 28-29.
- John, J. 1994. *Managing Redundancy in Overexploited Fisheries*. Washington, D.C.: World Bank.
- Johnson, C. 2000. Common Property, Political Economy, and Local Resource Management: Reflections on 'Rights-based' Fishing in Southern Thailand. *South East Asia Research* 8, (1): 31-53.
- Keen, E. A. 1988. *Ownership and Productivity of Marine Fishery Resources*. Blacksburg, VA: The McDonald and Woodward Publishing Company.
- Kellert, S. R., J. N. Mehta, S. A. Ebbin, and L. L. Lichtenfeld. 2000. Community Natural Resource Management: Promise, Rhetoric, and Reality. *Society & Natural Resources* 13: 705-715.
- King, M., and L. Lambeth. 2000. *Fisheries Management by Communities: A Manual on Promoting the Management of Subsistence Fisheries by Pacific Island Communities*. Noumea, New Caledonia: Secretariat of the Pacific Community.
- Kirby, K. M. 1996. *Indifferent Boundaries: Spatial Concepts of Human Subjectivity*. New York: The Guildford Press.
- Lee, R., A. Leyshon, and C. Williams, Editors. 2003. *Alternative Economic Spaces: Rethinking*

- the 'Economic' in Economic Geography*. London: Routledge.
- Lewis, Dale M. 1995. Importance of GIS to Community-based Management of Wildlife: Lessons from Zambia. *Ecological Applications* 5, no. 4: 861-71.
- Macnab, P. 1998. There Must be a Catch: Participatory GIS in a Newfoundland Fishing Community. *Paper for the NCGIA Specialist Meeting: Empowerment, Marginalization and Public Participation GIS, October 15-17, 1998*.
- Mansfield, Becky. 2004. Neoliberalism in the oceans: "rationalization," property rights, and the commons question. *Geoforum* 35, no. 3: 313-26.
- Marx, Karl. 1976. *Capital Volume 1*. London: Penguin Books.
- McCarthy, J. 2002. First World political ecology: lessons from the Wise Use movement. *Environment and Planning A* 34, (1281-1302).
- McCay, B. J., B. Oles, B. Stoffle, E. Bochenek, K. St. Martin, G. Graziosi, T. Johnson, and J. Lamarque. 2002. *Port and Community Profiles, Amendment 9, Squid, Atlantic Mackerel, and Butterfish Fishery Management Plan: A Report to the Mid-Atlantic Fishery Management Council*, The Fisheries Project, Rutgers University, New Brunswick.
- McCay, B. J., D. C. Wilson, J. Lamarque, K. St. Martin, E. Bochenek, B. Stoffle, B. Oles, and T. Johnson. 2002. *Port and Community Profiles and Social Impact Assessment, Amendment 13 of the Surfclam and Ocean Quahog Fishery Management Plan: A Report to the Mid-Atlantic Fishery Management Council*, The Fisheries Project, Rutgers University, New Brunswick.
- McEvoy, A. F. 1986. *The Fisherman's Problem: Ecology and Law in the California Fisheries 1850-1980*. Cambridge: Cambridge University Press.
- McGoodwin, J. R. 1990. *Crisis in the World's Fisheries: People, Problems, and Policies*. Stanford: Stanford University Press.
- Meppem, T., and S. Bourke. 1999. Different ways of knowing: a communicative turn toward sustainability. *Ecological Economics* 30: 389-404.
- Mingay, G. E. 1997. *Parliamentary Enclosure in England*. New York: Longman.
- Mohamed, M. A., and S. J. Ventura. 2000. Use of Geomatics for Mapping and Documenting Indigenous Tenure Systems. *Society & Natural Resources* 13: 223-36.
- Mutume, G. 2002. Fish and Empire. *Multinational Monitor* 23: 7-8.
- (NEFMC) New England Fishery Management Council. 2001. *Draft Summary Statistics for the Northeast Multispecies Fishery*, New England Fishery Management Council, Newburyport, MA.

