

## Coastal management challenges from a community perspective: The problem of ‘stealth privatization’ in a Canadian fishery <sup>☆</sup>

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### ABSTRACT

Intertidal clam fisheries seem ideal candidates for the devolution of management authority from government to local stakeholders. In St. Mary's Bay, Nova Scotia, a private firm recently applied for a 10-year renewal of a large (1,627 ha) lease for quahog clam aquaculture. This case study examines the challenges of implementing community-based natural resource management (CBNRM) in rural fisheries within a broad integrated coastal management (ICM) institutional environment that favours corporate stakeholders. The challenges facing clam harvesters in rural Digby Neck, Nova Scotia arise from poor communication and coordination within government and between government and communities, as well as higher-level policy conflicts. The most important challenge arises from ‘stealth privatization’ of clam beaches. A single firm was granted rights of first refusal to depurate all clams harvested from closed (polluted) beaches in the region, resulting in the *de facto* privatization of all (polluted and unpolluted) clam beaches. Experiences in other parts of Canada suggest there may be community-based governance approaches that avoid the pitfalls associated with corporate management of clam beaches. New thinking is required about how to moderate the ‘privatization paradigm’ so prevalent within senior levels of government in order to ensure environmental and social sustainability in rural fishing communities.

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## 1. Introduction

Around the world, many vital marine fish, shellfish stocks, and other ecosystem services are under significant stress [1,2]. The decline of fisheries that depend on these stocks have been driven by factors such as technological innovation, demand-driven over-exploitation due to market integration and globalization of supply chains, subsidization of fishing fleets, and institutional failure [3–6]. One school of thought prominent in fisheries management research [7] and practice [8] is that substantial property rights should be granted to fishers through various types of individual quota systems, allowing them to respond to economic signals and

for fishing fleets to adjust their landing capacity to match resource availability.

Over time, many have recognized the limits of relying solely on market-based solutions for fisheries management based on an overly-narrow idea of ‘efficiency’ [9,5,10], and there has also been growing recognition of the linkages between humans who earn a livelihood from the sea and the marine ecosystems that support them [11]. Privatization strategies have sometimes facilitated the allocation of common pool fishery resources to large corporate players that do not have local connections to the region or the environment [12] nor much capacity for public oversight [13]. Pinkerton and Edwards [14] argue that the privatization of fisheries can have negative economic impacts on many quota lessees. Butler [15] documented how the impacts of a move to a quota system in the British Columbia halibut fishery varied generationally, even amongst fishermen in the same family.

Many people who formerly accessed fishery resources via commons arrangements blame continuing stock declines on privatization and on a centralized, bureaucratic, top-down management that explicitly or implicitly supports privatization of common pool resources, an argument that links their plight to failures of democracy [16–18]. As a consequence, many scholars

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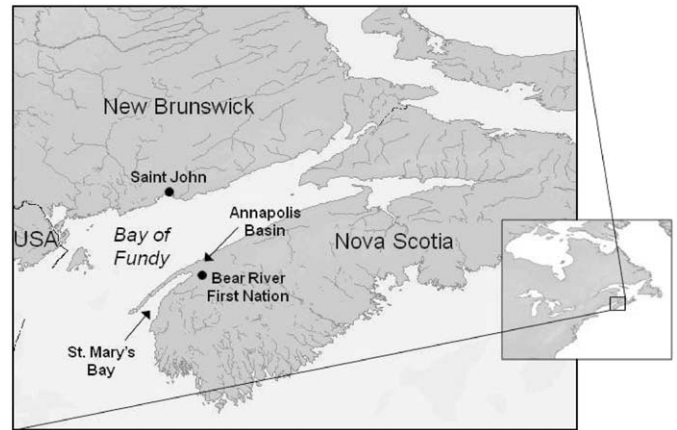
and fishers see community-based natural resource management (CBNRM) as a potential solution for crises involving inshore traditional fisheries [9,19,20,12,21,11,22]. This has led to experimentation with decentralization or devolution of management authority in some fisheries, usually through co-management or community-based management arrangements [21–24].

The recognition that fishers are but one stakeholder with claim to ocean resources has also led to increasing emphasis on integrated coastal management (ICM) [25–27]. Progress in implementing ICM has, however, been slow in Canada [28,21] and elsewhere [29,30]. The lack of progress is in part due to the challenges of implementing CBNRM within broader and complex ICM environments.

