

Winter 2001

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Recommended Citation

Hamilton, L.C., Butler, M.J. Outport adaptations: Social indicators through Newfoundland's Cod crisis. (2001) *Human Ecology Review*, 8 (2), pp. 1-11.

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Outport Adaptations: Social Indicators through Newfoundland's Cod Crisis

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Abstract

The 1992 moratorium on fishing for Northern Cod marked a symbolic end to the way of life that had sustained Newfoundland's outports for hundreds of years. It also marked the completion of an ecological regime shift, from an ocean ecosystem dominated by cod and other predatory groundfish, to one in which such fish are comparatively scarce, and lower-trophic-level invertebrates more common. We examine patterns of change seen in large-scale social indicators, which reflect the smaller-scale adaptations of individuals and communities during this ecological shift. Trends in population, migration, age, unemployment and dependency suggest declining conditions in rural Newfoundland over the years of fisheries troubles. The 1992 crisis accelerated previous trends, but did not produce great discontinuities. Some trends date instead to the late-1980s resource-depletion phase that ended the "glory years" of Newfoundland's groundfish boom. Government interventions meant to soften the economic impact of the 1992 crisis also blunted its social impacts, effectively postponing or distributing these over a number of subsequent years. Outport society is adapting to shifts in the regulatory and global-market environment, as well as changing marine ecology. Adaptive strategies include new investments in invertebrate fisheries, changes in education and migration, and continuing reliance on the informal economy.

Keywords: Newfoundland, fisheries, social indicators, population, migration, cod crisis, dependency

Introduction

The Northern Cod, an Atlantic cod (*Gadus morhua*) population inhabiting the continental shelf off Newfoundland's east and northeast coasts, historically has been among the world's richest fishery resources. This resource supported European settlement of North America (Innis 1978; Kurlansky 1997), and shaped society on the island of Newfoundland itself for five hundred years (Sider 1986; Sinclair

1988; Candow and Corbin 1997). During those centuries, fishing technology and effort increased slowly, having incremental and hard-to-perceive effects on the resource (Hutchings and Myers 1995). In the decades after World War II, however, technology and effort leaped forward. The Northern Cod came under new pressure from industrialized trawler fleets. Canada's 1976 declaration of a 200-mile economic exclusion zone (EEZ) sharply cut back fishing by foreign fleets, but Canadian domestic capacity soon built up to compensate. Signs of depletion were noticeable, but not yet officially acknowledged, in the late 1980s (Chantraine 1993; Finlayson 1994). By 1992, as Northern Cod biomass fell to one percent of its earlier level, a crisis was undeniable. Facing ecological collapse on a historically unprecedented scale, the government declared a moratorium on fishing for the Northern Cod.

It was soon apparent that this collapse involved more than the Northern Cod. Cod resources off Nova Scotia, New England, Greenland and in the Gulf of St. Lawrence also were dangerously depleted by the early 1990s (Boreman et al. 1997). Populations of other fish species — some valued by commercial fisheries, and others taken unintentionally as bycatch — fell in many areas as well (Hamilton, Duncan and Haedrich 2001). Northeastern Atlantic fisheries, including those of Iceland, Norway and the Faroe Islands, had experienced their own crises in groundfish resources during the late 1980s or early 1990s (Hannesson 1996; Hamilton and Haedrich 1999). In Newfoundland's case, however, the fall from abundance to commercial extinction was most profound. In the years since the Northern Cod moratorium, there has been little evidence of recovery (Lilly et al. 2000), and recovery appears unlikely at present levels of fishing (Haedrich and Hamilton 2000).

On land, the Northern Cod moratorium affected tens of thousands of Newfoundland workers, and undermined hundreds of coastal communities (Candow and Corbin 1997; Palmer and Sinclair 1997; Harris 1998). There were dire warnings about the social consequences, but government interventions softened these — initially, providing income assistance through the \$484 million Northern Cod Adjust-

ment and Recovery Program (NCARP), followed in 1994 by The Atlantic Groundfish Strategy (TAGS) with an allocation of \$1.9 billion. As TAGS expired in 1998, a further \$730 million package was announced to assist with retraining and restructuring adjustments for workers displaced by the downsizing fishery. The benefits of TAGS and other supports, distributed unevenly among outport residents, created new inequalities and social divisions.

Although groundfish have not returned to their earlier abundance, alternative species have become the new mainstays of Newfoundland fishing. These alternatives — principally invertebrates such as crab and shrimp — currently yield catches comparable in value to the former cod fishery. Income from the alternative fisheries is distributed differently, however. It does not necessarily benefit the same people, enterprises or places that formerly were supported by cod.

In this paper, we examine some of the social changes occurring in Newfoundland through the Northern Cod moratorium. Comparisons of social indicators across five Newfoundland regions provide a large-scale perspective on this period, and show the crisis aftermath in the context of earlier trends. Finer-scale perspectives help to interpret these trends.

From Cod to Crustaceans

In 1991, 45% of Newfoundland's 568,000 people lived on the Avalon Peninsula, many of them around the capital city of St. John's (Figure 1). Away from St. John's, Newfoundland's population is dispersed among a handful of smaller regional centers, and hundreds of coastal towns or villages called outports. Most outports had been settled initially for cod fishing. Often they possessed few local resources besides cod, and were distant from population centers or markets. In the analyses that follow, we focus on the comparatively urban Avalon Peninsula and on four rural regions (Census divisions) that are Newfoundland's most fisheries dependent: the Northern Peninsula, Notre Dame Bay, South Coast and Burin Peninsula. In 1991, more than 20% of the Northern Peninsula's labor force worked in "fishing and trapping" (primarily fishing) industries. The Notre Dame Bay (12%), South Coast (10%) and Burin Peninsula (8%) regions also leaned heavily on fishing. In contrast, fishing comprised a smaller fraction (2%) of jobs on the Avalon Peninsula. Even the Avalon, however, contains rural areas and outports.

