

**Title: Space, Time and Diversity in the Canadian Lobster Commons: Transforming territories and resulting collective action challenges**

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Panel: Theoretical and empirical insights to address the challenge of governance for multi-use ocean commons (Allain Barnett and Melanie Wiber, co-organizers).

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**Abstract:** Oceans generally, and the fisheries specifically, represent one of the first resource systems to be theorized as the tragedy of the commons. But as much subsequent research has demonstrated, ocean resource systems have a complex history of property rights attached to them, at the international, national, regional and local levels, leading to polycentric governance. For example, in the Canadian Maritimes lobster fishery, the adjacency principle was an accepted moral principle that supported fine-grained spatial management of fishing effort and thus of the resource stock. In turn, this spatial morality allowed for collective action by local communities and for co-management with government in a form of polycentricity. But things are changing out on the water. This paper examines the recent challenges to the management of Lobster Fishing Areas (LFAs) in the Canadian Maritimes. It explores the recent spatial and temporal destabilization of LFAs that has resulted from changes in access rules and in the materiality of fishing. Market gluts, climate change and redistribution of commercial species, competition for space with aquaculture, and new gear to fish deeper waters have all contributed to unstable boundaries between separate fishing spaces and to differentiation within communities. These changes are challenging the adjacency principle and the local distribution of benefits from the inshore fishery. As community interests diverge, the ability to collaboratively manage fishing effort has been undercut. Federal management has failed to pay sufficient attention to this destabilization/differentiation and thus has contributed to collective action challenges.

## **Introduction**

Governance of ocean spaces has increasingly developed along lines suggested by V. Ostrom in his groundbreaking work on polycentricity (V. Ostrom 1999a, 1999b; see also McGinnis and Ostrom 2011). Polycentric governance has been defined as “a structural feature of social systems of many decision centers having limited and autonomous prerogatives and operating under an overarching set of rules” (Aligica and Tarko 2012: 237)<sup>1</sup>. In the Canadian Maritimes, community self-management of adjacent ocean waters was augmented in the early 20<sup>th</sup> century by bureaucratic government structures such as the federal Department of Fisheries and Oceans (DFO). In turn, top-down, centrist management was amended in the 1980s through community-

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<sup>1</sup> In legal anthropology, a similar concept was developed by Sally Falk Moore, and called semi-autonomous social fields (Moore 1973). This subsequently led to research into the legal dimension of polycentric governance, a field now known as legal pluralism (Griffiths 1986).

based management institutions (Kearney et al. 2007; Wiber et al. 2004), including species management boards for specific geographic areas. In recent years, conflict with other resource users has led to further governance innovation, with attempts to introduce spatial management areas with multi-stakeholder advisory groups (Parlee and Wiber 2014). In addition, “private transnational governance” through new market certification organizations such as the Marine Stewardship Council (MSC) has proliferated the authority structures influencing resource management in ocean spaces (Foley 2013: 285; Parlee and Wiber 2012). While these developments may contribute to “institutional diversity” and be thought to increase the ability for “multiple independent actors to mutually order their relationships with one another” (Araral and Hartley 2013: 1), the effect on the ground involves some troubling ethical and moral issues around distribution of benefits and effectiveness of the delivery of public goods. Unlike Brewer (2010), I find that the operation of polycentric authorities in the Canadian lobster fishery has promoted conflict and deterritorialization, rather than creating the opportunity for new citizen engagement around spatial organization. Perhaps, as Pahl-Wostl and Knieper (2014: 147) suggest, the key to successful polycentric governance lies in effective vertical and horizontal coordination. Yet, recent developments in the spatial and political organization of the Canadian Maritime lobster fishery imply interesting challenges for such coordination in the management of collective goods, and thus for future theorizing around polycentricity<sup>2</sup>. These challenges may find their primary source in different and conflicting sets of values that are hard to reconcile.

### **A Case Study of the Canadian Maritime Lobster Fishery**

In November 2016, advertisements by “foreign buyers” appeared in rural Nova Scotia newspapers offering high prices for the licenses of “fishermen looking to retire” (CBC 2016). Both local fishermen and the president of the Independent Fish Harvesters Federation quickly reacted, labelling this a “brazen and illegal” strategy and stating that their fishery was “not open to foreigners” (CBC 2016). These advertisements were viewed by fishermen as a part of wider efforts to undercut federal regulation such as the owner-operator policy that keeps fishing licenses in the hands of local fishermen and prevents corporate entities from being both harvester and processor. But the incentives to ignore federal policy originate as much in technological and social changes from within, as they do from foreign investors from without (Canadian Independent Fish Harvester’s Federation 2016). The resulting situation is threatening the longstanding boundaries of fishing grounds, reorganizing access rights to the fishery, dividing local communities, and inhibiting collective action.