In this paper, we report on some of the findings of a five-year Community-University Research Alliance (hereafter 'Coastal CURA') that is examining CBNRM and ICM implementation in the Canadian Maritime provinces. The Coastal CURA ([www.coastalcura.ca](http://www.coastalcura.ca)) involves two universities, four First Nations, two fishermen's organizations, several community organizations from the Maritimes (New Brunswick, Nova Scotia and Prince Edward Island), and academic collaborators from across Canada. We highlight three particular ICM-related challenges with regards to CBNRM in the Canadian clam fishery. First, we examine the problem of bureaucratic 'silos' in clam fishery regulation, where four government agencies (three federal and one provincial) are directly involved in managing clam habitat, clam fishing, and clam processing. Lack of communication between agencies frustrates community organizations and erodes their trust in government decisions. Second, we examine the role of higher-level policy conflict, particularly with regard to public health and sanitation concerns in the clam fishery, and their use in the deflection of Aboriginal rights with regard to fishery access and managerial responsibilities in one location in Nova Scotia. Third, our major emphasis is on a process we refer to as 'stealth privatization' of the clam resource in Nova Scotia. Stealth privatization is encouraged by government and rooted both in the 'privatization paradigm' that key senior government regulators adhere to, and to operational-level incentives within the public service to avoid resource-intensive managerial responsibilities.

## 2. Methods

The case material for this paper is drawn from participatory research undertaken by the Coastal CURA team. A primary objective of the Coastal CURA is to explore institutional mechanisms that enhance ICM for sustainable development in the coastal Maritimes, a region of intense competition for space and marine resources, and to assist in developing capacity within coastal communities to participate in such institutions. Our research team has been critically examining the governance of several Maritimes fisheries, including groundfish, lobster, scallop, and clams. This has involved reviewing the mechanisms and processes by which power and decision-making are allocated among different actors [31] and exploring the impacts of subsequent management decisions on resource use, transformation, and community engagement. This paper focuses on a clam fishery in St. Mary's Bay and the Annapolis Basin, located on the southeastern shore of the Bay of Fundy in the province of Nova Scotia (Map 1). Coastal CURA team members (community members, community organizers, students, academics) attended many key community meetings on the clam fishery over the past three years and have analyzed the resulting transcripts (public consultations were taped with the permission of all those taking part).



Map 1. Map of the Bay of Fundy region in the Canadian Maritimes.

As the Coastal CURA team works closely with local communities and fishing organizations engaged in inshore fisheries, we have rich detail on the key challenges of CBNRM implementation within a recently-developed Canadian ICM framework. The clam case study became part of the Coastal CURA research on the advice of two Coastal CURA community partners, the Marine Resource Centre (a non-profit organization that assists Bay of Fundy coastal communities in marine resource research and planning) and Bear River First Nation, an Aboriginal community located in southern Nova Scotia. There are several longstanding issues in clam management in this region, including over-harvesting and periodic problems with marine and land-based pollution. Over the past several years, the Marine Resource Centre and other members of the Coastal CURA team have collaborated with clam harvesters on clam seeding experiments and habitat restoration, convened learning circles on clam management, catalogued and digitized the clam harvesting association records, and documented the history of clam leases and the impact of clam harvesting on local communities.

We find clam governance a particularly appropriate context to examine the relationship and tensions between CBNRM and ICM as it has been argued [32] that clams, as sedentary organisms, should provide the basis for predictable fisheries that lend themselves well to local management (a position consistent with transaction cost economics [33,34]). For comparative purposes, in 2008 we also spoke with clam fishermen, processors, and NGO staff (25 semi-structured interviews) on the coast of southwest New Brunswick (NB), from Saint John to the US border. For comparative purposes, we also drew on the experience of Coastal CURA researchers working on the Canadian Pacific coast clam fisheries.

## 3. Background

### 3.1. Integrated coastal management

In 1996 the Canadian federal government passed the *Oceans Act*, which endorsed ICM and empowered the Department of Fisheries and Oceans (DFO) to lead in the development of integrated management plans for Canada's oceans. The *Oceans Act* also recognized the importance of involving local communities in coastal and ocean management. Other guidelines followed (the *Oceans Strategy* in 2002 and the *Oceans Action Plan* in 2005) which promised to create institutional arrangements whereby those dependent on coastal resources would be involved in designing, implementing, and monitoring all coastal and ocean management plans (see [www.dfo-mpo.gc.ca/oceans/publications/](http://www.dfo-mpo.gc.ca/oceans/publications/)

[index-eng.htm#leg](#) for the *Ocean Act*, *Oceans Strategy*, and *Oceans Action Plan*). Provincial governments also passed acts containing language that endorses participatory governance approaches.

DFO has defined ICM as “a comprehensive way of planning and managing human activities so that they do not conflict with one another and so all factors are considered for the conservation and sustainable use of marine resources and shared use of ocean spaces” [56]. While this definition has the advantage of brevity, its focus on conflict resolution seems to lack some of the breadth and complexity reflected in Chapter 17 of the Rio Declaration and other common international definitions of integrated management [35,27,36]. Bastien-Daigle et al. [28] described ICM as “a continuous and dynamic process that unites government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources” (p. 97). Components that require ‘integration’ include political and legal jurisdictions, ecosystem parameters, conflicting uses, social, cultural and economic needs, and controls on anthropogenic impacts. McFadden [30] has pointed out that integrated management must also involve the integration of different knowledge systems, including different academic traditions. We would add that ICM should also integrate alternative management paradigms and different local ways of knowing about a space and its constituent components.