Figure 2 tracks changes in the landed value of fisheries products by type, in four rural regions over 1986-2000. Raw data were provided by the Newfoundland Region Department of Fisheries and Oceans (see Collins and Corbett 2000). For our analysis, we aggregated port-of-landing information into Census division units, and applied the consumer price index

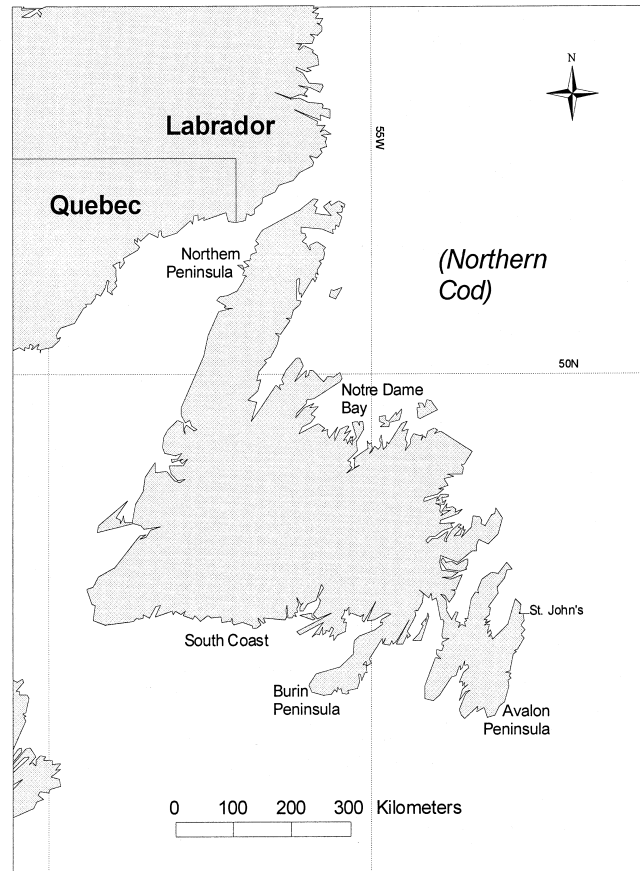


Figure 1. The island of Newfoundland, showing locations of the five regions compared, and the home of the Northern Cod.

to convert nominal values into approximately constant (2000) Canadian dollars. The vertical scale in Figure 2 extends from zero to \$90 million. Figure 3 graphs similar data for the Avalon Peninsula; note that the vertical scale runs from zero to \$240 million. Fishing activities based on the Avalon were larger in total value, although proportionately smaller in terms of employment.

Figures 2 and 3 depict fisheries responding to an ecological regime shift. Historically, groundfish species (especially cod) comprised most of the value. In these graphs, groundfish landings show general declines punctuated by sharp drops around 1992-94, as the Northern Cod and other key fisheries closed down. While groundfish declined, two crustacean species became much more important: snow crab (*Chionoecetes opilio*) and northern shrimp (*Pandalus borealis*). These and some other invertebrates grew more abundant as predatory groundfish disappeared (for one analysis of the cod-shrimp correlation, see Lilly, Parsons and Kulka 2000). At the same time that the ecological regime was shifting, there were also market changes (Apostle et al. 1998).

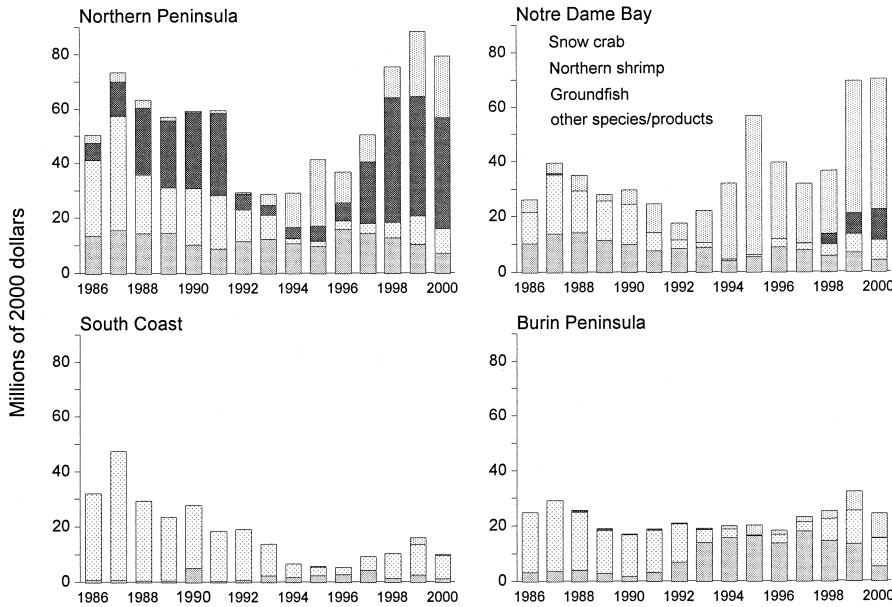


Figure 2. Adjusted value of landed catch by species type in the most fisheries-dependent Newfoundland regions, 1986-2000. Data source: Department of Fisheries and Oceans, Newfoundland.

for a new stable state. Shrimp are relatively short-lived species, known for population fluctuations partly driven by ocean conditions (Parsons and Colbourne 2000). Their estimated biomass at this writing remains high, but the average size of individuals has decreased (Orr et al. 2001; DFO 2001a). This depresses the catch value, and raises uncertainty about the stock's future. Legal and trap-design limitations theoretically ought to keep most female snow crab from being caught, and thus protect that stock from overfishing. Nevertheless, after increasing for several years, the estimated biomass of snow crab — including mature females — fell sharply in 1999, and declined further in 2000 (DFO 2001b). Greenland halibut, one of the most important remaining groundfish

Shrimp, crab and other invertebrates increasingly brought high prices on the new global markets. Together, the ecological and market shifts allowed Newfoundland's fishing industry to substitute invertebrates for the vanishing cod.

The cod-to-crustaceans transition appears to have been roughly an even exchange, for the economy of Newfoundland as a whole. At smaller scales, we see less even effects. Landings on the Northern Peninsula fell and then rose again, with booming shrimp harvests in the Gulf of St. Lawrence and Labrador Sea. Notre Dame Bay landings also increased, largely due to snow crab. But South Coast and Burin Peninsula fisheries, which in the 1980s had values similar to Notre Dame Bay, subsequently faced decline or stagnation. The Avalon Peninsula (Figure 3) showed comparatively steady and diverse expansion, based not only on crab and shrimp, but also groundfish - notably, turbot or Greenland halibut (*Reinhardtius hippoglossoides*).

