

Understanding Small-Scale Fisheries in Canada

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Abstract

Understanding Canadian small-scale fisheries requires knowledge-building, through formal research as well as the lived experiences of fishers and fishing communities. This chapter assesses how processes of knowledge-building, as well as the state of knowledge overall, have evolved over time, and how new perspectives have emerged. The evolution is tracked beginning with a baseline at the time of a novel 1989 international conference on small-scale fisheries globally, and then moving on to the present day. The chapter explores the nature of research and other knowledge-building on small-scale fisheries, in a Canadian setting, including the diverse sources of knowledge, the level of multidisciplinary, and the various identified knowledge needs across fishery systems and fishery management. It is shown that some knowledge gaps identified decades ago are still present today, while other gaps have been at least partially filled, and further, studies in newer areas have blossomed. Perhaps most importantly, there is wider acknowledgement of the identity and importance of small-scale fisheries in Canada – a reality that bodes well for the future, even as the benefits of stronger recognition in government policy are apparent. Looking back at history leads us to an updated knowledge-building agenda for small-scale fisheries in Canada – a crucial step in the face of new legal,

institutional, economic and conservation challenges.

Introduction

Understanding Canadian small-scale fisheries requires research, and other forms of knowledge-building. This chapter seeks to assess the evolution of that understanding, through a personal journey over the decades. Back in 1989, a novel international conference (Durand et al. 1991) was held on research and knowledge-creation in small-scale fisheries globally. While small-scale fisheries had been considered, in some manner, in many previous occasions – e.g., a major meeting of the UN Food and Agriculture Organization in 1984 (FAO 1984) – this was something unique, with its focus specifically on research and knowledge in, and for, small-scale fisheries. The conference brought together perspectives from all regions of the world, as exemplified in the set of plenary presentations. I provided one of those plenary talks, on the North American region, which led to an accompanying article on “Small-Scale Fisheries in North America: Research Perspectives” (Charles 1991: hereafter referred to as the “review”). This chapter draws on that review to assess what has evolved, and in what ways, since that time. The focus here is on highlighting certain key themes, rather than an exhaustive examination, reflecting the reality that the original review was limited only to research on small-scale fisheries in Canada and the United States, and largely on commercial fisheries, with limited coverage of non-commercial Indigenous fisheries, subsistence and recreational fisheries, as well as other forms of knowledge besides conventional research approaches.

Some notes on the content: (a) Many quotations from the original review (i.e., Charles, 1991) are used, and indeed, all quotations are from that source unless explicitly attributed elsewhere. (b) The references provided are a mix of those from the original review (within quotations) and a selection of more recent ones, with a general approach of limiting the latter to one or two examples on each topic covered, with apologies for this limited coverage. (c) Concerning vocabulary, the term ‘fisher’ is used for present-day wording, but the original term ‘fishermen’ has been kept when quoting the original review,

and on the other hand, all language is updated to use the term ‘Indigenous’ throughout.



The nature of small-scale fisheries in Canada

Until recently, the term ‘small-scale fisheries’ was not widely used in Canadian fishery discussions. Indeed, the review noted 30 years ago that “*use of the term ... is almost absent from the everyday fisheries language of North America*”. This point remained true decades later, within the negotiations over the Small-Scale Fisheries Guidelines (FAO 2015). Canadians supporting the approval of the Guidelines were conscious that the Canadian government may have seen small-scale fisheries as only existing outside the country, perhaps only in developing countries (of the global South). If pushed on the subject, the government may have conceded that some Indigenous fishing was ‘small-scale’, and that there may be cases of subsistence fishing, but certainly, it is fair to say that the term ‘small-scale fisheries’ was rarely used in Canada. For example, in the case of governmental fishery staff, as suggested in the review: “*essentially no one in the North American fisheries bureaucracy refers*

to 'their' fisheries in this way. Instead, reference is to 'inshore' fisheries, or 'small-boat' fisheries, or [Indigenous] fisheries; these are the possible candidates for North American small-scale fisheries."

In particular, in the 1980s and 1990s, the terms 'inshore' and 'offshore' were prominent in discussing the fisheries of Atlantic Canada:

"... we speak of a dichotomy between 'inshore' and 'offshore' fisheries, based on the distance from shore at which fishing takes place - the inshore fishery clearly involves smaller boats, more labour intensive operations, and more connections with coastal communities than does the offshore, and hence it is perhaps reasonable to speak of this as a 'small-scale' fishery."

