The Regional Economy of Southeast Alaska

Final Report

prepared for
Alaska Conservation Foundation

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1. Introduction

1.1. Purpose

This report provides a broad overview of the regional economy of Southeast Alaska, including trends over time for individual communities and boroughs. It also addresses several specific topics identified by the study team and the project sponsors. The main purpose is to add to the information and knowledge base available to help people make informed decisions.

This knowledge base now includes several excellent and recent reports. These will be mentioned, cited, and briefly summarized below, but not recapitulated at any length. Readers of this report are strongly encouraged to consult these other reports. To facilitate this, we have created a companion Web site to this report. It is currently hosted at:

www.iser.uaa.alaska.edu/iser/people/colt/southeast/southeast_economy.html

This Web site will host digital copies of some of the important papers cited, as well as several spreadsheets with population and economic data for Southeast Alaska.

We rely on publicly available data from sources such as the U.S. Census and Bureau of Economic Analysis. Specific data sources are cited as they are referenced.

1.2. Study area

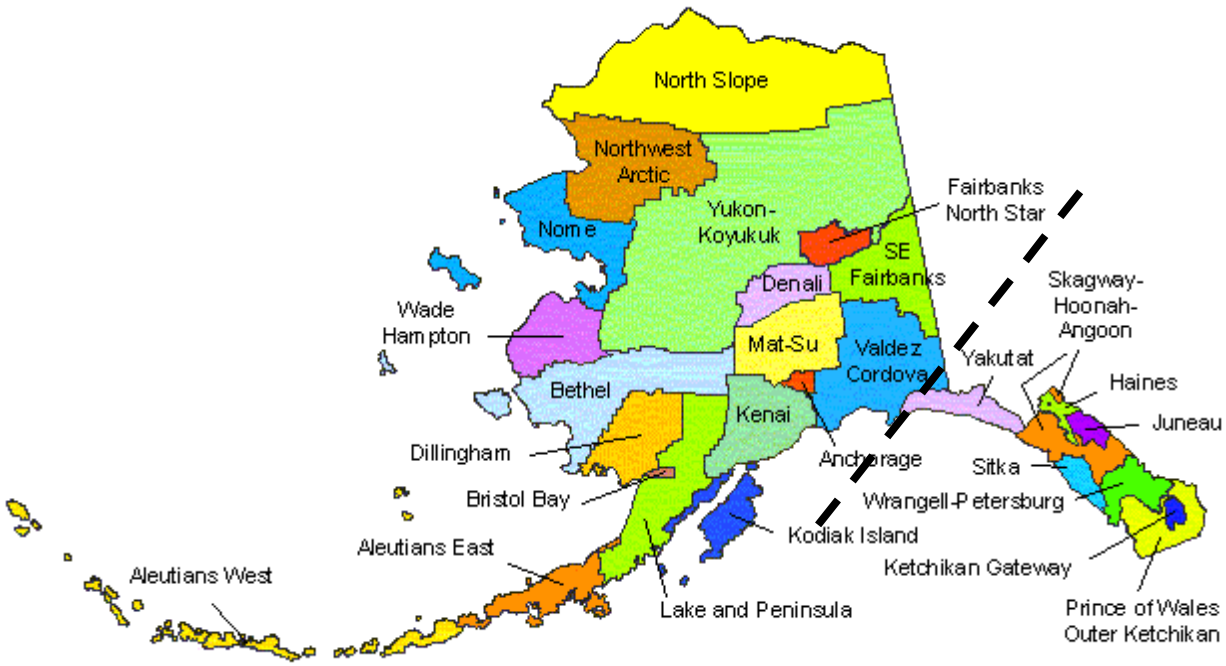
Southeast Alaska consists of all boroughs and census areas including and east of the Yakutat Borough. (An Alaska borough or census area is the geographic equivalent of a county in the lower 48 states.) The eight boroughs and census areas are listed in Table 1. The "Southeast Region" is one of six longstanding labor market regions defined by the Alaska Department of Labor and Workforce Development. Following numerous other authors, we will refer to the Juneau City and Borough as "Juneau" and to the remaining seven census areas as "rural Southeast" or "rural Southeast Alaska."

Table 1. Southeast Alaska census areas and population

Area name	July 1 2004 (est.)	April 1 2000 (census)	April 1 1990 (census)	Average annual growth rate 2000-2004	Average annual growth rate 1990-2000
Southeast Region	70,622	73,082	68,989	-0.8%	0.6%
Haines Borough	2,245	2,392	2,117	-1.5%	1.2%
Juneau City and Borough	30,966	30,711	26,751	0.2%	1.4%
Ketchikan Gateway Borough	13,030	14,059	13,828	-1.8%	0.2%
Prince of Wales-Outer Ketchikan Census Area	5,548	6,157	6,278	-2.4%	-0.2%
Sitka City and Borough	8,805	8,835	8,588	-0.1%	0.3%
Skagway-Hoonah-Angoon Census Area	3,101	3,436	3,680	-2.4%	-0.7%
Wrangell-Petersburg Census Area	6,247	6,684	7,042	-1.6%	-0.5%
Yakutat City and Borough	680	808	705	-4.0%	1.4%
Anchorage Mat-Su Region	347,646	319,605	266,021	2.0%	1.9%
All other areas	237,167	234,244	215,033	0.3%	0.9%
Alaska	655,435	626,931	550,043	1.1%	1.3%

Source: Alaska Department of Labor and Workforce Development (2004 estimates);
U.S. Census. www.labor.state.ak.us/research/pop/estimates/04t2-1.xls

Figure 1.
Alaska and Southeast region census areas



2. Summary of Findings

The population of Southeast is declining as net out-migration exceeds natural increase (the excess of births over deaths). Prior to 2004, all areas except Juneau were losing population, but even Juneau lost population between 2003 and 2004. In general people are moving from rural Alaska to urban Alaska and from all Alaska places to other states. These trends are more pronounced in Southeast.

Many individual Southeast places have sprung up or disappeared during the past 40 years in response to the shifting locations of logging activity. Some of these places seem to be persisting despite the loss of nearby timber jobs—filling the economic slack with tourism and unearned income.

There are really two regional economies in Southeast. The City and Borough of Juneau has an economy based on government and its role as regional transportation hub and service center for the rest of Southeast. All other places, collectively known as rural Southeast, have a stagnant or declining economy by many measures of activity.

The commercial fishing industry, always an economic mainstay of the region, remains flat in terms of volume as wild populations are fully exploited. Shore-based processing has steadily declined due to high costs, and major price declines for salmon have hurt fishing industry income.

The timber industry has suffered a steady decline since about 1980, when international competition pushed word product prices down faster than local costs of operation. Response to the closing of the two pulp mills has been mixed. In Sitka the economy and population are growing at a healthy rate, while in Ketchikan growth has been more sluggish.

Tourism is the fastest-growing industry in the region but its direct impacts on the economy cannot be directly or precisely measured. The number of cruise ship passengers visiting major ports has more than doubled since 1990, but the linkages between these visitors, the cruise industry, and the associated businesses on shore cannot be quantified with conventional economic data. To date, the large-ship cruise industry has not been willing to share data which would allow a more definitive assessment of how cruise tourism affects jobs and income in specific Southeast communities. A constellation of tourism business activity surrounds and depends on large cruise ships and their passengers. However there is also what may be termed a second tourism industry that caters to all other visitors. This small-scale

tourism industry includes small (100-500 passengers) cruise ships, hunting and fishing guides and lodges, the entire lodging industry, and much of the restaurant and hospitality industry.

The government sector has continued to underpin much of the regional economy. Nonprofit institutions such as Southeast Regional Health Consortium have provided hundreds of new jobs in the region. Their continued economic strength depends in part on federal funding, although demographics will drive health care industry growth to a large extent.

Between 1969 and 1996, unearned income (from investments and transfers) increased from 16 percent of total personal income outside of Juneau to 33 percent (Robertson 2004). However, recent data suggest that this shift toward unearned income may have slowed or stopped in recent years.

3. Historical Evolution of the Southeast Economy

This section draws together and reviews several previous studies of the Southeast economy. Some of these analyses are very recent. The primary purpose is to provide a minimal common historical perspective.[1] A secondary purpose is to provide some perspective from authors writing during the past, whose projections of the future have proven more, or less, accurate.

3.1. Evolution of the economy through 1984

In 1985 economist George Rogers completed a synthesis study of the Southeast Alaska economy. Rogers divided the economic history of the region since contact by non-indigenous peoples into three periods. The first was the era of furs, salmon and gold, prior to 1954. The second period was marked by construction of the pulp mills and the relative dominance of timber harvesting. The third period includes the overall economic boom in Alaska from oil development and oil revenues. The following sections are excerpted directly from this work (Rogers 1985).

Furs, salmon, and gold (1867-1954)

> Most of …the region was incorporated into the Alexander Archipelago Forest Reserve in 1902. This was proclaimed the Tongass National Forest in

[1] Readers interested in the region's economic history prior to statehood may wish to consult George Rogers' book, Alaska in Transition: The Southeast Region. (1960) Baltimore MD: Johns Hopkins Press and Resources for the Future.

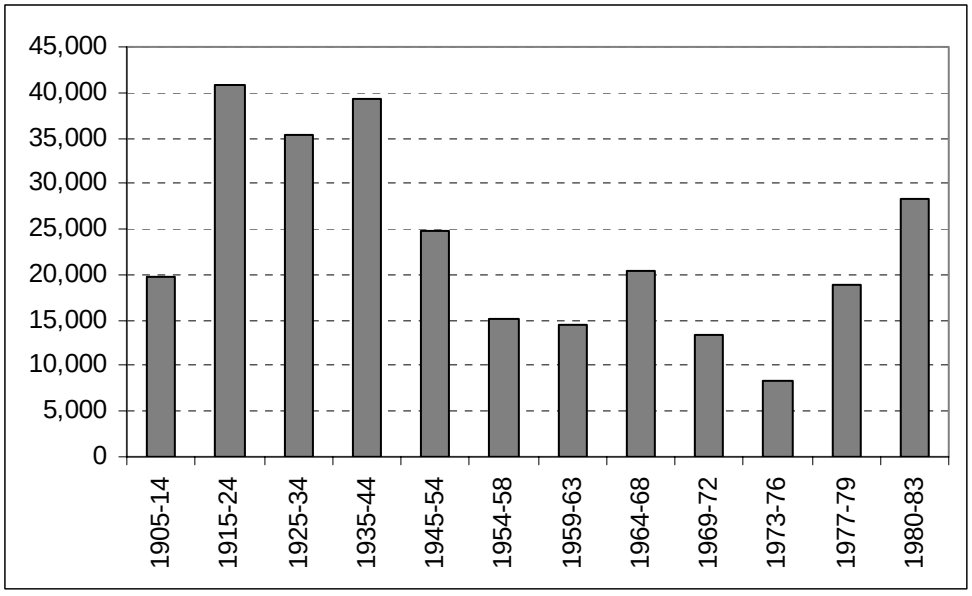
1907….Prior to these events, the region had been the home of the Tlingit and Haida people "from time immemorial" and then briefly served as the headquarters of the Russian fur trade in the eastern Pacific from the establishment of New Archangel (Sitka) in 1804 until the transfer of Alaska to the United States in 1867.

For the first decade of United States rule, no development took place. And then came two events in the year 1878. The first salmon canneries were established at Klawock and Sitka and the first gold camp at Windham Bay, foreshadowing what was to become the economic base of the region until the mid-twentieth century.

…The annual pack [of canned salmon] exceeded one million cases by 1908. Salmon harvests accelerated to an annual average of 20 million fish for the period 1905-1914 and achieved an annual harvest of 41 million fish in the next decade. The "crash" began when the annual harvest dropped from 31 million fish in 1945-1949 to 19 million fish in 1950-1954.

Other fisheries, particularly halibut, were exploited, but salmon was and continues to be dominant. In 1941, salmon products accounted for 94.1 percent of the total value of all fisheries products, [declining to] 84 percent in 1954.

Figure 2. Salmon catch in Southeast Alaska, 1905-1983 (thousands of fish)



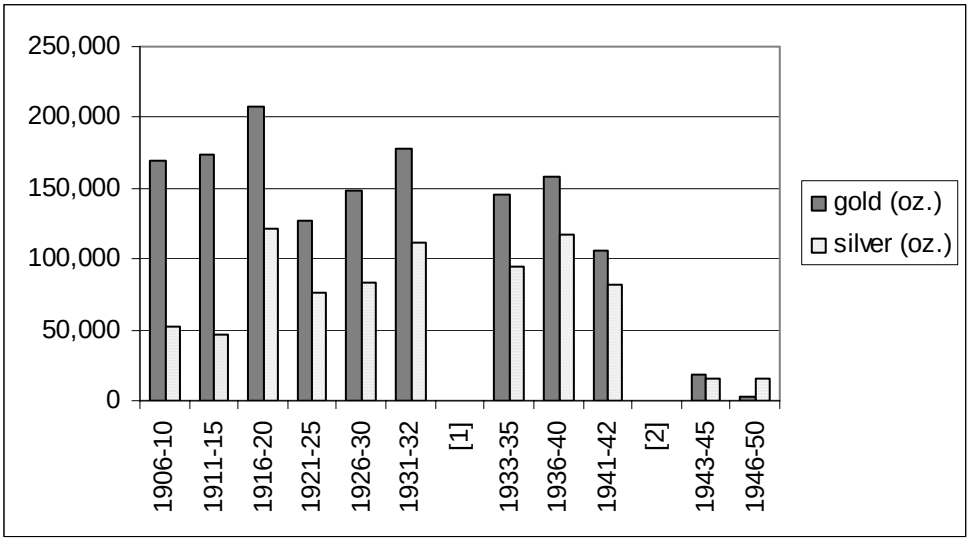
Notes: [1] Fish traps banned in 1959
[2] Limited entry introduced in 1973
Source: Rogers (1985) p. 6

The other main support of the region's economy was gold. Placer mining was used in the earliest period and since mid-century in the brief reworking of old mine tailings, but lode mining was the backbone of the industry from 1882 to the closing of the mines in 1942 by order of the War Production Board….

Gold discoveries and developments in northern British Columbia and Yukon Territory also had economic impacts within the region. The 1874 stampede to the Cassiar gold fields and the Stikine River established Wrangell as the gateway to that region…Similarly, the Klondike Gold Rush and the Chilkoot Trail resulted in the creation of the town of Skagway in 1897, and the construction of the White Pass and Yukon Railway in 1898 assured its continuation as the principal entry into the Yukon Territory until closure of the railroad in 1982. The Dalton Trail turned Haines into a third gateway by providing yet another alternative route and the Haines Highway spur of the Alcan Highway constructed during World War II, and the Haines-Fairbanks petroleum pipeline constructed in 1954 expanded this gateway first opened by gold.

Although the legal price of gold was increased from $20.67 to $35.00 per fine ounce in September 1933, this event had little effect beyond slowing a continual decline in annual production. When all gold mining was suspended as a wartime emergency measure in October 1942, the annual production had already achieved long-time lows. None of the mines reopened when the order was rescinded in July 1945 (Rogers 1985: 5-8).

Figure 3. Gold and silver production from Southeast Alaska lode mines, 1906-1954 (fine ounces per year, annual averages)

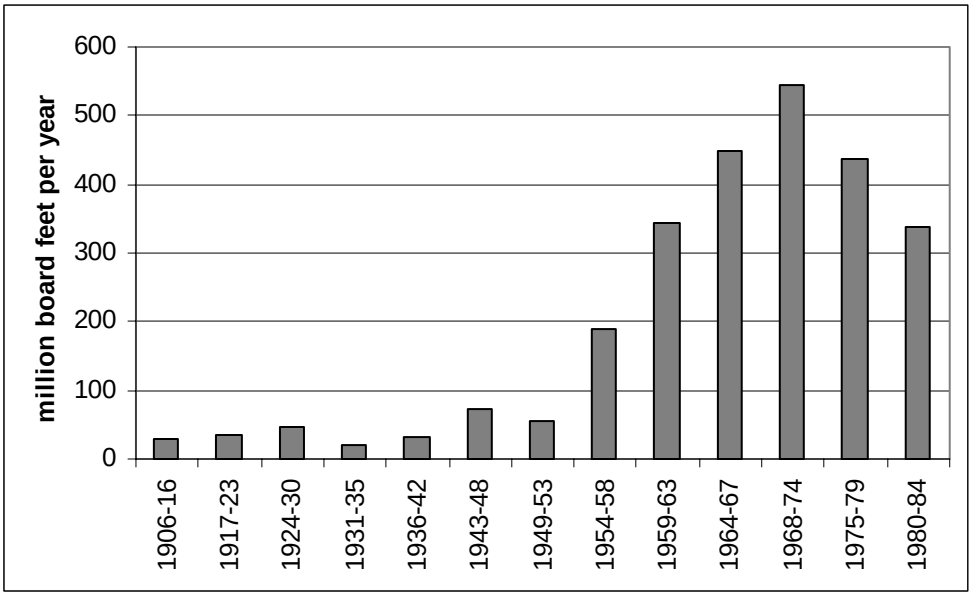


Notes: [1] Official price increased from $20.67 to $35.00 per oz., September 1933
[2] Gold mining suspended by War Production Board, October 8, 1942
Source: Rogers (1985) p. 8

"Transforming the Economy—1954-84"

The economic plight of the region at mid-century brought increased pressure on the Forest Service to create an expanded timber industry within the region……In 1954, a mill producing 300 tons daily (later increased to 525 tons) of high-alpha pulp for use in rayon and cellulose acetate production went into operation at Ketchikan. Late in 1959, a similar mill began operating in Sitka with an initial capacity of 390 tons per day for export to Japan. The average timber cut in the Tongass National Forest jumped from an average of 56 mmbf [million board feet] in 1949-53 to an average 189.4 mmbf for 1954-58.

Figure 4. Timber harvest from Tongass National Forest, 1906-1984 (average annual million board feet per year)



Notes: [1] Ketchikan Pulp Co. mill dedicated 1954
[2] Alaska Lumber and Pulp Co. Sitka mill dedicated 1959
Source: Rogers (1985) p. 10

Cant and lumber mills associated with these mills came into existence, and other mills such as the two mills at Wrangell were reorganized and expanded, and two new operations began on state land near Haines. But development was to fall far short of the goals set by the 1958-1967 timber management plan. A planned third pulp mill was abandoned in 1965. Attempts were also made to establish the

fourth planned pulp mill at Juneau, but delays caused by lawsuits led to its being aborted in 1976.

…The creation of the new pulp industry dramatically transformed the natural resource products base of the regional economy. For the five-year period 1949-1953, just prior to the operation of the first pulp mill, fisheries products represented 90.2 percent of the value of natural resource products and forest products, 9.6 percent. For 1954-59, fisheries products values dropped to 55.4 percent, and forest products rose to 43.6 percent; and for 1979-1983, these values changed to 38.5 and 61.5 percent, respectively.

The oil boom years (1970 – 1984)

For the period 1970-1979, the Tongass National Forest accounted for an average of 95.8 percent of the total regional [timber] harvest, the remaining 4.2 percent coming from state lands near Haines and BIA lands in the Annette Island reserve. With the transfer of commercial forest lands to the Native corporations and the start of logging on private lands under their ownership in 1980, the share of regional harvest from the national forest declined to only 66.7 percent for 1980-1984. Another factor causing decline in the national forest harvests was the importing of pulp grade logs into the region from British Columbia at lower costs than those supplied locally….According to Mehrkens, "Alaska's timber industry is almost solely dependent on export markets in Japan and, to a lesser extent, other Pacific Rim countries" (Mehrkens, 1985, p. 5)

….Salmon harvests continued their recovery,…rising from 30.6 million pounds in 1975 to 155.9 million pounds in 1983. …catch of other finfish (principally halibut) and shellfish fluctuated annually but continued to account for only a small amount of total volume and value of catch of all species. …the value of regional fisheries production to fishermen and to processors, when expressed in constant dollars, has increased but slightly over the past two decades.

Minerals activities have been insignificant since 1970, most of the output and value being accounted for by sand, gravel, and stone extracted for use by the construction industry…The most promising mineral potential is the U.S. Borax discovery made in 1974 of the largest known molybdenum deposit in the world. Following the discovery, the area in which the prospect is located was designated as the Misty Fjords National Monument, and sampling and development have been carried out haltingly under strict controls contained in the Alaska National Interest Lands Conservation Act of 1980 and in an atmosphere of challenge from environmental and conservation groups. Development of a second prospect on Green [sic] Creek on Admiralty Island started before creation of that national monument [and] is going ahead slowly under similar controls and conditions.

Government employment continued to grow throughout the period, but at declining rates as petroleum dollars began to decline. Most of this was concentrated [within Southeast] at Juneau.

Tourism is another basic industry of the region. Although widely discussed and advertised, reliable hard data on this industry does not exist….

The period following the passage of ANILCA has been one of very rapid growth for the state as a whole, but of very modest economic and population growth for the Southeast Alaska region with trends of both growth and decline within the region itself. Employment increased 30 percent statewide during the period 1980-1984, but the increase in the Southeast region was only 8.1 percent. The engine which drove Alaska's phenomenal growth, the flood of petroleum dollars into the state treasury, did have an effect on one of the region's major basic sectors, government, but this was registered primarily in growth of employment in the state capital at Juneau (23 percent from 1980 to1984) and in local government as a result of generous state grants.

The region's other dominant basic sector, manufacturing, did not grow at all but fell at a rate between one and two percent annually. Employment in food [e.g., fish] processing declined from 1,329 in 1980 to 871 in 1984, while lumber and pulp employment dropped from 2,887 to 1,882 over the five-year period. …The decline in the timber industry was due to a combination of marketing factors—decline in timber markets in Japan and worldwide markets for dissolving pulp, competition from other suppliers, and the strength of the U.S. dollar.

The trade and services sectors of the economy enjoyed increases due to government and construction employment growth in Juneau and expanding tourism. [However, there was a] decline in transportation, communications, and utilities employment from 2,522 in 1980 to 1,950 in 1984. Federal government declined (from 2,500 in 1980 to 2,087 in 1984) while the "finance insurance and real estate component of the economy" remained virtually constant (1,070 in 1980 and 1,046 in 1984).

3.2. Recent changes (1990 - 2004)

The trends initially identified by Rogers in 1985 – declining timber activity, stagnant fish harvesting, and increasing economic concentration in Juneau – generally continued through the 1990s. A recent review article in *Alaska Economic Trends* (Gilbertsen 2004) provides an excellent summary of these overall economic changes in Southeast since 1990.[2] Gilbertsen

[2] This article can be easily accessed at http://labor.state.ak.us/trends/trends2004.htm or via the companion website to this paper: http://www.iser.uaa.alaska.edu/iser/people/colt/southeast_economy.html

highlights the hypothesis that due to these trends, there are now really "two economies" in Southeast.

> In the last decade, the communities of Southeast Alaska have followed divergent economic paths. Juneau, the state's capital, has seen steady growth, while much of the rest of the region has seen heavy job losses in the timber and fishing industries. (p. 3)

> Over the ten-year period 1993 through 2002, Southeast's annual average employment increased by 5.5%, adding 1,849 jobs. At first glance, this indicates a continuing if modest rate of growth for the region. When the regional data are broken down by community, the picture changes. While Juneau added 2,719 jobs, the rest of Southeast actually shed a total of 870 jobs. In the southernmost part of the region, Ketchikan Gateway Borough, Prince of Wales-Outer Ketchikan, and Wrangell- Petersburg were the hardest hit, losing a combined total of 1,396 jobs. To the north, Haines, Sitka, Skagway-Hoonah-Angoon, and Yakutat fared somewhat better, adding a combined total of 526 jobs, 71 percent of which were in Skagway- Hoonah-Angoon. In short, Juneau employment grew 19 percent over this period, while employment in the rest of Southeast registered a 5 percent decline. (p. 9)

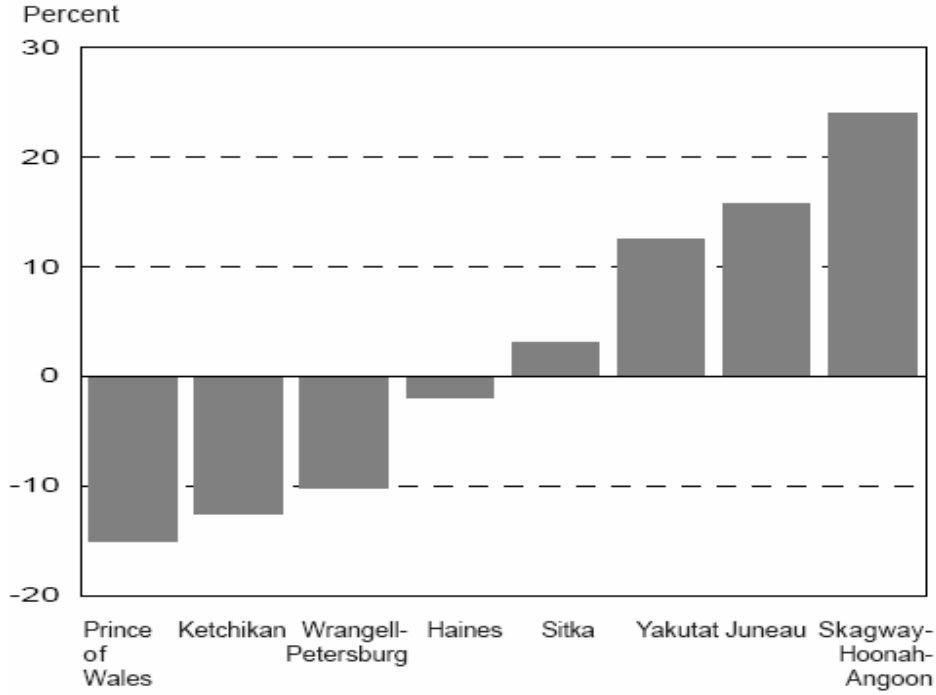
As a result of these changes in employment, only Juneau gained significant population during the past 15 years.