Although Newfoundland's historical cod fishery changed slowly over centuries, the final outcomes after fifteen years of rapid change in Figures 2 and 3 should not be taken

stocks, have been the object of international incidents termed the "turbot wars" in Canadian press (Harris 1998). Like other slow-growing, long-lived deepwater fish, this species cannot support intensive exploitation (Koslow et al. 2000). A recent article described northwest Atlantic Greenland halibut stocks as "clearly in trouble and very likely on the verge of collapse"

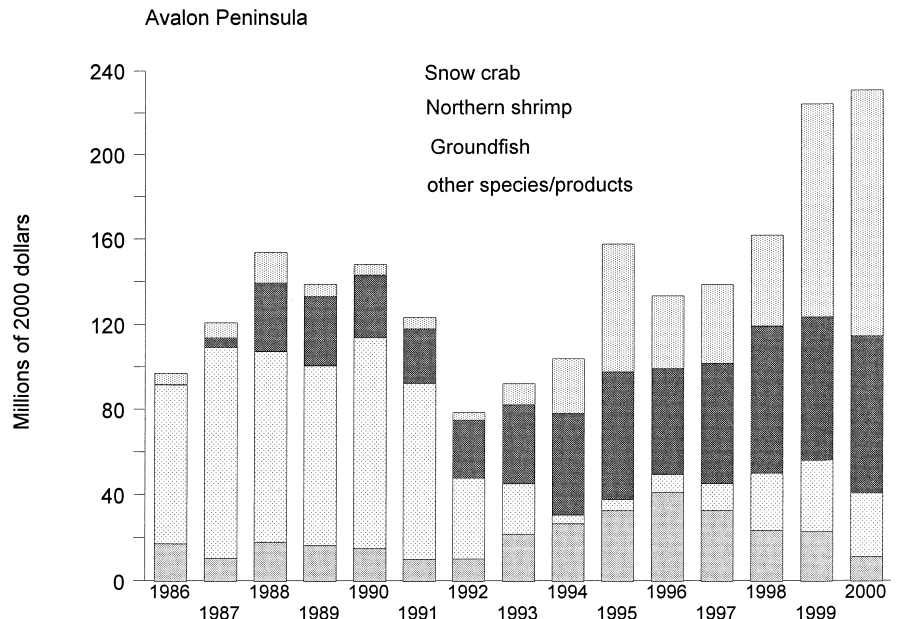


Figure 3. Adjusted value of landed catch by species type on the Avalon Peninsula, 1986-2000. Data source: Department of Fisheries and Oceans, Newfoundland.

(Haedrich, Merrett and O’Dea 2001, 118). DFO assessments are more optimistic, pointing to recent increases, but total biomass remains a fraction of its early-1980s value (Bowering 2000). We believe that ten years from now, if Figures 2 and 3 are redrawn with new data, they will reflect further ecological change.

One correlate of the cod-to-crustaceans transition in Figures 2 and 3 has been a growing inequality between regions, and between communities within regions. Capital investment, essential to the new fisheries, has been concentrated. Places with access to rich invertebrate resources, or with appropriate processing plants, had new geographical advantages. Figure 4 shows one measure of the inequality among Newfoundland’s sixteen DFO-designated statistical areas. In 1986, the top 25% of these areas landed 42% of the total value; by the late 1990s this fraction was above 55%. It bears noting that the trend took off in the late 1980s, predating the official fisheries crisis — but not the ecological transformation that propelled it (Hamilton, Duncan and Haedrich 2001). We will see similar patterns in social-indicators trends.

Cod are a democratic fish, historically accessible near shore to almost anyone with a small boat. Shrimp, in contrast, tend to concentrate farther offshore, and require larger vessels with more power for trawling. These two species consequently have different socioeconomic implications. Snow crab, which recently surpassed shrimp as Newfoundland’s most valuable landed product, also has a different profile than shrimp. Crab trapping requires less investment than shrimp trawling, and crab tends to support more processing

jobs on land. In 1998, roughly 30% of the snow crab landings value (and none of the shrimp) was brought in by vessels of the smallest size class (Collins and Corbett 2000).

Although small boats cannot drag a shrimp net, other vessels frequently are equipped to pursue multiple species, including either crab or shrimp depending on market and resource conditions. Fishing regulations vary with vessel length, and there are restrictions against modifying any vessel to exceed its current size category. In general, vessels in the 35-44 foot class can be increased up to 44 feet 11 inches; and vessels in the 45-64 foot class up to 64 feet 11 inches. The upper limits of these size classes have seen all of the growth in Newfoundland’s fishing fleet since 1988, while most other sizes declined (Collins and Corbett 2000). Many of the newer or recently modified vessels in Newfoundland harbors have an odd truncated appearance, unexpectedly wide and deep (also powerful) for their length. Such designs compress the maximum fishing capacity into a given length class. The (barely) under-65 foot vessels, though traditionally characterized as “nearshore” equipment, now often pursue resources on multi-day trips more than 200 miles at sea. Parsons (1998) notes that the under-65 foot class, which arose through regulations with “no apparent rationale,” is below the optimal size for Labrador Sea or Grand Banks fishing in terms of crew comfort, safety or onboard processing (hence, value of landed products).

The multispecies fishing power, long range and compressed hull designs of these boats reflect recent adaptations to several environments: the ecological conditions underwater, including sparser and more distant resources; global markets, such as Japanese demand for invertebrates; and the constantly evolving regulatory environment on land. Investments to build Newfoundland’s post-cod fishing fleet have come in part from large fish-processing concerns.

Population

In Newfoundland, population change provides a rough measure of community well being. Figure 5 depicts population trends in the rural regions. Populations grew until the mid-1980s, with the groundfishing “glory years” that followed Canadian expansion into the 200-mile EEZ (see Palmer and Sinclair 1997). Populations subsequently declined

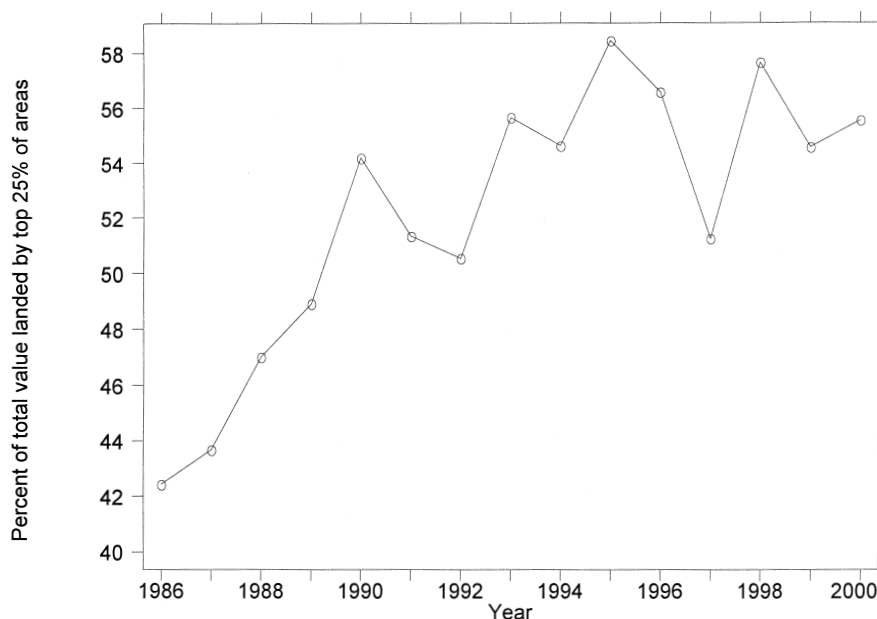


Figure 4. The percentage of total value landed by the top 25% (four of sixteen) Newfoundland fisheries statistical areas. Data source: Department of Fisheries and Oceans, Newfoundland.

