

The Political Ecology of the Canso Causeway:  
Development, Marine Harvesting, and Competing Notions of Progress

by

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## **ABSTRACT**

Completed in 1955, the Canso Causeway spans the Strait of Canso and radically transformed the surrounding area's political ecological landscape. Addressing the strained relationship between fishing and the State, this thesis aims to answer two questions: how did the marine harvesters of the Chedabucto Bay discuss their livelihoods in relation to the Canso Causeway in 2001-2003? Did their notion of 'progress' challenge the Province's assumption that its development agenda promotes meaningful economic growth? Along with supplementary archival research, I present a secondary analysis of interview data collected in 2001-2003 from marine harvesters who fished in the Chedabucto Bay. Exploring knowledge claims of ecosystem and livelihood impacts, I argue that their narrative constitutes an important challenge to the province's assumptions that its development agenda generates progress, raising critical issues concerning the political ecology of regional economic development in Nova Scotia.

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Thanks, Mom and Dad.

# Chapter 1 Introduction

Examining the political ecology of the Canso Causeway, this thesis presents an analysis of how marine harvesters questioned the State's assumptions that its development framework generates progress through promises of economic, social, and environmental growth. Asking, 'progress for whom?', this project employs a critical development lens to analyze historical and contemporary decision-making processes. Grounded in an analysis of how marine harvesters discussed their livelihoods in relation to the Causeway, this thesis argues their ecological observations constitute an important counter-narrative to the State-promoted development agenda, contributing insight into how people make sense of the unintended consequences produced by intervention and development projects.

## Context

Pushed forward by the Angus L. Macdonald Liberal government and built to completion in 1955, the Canso Causeway amounts to a fixed barrier constructed across the Strait of Canso connecting Cape Breton with mainland Nova Scotia. From its original inception, there was much political and economic interest in the project. Eliminating the established ferry system would allow for faster and more efficient transportation to Cape Breton and between Newfoundland, facilitating trade between the two provinces. The raw materials needed for the construction of the Causeway were sold to the Provincial Government by then Liberal MLA Alister Fraser who owned the adjacent Porcupine Mountain. The Canso Causeway, described as "the road to the isles" (Government of Canada, 1955), was the culmination of Premier MacDonald's promotion and manipulation of Cape Breton's 'Scottish' identity (McKay, 1992). Although this was not

entirely cynical, MacDonald felt deeply connected to notions of Scottish heritage, but he also recognized that a fixed link between mainland Nova Scotia and Cape Breton would have the added benefit of promoting tourism to Cape Breton.

Its construction produced a chain reaction of unintended consequences. As the Causeway neared completion, the Chedabucto Bay deepened as a result of strong tidal flows that scraped away at the sea floor through the narrowing passageway across the Strait of Canso. After the final damming of the Strait, ice no longer flowed through during winters which created a stable deep-water ice-free port<sup>1</sup>. These conditions catalyzed the industrial expansion of the Strait. Without worry of ice slowing the movement of goods, these industries could flourish thanks to the deep water and year-round ice-free conditions. Porcupine Mountain, the adjacent site where raw materials were extracted to build the Causeway, continued to operate as a rock quarry.

In this research, I focus on the Chedabucto Bay, the eastern embayment off of the Strait of Canso, where marine harvesters who had been fishing in the region their entire lives argued the fishing industry suffered as a result of the construction of the Canso Causeway and the industrial development that followed. The Canso Causeway exacerbated their struggle to access marine resources from the mid-1950s onward. I detail this struggle through the analysis of archival documents on one hand, and interview data collected between 2001-2003 on the other. The interviews were conducted with 11 peer-recommended, local ecological knowledge ‘experts’ working in the surrounding regions of the Chedabucto Bay. Peer-recommended refers to the sampling procedure originally used to identify interviewees by the Social Research for Sustainable Fisheries (SRSF)

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<sup>1</sup> See Appendix B for photographic evidence of the ice-free conditions created by the construction of the Canso Causeway.

research collaboration. Marine harvesters in the region were asked to name someone they considered most knowledgeable about local fishing grounds. Those who received the most mentions were selected and subsequently interviewed. Sharing observations about the ecological impacts of the Canso Causeway, the 11 local experts argued in 2001-2003 that fish and lobster spawn were no longer migrating through the dammed Strait of Canso as they had prior to its construction. Instead, marine species were forced to change their migratory patterns. They also argued that damming of the Strait decelerated tidal action in the Chedabucto Bay, encouraging the accumulation of mud at the bottom of the seafloor and subsequently covering up favorable conditions for catching lobsters. The change in tidal action also meant that industrial pollution dumped in the Strait of Canso would not be flushed away. Instead, they argued, the buildup slowly trickled down into the Chedabucto Bay, which also negatively impacted the conditions under which marine species thrive. I argue marine harvesters were obliged to renegotiate the conditions of their work, recognizing that the construction of the Causeway had changed the economic and ecological factors supporting their livelihoods.

### Conceptual Framework

Following Davis and Wagner (2003), I use the term ‘marine harvester’ throughout this work to bring attention to the distinctly political economic conditions of fishing livelihoods. I connect concepts of ‘livelihood’ and ‘local ecological knowledge’ to illustrate how the construction of Canso Causeway radically transformed the fishery of the Chedabucto Bay. I use these concepts to show that marine harvesters employed a shared system of knowledge that is used to piece together a viable living. Fishing is way of life whose distinct practices, ecological knowledges, and livelihood strategies are

learned over time. Marine resources are harvested across seasons using different types of methods, techniques, and technologies. To make a living, harvesters are expected to be able to predict with reasonable confidence how marine species' behaviors, abundances, weather patterns, seasonal, oceanographic, or geographic conditions will affect the success of their work. It stands to reason that not much is random or happenstance about the extraction of marine resources. It constitutes a harvest in more or less the same way strawberries are picked in the summer months or potatoes are dug in the fall of the year across the Maritimes. Local knowledge of fishing grounds, species behavior, livelihood practices and techniques are intrinsically economic and material in nature. While it is true that the ways and means of fishing are often learned through kin and community relationships, it is equally important to critically analyze how livelihood strategies undergo constant revision depending on the political ecological conditions of any given time.

I approach the history and consequences produced by the Canso Causeway using 'political ecology' as a lens for examining power relations in tandem with ecological change, treating the material world as a component of the political, economic, and cultural milieus in which ecological features are continuously reconstructed and shaped by key actors. Focusing on the intersection between marine harvesters and the 'State' (Abrams, 1988), I treat the Canso Causeway and its surrounding environment as the outcome of conflicting and dynamic historical, social, and economic forces. Capturing my conceptual priorities, political ecologist Lisa Gezon (2006) writes:

Embracing the material environment as socially and culturally constructed does not deny or even downplay its actual materiality. Instead, it provides an analytical lens through which to understand how social processes contribute to empirically observable landscape contours, resource fluctuations, and social differences in



access to power, prestige, and wealth. It provides a way of analyzing social power as contested, resulting in real people's lives being affected through unequal distributions of the power to transform and consume. Seeing nature as constructed takes away the analytical inevitability of landscapes and raises questions of how, when, and by whom (and at the expense of whom) landscapes came to be (11).

Seeing the Canso Causeway, Strait of Canso, and Chedabucto Bay as a socially and culturally constructed landscape allows me to go beyond the physical transformations that have taken place in the region since the mid-1950s. By asking questions about the logic under which these transformations have occurred, I can analyze the historical struggle over access to resources that has shaped the region's material, economic, and social contexts. There was nothing inevitable about connecting mainland Nova Scotia and Cape Breton through a causeway, nor was there anything natural about the deep-water ice-free conditions responsible for attracting industry to the Strait. These events are directly related to State intervention and industrial expansion, guided by a promise of generating economic growth through capitalist practices that depend on the exploitation of labour and material resources. This context drives the political ecology of the region.

Analyzing notions of progress, I critically consider whose interests were served in the schema of Strait development. Port Hawkesbury was a boom town during the construction of the Causeway and subsequent industrial expansion of the Strait, home to scores of industrial labourers but its population has been consistently declining for decades. Few Strait industries have established long-term success. Marine harvesters in the nearby Chedabucto Bay have consistently expressed the view that the chain of events produced by the Canso Causeway negatively impacted their capacity to make a living. Who benefited from the cumulative effects of the Canso Causeway's construction? Why was it positioned as an emblem of progress in Nova Scotia? If progress signifies

economic or social growth, then where is this progress found? At whose expense is the narrative of progress sustained? Using the anthropological critique of development, I critically analyze the decision-making processes that led to the construction and ensuing industrial expansion of the Strait, asking how the State-promoted development agenda transformed and disrupted the region, and focusing on the logic of intent and the manner in which ‘unintended consequences’ have a function. Examining fixed links involves more than an analysis of a structure’s physical existence (Baldacchino, 2007). Fixed links change the political, economic, cultural and ecological landscapes of places.

### Methodological Approach

I have developed and applied the framework outlined above to examine the following questions: How did marine harvesters discuss their livelihoods in relation to the Canso Causeway in 2001-2003? Do their observations challenge the State’s assumptions that its development agenda generates progress? What do their observations over time tell us about the political ecology of the Canso Causeway? In order to broach these questions, I employ a secondary analysis<sup>2</sup> of local ecological knowledge survey and interview data made available to me through my role as a research assistant working for Drs. Anthony Davis and Alida Bundy. This data was collected between 2001 and 2003 by Social Research for Sustainable Fisheries<sup>3</sup>, a community organization/university research collaboration which was sited at St. Francis Xavier University in Nova Scotia at the time. One of the major marine harvester organizations with members working in the

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<sup>2</sup> Although social research emphasizes the importance of fieldwork, there has been some attention given to the secondary analyses of qualitative data in the social sciences (Gutmann et. al., 2008; Hammersley, 2010). Some research projects simply produce too much data and, in these cases, there is a need to recruit someone with a shared orientation or training to analyze the data (Gravlee et. al., 2009). But secondary data can also be employed to investigate new sets of research questions (Heaton, 2008).

<sup>3</sup> See <http://faculty.msvu.ca/srsf>

Chedabucto Bay, the Guysborough County Inshore Fishermen's Association (GCIFA), was a core partner in this collaboration. Through an extensive sampling method, 11 peer-recommended local ecological knowledge 'experts' were selected and interviewed. Using nautical charts, they mapped out local fishing grounds and knowledge claims from the mid 1950s to the time of the interviews between 2001-2003. Using the construction of the Causeway to mark a distinct period in the region's history, each interview, often 2-4 hours in length, gave them an opportunity to express their relationship with the structure and how it had affected their capacity to make a living in the Chedabucto Bay. The SRSF materials are augmented through archival research including newspaper, industry, and government documents discussing the history, plans, and consequences of the Canso Causeway along with the industrial expansion that followed its construction. These sources of information have allowed me to describe the larger political economic context into which marine harvesters were thrust.

## Outline

In the following chapter, I explain the research design and methodology used to analyze data, included is a discussion of the implications of secondary analyses and a description of the original SRSF study. The third chapter presents a brief history of the construction of the Canso Causeway, illustrating how it produced a chain of events leading to the industrial expansion of the Strait of Canso. I describe this expansion and highlight the current operations. In Chapter 4, I problematize the concept of 'progress', expanding on the conceptual framework described above to critically consider the political ecology of development and its larger impacts on local livelihoods and knowledges. I position marine harvesting within the context of the State, illustrating their

strained relationship and struggle to access marine resources. In the fifth chapter, I present interview data collected from the 11 peer-recommended local ecological knowledge experts that reflects their attitudes and experiences described in 2001-2003. Using their ecological observations and knowledge claims, I describe their narrative of the Causeway, demonstrating how they collectively believed the structure barred marine species from entering the bay and how the damming of the Strait radically decelerated the tides and promoted the buildup of silt and industrial pollution. I suggest that their observations constitute a counter-narrative of progress, showing how the State-promoted development agenda exacerbated their difficulty extracting marine resources, further exploiting their labour and the ecological conditions of their work. I conclude in Chapter 6 by highlighting the limitations of this work and pointing to avenues for future research.