### 3.2. The St. Mary's Bay clam fishery

Intertidal shellfish harvesting has been a vital part of coastal livelihoods in Canada both before and after European settlement. In the Maritimes, there are many active intertidal fisheries. According to clam harvesters, harvesting soft shell (*Mya arenaria*) and quahog (*Mercenaria mercenaria*) clams has been important for both Aboriginal and non-Aboriginal coastal communities in several ways. The Bay of Fundy fishery contributes to household livelihoods and food security. It has sometimes served as the entry and exit fishery for men at the beginning and end of their fishing careers and is an important ‘backstop’ resource when other stocks decline. It is also a fishery in which women, children, and elders can participate. In more recent years, clam fisheries in several parts of Canada have served as a refuge resource when members of coastal communities lose access to fishing rights [32].

Clam fishing provides relatively modest financial returns for a low capital investment and physically demanding manual labour. Both market prices and clam yields have significant impacts on a harvester's livelihood; reductions in either can have serious financial and social impacts on the rural families and communities that depend on the clam fishery. While these intertidal fisheries were traditionally open access, requiring only that fishers obtain an annual license, there were a variety of social networks and norms at work. Most fishers were known to each other and had a long-standing history of interaction. In cases where new entrants moved into intertidal fisheries and did not abide by established norms of behaviour, violent conflicts occasionally erupted, as in the blood worm fishery in the early-2000s.

Given the way in which upland water quality issues affect shellfish quality, complex watershed issues are relevant to management of shellfish beds in the Bay of Fundy. The clamming grounds in the Annapolis Basin, for example, are impacted by freshwater inflow from six rivers in the Annapolis and Minas Basins. Contamination from sewage and agricultural runoff, nutrient enrichment, leeching from dumpsites, siltation from hydroelectric developments, and other environmental issues have resulted in generally poor to fair freshwater quality [37]. Poor

freshwater quality has impacted shellfish beds along the intertidal zone in the Bay of Fundy for decades [38]. Fifty years ago, the Annapolis Basin produced approximately 60% of the soft-shelled clam harvest in Nova Scotia but resource decline has substantially reduced this harvest. Poor upland water quality has also been implicated in toxic marine algae blooms (red tides) that can impact the safety of clams, potentially leading to Paralytic Shellfish Poisoning in humans that eat contaminated clam meat. It has been suggested that nutrient enrichment from agricultural runoff plays a role in the frequency and severity of blooms in adjacent marine waters [39].

Clam harvesters report that the two years between 2006 and 2008 were the worst on record for harvester incomes (< 33% of their normal income due to beach closures, lower harvests, and low prices). Many harvesters left the region to seek employment elsewhere (e.g., the Alberta oil industry) and those that remained were in a difficult financial situation. Given the impact of the recent (2008–09) international financial crisis on job opportunities for migrant workers and on seafood prices in the US market, the resilience of already vulnerable fishing families and rural fishing communities has deteriorated further. It was the urgency of this combination of factors that focused the attention of the Coastal CURA participants on the clam lease issue.

### 3.3. Clam fishery management

A complex mix of federal and provincial jurisdictions affect the management of coastal resources in Canada. Three primary federal government agencies—DFO, Environment Canada (EC), and the Canadian Food Inspection Agency (CFIA)—all share management responsibilities that directly impact the shellfish fishery. EC is the lead agency in water quality and classification of shellfish growing areas, while DFO is the lead agency in the controlled harvesting, transportation, and depuration of shellfish from classified areas. DFO is also responsible for enacting the opening and closing of shellfish growing areas and the enforcement of closure regulations. The CFIA is responsible for the handling, processing, marketing, import and export of shellfish. In addition, and particularly in the case of aquaculture, relevant provincial departments also hold some regulatory responsibilities.

Bacteriological (to measure fecal material) and shoreline surveys (to identify and quantify the level and dispersion of pollution) are used to classify coastal areas. The resulting classifications include: *approved* areas where minimum counts of contaminants are found, and where harvesting and direct marketing is allowed; *closed* areas where direct harvesting is prohibited due to chemical or bacteriological contamination; and *unclassified* areas where the sanitary suitability for harvesting is undetermined and therefore by default not approved for harvesting. Clams harvested from closed areas can be depurated by placing them in purified seawater for periods exceeding 24 h, during which time they purge themselves of harmful bacteria and viruses. The effectiveness of the depuration process is, however, influenced by a number of factors [40] so, as a precautionary measure, no shellfish can be harvested from grossly contaminated areas. Data from DFO shows that beach closures have increased dramatically over time throughout the Maritimes [41].

The quasi-governmental Atlantic Coastal Action Program (ACAP) organizations have an important non-regulatory role in the clam fisheries on both sides of the Bay of Fundy. The ACAP program was established by EC in 1991 to fund regional multi-stakeholder organizations to restore and support watersheds and adjacent coastal areas. The Clean Annapolis River Project and the Eastern Charlotte Waterways have both worked with clam harvester associations. With the help of these two ACAPs, clam

harvesters have experimented with habitat restoration and stock enhancement and developing harvest management protocols and strategies for their memberships. Representatives from Bear River First Nation, clam harvester organizations, clam processors, and all levels of government also sit on the Annapolis Watershed Resource Committee, a multi-stakeholder management board that focuses on Annapolis Basin marine resource issues.