For centuries, Maritime coastal communities in eastern Canada have relied on the inshore, multi-species (groundfish, lobster, scallop, shrimp) fishery, which is based on small enterprises operating boats of less than 13.7 meters in length, making day trips from homeports (Wiber et al. 2012). As a result of the 1980s decline of groundfish stock, lobster has emerged as the most important commercial species, with a 2014 landed value of \$CDN 942 million,

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<sup>2</sup> This paper relies on research collaboration with Allain Barnett and Robin Messenger. I am grateful to them for their empirical contributions and theoretical discussions. We have recently co-authored a paper on the influence of neoliberalism on the lobster fishery (Barnett et al. 2016a).

comprising 39% of all landed marine products<sup>3</sup>. Given this dependence on lobster, fishermen's livelihoods are vulnerable when market prices decline, as they did precipitously after the 2008 financial crisis (Barnett and Eakin 2015). This vulnerability creates what Steneck et al. (2011) have called "the gilded trap".

Polycentric governance in the Canadian Maritimes fishery has had a number of historic drivers. As in Maine (Acheson 1998), Maritime fishermen historically regulated access to their community fishing grounds. But due to market gluts and persistent poverty in coastal communities, an 1899 Royal Commission recommended that the federal government divide the lobster fishery into 6 districts with variable seasons to stagger delivery to markets (Prince 1899). Fishing districts were first established in 1910, with the current LFA boundaries redrawn in 1986 (Lawton et al 1999: 48) (see Figure 1). After 1986, the DFO limited licenses to a single LFA and enforced the boundaries with patrol boats. Today, LFA boundaries regulate fishermen's behavior spatially and temporally (Wiber 2014), but also socially and ecologically. They form part of the overarching set of rules under which multiple authority centers operate and that also include trap limits, gear restrictions and fishing seasons. To some extent, LFAs have been based on historic patterns, with boats fishing close to their ports and with a moral sense that fishing communities and fishing grounds ought to be linked based on geographic proximity. This 'adjacency principle' is still well supported by many fishermen (Brewer 2012, Foley et al. 2015), as is shown by its defence through local action, as I describe further below.

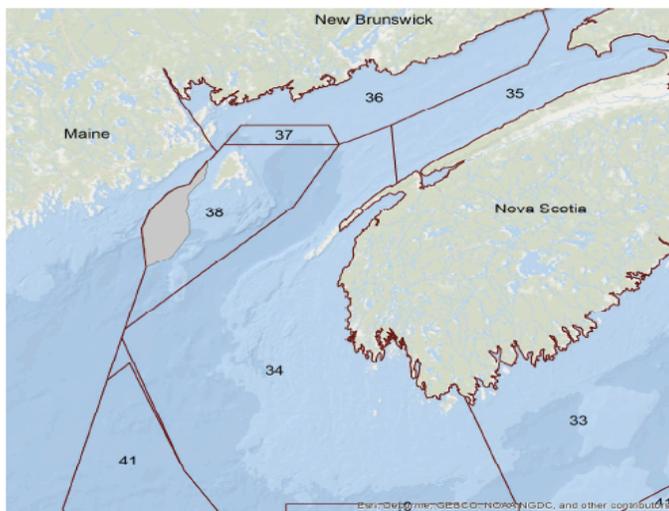


Figure 1. Map of Southwest Nova Scotia and Southwest New Brunswick, including the Grey Zone and numbered Lobster Fishing Areas (LFAs) as developed by Fisheries and Oceans Canada.

The current governance of this fishery involves at least three levels or centers of authority, relating to the community, the state and international market regulation through certification. Relations between these three levels have not always been smooth or productive of

<sup>3</sup> See <http://www.dfo-mpo.gc.ca/stats/commercial/land-debarq/sea-maritimes/s2014av-eng.htm>, last accessed January 2016.

public good outcomes<sup>4</sup>. While individual fishermen and their family members feel authorized to protect their right to fish in an LFA for which they have a license and more importantly from the local point of view, a family history (Acheson 1998, Brewer 2012, Davis and Kasdan 1984), they more commonly view their LFA as ensuring the economic survival of their fishing communities. Through a period of civil disobedience and some violence triggered by the introduction of individual transferable quota (ITQ) into the groundfishery, fishermen in the Canadian Maritimes successfully demanded a role in co-management (Wiber and Kearney 1996, Ulrich and Wilson 2009), including gaining some say over how LFAs are managed (Barnett et al. 2016). In LFA advisory boards coordinated by the DFO, elected port representatives from each port in the LFA meet regularly to discuss stock assessments, market conditions and potential changes to regulations. However, the minutes of such LFA advisory boards illustrate how often community and national agendas clash, as federal bureaucrats and local representatives argue over scientific assessments, market trends and licensing infringements (Barnett et al. 2016a). In recent times, corporate actors have succeeded in playing a role on these advisory boards, and have injected more “market sensitive” values into policy, often in violation of top-down regulation by the state that is supposed to enhance broad social and conservation objectives. The adoption of MSC certification by the east coast lobster fishery has introduced a new level of market authority, ostensibly in support of sustainability. The Nova Scotia and New Brunswick Lobster Eco-Certification Society is the client group holding MSC certification and includes harvesters, dealers/buyers, shippers, and processors (MSC 2015). Through its MSC certification, the Society impacts management decisions (in coordination with the federal government) in the majority of LFAs in the two provinces. But with a membership that includes most major processors, shippers, buyers and dealers with major markets in the US, Europe and Asia, this MSC client has significant clout and can push for change in government regulation.