## Conclusion

Considering the ways in which material conditions and relationships are constructed, this thesis examines the political ecology of the Canso Causeway. Situated in a constellation of power relations and intersecting interests, I apply the anthropological critique of development to an Atlantic Canadian case in order to show how the unintended consequences produced by the Canso Causeway transformed the daily experiences, practices, and ecological knowledges of marine harvesters in the Chedabucto Bay. Engaging the history of industrial expansion in the Strait, I examine why failing industries continue to be supported by the State. By addressing how the marine harvesters of the Chedabucto Bay talked about the structure, this project examines conflicting notions of progress. Through a secondary analyses of interview data and archival research to describe the history of development in the Strait, I situate harvesters'

ecological observations in relation to their livelihoods, showing that their knowledge claims were used to make a viable living. I argue that these observations challenge the State-promoted development agenda, constituting a counter-narrative to the promise of progress. Asking why their claims have not been taken seriously, I examine what is meant by progress by showing what it is not.

## Chapter 2      Research Design and Methodology

### Introduction

To study the political ecology of the Canso Causeway, I employ a secondary analysis of survey, interview and archival data. In this chapter, I describe the research design and methodology used to approach these data, elaborating on the background history of the original study while critically examining the implications of secondary analyses. Gathered through a marine harvester community organization and university research collaboration, Social Research for Sustainable Fisheries (SRSF) ([www://faculty.msvu.ca/srsf](http://www://faculty.msvu.ca/srsf)) focused on systematically documenting the local ecological knowledge of marine harvesters in Chedabucto Bay fishing communities. The survey and interview data documented marine harvesters' numerous observations concerning the ecological impacts of the Canso Causeway. These data are situated in a larger political economic context which is further described through my analysis of government archives and newspaper sources that discuss the construction of the Canso Causeway, along with the industrial development that followed.

My approach to this research has been facilitated and influenced through my role as a research assistant for Dr. Anthony Davis, professor of Social Anthropology and Sociology at Mount Saint Vincent University in Bedford, Nova Scotia and Dr. Alida Bundy, fisheries research scientist at the Bedford Institute of Oceanography in Dartmouth, Nova Scotia. Under their guidance, I was involved with research concerning the investigation and analysis of the local ecological knowledge of marine harvesters in Nova Scotia. In the summer of 2009, I was employed to begin work on this project. For roughly the duration of the next year, I was responsible for the extraction and analysis of

interview data collected in 2001 and 2002 by the Social Research for Sustainable Fisheries research project at St. Francis Xavier University under the supervision of Dr. Anthony Davis, who has given me full permission to independently analyze the data.

### Data analysis

My dual relationship to this data, expressed through this research and through my work as a research assistant for Drs. Davis and Bundy has strengthened this analysis. After spending more than a year examining the data, I developed an intimate understanding of how harvesters talked about the Canso Causeway, but also of how they expressed their observations and anxieties related to fishing practices, species behavior, and their fishing grounds. I organized, analyzed, and extracted the qualitative data using matrices designed under the guidance of Anthony Davis. Focusing specifically on fishing in the Chedabucto Bay and nearby small communities, I analyzed the intersections between State-promoted development and fishing livelihoods using this interview data. I extracted every observation and comment concerning the Canso Causeway in each interview, organizing and aggregating the data until key observations emerged. Where two or more harvesters shared the same observation about how the Causeway impacted their work, I grouped the remarks to show that a shared observation had been expressed. Given my research questions, I emphasized shared observations. Analysis of these interviews had two primary objectives: to investigate the ways in which harvesters discussed their livelihoods in relation to the Causeway and to examine the extent to which these attitudes were shared. To operationalize these concepts, I developed a matrix that facilitated the organization and extraction of the data around key themes that highlighted the ways in which marine harvesters discussed the Canso Causeway.

Once the data had been organized and analyzed, a member of our LEK research team, GIS specialist, Andrea Kmetty, offered to assist with the production of a map to help illuminate the observations made by marine harvesters. This map was produced over three different sessions using MapInfo Professional software. This map is a representation of local fishing grounds and ecological observations made by the peer-recommended experts. I explain the relevance of this map in Chapter 5 and a copy of it can be found in Appendix A.

Finally, these data are supported by archival documents retrieved from various sources. The Gut of Canso Museum and Archives<sup>4</sup> was an invaluable resource, providing access to a wealth of photographs and government documents detailing life before and after the construction of the Causeway. One of these photographs can be found in Appendix B. Government documents including environmental assessments retrieved from Nova Scotia Archives and other government departmental websites were also analyzed along with census and other geographical data obtained from Statistics Canada. Newspaper articles retrieved from the Chronicle Herald and other Nova Scotian newspapers were also used. I frequently relied on information retrieved from the Strait-Highlands Regional Development Agency, which afforded an insight into industrial development, past and present. Taken as a whole, these documents allowed me to reconstruct the historical context of the Canso Causeway and the industrial development that happened afterward. In Chapter 4, I use these documents to provide a brief sketch of the region's political ecological landscape.

## Secondary Analyses

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<sup>4</sup> Access to the Canso Causeway catalogue may be found here: [http://www.virtualmuseum.ca/sgc-cms/histoires\\_de\\_chez\\_nous-community\\_memories/pm\\_v2.php?id=record\\_detail&fl=0&lg=English&ex=00000566#](http://www.virtualmuseum.ca/sgc-cms/histoires_de_chez_nous-community_memories/pm_v2.php?id=record_detail&fl=0&lg=English&ex=00000566#)



My reading of the data employs a critical lens. I draw on work that emphasizes the need to critically examine the implications of secondary data analyses (Gutmann et. al., 2008; Hammersley, 2010; Gravlee et. al., 2009; Heaton, 2008; Corti & Bishop, 2005; Long-Sutehall, Sque, & Addington, 2010). Long-Sutehall, Sque, and Addington (2010) point out that certain questions must be asked throughout this process. These are:

- (i) Is it ethical to ask the secondary research questions you are asking of the primary data?
- (ii) Is there enough being said in the primary transcripts about the topic of interest so that it would be reasonable to assume that the secondary research questions can be answered?
- (iii) How will the primary dataset be assessed?
- (iv) Is there symmetry between the data collection and analysis techniques in the primary datasets?
- (v) How will epistemological questions regarding the context of data collection be addressed? (9)

Attending to these questions, I have critically examined the strengths and weaknesses of secondary analyses by considering what the data can and cannot reveal. It is important to note I had been working through and compiling various aspects of this data on behalf of Dr. Davis for a year before developing my own research questions. I had been made aware of the wealth of knowledge claims concerning the Causeway through the data I had been compiling for Dr. Davis. By familiarizing myself with the data in-depth, taking time to learn who these men were, how they conceived of and understood the ecology of their fishing grounds, and how they voiced their many concerns and observations, I have been able to critically assess and establish my own relationship with the interviews. It is my position that an analysis of these data would not have been possible without a prior familiarity and engagement with the many layered and dynamic ways in which these men are positioned not just in relation to the Canso Causeway, but to their families, communities, histories, and to their material and marine resources alike.

Before Dr. Davis gave me the data, I had been made aware of the ethical concerns and boundaries that supported the original study, which I have carried over into this thesis. I have respected the terms of informed consent provided by the interviewees. Ensuring consistency between the primary data set and my secondary analysis, I outline and build off the methods originally used to collect the data, trusting the rigor from which it was collected, and employing concepts of local ecological knowledge and expertise that first grounded how the data collection had been framed. In effect, I have changed very little about how this data had been intended to be used. My primary research question, how did the marine harvesters of the Chedabucto Bay talk about the Canso Causeway, is constructed specifically with concern for what I can reliably analyze based on the limitations of secondary analysis. I am unable to ask anything more of these men than what has already been collected. Where there were gaps in timeline or larger historical context, I supported the interview findings using government archives and newspaper articles. I have taken every effort to account for the shortcomings of secondary analyses.

### SRSF Study Background

Originally collected by the Social Research for Sustainable Fisheries<sup>5</sup> (SRSF) partnership, this research was originally conducted to investigate concerns raised by the

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<sup>5</sup> “Social Research for Sustainable Fisheries (SRSF) is a partnership linking university researchers and capacity with Mi’kmaq and non-Mi’kmaq fisheries community organisations. Although administered at St. Francis Xavier University, SRSF engages and represents a working collaboration between Guysborough County Inshore Fishermen’s Association, the Gulf Nova Scotia Bonafide Fishermen’s Association, the Paq’tnkek Fish and Wildlife Society, and St.FX as well as other university-based social researchers. Additional fisheries and community organisations are linked with SRSF through relations with these core partners. SRSF is funded by the Social Sciences and Humanities Research Council of Canada (SSHRCC) through its Community-University Research Alliance (CURA) programme. The basic purposes of SRSF are: to develop fisheries-focused social research linkages between university researchers and community organizations, to build social research capacity, and to facilitate specific fisheries social research activities that will examine the concerns of the partnered community organizations. Social research capacity,

Guysborough County Inshore Fishermen's Association (GCIFA). Members of the association were frustrated with their inability to discuss their shared observations concerning ecological shifts in Chedabucto Bay fishing grounds. There were serious concerns that fisheries scientists and managers were not interested in their observations. Without 'scientific evidence' to support observations of ecological change and phenomena, harvesters effectively felt unable to translate and communicate their observations and concerns. In their experience their world view had been dismissed by fisheries scientists and managers as largely baseless and anecdotal. Here, the SRSF research partnership provided an opportunity for concerns to be systematically documented and communicated.

SRSF was able to act as an intermediary, giving the GCIFA the opportunity to build the research literacy and capacity to document issues in a manner which might allow for the delivery of their observations to various management and science settings in a form that would not be easily dismissed. This is not to suggest that the SRSF group underemphasized critical study of concerns specified by the GCIFA and its members. Instead, it approached marine harvesters' observations seriously, devoting considerable time and resources to the construction of a research design that facilitated the critical examination of their particular livelihood practices and ecological observations (Davis & Wagner, 2003; Davis & Ruddle, 2010). While it was the GCIFA's wish to document experiences and anxieties concerning harvesters' livelihoods, GCIFA were made well aware that in so doing they were making these experiences and anxieties open to

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experience and linkages are developed through research-focused workshops and specific research projects. Further information about SRSF is available through the project's web site ([www.stfx.ca/research/srsf](http://www.stfx.ca/research/srsf))” (Davis, unpublished document).

examination and analysis<sup>6</sup>. The relationship was beneficial to the two groups. It provided the GCIFA with an opportunity to voice and to document their grievances in a systematic and legitimated arena while allowing SRSF the opportunity to build a body of data based on the application of a systematic design dedicated to documenting local ecological knowledge.

In order to collect and analyze the observations of Guysborough County marine harvesters systematically, an approach to ‘local ecological knowledge’ was generated by the research team. A social research survey was developed and applied to a list of 211<sup>7</sup> Chedebucto Bay licensed lobster harvesters. A similar survey had been conducted with the St. George’s Bay lobster harvesters, located on the Gulf of St. Lawrence side of the Causeway, two years earlier. This earlier questionnaire served as the model for the survey with Guysborough County harvesters. Additionally, the GCIFA invited both the Richmond County Inshore Fishermen’s Association and the Eastern Shore Fishermen’s Protective Association to participate as full partners in the study. Both organizations agreed.

The surveys were conducted from May 7, 2001 until June 11, 2001. Of the original list of 211 license holders, a total of 159 agreed to participate; 24 declined; 28 were unable to be contacted. That is over 3 in every 4 invited agreed to participate in the telephone survey, which is a relatively high rate of participation given the telephone method of soliciting engagement. This particularly high participation rate expresses

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<sup>6</sup> In fact, an earlier study (Davis et al, 2004) conducted through the SRSF group revealed that aspects of fishers’ ecological knowledge claims were, in fact, partially disproved, but that these harvesters were quite open to the “actual” explanation of ecological phenomena. This research also implicitly suggests that LEK is manifest through livelihood practices.

<sup>7</sup> This list was made up all 211 lobster license holders in Lobster Fishing Areas (LFA) 29, 31A, 31B, and 32. Rather than conduct a random sample of license holders, the research team decided to invite all lobster license holders to participate in the study.

harvesters' interest in sharing their concerns about the fishery. This is important: the participation rate and resulting data demonstrated that harvesters were deeply concerned with the issues and contexts being examined<sup>8</sup>.