The open access nature of the clam harvest began to change in the 1990s. For example, the Nova Scotia Department of Fisheries and Aquaculture (DFA) in 1997 issued a clam aquaculture lease to Innovative Fishery Products Inc. (IFP) for 1,627 hectares of intertidal beaches in the St. Mary's Bay area. A number of clam harvesters approached the Marine Resource Centre in 2007 when they learned that these annual leases were to be renewed for a ten year period. They hoped for assistance in preparing for the process of public consultation that they assumed would be part of the lease renewal, as privatizing the clam beach had significantly impacted their access to clams and incomes [42]. According to the provincial government, aquaculture leases should only be granted after public notice and public input in the licensing process, usually through the Regional Aquaculture Development Advisory Committee (RADAC—[www.gov.ns.ca/fish/aquaculture/radac/](http://www.gov.ns.ca/fish/aquaculture/radac/)).

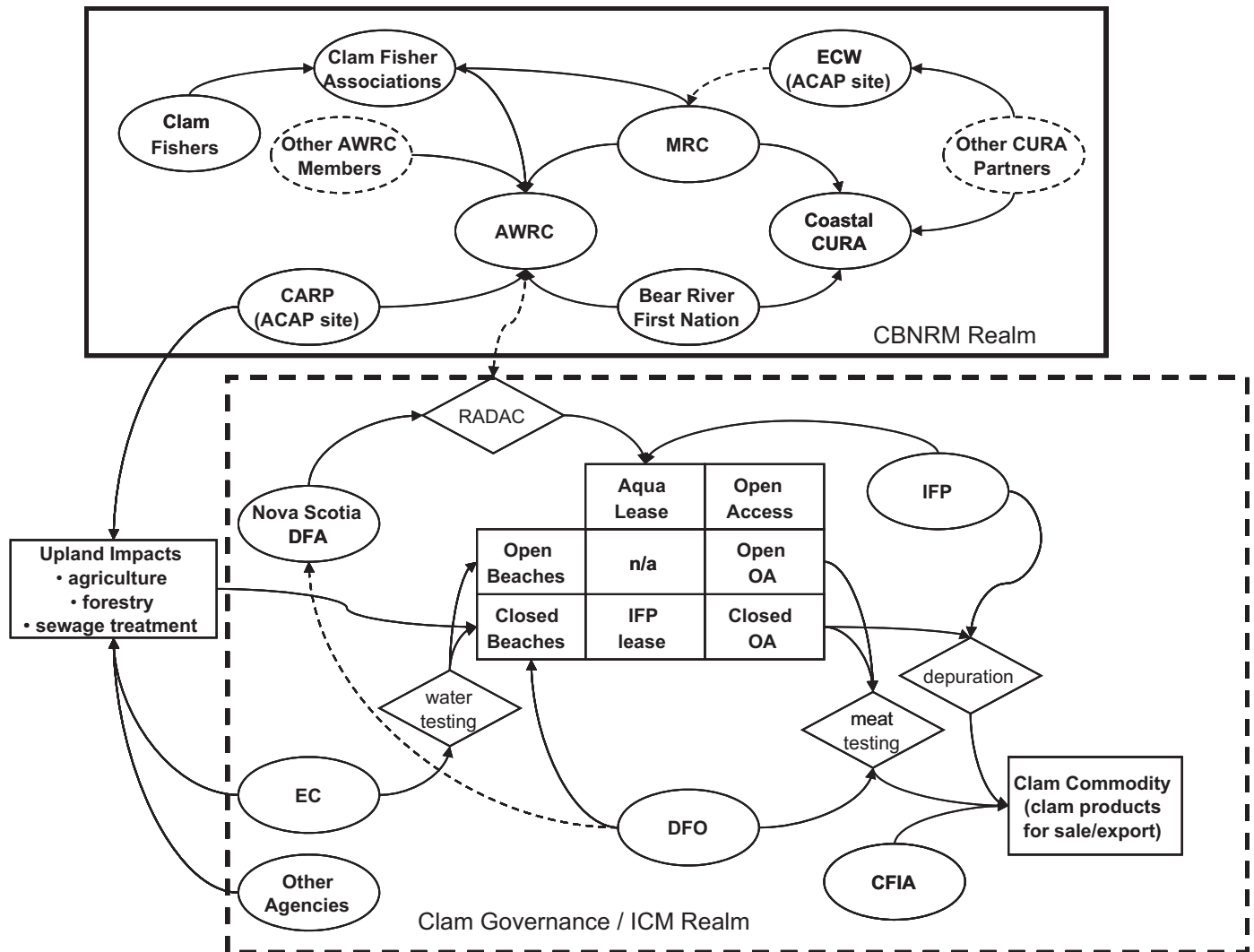
This process was not followed either for the original lease or for the renewal. Fig. 1 provides a schematic of the key actors, important production and governance processes, and the pertinent relationships within and beyond the fishery.