These multiple authorities all rely on LFA regulation as part of an overarching set of rules, but this is not to suggest that all actors are happy with the LFAs boundaries. One source of contention is the uneven distribution of space and “good bottom” across the LFAs. Some communities argue that they lost access to the most productive bottom when the current LFAs were established (Barnett and Anderies 2014). Another source of contention is the number of licenses operating within LFAs. For example, as of 2016, LFA 35 has 95 licenses, LFA 36 has 177 and LFA 38 has 136 (see Figure 1). In one case, the boundary line between two LFA was so contentious that a so-called buffer zone (LFA 37) was created between them. While fishermen from both LFA 36 and 38 can fish the buffer zone, historically there was little use made of this zone for lobster fishing. However, in 2013 conflict over this shared zone escalated. As one fisherman explained: “originally the boats weren’t big enough to give Grand Manan any trouble or vice versa. But now they are all running into each other all the time and what was merely a Campobello area became quite crowded.”<sup>5</sup> Recent gear and boat innovations together with changing patterns of lobster distribution have encouraged fishing deeper waters. As one fisherman put it: “where we fish now, you couldn’t catch a lobster years ago...and now, that’s where everybody is fishing. Inside where they used to get the lobsters, [it] seems like you can’t catch as many as you used to... you gotta go off farther.”<sup>6</sup> New larger boats with bigger engines,

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<sup>4</sup> For more on the relationship between MSC and the federal regulators in Canada see Foley 2013. For conflicts between local fishing organizations and the MSC see Foley et al. 2015.

<sup>5</sup> Wiber interview conducted March 4, 2013.

<sup>6</sup> Barnett interview conducted on June 25, 2012

and innovations in setting 10 or more traps on long trawl lines have created new competition over geographic space.

For those in the more advantageous zones, the impact on average income in comparison to the less advantageous zones is substantial. This can be estimated from landings per license. For example, when averaged across 2009-2015, the difference in landings per license between LFA 36 and 38 of 17.74 mt, translates into a difference in the range of annual revenue of between \$119,000 CAD to \$238,000 (with average prices ranging from \$3 to \$6/lb). Understandably, fishermen who feel disadvantaged often call for changes, while fishermen in a supposedly more advantageous zone resist such change. The approach of federal regulators has often been to require consensus among all adjacent LFAs before any proposed change in one LFA can be implemented. While this might be seen as effective cooperation and horizontal coordination (Pahl-Wostl and Knieper 2014: 141)<sup>7</sup>, this approach has effectively blocked revisions to such things as season opening dates in specific LFAs. As climate change through water temperature affects the migration of lobster inshore in the spring and offshore in the fall, lack of adaptation to these changes will undoubtedly impact landings and incomes for the more affected LFAs.

The introduction of salmonid aquaculture has also affected fishermen satisfaction with LFA boundaries. In New Brunswick's provincial waters, Aquaculture Bay Management Areas (ABMAs) were established by the province in areas of productive lobster or scallop fishing bottom (Chang et al 2014; Wiber et al. 2012). Such aquaculture operations displace fishermen, particularly in LFA 36. Even where aquaculture subsequently abandoned specific lease sites, significant debris (mooring blocks, cage components) left behind make fishing in those locations dangerous and potentially costly due to gear damage (Barnett et al. 2016b). Further, aquaculture operations require movements of cage materials, fish feed and pesticides between lease sites. Aquaculture boats often cut or drag lobster gear, creating 'ghost traps' that sink to the bottom and cannot be retrieved. This fishing debris can entangle right whales or continue to trap marine organisms, with negative publicity for commercial fisheries. Aquaculture pesticides, feed, fish feces, antifoulants, elevated sulphur concentrations and other material manifestations of aquaculture move through the water in unpredictable ways (Burrige et al 2010; Burrige et al 2014). Some of these materials have killed commercial species, including lobster, leading to a major fine levied against the largest aquaculture operator in the region (CBC 2013).

In the next section, I examine how changing fishing practices and technologies, and changing economic activities within LFA boundaries, are creating conflicts between polycentric authorities over competing moral values and conceptions of territorial organization. I will argue that the role of competing value systems has been under-theorized in the polycentric governance literature (but see Aligica and Tarko 2012; Araral and Hartley 2013).

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<sup>7</sup> Pahl-Wostl and Knieper (2014: 143) subdivide coordination in polycentric governance between the horizontal and vertical. Horizontal coordination provides links "across sectoral and administrative boundaries" and "integration across diverse issues and provincial borders" (ibid: 141, 147). Vertical coordination "reflects how far legal arrangements support coordination and facilitate collaboration between government actors across administrative levels" (ibid: 143). See also Table 2, page 143.

## Deterritorialization

Changes in fishing practices and technologies, changing licensing approaches and conflict over seasons are impacting how stakeholders view LFA boundaries. I discuss these changes by reference to two axes, one involving (de)territorialisation and one involving moral arguments related to materiality (see Figure 2).