SRSF-GCIFA employed a systematic approach to identifying LEK 'experts' using peer recommendation (Davis & Wagner, 2003). The survey was primarily designed with the intent to collect a rank ordered list of particularly knowledgeable harvesters in different regions of the Chedabucto Bay fishing grounds. This information was collected in order to allow SRSF to determine a systematic basis for selecting candidates for face-to-face interviews. Each participant was asked: "Other than yourself, who would you say knows the most about the local fishing ground?" After answering this question, the license holder was again asked "Are there any other persons currently fishing or retired from fishing who think are very knowledgeable about the fishing ground?"<sup>9</sup> Most respondents offered three names although the interviewers collected as many as five.

136 harvester names were collected using this method. It was determined that LEK 'experts' were those who had received two first mentions or three total mentions. This distinction was critical to both the methodological and theoretical orientation of LEK. It ensured that interviews would be completed with at least two harvesters from each community and that harvesters, as a group, were indeed recommending those they perceived to be the 'most knowledgeable' about the fishing grounds. The list was further

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<sup>8</sup> A copy of the survey may be found at [http://www.msvu.ca/site/media/msvu/Phase1\\_Survey2.pdf](http://www.msvu.ca/site/media/msvu/Phase1_Survey2.pdf)

<sup>9</sup> A copy of the telephone survey may be viewed at: [www.stfx.ca/research/srsf](http://www.stfx.ca/research/srsf), within the Research Instruments section.

broken down and it was determined that 14 harvesters from the Chedabucto Bay site<sup>10</sup> had received either a minimum of two first mentions or three total mentions. Of this list, no harvester received less than two first mentions or four total mentions. Of the 14, three were retired while the remaining 11 were currently fishing.

It should be noted that every harvester on the list received at least one first mention. Some received well above the minimum criteria, with mentions ranging from 6 to 17 for the entire list. These figures reveal that harvesters shared amongst themselves an understanding of who best understood the fishing grounds in their region. This quality is particularly compelling because it suggests that the social structure of fishing in these communities contains a hierarchical structure where one or several individuals are collectively understood as possessing the ‘most’ knowledge about the fishing grounds and its ecology. Additionally, it begs the question: what distinguishes ‘experts’ from other harvesters? Is ecological knowledge the predominant factor that separates an expert from a regular harvester or is there another factor at play? It is important to consider the ways in which economic success and status plays a part in distinguishing ‘experts’. Having ‘status’ or a favorable reputation within a community affords access to privilege, an expression of power within the larger whole.

## The Interviews

11 of the original 14 identified harvesters completed interviews. Interviews were conducted from July 2002 until fall of 2003. Each interview was conducted by two SRSF-GCIFA partnership members, one GCIFA staff person and one university researcher. This was largely logistical in nature, allowing one member to focus on

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<sup>10</sup> The site included the following communities: Canso and area; Half Island Cove, Queensport, Petit-de-Grat, and Arichat.

guiding the interview structure while the other assisted with the recording of data. All peer-recommended LEK experts provided signed informed consent prior to the interview sessions. Two informed consent forms were signed (one copy was given to the expert and another was kept at the GCIFA office) and all experts permitted the recording of interview sessions. Experts were given information regarding the goals and intentions of the study. This also included an explanation of how each expert had been identified by fellow harvesters. The research team explained that they hoped to conduct several interviews and that one would include a mapping component where nautical charts would be used to collect harvester LEK experiences and observations. A minimum of two interview sessions were conducted with all experts, with several experts being interviewed as many as four times. The duration of these sessions was generally between two and four hours. All participants were given a full copy of the transcribed interview. Because of the sensitive nature of the data, anonymity and confidentiality were assured by the research team. I continue to maintain the anonymity and confidentiality of the interviewees by amalgamating these responses, referencing interview excerpts using a coding system<sup>11</sup>.

In most regions, several interviews were completed. The intention here was to obtain a minimum of two independent observations on the same phenomenon or knowledge claim. This would assure the observations and claims were shared, and as such were aspects of the local knowledge system. Each interview took place at the respective interviewee's home, generally around a kitchen table, so that they could use nautical charts to locate the various qualities of fishing and LEK in the Chedabucto Bay

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<sup>11</sup> 'H' (for harvester) followed by a number in sequential. H1, H2, H3, etc.

region. These were official nautical charts prepared by the Department of Fisheries and Oceans. Throughout the interview, the respondent used coloured pencils to indicate different time periods to reflect any shifts in the fishery. Each respondent made note of ecological shifts that had taken place since the construction of the Canso Causeway.

The interviews were organized around three different themes and areas of question. The first is genealogical in nature, building a family history of fishing, explaining the historical and social relationships of each interviewee. Each of the interviewees were embedded in long-standing fishing families and traditions, often involving three or more generations of harvesters who fished the same grounds. Each learned to fish at a young age through a family member, often a father or an uncle. The purpose of this section of the interviews serves to collect data about who these people were, but also to document the extent to which they were embedded in kin, community, and livelihood relations that relate back to the activity of fishing. The collection of this data was essential for framing the social contexts of peer-recommended experts, grounding some of the qualities that reproduced fishing livelihoods in the region.

The goal of the second section of the interviews was to gather a detailed life history of each interviewee's experience with fishing as it relates to boats, social relations, fishing techniques, quantities and types of equipment, fishing grounds, marine species, economic relationships and any shifts in the aforementioned factors they experienced over the years they fished in the Chedabucto Bay. Given the emphasis placed on distinguishing LEK as a shared system of knowledge, it was important to design the interview schedule in a way that would allow harvesters to express a shared chronology. This facilitated an ability to cross-reference observations in order to determine the extent



to which they were shared and represented in LEK. To document a shared system of knowledge, the fishing history and LEK component of the interview schedule was organized around time periods, using fishing boat names as a means for situating different processes and moments in time and as a tool to facilitate their recollections.

The final, and generally longest, section of the interviews deals with each harvester's knowledge of their fishing grounds. These interviews were largely concerned with creating an inventory of each interviewee's sense of the grounds by identifying particularly abundant fishing regions, biota, vegetation, and any salient shifts that had taken place in the Bay over a roughly 60-year period, depending on the interviewee's age at the time of the interview. This section was aimed to document their knowledge of lobster, herring, mackerel, and cod by targeting their understandings of the species' behavioral attributes and qualities. Questions related to the species' locational and seasonal distribution, spawning and nursery locations, species relationships, species abundance, and other behavioral qualities. Data was also collected with reference to the physical attributes of the fishing grounds, identifying, for example, the qualities that constitute particularly desirable fishing grounds. Using nautical charts, harvesters documented these qualities using distinct pencil colors to indicate time periods, species, and locations.

As the interviews were organized through time period and many of the harvesters interviewed had been fishing before, during, or shortly after the construction of the Causeway, it was used as a historical guide for mapping the local fishing industry, often used as an entry point for talking about when they had first learned to fish. Though not the central theme of the interviews, the focus on the Canso Causeway as a historical

marker gave harvesters a tool for recalling the early conditions of their livelihoods in the Chedabucto Bay. Throughout the course of each interview, respondents were questioned about their knowledge regarding the ecological impacts of the Canso Causeway, usually asked to identify whether they could remember if the Causeway had affected their livelihoods in the Chedabucto Bay or if they could identify any distinct changes that had occurred after the Causeway's construction<sup>12</sup>. By treating the Causeway as a distinct component of the interviews, harvesters could talk about any changes produced from its construction and identify how or whether it had directed the course of their livelihoods. From there, harvesters made a series of overlapping knowledge claims, largely concerning the migratory patterns of marine species and the Bay's tidal action, which they argued were directly related to the construction of the Canso Causeway. This is where I focus a great deal of my attention and analysis.

## Conclusion

In this chapter, I describe the methodology and research design used to analyze how the marine harvesters of the Chedabucto Bay talked about their livelihoods in relation to the Canso Causeway. Employing a secondary analysis of interview data collected from 2001-2003 by the Social Research for Sustainable Fisheries research collaboration, I support the interview data using archival documents and a mapping component. Early in this chapter, I referred to several questions that must be asked throughout the process of analyzing secondary data, calling for a critical attention to secondary analyses. By attending to the implications of analyzing interview data secondarily, I show how I have positioned my role as a research assistant for Drs.

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<sup>12</sup> A copy of the interview schedule may be found at:  
<http://www.msvu.ca/site/media/msvu/Social%20Research%20for%20Sustainable%20Fisheries%20Interview%20Schedule.pdf>

Anthony Davis and Alida Bundy in relation to the data. The research design and methodology outlined above strives to satisfy any larger concerns around the employment, shortcomings, or ethical ramifications of secondary data analysis. I take care to describe the original SRSF study and the quality of how ‘local ecological knowledge’ was documented and researched. The original data’s methodological rigor, particularly its sampling procedure operated through peer-recommendation for local ecological ‘experts’, opens the opportunity to analyze how knowledge claims are systematically shared and legitimized. Local ecological knowledge, as documented in these interviews, is the empirical material from which I examine how harvesters talked about their livelihoods in relation to the ecological impacts of the construction of the Canso Causeway.

## Chapter 3      A Brief History of the Canso Causeway

In this chapter, I focus on the background history and unintended consequences produced by the construction of the Canso Causeway. I explain the priorities, interests, and pressures that informed the Nova Scotian provincial development agenda at the time. In the 1950s, the Angus L. Macdonald government, concentrated considerable resources into developing infrastructure in the Province. Newfoundland became a Canadian province in 1949. Set against this context, and also due to the coal industry, there was incredible pressure to improve the transportation of goods between the new province and Cape Breton (and then along to mainland Nova Scotia). Drawing on archival research to outline this history, I describe the chain of events catalyzed by the Causeway's construction, focusing on the unforeseen industrial expansion of the Strait of Canso. I move into a discussion of how marine harvesters observed declining lobster populations after the Causeway's construction, showing how their claims were downplayed and explained away in the ecological assessment that followed. The assessment argued instead that overfishing was to blame. I conclude this background discussion by positioning the Causeway at the current juncture.

### Previous Scholarship

In recent years there has been some scholarly attention given to the Canso Causeway. Studies have focused on the social and historical significance of bridging Cape Breton and Nova Scotia's mainland (McKay, 1992; Beaton & Muise, 2008), although these works are largely focused on the cultural significance of the Causeway, both as a site for generating tourism and as a means for constructing an image of Scottish identity. Raymond Foote's (1979) study of rapid industrialization in Port Hawkesbury is

not centrally focused on the Canso Causeway, but uses it as an entry point for examining the unintended industrial consequences experienced in nearby Port Hawkesbury during the 1960s and 1970s. Mike Hunter and Carol Corbin's (2007) work provides a sophisticated analysis of the impacts of the Causeway and hints at its impacts on the fishery; but, like the other works, analyzes its particular relationship with Cape Breton, leaving room for further analysis. Michael Dadswell (1993), Irene Novaczek (1993), and Anthony Davis & John Wagner's (2005) respective pieces point out that the Canso Causeway has negatively impacted the Chedabucto Bay and its fishery, but it is not their central focus. These works are, however, symptomatic of a need to further analyze the politicization of bridge-building, development, and its consequences in the Strait of Canso.

## History

Before the Causeway's existence, trade and transportation between mainland Nova Scotia and Cape Breton was conducted through a ferry service. The ferry service was sporadic and limited the frequency of travel. Canoes, rowboats, and other marine vessels were also used to cross the Strait but crossing to and from Cape Breton was considered a hassle. It was not unusual that it would take several hours to get across the relatively short distance. Natural resources (primarily Cape Breton's rich supply of coal) could not be moved all that efficiently, and especially during winter, were subject to fierce weather conditions and ice floats, sometimes resulting in loss of life and raw materials from capsized boats.