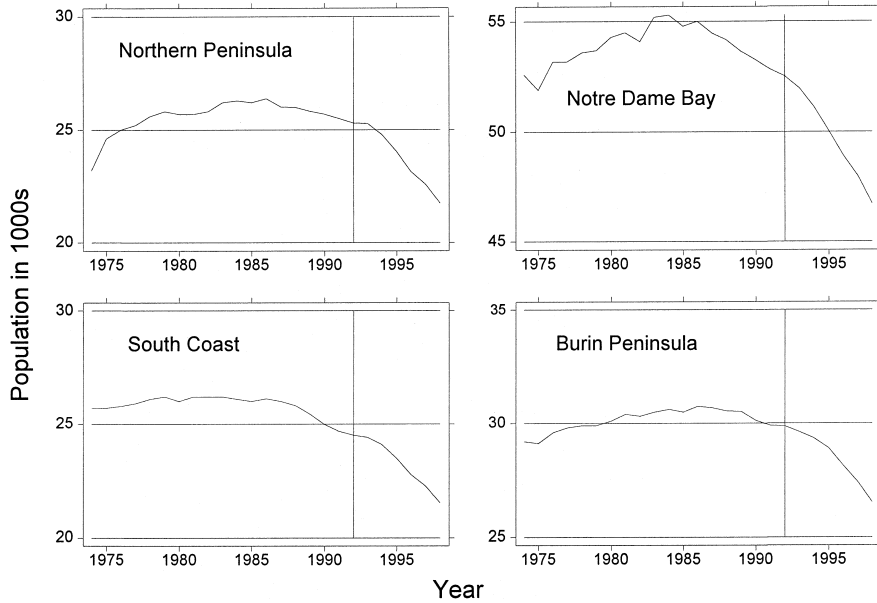


Figure 5. Populations of the most fisheries-dependent regions, 1974-98. Note changing vertical scales. Vertical lines mark the 1992 Northern Cod moratorium. Data source: Newfoundland Statistics Agency.

across all four regions, as resource depletion set in. From 1986 to 1998, the Northern Peninsula and South Coast regions both lost 18% of their populations. The Burin Peninsula fell by 14%, and Notre Dame Bay by 13%.

Figure 6 graphs population on the Avalon Peninsula. Whereas rural populations had been declining since the mid-1980s, along with groundfish, Avalon continued to grow until collapse was officially recognized in 1992. Some of this growth reflected in-migration from rural regions. In comparison to the outports, the St. John's area on Avalon offers a wide range of employment and educational opportunities. However, following the crisis, Avalon population fell too, so that by 1998 it had again reached its 1986 level.

Figure 7 shows trends in net migration 1987-97, a period that coincides with the end of the "glory years," and the subsequent era of crisis. Except for the early 90s on Avalon, net migration was predominantly negative for all of these places and years. Outmigration has long been typical of rural Newfoundland, but in the past this was offset by high birthrates. Due to modernization of women's roles, Newfoundland's his-

torically high birthrates have been declining, to a point where they no longer compensate for migration. The Northern Cod moratorium of 1992 was followed by increasing outmigration from Notre Dame Bay and the Avalon and Burin Peninsulas. On the Northern Peninsula and South Coast, however, migration downturns did not begin until a year or two later, when Northern Gulf of St. Lawrence cod also came under a moratorium (1993-94).

Outmigration is a selective phenomenon that alters the demographics of source communities. Limited job and educational opportunities, combined with the turmoil in fisheries, made outport life less attractive to young adults. From 1986 to 1996, Canada experienced a 7.3% increase in the number of males aged

20-44, while Northern Peninsula (- 11.4%), South Coast (-9.4%), Notre Dame Bay (- 8%) and Burin (- 5.5%) all experienced declines. A similar picture emerges for women between the ages of 20-44: Canada experienced an 8.8% increase from 1986-1996, but we see a net loss of young women on the Northern Peninsula (- 9.9%), South Coast (- 9.0%), Notre Dame Bay (- 7.3%) and Burin (- 5.3%). The

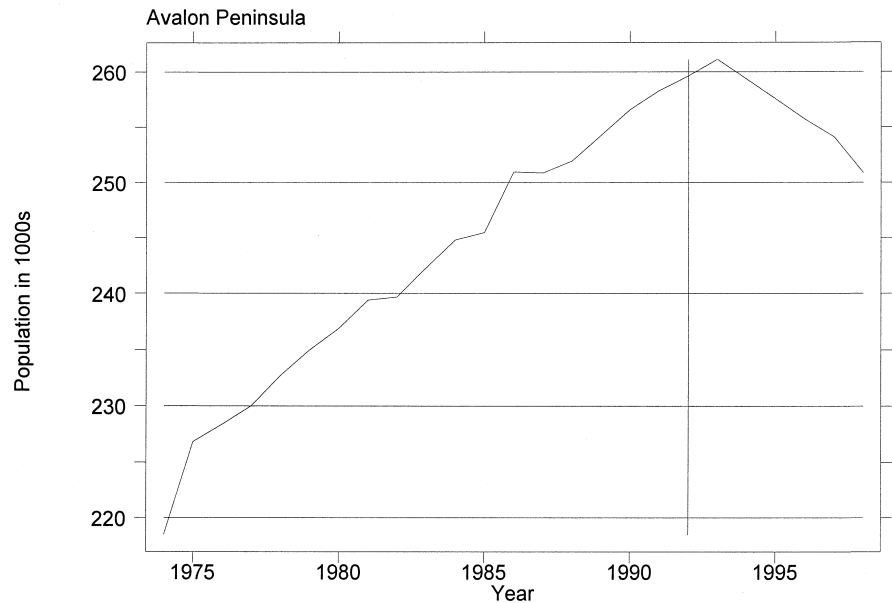


Figure 6. Population of the Avalon Peninsula, 1974-98. Data source: Newfoundland Statistics Agency.