Gilbertsen goes on to consider the reasons for the changes in total employment. It is straight forward to document the continued decline in the timber and fishing industries:[3]

> In the decade of the 1990s, the Alaska Pulp Corporation and Ketchikan Pulp Company ceased operations. Mill closures in Ketchikan, Sitka, and Wrangell dramatically impacted the economies of these communities by eliminating their major private sector sources of year round employment. In addition, the seasonal but well paid logging activities in Prince of Wales-Outer Ketchikan, Wrangell-Petersburg, and Skagway-Hoonah-Angoon census areas were severely reduced. In 1990, there were 3,450 sawmill and logging jobs in the region. By 2002, only 450 of these remained.

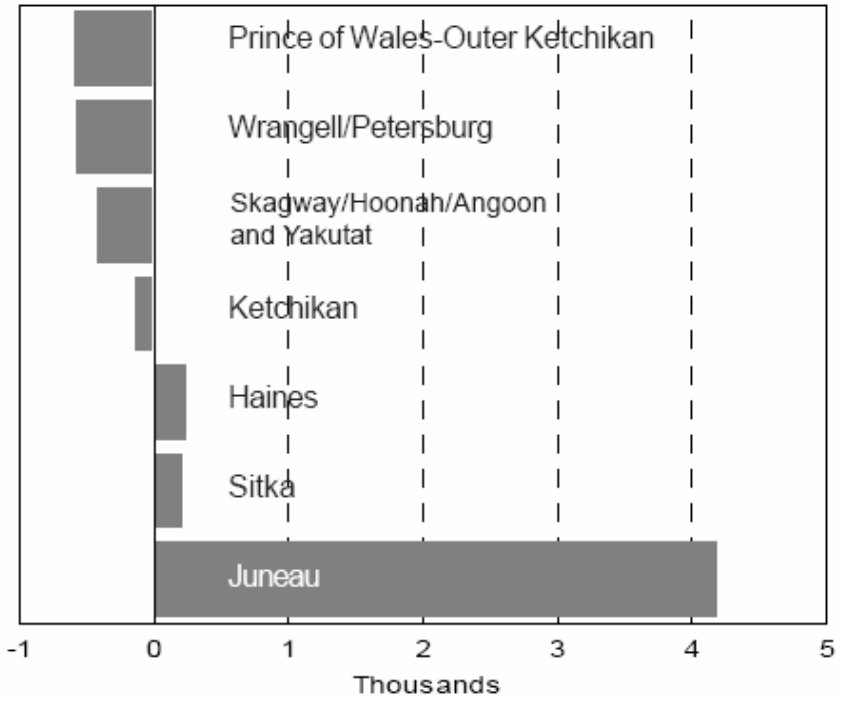
[3] Most fish harvesting activity is not recorded as wage and salary employment and does not figure into the total employment numbers shown in most official tabulations of "employment."

Figure 5. Percentage change in Southeast wage and salary employment by census area, 1993-2002



Note: Wage and salary employment does not include most fish harvesting activity and does not include sole proprietors operating small businesses.
source: Gilbertsen 2004

Figure 6. Change in Southeast population by census area, 1990-2002



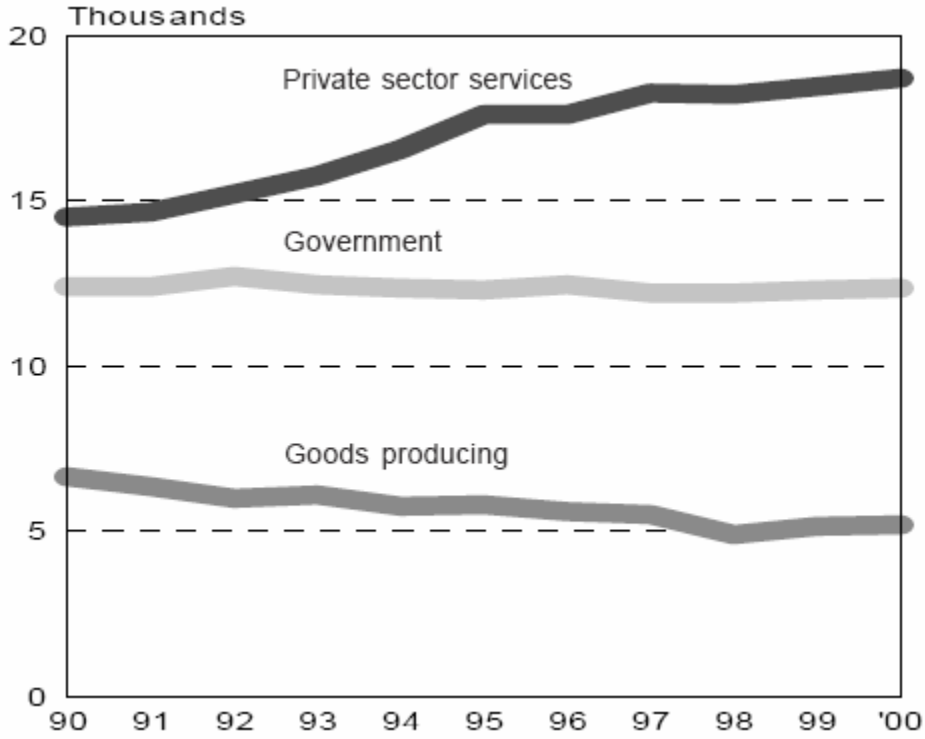
> The salmon and herring fisheries of the area have also experienced hard times. While salmon runs remain extremely strong in historical terms, prices have fallen to such low levels that large numbers of fishermen have been forced out, or have voluntarily left the industry. In 1992, for example, 2,658 salmon permit holders harvested 188 million pounds of salmon valued at $109 million. A decade later, 1,671 salmon permit holders landed 220 million pounds valued at only $35.4 million. The reduced fishing effort resulted in a 17 percent increase in harvest volume, but a 68 percent decline in harvest value. The nearly 1,000 fewer permits represent a 37 percent reduction in fishing effort, and do not capture the even greater decline in the number of crewmember jobs.
>
> …Fish processing employment, always dominated by a transient workforce, has also slightly declined over the last decade. (pp. 4-5)

In contrast to the decline of timber and fishing, the economy of Juneau has grown. However, Gilbertsen cautions that this growth is not simply the result of more government jobs:

> Although intuition might suggest that Juneau's growth has been the result of growing government, such intuition would be mistaken. While government remains the unquestioned heart of the economy, most of Juneau's growth over the last decade has come from the private sector. (p. 3)

Indeed, the growth in services in Juneau has been so pronounced that it created an overall shift in employment away from goods and toward services for the entire Southeast region (Figure 7). Gilbertsen ties the growth of service business activity to purchasing power of government employees. However, one could also interpret the data as a reflection of increased outsourcing of government functions and services to private firms. It is also unclear how the nonprofit sector, epitomized by regional health care organizations, is counted.

Figure 7. Changes in employment type for all of Southeast, 1990-2000



Note: data based on pre-2001 classification system and cannot be directly compared to post-2001 data.
Source: *Alaska Economic Trends,* March 2004

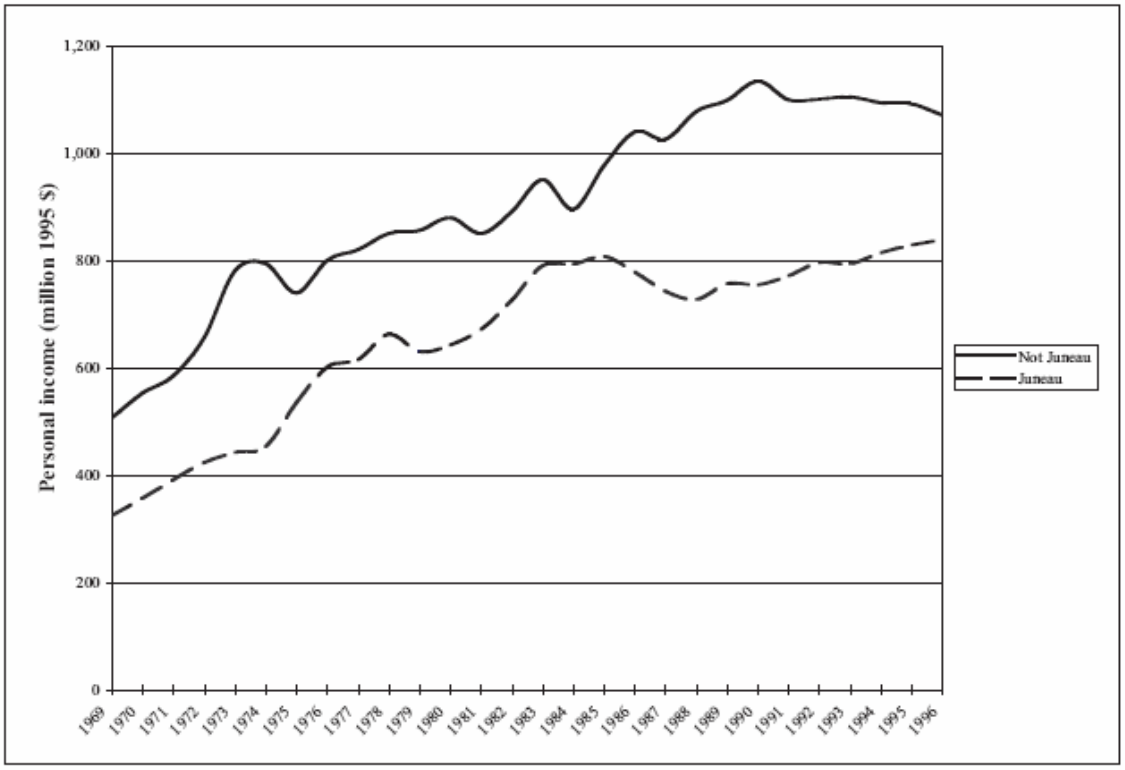
3.3. The rising importance of unearned income

An important study was completed by Guy Robertson (2004) as part of the Tongass Land Management Plan process. Robertson focused primarily on structural economic changes through 1996 in areas other than Juneau, which he called the "rural Southeast Alaska economy." He was looking beyond the simple "economic base" conception of the economy by considering sources of income and purchasing power that might not be directly tied to current production in the area. The technical term for such income is "unearned income." It includes, for example, investment income, pensions, social security checks, and other transfer payments. Some economists call this the "mailbox economy."

Robertson begins his analysis by noting the continuing decline in resource-based extractive industry and the slow but steady growth in services. He is interested in whether the observed economic change reflects region-specific changes in the traditional "economic base" of tourism and timber, or whether it is instead a product of a national trend toward a service-based

economy. Robertson's analysis begins by noting that aggregate personal income[4] in rural Southeast declined after about 1990. (Considering income per person, he further notes that "although real income in rural Southeast Alaska increased from around $17,000 per capita in 1969 to $24,000 in 1996, all of this increase occurred prior to 1986.").

Figure 8. Total Southeast Alaska personal income, 1969 – 1996, for Juneau Borough and for all other areas (millions of real 1995 dollars)



Source: Robertson 2004, p. 7. Data from U.S. Bureau of Economic Analysis, Regional Economic Information System.

Robertson's analysis then focuses on the importance of unearned income in the overall income mix. He notes that:

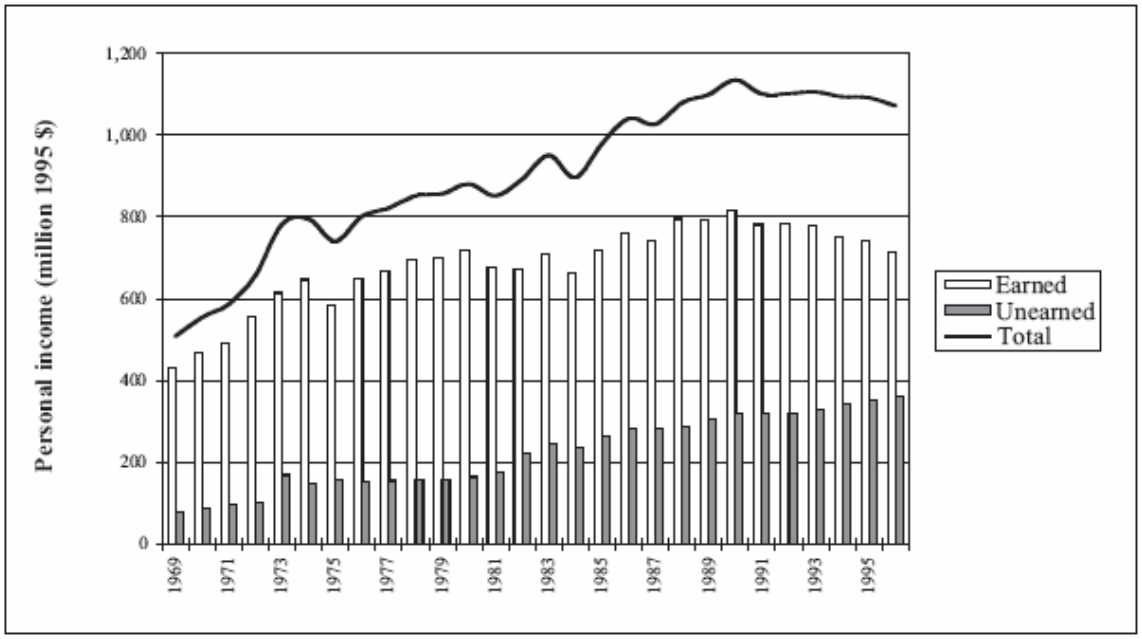
> Perhaps the most important distinction that can be drawn between different types of income sources is between earned and unearned income. Earned income, whether in the form of wages or profits to the self-employed, is directly

[4] Personal income is generally referred to on a "per capita" (meaning per person) basis. A decline in aggregate personal income means that either per capita income is declining faster than population growth, or population is declining, or both.

tied to economic activity occurring within the region. Unearned income, on the other hand, comprises dividends, other payments to capital, and a wide variety of transfer payments to individuals from local, state, and federal governments, and it need not be connected to local economic performance. Likewise, whereas earned income will necessarily correspond with a certain number of jobs in [places where] the income is earned, unearned income has no direct link to employment. Consequently, the importance of unearned income in regional economies is often overlooked … Nonetheless, it constitutes an increasingly important income source in many rural communities. And, although the dynamics entailed in its distribution and impact in the local economy are quite different from those of major manufacturing or resource extraction industries, the role of unearned income as an outside source of money is broadly analogous to the role of the major export industries commonly emphasized in export-base analysis.

…From 1969 to 1996, real unearned income increased four-fold, and, as a result, this income category now accounts for approximately one-third of total personal income in rural Southeast.

Figure 9. Rural Southeast Alaska personal income by major source, 1969-1996



Source: Robertson 2004, p. 9. Data from U.S. Bureau of Economic Analysis, Regional Economic Information System.

Robertson concluded that:

The most important economic developments in rural Southeast Alaska [between 1969 and 1996] were the decline in manufacturing activity and the concomitant increase in services and related activity. While the contraction in

manufacturing has resulted in falling wages and stagnant total income, expansion in services and related sectors has allowed for continued employment growth in the region. Increases in tourism-related activity underlie a portion of the structural shift to non-manufacturing sectors, but increases in other income sources are found to be at least equally important in maintaining regional income and thereby supporting economic growth. Non-wage income, such as retirement and health benefits or returns on investments, composes most of these other income sources. These developments reflect trends occurring at the national level and within the Pacific Northwest. The changes indicate the increasing importance of non-commodity forest outputs (primarily amenities and recreational opportunities) in supporting both the tourism and residential activity on which the region's economy increasingly relies. (p. 1)

4. Population

4.1. A note on census geography

Socioeconomic change in Southeast is hard to track because the geographical boundaries of census areas and boroughs have shifted several times. Between 1970 and 1980, there was a major shift from nine census divisions to seven boroughs and census areas. These areas remained the same for the 1990 census. Then, in 1992, the Yakutat Borough formed and removed itself from the Skagway-Yakutat-Angoon Census Area. In general, this report will use the 1980/1990 census geography, since it is by far the easiest to extend backward and forward in time to create consistent time trends. In practical terms, this means that the Skagway-Yakutat-Angoon census area will be presented as a single unit for the year 2000 and beyond. This unit comprises the Skagway-Hoonah-Angoon Census Area and the Yakutat Borough.

4.2. Regional population and trends

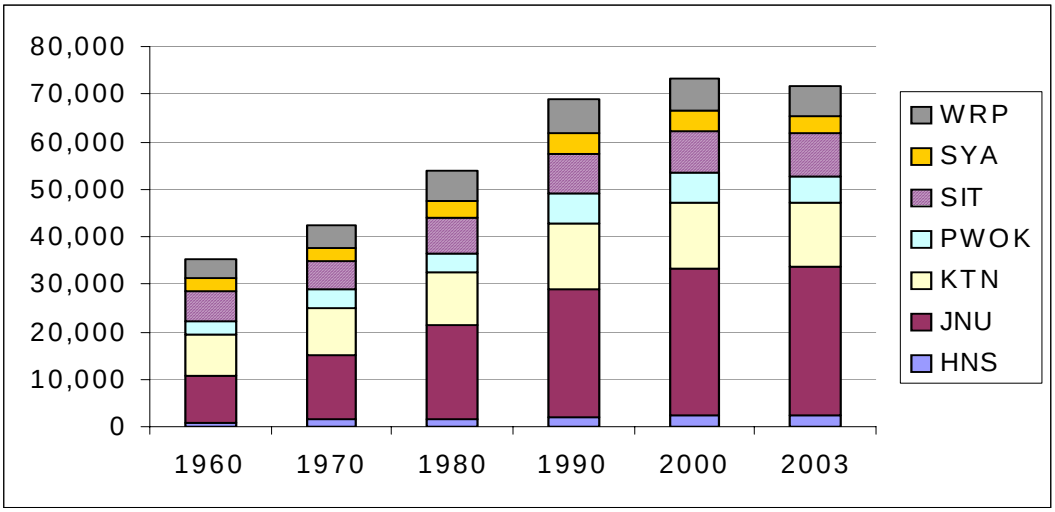
This section presents data on population change over time at the borough level. During the forty years following statehood, growth accelerated to 2.5 percent per year during the 1980s, and the population of the region more than doubled, reaching a high of just over 73, 000 people for the year 2000 census. Meanwhile, Alaska grew faster in response to the twin economic booms caused by the construction of the TAPS pipeline and then the massive spending of Prudhoe Bay oil revenues. On average, Alaska seems to have grown about 0.7 percentage points faster than Southeast. However, during this time the City and Borough of Juneau grew faster

than other Southeast areas, increasing its share of the total Southeast population from 27 percent up to 44 percent. This is not surprising given the strong economic connection between Juneau and State of Alaska oil revenues and government activity.

There was a significant growth slowdown that appears in the data during the 1990s. Since the census only provides data once every decade, it is uncertain exactly when the slowdown started. (Robertson (2004) noted that aggregate personal income growth ceased after about 1986 for the non-Juneau region as a whole.)

Table 2. Long-run population trends for Southeast census areas

	1960	1970	1980	1990	2000	2003
Haines Borough	792	1,401	1,680	2,117	2,392	2,319
Juneau City and Borough	9,714	13,556	19,528	26,751	30,711	31,246
Ketchikan Gateway Borough	8,774	10,041	11,316	13,828	14,059	13,533
Pr. of Wales-Outer Ketchikan CA	3,068	3,782	3,822	6,278	6,157	5,594
Sitka City and Borough	6,250	6,073	7,803	8,588	8,835	8,897
Skagway-Yakutat-Angoon CA	2,624	2,792	3,478	4,385	4,244	3,857
Skagway-Hoonah-Angoon CA	2,351	2,566	2,944	3,680	3,436	3,167
Yakutat City and Borough	273	226	534	705	808	690
Wrangell-Petersburg CA	4,163	4,920	6,167	7,042	6,684	6,321
Southeast Alaska	35,385	42,565	53,794	68,989	73,082	71,767

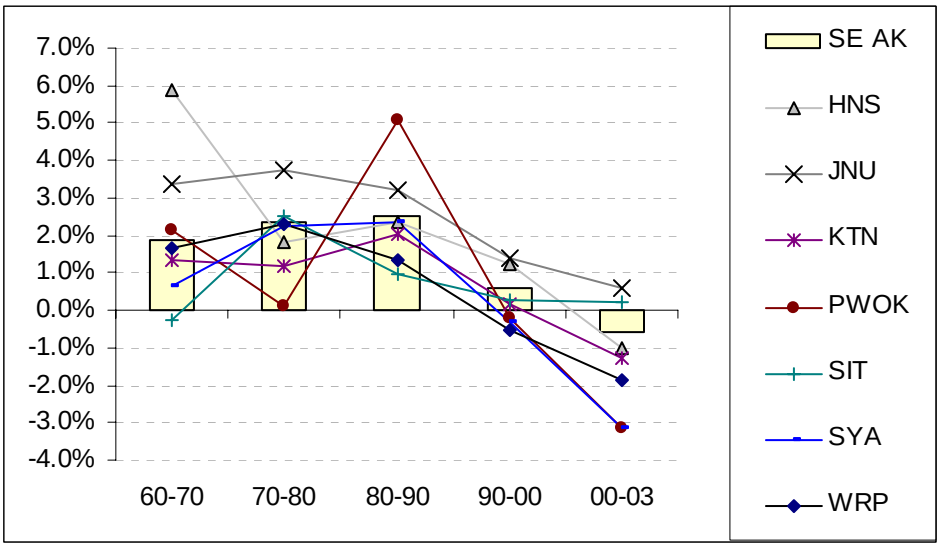


source: ISER compilations of U.S. Census Bureau raw data (worksheet BEA_summary_by_area.xls)

Table 3. Average annual population growth rates

	60-70	70-80	80-90	90-00	00-03
Haines Borough	5.9%	1.8%	2.3%	1.2%	-1.0%
Juneau City and Borough	3.4%	3.7%	3.2%	1.4%	0.6%
Ketchikan Gateway Borough	1.4%	1.2%	2.0%	0.2%	-1.3%
Pr. of Wales-Outer Ketchikan CA	2.1%	0.1%	5.1%	-0.2%	-3.1%
Sitka City and Borough	-0.3%	2.5%	1.0%	0.3%	0.2%
Skagway-Yakutat-Angoon CA	0.6%	2.2%	2.3%	-0.3%	-3.1%
Skagway-Hoonah-Angoon CA	0.9%	1.4%	2.3%	-0.7%	-2.7%
Yakutat City and Borough	-1.9%	9.0%	2.8%	1.4%	-5.1%
Wrangell-Petersburg CA	1.7%	2.3%	1.3%	-0.5%	-1.8%
Southeast Alaska	1.9%	2.4%	2.5%	0.6%	-0.6%
Alaska	*3.0%*	*2.9%*	*3.2%*	*1.3%*	*0.3%*

Figure 10. Average annual population growth rates



Since the 2000 census, every census area in Southeast lost population through 2003 except Sitka and Juneau. However, both of these areas probably lost population between 2003 and 2004. Overall, the region has lost almost 2,400 people (-0.6 percent) since 2000.

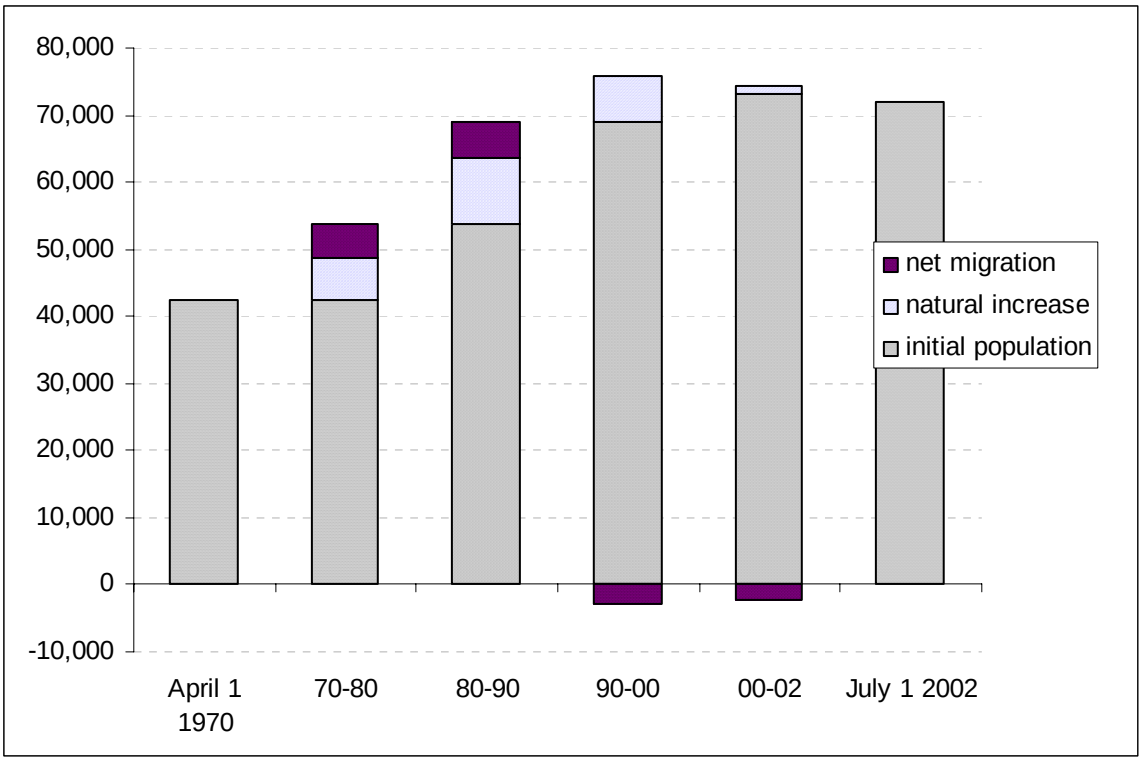
4.3. Migration and age structure

The main reason that the population is declining is that out-migration is outpacing the "natural increase" caused by more births than deaths. Figure 11 shows how net in-migration[5] fueled growth during the boom years of the 70s and 80s. It shows also how net out-migration

[5] By convention, the term "net" migration means net *in*-migration to a place.

surpassed natural increases after 2000 to cause an absolute decline for the Southeast Alaska population as a whole.