The review further elaborates on the nature of 'small-scale' fisheries in Canada, namely a tendency for those fisheries to be:

"(i) located in geographical regions which lie outside the mainstream social and economic centres, and/or (ii) involving participation principally by fishermen belonging to groups in society (e.g., [Indigenous] peoples) that have been traditionally excluded from the centres of economic and political power."

This said, 'inshore' fisheries in Canada are diverse, ranging from those (including many Indigenous fisheries) focused on food for subsistence, and on cultural aspects, to inshore commercial fisheries in many parts of Canada that are heavily capitalized and that take a 'business' perspective.

Knowledge-building approaches: participation, multidisciplinary and inclusion

The review, from thirty years ago, focused explicitly on research about small-scale fisheries, highlighting two desirable aspects that were, back then, largely under-developed: participatory research and multi-disciplinary research. These are discussed here, along with another aspect not covered in the review, but which has become an essential ingredient today – the recognition and incorporation of multiple knowledge sources in fisheries.

Participation. The promotion and practice of broader participation in fishery research was noted in the review as something of a rarity at the time:

“The concept of participatory research - in which fishermen and others in the fishery sector are involved in determining research priorities and in carrying out the work - is certainly not well-established in North America. While fishermen’s organizations often express the desire to participate, it is rare to achieve such involvement.” That said, *“A limited amount of research activity is carried out by participants in the fisheries of North America; this is largely done by large processing companies and by fishermen unions, and is most often accomplished through contracts with consultants or academics.”*

Today, broader participation is surely a much-supported characteristic of small-scale fisheries knowledge-building, including research per se, one which has expanded greatly and is now a fundamental ingredient also in modern fisheries governance, especially for small-scale fisheries (McConney & Charles 2009; Léopold et al. 2019). Furthermore, while the idea of ‘participatory research’ may simply be straightforward involvement of fishers in governmental science activities, there are also approaches involving ‘action research’ (Leopold et al. 2019) that can play a major role in ‘enhancing community empowerment’ (Wiber et al. 2009) – this can also take the form of ‘community science’ controlled and led by the coastal community (Charles et al. 2020). While there are many routes to greater participation in small-scale fishery knowledge-building, there are calls for greater implementation of practical participatory approaches, as discussed below.

Multidisciplinarity. While participatory knowledge-building (and research) has expanded greatly from the low baseline at the start of the 1990s, it is not clear whether multi-disciplinary (or inter-disciplinary or transdisciplinary) research – though certainly widely advocated – has expanded as straightforwardly. Consider that the 1991 review stated that “*serious ecological, economic and social problems remain*” in the fisheries, suggesting that while this “*is undoubtedly due in part to failures at the political and institutional levels*”, it is possible that “*something has been lacking in the research itself*”. The review went on to state that:

“...there may well be an argument that all the discipline-based research output over the years has barely touched on the complex problems of a multi-faceted fishery... somehow all the small details of the system are never added together to make a whole.”

It is remarkable that many publications have emerged in recent years making the same point and advocating similar multi-disciplinary knowledge-building approaches (e.g., Stephenson et al. 2018). These recent articles also make the same point about the particular need for social sciences as did the 1991 review: “*Since there is already an abundance of natural science research in fisheries, the push for multidisciplinary tends to involve the incorporation of social science research into fishery studies and policy formulation...*”. Indeed, calls for more attention to social sciences in fisheries go back much further in time – notably, in a Canadian context, see Andersen (1978).

Knowledge inclusion. The 1989 conference was based around ‘research’. If it were being organized today, the focus might have been instead on ‘knowledge’ – reflecting the expanded recognition that building a strong understanding of fisheries does not come solely from formal ‘research’ activity, but rather from a diverse range of knowledge sources. In particular, knowledge-building comes not just from a Western science perspective, but from recognizing and supporting multiple forms of knowledge. In Canada, that especially calls for appreciating the role of Indigenous Knowledge, and the Traditional Ecological Knowledge held by Indigenous peoples (Menziez 2006; Berkes 2018), as well as fisher knowledge and coastal community knowledge (e.g., Haggan et al. 2007; Charles et al. 2020). While these aspects

are now regularly advocated, and to some extent considered, in fishery science and management, there are also regular calls for more comprehensive efforts to integrate knowledge sources, as noted below.

Barriers to participatory, multidisciplinary and inclusive knowledge-building. While undeniably there has been progress over the years in developing and implementing participatory and multidisciplinary knowledge-building, and in appreciating the diverse range of knowledge sources, much remains to be done. Why is this, given that the need for participation, multidisciplinary and inclusiveness in fishery knowledge-building is so widely recognized? A key challenge seems to lie in institutional barriers.