#### 4. ICM implementation challenges

In this section we use the above clam fishery to illustrate three implementation challenges that affect the viability of CBNRM and the implementation of ICM, including (1) bureaucratic silos, (2) policy conflicts, and (3) stealth privatization.

##### 4.1. Bureaucratic silos

In an organizational context, the term 'silo' refers to the lack of horizontal, integrative government services across different departments, branches, and divisions. Bureaucratic organization ideally enables the clear assignment of roles and responsibilities in specific policy areas. However, when individual agencies (or branches within agencies) have overlapping responsibilities, and mechanisms to coordinate or communicate are not effective,



**Fig. 1.** Schematic of the major processes, actors, and linkages in the St. Mary's Bay clam fishery. Notes: ECW—Eastern Charlotte Waterways (NB); AWRC—Annapolis Watershed Resource Committee (NS); MRC—Marine Resource Centre (NS); CARP—Clean Annapolis River Project (NS); ACAP (Atlantic Coastal Action Program); CURA—Community-University Research Alliance; RADAC—Regional Aquaculture Development Advisory Committee; IFP—Innovative Fishery Products Inc. (NS); DFA—Department of Fisheries and Agriculture; EC—Environment Canada; DFO—Department Fisheries and Oceans; CFIA—Canadian Food Inspection Agency.

bureaucratic silos become a management problem. DFO has substantial internal policy conflicts because one branch (Fisheries and Aquaculture Management) has a mandate to both support and regulate aquaculture and commercial fisheries (under the *Fisheries Act*) and another (Oceans) has a mandate to support conservation (under the *Oceans Act*). Shellfish management is further hampered by the lack of effective coordination of management efforts and jurisdiction over watersheds and adjacent coastal zones. Correspondence from the archives of clam harvester associations in the Bay of Fundy area illustrate how harvesters on both sides of the Bay have lobbied government for decades to provide help in addressing upland pollution sources and habitat destruction, and marine clam stock declines.

From a community perspective, bureaucratic silos present challenges for consultation, community engagement, governance legitimacy, and, ultimately, environmental sustainability. Community members with complaints or questions are often shuffled from one government office to another, particularly when both federal and provincial agencies are involved. Often the bureaucrats they interact with give mixed or conflicting messages about who is responsible for what.

For example, when it became apparent in 2007 that no public or First Nation consultation process was planned in advance of the St. Mary's Bay lease renewal, Marine Resource Centre staff and the Bear River First Nation contacted local municipality, provincial officials, and DFO regulators. The Marine Resource Centre then organized several public meetings for community members, inviting federal and provincial regulators to respond to local concerns. As the provincial site approval process was not followed in the original St. Mary's Bay leases, many questions were raised when the lease was to be extended. Why was the federal agency responsible for fish habitat not protecting clam stocks in St. Mary's Bay? Why did they allow the province to grant an aquaculture license for the harvesting of natural clam stocks? Who was collecting data on the impact of these operations? How could the lease be extended without evidence of either sustainable management of wild stocks, or seeding/enhancement?

The provincial and federal bureaucrats who attended the community meetings did little to satisfy local concerns. For example, they argued that there was no need for a public consultation process on the lease renewals, since annual leases had been granted in the area for a long time; extending the lease period was just 'a paper transaction'. This implied that in 1997, the original leases had, contrary to community perceptions, been properly granted by officials currently not present to speak for themselves. When asked about the exclusion of local harvesters from the resource, bureaucrats responded that digging on a closed beach had always required harvesters to sell to the depuration plant owner, and that clam harvesters remained free to sell clams sourced from open beaches to the highest bidder. When harvesters pointed out that IFP hiring practices had made that impossible, the response from the DFO area manager was that his department had no mandate to control hiring, or the conditions of employment.

While the DFO refused to get involved in labour issues, it had intervened in the marketplace by limiting competition in the shellfish processing sector. DFO officials explained that they had granted IFP first right of refusal to all clams from closed beaches in order to provide some supply stability for the expensive depuration plant that IFP had developed for the area. While arguments for monopoly powers are sometimes justifiable for strategic 'nursery industries' or public good provision, a processing facility for a regional clam fishery did not seem justified as critical public infrastructure. But when challenged to compare this investment with those in other sectors, the DFO official deferred, citing IFP's right to corporate privacy.

#### 4.2. Policy conflict

Deeply rooted policy inconsistencies are also an impediment to effective ICM. They have their source in different mandates, in constitutional uncertainty, and in lack of policy coordination between governments and agencies. From the community perspective, policy conflict leads to 'catch-22' situations, disillusionment, and disengagement from the stakeholder process.