Figure 11. Components of population change for Southeast Alaska

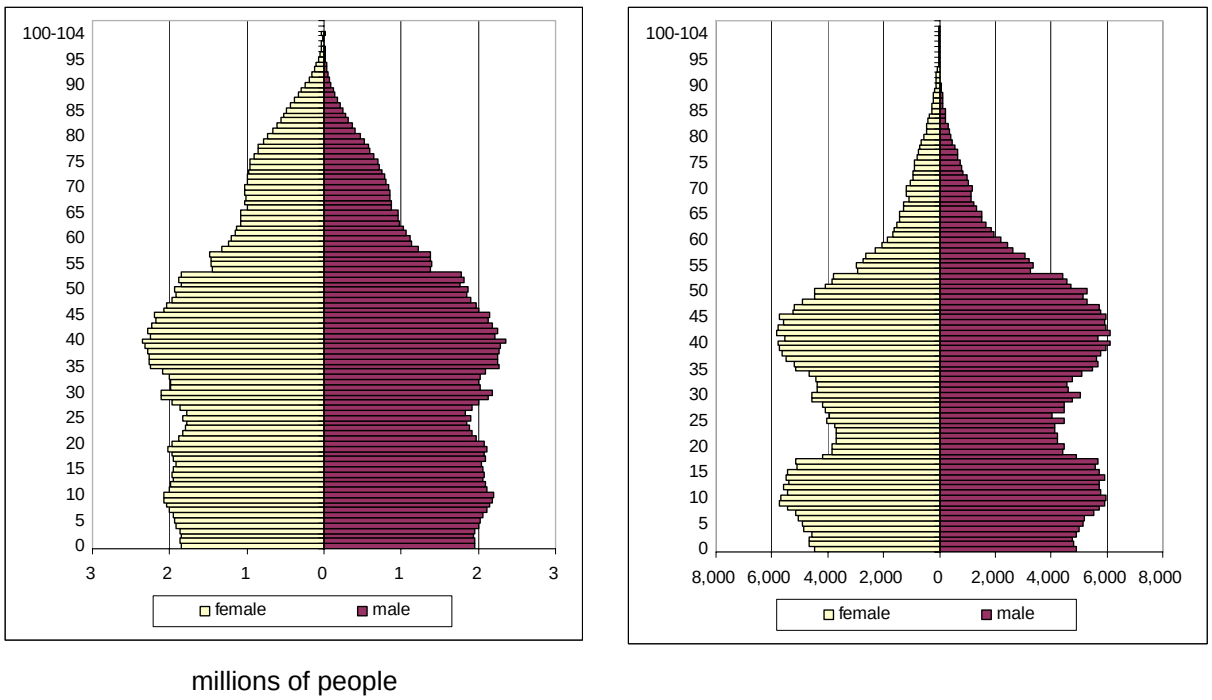


	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	42,565				
70-80	42,565	6,258	4,971	53,794	2.4%
80-90	53,794	9,699	5,496	68,989	2.5%
90-00	68,989	6,856	(2,763)	73,082	0.6%
00-02	73,082	1,165	(2,333)	71,914	-0.8%
July 1 2002	71,914				

The situation is more pronounced for specific census areas, such as the Prince of Wales Island area. (Appendix A shows the components of population change for each individual census area.) People could be leaving the area in search of jobs or education. We can see this by looking at the age structure diagrams for Southeast and some of its component places. The

region appears to have a slightly more pronounced dearth of young people than Alaska as a whole; statewide there is a very pronounced lack of people in the early 20s age brackets when compared to the rest of the United States.

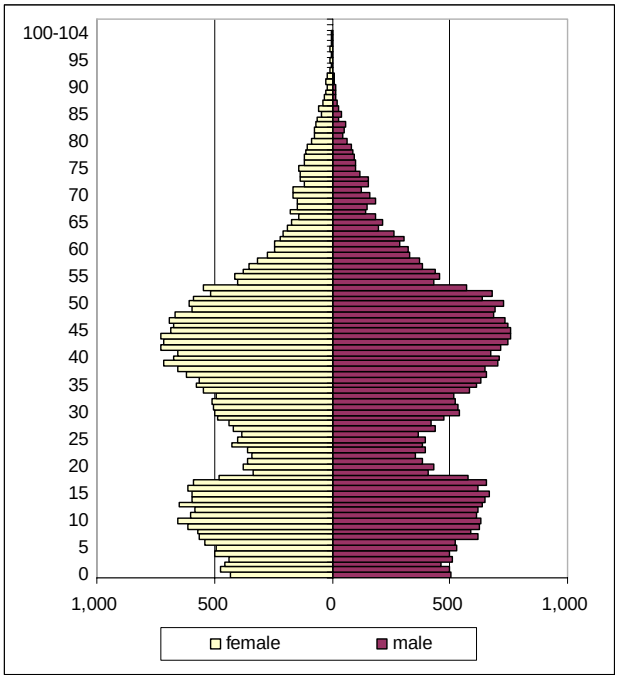
Figure 12. U.S. and Alaska age structures, year 2000



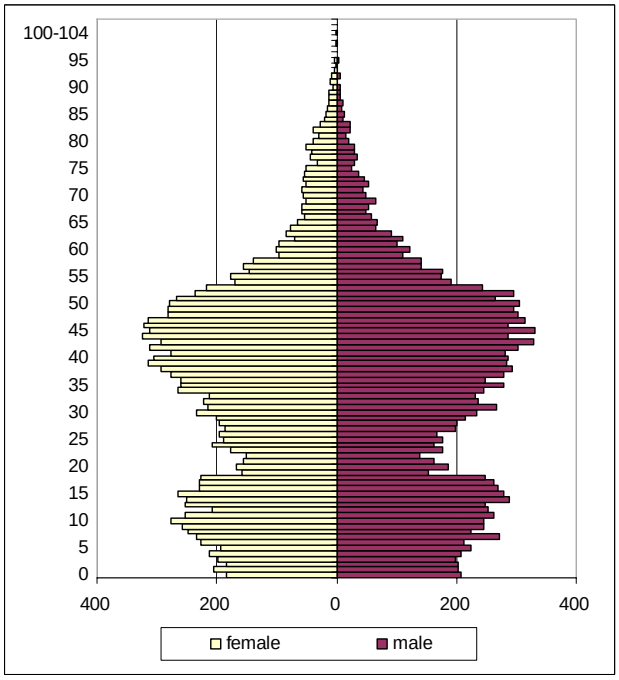
Although it is not possible to know with certainty, it is plausible that during the late 1990s younger people were leaving Southeast, which would reduce the number of new births and the natural increase, further exacerbating the population decline from the migration itself. Sitka might be an exception that demonstrates this rule: it has a slightly more stable or "flat" age distribution than some of the other areas.

Figure 13. Current age distributions in Southeast Alaska

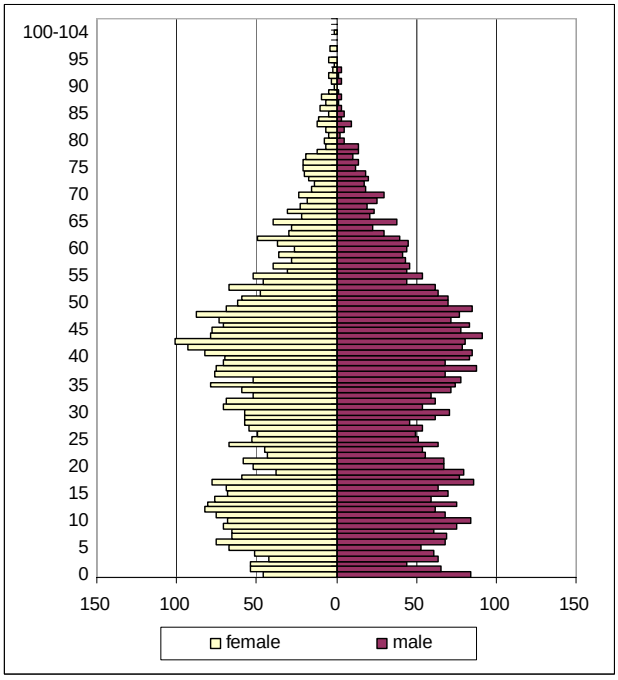
Southeast Alaska (median age = 35.9)



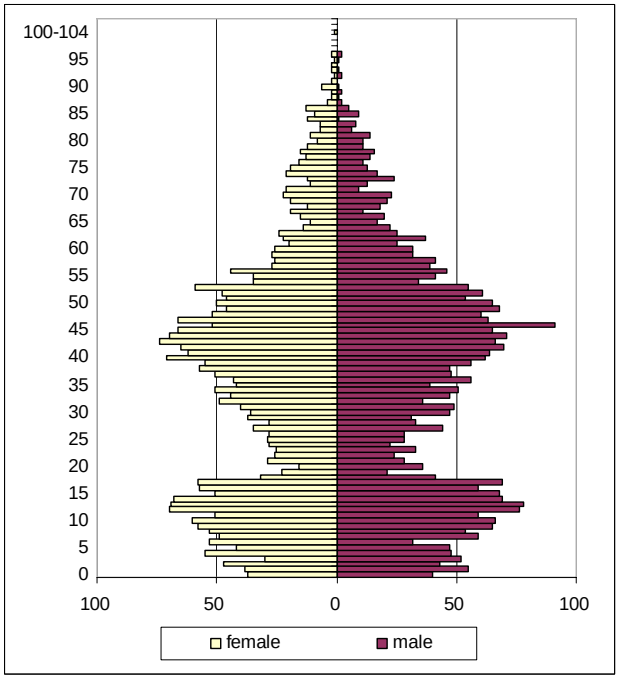
Juneau (median age = 35.3)



Sitka (median age = 35.2)



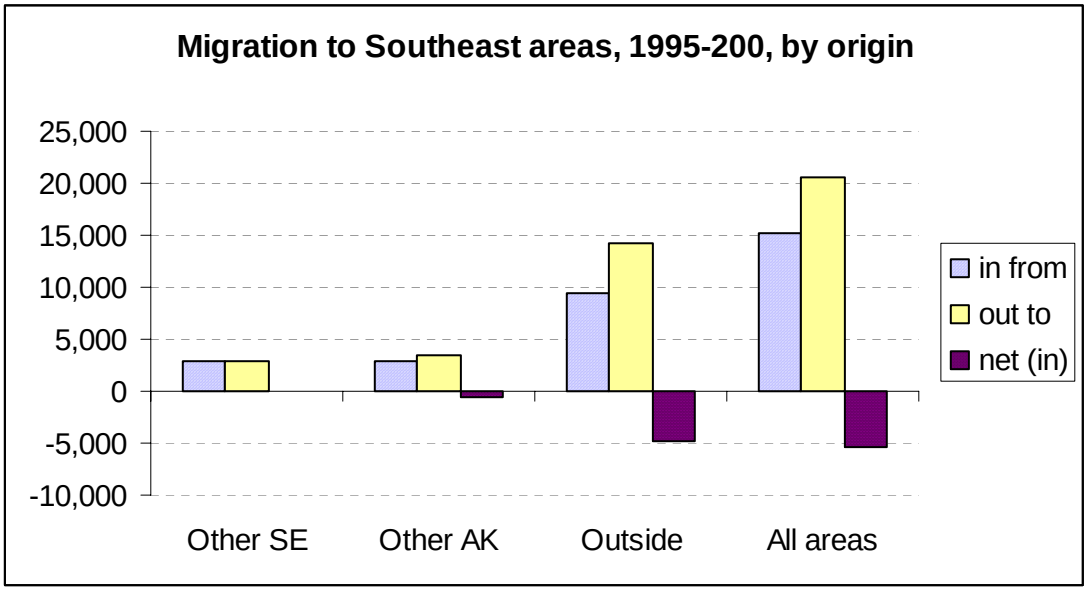
Wrangell-Petersburg (median age = 37.2)



4.4. Recent migration patterns

Census data allow us to learn more about the patterns of migration that are fueling the population decline in Southeast. (Similar patterns are occurring in other regions of Alaska, and the state as a whole is experiencing out migration, but it is not sufficient to negate natural increase so the population is still growing in these other regions). The 2000 census asked people what county they were living in five years previous; i.e, in 1995. This information allows us to calculate the net migration that occurred between 1995 and 2000 to each census area in SE from each other SE census area, from other regions of Alaska, and from other states. Figure 14 shows the overall pattern for all of Southeast. The migration patterns for each borough and census area, as well as the overall migration data matrix, are presented in Appendix B. Note that the movements between census areas within the region net out to zero as they should. During the period, 9,420 people came in to Southeast Alaska from other states, and 2,920 people came into the region from other parts of Alaska. At the same time, however, 14,223 people left Southeast for other states and 3,528 left for other parts of Alaska. The net result was a net outflow of 5,411 people between 1995 and 2000.

Figure 14. Migration to and from Southeast Alaska, 1995-2000



Migration occurred:	in to SE AK from:	out from SE AK to:	net migration
Other SE areas	2,914	2,914	0
Other Alaska (not SE)	2,920	3,528	-608
Outside	9,420	14,223	-4,803
All Areas	15,254	20,665	-5,411

The same phenomenon, of people migrating toward larger and more urban places, also occurred *within* Southeast as Juneau received net migration from almost all other areas of the region. However, Juneau was also the source of many people leaving for other states, so it also experienced net out migration.

Table 4. Migration to and from the Juneau Borough, 1995-2000

Origin or Destination	in to JNU from:	out from JNU to:	net migration
Haines Borough	52	109	-57
Juneau Borough	0	0	0
Ketchikan Borough	274	130	144
POW-Outer Ketchikan CA	94	17	77
Sitka Borough	176	153	23
Skagway-Hoonah-Angoon CA	240	124	116
Wrangell-Petersburg CA	229	84	145
Yakutat Borough	0	26	-26
Other Alaska	1,303	1,446	-143
Other states (=Outside)	4,005	5,601	-1,596
All Areas	6,373	7,690	-1,317

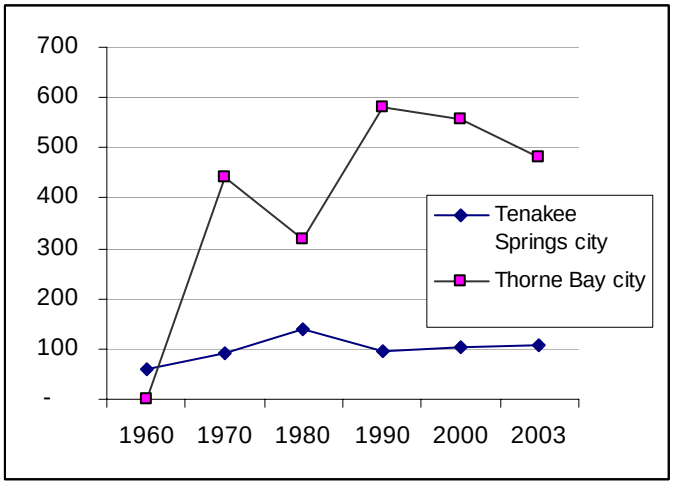
4.5. Population of specific places

We used census data files and published compilations of population data to construct a table of Southeast population change by individual community. The printed table below generally has the virtue of "adding up" without double counting any census "place" twice. (One prominent exception to this rule is that both the Skagway-Yakutat-Angoon census area and the Skagway-Hoonah-Angoon census area are listed for all years.) However, it does include several

significant Alaska Native Village Statistical Areas (ANVSAs), such as Douglas (within the City and Borough of Juneau) and Saxman City (abutting Ketchikan).[6]

Perhaps the most immediate lesson to be learned from examining the place-level population data is that many places appear—and others disappear—quite regularly. Too, the population of many individual communities seems to be much more volatile from decade to decade than the population of larger places. Places such as Thorne Bay and Tenakee Springs, shown in Figure 15, illustrate this volatility. It is harder and riskier to make business or personal investments of resources or time in such a volatile demographic environment. This business and social risk may then make the initial volatility worse.

Figure 15. Examples of volatile population levels in individual places



[6] A version of the table in Excel is available on the report web site.

Table 5. Population of communities, 1960 - 2003

	1960	1970	1980	1990	2000	2003
Haines Borough	792	1,401	1,680	2,117	2,392	2,319
Chilkoot *				221	338	357
Covenant Life CDP				47	102	126
Excursion Inlet CDP					10	12
Haines CDP (city) /10	392	463	993	1,238	1,811	1,704
Lutak CDP				45	39	36
Mosquito Lake CDP				80	221	220
Mud Bay CDP					137	149
Remainder of Haines borough	400	938	687	707	72	72
Juneau City and Borough	9,714	13,556	19,528	26,751	30,711	31,246
Douglas *					5,297	5,057
Juneau city and borough	9,714	13,556	19,528	26,751	30,711	31,246
Ketchikan Gateway Borough	8,774	10,041	11,316	13,828	14,059	13,533
Ketchikan city /1 /5	6,483	6,994	7,198	8,263	7,922	7,989
Saxman city *	153	135	273	369	431	424
Remainder of Ketchikan Borough	2,138	2,912	3845	5,196	5,706	5,120
Pr. of Wales-Outer Ketchikan CA	3,068	3,782	3,822	6,278	6,157	5,594
Craig *				1,260	1,725	1,495
Annette 60 70 80 90	337	195	139	43		
Cape Pole 70 80		123	29			
Coffman Cove city			193	186	199	164
Craig city	273	272	527	1,260	1,397	1,177
Dora Bay CDP 90				57		
Edna Bay CDP	135	112	6	86	49	45
Hollis CDP				111	139	175
Hydaburg city *	251	214	298	384	382	369
Hyder CDP			77	99	97	77
Kasaan city *	36	30	25	54	39	57
Klawock city *	251	213	318	722	854	847
Labouchere Bay 90				149		
Long Island 90				198		
Metlakatla CDP		1,050	1,056	1,407	1,375	1,329
Meyers Chuck CDP		37	50	37	21	18
Naukati Bay CDP				93	135	109
North Whale Pass 80			90			
Point Baker CDP			90	39	35	33
Polk Inlet 90				135		
Port Alice90				30		
Port Protection CDP				62	63	57
Thorne Bay city	-	443	320	581	557	481
Whale Pass CDP				75	58	67
Remainder of POW-OK CA	1,758	1,093	604	470	757	589

Table 5. Population of communities, 1960 - 2003 **(cont.)**

	1960	1970	1980	1990	2000	2003
Sitka City and Borough	6,250	6,073	7,803	8,588	8,835	8,897
Sitka city and Borough	6,250	6,073	7,803	8,588	8,835	8,897
Skagway-Yakutat-Angoon CA	2,624	2,792	3,478	4,385	4,244	3,857
Skagway-Hoonah-Angoon CA	2,351	2,566	2,944	3,680	3,436	3,167
Angoon city *	395	400	465	638	572	507
Cube Cove CDP				156	72	-
Elfin Cove CDP		49	28	57	32	32
Freshwater Bay 90				68		
Game Creek CDP				61	35	36
Gustavus city /11	107	64	98	258	429	438
Hobart Bay CDP				187	3	-
Hoonah city *	686	748	680	795	860	850
Klukwan CDP (Chilkat *)			135	129	139	120
Pelican city	135	133	180	222	163	113
Skagway city	659	675	768	692	862	844
Tenakee Springs city	60	93	138	94	104	106
Whitestone Logging Camp CDP				164	116	60
Remainder of Skag-Hoonah-Angoon CA	309	404	452	159	49	61
Wrangell-Petersburg CA	4,163	4,920	6,167	7,042	6,684	6,321
Kake city *	455	448	555	700	710	683
Kupreanof city	26	36	47	23	23	30
Petersburg city	1,502	2,042	2,821	3,207	3,224	3,079
Port Alexander city	18	36	86	119	81	70
Rowan Bay 90				133		
Saint John Harbor 90				69		
Thoms Place CDP					22	12
Wrangell city	1,315	2,029	2,184	2,479	2,308	2,123
Remainder of Wrangell-Petersburg Censu	847	329	474	312	316	324
Yakutat City and Borough	273	226	534	705	808	690
Yakutat CDP *	230	190	449	534	680	635
Remainder of Yakutat Borough	43	36	85	171	128	55

Notes to table:
(1) Places with an asterisk (*) are Alaska Native Village Statistical Areas, which may or may not coincide to some extent with other listed areas.
(2) CDP means "census-designated place," a de-facto community that is typically not incorporated as a political subdivision of the State of Alaska.
(3) places in *italics* are not included in the year 2000 census geography.

5. Income and Employment

5.1. Per capita personal income

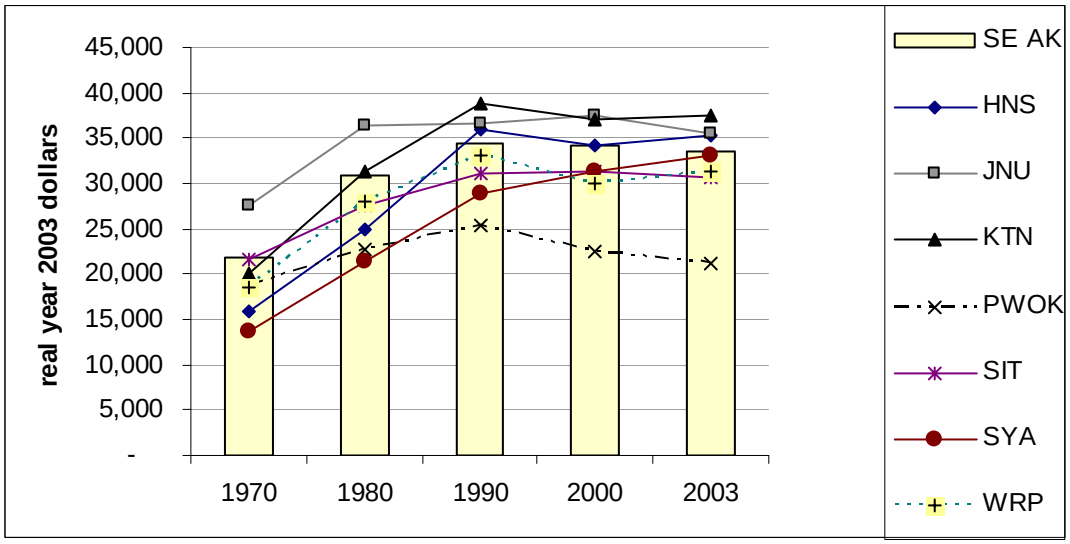
One of the best overall measures of economic health and trends over time is per capita (meaning "per person") personal income, adjusted for inflation. This measure has several advantages over other measures of economic health. It represents the actual standard of living and overall purchasing power achieved by people in a region. It includes earnings from sole proprietor businesses, notably including fishing. Unlike employment data, income measures automatically reflect the seasonality, availability, and pay scale of work that may be associated with "one job." Finally, personal income data are adjusted for residence so that personal income measures the economic well-being achieved by the people who live in a place, rather than those who might work there but take their money elsewhere.

Table 6 and Figure 16 show real (meaning adjusted for inflation) per capita personal income expressed in year 2003 dollars. Income grew rapidly, by more than 3 percent per year, during the 1970s as the state government ramped up for the oil boom and the labor market heated up. This regional growth was slightly faster than that of Alaska as a whole. During the 1980s growth slowed both in Alaska generally and in Southeast as the recession of the late 80s took away some of the income gains that had been achieved earlier in the decade with high timber prices and the petroleum revenue spending boom.

Table 6. Real per capita personal income by census area, 1970-2003
(year 2003 dollars)

	1970	1980	1990	2000	2003
Haines Borough	15,799	24,903	35,921	34,191	35,237
Juneau City and Borough	27,506	36,404	36,587	37,434	35,478
Ketchikan Gateway Borough	20,164	31,259	38,718	37,033	37,393
Pr. of Wales-Outer Ketchikan CA	18,780	22,672	25,379	22,555	21,283
Sitka City and Borough	21,520	27,614	31,020	31,313	30,591
Skagway-Yakutat-Angoon CA	13,747	21,490	28,938	31,368	33,121
Wrangell-Petersburg CA	18,634	27,916	33,106	29,993	31,416
Southeast Alaska	21,845	30,776	34,450	34,223	33,592
SE average annual growth		*3.5%*	*1.1%*	*-0.1%*	*-0.6%*
Alaska	20,809	28,254	31,245	32,163	33,213
Alaska average annual growth		*3.1%*	*1.0%*	*0.3%*	*1.1%*

Figure 16. Real per capita personal income growth, 1970-2003



After 1990, real per capita income growth slowed markedly or ceased altogether in many places. Income continued to rise very slowly in Juneau, Sitka, and Skagway-Yakutat-Angoon, places where government and tourism were exerting a positive force on the economy. It dropped everywhere else as the pulp mills closed, ANCSA village corporations finished their most lucrative logging, and the state's fiscal problems led to reduced spending. The entire Alaska economy experienced a similar slowdown, but it was not quite as severe.