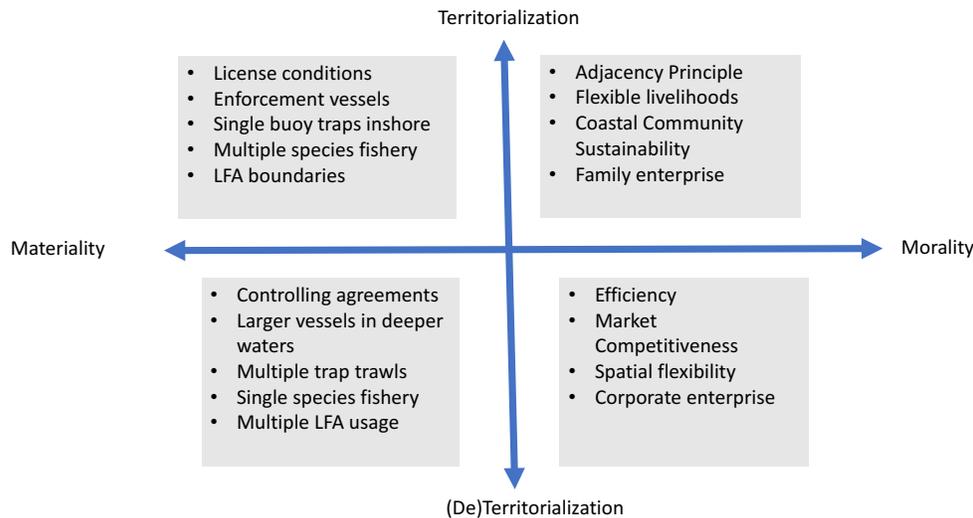


Figure 2. Interacting material and moral elements in the spatial management of the lobster fishery.

While DFO maintains authority over the LFA territorial spaces through license conditions, enforcement vessels and trap limits, it does so with reference to moral dimensions accepted by many fishermen such as the adjacency principle, community sustainability and support for inshore family enterprises (top Figure 2). Meanwhile, deterritorialization has been enhanced by both material and social innovation (controlling agreements, larger vessels, multi-trap trawls, single species focus); it also is supported by moral arguments about efficiency and market competitiveness (bottom, Figure 2). With technological change (on the bottom left, Figure 2), lobster fishing is moving out into deeper waters. This material innovation has affected human relations in several ways. Fishermen on both sides of the LFA boundary engage in line testing behavior, setting their traps as close to or on the line as possible, something that both enforcement officers and fishermen claim was previously rare. Fishermen can now place buoys within their own LFA and run long trap trawls into adjacent LFAs. GPS in the wheelhouse creates opportunities to track fishing gear without surface buoys. Regulatory changes also enhance access to multiple LFAs; these involve license transferability and the introduction of corporate controlling agreements that together have resulted in both more corporate control of the fishery and challenges to LFA regulation (bottom, Figure 2). Barnett et al. (2016a) deal with some of these developments in detail. Here I briefly describe how these changes challenge LFA boundaries and the previous value attached to them, in order to introduce questions about the impact of polycentric governance.

Beginning in 1981, the federal government introduced “limited entry”. First, a fishing license became a non-transferable “privilege” that would only be granted to “bona fide fishermen” (Bodiguel 2002). This threatened the historic coastal mixed economy, as entry was limited to those who could demonstrate that they fished full time and for the majority of their household income. Second, new licensing limited the territory in which fishermen could operate, setting up spatial areas for which species-specific licenses were granted. Under state regulation, fishing licenses are *de jure* non-transferable, that is, they cannot be sold or transferred to others. However, various DFO buy-back programs designed to reduce the number of active fishing enterprises, “established licenses as marketable items in the fishermen’s mind” (Bodiguel 2002: 275). Over time, demands for licence transferability applied pressure on licensing provisions and regulatory practices, ultimately enabling the so-called “beneficial interest” in a license to be *de facto* bought and sold, much like a property right (Sinha 1999). For example, under the regulations, an existing license holder could request that their license be reissued to a new entrant to facilitate transfers between generations within a family. But this also created a loophole using contract law between a license seller and a license buyer to transfer a license (Wiber and Kearney 1996). In recent times, so-called non-transferable licenses have been sold for more than \$500,000 CAD in LFA 34 (Barnett 2014; Bodiguel 2002).

Soon, financial institutions were seeking clarification from the DFO as to whether licenses should serve as collateral for loans. While the DFO has held to the position that licenses are the property of the Crown (Bodiguel 2002), the 2008 Saulnier decision at the Supreme Court of Canada (Saulnier v. Royal bank of Canada, 3 S.C.R. 166, SCC 58. 2008) has undercut this argument<sup>8</sup>. In that case, a bankrupt license-holder appealed an earlier court decision that allowed his bank to seize the license against defaulted loans. The appeal was dismissed by the court, essentially facilitating the treatment of licenses as *de jure* property. As a result, DFO officials have found it difficult to control the so-called “black market” in licenses (Barnett and Eakin 2014). Financiers have also found other legal loopholes that allow them to enter into contract agreements with fishermen to control their licenses. The Canadian Independent Fish Harvesters Federation has estimated as many as 10 to 15 percent of licenses in southwest Nova Scotia alone are subject to licensing agreements (CBC 2016). Some fishermen blame the DFO for “turning a blind eye”, and point to the presence of corporate actors on LFA advisory boards as one influence on the DFO. They express concern that the “stacking” of licenses on single boats serves to increase fishing effort and territorial access. But license stacking cannot be understood without reference to those backstage elements (licensing enforcement, marketing pressures and certification) that increasingly change the way that the lobster fishery is governed.