For example, First Nations in the Maritimes have never signed treaties that extinguished their aboriginal title. Further, the 1999 Marshall Supreme Court Decision reinforced their constitutionally recognized right to marine resources not only for food and ceremonial purposes, but also for purposes of trade (commercial fishing). Given these and other circumstances, Isaacs [43] argues that any attempt to infringe on First Nation rights must be justified with "compelling and substantive public objectives" and, further, that DFO has generally failed to outline objectives that would justify infringement. Representatives of Bear River First Nation had several times contacted federal and provincial regulators to protest the IFP lease and depuration monopoly, arguing that the monopoly acted both as an infringement on their historic access rights and on the right to consultation.

When Bear River First Nation asked the provincial regulator to justify the extension of the aquaculture lease, they were told that it was in support of public health. But Bear River First Nation was not asking to harvest and sell clams without depuration; the question was who would undertake the depuration and who would manage clam stocks. The provincial government argued that aboriginal access to the resource was already infringed as a result of federally-mandated beach closures and, therefore, the leases had no additional impact on aboriginal access. As representatives of the Bear River First Nation pointed out, the private lease and first right of refusal granted to IFP precluded the possibility of an Aboriginal-owned depuration plant and clam harvesting enterprise. More importantly, it precludes First Nation involvement in management approaches that would be compatible with Aboriginal values, traditions, and experience such as improving water quality, habitat restoration, and stock enhancement. Are there 'substantive public purposes' that support infringement on aboriginal access rights in St. Mary's Bay? It appears not but resolving the issue definitively through litigation against multiple government agencies would be a daunting and prohibitively expensive process for a single First Nation.

#### 4.3. Stealth privatization

We characterize the case of the aquaculture lease in St. Mary's Bay as 'stealth privatization' for two reasons. First, when the provincial minister grants an aquaculture lease, the lease is subject to conditions and production performance clauses that have not been met. Over the course of the first 10 years of the lease, there is no evidence of substantive efforts to engage in aquaculture and despite a clause in the lease to the contrary, the public has often been excluded from the leased beaches. Second, by allowing the *de facto* monopolization of clam processing by a single depuration plant owned by IFP, governments also effectively ceded control of clam production from non-leased clam beaches on the NS side of the Bay of Fundy to IFP.

##### 4.3.1. Aquaculture lease conditions and performance

Is bottom culture aquaculture a legitimate option for clam management? The current Canadian fisheries policy makes three claims for privatization of this type: (1) private owners will better protect the resource for which they have an exclusive benefit

stream [7]; (2) resource stocks can be controlled and optimized through human intervention [44]; and (3) the corporate sector is the best option for holding resource rights and for serving as partners in sustainable management, a view advocated by senior DFO managers in various publications [8]. All three claims have been challenged [45,14,13,46] and protested by fishermen and local residents. DFO has promoted aquaculture as more productive than wild clam management but studies have suggested that improved productivity is influenced by a number of factors difficult to control for, including water temperature, adverse currents, winter mortality rates and the predator profile of the beach [47]. Members of local communities often do not view property rights arising from such devolution as legitimate [48]; on the west coast of Canada, poaching on leased clam beaches with low public legitimacy has been a major problem [49].

Under British common law, tidal and submerged lands have long been considered *public land*, in the sense of “independent of and indeed superior to the claims of any purported government manager” [50]. They were “public by their very nature”, which Rose [50] goes on to characterize as vital to navigation, fishing, commerce and recreation. While the crown claims title to lands below the high tide line in Canada except in cases of evidence to the contrary, these lands have traditionally been open for public uses, including fishing and shellfish gathering. Beaton [51] discusses the complexities of property rights in Nova Scotia beaches. Community struggles over changes in property right regimes have also been documented in Canada [52] and New Zealand beaches [53].

We obtained copies of annual renewals for lease #8356 (dated 23 February 2000) and lease #1228 (dated 13 February 2001). Both are between the province of Nova Scotia and IFP, and both define conditions of the lease in the following way: “an aquaculture project...for the bottom cultivation of quahogs only”; “non-exclusive...and does not give the lessee the right to exclude the general public from the leased area except for the harvesting of shellfish”; “the lessee is hereby prohibited from restricting recreational activities on the lease”; and “the lessee shall submit a plan of operation once a year.” While the IFP lease is for quahog aquaculture, the published result of joint research undertaken by IFP and DFO only “describes the commercial harvest and age structure of the northern quahog population from St. Mary’s Bay and provides estimates of total mortality and exploitation rates for the lease area” [54]. There was a steady increase in extraction rates for the period 1999–2001 and no evidence after 12 years that any stocking or active beach management typically associated with ‘aquaculture’ has taken place.

The government view that the corporate sector may be the most effective partner for fisheries management may be explained on the basis of efficiency and cost-minimization. Wyman [55] has suggested that such considerations were at work in calculating the relative merits of quota systems in Canadian fisheries. One reason given by government officials in the public meetings for extending the St. Mary’s Bay lease was governance efficiency. The alternative to corporate property rights would have been the costly regulation of a large number of individual harvesters lacking the financial and logistical capacity for water quality testing needed to keep the area open to harvesting and for processing. The option of a clam harvesting, management, and processing cooperative was not explored even though cooperatives have been developed in other areas (including across the Bay of Fundy in NB, where Eastern Charlotte Waterways helped develop a water monitoring cooperative).