5.2. Total personal income

While real per capita personal income measures the average well-being of people, the measure says nothing about the size and growth of the entire economy. Wage and salary employment is often used to measure this overall progress, but once again, these employment numbers can be uninformative when looking at an economy such as Southeast Alaska. Fishing activity is not measured and is not reported in wage and salary employment data. Neither is other small business activity undertaken by proprietors, which would include many small-scale recreation and tourism businesses.

Table 7 and Figure 17 show the overall pattern of personal income generation for the entire region. There are four major components of personal income. Wages and salaries from employment plus proprietors' income (from fishing or small business) together make up so-called "earned income." Dividends, interest, and rent (such as an Alaska Permanent Fund dividend) plus transfer payments (such as social security payments) together make up so-called

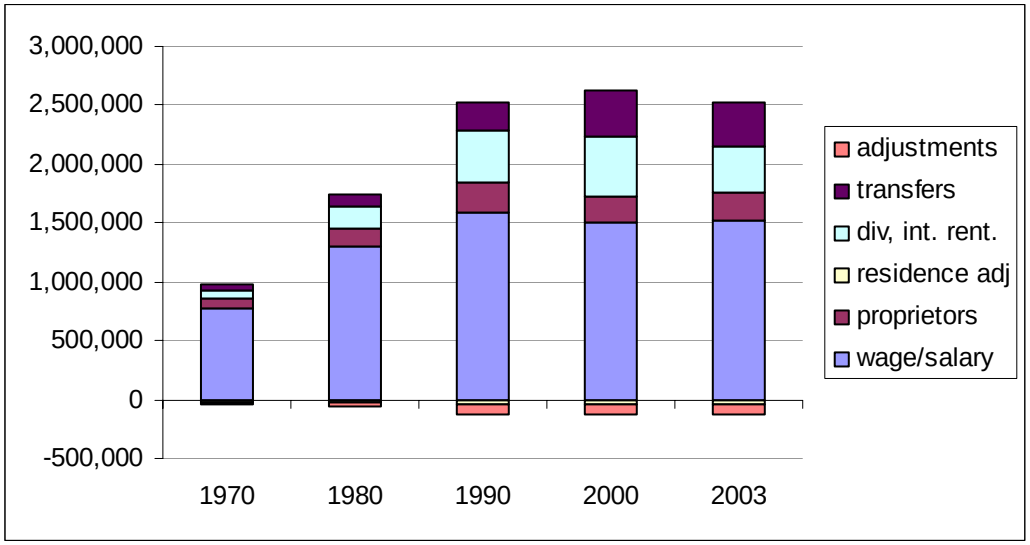
"unearned income." A fifth component of reported personal income in the published data is the residence adjustment. When the adjustment is positive, it means that residents are earning money elsewhere and bringing it back to the region, adding to the wages and salaries paid out to workers in the region. When the adjustment is negative, as it is for Southeast Alaska as a whole, it means that, overall, nonresident workers are earning wages, salaries, and proprietors' income in the region and taking the money out of the region.

Table 7. Components of total real personal income earned by Southeast residents, 1970-2003 (thousands of year 2003 dollars).

Components of total personal income (thousands of real 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	770,815	1,306,414	1,596,499	1,506,852	1,526,001
Proprietors' income	84,524	150,500	246,300	223,550	228,925
Residence adjustment	(23,224)	(16,028)	(48,882)	(38,074)	(33,698)
Dividends, interest, rent	74,699	180,082	443,962	502,377	398,684
Personal transfers	55,460	101,086	239,131	387,804	366,161
Adjustments and other, net	(23,707)	(48,313)	(82,505)	(85,592)	(84,410)
Personal income	938,566	1,673,742	2,394,506	2,496,917	2,401,663

Figure 17. Components of total real personal income earned by Southeast residents, 1970-2003 (thousands of year 2003 dollars).



The three middle bars in the graph summarize the shift toward unearned income that Robertson (2004) found looking at data through 1996. As Table 8 shows, the share of personal income from wages and salaries declined from about 80 percent to about 60 percent between 1980 and 2000. The share from proprietors' income stayed constant, and the share of unearned income doubled - from about 17 percent to 35 percent.

Table 8. Percentage shares of total personal income by source, 1970-2003

	1970	1980	1990	2000	2003
Wages & Salaries	82%	78%	67%	60%	64%
Proprietors' income	9%	9%	10%	9%	10%
Residence adjustment	-2%	-1%	-2%	-2%	-1%
Dividends, interest, rent	8%	11%	19%	20%	17%
Personal transfers	6%	6%	10%	16%	15%
Adjustments and other, net	-3%	-3%	-3%	-3%	-4%
Personal income	100%	100%	100%	100%	100%

Since the year 2000, however, the mix of income sources may have stabilized. Although it is too early to tell from current data, the share of earned income did increase back to 73 percent of personal income between 2000 and 2003 while the share of unearned income decreased from 35 percent down to 31 percent. The overall regional increase in the share of total income from wages and salaries masks a large difference between Juneau and Rural Southeast. In Juneau, the wage and salary share increased from 55% to 61%, while elsewhere the share continued to drop, from 57% to 56%. (Details are shown in Appendix C).

5.3. Total employment

Table 9 shows total Southeast employment as measured by the Bureau of Economic Analysis (BEA). Total employment increased faster than population and slower than per capita income during the economic boom years of the 1970s and 1980s. This is normal, as the demand for labor during a boom is satisfied partly through in-migration, partly through nonresident workers, and partly through wage increases that bring supply and demand into balance. During the 1990s, however, total Southeast employment grew at less than 1 percent per year. It then declined slightly after 2000.

Table 9. Total employment in Southeast Alaska, 1970-2003
(Bureau of Economic Analysis data)

	1970	1980	1990	2000	2003
Population (census)	42,565	53,794	68,989	73,082	71,767
average annual growth		*2.4%*	*2.5%*	*0.6%*	*-0.6%*
Total employment	21,599	34,113	46,715	50,855	49,422
average annual growth		*4.7%*	*3.2%*	*0.9%*	*-0.9%*
wage and salary	19,079	28,764	35,929	37,922	37,703
proprietors	2,520	5,349	10,786	12,933	11,719
proprietors' share	*12%*	*16%*	*23%*	*25%*	*24%*
Real per capita income	5,525	16,193	25,143	31,780	33,592
average annual growth		*11.4%*	*4.5%*	*2.4%*	*1.9%*

note: BEA data measures full-time and part-time employment, with no adjustment for part-time jobs. As a practical matter, BEA wage and salary employment numbers are about 5% higher than Alaska Dept. of Labor employment figures, which attempt to measure average annual employment. Alaska DOL does not measure proprietors' employment.

It is important to remember that the BEA measure of employment includes proprietors, which in this region includes fish harvesters. The decline in total employment after 2000 is due largely to a decline in proprietors' employment. In fact, the Alaska DOL measure of wage and salary employment actually increased slightly (see Table 10 shows total employment by industry over time, including the most recent data for 2005. In order to construct a consistent picture of employment by industry over time, it is necessary to use Alaska Department of Labor data. These cover wage and salary employment only, although we have added estimates of commercial fish harvesting employment from a separate analysis.

Table 10 below). It is possible, therefore, that the employment decline is due to exit from the fishing industry in response to very low salmon prices. Of course, as discussed at the start of this report, other traditionally important sectors such as timber, wood products, and fish processing have seen a drop in jobs, and the overall total for Southeast reflects the combination of modest growth in Juneau and relative stagnation in other areas.

Another message from Table 9 is the growing importance of proprietors' employment in the total – up to 24 percent in 2000 from only 11 percent in 1970. Since it is very unlikely that fish harvesting increased significantly after 1970 (and even less likely, after 1980), this increase is probably due to the rise of small business operations that serve both government and tourists. Many of these proprietors' jobs are part-time and/or seasonal.

Appendix C presents the personal income and employment information that has just been discussed for the entire region, but for individual census areas. There is much to be learned from a close reading of this information. It should be remembered that the BEA data relating to proprietors are based on a small sample and the numbers for individual census areas tend to fluctuate quite a bit.

5.4. Employment by industry

Table 10 shows total employment by industry over time, including the most recent data for 2005. In order to construct a consistent picture of employment by industry over time, it is necessary to use Alaska Department of Labor data.[7] These cover wage and salary employment only, although we have added estimates of commercial fish harvesting employment from a separate analysis.

[7] BEA employment data for census areas is heavily suppressed to protect confidentiality.

Table 10. Wage & salary and fish harvesting employment in Southeast Alaska, 1970-2005

(Alaska Dept of Labor data)

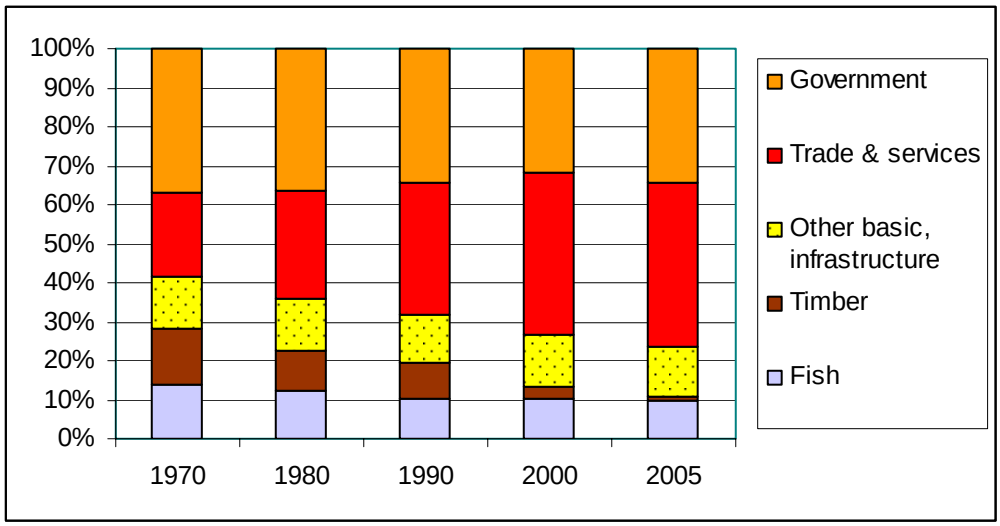
	1970	1980	1990	2000	2005
Wage and salary employment					
Mining	50	24	350	309	312
Construction	649	1,213	1,150	1,805	1,614
Manufacturing (includes logging)					
Logging, sawmills, wood products[(1)]	1,611	1,888	2,550	1,118	474
Seafood processing	769	1,368	1,350	1,487	1,512
Pulp mills	1,012	1,026	900	0	0
Other manufacturing	93	144	250	482	262
Transport, communication, utilities	1,685	2,448	2,650	2,621	2,672
Trade	2,072	3,587	5,450	6,254	6,761
Finance, insurance, real estate	342	1,088	1,050	1,175	1,192
Other services	1,464	3,190	5,650	8,100	8,328
Government					
Federal (civilian)	2,065	2,500	2,150	1,800	2,017
State & local	4,784	7,955	10,200	10,435	11,249
Other	115	144	0	309	186
Total wage and salary employment	16,710	26,574	33,700	35,895	36,579
Fish harvesting (proprietors)	1,781	2,177	2,295	2,413	2,262
Total average annual employment [(2)]	18,491	28,751	35,995	38,308	38,841

notes: (1) includes "forestry" from the year 2005 classifications
(2) does not include proprietors employment other than fish harvesting

sources: (a) Alaska Dept of Labor and Workforce Development, *Statistical Quarterly* (1970-80) and *Employment and Earnings* (1990-2005)
(b) 1970 and 1980 fish harvesting from Rogers 1985, Table 32.
(c) 2000 and 2005 fish harvesting from Alaska Dept of Labor, personal communication

The shifting industrial structure is highlighted in Figure 18, which shows the dramatic growth of the trade and services sectors. Many of these trade and services jobs are part of the tourism industry (which is not measured separately in any official data source) and some of them probably reflect increased contracting of government work to private sector businesses. The steady rise in total government employment is mostly driven by local government, which includes school teachers.

Figure 18. Shares of employment by sector in Southeast Alaska, 1970-2005



	1970	1980	1990	2000	2005
Fishing and fish processing (Fish)	14%	12%	10%	10%	10%
Logging, sawmills, pulp mills (Timber)	14%	10%	10%	3%	1%
Other basic and infrastructure	13%	13%	12%	14%	13%
Trade, services, and other	22%	28%	34%	41%	42%
Government	37%	36%	34%	32%	34%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: compiled from data in Table 10, this study.

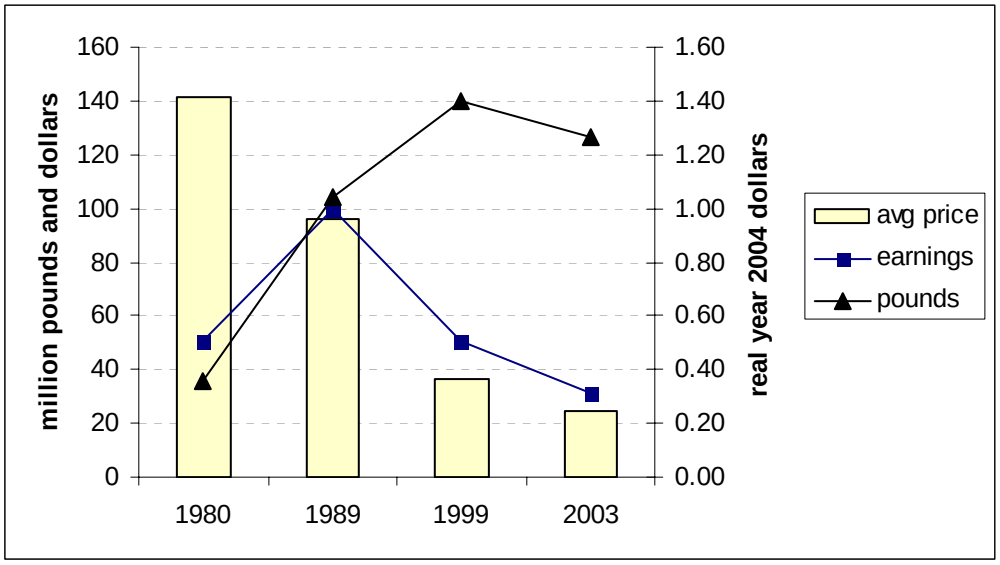
5.5. Fish harvesting catch and earnings

Fish harvesting has always been a mainstay of the Southeast Alaska economy, as discussed in the historical review above. Recently the industry has been badly hurt by a steep decline in salmon prices.

Figure 19 shows the total pounds of salmon caught by Southeast residents. Volume increased dramatically, partly due to the rise of hatchery operations. Average price declined equally dramatically (the figure shows the price in real year 2004 dollars). Part of the price

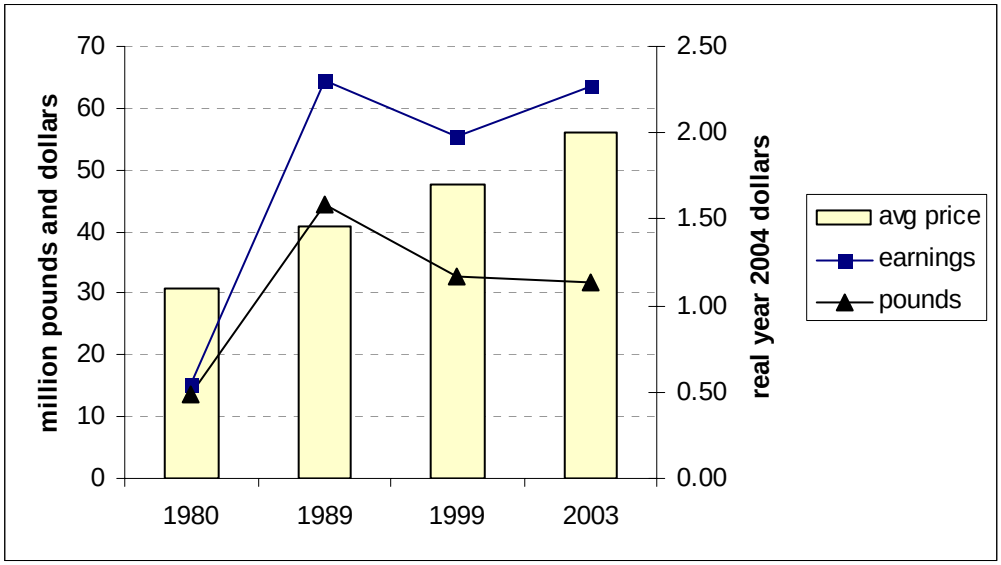
decline is probably due to a shift toward hatchery-reared pink salmon in the species mix, but a significant part is due to the general collapse in salmon prices that accompanied the rise of the farmed salmon industry. The net result of these factors is that despite a large increase in harvest volume, real earnings from salmon fell by 70 percent between 1990 and 2003.

Figure 19. Southeast Alaska residents' salmon catch, earnings, and average price, 1970-2003



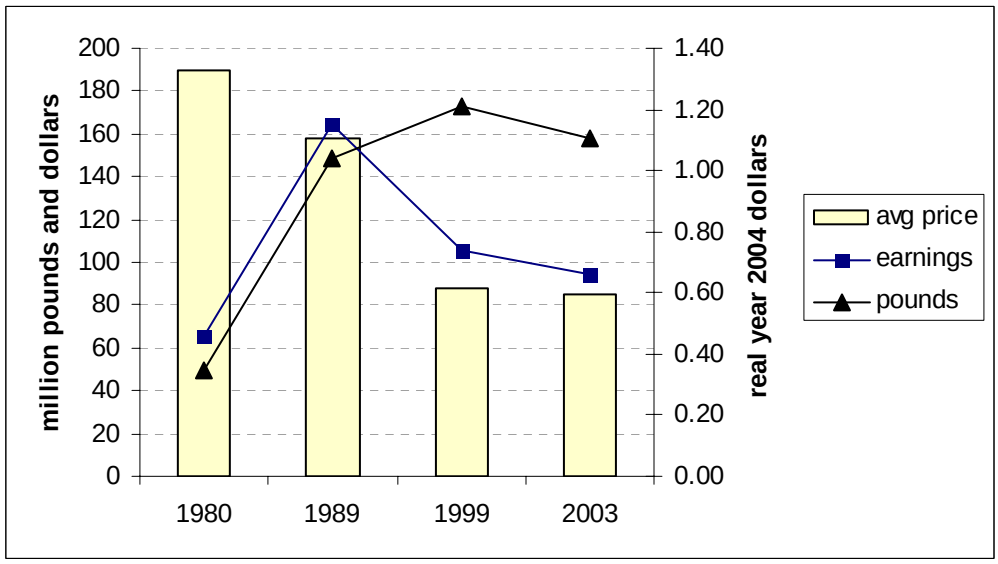
The picture looks better for all other species taken together (chiefly halibut, also crab, herring and sablefish). For these species, average price has increased while volume declined, leading to roughly constant real income.

Figure 20. Southeast Alaska residents' catch, earnings, and average price for limited entry species other than salmon, 1970-2003



Although one might hope that these two scenarios would balance each other out, the volume of other species is far less than the volume of salmon. Therefore, Figure 21 shows that fishers' real income has dropped nearly by half since 1989 due to the fall in real salmon prices.

Figure 21. Southeast Alaska residents' catch, earnings, and average price for all limited entry species, 1970-2003



Appendix D presents catch and earnings, for salmon and for other species, for 24 individual communities.

6. The Forest Products Industry

Recent years have brought major shifts in the Alaska forest products industry. Looking only at the short period from 1990 to 1996, timber harvest from national forests in Alaska declined by nearly 80 percent. Factors contributing to this decline include the closure of the Ketchikan and Sitka pulp mills, changes in markets for Alaska forest products, especially in Japan, and changes in conditions faced by Alaska's competitors.[8] This market shift produced a substantial decrease in harvest levels on the Tongass National Forest and a decrease in harvests on privately held Alaska Native corporation lands in Southeast Alaska.

As a result of these economic conditions, primary processing of Alaska forest products has grown only slightly. Most of this modest growth is occurring in small firms located in Southcentral or Interior Alaska, rather than Southeast Alaska, the forest products industry's traditional stronghold. The Alaska Department of Natural Resources conducts sales in Interior Alaska that provide timber to small mills that supply wood to local Alaska markets.[9]

6.1. Wood product markets

Traditionally most timber cut in Alaska was destined for export commodity markets with little processing. After World War II, the federal government's interest in increasing year round settlement in Alaska led to the construction and subsidized operation of two pulp mills, in Sitka and Ketchikan, intended to use the large volume of low grade Tongass National Forest timber, primarily western hemlock. The closure of these mills and termination of their 50-year timber supply contracts substantially changed the industry's production and market dynamics. The low grade hemlock (approximately 60% of the volume) in mixed Southeast Alaska hemlock-spruce forests, which was previously processed by the pulp mills, cannot compete in the open global market. U.S. Forest Service utilization standards do not allow leaving these low grade logs on the forest when carrying out clear cut timber harvesting, the predominant timber cutting method. Most of the commercial value of Southeast Alaska mixed forests stands is derived from Sitka

[8] Brooks, David and Richard Haynes, *Conservation and Resource Assessments for the Tongass Land Management Plan Revision, Timber Products Output and Timber Harvests in Alaska: Projections for 1997-2010*, USDA Forest Service, Pacific Northwest Research Station, Gen. Tech. Report PNW-GTR-409, September 1997.

[9] For detailed information on Alaska timber harvests and exports see: Fay, Ginny, *Alaska Timber Harvests and Export Volumes*, prepared for the Alaska Conservation Alliance, May 2003.

spruce, high grade Western hemlock and yellow cedar. As a result, much of the timber harvesting in previous decades was directed at high volume timber stands that are also ecologically important to fish and wildlife. Currently, however, much of the logging is directed at yellow cedar, which commands the highest prices on the export market.

A recent report by the Alaska Department of Labor and Workforce Development succinctly summarizes the state of the Alaska forest product markets.[10] The report states that:

- Alaska is a high cost area, meaning other areas of the world (Russia, China, or even southern states in the United States) can process and market wood products with lower costs than Alaska.
- In high-cost areas, the wood products industry has consolidated many local businesses to form corporations whose perspectives are global in scope in order to save money.
- The economic reasons are complicated, but the underlying fact is that the growing worldwide production of timber has exceeded demand for most of the past decade.
- As a result of increased competition in the raw material market with wood produced in low-cost areas, many Alaska mills have closed.
- Even if markets for Tongass timber revive, Alaska wood products manufacturing is not expected to create a demand for a substantial increase in logging. It will instead focus on more profitable use of current levels of log production.

Key market forces affecting the Tongass timber industry include:

- Demand for Tongass trees has fallen dramatically because of an international glut of timber.
- The timber industry's best customers (the Japanese) are buying wood from other countries.
- The Tongass is a high-cost producer in a tough international market that includes heavyweight competitors such as Canada and Scandinavia.

A global market has developed for plantation trees in order to obtain cheaper wood products. Similar to the threat posed by salmon farms to Alaska's wild stock fisheries, tree farms located in low-cost developing nations are expected to capture an ever-greater share of world markets.

Another recent publication by USDA Forest Service research station economists concluded that:[11]

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[10] Gilbertson, Neal and Dan Robinson, Natural Resources: Mining and Timber, *Alaska Economic Trends*, December 2003.

[11] Stevens, James A .and David J. Brooks, 2003. Alaska softwood market price arbitrage. Res. Pap. PNW-RP 556. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 12 p.

> Western hemlock and Sitka spruce logs from Alaska share an integrated market (Japan) with logs produced in British Columbia and the U.S. Pacific Northwest. Given the evidence that markets are at least imperfectly integrated, Alaska production costs matter; that is, Alaska producers will be limited in the degree to which they incorporate their relatively higher costs in product prices and retain market share. It is not surprising, therefore, that Alaska production and exports are quite sensitive to international market conditions. High-cost producers are typically the last-in, first-out suppliers of commodity products that have close substitutes. These results do not challenge the idea that Alaska does produce some unique (and high-value) products from old-growth Sitka spruce and Alaska yellow cedar. For both logs and lumber, however, this accounts for a very small portion of total production. In the commodity markets that make up the bulk of the end uses for Alaska's timber resource, these results lend support to the conclusion that Alaska is competing in integrated and competitive world markets. The closure of the Alaska pulp mills coincided with structural changes in Japanese lumber markets; starting in the mid-1990s, European-origin, kiln-dried lumber began substituting for green hemlock lumber produced in North America.

In the calendar year 2001, the total value of wood products exported from Alaska was $146.2 million, including $136 million in softwood logs, $9.5 million in chips, and $700,000 in lumber. The total value decreased 26% from the previous year's total of $196.6 million. As a high cost producer, Alaska timber is likely to be the "last in, first out" in the global market leading to annual fluctuations depending on global demand.

6.2. Competitive position of Alaska timber supply

An important recent study, by Lisa Crone (2004), analyzed more specifically the role of the timber industry in Southeast Alaska and compared it to the role of timber in the Pacific Northwest. Crone found that historically, economic activity in rural Southeast Alaska was heavily reliant on the extraction and primary processing of natural resources. As a result, the industry is dependent on national and global economic activity and markets. Globalization and changes in the markets for key Alaska products have increased this dependency. The resulting changes in the regional economy have not been evenly spread among the communities of Southeast Alaska.[12] For example, Sitka and Ketchikan were the sites of the two pulp mills and Prince of Wales Island contains the majority of the region's ANCSA corporation timber lands. These sub-regional economies felt the swings of the timber markets more intensely than other

[12] Crone, 2004, p. 33.

areas. This general conclusion is reflected in the population and personal income data mentioned above and presented at the borough level in Appendix C.