For example, one might ask why fishermen are willing to sign contract agreements with the corporate sector? Such men make three basic arguments to support their position: economic flexibility, financing retirement and facilitating entry of young fishermen. With respect to the first argument, when two licenses are fished from one boat, two fishing enterprises save fuel and crew expenses<sup>9</sup>. After the 2008 financial crises, these arrangements grew in number and took on their own moral value, being justified through a rhetoric of modernity, market competitiveness and efficiency, which were also key concepts during certification (bottom right corner, Figure 2).

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<sup>8</sup> See <https://scc-csc.lexum.com/scc-csc/scc-csc/en/item/6231/index.do>, accessed May 30, 2017.

<sup>9</sup> While DFO allows this arrangement, they require that the two license-holders reduce the number of their combined traps. For example, if each man had a license for 300 traps, once they combined effort on one boat, they could only fish 450 traps rather than 600.

Within the lobster management boards, members affiliated with corporate processors represent these developments as inevitable. However, other fishermen argue that corporate processors can now keep the vessel fishing throughout the year in different LFAs, increasing pressure on the stocks and impacting the highly valued distribution of benefits (as seen in the upper right hand quadrant, Figure 2). For example, fishermen under contract to processors become wage laborers instead of owning their own enterprise and sustaining their local communities. Under these agreements, both skipper and crew receive set salaries instead of a share of the catch value. In fishing communities, these contracts are often referred to pejoratively as “controlling agreements” (Barnett et al. 2016a). As one fisherman explained, agreements can vary: “one I work on takes 47%, and the captain and crew must pay expenses except for gear...the crew pay off the boat, and the average [left over] is about 12.5%.”<sup>10</sup> Yet other fishermen point to a lack of retirement benefits to justify entering into agreements with processors. Older fishermen are tempted by high prices offered for their licenses that often far exceed the value in their boats and gear. However, as buyers for these licenses usually do not come from the communities where people are willing to sell, such retirees are often represented by their fishing organizations and fellow community members as greedy or selfish. Many argue that every sale of a license to an outsider is a loss of community access to their economic mainstay as transferred licenses rarely make their way back into community hands. The third argument springs from this loss and involves inner-generational inequities generated by rising license costs, which serve as a barrier for new entrants. Many young fishermen can only obtain financing for licenses through contracts with fish buyers and processors. Within communities then, collective action becomes more difficult as resentments and disputes over license transfers proliferate.

These agreements contravene DFO owner-operator policy, which emerged as a result of collective action and fierce political engagement by Maritime fishermen. East coast fishing organizations fought and continue to fight to maintain the independent, inshore fishery and the economic health of coastal communities<sup>11</sup>. As a result, new technological and access developments in the lobster fishery have generated tension and conflict both within and between fishing communities, within local, regional and national fishermen’s association meetings, and between the DFO and such organizations. Within communities, many people express concern that the adjacency principle is eroding, destroying the attachment between fishermen and place. For example, fishermen from LFA 38 complain that they have lost too many licenses to fishermen from LFA 34 (see Figure 1). In November 2012, some LFA 38 fishermen untied and set adrift a number of LFA 34 vessels, and barricaded government offices to protest license transfers (CBC 2012). In response, the Minister of Fisheries agreed to temporarily freeze license transfers for ten LFA 34 boats that were set to fish in LFA 38 (CBC 2012). LFA 38 fishermen further lobbied for stricter enforcement of the “residency clause” that requires that fishermen from an LFA have residence on adjacent lands. But many fishermen are aware that such actions often hurt both retiring and younger fishermen in their own communities.

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<sup>10</sup> Barnett interview, May 29, 2012.

<sup>11</sup> This is in contrast with the west coast of Canada where concentration of fishing rights in corporate hands has been extreme (Pinkerton and Edwards 2009).

## Discussion

The polycentric governance literature might interpret the above events in different ways. Rent seeking under conditions of ineffective coordination might be one interpretation (Pahl-Wostl and Knieper 2014). Such rent seeking could be explained through agency capture of the DFO by the corporate sector (Singleton 2007; Barnett et al. 2017). Another interpretation might emphasize the need for integrated management and cross-agency cooperation to reduce fragmentation and to align courts and policy (Charles 2010). Yet another interpretation, and one that I present here, might be that polycentric efforts at cooperation and coordination are blocked by basic incompatibilities between value systems (see right hand side of Figure 2).