- Nickerson-Tietze. 2000. Community-Based Management for Sustainable Fisheries Resources in Phang-nga Bay, Thailand. *Coastal Management* 28, (65-74).
- Nietschmann, B. 1995. Defending the Miskito Reefs with Maps and GPS. *Cultural Survival* 18, no. 4: 34-37.
- NRC. 1998. *Improving Fish Stock Assessments*, National Research Council. National Academy Press, Washington, D.C..
- O'Leary, W. M. 1996. *Maine Sea Fisheries: The Rise and Fall of a Native Industry, 1830-1890*. Boston: Northeastern University Press.
- OECD. 2000. *Transition to Responsible Fisheries: Economic and Policy Implications*. Paris: Organization for Economic Co-operation and Development.
- Palsson, Gisli, and Agnar Helgason. 1994. Figuring Fish and Measuring Men: The Quota System in the Icelandic Cod Fishery. *Annual Science Conference of The International Council for the Exploration of the Sea* Newfoundland.
- Peluso, Nancy Lee. 1995. Whose Woods are These? Counter-Mapping Forest Territories in Kalimantan, Indonesia. *Antipode* 27, no. 4: 383-406.
- Pierce, D. E., and P. E. Hugl. 1979. *Insight into the Methodology and Logic Behind National Marine Fisheries Service Fish Stock Assessments*. Boston: Massachusetts Division of Marine Fisheries, Massachusetts Coastal Zone Management Office.
- Pomeroy, R. 1995. Community-based and comanagement institutions. *Ocean and Coastal Management* 27, (3): 143-62.
- Rees, J. 1985. *Natural Resources: Allocation, Economics and Policy*. New York: Routledge.
- Robbins, P. 1998. Paper forests: Imagining and deploying exogenous ecologies in arid India. *Geoforum* 29, (1): 69-86.
- . 2002. Letter to the editor. *Environment and Planning A* 34: 1509-13.
- Rocheleau, Dianne, Barbara Thomas-Slayter, and David Edmunds. 1995. Gendered Resource Mapping. *Cultural Survival Quarterly* Winter: 62-68.
- Ruddle, Kenneth. 1998. Introduction to the special issue on a modern role for traditional coastal-marine resource management systems in the Pacific Islands. 99-103.
- Russell, E. S. 1931. Some Theoretical Considerations on the 'Overfishing' Problem. *Journal Du Conseil. Conseil Permanent International Pour L'Exploration De La Mer* 6: 3-20.
- Sandersen, H. T., and S. Koester. 2000. Comanagement of Tropical Coastal Zones: The Case of the Soufriere Marine Management Area, St. Lucia, WI. *Coastal Management* 28: 87-97.
- Scott, Anthony. 1955. The Fishery: The Objectives of Sole Ownership. *Journal of Political*

- Economy* 63: 116-24.
- . 1957. Optimal Utilization and the Control of Fisheries. In *The Economics of Fisheries*. Turvey, and J. Wiseman. Rome: FAO/UN.
- . 1988. Development of Property in the Fishery. *Marine Resource Economics* 5: 289-311.
- Sirait, M., S. Prasodjo, and J. Fox. 1994. Mapping Customary Land in East Kalimantan Indonesia: A Tool for Forest Management. *Ambio* 23, no. 7: 411.
- Smith, T. D. 1994. *Scaling Fisheries: The Science of Measuring the Effects of Fishing, 1855-1955*. Cambridge: Cambridge University Press.
- St. Martin, Kevin. 1999. "From Models to Maps: The Discourse of Fisheries and the Potential for Community Management in New England. Ph.D Dissertation." Clark University.
- . 2001. Making Space for Community Resource Management in Fisheries. *Annals of the Association of American Geographers* 91, (1): 122-42.
- . 2004. GIS in Marine Fisheries Science and Decision Making. in *Geographic Information Systems in Fisheries*. Editors W. L. Fisher, and F. J. Rahel American Fisheries Society.
- . forthcoming. Inserting Community and Reclaiming the Commons. *Geoforum*.
- Symes, David, and Kevin Crean. 1995. Privatisation of the Commons: the Introduction of Individual Transferable Quotas in Developed Fisheries. 175-85.
- Thompson, P. 1983. *Living the Fishing*. Tony Wailey, and Trevor Lummis. London: Routledge & Kegan Paul.
- Turvey, and J. Wiseman. 1957. *The Economics of Fisheries*. Rome: FAO/UN.
- Walker, P. A. 2003. Reconsidering "regional" political ecologies: toward a political ecology of the rural American West. *Progress in Human Geography* 27, (1): 7-24.
- Wilson, Douglas C., and Poul Degnbol. 2002. The Effects of Legal Mandates on Fisheries Science Deliberations: the Case of Atlantic Bluefish in the United States. *Fisheries Research*, no. 58: 1-14.
- Wilson, James A., James M. Acheson, Mark Metcalfe, and Peter Kleban. 1994. Chaos, Complexity and Community Management of Fisheries. *Marine Policy* 18, no. 4: 291-305.

FIGURES

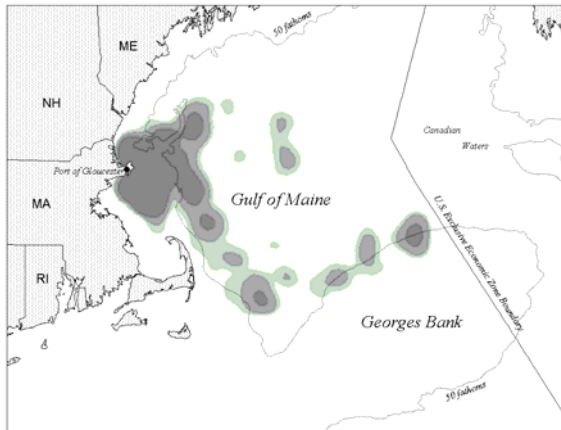


Figure 1: The shaded areas show density of “fisherdays” for large trawl boats originating from Gloucester, Massachusetts aggregated for the period 1994-2000. Original data from the National Marine Fisheries Service (NMFS), Northeast Fisheries Science Center.



Figure 2: A fisher-produced T-shirt illustration (copyright Joseph Sinagra) captures this sentiment. Here the monster of big business and oil interests (capitalism?) has invaded traditional fishing locations and is destroying family-owned and operated fishing vessels.