In 1949, the Strait of Canso Board of Engineers prepared a report (commissioned by the federal and provincial governments) entitled *Report on the Problem of Crossing*

*the Strait of Canso* which captured the attitudes and concerns of local residents with regard to the ferry service. Frustrated with slow and especially inconvenient winter service, the report highlighted the many problems experienced by local residents and ferry workers. The report argued that passengers and freight were often delayed due to the slow process of disassembling and reassembling rail cars before and after crossing the Strait (Strait of Canso Board of Engineers, 1949, 3). Given the need to move coal out of Cape Breton, there was pressure on the provincial and federal governments to improve transportation to and from the Island. At the same time, some residents in nearby Port Hawkesbury held the ferry service in high regard, believing that those employed by the ferry service had secured particularly prestigious jobs (Foote, 1979, 42). Even in 2005, it was reported that a Mulgrave resident believed that the construction of the Causeway had negatively impacted the town when the ferry was removed (Duffy, 2005).

One year before the *Report on the Problem of Crossing the Strait of Canso* was published, the board of engineers had produced a report entitled *A Permanent Crossing Over the Strait of Canso* (1948) which considered the possibility of replacing the ferry service since improving it was out of the question due to the financial cost. Both a tunnel and a low-level bridge were considered, but it was decided that these structures were neither cost-efficient nor appropriate to the region. All the same, as pressure to improve the ferry service increased, the need for a permanent bridge became evident. With Cape Breton's coal industry gaining economic importance in the Province, it was essential that the governing bodies devise a plan to quickly and efficiently move resources between the two regions. Then, in 1949, Newfoundland became a Canadian province which further intensified the need to improve transportation through infrastructure development.

Bridging mainland Nova Scotia with Cape Breton Island was now a clear necessity in the eyes of the federal and provincial governments.

Set against this context, the Canso Causeway was also born out of a particular set of decision-making priorities. As the Maritime Provinces established themselves in the post-war period, the main instrument at their disposal was the development of transportation policy. This was especially true in the 1950s (Forbes, 1989, 130). Ernest Forbes (1986) argues that "...the politicians and bureaucrats who directed Canada's economic development emerged from the Second World War with a profound sense of accomplishment" (3). Decision makers were motivated by a desire to modernize the region without much concern for the consequences of what they saw as "progress". There was an especially romantic, idealistic sensibility around their thinking during this period.

A new idea, a causeway, which amounted to a fixed link between mainland Nova Scotia and Cape Breton and a more or less solid barrier across the Strait of Canso, emerged and gained political interest. A few years earlier, a causeway was constructed in southwestern Nova Scotia, linking Cape Sable Island to the mainland (Medel, 2008). The Canso Causeway would fit nicely into this framework and was modeled after the Cape Sable Island plans (ibid, B5). Planners acknowledged that a causeway could cause ecological impacts, but the need for a fixed link was more pressing (Strait of Canso Board of Engineers, 1951). Besides, at the time, the Province did not require ecological assessment studies. In 1951, a report was published which outlined the plans and possible implications of damming the Strait of Canso. From the report:

There seems to be no way of predicting the total effect of such a dam on the navigational season or local climate, but there can be no reasonable doubt that changes would arise due to the shutting off the flow of water from the Gulf of St. Lawrence through the Strait to the sea. It would seem likely that ice would

form locally much earlier in view of the absence of flow. It also seems likely that ice would last longer in the spring since it would not be carried save by the wind, and it would have to melt in place. The possible effect of these changes on local temperatures and upon shipping and fishing industries in the neighborhood cannot be estimated (Strait of Canso Board of Engineers, 1951, 8).

Shortly thereafter, construction of the Canso Causeway began. A striking example of the power and privilege underscoring the construction of the Causeway, the raw materials used to build the structure were sold to the Province by then-Member of the Legislative Assembly, Alistair Fraser, who owned Cape Porcupine Mountain, located near Mulgrave adjacent the construction site. Fraser eventually sued the Province for payment of the materials, arguing that he had not been fairly compensated. This led to a Supreme Court case (*Fraser v. The Queen*, 1963) where it was decided that the Province would pay Fraser the market value of the materials. Serving the interests of foreign capital, the excavation site continues to operate today under the ownership of Martin Marietta Materials.

In 1955, construction of the Causeway was complete. Described as the “dream of the former premier of Nova Scotia, Angus L. MacDonald” (Macdonald, 1995) who died just months before its opening, the Causeway was to be his realization of Nova Scotia’s ‘Scottish’ identity (McKay, 1992). Although this has been framed as a matter of cultural significance, McKay notes that part of the appeal was the quiet manipulation of Nova Scotia’s Scottish history in the hopes of generating additional economic gains through tourism. With much fanfare, the Canso Causeway was officially opened on August 13. The opening ceremonies programme, distributed to all attendees, declared that “The Canso Causeway ranks high among the construction feats of this century and stands as a lasting testimonial to the skill, enterprise and determination of Canadians of this



generation" (Government of Canada, 1955). 100 bagpipers were hired to lead the parade celebrating the new union between Cape Breton and mainland Nova Scotia.

### Unintended Consequences

While there was some concern that the Causeway would generate some unplanned ecological consequences, the actual outcomes of the structure's creation were unimaginable. As the structure neared completion, tidal flows moved through a more constricted opening which eroded the bottom of the Chedabucto Bay from a depth of 187 to 218 feet (Hogg, 2005, 16), creating the world's deepest ice-free passage (CBC, November 4 2010). The ice that had once inconvenienced the ferry service was now gone. Planners responsible for the execution and construction of the Causeway had not anticipated this effect. The erosion of the sea floor coupled with the ice-free conditions in the Bay changed the Strait of Canso and its surrounding regions, facilitating the creation of the world's first year-round, ice-free, deep-water "superport". The industrial potential seemed endless.

While the 1960s were characterized as a period of delivering and financing government services (Stanley, 1993), later in the decade, the Atlantic Provinces were increasingly pushed to transition from a resource-based seasonal labour economy to an industrial economy (ibid, 426)<sup>13</sup>. The conditions produced by the Causeway allowed the Province to appeal to the federal government, which maintained official ownership of the structure until 2014 (CBC, July 2 2014), and to attract industry to the Strait of Canso region. Providing representation from Inverness, Richmond, Antigonish, and Guysborough counties, the Four Counties Development Association was formed

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<sup>13</sup> Many marine harvesters left the fishery in pursuit of work in the newly industrialized region. Upon decline of the labour boom, some tried to return to their original line of work but were frequently denied entry due to low lobster catch-rates.

specifically to attract industry to the region (Cape Breton Post, October 1 2011). A number of studies examined the potential for industrial expansion in the Strait (Kaiser Canada, 1968; Foundation of Canada Engineering Corporation Limited, 1973; Fenco Consultants Limited, 1980). Due to the unintended consequences produced by the construction of the Causeway, the Strait of Canso has become one of the most studied regions in Atlantic Canada because of the creation of the superport (Beaton & Muise, 2008, 67).

Since the superport's genesis, the region has attracted all manner of private industry, many of which have changed hands over the years. In 1959, Stora Kopparberg of Falun, Sweden, began construction of a pulp mill at Point Tupper in Richmond County<sup>14</sup>, which opened in 1962. Though it operates today as Port Hawkesbury Paper, its history has been particularly troubled, frequently closed and reopened under different management. Also in 1962, Bestwall Gypsum, which was later acquired by Georgia Pacific, began mining gypsum in the Strait of Canso, but later moved their operations to various sites in Inverness County. They continue to operate a shipping wharf in Point Tupper. In 1970, Nova Scotia Power opened a generating station in Point Tupper, which continues to exist today, and provides subsidized power to Strait region industries, such as Port Hawkesbury Paper. Stern Group, Nustar Energy, Maher Melford Terminal, and Anadarko Petroleum also continue to operate today in the Strait region. Perhaps the most consistent industry in the area is the original rock excavation quarry, crushing, and high-quality gravel export operation operating out of the top of Cape Porcupine Mountain, originally created to provide the materials for the construction of the Canso Causeway. In 1978, the site was purchased by Nova Construction Limited in Antigonish. The quarry

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<sup>14</sup> Located on the Cape Breton side of the Strait of Canso.

was then purchased in 1986 by a Connecticut company, Lone Star Industries, and was later absorbed in 1995 by North Carolinian based Martin Marietta Materials, under whose management it continues to operate today. In March 2018, it was reported that the company would invest an additional \$50 million in equipment upgrades, which are projected to increase Porcupine Mountain Quarry's capacity by 50% (Port Hawkesbury Reporter, March 27 2018).

### Fishing Concerns

Meanwhile, marine harvesters in the nearby Chedabucto Bay began to express concern over the migratory patterns of groundfish such as white hake and pelagic fish such as herring and mackerel. They attributed these shifts to the environmental impact of the Causeway.

In 1979, two reports were produced to examine the impacts of the Canso Causeway on the region's fishery. The first report argued that the Canso Causeway had little, if any, negative impact on the ecological viability the Chedabucto Bay's fishery. It acknowledged that lobster landings were in decline, but that this was actually due to a larger historical process dating back to 1892 (Robinson, 1979, 95). It suggested instead that overfishing was the greatest factor impacting the fishery and not the damming of the Strait. Robinson explains:

Admittedly the data relating to stock and recruitment in the study area are inferential. They may be so only because of their general paucity and restriction in terms of time and area distribution. Thus, it is suggested that the recruitment overfishing is a phenomenon to which most Canadian Maritime lobster stocks are subject under the current lobster fishing regulations, and that the Chedabucto Bay and associated eastern Atlantic coast stock, due to its unique mix of parameters, appears to be the most vulnerable to overfishing (95-96).

The second report, on the other hand, produced by Michael Dadswell (1979), attributed plummeting lobster stocks to the Canso Causeway. In his report, Dadswell argues that the blocking of the Strait of Canso prevented lobster larvae from moving from St. George's Bay to the Chedabucto Bay. His explanation is as follows:

...larval recruitment from the St. Georges Bay to Chedabucto Bay was stopped by the construction of the Canso Causeway and, since most larval production in the Chedabucto Bay was probably transported down the eastern Nova Scotia coast, the Chedabucto lobster population was not self-sustaining under fishing pressure. St. Georges Bay probably supplied 60% or more of the larvae settlement in Chedabucto Bay (Dadswell, 1979, 140).

Curiously, an editor's note appears at the end of Dadswell's study:

The consensus among Maritime lobster assessment biologists is that overfishing was the main factor leading to the reduced lobster landings in the Chedabucto Bay area, with the closure of the Canso Strait being a secondary contributing factor. If this viewpoint is correct, an increase in lobster production can be expected in the Chedabucto Bay area, providing fishing effort remains low (McCracken, 1979, 145).

McCracken's editorial note gives preference to overfishing even though Dadswell explicitly states that the damming of the Strait explains declining lobster populations.

Dadswell's observations, however, continue to be expressed by the marine harvesters of the Chedabucto Bay.

### The Current Juncture

At present, the Canso Causeway operates under the management of the Provincial government. There has been some concern about its ecological impacts (Canadian Press, 2006; Jackson, 2008), however these concerns have been largely ignored by policy makers. The Provincial government continues to give preference to the Strait of Canso industries even though groups such as the Ecology Action Centre have pointed out that these industries are environmentally destructive (CBC, November 2 2010). The Mayor of

Port Hawkesbury, Billy Joe McLean, boasted to the Chronicle Herald in 2004 that Port Hawkesbury would become a city in “ten years” (MacIntyre, 2004, B2) thanks to the industrial development of the Strait. Statistics Canada census data reveals, however, that the town’s population has actually been steadily dropping since 2001 from 3,701 to 3,517 in 2006 to 3,366 in 2011, and 3,214 in 2016 (Statistics Canada, 2017). Raymond Foote’s (1979) study of rapid industrialization in Port Hawkesbury concludes that the industrialization in the region failed to enhance the economic or social qualities of the town. The failure to improve these qualities has also encouraged young and old alike into out-migration (Beaton & Muise, 2008, 68).

## Conclusion

This chapter has provided a very brief overview of the history of the Canso Causeway, illustrating why and how the State was moved to build a structure connecting mainland Nova Scotia with Cape Breton. Explaining some of the assumptions made by government actors, I use this outline to show that the State was motivated to improve the trade and transportation of raw materials out of Cape Breton and Newfoundland while capitalizing on the potential for improving tourism to and from the islands. I have described how the construction of the Causeway transformed the Strait of Canso, producing a chain reaction of unintended consequences that led to the rapid industrialization of the region. I have also demonstrated that marine harvesters observed the ecological impacts of the Causeway. Briefly describing two contrasting ecological studies of the Causeway’s impacts, I have explained how the State failed to prioritize the anxieties and observations of marine harvesters, giving preference instead to corporate interests in the region. I conclude by pointing out that despite the belief the construction

of the Causeway and the industrial expansion that followed produced social and economic growth in the region, the population of Port Hawkesbury has been gradually declining. In the next chapter, I ask what these beliefs signify by problematizing what is meant by 'progress'.