The closure of Southeast Alaska's pulp mills in the 1990s and overall loss of jobs and decline in earnings from the logging and wood products industries signaled that manufacturing no longer dominated the region's economy. The reduced timber harvest on the Tongass National Forest is only one of several factors that have contributed to the decline in the forest products industry. Other contributing factors cited by Crone include:

- declining market demand for the pulp mills' products,
- the adoption of efficiency enhancing and cost-cutting mechanization as well as aggressive marketing strategies in competing regions,
- increased costs associated with operating older, polluting mills,
- decreased timber harvests from Alaska Native lands, and
- the larger forces of global competition, which have affected Alaska's wood products industry as well as the state's fishing and mineral industries.[13]

The Alaska and Juneau economies have generally not followed U.S. business cycles. Although the manufacturing sector in rural Southeast Alaska was able to recover from the 1980s downturn in world timber markets, it subsequently collapsed in the 1990s. Despite the expansion of the national economy from 1992 to 2000, Southeast Alaska suffered very low average annual growth rates in earnings, total personal income, and population during that period. A trend common to all five areas in the Pacific Northwest analyzed by Crone is a growing service sector. In Southeast Alaska, part of this growth is a result of the growth in tourism to the region. Crone found that rural communities can become more resilient by increasing their accessibility and economic diversity and by developing physical infrastructure to accommodate growth. In addition to tourism, Southeast Alaska has a comparative advantage in attracting migrants seeking quality-of-life improvements. Both tourism and in-migration may continue to contribute to growth in the service sector in Southeast Alaska, but similar to the timber economy, tourism growth is not being experienced uniformly across the region.

The overall impact of these changes is that rural Southeast Alaska is increasingly less reliant on resource extraction, epitomized by timber, and more reliant on a broad range of non-manufacturing activities. These other activities depend for their support both on tourism and on

[13] Ibid, p. 62.

local residents with a mix of income sources. According to Robertson (2004), these changes can be partially interpreted as a shift from a traditional frontier economy to a more rounded and developed regional economy. Ongoing economic diversification and the decline of average wages to levels closer to the national average support this interpretation. However, to the extent that tourism is driving growth, the region may be merely replacing more traditional resource-dependent industries with another, albeit quite different, resource-dependent industry. Growth in unearned income and in personal services sectors (such as health care, social services, food service, retail) indicates that tourism is by no means the sole driver of growth in rural Southeast Alaska.[14]

6.3. Timber-related employment

As discussed above in section 3.2, timber-related employment has been declining steadily for the past two decades. In calendar year 2001, logging companies and sawmills statewide[15] employed an annual average of 1,200 workers, peaking at 1,500 in August at the height of the logging season. Primary sawmills employed approximately 400, or one-third, of that total and offer more seasonably stable employment. Overall employment is down 37% from five years earlier. In 1996 industry-wide employment, excluding the Ketchikan Pulp Company pulp mill operating at the time, was 1,900. Industry wide earnings totaled $45 million for 2001, and average monthly individual earnings were $3,219. Logging accounted for $30 million of total earnings and these positions earned slightly more than sawmill workers.

Based on U.S. Forest Service data on harvests and employment, total annual full-time equivalent employment from the Tongass National Forest is roughly 4 jobs per 1 million board feet (MMBF) harvested. Non-Tongass related employment is closer to 1.7-2 jobs per 1 MMBF because timber from non-federal lands (primarily Alaska Native corporation lands) is primarily exported as round logs.

[14] Robertson, 2004, p. 20.
[15] The statewide data are comprised almost exclusively of Southeast operations.

6.4. Future timber demand projections

In their most recent projection of demand for timber from the Tongass National Forest, Brackley, et al. summarizes prior demand projections and actual sales.[16] The range in annual demand for timber from Alaska National Forests is 48 to 370 million board feet of logs annually. Areas of uncertainty include the prospect of continuing changes in markets and conditions faced by competitors, and the rate of investment and innovation in manufacturing in Alaska. They conclude:

> From 1990-2004, the harvest of timber in Alaska declined by nearly 67 percent. During the same period, harvests from the Alaska National Forests have declined by 92 percent. Factors contributing to this decline included changes in the structure of the Alaska forest sector, changes in markets for Alaska products, and changes in conditions faced by Alaska's competitors. Our revised projections of average demand for Alaska National Forest timber from 2005-25 range from about 33 to 370 mmbf (table 3). Four broadly different scenarios display alternative futures for Alaska and the resulting demand for its National Forest timber. In addition to differences in the total quantity of timber demanded, these scenarios also differ in the use of the projected harvest. In the expanded lumber scenario, approximately two-thirds of the total potential harvest is used to manufacture lumber in Alaska. In the high integrated scenario, the entire saw log and utility log component of the timber harvest is assumed to be used to manufacture products in Alaska. The high integrated scenario may also require that low-grade timber from other owners (Native and state lands) become available to the industry, contrary to the assumption listed. This has happened in the past and could again occur in the future.
>
> Critiques of projections for Alaska rest on different opinions about values for the major assumptions. For example, in the early 1990s the critical issue was projections of Alaska lumber exports. Jay Gruenfeld Associates (1991) expected Alaska lumber exports to Japan in the 1990s to average more than 400 mmbf. This implied that Alaska lumber production in 1990-99 would average more than peak production in the 1970s (lumber production in Alaska peaked in 1973). A previous projection (Brooks and Haynes 1994) expected Alaska lumber exports to increase throughout the 1990s, but to average roughly 220 mmbf. From 1990-96, Alaska lumber exports averaged 118 mmbf. Projections in 1997 suggested that exports would increase 30 mmbf annually from the then current (1996) level and

[16] Brackley, Allen M.; Rojas, Thomas D.; Haynes, Richard W. 2006. Timber products output and timber harvests in Alaska: projections for 2005-25. Gen. Tech. Rep. PNW-GTR-677. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. p. [forthcoming]

> would range from 66 to 180 mmbf by 2010. Reported volumes of lumber exported from Alaska during 2000-03 averaged 18.4 mmbf. During the same period, shipments to domestic markets were 54.9 mmbf. The current scenarios estimate that lumber production by 2010 will average between 69 and 147 mmbf. (p. 28)

Markets for Alaska forest products have also shifted. According to Brackely, et al.:

> The latest capacity report (Brackley et al., in press) also indicates that there have been major shifts in the markets served by Alaska sawmills. Prior to 1997, up to 95 percent of production was exported to Japan. Since 2000, exports have fallen and the volume shipped to domestic markets has ranged from 60 to 83 percent of production. Western hemlock continues to be the major species processed by Alaska mills (50 to 56 percent). Shipments to the continental 48 states are destined for sale as shop lumber or as niche market specialty products.
>
> A federal grant program was approved ($4 million) in 2001 and 2002 to assist producers with the purchase of drying and secondary processing equipment. A recent review of the impacts of the grants (Nicholls et al., n.d.) determined that mills in Alaska now have the ability to dry approximately 6.6 mmbf annually. It is estimated that 0.8 mmbf of dry, surfaced lumber was produced in 2004. Producers drying lumber also reported that the dry, surfaced lumber was well received in local markets. One producer reported that the gain from drying and planning was marginal, but the ability to sell products has vastly improved. Given updated grading rules for Alaska lumber, some of the small mills are now selling dimension lumber and competing with local building supply stores. (p.13)

6.5. Topics of controversy

The most significant topics of controversy regarding timber harvesting in Southeast Alaska are 1) whether timber harvesting adversely impacts fish and wildlife and 2) whether the failure of the U.S. Forest Service to fulfill the 50-year contracts to offer timber to the companies operating the Ketchikan and Sitka pulp mills was responsible for shutting down their operations. The research conducted during the 1970s and 1980s by the Alaska Department of Fish and Game and the U.S. Forest Sciences Lab provided overwhelming evidence regarding the impact of clearcut timber harvesting on fish and wildlife in Southeast Alaska. This information was used and formed the basis for Congress' passage of the Tongass Timber Reform Act (TTRA) in 1990.

The economic argument may have finally been put to rest with the U.S. Federal Court of Claims decision rendered on January 28, 2004 (U.S. Federal Court of Claims, No, 95-153C, Alaska Pulp Corporation v. United States of America). The essence of this court decision was that APC was not entitled to damages from the U.S. Forest Service as a result of unilateral

breach of contract of the TTRA because APC suffered no damages attributable to the TTRA. This was because their Alaska timber operation was unprofitable with or without the TTRA. The TTRA required the U.S. Forest Service to offer timber in a similar manner by which it conducts independent competitive timber sales. At no time after the passage of the TTRA in 1990 until APC ceased operations in 1993 did the U.S. Forest Service fail to offer adequate timber under terms similar to those prior to the passage of the TTRA. This lawsuit should put to rest the notion that the timber industry in Southeast Alaska is constrained by inadequate timber supply rather than by market forces.

The remaining topics of controversy revolve primarily around what form a viable, market-based timber industry could take in Southeast Alaska and what policy and management practices should the U.S. Forest Service implement to support this new transformed industry. As discussed above, the research by the USFS Alaska Region 10 economists, economists at the Pacific Northwest Forest Research Station, and others indicates that Alaska can not compete in world commodity markets such as pulp, fiber board, or plywood—Alaska mills are simply too high cost, low efficiency and low technology to compete in the low grade timber markets. The question remains as to whether select harvesting of high quality timber in small sales to support value-added processing is economically viable. Technical research on that question has been conducted out of the Sitka, Alaska Wood Utilization Research and Development Center[17] and the Portland, Oregon Forestry Sciences Laboratory. No economic analyses have concluded that a large-scale commodity production timber industry is economically feasible in Southeast Alaska. The failure of the fiberboard production facility in Ketchikan despite significant subsidies and land and tax concessions supports this general proposition.

With respect to the form of a transformed market-based industry, the following ideas and options have been presented by a number of players.

Non-timber forest products. The commercial utilization of non-timber forest products, sometimes called 'special forest products' could be developed in Alaska's coastal and boreal forests. Commercial businesses specializing in birch syrup, wild berries, mushrooms, and landscaping plants draw economic value from Alaska's forests without the fish and wildlife impacts associated with clearcut timber harvesting. These businesses can operate in remote regions of the state, providing jobs in rural communities. The USDA forest service estimates

[17] http://www.fs.fed.us/pnw/sitka/

that in 1989 special forest products provided 10,000 jobs and contributed $128 million to the economies of Washington, Oregon, and British Columbia. [18]

Development of Micro Sales. The Forest Service's Micro-Sale program on Prince of Wales was developed as a pilot project to evaluate small scale timber harvesting directed toward niche and specialty markets. To create this program, conservation groups collaborated with local wood products businesses and community leaders on Prince of Wales Island to create a road-based small-scale logging program. Participating operators have bought more than 50 sales along the existing road system, bringing value-added employment and related benefits to people throughout Prince of Wales Island communities.

Timber subsidies. In an open market, Southeast Alaska lumber producers have difficulty competing with more efficient mills in other regions. [19] In sawmilling, the costs in Southeast Alaska are significantly higher than those in both the Pacific Northwest and British Columbia. Timber cutting from the Tongass National Forest operates at a loss to the USFS—each timber industry job in Southeast Alaska is estimated to cost the U.S. Treasury more than $170,000 annually.[20] Subsidies can result in isolation from market forces and can lead to inefficient and uncompetitive industries. The exertion of market forces can result in efficiency improvements such as logging to meet global demand, increased wood utilization, manufacturing efficiency, marketing and product entrepreneurship, and appropriate numbers and kinds of sector entries. Southeast Alaska's competitive advantage is its high quality wood. Reducing subsidies is likely to shift the sector away from commodity fiber production, which is not competitive in world markets, to specialty product production.

Cedar round log exports. Southeast Alaska has a near monopoly in Alaska yellow cedar production, which until recently commanded high prices in the Japanese market. These prices could support increased processing, but processors must compete with log exports from federal lands. With an export ban or round logs from federal land, value-added processors using cedar are more likely to be able to compete. This has the clear advantage to Alaska of creating resident

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[18] USDA, Forest Service, *National Strategy for Special Forest Products*, March 27, 2001. See also:
www.fs.fed.us/r10/tongass/management%20news/sfp/index.htm
www.akborealforest.org/fus/index.php (blueberry example for economic value)

[19] Robertson, Guy C. and David J. Brooks, *Assessment of the competitive position of the forest products sector in Southeast Alaska*, Gen. Tech. Rep. PNW-GTR-504. http://www.fs.fed.us/pnw/pubs/gtr504.pdf.

[20] Southeast Alaska Conservation Council, *Taxpayer Losses and Missed Opportunities: How Logging and Road Building in the Tongass National Forest Costs Taxpayers Millions*, 2003.

jobs, as well as creating the opportunity for the State to control the abundance of (and therefore demand for) rare Alaska cedars.

Forest Certification. The Forest Stewardship Council (FSC) has certified 20.9 million acres of forest on both public and private land including state forests in Minnesota, Pennsylvania, New York, North Carolina, Maine, and Tennessee. Certified forests have timber harvest rates and practices that ensure sustainability. FSC also certifies "chain of custody" companies to guarantee lumber and products bearing the FSC logo are made from timber coming from certified forests and FSC works to expand the market for products from certified forests. Alaska could create certified forests on state lands and work with large private landholders, especially Native corporations engaged in forestry, to add value to Alaska timber products and to expand into niche markets.[21]

6.6. Robertson: the missing multiplier

Robertson (2003) looked in detail at data on the relationship between so-called "basic" sector employment (notably including timber-related jobs) and total employment by community and over time in 15 Southeast Alaska communities. The economic base hypothesis holds that changes in export-derived employment and income (termed "basic") are positively linked to changes in other local employment and income serving the demand of residents and nearby firms (termed "nonbasic"). This assumption drives the economic base and input-output models commonly used to estimate economic impacts. The hypothesis is summarized and applied in the form of a static economic multiplier, used to measure the change in nonbasic employment expected from a change in basic employment.[22]

Economic base models stress outside demand for locally produced goods and services—the income generated by basic economic activity, whether from timber harvesting and export to distant markets or tourism associated with outside visitors, is seen as the driver of the local economy and the local support and service "nonbasic" sectors.

Robertson conducted a series of statistical analyses to see if any relationship exists between basic and nonbasic sectors of the economies of 15 Southeast Alaska communities. He

[21] DeForest, Russell, personal communication, December 12S, 2003.

[22] Robertson, Guy C., A Test of the Economic Base Hypothesis in the Small Forest Communities of Southeast Alaska, USDA Forest Service, Pacific Northwest Research Station, Gen. Tech. Report PNW-GTR-592, December 2003, p. ii.

found, specifically, that mill closures throughout the region, but notably in Haines and Sitka, did not result in commensurate impacts in other sectors of the local economies. Similarly, positive changes in basic employment also had no corresponding positive increases on nonbasic employment. Robertson concluded that there is no robust or stable relationship between basic and non-basic employment:

> The economic base hypothesis and its derivative modeling techniques emphasize export industries as the sole determinant of local economic activity. Other approaches have stressed local characteristics such as the pool of labor skills, social cohesion in the face of change, local infrastructure, and the overall desirability of the community as a place to live. The results presented here indicate that an emphasis on basic economic activity to the exclusion of everything else is unwarranted. Other factors are important, and using changes in basic employment to predict changes in total employment does not work.[23]

Therefore, traditional economic base models cannot be relied upon to project job growth from increased resource extraction activity.

6.7. Tsournos and Haynes: the basis for growth

Peter Tsournos and Richard Haynes completed a paper in 2004 that looked extensively at the literature on resource-based growth.[24] The intuitive explanation for why an economy grows or develops often involves the ways in which land (resources), labor, and capital interact. They review the literature for what is known about the different pathways for economic growth and development in resource-abundant regions. They discuss the effectiveness of the forest products industry as a determinant of economic development and how comparative advantages of different forest goods and services have changed. Much of the discussion is based on southeast Alaska where the development of a forest products industry was seen as offering potential economic opportunities that would increase the stability of local communities. The experience of the last several decades there suggests that a more comprehensive strategy than just the development of a timber industry is required to sustain economic growth.

[23] Robertson, 2003, p. v.

[24] Tsournos, Pete; Haynes, Richard W. 2004. An assessment of growth and development paths for southeast Alaska. Gen. Tech. Rep. PNW-GTR-620. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 27 p.

7. The Cruise Industry

7.1. Large ship cruise industry description

Cruise ship visitation to Alaska has increased at a rapid rate since the early 1990s (Table 11.). Over the last 12 years, the average annual rate of growth was 9.4 percent. In 2004, the number of cruise ship passengers was more thant triple the 1992 passenger count and almost double the number of passengers who visited in 1996.

Table 11. Alaska Cruise Passenger Annual Growth

Year	Cruise Passengers	Annual Growth Rate
1992	265,000	
1993	306,000	13%
1994	379,000	19%
1995	383,000	1%
1996	464,484	18%
1997	524,842	12%
1998	569,707	8%
1999	595,959	4%
2000	640,477	7%
2001	690,648	7%
2002	739,757	7%
2003	776,991	5%
2004	884,406	12%
Source: Alaska Cruise Line Agencies.		

There are a number of factors that support and suggest continued robust cruise passenger growth rates. These include: [25]

- Cruise lines have been highly adept at converting the land-based resort guest into a cruise passenger. They have been able to package and mass market an all-inclusive resort-at-sea experience that is highly price competitive when compared to similar land resort vacation. At the same time they enjoy a high profit rate.
- Cruise lines have also been successful at developing new products that generate sustained interest in cruising.

[25] KPFF Consulting Engineers; Bermello-Ajamil and Partner, Inc.; Peratrovich, Nottingham and Drage, Inc.; BST Associates; and Millers + Peters Architects, *Port Planning Project, Phase I-Inventory Needs and Assessment*, prepared for the City of Ketchikan, December 2002.

- Cruise lines industry products deliver a high level of passenger satisfaction with high cruise retention rates—Alaska has one of the lowest cruise return rates but other cruise regions help feed a loyal clientele into the Alaska cruise market.
- Cruise ship companies continue to add to their berth capacity via construction of new and larger ships targeted for Alaska deployment. Alaska ships have historically filled their capacity with rates of growth being primarily berth supply constrained rather than market demand constrained.
- The cruise lines land tour components continue to add investment in the form of rail cars and hotel rooms.

Factors limiting Alaska cruise growth include: [26]

- Vessel size and capacity growth is likely to continue which impacts berth space, tendering operations, and all shore logistics. Limited docking space in terms of number of ships that can be accommodated in ports and the increased size of ships are issues to be addressed along with investment capital for the construction of additional berth space.
- The growing number of passengers in ports requires that shore excursion coordination and development be addressed by improving and expanding dispatch sites, coordinating the movement of passengers and increasing shore excursion opportunities.
- Many of the land tour excursions are open jaw with cruising in one direction and airlift in the other. Airline capacity and competitive pricing affect the expansion of this portion of the cruise market.
- Community accommodation and tolerance of growing numbers of cruise visitors is a significant factor that could impact expansion in a number of communities. New itinerary options with expansion into secondary ports is challenging because of the smaller size of the secondary communities and larger ships that require rapid expansion of shore excursion and logistics capability. Current ports have been able to adjust over time as passenger numbers and ship sizes increased.

[26] Glosten Associates, Inc., *Cruise Ship Traffic Projections Technical Memorandum*. September 2001. Prepared for HDR Alaska, Inc.

City of Ketchikan-*Ports and Harbors Facility Development Plan, Phase I-Inventory and Needs Assessment*, Contract No. 02-04, December 2002.

- Sustaining current rates of growth will require increasing the Alaska return factor. Expansion of pre- and post-cruise land tour options are an important component of enhancing the level of repeat visitors.

There are seven basic itineraries for Alaska cruises:[27]

- **Inside Passage** (round trip cruise)—this is the primary seven-day staple of the major North American Cruise Lines, has the most consumer recognition, and is approximately 50 percent of the Alaska market. This package fits into the prominent one week American vacation and has a fairly consistent port of call pattern in Southeast Alaska.
- **Open-Jaw** (one-way cruise)—this is a cruise one way, fly one way itinerary with significantly more competition among ports for starting and ending locations (current competition focuses on Vancouver, B.C. and Seattle in the south and Seward and Whittier in the north). This is a longer 10-15 day trip with constant efforts by cruise companies to fully utilize their Alaska and Canadian land investments and move passengers more efficiently. The longer trip length allows for more fluctuation in trip itineraries and more competition in the land components among companies. As os 2002-2003, this sub-segment was approximately 39 percent of the Alaska market and is dominated by Princess Cruises, with four vessels dedicated to this sub-segment. Princess is followed by Holland America Line with two vessels, and Royal Caribbean International, Celebrity Cruises, Carnival Cruises and Radisson with one vessel each.[28]

These (above) are the two most prominent itineraries in terms of number of passengers moved. Four of the remaining five sub-segments are:

- **Alaska Repositioning** (4 percent), offered out of necessity to move cruise fleets to their summer homeports of Vancouver and Seattle, primarily from the Caribbean.
- **Alaska Coastal** (4 percent), is a cruise pattern that extends the standard Alaska cruise to a 10- to 14-night sailing with additional ports visited both in Southeast Alaska and further north. Three ships offer this itinerary—the Universe Explorer offers a series of 6, 14-night Coastal sailings, the Crystal Harmony offers 12-night trips from San Francisco for

[27] kfpp, p. 8-26.
[28] kfpp, p. 8-28.

its entire season, and the Regal Princess—the smallest ship in this sub-segment offers 11, 10-night sailing from San Francisco.

- **Inside Passage Introductory** (1 percent), is a 4-night introductory cruise offered in September that only sails as far north as Ketchikan. It is used to extend the season when other ports farther north are usually already experiencing poor weather.
- **Dry-dock and ship servicing** (less than 1 percent), focuses on moving ships to areas for maintenance work with minimal time out of service.

7.2. Small ship adventure cruise subsector

The following analysis of the small cruise ship sub-sector is intended to more closely analyze the economic linkages between the industry and the economy of Southeast Alaska on a community basis. Research questions were addressed through structured interviews and analysis of financial data provided by small cruise companies.

The **small ship adventure** product (2 percent of total current volume), is the market sub-segment that started Alaska cruising many years ago but has been surpassed by the North American mass market products.[29] While the market is dominated by the big ships and companies, this segment has also seen considerable growth in the last ten years driven by North Americans looking for adventure and new experiences. The vessels range in size from 12 to 125 guests per ship and call in numerous small ports and historic locations in Southeast, Southwest and Northern Alaska to deliver an historic, cultural and natural experience for their passengers. Alaska Sightseeing/Cruise West is the primary player in this subsector. They homeport their ships in Ketchikan, Juneau, Whittier and other locations to deliver 4- to 15-night cruise adventures with the option for land tour segments. Other companies include Lindblad Expeditions, American Safari, the Boat Company, and the American Steamboat Company. In addition to using some of the larger ports, the smaller vessels also visit Petersburg, Wrangell, Elfin Cove, Gustavus, Haines, Hoonah, Kake, Metlakatla, Whittier, Valdez, Dutch Harbor, Nome, and others not visited by the larger ships. Alaska Sightseeing/Cruise West and Lindblad Expeditions host the majority of Southeast Alaska small cruise sector passengers.

[29] Some industry experts suggest that the small ships are 2.6% of the Alaska market. However, based on 2005 passenger numbers provided from the primary Southeast Alaska operators and capacity of the rest of the fleet, we estimate that small ships comprise approximately 2.0% of the Southeast Alaska market and approximately 20,000 passengers visited Southeast Alaska aboard small ships in 2005. This does not include charter yachts, a relatively new, growing, and lucrative visitor segment

While not large, this sector generates ocial and economic benefits for Alaska communities that might otherwise not benefit from the larger cruise operations. Because they spend more time in home ports and/or day cruising, the economic impacts of these small ships are spread throughout hotel, airlift, provisioning, and other spending categories. Staff and crew are also typically U.S. residents and some are from Alaska.[30]

Many of the small communities that the small cruise ships visit could not accommodate the current large ships or the number of passengers they carry. Some are limited by residents' desire not to have a huge influx of guests, lack of sufficiently large berthing or lightering facilities, and limited shore excursion offerings. Some of the smallest communities may never care to or be able to service the large vessels but some of the intermediate communities such as Wrangell, Petersburg, Haines, Valdez, Cordova could transition into servicing the large cruise ship sector by first working with the smaller ships.

As the number of cruise passengers grows, the larger ships will need to look to these intermediate towns to offer additional ports of call and to relieve some of the pressure from heavily visited communities. In addition, the clientele of the smaller ships are often looking for an experience different from mass cruising and thus, prefer the smaller, less developed communities rather than those with daily influxes of thousands of cruise passengers from dockings of large ships.