#### 4.3.2. Monopoly powers in the clam industry

Clam harvesters’ incomes are already under threat from a number of directions. Most clam harvesters need access to both

open and closed beaches in order to earn an adequate income. To dig in closed areas, however, clam harvesters must work for or sell to a licensed depuration plant: this is the issue at the core of stealth privatization. St. Mary’s Bay closed beaches contain the only commercially viable quahog clam stocks on the Nova Scotia side of the Bay of Fundy. When first right of refusal to depurate clams from closed beaches was granted to IFP, clam production from closed beaches effectively fell under their exclusive control and conditions changed for the worse for local clam harvesters. As one clam harvester put it “you are essentially forcing me to become an employee of this one private company”.

In addition to controlling harvests on closed beaches, IFP has been able to dictate production and sales terms for independent clam harvesters working on open beaches, where depuration of clams is not required. Soft shell clams are found deeper under the surface of the sand and are more difficult to dig than are quahog. Harvesters were required to harvest soft shell clams from open beaches and to sell them to IFP in order to get access to closed beaches; that is, product from closed beaches needing depuration would not be accepted from harvesters who refused to also supply clams from open beaches.

Clam harvesters feel that it is in their own best interests to promote rehabilitation of closed beaches and to address pollution issues that may close beaches in the future. They argue, however, that the current system does not create incentives for habitat protection and renewal. If water quality is improved so that local beaches are classified as open, the government will cancel the IFP lease (which is limited to closed beaches). In addition, clam harvesters believe that IFP, by forcing them to harvest specified volumes of clams from open beaches, may deplete the few remaining open beaches, thereby ensuring their ongoing monopoly power in the marketplace.

## 5. Discussion

We identified three key issues that hamper effective CBNRM under the current ICM regime in St. Mary’s Bay: the lack of communication and coordination—the silos—between and within government agencies; higher-level policy conflicts; and ‘stealth privatization’.

Silos represent a significant barrier to local level integrated management initiatives. At the operational level, there has been limited coordination between government agencies responsible for upland pollution control, beach monitoring, beach closures, water quality monitoring, and meat testing. As Pinkerton and John [32] note, ensuring that beaches are only closed when accurate and adequate data is gathered contributes to the legitimacy of a regulator. Conversely, the inability of government agencies to fulfill their duties reduces the legitimacy of externally imposed rules, potentially leading to deteriorating rule compliance in fisheries.

It was hoped that the Annapolis Watershed Resource Committee, as the key organization bringing diverse community interests and perspectives to the management process, could help overcome operational-level communication problems between government agencies and community organizations. The Committee should have been the key link between community and resource governance, between local and broader ICM processes (recall Fig. 1). But decisions regarding lease issuance and renewal were taken without meaningful government engagement with local stakeholders. As a result, community members lost confidence in the Watershed Resource Committee. As Butler [15] highlights, increased involvement of fishermen in the CBNRM process provides the opportunity for direct engagement with (and critique of) management structures and biological models but also

increases stakeholders' potential disappointment with the governance system.

In their survey of civil servants and quasi-government ACAP staff, Bastien-Daigle et al. [28] identified a number of practical problems with ICM implementation in the Maritimes, some of which were: government were more focused on conflict resolution than stakeholders, who were more focused on ecological outcomes; trust was low amongst many stakeholders and stakeholder capacity lacking in some cases; government retained control over problem identification, prioritization of issues and funding allocations; Aboriginal participation in ICM had been lacking; and the enabling regulatory framework for ICM was lacking.

In September 2008, the Coastal CURA community partners participated in a workshop that sought community input on ICM goals and indicators. In the exercise, community members identified 44 goals and indicators that they felt were important. Contrary to the findings of Bastien-Daigle et al. [28], ecological concerns figured in only nine of the goals and indicators (clean clams, improved water quality). Social and economic indicators received the greatest attention (alleviation of poverty, youth retention in rural communities, new markets, more jobs), followed by process indicators (enabling legislation, collective regional planning, government showing community more respect, increased access to information), and finally by equity indicators (increased numbers of small boats back on the water, priority of local food). Our research suggests that communities are very concerned and frustrated with top-down solutions that do not align with their own priorities. Unfortunately, in the Canadian context, neither side seems to be speaking the same language when it comes to ICM, sustainability, and CBNRM. Despite the 1996 *Oceans Act*, the 2002 *Oceans Strategy*, and the 2005 *Oceans Action Plan*, CBNRM appears to mean one thing to governments and quite another to communities.