## Chapter 4      The Problem with Progress

There is a picture by Klee called *Angelus Novus*. It shows an angel who seems about to move away from something he stares at. His eyes are wide, his mouth is open, his wings are spread. This is how the angel of history must look. His face is turned toward the past. Where a chain of events appears before *us*, *he* sees one single catastrophe, which keeps piling wreckage upon wreckage and hurls it at his feet. The angel would like to stay, awaken the dead, and make whole what has been smashed. But a storm is blowing from Paradise and has got caught in his wings; it is so strong that the angel can no longer close them. This storm drives him irresistibly into the future, to which his back is turned, while the pile of debris before him grows toward the sky. What we call progress is *this* storm (Benjamin, 2003, 393).

### Introduction

The construction of the Canso Causeway has produced multiple narratives of ‘progress’ that influence how people interact with and think about the structure. A pool of dynamic and dialectical social relations, ranging from citizens, mainland Nova Scotians and Cape Breton residents alike, living in close proximity to the Causeway or using it on their way to work, through the marine harvesters on either side of the Canso Causeway, to the former residents of Point Tupper, the current residents of Port Hawkesbury and the industrial labourers employed by one of the many Strait of Canso industries. Presiding over and driving this mix are the corporate powers who own and operate the many industries, the regional economic development agencies, and the Provincial and Federal governments.

In this chapter I approach the political ecology of the Canso Causeway by exploring how the unintended consequences produced by its construction were framed by State actors, industrial interests, and marine harvesters. Using the anthropological critique of development<sup>15</sup> to examine the role of the State, I argue that the unforeseen creation of

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<sup>15</sup> I elaborate on the critique’s meaning on pages 39-43.

a year-round ice-free deep-water port fit within the narrative of economic growth promised by the Province's development agenda. While this narrative has been framed as 'progress' by those responsible for developing the Causeway and the Strait of Canso, the critique of development described in this chapter points out that, in the current iteration, 'progress' is often understood as the State's intent or ability to develop and not necessarily as the outcome of state development (which can always undergo further intervention). As a result, we need to be critical and cautious of assumptions that industrial development in the Strait of Canso will generate forms of progress. I have illuminated why these consequences have been especially troublesome for marine harvesters by shedding light on their already troubled history with the provincial and federal governments. At present, neoliberal management policies indirectly shape their access to marine resources.

Employing the concept of livelihood to situate the political ecological processes that impact the fishery, I argue that fishing livelihoods constitute an entire way of life, connecting marine harvesters with kin and community, and to shifting knowledges of fishing grounds used every day to piece together a viable living. Grappling with how their knowledge of the fishery is oriented, I apply the concept of local ecological knowledge and highlight the concept's strengths and weaknesses. I define LEK as a shared system of knowledge used by marine harvesters to make a living. Situating the ways in which fishing livelihoods in Nova Scotia and in the Strait of Canso region are subject to historical and political struggles over access to resources, I have laid out a critique of progress that facilitates a counter-narrative to the development agenda responsible for transforming the livelihood conditions of the Strait of Canso and Chedabucto Bay.



## The Political Ecology of the Canso Causeway

Concerned with how “landscapes came to be” (Gezon, 2006, 11), I treat the Canso Causeway and its surrounding environment as the sum product of conflicting and dynamic historical, social, and economic forces. Political ecologists Susan Paulson and Lisa Gezon (2005) note that places are not standalone things; they are products of broader processes. They write, “The understanding that global flows are necessarily embedded in local processes prompts a consideration of place not merely as an isolatable physical space but as a dimension of historical and contemporary connections” (Gezon & Paulson, 2005, 9). In the preceding chapter, I sketched out the history of the Canso Causeway’s construction along with the industrial development that followed, describing the wave of foreign capital that has flown in and out of the region since the 1960s, showing how the area is connected to a larger political economic context. Indeed, connecting Cape Breton with mainland Nova Scotia has extended far beyond building a road, thrusting the region’s history evermore into a process of change. By specifically prioritizing the historical, political, and social contexts of the Chedabucto Bay’s fishery in order to situate how marine harvesters are located in webs of historical, political, and social significance, I do not engage this context to “understan[d] the past for its own sake” (Stocking, 1965, 212), but to instead situate the broader decision-making processes that continue to shape the region. As the past exists in constant conversation with the present, my analysis requires a dialectical approach to the social, ecological, and political (con)juncture (Smith, 1999) produced by the unintended consequences of the Canso Causeway. Understanding the chain of events produced by these consequences is about understanding an active process of change in political economic priorities, labour

relations, and in the ways marine harvesters experience and talk about their capacity to make a living. Olson (2005) notes that:

...The tendency to look at communities as simply the places that get impacted plays down their contexts and histories and brackets anthropology to the description of impacts. This loses the more proactive senses of community that stress what communities can do rather than what is done to them, and renders less visible the multiplicities of interests, positions, and values in any given community (249).

I focus on how marine harvesters have responded to the ways in which their livelihoods have changed in relation to the Canso Causeway. To be sure, the Causeway catalyzed a series of ecological impacts in the region. There is nothing ‘naturally occurring’, for example, about the creation of an ice-free passage through the Strait of Canso; this is the result of development and larger political economic interventions. But my examination is about how marine harvesters talked about these changes and how they incorporated them into their own interests, positions, and values. Do their observations about the Canso Causeway provide an important counter-narrative to ‘progress’?

### What Does ‘Progress’ Actually Mean?

In the broadest sense, the belief that development produces economic progress (Harvey, 1990, 35) is a ubiquitous assumption. Often actually concerned with economic growth and geographical expansion, and not, for example, fostering sustainable livelihoods, social relations, or ecologies, ‘progress’, for my purposes, is the assumed outcome of global capitalism where the “geographical landscape of capitalist activity is riddled with contradictions and tensions” (Harvey, 2007, 100-101). I use the concept of progress in relation to State-promoted development to highlight these contradictory and confused meanings which can be understood as (1) the tendency for ‘progress’ and

‘development’ to be at one moment synonymous and (2) at another moment antithetical, requiring intervention in order to correct the emergence of wrong sorts of ‘progresses’ (3) embedded in historical or conceptual assumptions (Cowen & Shenton, 1996). These understandings of development signify a hierarchy of value through the “appropriation of the idea of progress, of high and lower stages of human improvement and notions of superior and inferior knowledge...” (Gibson-Graham, 2005, 5), which has been the case in the Chedabucto Bay where the ecological observations of marine harvesters have been largely ignored and instead an image of economic growth generated by Strait industries is favoured and propped up by the overarching development agenda. Using progress as a concept that can be appropriated and managed by governing bodies, I treat its application to the Canso Causeway, Strait of Canso, and Chedabucto Bay discursively and flexibly, as a multi-vocalic and multivalent expression of historical, social, and political economic struggles. Progress is not only an assumption or instrument of governance, it is also a vehicle used by people who are left to make sense of and react to its application and consequences.

### Critique of Development

These consequences, I argue, are most usefully analyzed using the anthropological critique of development. Gow (1996) defines this critique through a series of questions, writing:

If one major developmental goal is the alleviation of poverty, why is poverty on the increase? Why are there such discrepancies between what is planned and what actually happens? Why do those who work in development choose to ignore recent history and refuse to learn from previous experiences? Why is development invariably defined as something that originates externally rather than internally? Why is so much of planned development viewed as a failure? (165).

Indeed, in the case of the Causeway, not a lot has changed since the region was first industrialized more than five decades ago. In effect, the State continues to prop up failing private industries amid continued claims that the area holds economic potential. In reality, the only consistently stable and profitable industry in the Strait is the original rock quarry used to construct the Causeway, now owned by Martin Marietta Materials. In 2006, the Port of Port Hawkesbury, where the crushed rock is processed for export, was the second largest per tonnage (Statistics Canada, 2006) in the country due almost exclusively to the contributions made by the rock quarry. At the same time, regional wages remain low (Statistics Canada, 2017). Over the past 10 years, the pulp and paper mill again shut its doors and reopened under new management.

Thinking through Gow's questions highlights the history of failed industrial development that emerges from the Canso Causeway's construction, allowing for an emphasis to be placed on how its unintended consequences played into the Province's political economic concerns, moving the labour force from traditional/seasonal resource extraction to industrial wage labour through the rapid industrialization of the Strait of Canso. Strait development is an ongoing process that can be thought of as "a series of events and actions, as well as a particular discourse and ideological construct" (Gardner & Lewis, 1996, 25) grounded in a promise of generating progress. It is both material and conceptual, involving changes to the Strait's ecosystem that are supported by plans for economic growth generated by future industrial expansion.

### The Function of Unintended Consequences

Development's execution produces consequences that extend far beyond the scope of the project's intentions; the consequences of development are just as important

as its stated goals. James Ferguson's work (1990) sheds light on the intentions of specific improvement schemes and the unintended consequences of these plans. The unintended consequences of development's oversight often create further schemes for improvement. But Ferguson makes the important point that unintended consequences have some function. He writes:

If unintended effects of a project end up having political uses, even seeming to be 'instruments' of some larger political deployment, this is not any kind of conspiracy; it really does just happen to be the way things work out. But because things do work out this way, and because 'failed' development projects can so successfully help to accomplish important strategic tasks behind the backs of the most sincere participants, it does become less mysterious why 'failed' development projects should end up being replicated again and again. It is perhaps reasonable to suggest that it may even be because development projects turn out to have such uses, even if they are in some sense unforeseen, that they continue to attract so much interest and support (Ferguson, 1994, 256).

It is uncanny how well Ferguson's points here relate so saliently to the history of the Canso Causeway. As the Causeway neared completion and inched toward Cape Breton Island, strong flows of water gushed into what was left of the opening of the Strait of Canso, eroding the sea floor, creating a deep passage. Where ice once moved into the Chedabucto Bay from the Gulf of St. Lawrence, the Causeway now blocked the Strait's ice flow, thereby creating the conditions for an ice-free deep-water port. These outcomes were unforeseen. Although unintended, this outcome caught the attention of planners as they sought to "improve" the region through further industrialization in the region. From there, the Strait was industrialized through the creation of pulp and paper mill, oil refinery, rock quarry, etc.

### Objectives and Oversight

The construction of the Canso Causeway was made possible by the federal and provincial governments, planners, engineers, construction workers, etc., who moved the

plan forward and gave little consideration to the social dynamics of fishing in the region. Foote (1979), whose study of rapid industrialization in the Strait of Canso and its effect on the town of Port Hawkesbury, argues that in this context, expert planners working on the Causeway concerned themselves with recommendations made by economists who were unaware of the social conditions of the region, basing their plans “on myth rather than reality” (9). Additional attention has been given to the manner in which development schemes and planners are short-sighted and/or unable to grasp the dynamics of social processes, resulting in a reductive understanding of the needs and knowledges emerging from particular spaces (Scott, 1998; Mitchell, 2002; Li, 2007). Despite suspicion that the Causeway might affect the ecology of the surrounding regions, planners moved things forward anyway due to State pressure, focusing on the technical processes that *could* be controlled and realized. Guided by the absolute belief that Cape Breton and mainland Nova Scotia needed to be quickly bridged, all aspects of the planning and execution of the Causeway were pushed forward without concern for the social, ecological, or political economic impacts that might be produced in its wake. In effect, Canso Causeway planners engaged in the reductive task of rendering all aspects of the Strait of Canso “technical” (Li, 2007, 21) by “[screening] out the political economic processes” (272) of the region. The *intention* to develop superseded consideration for the everyday realities of life in the Strait of Canso, including an account of the local fishing industry. Under development schemes, “the realm of intentions and ideas seems to come first” (Mitchell, 2002, 42-43), blinding planners to the social and political economic contexts that are right in front of them. Guided by the promise of progress, plans “...give the intention to develop priority over the actual processes of change” (Cowen & Shenton, 1996, 117),

which also partially explains why so many industries have tried and failed in the Strait. In 2010, Tim Gilfoy, CEO of the Strait of Canso Superport Corporation Limited, is quoted: “The Strait of Canso Superport is one of the largest tonnage ports in Canada with thousands of acres of industrial land for expansion. Come grow with us!” (Atlantic Business Magazine, 2010, 81). But if the deep-water ice-free passage through the Strait of Canso really did provide the ideal conditions for industrial expansion, then why have so few industries established anything resembling long-term consistency in operation?