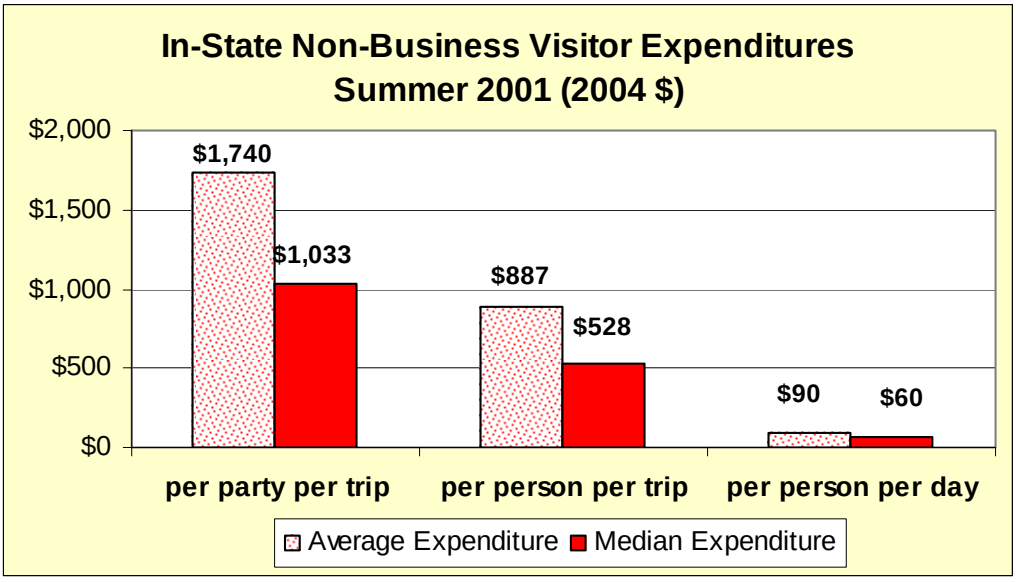
7.3. Expenditure patterns of visitors overall

Most tourism research in Alaska is directed at marketing or focused on visitor numbers and expenditures. The most comprehensive data comes from the the Alaska Visitor Statistics Program that has been conducted four times since the early 1980s. Figure 22 shows the average and median expenditures per party per day, per person per trip, and per person per day from the most recent surveys conducted in 2000-2001. The median amount spent per person per trip during the 2001 summer season was $528 (2004 $), while the average amount was $887. Figure 23 shows visitor spending per-party, per- trip based on how the visitor traveled to Alaska, and

[30] kfpp, p. 8-33. Many of the ship staff move with the ship seasonally to its various regions of operation, so for some "residency" is difficult to ascertain.

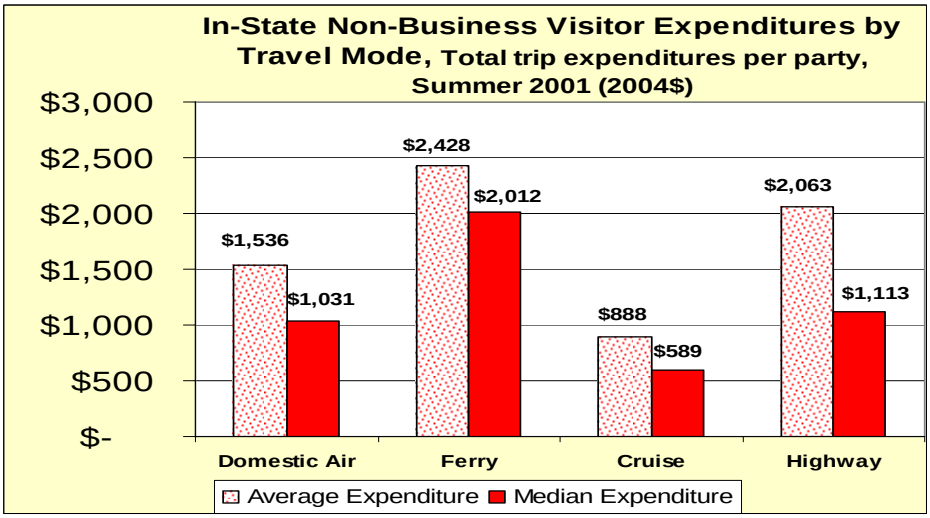
indicates that visitors arriving via ferry spend the most ($2,428), almost three times as much as cruise ship arrivals ($888).[31]

Figure 22. Non-business visitor expenditures



Source: DCED, AVSP data, 2002.

Figure 23. Visitor expenditures by travel mode



Source: DCED, AVSP data, 2002.

[31] In-state visitor spending by ferry travelers is different from the other categories because it includes the in-state expenditure of traveling to Alaska on the Alaska Marine Highway System, whereas other modes of arrival in Alaska entail out-of-state expenditures for travel to Alaska such as airlines and cruise ships whose companies are not based in Alaska.

7.4. Small cruise ship growth and itineraries

According to company representatives, the last couple years have been some of the most successful for the small cruise sector in Southeast Alaska. Exit from the market of Society Expeditions and Glacier Bay Cruise Lines is not a result of market weakness; Society Expeditions lost access to the vessel it was leasing. The small vessels operate in Alaska from mid-May to mid-September. Many spend the shoulder season in the Pacific Northwest and the winter in Baja, the Sea of Cortez, Panama, Costa Rica or other southern locations.

Most of the small ships operate out of Southeast Alaska ports because they are American hulled and flagged ships they do not need to sail from Vancouver, Canada or visit foreign ports. Lindblad Expeditions currently runs 14, one-week trips using two vessels. Each vessel also operates an eleven-day positioning trip when the vessel travels to or from Seattle to the Southeast Alaska region at the beginning and end of the summer season.

Similar to the large cruise ship sector, approximately 20% of the small cruise ship sector passengers take land tour packages as extensions of the cruise portions of their vacations. For Lindblad Expedition's ground tours, their Denali National Park stays are four nights with visitors staying at the Kantishna in holdings inside the Park. Most of the larger cruise land tours were one-night Denali stays until the last couple years when the large ship tour packages began shifting to two night stays in Denali; now, at least half of their visitors stay two nights in the Nenana Canyon area near the Park entrance.

Most of the small cruise companies focus on natural history, kayaking, hiking, Native culture, and smaller towns. The small cruise ship sector guests seek (and pay for) a significantly different experience than that offered by the larger ships, especially a less crowded and more learning-oriented environment. The small ship companies strive to provide this type of experience.

Lindblad Expedition's trips primarily visit natural areas with trips either starting or ending in Juneau or Sitka. The other town visited is Petersburg. Most of the small ships avoid the communities visited by the larger ships. The exception to this is Juneau, which is ideally positioned for travel into Glacier Bay National Park and is also the major air hub in Southeast Alaska. The small ships do not use the same docks as the larger ships. They start or end their trips on Saturdays, which is a slower day for larger ship dockings because most depart and arrive in Vancouver over the weekend. Lindblad's trips are focused on northern Southeast Alaska so

Ketchikan is too far away for most of their itineraries and they avoid Skagway except in May when the crowds are smaller.

Cruise West similarly has longer repositioning cruises to or from Seattle and Southeast Alaska in the spring and fall. They offer nine-day Inside Passage cruises that either start or end in Juneau or Ketchikan and visit other port towns or nine-day Wilderness Tours that focus more on remote areas and less on visiting towns. Another cruise option is a shorter, five-day, "Daylight" tour on which passengers stay on shore every night. With the exception of one vessel, Cruise West also has American hulled, American crewed ships.

Clipper Cruises offers seven, eight-day cruises and two, 12-day repositioning cruises between Southeast Alaska and Seattle. The seven-day cruises focus on northern Southeast Alaska starting and ending in Juneau. Their itinerary takes them to Skagway, Haines, Elfin Cove, Glacier Bay, Sitka and Tracy Arm before returning to Juneau. The vessel used in Alaska is the 138 passenger, *Yorktown Clipper*, which is an American hulled vessel with an American crew.

The **American West Steamboat Company**, *Empress of the North* with passenger capacity of 235, cruises Alaska's Inside Passage during the summer. Roundtrip from Juneau, the seven-night Alaska itinerary includes Petersburg, Ketchikan, Wrangell, Juneau, Skagway as well as cruising in Glacier Bay, Misty Fjords, Tracy Arm, Peril Strait and Wrangell Narrows. One-way from Seattle or Sitka, the 11-night itinerary of Southeast Alaska and the Inside Passage includes all the components of the seven-night cruise, plus Seattle, Victoria, Vancouver and the San Juan Islands.

There are also a growing number of companies offering "extra small" cruise ship experiences on vessels carrying 25 or fewer passengers. These include The Boat Company, American Safari, Alaska Northwest Charters, Alaska Sea Adventures, Bluewaters Adventures, Seawolf Adventures, and Pacific Catalyst. Some of these carry as few as eight passengers and offer whole-boat and special charters. These companies are briefly described below.

The Boat Company's trips last six to nine days aboard one of two, mid-sized vessels (the smallest at 145 feet, carries 20 passengers, and the largest at 157 feet, carries 24). In 2005, The Boat Company used two vessels to offer 29, eight-day cruises that started or ended in either Sitka or Juneau. Their boats reposition from Alaska to Costa Rica and Panama for the winter season. In 2006, their schedule will be expanded to 34, eight-day cruises. The Boat Company's trips focus on outdoor adventure, advertising that they cruise no more than four to six hours per day.

Unlike most of the other small and large cruise companies, they specifically offer sport fishing opportunities and pack and freeze fish for their passengers.

American Safari has three vessels, two of which carry 12 passengers and the third carries 22 passengers. The 22-passenger vessel, the *Safari Quest*, does 14, eight-day trips between Juneau and Sitka with a stop in Petersburg, as well as Tracy Arm.

Pacific Catalyst offers 16, seven-day Southeast Alaska natural history tours on their 11-passenger vessel. They also offer four, seven-day repositioning trips between Friday Harbor in the Washington San Juan Islands to Bella Bella, British Columbia and from British Columbia to Ketchikan (and the reverse in the fall). Their trips are between Juneau and Petersburg with a focus on wilderness natural history and no stops in other communities.

Seawolf Adventures is based out of Gustavus offering 18, six-day trips into Glacier Bay on its twelve-passenger vessel the *Seawolf*. **Bluewater Adventures** is a Canadian company with three vessels that can carry 12 to 16 passengers on 8- to 11-day trips in Southeast Alaska. They offer 14 trips per season in their Alaska itinerary. **Alaska Sea Adventures** offers 22 special and custom voyages for six to eight passengers out of Petersburg, Alaska. They specialize in photography, birds, whales, and archeology.

An estimated 20,000 people visited Alaska as passengers on small cruise ships during summer 2005. Table 12 shows an estimate of the number of small cruise ship passengers that visited Southeast Alaska ports. These estimates are derived from numbers provided by small cruise ship companies as well as itineraries and ship passenger capacities from company and other websites. These passenger numbers are used to estimate expenditures in the visited communities.

Table 12. Southeast Alaska small cruise ship visitor counts, 2005

	Visitors	
	Number	Percent
Elfin Cove	600	3%
Gustavus	216	1%
Haines	2,000	10%
Hoonah	1,000	5%
Hyder	1,200	6%
Juneau	19,000	95%
Ketchikan	10,000	50%
Metlakatla	4,000	20%
Pelican	600	3%
Petersburg	15,000	75%
Sitka	16,000	80%
Skagway	2,000	10%
Tenakee Springs	1,000	5%
Sources: Small cruise ship 2005 passenger numbers or carrying capacity		
and trip itineraries provided by individual companies or obtained from		
company websites.		

7.5. Small cruise ship economic information

Most of the small cruise ship passengers fly into Southeast Alaska and initiate their trips in Juneau, Sitka, Petersburg or Ketchikan. For a small number of ships homeported there, Petersburg serves as a starting or ending port. For a larger number of small cruise ship passengers, Petersburg is an in-transit visited port, some of which include overnight stays. For the more common Juneau-Sitka itineraries, if the trip starts in Juneau, passengers terminate their voyage in Sitka and visa versa. Some small ship companies also begin or end their trips in Ketchikan, but Juneau, Sitka and Petersburg are the favored ports—Sitka and Petersburg because of their community character and lack of crowding; Juneau because of its strategic location in northern Southeast with proximity to Glacier Bay National Park, Tracy Arm, Chichagof Island, as well as Juneau's port facilities and airport.

Estimates of in-region small cruise ship expenditures were developed using information provided by the companies operating in Southeast Alaska. Not all companies responded to our data request but those that did carried approximately 45% of the visitors who traveled in Southeast Alaska aboard small cruise ships in 2005. Information from the responding companies was extrapolated to the entire small cruise ship market on the assumption that the non-responding companies had similar expenditure patterns as the responding companies. This assumption may or may not be accurate for specific categories or locations of expenditures.

However, it is probably quite accurate for the breakout of total expenditures across the major communities, for total regional expenditure by categories and for total in-region expenditures.

Small cruise ship companies make significant expenditures in the region provisioning their vessels and guests—an estimated $10.3 million (Table 13). These result largely from their beginning and ending most of their trips from communities in the region and home porting their vessels in Southeast Alaska communities. As a result, they purchase fuel and a significant portion of their provisions as well as doing laundry in Southeast Alaska communities. Given that a number of the non-responding companies operate the smallest ships, it is likely that their per passenger in-region expenditures are higher than the larger companies because many are locally owned and operated and they have little space for carrying a season's worth of provisions brought in from outside the region.

Because most of their trips (except repositioning trips at the beginning or end of the season) start and end in the region, companies also keep a network of on-land employees housed in Southeast Alaska communities for the operating season as well as a small number of employees year round. In our data, the category of "employee expenditures" includes hotel or rental costs for housing, meals, transfers, and land crew wages. It does not include wages to on-board crew or expenditures made by crew members independently.

Similarly, passengers also start and end their trips in Southeast Alaska communities. This increases in-region expenditures significantly with the addition of hotel and meal costs. Approximately $2.0 million in hotel costs are estimated to be part of the tour package (Table 13), while an additional $3.8 million in hotel and meal costs are estimated to be made by passengers on their own pre- and post-cruise (Table 14). In total, an estimated $5.8 million is estimated to be spent for hotels, meals, and bed tax payment to communities from small cruise companies and their passengers.

Another significant expenditure in Southeast is $1.4 million for ship bunkers or fuel (Table 13). The community split on this category is probably not accurate because it does not include information from companies that start and end trips in Petersburg. As a result, some at least minimal bunkering expenditures are likely to occur in Petersburg.

An estimated 30% of provisions, consumables and equipment are purchased in Southeast Alaska. Purchased provisions are predominately fresh fish and seafood, and fresh produce. These totaled approximately $800,000.

Port costs include port docking and other fees, taxes, office rental costs and land transportation operating costs such as van and bus fuel. These expenses equaled approximately $629,000. An additional $607,000 was spent on laundering costs.

Table 13. Small cruise ship companies' estimated provisioning expenditures in Southeast Alaska, summer 2005

Expense	Juneau	Sitka	Petersburg	Ketchikan	TOTAL
Port Costs	$268,516	$67,013	$140,437	$152,573	$628,538
Laundry	$0	$212,531	$364,338	$30,362	$607,230
Bunkers	$231,080	$1,044,483	$0	$147,891	$1,423,455
Provisions, Consumables & Equipment	$305,026	$113,229	$205,661	$173,310	$797,227
Crew land expenses	$641,965	$25,419	$195,737	$338,496	$1,201,618
(hotels, meals, transfers, land crew wages, rent)					
Passenger included tours and transfers	$944,578	$944,578	$86,747	$0	$1,975,900
Optional shore excursions	$552,282	$6,932	$799,538	$365,107	$1,723,859
(flightseeing, fishing)					
Hotel costs included in tours	$1,056,037	$0	$399,769	$508,377	$1,964,183
Community Subtotal	$3,999,500	$2,414,200	$2,195,200	$1,716,100	
Cruise Companies' Provisioning Expenditures in Southeast Alaska					**$10,322,000**
Estimated Number of Passengers					20,000
Cruise Ship Companies' Average In-Region Expenditures per Passenger					$516
Number small ship passengers on land tours (assume 15% participation rate)					3,000
Cruise Ship Companies' Expenditures on Denali National Park Land Tours					**$8,939,400**
(lodging, transportation, meals, guides in Fairbanks, Denali National Park and Anchorage)					
Alaska In-State Provisioning & Land Tour Expenditures					**$19,261,400**
Sources: Financial information provided by individual companies as well as itinerary information from companies and websites.					

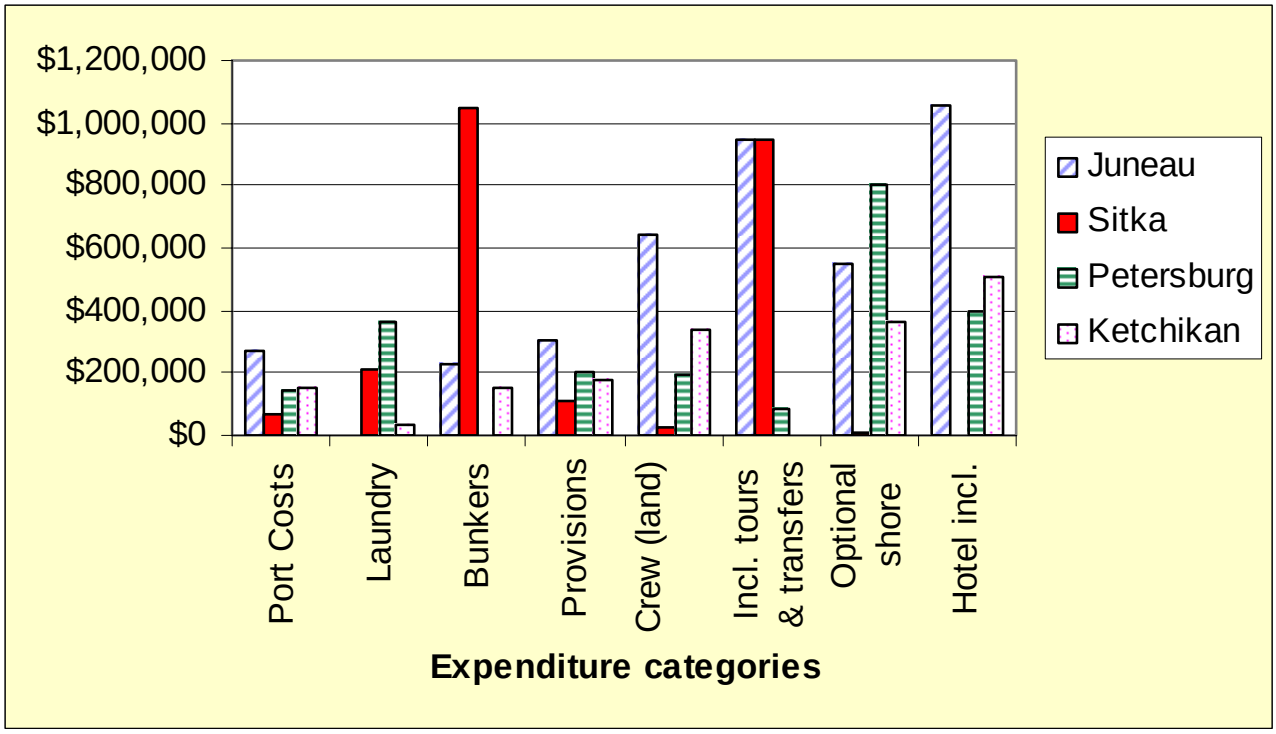
Tours and shore excursions

A large number of passenger tours and transfers are included in small cruise ship packages. Companies spend collectively almost $2.0 million to Southeast vendors for these tour package activities. Passengers also spend an additional $1.7 million on optional tours purchased through cruise companies. These estimates do not include any activities that cruise passengers might have purchased on their own and not through the cruise company. Tours, vessel and crew expenditures by small cruise ship companies to vendors and communities in Southeast Alaska total an estimated $10.3 million.

Approximately 15% or 3,000 small cruise ship passengers are estimated to purchase an optional land tour extension to Denali National Park and Preserve as part of their cruise package.[32] The small cruise companies pay for lodging, meals, transportation and guides, primarily to Alaska vendors for these four-day trips in Denali National Park. These company land tour expenditures are estimated to total $8.9 million.

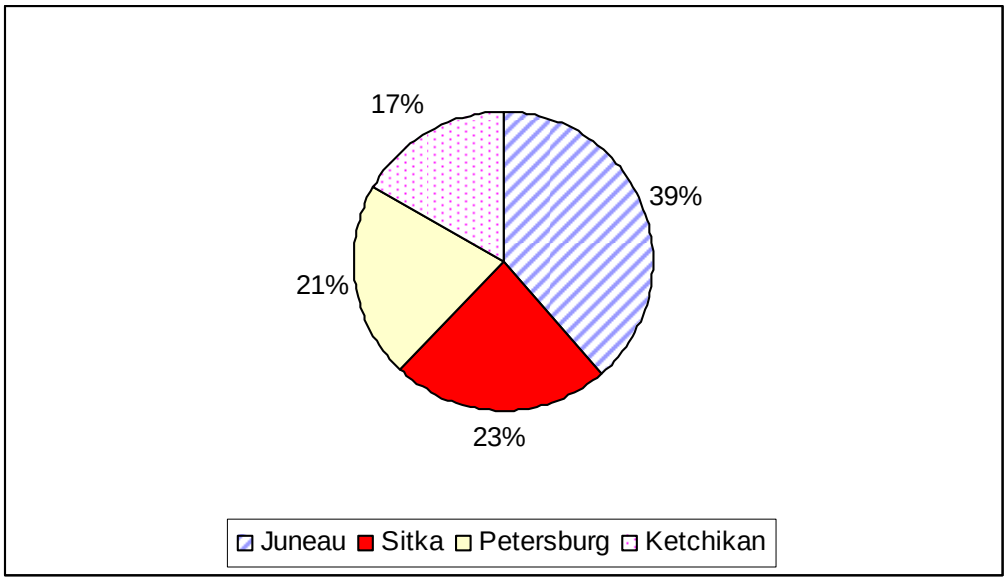
Collectively, land tour options and total small cruise company expenditures in Alaska are approximately $19.2 million. Passenger expenditures independent of cruise company purchases are not included in this total.

Figure 24. In-region small cruise company expenditures by category and port, 2005



[32] We have no information on how many visitors travel on their own to Denali or other locations in Alaska pre- or post-cruise. These estimates are based on people who purchase tours directly from their small cruise companies.

Figure 25. Small cruise ship in-region expenditures by port



Hotel and meal expenditures pre- and post-cruise

Most visitors stay one night pre- and one night post-cruise in hotels and purchase meals. Many extend their stays but for purposes of this analysis, it is assumed that the traveling party is two people staying a total of two extra nights, double occupancy and have two days of meals. Hotel rooms are assumed to cost $100 per night double occupancy. Food is estimated to cost $75 for two days for each of the two people for a total of $150 for both people pre- and post-trip. These cost assumptions are conservative. Bed and sales taxes to communities are in addition to these base prices.

Estimated hotel and meal expenditures for 2005 for the Southeast region are $2.0 million and $1.5 million, respectively. An additional $304,000 in bed and sales taxes are collected by communities. Approximately 40% of these sales and revenues are estimated to occur in Juneau for a total of $1.53 million. Sitka accounts for $1.34 million, Petersburg $568,500 and Ketchikan $369,000. These estimates are based on the number of passengers who start and end trips in each port and whose itineraries include overnights in these ports.

Table 14. Small Cruise Ship Estimated Hotel and Meal Expenditures, Pre- and Post-Cruise

	Hotel Expenditures	Bed & Sales Tax Revenues	Meal Expenditures	Sales Tax Revenue (meals)	Region & Community Total
Region Total	$2,000,000	$226,000	$1,500,000	$78,000	$3,804,000
Juneau	$800,000	$96,000	$600,000	$30,000	$1,526,000
Sitka	$700,000	$84,000	$525,000	$31,500	$1,340,500
Petersburg	$300,000	$30,000	$225,000	$13,500	$568,500
Ketchikan	$200,000	$16,000	$150,000	$3,000	$369,000
Note: Bed taxes are in addition to sales taxes. Calculations assume 2-person traveling parties only spending one night each					
pre-and post-cruise; hotel rooms average $100/night double occupancy and meals are $75 per person per trip.					
Sources: Alaska State Assessor's Office, Alaska Taxable, 2005. Small cruise ship 2005 passenger					
numbers or carrying capacity and trip itineraries provided by individual companies or obtained from company websites.					

Taxes and fees paid to communities

In addition to port tonnage fees, small ships and their passengers pay and estimated $885,400 in fees and taxes to Southeast Alaska communities. Most of these are in sales and bed taxes, as well as marine and airport passenger fees, and parking, license, registration and safety fees. Over a third of these are paid in Juneau, followed by Sitka, Petersburg and Ketchikan. It is unclear to what extent companies included these taxes and fees in their port cost reporting. As a result, these figures are not added to final figures on Southeast Alaska expenditures. However, for the smaller communities, these figures are clearly additions to the regional totals.

Table 15. Southeast Alaska small cruise ship estimated taxes and fees, by community, 2005

	Visitors			Hotel	Passenger Fees		----------Fees----------				
Community	**Number**	**% of Total**	**Sales**	**Bed & Sales**	**Marine**	**Airport**	**Parking**	**License/ Regist.**	**Safety/Reg.**	**Other**	**Total**
Elfin Cove	600	3%	---	---	---	---	---	---	---	---	0
Gustavus	216	1%	$216	$1,296	---	---	---	---	---	---	$1,512
Haines	2,000	10%	$6,300	$0	---	---	---	---	---	---	$6,300
Hoonah	1,000	5%	$1,750	$0	---	---	---	---	---	---	$1,750
Hyder	1,200	6%	---	---	---	---	---	---	---	---	$0
Juneau	19,000	95%	$95,000	$96,000	$95,000	$36,000	$12,000	$5,000	$15,000	$5,000	$359,000
Ketchikan	10,000	50%	$35,000	$16,000	$60,000	$15,000	$15,000	$3,500	$5,000	$30,000	$179,500
Metlakatla	4,000	20%	---	---	---	---	---	---	---	---	$0
Pelican	600	3%	$840	$0	---	---	---	---	---	---	$840
Petersburg	15,000	75%	$90,000	$30,000	---	---	$10,000	$3,500	$5,000	---	$138,500
Sitka	16,000	80%	$96,000	$84,000	---	---		$5,000	$10,000	---	$195,000
Skagway	2,000	10%	$2,800	$0	---	---	---	---	---	---	$2,800
Tenakee Springs	1,000	5%	$200	$0	---	---	---	---	---	---	$200
Total			$328,106	$227,296	$155,000	$51,000	$37,000	$17,000	$35,000	$35,000	$885,402
Notes: Passengers visit multiple ports; visitor numbers are based on the estimate of the proportion of approximately 20,000 passengers who visit each port.											
Sources: Alaska State Assessor's Office, Alaska Taxable, 2005. Small cruise ship 2005 passenger numbers or carrying capacity and trip itineraries provided by individual companies											
or obtained from company websites.											