The polycentric governance literature raises questions about how polycentricity is affecting the management of common pool resources (Brewer 2010, Foley 2013, McGinnis and Ostrom 2011, E. Ostrom 2010), and whether or not it will lead to better gains in public goods such as sustainability and ethical distribution of benefits (Pahl-Wostl and Knieper 2014). A summary of some of the literature suggests that so far, polycentricity has a Janus face. Foley and McCay (2014), for example, examine the impact of eco-certification in two different settings, and suggest that a number of common pool and/or historical factors can influence whether or not the intrusion of private market-based governance into existing governance arrangements will further “inclusion, cooperation, and collective action” or generate “exclusion, confusion, and conflict” (see also Foley and Hébert 2013). They raise questions about the nature of the MSC “client”, and whether or not this client can legitimately represent collective interests. They further argue that territoriality is an important component of positive public good outcomes, suggesting that “smallness of numbers and spatial scale, accountable leadership, ... fairness and transparency” are linked together in well-known “design principles” (see also Figure 1 in Aligica and Tarko 2012: 257). From this perspective, it is interesting to examine the Nova Scotia and New Brunswick Lobster Eco-Certification Society, as it represents a wide geographical area (including many LFAs) and a diverse body of stakeholders, including the corporate sector that has been pushing for deterritorialization. To what extent will this organization enhance or be impervious to corporate take-over of the lobster fishery? A number of existing case studies suggest that MSC certification pays very little attention to distribution of benefits (see Foley 2013, Foley and Hébert 2013, Foley et al. 2015).

The issue of scale has been raised by Elinor Ostrom (2010), who also views polycentric arrangements in relation to greenhouse gases as potentially Janus faced; that is, both potentially positive in yielding general benefits and potentially negative in generating threats (see also Araral and Hartley 2013). And it is true that “scaling up” lobster fishery organizations can yield the benefits of large-scale collective action, as in holding the federal government to the owner operator policy; but there is also evidence that these larger organizations sometimes disconnect from experiences on the ground (as with Maritime fishermen’s organizations decrying controlling agreements and thereby overlooking the need for retirement support or funding for young entrants). Aligica and Tarko (2014), meanwhile, raise the question of the tension between efficiency and resiliency, drawing in flexible and polycentric institutional processes as the mechanism to promote “innovation and creative socio-cultural adaptation” (ibid: 54). The trouble is, innovation and creative adaptation can be in the eye of the beholder. So far, despite many local attempts at innovation in dates for opening the fishing season or in revising access rules, both local communities and DFO bureaucrats have proved resistant to these new ideas – often

with good value-based justification<sup>12</sup>. Those who oppose deterritorialization do so on the grounds of sustainability (of community, of local small-scale operators and of the fish stock). Those who wish to deterritorialize the lobster fishery also make arguments on the grounds of adaptation and sustainability (to warmer waters and changing lobster distribution patterns, to market challenges, to economic downturns). One wonders whether “only time will tell” in addressing the question of the public good to be achieved under competing value systems in polycentric governance.

A significant social dilemma in ocean common-pool resources is how to maintain healthy common pool resource stocks over time while ensuring as wide a distribution of benefits as possible? One interpretation has been that in limiting those with access rights, we protect the common resource stocks. But concentration of resource rights in fewer (corporate) hands has not slowed the decimation of commercial fish stocks – quite the opposite (Wiber 2000). So what does the polycentric governance literature offer us in response to this well-known problem? Relying on one case study, this paper has examined the polycentricity literature to address that question. As with the literature cited above, I can see benefits from the operation of multiple “design centers”, including decision-making by fishermen that fits their individual circumstances – but unfortunately that often does not meet the needs of the community (as when retiring fishermen alienate their licenses to buyers outside of the community). Similarly, I can see anonymous decision-making at the community level (through LFA stock assessment committees) as valuable in matching stock assessments, market prices and potential landings. But again, when influenced by a number of fishermen working under controlling agreements, one wonders how anonymous the decisions reached really are? And while the MSC certification of lobster has given all the regional fishermen access to world markets, and all under the same set of overarching sustainability rules, it appears that many incentives continue to exist to fish harder and in a wider territory (rent seeking) that must surely negate the MSC certification gains. The polycentric governance literature could do more than present the Janus face of polycentric government – perhaps further case studies, such as that of the Canadian Maritimes lobster fishery, will continue to challenge this literature and present clues as to why successful collective action is the result in one situation, while conflict, confusion and over-exploitation is the result in another. One clue, I have argued, lies in competing value sets which are not easily aligned or coordinated.

## **Bibliography**

Acheson, J M 1998 *The lobster gangs of Maine*. Hanover and London: University Press of New England.

Aligicia, P D and Vlad Tarko 2012 Polycentricity: From Polanyi to Ostrom, and Beyond. *Governance: An International Journal of Policy, Administration and Institutions* 25(2): 237-262.

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<sup>12</sup> Sarewitz (2004) notes that these value-based decisions are not easily resolved by reference to science, as he argues that we do not have “scientific facts” detached from social values – so to use science in disputes over values is a use for which science was never designed (ibid: 398). Politics is designed to adjudicate value disputes – science is not.

Aligicia, P D and Vlad Tarko 2014 Institutional resilience and economic systems: Lessons from Elinor Ostrom's work. *Comparative Economic Studies* 56: 52-76.

Araral, Ed and Kris Hartley 2013 Polycentric governance for a new environmental regime: theoretical frontiers in policy reform and public administration. In 1st International Conference on Public Policy. Grenoble, France, June 2013. Retrieved April 21, 2017 from: [http://www.icpublicpolicy.org/IMG/pdf/panel\\_46\\_s1\\_araral\\_hartley.pdf](http://www.icpublicpolicy.org/IMG/pdf/panel_46_s1_araral_hartley.pdf).