### Regional Economic Development in Atlantic Canada

Ralph Matthews (1976) offers more context to development in Atlantic Canada, also arguing that development plans are reductive and fail to account for the complexity of social processes and communities. The Canadian development scheme is particularly problematic due to its centralized structure. The structure of the provincial and federal governments and their uneven, sometimes confused relationships often narrowly assumes that industrial development will provide *the* vehicle for improvement. It fails to see that these improvement strategies are not well suited to rural regions, like the Strait and surrounding area. He explains:

The type of development that most concerns centralized government is the top-down variety which focuses on general strategies and rarely reaches the level of the small community. These development plans are directed towards major industrial complexes which provide large numbers of jobs quickly...Top-down planners seem inclined to focus on economic and industrial development, ignoring the consequences of their actions of social and cultural values? (Matthews, 1976, 47).

Atlantic Canadian development schemes fail to identify and account for the scope and consequences of their actions because their priorities are not grounded in a concern for the particular places they are trying to improve. Instead, the intertwined roles of the

provincial and federal government can obscure their capacity to see the consequences of the development agenda (Savoie, 2000, 34), focused instead on servicing the needs of private capital. It was only in 2014, for example, that the federal government handed over ownership of the Canso Causeway to the provincial government. Even today, the federal government owns and maintains the canal and navigational locks at the Strait of Canso and continues to subsidize funding for repairs (CBC, July 2 2014). Driving much of the background logic behind the Canso Causeway's development is a confused and constantly shifting relationship between these two governing bodies who are responsible for managing available resources and often unaware that the development plans they execute are not "based on the natural skills, crafts and resources of the traditional economy, [but] simply extensions of urban policies into rural areas" (Matthews, 1976, 22).

#### Who Actually Deals with the Consequences of Development?

While development plans are carried out by decision-makers, planners, engineers, experts of varying degrees, etc., people who are left in the region are the ones who make sense of the meaning and everyday consequences produced by intervention. Practitioners of development have the privilege of quickly entering and exiting a region, but development projects become woven into and intertwined with the social fabrics of the physical spaces they are intended to improve (Pigg, 1993, 46). "Region-building projects", Orvar Löfgren (2004) writes, "often start as elite efforts, organized from above, but the ways in which the region materializes or fails to materialize is not a process which can be monitored and directed like the building of [a] bridge" (73). For the marine



harvesters in the Chedabucto Bay who were forced to adapt to the consequences of the construction of the Canso Causeway, this is especially true.

### Livelihood, Fishing, and The State

Fishing livelihoods involve their own sets of conditions, resources, social relations, class relations, and understandings. Gavin Smith (1991) defines livelihood as the “daily task of piecing together a living” (13). Along the coast of Nova Scotia, this piecing together has often been grounded in the coastal zone small boat fishery, where it is “...best understood as a way of life rather than an occupation” (Davis & Ruddle, 2012, 250). But this way of making a living has changed dramatically over the past century. The emergence of new fishing technologies has affected the ways in which fishing actually takes place, creating technologically-astute marine harvesters equipped with high tech sounders, compasses, and GPS-equipped fishing boats (SRSF, 2001). But these shifts also come at a financial cost. The federal Department of Fisheries and Oceans has adopted a far greater regulatory role (Sinclair, 1992, 93) than it once had in the form of costly and selective fishing licenses and by restricting when and where fishing is possible, dictating a shift in fishing practices from one generation to the next. Davis and Wagner (2006) point out that access is determined by the state. In Canada, “participation in fishing is a ‘privilege’, the terms and conditions of which are determined by the Crown” (478). This intensification of management practices consequently means that there are fewer inshore harvesters since the high costs of making a viable living has increased. Apostle and Barrett (1992) argue that this intensification could be due to the challenges fishing poses to capitalist expansion and practice. Because of these challenges, the management scheme has had to develop indirect strategies to exclude harvesters from

controlling the means of production. They write:

The fishery offers a particularly interesting opportunity to examine the nature of obstacles to extended capitalist development. Capital can neither privatize access nor consolidate production in the harvesting sector in a manner that is consistent with the basic principles and organizations methods of industry elsewhere (Apostle & Barrett, 1992, 38).

Although fishing poses challenges for capital accumulation, it has, in no way, been excluded from capitalist processes and expansion. Unpredictable qualities inherent to fishing are what make the fishery difficult to privatize, so how can a migratory species such as mackerel be privatized? Apostle and Barrett are pointing out that the ‘on the water’ social conditions contrast notably with ‘at the wharf’ conditions, and that the economics of resource exploitation pose risks and challenges for capital to undertake a direct role. Ultimately it is more ‘efficient’ to appropriate value through control of price and access to markets, leaving coastal harvesters to bear the capital investment risks.

Davis and Ruddle (2012) connect the dots:

...The neoliberal state pursues regulatory policies and seeks opportunities that will download responsibility and costs onto citizens, whom it understands as ‘clients’, ‘users’, and ‘stakeholders’. In so doing, the state champions the imposition of market-based logic and discipline to organize and express new management responsibilities. In turn, this fosters the interweaving of livelihood interests as self-interest with management responsibilities (247).

Approaching the intersection between fishing and the neoliberal state can be challenging because there are multiple layers of perspective to consider (Morse, 1992, 149). Marine harvesters are not an exclusively homogenous group with shared interests. There are many different strategies and avenues harvesters can pursue to piece together a living. It is important, for example, to distinguish between inshore and offshore harvesters and their related political ecological/economic contexts. These two conflicting groups are

sometimes at odds with one another (Matthews, 1983, 198) since offshore, industrial fishing is often given priority by governing bodies. The 1992 cod moratorium and further collapses in the ground fishery speak both to the ways in which small boat harvesters have been blamed for overfishing and also to the role and execution of power embedded in the state. Greenberg (2006) argues that small boat harvesters are often blamed for depleting fish stocks, but in reality, responsibility rests with the governing body's poor management practices, underscored by the insatiable thirst for capital implicit in the neoliberal state. Promoted through 'management policies' of conditions wherein capital can better pursue its prime interests, the industrial capitalist mass harvest and non-selective fishing have devastated the ecology, resources, and livelihoods of the more traditional resource-based economies.

### Local Ecological Knowledge

With these conditions in mind, it is no stretch to imagine the tensions that exist between inshore harvesters and external regulating bodies. On top of this, harvesters are constantly mediating the physical conditions of their work. Weather, tides, shifts in biota and vegetation from one year to the next, and the commercial market are all factors to consider; indeed, marine harvesters take account of these conditions when they begin each fishing season. It is true that fluctuations in fishing stock and the market also depend on a variety of other factors. This sort of livelihood involves risk-taking and an understanding of the material conditions that make up each harvester's grounds. This understanding has been approached using the conceptual lens of 'local ecological knowledge'. Drawing upon the work of Anthony Davis (Davis & Wagner, 2004; Davis & Ruddle, 2010; Davis & Ruddle, 2012), I define LEK as a local system of knowledge and

knowledge claims that are demonstrably shared among a group of harvesters and used for the purposes of piecing together a viable living. Often synonymous with ‘traditional ecological knowledge’ or ‘indigenous ecological knowledge’, LEK is used to capture “the sum of the data and ideas acquired by a human group on its environment as a result of the group’s use and occupation of a region over many generations” (Mailhot cited in Neis et al, 1999, 218). I treat LEK as knowledge that facilitates livelihoods. For example, harvesters in the Chedabucto Bay have expressed that the migratory patterns of marine species were redirected due to the damming of the Strait of Canso. Their knowledge of these migratory patterns is intrinsically linked to a shift in how they could reliably expect to make a living, before and after the construction of the Canso Causeway. This is articulated by García-Quijano (2009) who suggests that “the main value of LEK...for small-scale fishers around the world, is that it helps them navigate their social and ecological systems and make a living from fishing” (2). LEK is the strategic information and particular world view that harvesters must possess in order to make a viable living.

### The Political Implications of LEK: A Note of Caution

But this conceptualization of LEK has also made it a rather attractive sell to marine policy and management circles seeking to understand how particular ecological regions are influenced by the people who use them. There has been a push for the collection of LEK by natural scientists (Almudi & Kalikoski, 2010; Carter & Nielsen, 2011; Foster & Vincent, 2010; Moreno-Baez et al., 2010). These researchers argue that the collection and use of marine harvesters’ LEK will help to improve the management of the fishery. This literature tends to overwhelmingly ignore the political tensions and contentious relationship that exists between fisheries management and marine harvesters,

as described above. Others have approached LEK as a knowledge that is either “disappearing” or could disappear and as a result needs to be collected, documented, and preserved (Martin, Diemont, & Ferguson, 2010). Some researchers suggest that the political mobilization of LEK to supplement data-poor fisheries research might give added weight to harvesters’ practices and experiences. They suggest that LEK could mediate the tensions that exist between marine harvesters and fisheries management if it is able to change the status quo of management practices (Murray et. al, 2008; Rasalato et. al, 2010; Emery & Barron, 2010). These works emphasize a need for collaboration but are largely apolitical in scope; they do not engage the political economic context of fishing or the neoliberal state.

Emerging from the debate is a warning against an uncritical and apolitical approach to collecting, documenting, and incorporating LEK into marine policy or further research. LEK is subject to power relations, history, and conflict. Failing to situate LEK in the larger context of neoliberalism produces “a political drama where agency is distributed across unequal power relations, the specific inequalities of which are inevitably modified according to whose knowledge comes to be valued” (Sheperd, 2010, 646). As I have suggested throughout this chapter, there is little proof the neoliberal state values the livelihoods (let alone the ecological observations) of marine harvesters. LEK, then, must be approached carefully. Knowledge is political and must be grounded in the political arenas of capitalist practices and processes where marine harvesters struggle to make a viable living. The “daily task of piecing together a living” (Smith, 1991, 13) embeds marine harvesters in a way of life made up of tight-knit social relations and larger processes that bear upon their motivations for fishing, framing their understanding of the

material world and environment wherein they extract their livelihoods.

## Conclusion

Situating my analysis in the political ecology of the Canso Causeway, I argue that the unintentional consequences produced by its construction played into the State development agenda's larger narrative of 'progress'. Challenging the assumption that Strait development generates economic growth, I apply the anthropological critique of development to frame how the planning and execution of the Canso Causeway was short-sighted and failed to account for the livelihood patterns of local marine harvesters. I position industrial expansion in the Strait as symptomatic of larger capitalist practices and processes, noting the neoliberal character of contemporary strategies for Strait management. Given that so few Strait region industries have succeeded, I ask why the State-promoted development agenda continues to reproduce the same failing strategies. Illustrating that the unintended consequences produced by the Canso Causeway have some function, I show how development is grounded in intent rather than on the material, everyday realities of life in the Strait of Canso and surrounding regions. Continuing to link this political economic context to marine harvesters, I move into a discussion of livelihood, fishing, and 'local ecological knowledge' (LEK). Arguing that fishing livelihoods are exploited and indirectly managed, I highlight the strained relationship that exists between marine harvesters and the State. I suggest that the intensification of neoliberal management policies have affected how marine harvesters negotiate their livelihood conditions and local ecological knowledge. Using the work of Anthony Davis (Davis & Wagner, 2004; Davis, Hanson, Watts, & Macpherson, 2004; Davis & Wagner, 2006; Davis & Ruddle, 2010; Davis & Ruddle, 2012), I define LEK as a shared system of

knowledge that is used to piece together a living. Applying careful consideration to the political implications of exploring LEK, I position the concept as a means for analyzing how marine harvesters express their ideas about making a living, the marine environments they use to do so, and the larger political economic processes that structure what they can and cannot do. This shared system, as I will argue in the following chapter, provides the basis for a counter-narrative to assumptions that the State-promoted development agenda generates progress.