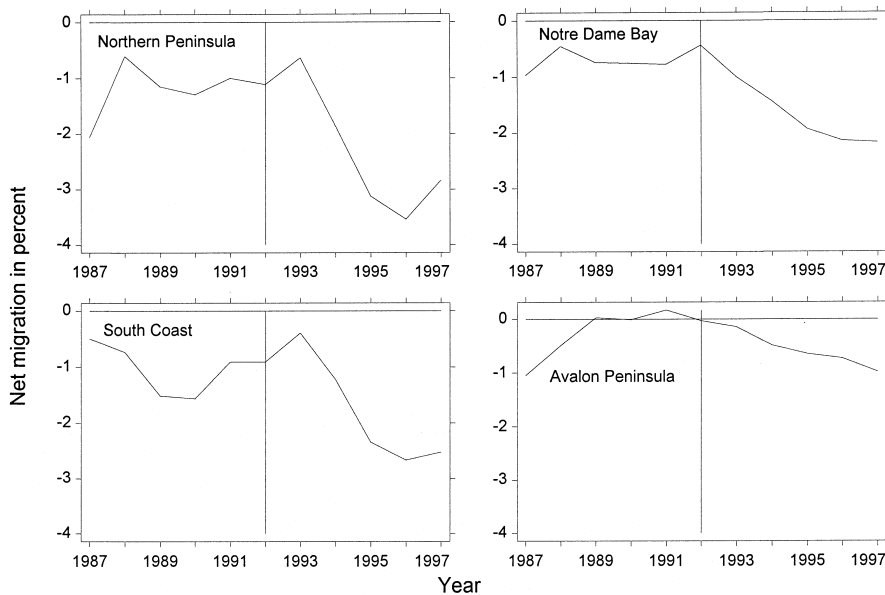


Figure 7. Net migration rates 1987-97. Data Source: Newfoundland Statistics Agency.

Avalon Peninsula, which exported some people but also received migrants from the outports, showed no net change in young men, and a 3.3% gain in young women, during this decade.

As the population of young people in a region decreases, the proportion of elders increases. In Canada, the fraction of the population over the age of 65 grew by 14% between 1986 and 1996 (from 10.7% to 12.2%), but in rural Newfoundland this segment's relative size grew much faster. The proportion of individuals over 65 increased at double the national rate on the South Coast (from 7.6% to 10.4% over 1986-1996) and Northern Peninsula (from 7.2% to 10.2%). As they grew proportionately older, outport communities were left with less of the human capital that could be critical for their economic and social futures. At present, however, they still remain younger than Canada as a whole.

A more detailed analysis of migration statistics, using the Community Accounts database of the Newfoundland Statistics Agency, reveals behavioral changes that underlie the demographic changes. The group most prone to leave rural Newfoundland over 1991-96 consisted of 15 to 19 year olds. However, the Avalon Peninsula during the same period experienced a net gain of such people. Avalon outmigrants were more often from the 20-24 year old group, or older. Whereas traditional outport youth might have seen little need for education, and often dropped out before completing high school, in modern times — especially since the fisheries crisis — the value of schooling has become more apparent. Increasing proportions of outport youth, with new encouragement from families, government and outport realities,

have opted for post-secondary education. St. John's, home of Newfoundland's only university, gained from this migration stream. After college or training, however, many of the young adults continued moving out of Newfoundland. Such behavior helps to explain both the older profile of Avalon outmigrants, and the delay between rural and Avalon population downturns seen in Figures 5-6.

Examining survey results in which most Northern Peninsula youth express intentions to move away, Sinclair (2001, 44) concludes:

As outmigration proceeds, and assuming the birth rate remains low, declining population will challenge the capacity of the province to provide services to those who remain ... At this time, the people of the Great Northern Peninsula face a challenge as great as any in their history.

Employment

Population shifts reflect and reinforce changes in employment prospects. Table 1 draws on data from the 1986, 1991 and 1996 censuses to compare employment patterns before, during and after the cod crisis. Canada's unemployment rate fell slightly, from 9% in 1991 to 8.6% in 1996. Rural Newfoundland's base rates stood around four times this national level (34-37%) by 1996, though they had actually declined on Notre Dame Bay. Even as many people left rural regions to seek jobs, an increasing proportion of those left behind appeared jobless.

There are notable contrasts between male and female unemployment trends. Although male unemployment declined for Canada and Avalon over 1991-96, it increased on Burin, the South Coast and the Northern Peninsula. However, while male unemployment rose in these rural regions, female unemployment decreased everywhere except Burin; there it increased at a much slower rate (an 8.7% increase for females as opposed to a 49.6% increase for males). These findings might partly reflect the tertiary-sector (non-fishery) occupations of many women, and their movement into the work force as male employment declined.

Higher male unemployment reflects hard times in the fishing industry. Among all Canadians, the percentage of

Table 1. Changes in employment and sources of income, from the 1986, 1991 and 1996 censuses. Data Source: Statistics Canada.

Variable	Region	1986	1991	1996	% change 1991-96
% Unemployed	Canada	8.5	9.0	8.6	-4.4
	Avalon	17.5	19.9	16.9	-15.1
	Burin	20.5	25.7	33.8	31.5
	South Coast	22.9	30.6	33.7	10.1
	N. Peninsula	29.4	36.1	36.8	1.9
	Notre Dame	32.6	41.5	34.6	-19.9
% Males Unemployed	Canada	—	8.9	8.7	-2.2
	Avalon	—	20.3	18.2	-10.3
	Burin	—	24.0	35.9	49.6
	South Coast	—	27.3	33.6	23.1
	N. Peninsula	—	34.7	36.8	6.1
	Notre Dame	—	44.3	39.0	-13.6
% Females Unemployed	Canada	—	9.2	8.5	-7.6
	Avalon	—	19.4	15.5	-20.1
	Burin	—	28.6	31.1	8.7
	South Coast	—	35.8	33.9	-5.3
	N. Peninsula	—	37.7	36.8	-2.4
	Notre Dame	—	37.5	28.2	-33.0
% income from employment	Canada	78.7	77.8	75.3	-3.2
	Avalon	75.8	75.1	71.3	-5.1
	Burin	71.4	69.7	60.2	-13.6
	South Coast	70.2	68.5	56.2	-18.0
	Notre Dame	61.2	61.1	55.8	-9.5
	N. Peninsula	66.1	63.0	56.0	-11.1
% income from government transfer	Canada	11.1	11.4	14.0	22.8
	Avalon	17.4	17.5	20.2	15.4
	Burin	26.0	26.3	34.6	31.6
	South Coast	26.7	27.2	37.9	39.3
	N. Peninsula	32.2	33.9	39.4	16.2
	Notre Dame	35.8	35.0	38.4	8.9

income coming from employment declined 3.2% during 1986-96 (from 78.7% to 75.3%). On Avalon, the percentage of income from employment fell by 4.5% (75.8% to 71.3%). More dramatic falls occurred on the South Coast (14%), Burin (11.2%), Northern Peninsula (10.1%) and Notre Dame Bay (9.5%), with the largest declines happening over 1991-96. By 1996, only 56% of all income in the three most fisheries-dependent regions (South Coast, Notre Dame and Northern Peninsula) came from employment.

Government subsidies sought to offset the loss of jobs due to the fisheries troubles. In Canada as a whole, some 14% of all income came from the government in 1996. This compares with 20% on Avalon, and 35-40% in the rural regions. The percentage of reported income from government transfers on Burin rose from 26.3% to 34.6%, a 31.6% increase in only five years. The South Coast experienced the most dramatic increase in government transfers from 1991 to 1996 (from 27.2% to 37.9%). Notre Dame and the Northern

Peninsula had even higher levels of dependence on transfer payments.