Barnett, A 2014 From policy instruments to action arenas: toward robust fisheries and adaptive fishing households in Southwest Nova Scotia. Unpublished PhD Dissertation, Arizona State University.

Barnett, Allain and J M Anderies 2014 Weak feedbacks, governance mismatches, and the robustness of social-ecological systems: an analysis of the Southwest Nova Scotia lobster fishery with comparison to Maine. *Ecology and Society* 19(4): 39.

Barnett, Allain and H C Eakin 2015 "We and us, not I and me": justice, social capital, and household vulnerability in a Nova Scotia fishery. *Applied Geography* 59: 107–16.

Barnett, Allain, R Messenger and M Wiber 2016a Enacting and contesting neoliberalism in fisheries: the tragedy of commodifying lobster access rights in Southwest Nova Scotia. *Marine Policy* [doi.org/10.1016/j.marpol.2016.03.002](https://doi.org/10.1016/j.marpol.2016.03.002)

Barnett, Allain, M Wiber, M Rooney and D C Maillet 2016b The Role of Public Participation GIS (PPGIS) and Fishermen's Perceptions of Risk in Marine Debris Mitigation in the Bay of Fundy, Canada. *Ocean and Coastal Management* 133: 85-94.

Bodiguel, C 2002 Fishermen facing the commercial lobster fishery licensing policy in the Canadian Maritime Provinces: origins of illegal strategies, 1960–2000. *Marine Policy* 26: 271–81.

Brewer, J F 2012 Don't fence me in: boundaries, policy, and deliberation in Maine's lobster commons. *Annals of the Association of American Geographers* 102(2): 383-402.

Burrige, L E, M C Lyons, D K Wong, K MacKeigan and J L VanGeest 2014 The acute lethality of three anti-sea lice formulations: AlphaMax®, Salmosan®, and Interlox®Paramove™50 to lobster and shrimp. *Aquaculture* 420-421: 180–186.

Burrige, L, J S Weis, F Cabello, J Pizarro and K Bostick 2010 Chemical use in salmon aquaculture: a review of current practices and possible environmental effects *Aquaculture* 306(1-4): 7–23.

Canadian Independent Fisher Harvester's Association 2016 Changes to the Fisheries Act to provide modern safeguards for the sustainable development and management of Canada's coastal fisheries. Brief presented to the Standing Committee on Fisheries and Oceans pursuant to

the resolution adopted September 19, 2016 to study and review the scope and application of the Fisheries Act.

CBC Online News 2012 Grand Manan lobster fishermen win a temporary license freeze. (<http://www.cbc.ca/news/canada/new-brunswick/grand-manan-lobster-fishermen-win-temporary-licence-freeze-1.1244702>). Accessed 20 May 2016.

CBC Online News 2013 Aquaculture company on the hook for \$500K for pesticide use. Kelly Cove Salmon pleaded guilty to 2 charges related to deaths of lobsters in Bay of Fundy. (<http://www.cbc.ca/news/canada/new-brunswick/aquaculture-company-on-the-hook-for-500k-for-pesticide-use-1.1317105>). Accessed 20 May 2016.

CBC Online News 2016 Southwest Nova Scotia lobster licenses sought by foreign buyers, ad says. (<http://www.cbc.ca/news/canada/nova-scotia/ad-seels-access-southwest-nova-lobster-licenses-1.3852109>). Accessed 16 November 2016.

Chang, B D, K A Coombs, and F H Page 2014 The development of the salmon aquaculture industry in Southwestern New Brunswick, Bay of Fundy, including steps toward integrated coastal zone management. *Aquaculture Economics & Management* 18(1): 1–27.

Charles, Anthony and the CURA team. 2010 Integrated Management: A Coastal Community Perspective. *Horizons* 10(4): 26-34.

Davis, A and L Kasdan 1984 Bankrupt government policies and belligerent fishermen responses: Dependency and conflict in the Southwest Nova Scotia small boat fisheries. *Journal of Canadian Studies* 19(1): 108-112.

Foley, P 2013 National government responses to Marine Stewardship Council (MSC) fisheries certification: Insights from Atlantic Canada. *New Political Economy* 18(2): 284-307.

Foley, P and K Hébert 2013 Alternative regimes of transnational environmental certification: governance, marketization, and place in Alaska's salmon fisheries. *Environment and Planning A* 45: 27734-2731.

Foley, P, C Mather and B Neis 2015 Governing enclosure for coastal communities: Social embeddedness in a Canadian shrimp fishery. *Marine Policy* 61: 390-400.

Foley, P, B. McCay 2014 Certifying the commons: eco-certification, privatization, and collective action. *Ecology and Society* 19(2): 28. DOI: <http://dx.doi.org/10.5751/ES-06459-190228>.

Griffiths, J 1986 What is Legal Pluralism? *The Journal of Legal Pluralism* 24: 1-56.

Kearney, John, Fikret Berkes, Anthony Charles, Evelyn Pinkerton, Melanie Wiber 2007 The Role of Participatory Governance and Community-Based Management in Integrated Coastal and Ocean Management in Canada. *Coastal Management Journal* 35(1):79-104.