## Chapter 5      The Significance of Harvester Ecological Knowledge

“If there is any meaning to history, then that meaning has to be discovered and defined from within the maelstrom of change, a maelstrom that affects the terms of discussion as well as whatever it is that is being discussed” (Harvey, 1990, 12).

### Introduction

Although the Strait of Canso underwent significant industrial expansion in Nova Scotia beginning in the late 1950s, this was not the first moment in history that the region was considered economically important. The importance of the Chedabucto Bay’s fishing industry dates to the 1600s. Innis (1940) and Hart (1975) document how the French and British colonies warred for control over the region specifically due to its abundance of marine resources. Fishing is a vital activity in the region and is carried out in the context of a history of cultural and economic struggle. In the early part of the twentieth century, marine harvesters in the province were amongst the poorest working people; while this has gradually improved over time (Matthews, 1983, 200-201), harvesters are affected by those larger forces that restrict their ability to make a living. When an event or process shakes up this struggle, like the construction of the Canso Causeway or the subsequent industrial expansion that followed, so too does that livelihood change.

In this chapter, I present interview data collected in 2001-2003 from peer-recommended local ecological knowledge ‘experts’ who fished in the Chedabucto Bay all their lives. Exploring the ways in which marine harvesters discussed their livelihoods in relation to the Canso Causeway, I argue that the structure exists as a historical and geopolitical marker that disrupted their ability to make a living, along with the ecological



conditions of the Chedabucto Bay. They discussed these disruptions largely in relation to (1) declining ground fish and lobster stock since the Causeway's construction, due to forced shifts in migratory patterns, (2) reduced tidal action in the Chedabucto Bay that promoted the buildup of silt and resulted in a dramatic increase in pollution due to industrial development in the Strait of Canso. I bring these observations together by describing 'The Garden', a local landmark that had once been known for its fertile fishing ground, but since the construction of the Causeway, declined and all but disappeared. Illustrating how marine harvesters discuss their livelihoods through observations about the environment, I show that harvesters did not share the province's assumptions about its development framework. Manifest in the daily practice of fishing and informed specifically by what progress is *not*, harvesters expressed their notions of progress by identifying the everyday qualities that impeded their ability to make a living. Harvesters challenged the province's assumptions about development by finding ways to express how the Canso Causeway negatively impacted their work. I conclude by suggesting that the Canso Causeway symbolizes an ongoing adversarial relationship existing between marine harvesters and the Canadian state.

### Ecological Observations

The 1955 damming of the Strait of Canso obstructed the expected flow of lobster larvae and migration of key commercial catch species, preventing marine resources from populating the bay as they had in the past. "...In a matter of a year or two," one harvester noted, "the system changed. And it wasn't just building a bridge; this causeway blocked off...[the] passageway completely. The whole environment had to readapt" (H7, 2002). As the bay changed, so too did their understanding of the everyday conditions of fishing

in the Chedabucto Bay. Interview data collected from 11 peer-recommended local ecological experts illustrated that marine harvesters overwhelmingly and unanimously agreed that the Canso Causeway had negatively impacted the Chedabucto Bay's ecosystem and fishery. They talked about these impacts in relation to present-day conditions and as a historical process of change and adaptation, often describing what the Bay, and their livelihoods, were like before the construction of the Causeway. Consistently and unambiguously expressed through observations that emphasized declining fish stocks, the character of these observations was necessarily economic in nature. Decreasing fish populations meant, for these men, a decreased capacity to make a viable living through fishing.

### Impact on Migratory Patterns

Blocking the Strait forced fish to change their migratory patterns. Fish used to travel south from Cape Breton, down the Strait of Canso, and into the Chedabucto Bay; this was the case for all commercial migratory fish. “[The Causeway],” one harvester argued, “made all the change in the world. We never got mackerel in the fall of the year. It never came through” (H9, 2002). Another noted that “there used to be haddock [and] hake, but that was before they built the Causeway” (H1, 2001). Opposing the State's narrative, the unintended consequences of the construction of the Canso Causeway were experienced as a detriment to the local fishery, intensifying unfavorable and inopportune conditions of work. Possibly the most important aspect of harvester LEK is knowing where fish will be. This did not change in the wake of the Causeway's construction, nor in the subsequent realization that it had changed the predictability of their harvest. If fish

were not migrating through the Strait of Canso, where were they going? How had the marine resource been effectively redistributed? Harvesters had answers.

We used to get a lot of hake. They get it in Port Hood<sup>16</sup> now. Not one down here. Haddock was the same. We used to get haddock that came from the North Bay<sup>17</sup>. We haven't seen haddock since. It [was] cut off [from the Bay]. After the first year they [built] the Causeway, I set nets, but after that I didn't bother [anymore] because I never got any mackerel (H9, 2002)

Not only were harvesters forced to change their livelihood strategies, they also needed to transform a series of (what had been) reliable expectations about the fishery. After the Causeway, they argued, commercial species such as hake, haddock, and mackerel swam south through the Northumberland Strait, around Prince Edward Island, and then back north around Cape Breton, until finally heading south adjacent the Gulf Stream.

I can't say but I'll say the Causeway got a lot of things to do with it... They never use[d] to get herring off Ingonish... they're getting all kinds of herring off Sydney so that changed the herring from coming in this way to going the other way. To my knowledge [it's] the same thing [with mackerel]. They are getting mackerel off PEI... I'd say that the Causeway [explains] the mackerel that's coming up from PEI in the fall of the year (H8, 2002).

An unfortunate consequence of the Causeway is that it literally divided the local fishery. The development model employed by the State presents itself as doing exactly the opposite, but the Causeway created tensions in the broader fishing community over access to resources. The same is true for the commercial lobster fishery. While the obstruction of the Strait prevented lobster larvae from entering the Chedabucto Bay, it also meant they had been cordoned off on the other side of the Causeway, in St. George's Bay. "When you go [to the] other side of the Causeway," one harvester noted, "the lobsters are thick and [on] this side, there's none" (H4, 2002). Though unintended, the

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<sup>16</sup> Located on the other side of the Causeway, adjacent St. George's Bay.

<sup>17</sup> Located in Cape Breton.

construction of the Canso Causeway brought with it the challenge of anticipating where the fish had gone. To continue making a viable living, harvesters were obligated to invest additional resources toward understanding the shifting conditions of their work and the Bay's marine ecology. But along with shifting livelihood conditions, tight-knit connections to and ideas about place, space, and community were also swept up in the storm of change brought about by the Canso Causeway.

### Slowed Tidal Action, Silt, and Pollution

“The downfall in the Bay was the tide. The Causeway changed the tides completely”  
(H9, 2002).

Though damming the Strait literally prevented fish from swimming through, it also radically decelerated the flow of tides. The impacts were two-fold: without strong tidal action once present in the Bay, there was (1) nothing to flush away accumulating mud at the bottom of the ocean floor, which dramatically intensified unfavorable conditions for harvesting lobster<sup>18</sup> nor was there anything to (2) move the buildup of industrial pollution collecting at the base of the Strait largely due to the pulp and paper mill. Explaining the connections between the Causeway, tidal action, industrial development and declining marine resources, one harvester commented:

Since they put the Causeway there, the lobsters went down [in number]. And I would say it's the same thing with the rest of the fish. It stopped the tide from going through. It didn't help the fisheries in any way...The pulp mill['s pollution] is still there. Nothing moves out” (H10, 2002)

Supporting this claim, another harvester noted:

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<sup>18</sup> One of the most common observations made by harvesters is that “muddy bottom” presents an extremely poor condition for lobster fishing.

‘...the Causeway hurt the fishermen a lot in Chedabucto Bay...[with the] pulp mill and [other industries]...There used to be a lot of tide going back and forth...[that] would [have flushed the pollution] out...The Causeway should have...been a bridge like [in] Halifax, and then everything...would have pass[ed] underneath’ (H8, 2002).

Though the Angus L. MacDonald provincial government had also been responsible for bridging Dartmouth and Halifax in 1955, it had been determined that building a bridge across the Strait of Canso would be far too costly. Because those responsible for developing the Strait failed to shoulder the costs of a bridge, harvesters were quietly, and without additional resources, left to sort through the political, economic, and ecological chain of events that followed. Another unintended consequence of the Causeway is that marine harvesters in the region indirectly assumed the material expenditures associated with adapting to their fluctuating livelihood conditions. This was not the economic growth that had been promised.

### The Destruction of ‘The Garden’

These ecological impacts are brought together through descriptions of ‘The Garden’, a local historical landmark and fishing ground assigned by marine harvesters in the Chedabucto Bay. During interviews, harvesters had been able to point out this region, which is represented in Appendix A.

Framed against images of mud and pollution, shared visions of a previously lush garden provide a powerful sense of what the Canso Causeway represents to these men. Once a bountiful lobster ground, the Garden had since been destroyed due to significant accumulation of mud along the seafloor. Before the damming of the Strait of Canso, harvesters could reliably expect to do well in the Garden. It had been a place where they knew they could catch lobster. Experienced as a serious forfeiture, harvesters made sense

of lost resources through their ecological observations. The Strait's obstruction meant fish and lobster larvae could not get through to the Chedabucto Bay. Slowed tidal action meant mud settled at the base of the seafloor, covering up favorable conditions for marine species to gather. All the while, industrial expansion was taking place, now providing a continuous source of pollution in the Strait. As one harvester said, "After the Causeway, the old Garden went downhill. We never fished on the Garden again" (H6, 2002).

### A Counter-Narrative to 'Progress'?

What, then, is 'progress' to a marine harvester? It seems fruitful to think of 'progress' as a configuration of what matters to these men in their pursuit of a viable living. As the key site of historical, social, and economic relationships, their livelihoods, families, friendships, and material realities depend upon their ongoing ability to fish in the Chedabucto Bay. Given that they were the locally selected ecological 'experts' of their region, the significance of their observations bears consideration. While they were by no means conservationists, inshore marine harvesters did share a knowledge of the physical and ecological qualities of the Chedabucto Bay; it is the material reality where they spent much of their lives. Since their understanding of these qualities was directly informed by their capacity to make a viable living, the observations described above show that marine harvesters saw the Canso Causeway as a destructive force in this pursuit. For this reason, their notion of 'progress' is often grounded by specifically describing what progress *is not*. And for these men, progress did not mean struggling to make a living. By examining their observations, a counter-narrative to the 'promise of progress' offered by the Canso Causeway becomes obvious. Their collective understandings of these ecological shifts, through rerouted larval and marine species

migratory patterns, slowed tidal action resulting in unfavorable conditions to harvest marine species, or industrial pollution indicates a common knowledge that forces outside their control were continuously threatening to extract those same resources needed to make a living. Their livelihoods were always precariously situated in a larger drama of political ecological forces.

### A Lightning Rod for Tension

“You still could make a living [before the Causeway was built] but after that, we were finished here” (H9, 2002).

Thrust into an unsupportive web of political economic forces, marine harvesters were left to develop their own explanations for ecological phenomena in the Chedabucto Bay. Situating the Bay’s shifting marine ecology alongside the larger development schemes that weighed upon their ability to make a living, marine harvesters’ collective frustration with the chain of events produced by the construction of the Canso Causeway was evident. Not only did the damming of the Strait impact their livelihoods, but so too did the industrial development that followed. Amid the State’s assumption that its approach to development generated progress, harvesters were forced to reckon with the daily reality of these assumptions and so-called ‘progress’. By examining the frequency of stark comments that “[the Causeway] destroyed everything and everybody on this coast” (H5, 2002) or that it “killed the Bay” (H2, 2001), I wonder if their criticisms tell us something deeper about how people make sense of shifting landscapes and livelihoods, particularly when these transformations take place totally outside their sphere of control. Perhaps the Canso Causeway offered these men a vehicle for talking about broader changes in their capacity to make a living.