In a U.S. or urban Canada context, such high levels of unemployment and dependency would paint a picture of miserable poverty. Newfoundland outports do not necessarily conform to this picture, however. Instead, some small places that have lost hundreds of jobs nevertheless give a hopeful impression, with neat yards, painted houses and a fair number of new cars. The apparent discrepancy underlines a need for caution in interpreting unemployment statistics. Reliance on Canada's unemployment insurance (UI) program has long been very high in Newfoundland outports. Analysis of Statistics Canada data by the Newfoundland Statistics Agency in the early 1990s found that in 45% of Newfoundland communities, *all* of the workforce accepted unemployment insurance at some time. UI has been part of the fabric of modern outport life, with many people seeking work for the minimal 11-week periods required to qualify for benefits. Since much outport employment is temporary or seasonal, the "unemployment rate" can vary substantially from week to week. Moreover, the loss of fishing or fish-processing jobs might be offset economically so long as there exist any other ways to qualify for UI. The TAGS program further complicates interpretation of unemployment statistics in the 1996 census. Jobless TAGS recipients could have been counted either as "unemployed" or "not in the labor force," depending on their own (or Census interviewers') perceptions.

Rural Newfoundland hosts a strong informal economy (Felt and Sinclair 1992), which also contributes to outport adaptations. This informal economy includes the use of country foods such as moose meat or fish, or local firewood cut for heating. It also includes barter or cash-based exchanges of goods and services such as home-building and vehicle maintenance. A 1986 study (House, Hanrahan, and Simms 1986, 146) gave the following estimates of personal income by source, for full and part-time fishermen.

	Full-time	Part-time
fishing	40%	20%
other employment	4%	13%
transfer payments	24%	25%
household production	32%	42%

"Household production" refers to the replacement value of shelter, fuel, repairs and food obtained directly through household labor.

Employment for cash, unreported meat, fish or timber sales, and other informal-economy income further contributes to outport standards of living without casting much shadow in official statistics. The total magnitude of informal-economy activities is unknown, but it appears capable of providing a buffer against the troubles of the formal economy.

Table 2. Human capital changes: Education statistics from the 1986, 1991 and 1996 censuses. Data Source: Statistics Canada.

Variable	Region	1986	1991	1996	% change 1991-96
% population > 15 years, w/o grade 9	Canada	17.3	13.9	12.1	-12.9
	Avalon	19.8	14.6	12.1	-17.1
	Burin	33.9	27.5	23.0	-16.4
	South Coast	43.2	35.7	31.6	-11.5
	N. Peninsula	38.6	32.5	27.9	-14.2
	Notre Dame	38.6	31.3	27.9	-10.9
% population > 15 years, with college	Canada	9.6	11.4	13.3	16.7
	Avalon	8.1	9.3	11.3	21.5
	Burin	3.1	3.9	4.5	15.4
	South Coast	3.1	3.4	3.8	11.8
	N. Peninsula	2.9	3.6	4.9	36.1
	Notre Dame	2.7	3.3	4.0	21.2

Education

Table 2 depicts changes in education over the course of the groundfish collapse. Overall, we see that the people remaining in the region tended to stay in school longer, and were more likely to have earned a college degree, in 1996 than in 1986. The percentage of individuals over 15 years old but without a ninth-grade education decreased in all regions. Even so, the percentage of individuals with low education in 1996 remained well over twice the national level on the South Coast (31.6%), Northern Peninsula and Notre Dame Bay (both 27.9%).

Although rural residents tended to stay in school longer in 1996 than in 1986, the prevalence of university degrees remained far below national levels. The percentage of university graduates increased in Canada from 9.6% in 1986 to 13.3% in 1996, and showed similar trends on Avalon (from 8.1% to 11.3%). The proportions of college graduates grew in all four rural Newfoundland regions too, but in 1996 they were still less than half of the national level.

A more educated population could improve prospects for economic diversification in the outports. Upward trends notwithstanding, outport human capital levels are low. For college graduates, the employment opportunities in outports cannot generally compete with those in

cities. This reality motivates continuing outmigration of young people seeking education and white-collar jobs. Although adaptive for individuals and probably for their extended families, outmigration limits the human resources that might support community development beyond fishing.

Crime

Through this period of economic instability and increased unemployment, there was no general increase in crime. On the contrary, crime rates (Figure 8) declined in four of the five study regions over 1991-96. The total number of crimes reported per 1,000 people dropped 42% on the Northern Peninsula (75.8 to 44.3), 24% on Burin (89.9 to 68.4), 23% on Notre Dame Bay (53.9 to 41.3), and 20% on the Avalon Peninsula (from 104 to 83.2). South Coast crime rates rose during 1994-95, but subsequently returned to a point below their 1991 level.

Taken separately, property crime rates (not shown) declined in all these regions over 1991-96: by 38% on the Northern Peninsula (16.9 to 10.4 per 1,000), 35% on Burin (28 to 18.3), 27% on the South Coast (17.8 to 12.9, but with a spike at 25.1 in 1995), 24% on Notre Dame Bay (15.3 to 11.7) and 17% on Avalon (42.9 to 35.4). Violent crime rates, on the other hand, peaked in years following the cod crises on Avalon (1992), Notre Dame (1993-94), Burin (1992-94), and the South Coast (1993-95). By 1996, however, Avalon and Notre Dame violent crime rates had fallen below their 1991 level; and the rates of Burin and the South Coast were near

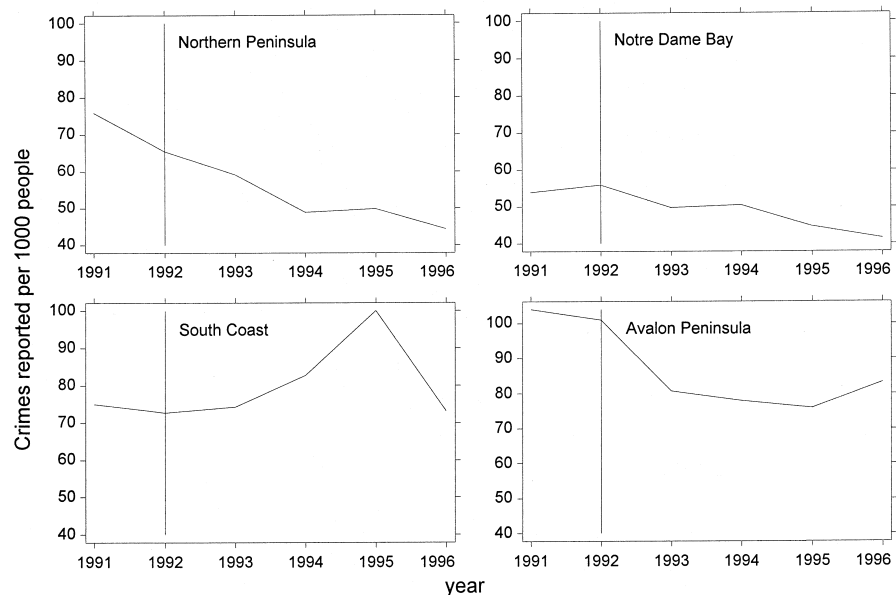


Figure 8. Total crimes reported per 1,000 people, 1991-96. Data source: Newfoundland Statistics Agency.