Lawton, P, D A Robichaud, D S Pezzak, M B Strong and D R Duggan 1999 The American lobster, *Homarus americanus*, fishery in the Bay of Fundy (Lobster Fishing Areas 35, 36 and 38). Canadian Stock Assessment Secretariat Research Document 99/31. Fisheries and Oceans Canada, Ottawa.

Lewis, Paul forthcoming The Ostroms and Hayek as Theorists of Complex Adaptive Systems: Commonality and Complementarity. *Advances in Austrian Economics*.

Marine Stewardship Council (MSC) 2015 Nova Scotia and New Brunswick inshore lobster fishery achieves MSC certification. Accessed at <https://www.msc.org/newsroom/news/nova-scotia-and-new-brunswick-inshore-lobster-fishery-achieves-msc-certification>. Last accessed May 30, 2017.

McGinnis, M D and E Ostrom 2011 Reflections on Vincent Ostrom, Public Administration, and Polycentricity. *Public Administration Review* 72(1): 15-25.

Moore, S F 1973 Law and Social Change: The Semi-Autonomous Social Field as an Appropriate Subject of Study. *Law & Society Review* 7(4): 719-746.

Ostrom, V. 1999 Polycentricity (Part 1). In M. McGinnis (ed.), *Polycentricity and Local Public Economies: Readings from the Workshop in Political Theory and Policy Analysis*. Ann Arbor: The University of Michigan Press. P. 52.

Ostrom, V. 1999 Polycentricity (Part 2). In M. McGinnis (ed.), *Polycentricity and Local Public Economies: Readings from the Workshop in Political Theory and Policy Analysis*. Ann Arbor: The University of Michigan Press. P. 119.

Pahl-Wostl, C and C. Knieper 2014 The capacity of water governance to deal with the climate change adaptation challenge: Using fuzzy set Qualitative Comparative Analysis to distinguish between polycentric, fragmented and centralized regimes. *Global Environmental Change* 29:139-154.

Parlee, Courtenay and Melanie Wiber 2012 Who is governing food systems? Power and legal pluralism in lobster traceability. *Journal of Legal Pluralism* 64: 121-148.

Parlee, Courtenay and Melanie Wiber 2014 Institutional Innovation in Fisheries Governance: Adaptive Co-Management in Situations of Legal Pluralism. *Current Opinion in Environmental Sustainability* (COSUST) 11:48-54.

Patterson, James 2017 Purposeful collective action in ambiguous and contested situations: exploring 'enabling capacities' and cross-level interplay. *International Journal of the Commons* 11(1): 248-274.

Pinkerton, E and D Edwards 2009 The elephant in the room: the hidden costs of leasing individual transferable fishing quotas. *Marine Policy* 33(4): 707-713.

Prince, E E 1899 Report of the Canadian lobster commission. Sessional Papers, Department of Marine and Fisheries, Victoria, BC.

Sarewitz, D 2004 How science makes environmental controversies worse. *Environmental Science & Policy* 7:385-403.

Singleton, S 2000 Co-operation or capture? The paradox of co-management and community participation in natural resource management and environmental policy-making. *Environmental Politics* 9:2: 1-21, DOI: 10.1080/09644010008414522

Sinha, J 1999 The “transfer” of fishing licenses in Canada: A legal overview. Report prepared for the Canadian Council of Professional Fish Harvesters, December 6, 1999.

Steins, N S and V M Edwards 1999 Synthesis: Platforms for collective action in multiple-use common-pool resources. *Agriculture and Human Values* 16: 309-315.

Steneck, R S, T P Hughes, J E Cinner, W N Adger, S N Arnold, F Berkes, S A Boudreau, K Brown, C Folke, L Gunderson, P Olsson, M Scheffer, E Stephenson, B Walker, J Wilson and B Worm 2011 Creation of a gilded trap by the high economic value of the Maine lobster fishery: gilded trap of Maine’s lobster fishery. *Conservation Biology* 25: 904–912.

Ulrich, C and D C Wilson 2009 Rights-based management and participatory governance in Southwest Nova Scotia. In Hauge, K H and D Wilson, eds., *Comparative evaluations of innovative fisheries management*, Dordrecht: Springer. Pp. 43-68.

Wiber, M G 2000 Fishing Rights as an Example of the Economic Rhetoric of Privatization: Calling for an Implicated Economics. *Canadian Review of Sociology and Anthropology* 37.3: 267-288.

Wiber, M G 2014 Syncopated rhythms? Temporal patterns in natural resource management. *Journal of Legal Pluralism* 46(1): 123-140.

Wiber, M G, Tony Charles, Fikret Berkes and John Kearney 2004 Participatory Research Supporting Community-Based Fishery Management. *Marine Policy* 28(6): 459-468.

Wiber, M G and J Kearney 1996 Stinting the commons: property, policy, or power struggle? In M Wiber and J Spiertz, eds., *The role of law in natural resource management*, 'S-Gravenhenge, Vuga Press, Pp. 145–66.

Wiber M G, S Young and L Wilson 2012 Impact of aquaculture on commercial fisheries: Fishermen’s local ecological knowledge. *Human Ecology* 40(1): 29–40.