Grounded in an ongoing historical struggle over access to resources, there exists an uneasy relationship between the intensification of neoliberal capitalist processes and fishing. Since the construction of the Causeway, many harvesters were pushed out of the fishery due to skyrocketing overhead costs and larger pressures to join the seasonal/industrial labour force. One harvester mentioned: “Besides [lobster and crab earnings] you wouldn’t be able to [make a living through fishing]. Not the way everything costs. Now everything is a fortune” (H1, 2002). Where a harvester once freely passed their fishing gear and licenses down to a child upon retirement, for example, this was not so frequently the case. These items needed to be sold to service debts or secure something resembling a pension. Harvesters could no longer envision that their children would enter the fishery in the same way that they had been groomed to do so by their families when they were young. The unintended consequences of the Canso Causeway are not solely to blame for the strife experienced in the Chedabucto Bay’s fishery.

Successfully adapting to change effectively became the hallmark livelihood feature for these local ecological experts. Their capacity to generate a viable living hinged on whether they could adjust not only to a changing marine/ecological landscape, but also to emerging beliefs, attitudes, and expectations exacerbated by the intensification of neoliberal capitalism through the 1970s onward. Due in part to the relationships these men shared with one another and to the Bay itself, the construction of the Canso Causeway catalyzed a series of consequences within a fluctuating cultural, political, and economic context. Relations of kin, community, property, and livelihood were swept up in a larger process of change centered around downloading responsibility onto individuals, effectively freeing up private industry and foreign capital to set up shop in



the Strait of Canso under the reckless and uncritical assumption that it would generate progress through economic growth. The industrial expansion of the Strait's "success" or "progress" is best understood as a reflection of the exploitation grounding the expression of capitalist processes and practice. Pressured to make space for the wave of uncertainty generated by State-promoted development and neoliberal policies, the counter-narrative provided by the marine harvesters of the Chedabucto Bay problematizes the value and the consequences of the construction of the Canso Causeway, but also of the larger forces responsible for making, maintaining, and managing the realities of its cumulative effects. Marine harvesters, whose livelihoods were grounded in their capacity to extract marine species, talked about the Canso Causeway specifically because it has barred their access to these resources.

## Conclusion

Marine harvesters in the Chedabucto Bay discussed the Canso Causeway as a key source of stress in their pursuit of a viable living. Its constant reminder shaped their livelihood strategies and experiences, forcing them to accommodate a series of unintended consequences brought about by its construction. These unforeseen consequences are often seen through the lens of industrial expansion by the State-promoted development agenda. However, this development narrative often obscures the fact that marine harvesters have had stakes in the Strait of Canso for hundreds of years. They were historically connected through kin and community relationships embedded in wider cultural, political, and economic processes.

In this chapter, I synthesize the significance of the history of the Canso Causeway in relation to the local ecological experts of the Chedabucto Bay. Presenting interview

data that captured the collective disdain for the Canso Causeway, I have described how they discussed the ecological impacts of the damming of the Strait of Canso. They talked about these consequences through forced changes in the migratory patterns of fish and lobster larvae that obstructed their access to the Chedabucto Bay and through the impacts on tidal action which resulted in a slowed tide that promoted the buildup of mud and industrial pollution over once profitable fishing grounds. I bring these observations together by describing ‘the Garden’, a local fishing ground in the Chedabucto Bay that had once been considered an especially advantageous place to fish. But since the construction of the Causeway, the Garden’s viability had declined due to low catch rates and a muddy seafloor. In 2001-2003 harvesters reported no longer fishing on the Garden as they had prior to the Causeway’s construction.

These findings show that marine harvesters discussed the Canso Causeway in relation to their livelihoods specifically because it disrupted their ability to make a living. Their ecological observations underscore a troubled historical struggle over access to marine resources, offering a counter-narrative to the Causeway’s promise of progress as presented by the State-promoted development agenda. Marine harvesters did not share the assumption that the unintended consequences of the Canso Causeway promoted economic growth through the expansion of private industry and foreign capital investments. Instead, they disputed these claims, showing how these assumptions impeded their ability to access marine resources. Forced to reckon with the consequences of government intervention and the rise of neoliberal policies daily, marine harvesters developed an intimate knowledge of the political ecology of the Chedabucto Bay, the

chain of events produced by the construction of the Canso Causeway, and of the larger web of political forces under which they were constantly thrust.

## Chapter 6 Conclusion

Addressing the strained relationships between fishing, the State, and its development agenda, this thesis has aimed to answer three questions: how did the marine harvesters of the Chedabucto Bay discuss their livelihoods in relation to the Canso Causeway in 2001-2003? Did their notion of ‘progress’ challenge the province’s assumptions that its development agenda promoted meaningful economic, environmental, or social change? What do their observations tell us about the political ecology of the Canso Causeway? Completed in 1955, the Canso Causeway amounts to a fixed barrier spanning the Strait of Canso that radically changed the surrounding area’s political ecological landscape. Briefly reviewing the background history of the Causeway’s construction and the industrial expansion that followed, I have presented interview data collected from 11 peer-recommended local ecological knowledge experts who had been fishing in the Chedabucto Bay in 2001-2003 and before. Exploring knowledge claims of ecosystem and livelihood impacts, I have argued that their narrative of change constitutes an important challenge to the province’s assumptions that its development agenda generates progress, raising critical issues concerning the political ecology of regional economic development in Nova Scotia.

Through my relationship as a research assistant for Drs. Anthony Davis and Alida Bundy from 2009-2011, I employed a secondary analysis of interview data collected by Social Research for Sustainable Fisheries in 2001-2003. Guided by questions around how marine harvesters discussed their livelihoods in relation to the Canso Causeway, I aggregated and organized knowledge claims that reflected their key arguments. I centered these arguments around observable ecological shifts that had forced them to adapt their

livelihood strategies to continue making a viable living. Data analysis showed harvesters contend that the damming of the Strait of Canso had directly contributed to low catch rates through forced shifts in migratory patterns and through decelerated tidal action that promoted unsuitable conditions for harvesting marine species. Sketching a brief history of the larger decision-making processes backgrounding the transformation of the Strait region, I supplemented the interview data using archival research to provide a brief history of (1) the province's decision to develop the region in the 1950s, (2) the unintended ecological and economic consequences of the Causeway, and (3) the emergence and intensification of industrial expansion catalyzed by the Causeway's construction.

Using the lens of political ecology to frame my analysis, I have applied the anthropological critique of development in an Atlantic Canadian context in order to examine who benefits from the so-called "progress" generated by the Causeway and the industrial expansion of the Strait. Arguing that the provincial development agenda's larger narrative of progress has been at the expense of the marine harvesters of the Chedabucto Bay, I connected concepts of livelihood and local ecological knowledge to show how the Canso Causeway has negatively impacted their capacity to make a living. Since their knowledge claims are entirely focused on how the Causeway exacerbated their struggle to extract marine resources, they illustrate a distinct counter-narrative to the Province's assumptions that its development agenda generates economic and social progress. These contestations speak to a larger history of conflict and web of political ecological relationships based around the exploitation of marine harvesters, the resources

they work to extract, and the ecological contexts where they have always struggled to eke out a living.

### Limitations and further research

It should also be noted that the data was collected almost twenty years ago. I wonder whether this gap calls for further research, and if there is any need to check in with what has or has not changed in the lives of marine harvesters or in their perceptions of the Canso Causeway or local fishing grounds. All marine harvesters interviewed would now be retired: has retirement shaped their attitudes, beliefs, and relationship to the Bay? Who is now fishing in their place?

I also wondered about the marine harvesters located on the other side of the Causeway, in St. George's Bay. How did they talk about their livelihoods in relation to its construction? Did they benefit from the damming of the Strait? Some harvesters believe the Causeway actually helped the fishery because lobster larvae were blocked from entering the Chedabucto Bay which subsequently meant greater lobster catches on the St. George's Bay side (Dadswell, 1993). Unfortunately, given the limited scope of this thesis and the need for a realistic research focus on the unintended consequences of the Canso Causeway it is necessary to restrict the enquiry to Chedabucto Bay, and to leave the impacts on St. George's Bay for future study.

This thesis might provide entry points for comparative analyses between types of State-promoted development projects, and of fixed links in particular, that have impacted Atlantic Canadian fisheries. Future work could examine the intersection of power, history, and the political ecology of structures like the Cape Sable Island Causeway (Medel, 2008) or the Confederation Bridge (MacGregor, 2009), which have both been

reported to have disrupted nearby fisheries. These works could provide additional insight into the ways in which livelihoods and ecological knowledges are intertwined and negotiated in similar political economic contexts. It could also provide the opportunity for continued application of the anthropological critique of development in Atlantic Canadian contexts. Likewise, case studies examining Strait industries in more detail could enrich findings presented here.

Although I do not attend to gender in this work, this is not to suggest that I have not considered the ways in which women have participated in fishing. Women have played a vital role in Atlantic Canadian fisheries, contributing their labour to small boat harvesting and to processing plants (Neis, 1999; Porter, 1985), but given that all the peer-recommended experts who had been interviewed were men and the limited scope of my research, I have been unable to situate and attend to the larger implications of how fishing is gendered and how these roles impact fishing the Chedabucto Bay. However, this does offer the opportunity for future consideration of women's role in the area's fishery. Survey data collected by the Social Research for Sustainable Fisheries research collaborative, for example, revealed that Richmond and Guysborough County harvesters reported 35.9% of wives fished compared to 28% of sons (SRSF, June 2002, 11), showing that women's labour contributions constitute an important piece of the larger fishing community's social tapestry.

## Implications

These findings are supported by a larger body of work that has identified a need to critically examine development and decision-making processes. This lens is frequently used to examine cases elsewhere in the world, but I strongly argue in favor of its use in

more Atlantic Canadian contexts, particularly where expressions of power intersect with debate around the failure of ‘regional economic development’. In this case study, the anthropological critique of development has shown itself to be an invaluable analytic tool.

Recent interest in documenting local ecological knowledge as a means for generating marine policy offers an opportunity to unpack the implications of employing LEK in politically contested sites. Researchers employing this concept should reckon with the power relations inherent in fishing, carefully noting that ecological knowledge is not produced for the sake of accumulating knowledge, but to instead piece together a viable living. As I have argued, fishing, as a way of life, is enmeshed in a historical struggle over access to resources, and failure to capture this context risks further intensifying the exploitation marine harvesters face in their pursuit of extracting marine resources. This research contributes to a growing criticism with neoliberal policies intended to download responsibility onto individual citizens to the implied benefit of private capital interests. Any efforts to co-opt their knowledge claims with the intention of improving fisheries management must not naïvely offer an assist to the neoliberal logic and practices into which they would be fed, but to instead critically consider the potential for unintended consequences that might negatively impact their ongoing capacity to make a living.

### Concluding remarks

Attending to the contradictory expressions of ‘progress’ produced by the construction of the Canso Causeway, my analysis, grounded in the ways marine harvesters discussed their livelihoods, questions whether their notion of progress



challenged the province's assumption that its development agenda generates growth. The counter-narrative they provided, that the damming of the Strait of Canso obstructed their capacity to extract marine resources, asks us to critically consider the intentions of State-promoted development. If the State's agenda is executed at the expense of the people and places it has promised to develop, then for whom are these promises actually made?

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# Appendix A: Map of 'The Garden'



MAP 1

**Study Area Legend**

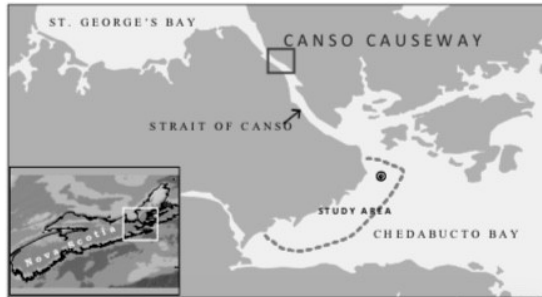
- Township
- Harbour
- Mud Location

**Study Area Boundary**

- The Garden

**Topography**

- Landmass
- Water Body



MAP 2

Map Sources:  
 Nautical Chart 4335  
 Maritime Demographic Maps  
 (Statistics Canada Census)

Author: Lora O'Halloran  
 GIS Supervisor: Andrea Kmetty

Disclaimer: Maps are serving as visual aids only;  
 locations are approximate.

November, 2010

Appendix B: Ice-Free Conditions in the Strait of Canso