their 1991 levels (around 7 and 8 violent crimes per 1,000, respectively). Northern Peninsula data show a steady decrease in violent crime during this period. Although the temporary rise of violent crimes in four areas deserves closer scrutiny, we otherwise see no indication that the fisheries crisis brought a broad increase in delinquency. Disproportionate outmigration by teenagers and young adults might have contributed to the actual declines seen.

It is worth emphasizing that on the Northern Peninsula, Notre Dame Bay and Burin Peninsula, crime rates throughout this period remained comparatively low. Like some outports' cared-for appearance, the low crime rates of rural Newfoundland suggest that social integration often remained effective despite economic stress.

Conclusion

Sociologists have examined the problems of boom-bust cycles, lagging human and social capital, dependency and underdevelopment in natural resource dependent communities or NRDCs (e.g. Bunker 1989; Freudenburg 1992; Freudenburg and Gramling 1994; Humphrey 1995; Johnson and Stallman 1994; Rural Sociological Society Task Force on Persistent Rural Poverty 1993). Some generalizations about NRDCs can be offered on the basis of forestry, mining and energy-community studies (following Freudenburg and Gramling 1994; Humphrey 1995):

- Many NRDCs experience persistent, long-term poverty. Resource extraction industries did not link to other industries to produce more diversified economic growth, nor did most of their workers invest in human capital sufficient to support adaptation to other industries or locations.
- There has been a long-term downward trend in employment, due to shifts from labor-intensive to capital-intensive extraction and processing, global competition among resource providers, and "dematerialization of manufactured goods in advanced industrial countries" (Humphrey 1995, 94).
- Resource-extraction industries' backward and forward linkages (e.g., manufacturing resource-extraction equipment; processing raw materials into finished products) often take place outside the NRDCs themselves. This limits the local benefits derived from their natural-resource industries.
- Even in NRDCs, workers increasingly need advanced training and technological skills that are unavailable in their remote locations. The skills mismatch and "institutional mismatch" further hinder local development and lead to regional centralization.

These generalizations apply well to rural Newfoundland, which suggests that its troubles have at least partly structural causes not tied to fishing per se. On the other hand, the timing of changes seen in Figures 5-8 and Tables 1-2 support inferences that fisheries-specific events — the late-1980s decline and the early-90s crisis in groundfish resources — had social impacts as well. Subjective evidence for ecological effects can be found among the first-person accounts of fisher folk (e.g., Hamilton and Duncan 2000). Similar patterns of demographic change following fisheries events have been observed in other fisheries-dependent regions of the northern Atlantic (Hamilton and Otterstad 1998; Hamilton and Haedrich 1999).

Social changes since Newfoundland's cod crisis show adaptations to multiple environments: not only shifting marine ecosystems, but also the global economy and fisheries regulations. Some adaptations follow traditional outport patterns — intensification and increasing range in the fisheries, reliance on the informal economy and transfer payments, and borrowing from fish processors. Although once again rich, today's fisheries are more concentrated, requiring more capital and less labor than their predecessors. The changes make fisheries less broadly supportive of outport society as a whole. Declining population due to reduced family size and increased outmigration, especially among young people with education and skills, is one unsurprising though unfortunate result.

Economic diversification efforts, including tourism and offshore energy development, have made visible impacts on some ports. These provide a prominent source of hope for the future. Expanding rural Newfoundland economies to the point where they could support present populations remains a formidable challenge, however (House 1999). At least equally formidable is the challenge of operating Newfoundland's currently booming invertebrate fisheries in a sustainable way. Despite fishing's narrowing role, a decade after the cod crisis it remains the foundation of outport life.

Endnote

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Acknowledgments

Cliff Brown, Cynthia M. Duncan and Richard Haedrich contributed to the research underlying this paper. We are grateful for comments and assistance with data from Alton Hollett at the Newfoundland Statistics Agency, and from Frank Corbett at the Newfoundland Region Department of Fisheries and Oceans. Discussions with Sean Cadigan, Earl Dawe, George Lilly, David Orr, Peter Sinclair and Michael Wernerheim, as well as suggestions by anonymous reviewers, helped to strengthen the final draft. The North Atlantic Arc (NAArc) project has been supported by grants from the Arctic System Science and Arctic Social Sciences programs of the U. S. National Science Foundation.