Consider, for example, barriers to multidisciplinary in small-scale fishery knowledge-building. Some of these, focusing on research, were identified in the review, back at the start of the 1990s:

- *“most researchers are trained principally in one discipline*
- *young researchers, who may be more likely to have a multidisciplinary training, might well have difficulty in being hired, into, or accepted within, the discipline-based environment of a university or government laboratory*
- *if a researcher wishes to pursue multidisciplinary work, the number of suitable journals in which to publish the results is rather limited (although this situation is slowly changing)*
- *multidisciplinary research, while undoubtedly challenging, may not be at the forefront of any one discipline, so that the researcher risks falling behind in their “home” field*
- *most fishery research bureaucracies either focus entirely on research in the natural sciences, or tend to separate researchers according to their discipline*
- *if an interdisciplinary research team is assembled, either in a university or in government, the work may be hampered by language difficulties, until researchers learn to communicate without the comfort of their own discipline’s jargon, and*
- *perhaps most fundamentally, the vast majority of fishery researchers seem happiest and most comfortable within their own discipline.”*

It appears that while some of these barriers are less present today (e.g., many more fishery researchers are now comfortable with multi-disciplinary and team research, and strong multi-disciplinary journals are now available), other barriers have endured to the present day (e.g., concerning the overly-narrow nature of fishery research and training institutions, and the status of multidisciplinary research within individual disciplines). Perhaps the enduring barriers provide an explanation why advocacy of multi-disciplinary / inter-disciplinary / transdisciplinary knowledge-building is still present today (e.g., Stephenson et al., 2018, 2019) as it was in the 1990s.

Barriers to participation in knowledge-building, and to inclusive use of multiple knowledge sources, may be examined similarly. Indeed, the above discussion of barriers to multidisciplinary applies as well to the links across disciplines through interdisciplinarity, and the transcending of disciplines through transdisciplinarity, and in turn, the very nature of transdisciplinary knowledge-building typically is based on participation and engagement by fishers and other 'stakeholders.' Other barriers arise, however, limiting participation and the incorporation of fisher, Indigenous, community and traditional knowledge.

Participation may be limited due both to the limited time, resources and capacity of fishers and their organizations (e.g., very concrete issues such as the possible loss of fishing time if a fisher participates in a research activity) and the limitations of governments in facilitating participation (Puley and Charles 2022). Inclusion of knowledge sources faces barriers of many forms, some of which are similar to those for multidisciplinary posed decades ago, while others relate to the specific technical, cultural and moral challenges involved in integration of knowledge sources. This can range from technical difficulties in linking fishery science models with traditional or fisher knowledge, to moral issues of ownership and control of knowledge, arising notably with Indigenous knowledge, but also with fisher knowledge about matters such as key fishing locations. There are no 'easy' resolutions to these barriers, but the widespread desire to move forward on participatory, multidisciplinary and inclusive knowledge-building bodes well for continuing progress on this.

Knowledge needs in Canadian small-scale fisheries

The 1991 review identifies several under-studied areas in which more knowledge-building is needed on small-scale fisheries, as well as some areas emerging at the time as significant topics. This section examines a range of such topics, as well as some (notably the last two in this list) that have more recently become major areas of study.

Fishery objectives. *“One of the most amazing features of the North American fisheries literature is the lack of discussion of fishery objectives. What is the purpose of the fishery? This question is rarely asked, particularly in academic research. ... Yet there are in fact a wide variety of fishery objectives...”* While the 1991 review identifies some pre-1990 publications that examine fishery objectives, certainly the academic assessment of this topic has expanded since that time, within Canada (e.g., see Stephenson et al. 2019) and for small-scale fisheries internationally (e.g., Weeratunge et al. 2014). The bigger challenge lies in whether the breadth of fishery objectives is actually incorporated into fisheries management. There is a sense of a new trend in this direction, though it is too soon to say how much it will be institutionalized in practice.

Fishery systems. *“The fishery production system involves the fish stock, the fishermen and the processing sector, as well as marketing and distribution activities. While analysis in all disciplines has focussed on the primary harvesting sector (fish dynamics, fleet economics, social interactions amongst fishermen, etc.), linkages amongst the various components of the fishery system need more attention.”* The study of fishery systems has expanded greatly since the early 1990s, such that we now have a much better grasp of the systems nature of fisheries (e.g., Charles 2001, Garcia & Charles 2008) and the need for systems-based monitoring of small-scale fisheries (e.g., Boyd & Charles 2006).