In summary, approximately 20,000 visitors traveled in Southeast Alaska in 2005 aboard small cruise ships. An estimated $10.3 million was spent by these companies and their passengers to operate vessels and enjoy shore excursions. This is approximately $520 per cruise ship passenger. An additional $3.8 million is estimated to be spent by cruise passengers for hotels and meals pre- and post-cruises. Approximately 15% or 3,000 small cruise passengers went on a Denali land tour excursion purchased through their small cruise company and collectively spent $8.9 million. A total of $14.1 million was spent in Southeast Alaska directly by small cruise ship companies and their passengers through purchases bought through their small cruise company. A total of at least $23.0 million was spent in Alaska by small cruise companies or by passenger through these companies in 2005.

8. Nature-based tourism

This section briefly introduces and describes the field work that we did during summer 2005 and summer 2006 in an attempt to better understand the emerging nature-based tourism industry in Southeast Alaska.[33]

8.1. Problems with measuring tourism as an industry

Tourism is not recorded as an industry in conventional economic data series. Rogers noted this in his review in 1985: "Tourism is another basic industry of the region. Although widely discussed and advertised, reliable hard data on this industry does not exist…." (p. 31) Although several attempts have been proposed or initiated to create a set of separate economic accounts to measure tourism in Alaska (Global Insight 2004), the State of Alaska has not followed through with implementation, which would require consistent data gathering and/or validation of parameters that relate conventional industries (such as "eating and drinking places") to sources of demand from tourist visitors from outside the region.

8.2. Nature-based tourism

There have been only limited attempts[34] to determine through survey research the extent and make-up of the nature-based tourism sector. This sector can be defined to include those businesses whose clients are primarily interested in experiencing Alaska's undisturbed ecosystems in one way or another. Problems abound with classifications (for example, how does a high-end sport fishing lodge experience fit the definition versus a six-hour float down the Mendenhall River by passengers from a large cruise ship). There is also a knowledge gap when trying to relate the ecosystem assets that generate the spending in the first place to the geographic pattern of where money is actually spent and income is generated and jobs are supported.

8.3. Summary of fieldwork completed in summers 2005 and 2006

A team of two field researchers spent eight weeks of field time in Southeast communities during summer 2005 to conduct finer-scale research on the amount of revenue generated, which

[33] A full report, "Nature-Based Tourism in Southeast Alaska: Results from 2005 and 2006 Field Study," is available from ISER. www.iser.uaa.alaska.edu

[34] Such as the AWRTA member survey of 2001.

activities are attracting tourists, and how the money flows through the economy. The communities investigated included Ketchikan, Sitka, Elfin Cove, Pelican, Tenakee, Hoonah, and Juneau. During summer 2006, one researcher returned to Sitka and Juneau for eight additional weeks of in-depth study.

The field research in 2005 was organized into two case studies: 1) Ketchikan as a *gateway community* for nature-based tourism activities, and 2) Chichagof Island as a *destination.* The communities investigated included Ketchikan, Elfin Cove, Hoonah, Pelican, Tenakee Springs, Sitka and Juneau. An important goal of the summer 2005 field work was to determine which field methods were most effective and efficient.

As part of this research, field staff interviewed both nature-based tourism businesses and visitors. In Ketchikan, 37 companies and 223 visitors, including cruise, air and ferry passengers, were interviewed. In the communities on Chichagof Island, 67 companies were interviewed. Additional local experts and other travelers were interviewed to expand our understandings of the sub-sector details of the tourism industry.

In 2006, research days and staff in the field were more limited so field work occurred only in Sitka and Juneau. However, applying lessons learned from 2005, greater efficiency was gained by interviewing only businesses in 2006. Interviews were primarily conducted in person but also by phone and email, which enabled information to be collected from more businesses. In Sitka, 39 businesses were interviewed; in Juneau, 50 businesses were interviewed. An additional 10 multi-day charter yacht companies were interviewed that operated in the northern waters of Southeast Alaska.

In both 2005 and 2006, in addition to businesses, field staff also interviewed the harbor masters and fuel docks personnel; staff at Convention and Visitor's Bureau; personnel with the U.S. Forest Service, Alaska Department of Fish & Game, and borough/city accounting offices. In 2005, City Accountants in Hoonah and Sitka, and the mayors of Hoonah and Pelican were also interviewed.

Key findings from this research include the following:

- Nature-based tourism generates over $250 million per year of direct business revenues in Sitka, Juneau and Chichagof Island for the companies we surveyed. This is most likely an underestimate of total revenue because not all nature-based tourism businesses and

business sectors were surveyed or included in our estimates. In addition, the summer of 2006 was especially wet, which decreased activity for some businesses.

- Tourism in Southeast Alaska is primarily focused on nature-based activities as people are attracted to the region for its beautiful scenery, fisheries, wildlife, marine mammals, glaciers, and other natural attributes.
- Nature-based tourism creates a significant economic ripple effect that keeps money circulating through many sectors of the economy. This money supports jobs in marketing, support services, food and beverages, accommodations, fuel sales, government, and other sectors.
- A large and growing portion of Southeast Alaska's visitors are cruise ship passengers. Both cruise passengers and independent travelers are similarly interested in nature-based tourism services. The majority of cruise ship shore excursions offer nature-based activities, from hikes and glacier viewing to flightseeing and forest canopy zip lines.
- There is a complex and extremely competitive system for prebooking cruise ship shore excursions. Businesses with exclusive cruise contracts make price and tour information available only to cruise passengers and often agree not to sell tours without going through the cruise line.
- The tourism businesses in cruise ports of call that appear to be most successful either have a cruise ship shore excursion contract or are catering to overnight (non-cruise) guests with high quality and high value services. Examples of these types of businesses include sportfishing lodges and multi-day yacht cruises.
- Unless a company offers a new creative shore excursion idea, it is difficult to compete with businesses holding existing cruise contracts. Despite this hurdle, A number of companies are offering creative new products including canopy ziplines, glass bottom boats, and an amphibious "duck" tour.
- Some operators attribute the increased interest in adventure activities to a change in cruise ship clientele. In recent years, cruise companies have been catering to a younger crowd, targeting families. In any event, increasing numbers of passengers are interested in more active pursuits.
- For shore excursions aimed at cruise passengers, competition exists not just with companies within a community but with other ports, as people are booking their shore excursions in advance and look at all the options. Sitka companies mentioned they were carefully tracking ziplines in Juneau and Ketchikan, dogsled tours on the Mendenhall Glacier, and other activities to see which market niche they could capture.
- There is some evidence that visitors are willing to pay premium prices for higher quality experiences in more pristine environments. It is not clear, however, what specific attributes (seclusion, fishing experience, food, services, perceived exclusivity, and environmental amenities) are the key components of this higher market value.
- It is possible to design a community-based tourism program that provides employment to local residents as is occurring in Hoonah. However, Elfin Cove appears to bring in more in gross revenues than Hoonah with about one-eighth as many visitors because Hoonah's

operation is relying on volume while Elfin Cove's is relying on a higher-priced fishing lodge experience. Day trips seem to be relatively higher cost, lower profit operations.

- Independent travelers appear to avoid the crowds and many are repeat visitors. Most tend to stay longer and have more open itineraries than those on cruise ships or organized tours. These characteristics make independent travelers more difficult to survey directly.
- The primary marketing mechanisms for smaller, non-cruise related businesses are the Internet and word of mouth. In addition, many customers return to the same fishing lodge, yacht tour, or other business year after year.
- Companies in several communities expressed a desire to move toward more marine wildlife viewing and sightseeing and away from sport fishing. These operators preferred wildlife viewing as it was less stressful with less pressure to catch fish. Wildlife viewing is highly attractive to visitors due to spectacular scenery and abundant wildlife including whales and other marine mammals. Some operators were making this shift, while others think they would not be able to match the revenue generated by sport fishing.
- Weather has a significant impact on business for companies whose tours are not prebooked on cruise ships. Operators noted a marked difference between the sunny, dry summer of 2004 and the remarkably wet summer of 2006. Visitors walking off a ship in the rain were much less likely to go on marine tours or hikes in soggy conditions, and seasonal revenue was down. Businesses with cruise contracts did not experience this setback as passengers are not reimbursed for presold tours when weather conditions are poor. The one exception was flightseeing, where companies had to cancel tours due to unsafe weather conditions.
- Promoting wildlife watching is an important marketing strategy for Southeast Alaska communities. Visitors' bureaus produced pamphlets with charismatic megafauna, such as whales and bears. Bureau staff cited studies showing the desire to see wildlife is what attracts a large portion of out-of-state visitors.
- A significant economic question that emerges from this research is how the public lands might be managed to maximize the economic returns to residents of Southeast Alaska communities, especially the smaller communities that can only accommodate smaller numbers of visitors at one time.

Table 16. Estimated gross revenue and number of visitors from nature-based tourism activities in Juneau, Summer 2006

Activity	Revenue	Visitors
Flightseeing	$43,000,000	118,000
Tracy Arm Tours	$2,150,000	16,000
Whalewatching	$32,000,000	230,000
Adventure	$11,000,000	80,000
Dogsled Tours	$16,000,000	31,000
Pack Creek Bear Viewing	$525,000	510
Sportfish Day Charters	$7,440,000	29,000
Lodges	$9,400,000	3,400
Freshwater/fly fishing	$1,200,000	3,500
City Tours*	$31,000,000	560,000
Total**	**$153,715,000**	**1,071,410**
* City tours includes tours to the Mendenhall Glacier, McCauley Salmon Hatchery, Glacier Gardens, and the Goldbelt Tramway. While not necessarily offered collectively as a tour, they are grouped together to protect proprietary information of individual companies.		
**Juneau hunting is included in Sitka information to protect proprietary information of Juneau guides.		
Sources: Company interviews and websites, summer 2006.		

Figure 26. Estimated revenue by activity, Juneau, summer 2006

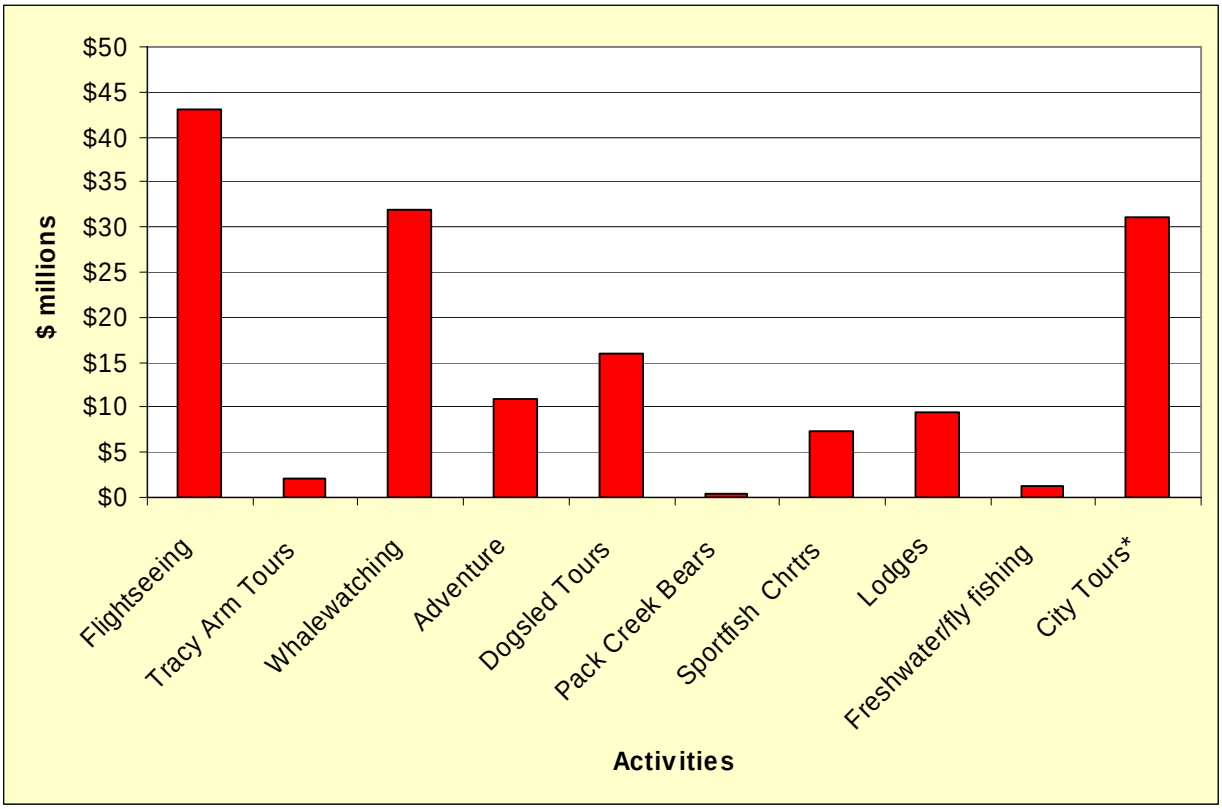


Table 17. Estimated gross revenue and number of visitors for nature-based tourism activities in Sitka, Summer 2006

Activity	Revenue	Visitors
Wilderness drop off	$590,000	3,200
Whale/wildlife watching	$6,200,000	54,000
Adventure	$1,850,000	18,000
Charter Yachts*	$21,000,000	4,400
Sportfish Day Charters	$5,649,600	32,000
Lodges	$34,500,000	14,400
City Tours**	$8,200,000	97,000
Hunting***	$1,500,000	310
Total	**$79,489,600**	**223,310**

*Charter Yacht revenues is attributable to both Sitka and Juneau but included in the Sitka number to avoid double counting.

* City tours includes tours to the Raptor Center and Sitka National Historic Park. While not necessarily offered collectively as a tour, they are grouped together to protect proprietary information of individual companies.

**Juneau hunting is included in Sitka information to protect proprietary information of Juneau guides.

Sources: Company interviews and Web sites, summer 2006.

Figure 27. Estimated revenue by activity, Sitka, summer 2006

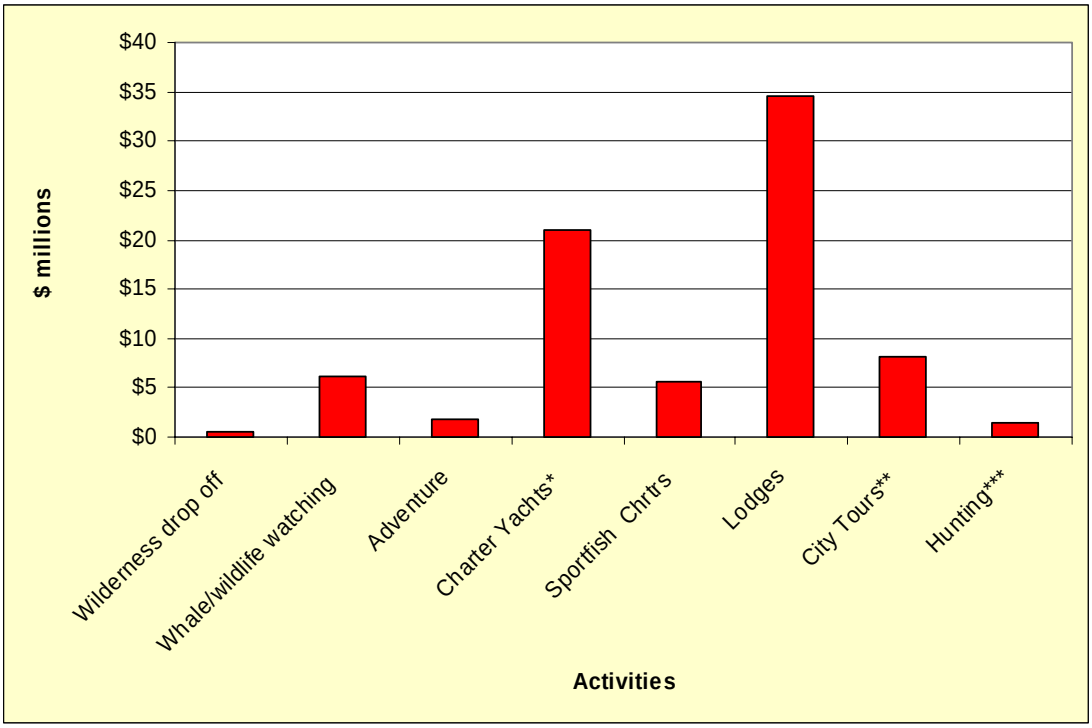


Table 18. Estimated revenue by community for nature-based tourism activities, Chichagof Island, summer 2005

Community/Activity	Revenue	Visitors
Elfin Cove		
Lodges	$4,889,500	1,528
Small Cruise Ships*	$90,000	3,000
Subtotal	***$4,979,500***	***4,528***
Hoonah		
Marine charters/Fishing lodge	$840,320	1,060
Hunting	$252,000	20
Sightseeing/Wildlife	$3,360,350	33,610
Subtotal	***$4,452,670***	***34,690***
Juneau		
Flight	$268,230	--
Boat rental	$209,000	72
Guided Kayaking	$259,280	283
Charter Yachts	$4,059,450	1,105
Subtotal	***$4,795,960***	***1,460***
Pelican		
Day Charters	$396,900	300
Charters/Lodging & Lodging only	$396,000	350
Drop-offs	$17,130	90
Subtotal	***$810,030***	***740***
Sitka		
Marine Charters/Kayaks	$19,930	40
Flight Service	$92,390	360
Multi-night	$240,930	100
Subtotal	***$353,250***	***500***
Tenakee		
Marine Charters	$155,000	100
Estimated Total	**$15,546,410**	**42,018**

*The small cruise ship industry is centered on northern Southeast Alaska in part due to the scenic beauty of Chichagof Island. As a result, these numbers are underestimates of economic activity attributable to small cruise ships.

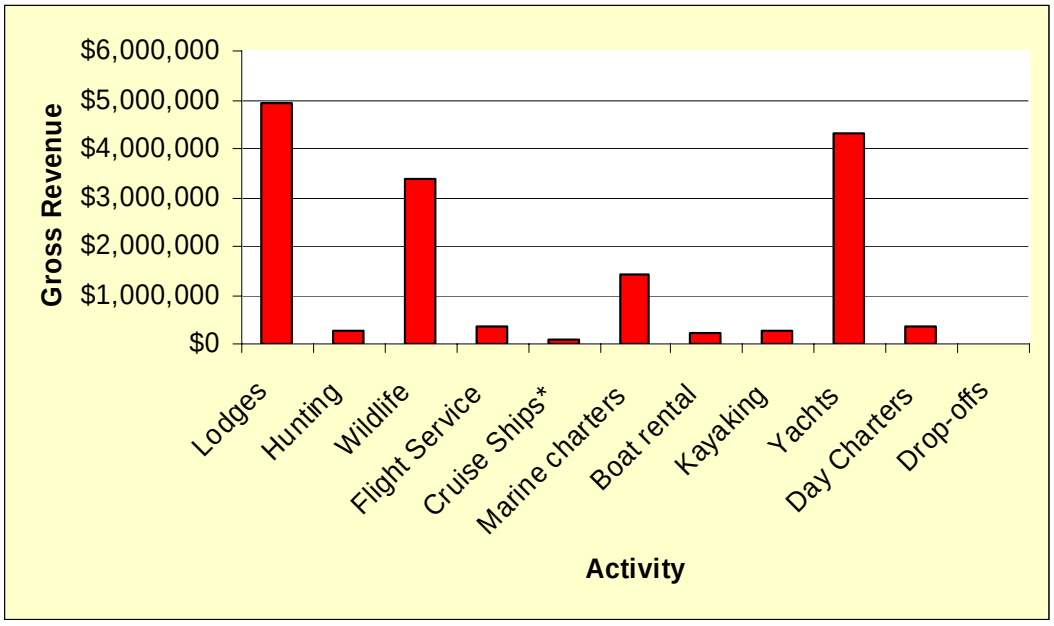
** Flight service companies provided only very rough estimates of passengers. Revenues were were estimated based on numbers provided by businesses receiving clients from flight service companies that did not include transportation in their tour prices. These are likely underestimates.

Sources: Company interviews and websites, summer 2005.

Table 19. Estimated revenue by activity for nature-based tourism activities, Chichagof Island, summer 2005

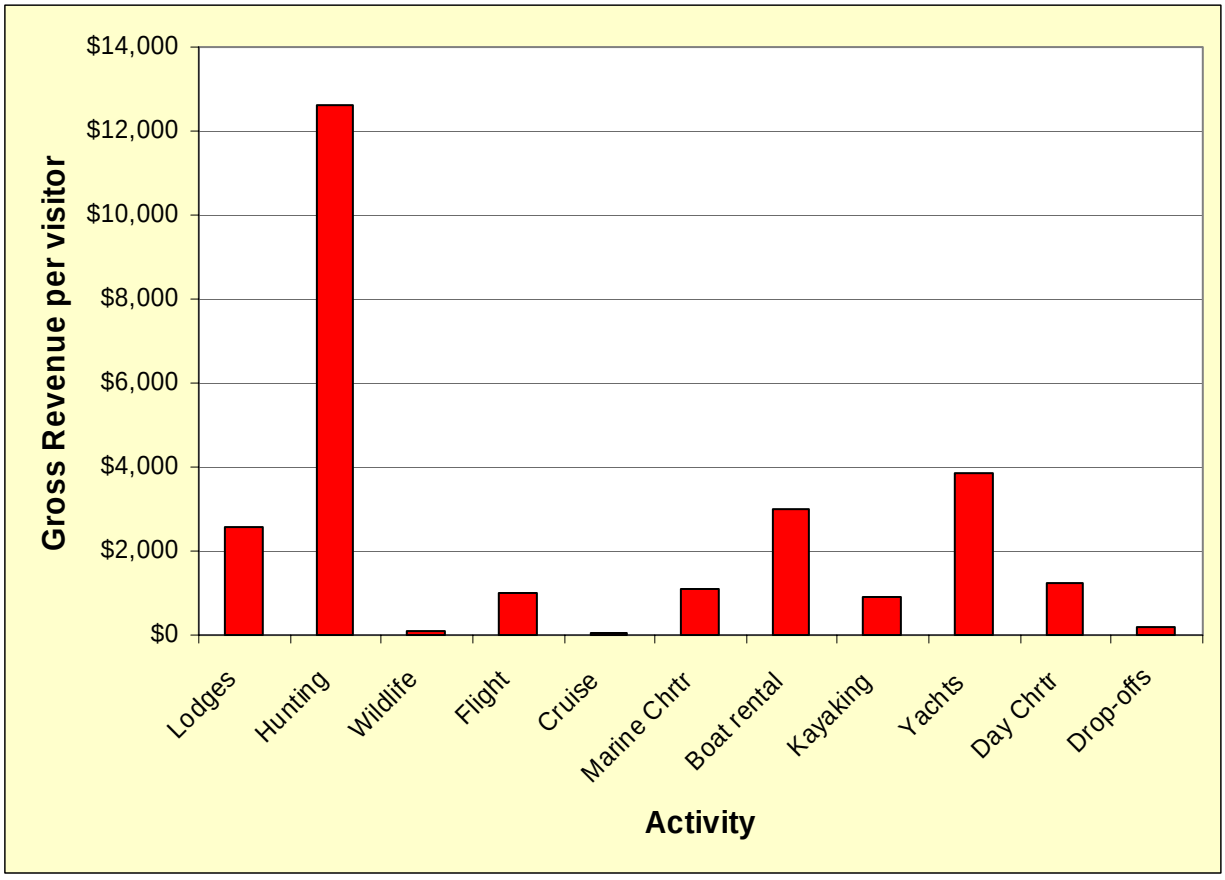
Activity	Revenue	Visitors
Lodges	$4,917,550	1,908
Hunting	$252,000	20
Sightseeing/Wildlife	$3,360,350	33,610
Flight Service	$360,620	360
Small Cruise Ships*	$90,000	3,000
Marine charters	$1,409,320	1,270
Boat rental	$209,000	70
Guided Kayaking	$261,210	285
Charter Yachts	$4,300,380	1,110
Day Charters	$371,850	300
Drop-offs	$17,130	90
Total	**$15,549,410**	**42,023**
*The small cruise ship industry is centered on northern Southeast Alaska in part due to the scenic beauty of Chichagof Island. As a result, these numbers are underestimates of economic activity as a result of small cruise ships.		
Sources: Company interviews and websites, summer 2005.		

Figure 28. Estimated revenue by activity, Chichagof Island, summer 2005



Note: Small cruise ship revenue is based only on shore activities and expenditures by passengers in Elfin Cove.

Figure 29. Estimated revenue per person by type of nature-based tourism activity, Chichagof Island, summer 2005



Note: Small cruise ship revenue is based only on shore activities and expenditures by passengers in Elfin Cove.

Appendix A
Components of Population Change, 1970-2002

This appendix shows population change broken down into the components of natural increase (births minus deaths) and net migration into the place of interest.