References

- Apostle, R., G. Barrett, P. Holm, S. Jentoft, L. Mazany, B. McCay and K. Mikalsen. 1998. *Community, States, and Market on the North Atlantic Rim: Challenges to Modernity in the Fisheries*. Toronto: University of Toronto Press.
- Boreman, J., B. S. Nakashima, J. A. Wilson and R. L. Kendall (eds.). 1997. *Northwest Atlantic Groundfish: Perspectives on a Fishery Collapse*. American Fisheries Society.
- Bowering, W. R. 2000. Trends in distribution, biomass and abundance of Greenland halibut (*Reinhardtius hippoglossoides*) in NAFO subarea 2 and divisions 3KLMNO from Canadian research vessel surveys during 1978-99. NAFO Scientific Council Reports document 00/12.
- Bunker, S. G. 1989. Staples, links and poles in the construction of regional development theories. *Sociological Forum* 4, 589-610.
- Candow, J. E. and C. Corbin (eds.). 1997. *How Deep is the Ocean? Historical Essays on Canada's Atlantic Fishery*. Sydney, Nova Scotia: University College of Cape Breton Press.
- Chantraine, P. 1993. *The Last Cod Fish: Life and Death of the Newfoundland Way of Life*. St. John's: Jespersion.
- Collins, J. and F. Corbett. 2000. Newfoundland region catches, landed value and vessel size: Some trends and issues (unpublished report). St. John's: Policy and Economics Branch, Newfoundland Region Fisheries and Oceans Canada.
- Department of Fisheries and Oceans. 2001a. Northern shrimp (*Pandalus borealis*) - Div. 0B to 3K stock status update. Ottawa: Department of Fisheries and Oceans Canada.
- Department of Fisheries and Oceans. 2001b. Newfoundland and Labrador snow crab stock status update. Ottawa: Department of Fisheries and Oceans Canada.
- Felt, L. F. and P. R. Sinclair. 1992. "Everyone does it": Unpaid work in a rural peripheral region. *Work, Employment & Society* 6 (1), 43-64.
- Finlayson, A. C. 1994. *Fishing for Truth: A Sociological Analysis of Northern Cod Stock Assessments from 1977-1990*. St. John's: Institute for Social and Economic Research.
- Freudenburg, W. R. 1992. Addictive economies: Extractive industries and vulnerable localities in a changing world economy. *Rural Sociology* 57, 305-332.
- Freudenburg, W. R. and R. Gramling. 1994. Natural resources and poverty: A closer look. *Society and Natural Resources* 7, 5-22.
- Haedrich, R. L. and L. C. Hamilton. 2000. The fall and future of Newfoundland's cod fishery. *Society and Natural Resources* 13, 359-372.
- Haedrich, R. L., N. R. Merrett and N. R. O'Dea. 2001. Can ecological knowledge catch up with deep-water fishing? A North Atlantic perspective. *Fisheries Research* 51, 113-122.
- Hamilton, L. C. and C. M. Duncan. 2000. Fisheries dependence and social change in the Northern Atlantic. In D. Symes (ed.) *Fisheries Dependent Regions*, 95-105. Oxford: Fishing News Books.
- Hamilton, L. C., C. M. Duncan and R. L. Haedrich. 2001. Above and below the water: Social/ecological transformation in northwest Newfoundland. Durham, NH: NAArc Working Paper 01-2.
- Hamilton, L. C. and R. L. Haedrich. 1999. Ecological and population changes in fishing communities of the North Atlantic Arc. *Polar Research* 18 (2), 383-388.
- Hamilton, L. C. and O. Otterstad. 1998. Demographic change and fisheries dependence in the northern Atlantic. *Human Ecology Review* 5 (1), 24-30.
- Hannesson, R. 1996. *Fisheries Mismanagement: The Case of the North Atlantic Cod*. Oxford: Fishing News Books.
- Harris, M. 1998. *Lament for an Ocean: The Collapse of the Atlantic Cod Fishery*. Toronto: McClelland and Stewart.
- House, J. D., M. Hanrahan and D. Simms. 1986. Background Report: Fisheries Policies and Community Development. Proposal for a Revised Approach to Managing the Inshore Fisheries in Newfoundland. Ottawa: Royal Commission on Employment and Unemployment.
- House, J. D. 1999. *Against the Tide: Battling for Economic Renewal in Newfoundland and Labrador*. Toronto: University of Toronto Press.
- Humphrey, C. R. 1995. Introduction: Natural resource-dependent communities and persistent rural poverty in the U.S.-Part IV. *Society and Natural Resources* 8 (2), 93-96.
- Hutchings, J. A. and R. A. Myers. 1995. The biological collapse of Atlantic cod off Newfoundland and Labrador: An exploration of historical changes in exploitation, harvesting technology, and management. In R. Arnason, and L. F. Felt (eds.), *The North Atlantic Fishery: Strengths, Weaknesses, and Challenges*, 37-93. Charlottetown, PEI: Institute of Island Studies.
- Innis, H. A. 1978 (1954). *The Cod Fisheries: The History of an International Economy*. Toronto: University of Toronto Press.
- Johnson, T. G. and J. I. Stallman. 1994. Human capital investment in resource-dominated economies. *Society and Natural Resources* 7, 221-233.
- Koslow, J. A., G. W. Boehlert, J. D. M. Gordon, R. L. Haedrich, P. Lorance and N. Parin. 2000. Continental slope and deep-sea fisheries: Implications for a fragile ecosystem. *ICES Journal of Marine Science* 57, 548-557.
- Kurlansky, M. 1997. *Cod. A Biography of the Fish That Changed the World*. Toronto: Alfred A. Knopf.
- Lilly, G. R., D. G. Parsons and D. W. Kulka. 2000. Was the increase in shrimp biomass on the Northeast Newfoundland shelf a consequence of a release in predation pressure from cod? *Journal of Northwest Atlantic Fisheries Science* 27, 45-61.
- Lilly, G. R., P.A. Shelton, J. Bratney, N. G. Cadigan, E. F. Murphy and D. E. Stansbury. 2000. An assessment of the cod stock in NAFO divisions 2J + 3KL. NAFO Scientific Council Reports document 00/33.
- Orr, D., D. G. Parsons, P. J. Veitch and D. J. Sullivan. 2001. Northeast shrimp (*Pandalus borealis*) off Baffin Island, Labrador and northeastern Newfoundland — first interim review. Research Document 2001/043, Department of Fisheries and Oceans Canada.
- Palmer, C. T. and P. R. Sinclair. 2000. Expecting to leave: Attitudes to migration among high school students on the Great Northern Peninsula of Newfoundland. *Newfoundland Studies* 16 (1), 30-46.
- Palmer, C. T. and P. R. Sinclair. 1997. *When the Fish Are Gone: Ecological Disaster and Fishers in Northwest Newfoundland*. Halifax, NS: Fernwood Publishing.
- Parsons, C. 1998. *Fishing Vessel Replacement Regulations in the Newfoundland Fishery: Implications for the Future* (Master's Thesis). St. John's: Memorial University of Newfoundland.

- Parsons, D. G. and E. B. Colbourne. 2000. Forecasting fishery performance for northern shrimp (*Pandalus borealis*) on the Labrador Shelf (NAFO Divisions 2HJ). *Journal of Northwest Atlantic Fisheries Science* 27, 11-20.
- Rural Sociological Society Task Force on Persistent Rural Poverty. 1993. *Persistent Poverty in Rural America*. Boulder: Westview Press.
- Sider, G. M. 1986. *Culture and class in anthropology and history: A Newfoundland Illustration*. Cambridge: Cambridge University Press.
- Sinclair, P. R. 1985. *From Traps to Dragnets: Domestic Commodity Production in Northwest Newfoundland, 1850-1982*. St. John's, Newfoundland: ISER.
- Sinclair, P. R. (ed.). 1988. *A Question of Survival: The Fisheries and Newfoundland Society*. St. John's, Newfoundland: ISER.
- Sinclair, P. R. 2001. Expecting to leave: Attitudes to migration among high school students on the Great Northern Peninsula of Newfoundland. *Newfoundland Studies*.



State-of-the-art shellfish fleet based at the village of Port de Grave, Avalon Peninsula (May 2001).



New fishing vessels, rigged for both crab pot hauling and shrimp dragging, at the new small boat Service Center in St. John's (May 2001).



Deep-sea trawler base and major fish processing plant at Trepassey, Avalon Peninsula — formerly the town's main employer (over 1,000 jobs), but now inactive (May 2001).