Processing sector. *“Land-based aspects of small-scale fisheries have received much less attention than those taking place at sea. However, some economic and social studies are available dealing with the processing sector ... For example, on-shore aspects of the British Columbia fishery are discussed by Pinkerton (1987a) and Guppy (1987), who focus on fishing-dependent communities and the processing sector, respectively. Vagneux (1984) considers the productivity and working*

conditions of processing plant workers in Quebec and elsewhere in Atlantic Canada.” This assessment in the review, pointing to a relative lack of studies involving processing (and other post-harvest) aspects of small-scale fisheries in Canada, seems to remain valid today. However, there may be a certain trend to more attention devoted to post-harvest components, with a growing focus on ideas of the ‘value chain,’ as emphasized in the global Small-Scale Fisheries Guidelines (FAO 2015), and of fisheries as ‘food systems’ (e.g., Lowitt et al 2020).

The role of women. The review noted that women in fisheries was a very under-studied topic, although some important work had been done. For example: “*The position of women in small-scale fishing communities, and particularly their work in fish processing plants [is assessed by] Lamson (1986) [who] looks at women in Atlantic Canadian fish plants, while Connelly and MacDonald (1983) and Porter (1985) consider more broadly the role of women in coastal fishing communities.*” Since then, a variety of studies has emerged relating to the role of women in small-scale fisheries – in Canada and around the world. Recent examples include Frangoudes and Gerrard (2018) and Knott, Power, Neis & Frangoudes (2021). The latter provides an extensive review of literature on feminist fisheries research, focusing on the North Atlantic region.

Labour. The review noted various ways in which labour in Canadian small-scale fisheries had been studied. For example: “*the papers in Chaumel (1984) deal with labour in North American fisheries and processing plants*” and “*Ferris and Plourde (1980, 1982) examine aspects of labour dynamics and unemployment in the small-scale fisheries of Newfoundland*”. Other related topics include “*fishermen’s cooperatives as a form of organization in the fishery (e.g., McCay, 1980) [and] the role and development of fishermen’s unions (e.g., Clement 1984).*” Since then, studies have continued to emerge on labour in fisheries, both on a local basis and internationally, often reflecting aspects of the Small-Scale Fisheries Guidelines (FAO 2015) – see, for example, Garcia Lozano et al. (2022).

Indigenous fisheries. Certainly, thirty years ago, Indigenous fisheries were on the agenda of fishery policy and management in Canada – notably in the Arctic and on the Pacific coast. These fisheries were also the subject of some research activity (e.g., Berkes 1990), including that described in the

review, e.g., Inuit fishing in the Arctic, and Indigenous salmon fisheries in British Columbia. What is clear today, however, is that this attention has grown greatly over time, as Indigenous fisheries, and fishing rights, have become prominent in Canadian fishery debates (e.g., Capistrano and Charles 2012; Charles 2020).

Fishery management systems. While the language has shifted somewhat to talk about governance of fisheries, discussions of small-scale fishery management, thirty years ago, identified important knowledge needs, that still resonate today. *“The important role of the fishery bureaucracy and its interaction with the fishing industry, needs more research attention. ... The regulatory component (including scientific research, management bureaucracy and the legislative framework) can be seen as fitting within a dynamic system alongside the fish, the fishing fleet, the fishermen and the fishing communities.”* The review identified the need for studying fishery management as one fitting with a fishery systems approach, and this has become much more prevalent today (e.g., McConney and Charles 2009; Charles 2013).

The Commons. *“Hardin’s (1968) ‘Tragedy of the Commons’ has had an enormous effect on the thinking of fishery researchers. Left to their own devices, so the argument goes, fishermen will destroy any social benefits that a fishery could produce. This conclusion, based on the assumption that fishermen are individualistic and myopic profit-maximizers, has led to the widespread advocacy of measures to reduce the number of small-scale fishermen...”* Although Hardin’s ideas greatly influenced many fishery economists, the bulk of research on the Commons has been critical of Hardin’s faulty analysis, leading to ideas of the ‘benefits of the commons’ (e.g., Berkes 2009).

Co-management. Around the time of the review, co-management was a topic of growing interest: *“...research has focused on showing how fisheries can be self-regulating (Berkes, 1981) or ‘co-managed’ jointly by fishermen and government (Kearney, 1984; Pinkerton, 1987b; 1989), if fishermen and fishing communities are brought fully into the management process. This research presents the argument that such management is more efficient than direct top-down intervention by government, since it shifts the management task to fishing communities...”* Since that time, co-management has become a major field of research (e.g., Pinkerton 2018),

as has the related theme of community-based fishery management (e.g., for the Canadian Maritimes: Charles et al. 2007).