The community views what they regard as government complicity in the stealth privatization of clam beaches in NS with dismay. Recently, representatives of DFO have argued that co-management or CBNRM is incompatible with the legislative authority required of the Minister. It seems a contradiction, however, to then allocate so much management authority to private corporate actors. This corporate-oriented privatization approach is particularly unpalatable to local residents who rely on coastal and ocean resources and who feel that government policy is incrementally depriving their communities of access to vital resources. A widespread impression is that governments, in an effort to reduce their internal costs, are relying on industry partners who need minimal government engagement. This appears to be a case of false economy. The lack of legitimacy of the regime is almost certain to prove expensive in the long-term, both in economic terms [34] and social terms as rural community resilience is eroded. In our Saint Mary's Bay case study, the secure property rights that had been predicted to create incentives for investment seem to have done the opposite. While it might initially seem that clams are a species ideally suited to privatized corporate management, upon closer scrutiny, privatization is not a good fit with any of the following: the nature of the resource, the nature of the rural culture, the incentives shaping the behaviour of industry and community stakeholders, or the institutions governing intertidal fisheries [32].

Is there an alternative approach? Comparative experiences from the clam industry on the New Brunswick side of the Bay of Fundy and from the west coast of Vancouver Island illuminate other options. Each of the three shellfish management systems with which Coastal CURA members are involved (Saint Mary's Bay, Southwest New Brunswick, and Vancouver Island) resolved their issues in different ways. For example, in the SWNB case,

clam harvesters worked closely with Eastern Charlotte Waterways to form a cooperative and secure a certified laboratory to test water samples in order to establish whether beaches should be open or closed. It received federal certification to do water quality testing, thus keeping areas open for harvesting which would otherwise have been closed (recall that untested beaches are automatically considered closed for harvest). Clam harvesters in SWNB pay a small fee to a clam cooperative to facilitate the cost of this regular testing and the response time on beach closures and openings is significantly shorter than with government testing in Nova Scotia. This cooperative is not a marketing organization, but rather a mechanism for funding the timely water and meat testing necessary to ensure that the harvested clams are safe for human consumption.

Comparing the St. Mary's Bay case study with shellfish management on the west coast of Vancouver Island [32] highlights the issue of Aboriginal engagement and management. On Vancouver Island, one First Nation managed a wild clam fishery under a communal license awarded by DFO. In this communal license, the moral legitimacy of the management regime was enhanced by devolution of management functions to First Nations, who implemented Aboriginal values of egalitarian allocation and transparent democratic process. The fisheries authority in the community successfully: (a) allocated harvesting opportunity on a rotating basis to diggers; (b) conducted stock assessments and set a sustainable and stable harvest rate; (c) opened and closed the fishery, monitored and enforced its own harvest regulations; (d) monitored product quality and an orderly sale to the depurator; and (e) educated diggers about keeping the beaches clean and not disrupting the ecology of the beach. In BC, a Contaminated Shellfish Harvesting License on beaches fronting First Nations land requires a partnership with a depurator as a condition of licensing. As a result, an Aboriginal community has managed wild clam beaches successfully in partnership with a depurator, simultaneously assuring the processor a steady supply of clams and secured access to clam beaches (i.e. without the granting of a monopoly in the depuration and processing sector). This suggests that depurators do not require monopoly power to successfully operate a processing business.

In conclusion, our participatory research suggests that communities cannot engage in successful CBNRM within a complex ICM regime if government agencies do not have the willingness and capacity to help build an enabling environment for community resource users. Rather than increasing dialogue amongst stakeholders, conserving ecological resources, reducing conflict over the use of those increasingly scarce resources, and building sustainable coastal communities and fishery enterprises, the current governance system in our case study is instead increasing conflict over local resources, creating incentives for unsustainable behaviour, and decreasing the resilience of both coastal communities and the biological resources on which they depend. Given Canada's relatively high institutional capacity, we are compelled to wonder how communities can successfully engage in CBNRM initiatives within broader ICM regimes, especially in regions with less progressive legislation.

The New Brunswick and British Columbia cases suggest that there are ways to overcome the coordination and legitimacy issues created by bureaucratic silos in politically complex fisheries. They also suggest that there are real alternatives to privatization, in terms of engagement with stakeholders, alternative property right regimes (see [23] for more details on community quotas) and better mechanisms to achieve a sustainable, resilient fishery. Addressing these challenges will take concerted on-the-ground effort and, in particular, changes in the core values of senior decision-makers within regulatory agencies. CBNRM is, we believe, a necessary, but not sufficient, condition for

successfully integrating community concerns and local management initiatives within broader integrated management frameworks. Without capable and forward-looking government agencies truly engaging communities, natural resource conservation and the resilience of both ecological and social systems will be compromised. While ongoing investment in community-level capacity is certainly needed for successful CBNRM, our experience in Canada suggests that new thinking is required about how to shape and moderate the 'privatization paradigm' so prevalent within senior levels of government agencies. Ironically, awareness and capacity building amongst senior decision-makers may be amongst the most critical investments needed to ensure on-the-ground environmental and social sustainability at the community level.

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