Decision-making and behavioural responses. The review noted the importance of understanding “*fisherman and community decisionmaking*” which “*requires cooperation amongst social scientists, economists, technologists and biologists.*” Related to this, it is noted that for better decision-making in fisheries, there is a need to be able to “*predict fishermen response to these regulations*” which in turn “*necessitates a reasonable understanding of fishermen behaviour (Wilens, 1979)*”. These themes began to be better addressed in the subsequent decades, although studies of fishery decision-making and behavioural responses, especially relating to small-scale fisheries, are still not very common (but cf. Andrews et al. 2021).

Conflict. The review noted that “[*in*] most North American small-scale fisheries... conflicts arise continually” and noted the importance of studying such conflict through, e.g., “*scientific analysis of the preferences held by each user group, and the development of suitable decision-making approaches*”, “*social science research into alternative participatory decision mechanisms*” and “*social, economic, legal and criminological research on illegal fishing and fishery law enforcement*”. Soon after the review was published, Canadian examples were used in developing a typology of fishery conflicts (Charles 1992), which has been used in various studies since then.

Biodiversity conservation and small-scale fisheries. While knowledge-building on small-scale fisheries has, for a long time, acknowledged their links to environmental stewardship and fishery conservation (see, in an international context, e.g., Johannes 1981), the modern imperatives of biodiversity conservation and responsible fisheries have made this theme an increasingly crucial one for knowledge-building, i.e. for understanding the role of small-scale fishers in stewarding fishery resources and ecosystems, and the opportunities of governments and others to enhance that activity (Charles 2017).

Human rights and fishing rights in small-scale fisheries. The idea that human rights had any relevance to fisheries was not on the fishery agenda thirty years ago. Now, however, there is an increasing understanding that,

for all fisheries but for small-scale fisheries in particular, it is important to evaluate fishery policy measures with a lens of human rights. There is an important link, as a result between human rights and fishing rights (Charles 2011a, 2011b, 2013).

Conclusion

Understanding small-scale fisheries in Canada requires examining the nature of those fisheries (i.e., what constitutes 'small-scale' in a Canadian setting) and the nature of the knowledge-building (notably, trends concerning participation, sources of knowledge, and multidisciplinary), as well as the various knowledge needs, as they arise across many different aspects of fishery systems and fishery management. This chapter has reviewed each of these aspects of understanding Canada's small-scale fisheries, from the perspective of (a) what was apparent at the time of the 1989 'Research and Small-Scale Fisheries' conference, (b) how those aspects have evolved since then, and (c) how new perspectives have emerged.

It is encouraging that some research and knowledge gaps have been at least partially filled over time, and studies in newer areas have blossomed. On the other hand, it is striking that others among the gaps identified decades ago are still present today, suggesting the need for significant action on those, perhaps targeted at overcoming resistance or constraints on the knowledge-building activities.

Such efforts are crucial at this time, given the major changes in Canada's fisheries law, the potential new mix of ocean uses, and the commitments being made for marine conservation, all of which call out for new knowledge-building efforts. In fisheries, changes in legislation, notably the Fisheries Act, affect the objectives being pursued and the policy options for doing so, which need to be analyzed accordingly. On ocean uses, the worldwide push for a 'Blue Economy' poses a threat to fisheries generally and small-scale fisheries in particular, through its potential to industrialize the ocean and expand ocean uses. And finally, Canada's commitments to marine conservation involve pursuing globally-set targets, e.g., the Aichi targets and their replacements,

that can change the seascape for fisheries.

Given these rapidly-emerging challenges, there is a crucial need to continue and enhance the knowledge-building efforts on small-scale fisheries in Canada. This will involve overcoming the barriers laid out in this chapter, and building on successes – in greater acknowledgement of the identity and importance of small-scale fisheries, and in efforts to build knowledge in inclusive, participatory and multidisciplinary ways. We need to build on the strong history of small-scale fisheries knowledge-building in Canada, through an agenda to be pursued today, and to keep us going for many years to come.

Acknowledgements

This chapter has benefited from interactions with colleagues decades ago, as well as colleagues today. I am especially grateful to Yvan Breton and Jacques Weber for guidance on the original review, to Fikret Berkes and Serge Garcia for many helpful comments in more recent times, and to colleagues with the Community Conservation Research Network (CCRN) and the UN Food and Agriculture Organization (FAO). Helpful comments on the paper from Evan Andrews and Christine Knott are much appreciated. Financial assistance from the Natural Sciences and Engineering Research Council of Canada, the Social Sciences and Humanities Research Council of Canada, and the Canadian Department of Fisheries and Oceans, is gratefully acknowledged.

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