The regions shown are:

Southeast Alaska

Haines Borough

Juneau Borough

Ketchikan Borough

Prince of Wales-Outer Ketchikan Census Area

Sitka Borough

Skagway-Yakutat-Angoon Census Area (from 1970 through 1990)

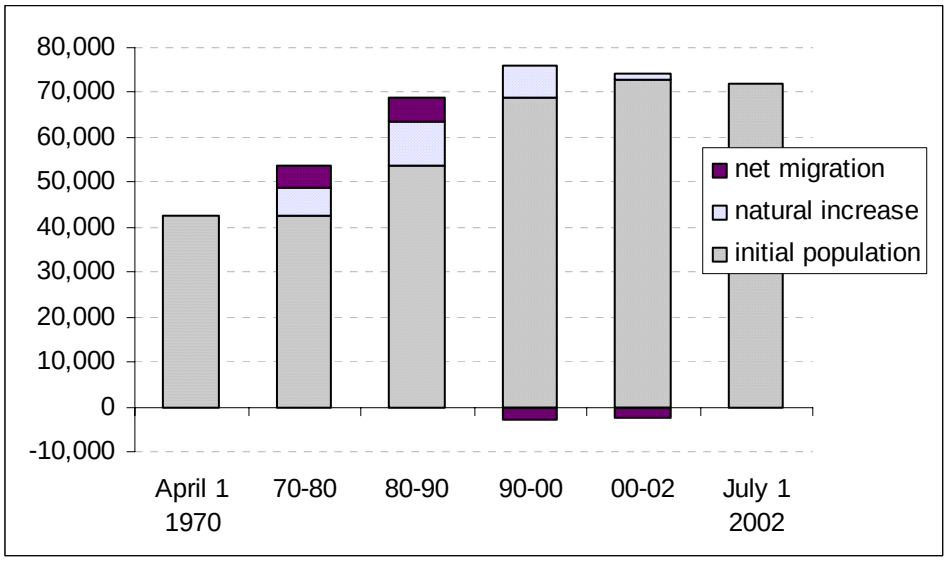
Skagway-Hoonah-Angoon Census Area (from 1990 through 2002)

Wrangell-Petersburg Census Area

Yakutat Borough (from 1990 through 2002)

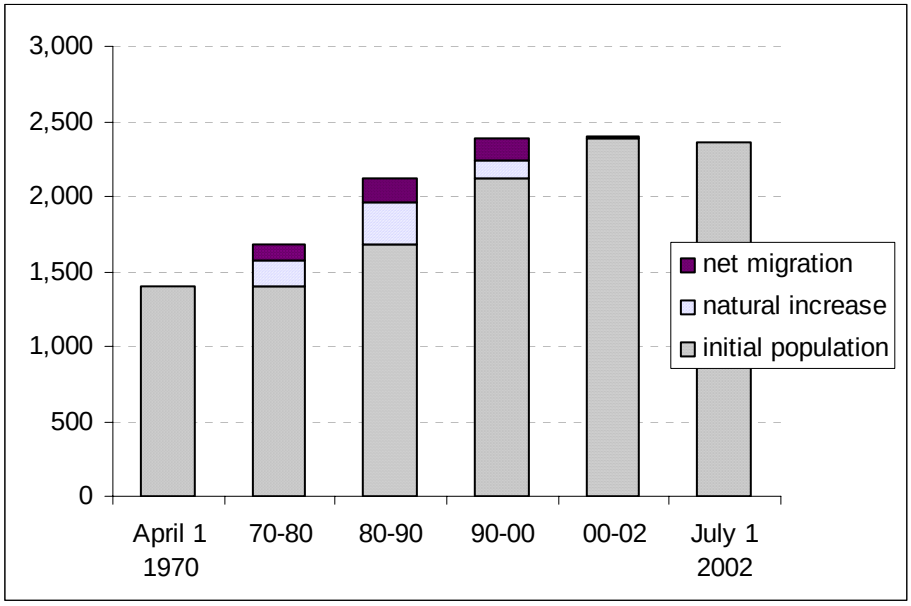
Southeast Alaska

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	42,565				
70-80	42,565	6,258	4,971	53,794	2.4%
80-90	53,794	9,699	5,496	68,989	2.5%
90-00	68,989	6,856	(2,763)	73,082	0.6%
00-02	73,082	1,165	(2,333)	71,914	-0.8%
July 1 2002	71,914				



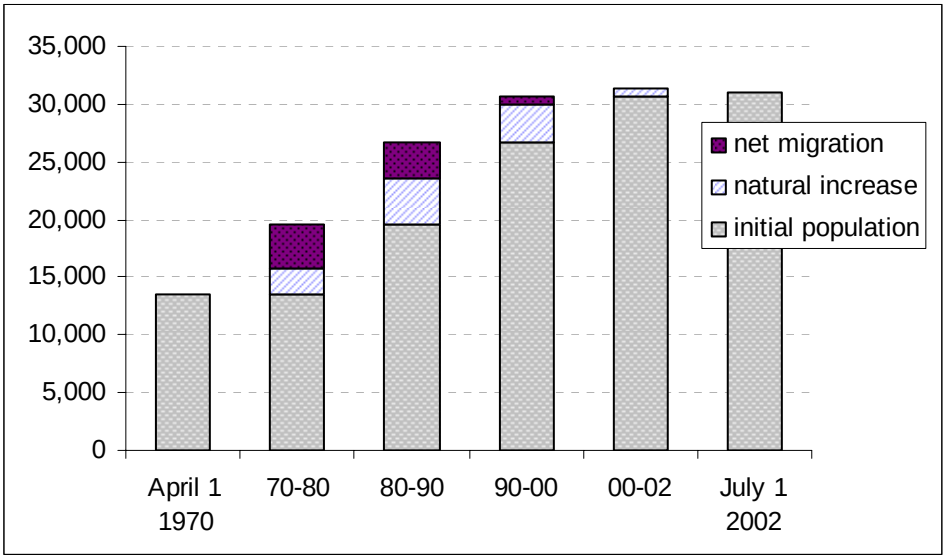
Haines Borough

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	1,401				
70-80	1,401	177	102	1,680	1.8%
80-90	1,680	276	161	2,117	2.3%
90-00	2,117	127	148	2,392	1.2%
00-02	2,392	5	(37)	2,360	-0.7%
July 1 2002	2,360				



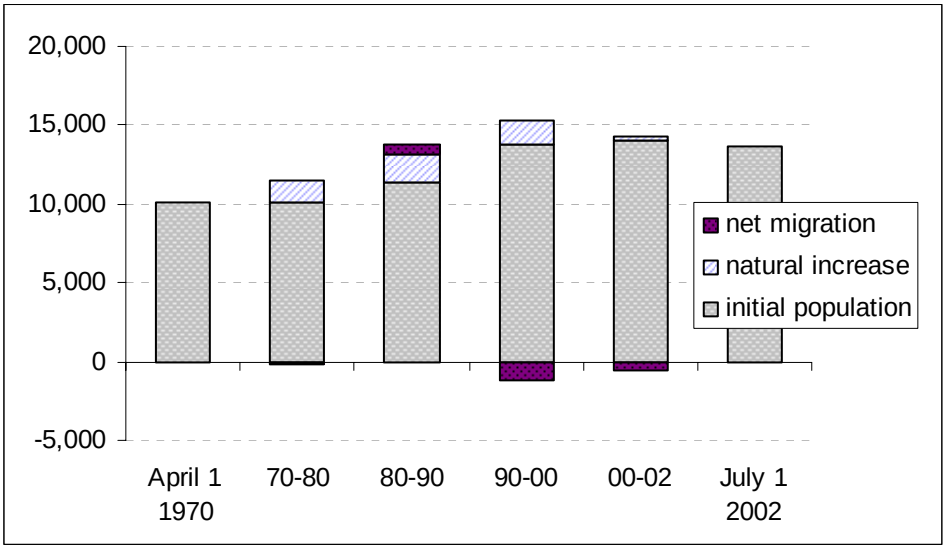
Juneau Borough

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	13,556				
70-80	13,556	2,129	3,843	19,528	3.7%
80-90	19,528	3,987	3,236	26,751	3.2%
90-00	26,751	3,291	669	30,711	1.4%
00-02	30,711	604	(334)	30,981	0.4%
July 1 2002	30,981				



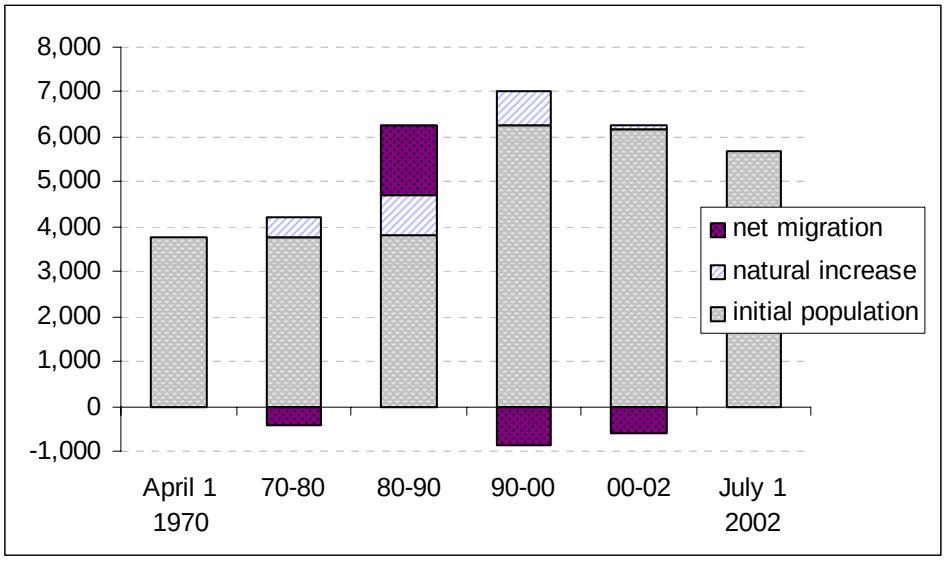
Ketchikan Gateway Borough

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	10,041				
70-80	10,041	1,402	(127)	11,316	1.2%
80-90	11,316	1,791	721	13,828	2.0%
90-00	13,828	1,473	(1,242)	14,059	0.2%
00-02	14,059	175	(564)	13,670	-1.4%
July 1 2002	13,670				



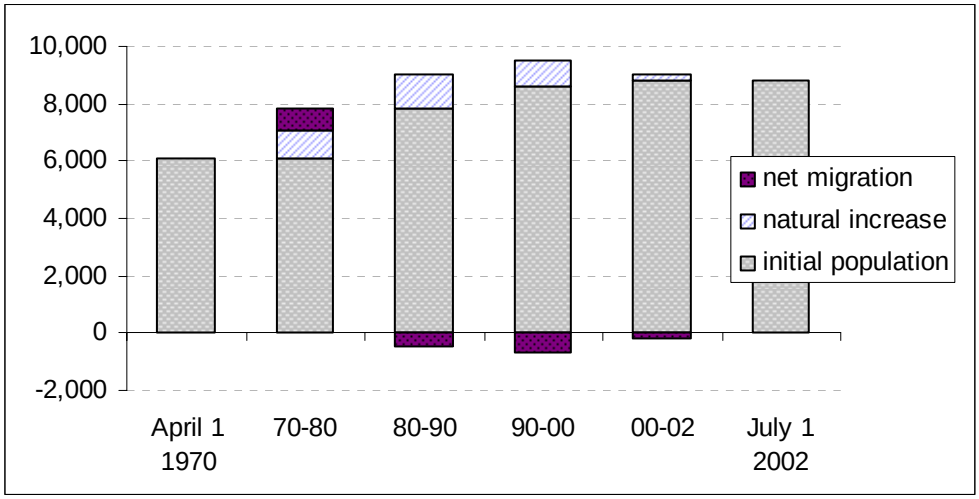
Prince of Wales Outer Ketchikan Census Area

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	3,782				
70-80	3,782	453	(413)	3,822	0.1%
80-90	3,822	879	1,577	6,278	5.1%
90-00	6,278	749	(870)	6,157	-0.2%
00-02	6,157	116	(595)	5,678	-4.0%
July 1 2002	5,678				



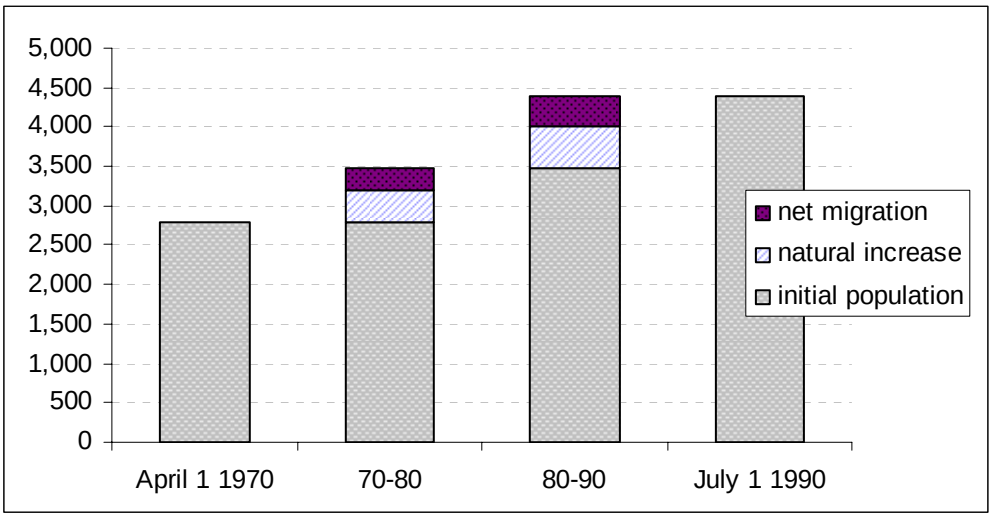
Sitka Borough

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	6,073				
70-80	6,073	964	766	7,803	2.5%
80-90	7,803	1,249	(464)	8,588	1.0%
90-00	8,588	922	(675)	8,835	0.3%
00-02	8,835	165	(164)	8,836	0.0%
July 1 2002	8,836				



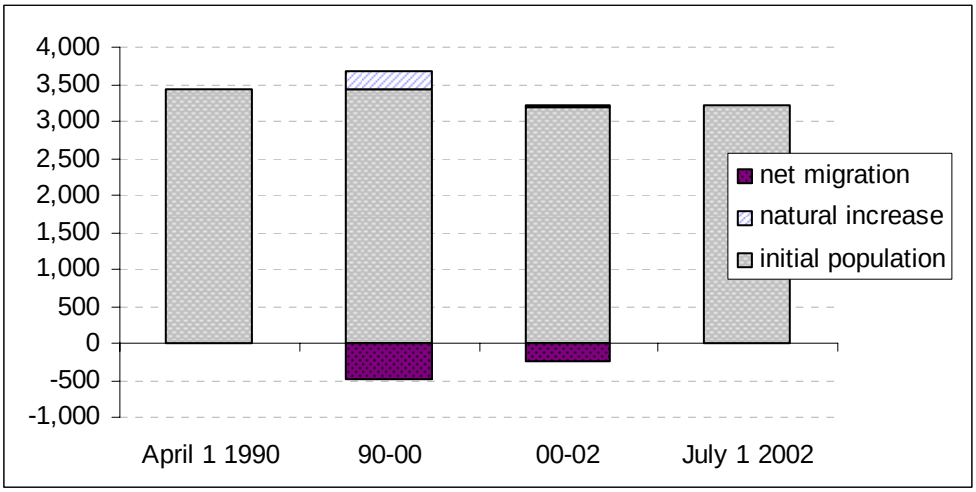
Skagway-Yakutat-Angoon Census Area

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	2,792				
70-80	2,792	398	288	3,478	2.2%
80-90	3,478	543	364	4,385	2.3%
July 1 1990	4,385				



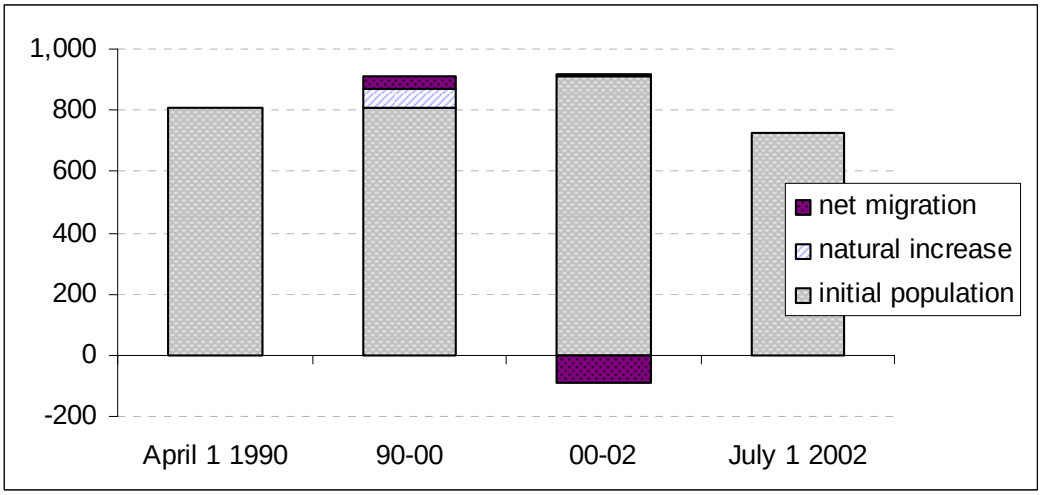
Skagway-Hoonah-Angoon Census Area

	initial population	natural increase	net migration	final population	average annual growth
April 1 1990	3,436				
90-00	3,436	235	(479)	3,192	-3.6%
00-02	3,192	21	(236)	2,977	-3.4%
July 1 2002	3,221				



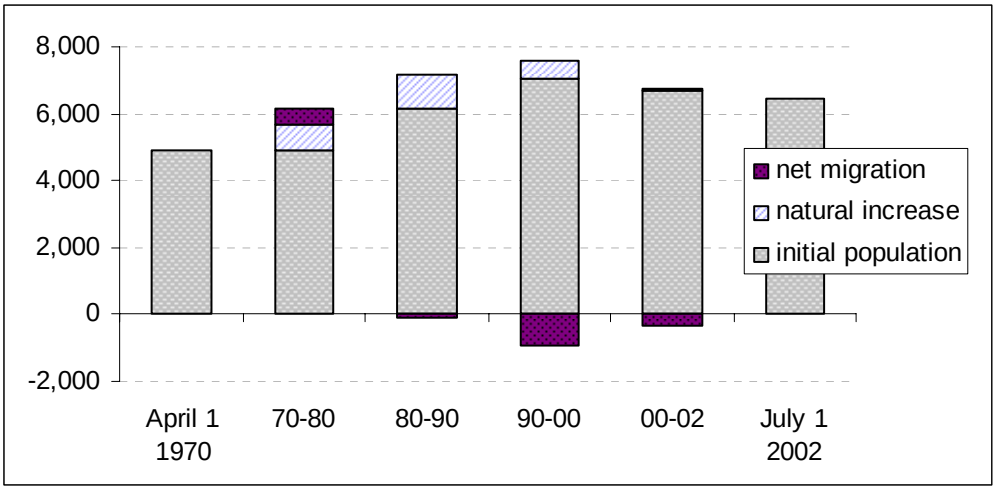
Yakutat Borough

	initial population	natural increase	net migration	final population	average annual growth
April 1 1990	808				
90-00	808	59	44	911	6.2%
00-02	911	8	(92)	827	-4.7%
July 1 2002	724				



Wrangell-Petersburg Census Area

	initial population	natural increase	net migration	final population	average annual growth
April 1 1970	4,920				
70-80	4,920	735	512	6,167	2.3%
80-90	6,167	974	(99)	7,042	1.3%
90-00	7,042	563	(921)	6,684	-0.5%
00-02	6,684	71	(311)	6,444	-1.8%
July 1 2002	6,444				



Appendix B
Population migration patterns

This appendix shows recent migration patterns affecting Southeast places during the period 1995 through 2000. The data come from the year 2000 census question that asks each person what county they were living in five years ago. This information allows us to calculate net migration to each census area in SE from each other SE census area, from other regions of Alaska, and from from other states.

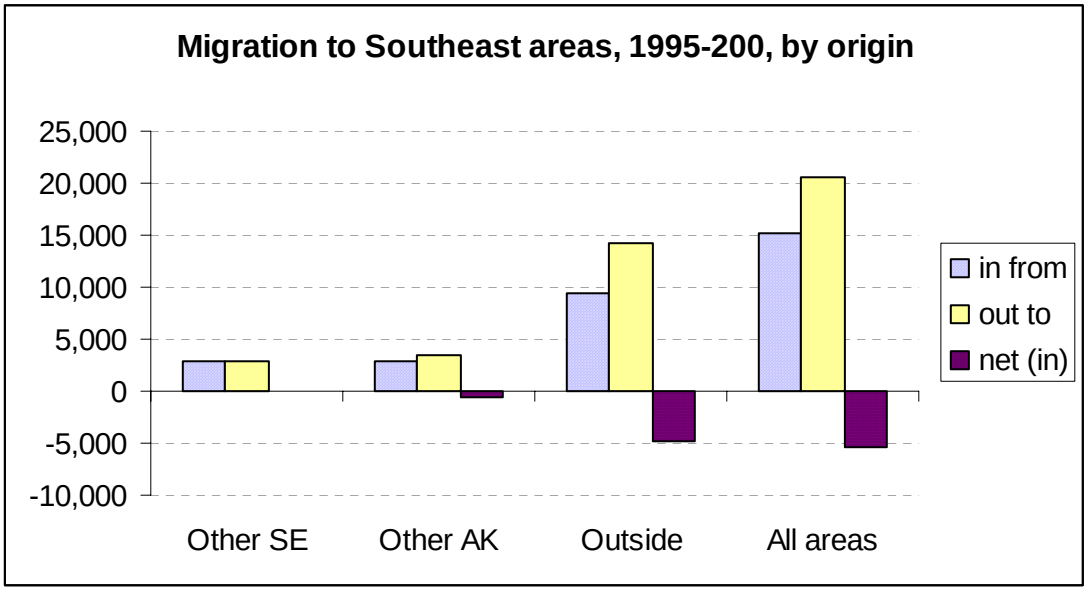
In demography, the term "net migration" refers to the net inflow, or net arrival, of people to a place. Hence, Southeast Alaska as a whole showed negative net migration between 1995 and 2000 because more people left than arrived.

The following abbreviations are used in the graphs:

SE AK	Southeast Alaska
HNS	Haines Borough
JNU	Juneau Borough
KTN	Ketchikan Borough
PWOK	Prince of Wales-Outer Ketchikan Census Area
SIT	Sitka Borough
SHA	Skagway-Hoonah-Angoon Census Area
WRP	Wrangell-Petersburg Census Area
YAK	Yakutat Borough
Other AK	Other Alaska regions (not Southeast)

Migration to Southeast Alaska, 1995-2000

	in to SE AK from:	out from SE AK to:	net migration
Other SE areas	2,914	2,914	0
Other Alaska (not SE)	2,920	3,528	-608
Outside	9,420	14,223	-4,803
All Areas	15,254	20,665	-5,411



Migration Raw Data from U.S. Year 2000 Census

Residence in 1995	Residence in 2000											
	HNS	JNU	KTN	POK	SIT	SHA	WRP	YAK	Other AK	Outside	Total	SE
Haines Bor		52	-	12	-	3	-	-	166	424	657	67
Juneau Bor	109		130	17	153	124	84	26	1,446	5,601	7,690	643
Ketchikan Bor	5	274		129	36	10	31	-	620	3,215	4,320	485
POW-OK CA	10	94	285		34	13	55	-	344	1,254	2,089	491
Sitka Borough	6	176	77	31		67	35	2	359	1,673	2,426	394
Skag-H-An CA	31	240	20	17	68		67	1	256	637	1,337	444
Wrang-Psg CA	2	229	47	62	25	12		4	194	1,272	1,847	381
Yakutat Bor	-	-	-	-	5	-	4		143	147	299	9
Other Alaska	139	1,303	549	196	426	121	129	57		111,837		2,920
Outside	290	4,005	1,730	558	1,723	392	612	110	86,142			9,420
Total	592	6,373	2,838	1,022	2,470	742	1,017	200				15,254
Southeast AK	163	1,065	559	268	321	229	276	33	3,528	14,223	20,665	2,914

Examples of how to read this table:

In 2000, there were 109 people living in Haines who had been living in Juneau in 1995.

In 2000, there were a total of 592 people living in Haines who moved there from some other county since April 1, 1995.

A total of 657 people left Haines for some other county between 1995 and 2000. Of these, 424 people left for counties not in Alaska.

A total of 9,420 people moved to Southeast from outside Alaska. During the same period, a total of 14,223 people moved from SE Alaska to counties outside Alaska.

Note that net (in)-migration must be determined by subtracting total people moving out from total people moving in. For example, 299 people moved from Yakutat to all other counties, while at the same time 200 people moved to Yakutat. The net migration to Yakutat was 200 – 299 = -99. Net migration numbers are reported in the following table.

Net Migration Matrix

		From: HNS	JNU	KTN	POK	SIT	SHA	WRP	YAK	Other AK	Outside	Total	SE
TO	Haines Bor		57	5	-2	6	28	2	0	-27	-134	-65	96
	Juneau Bor	-57		144	77	23	116	145	-26	-143	-1,596	-1,317	422
	Ketchikan Bor	-5	-144		156	41	10	16	0	-71	-1,485	-1,482	74
	POW-OK CA	2	-77	-156		-3	4	7	0	-148	-696	-1,067	-223
	Sitka Borough	-6	-23	-41	3		1	-10	3	67	50	44	-73
	Skag-H-An CA	-28	-116	-10	-4	-1		-55	-1	-135	-245	-595	-215
	Wrang-Psg CA	-2	-145	-16	-7	10	55		0	-65	-660	-830	-105
	Yakutat Bor	0	26	0	0	-3	1	0		-86	-37	-99	24
	Other Alaska	27	143	71	148	-67	135	65	86		-25,695		
	Outside	134	1,596	1,485	696	-50	245	660	37	25,695			
	Total	65	1,317	1,482	1,067	-44	595	830	99				5,411
	Southeast AK	-96	-422	-74	223	73	215	105	-24			-5,411	

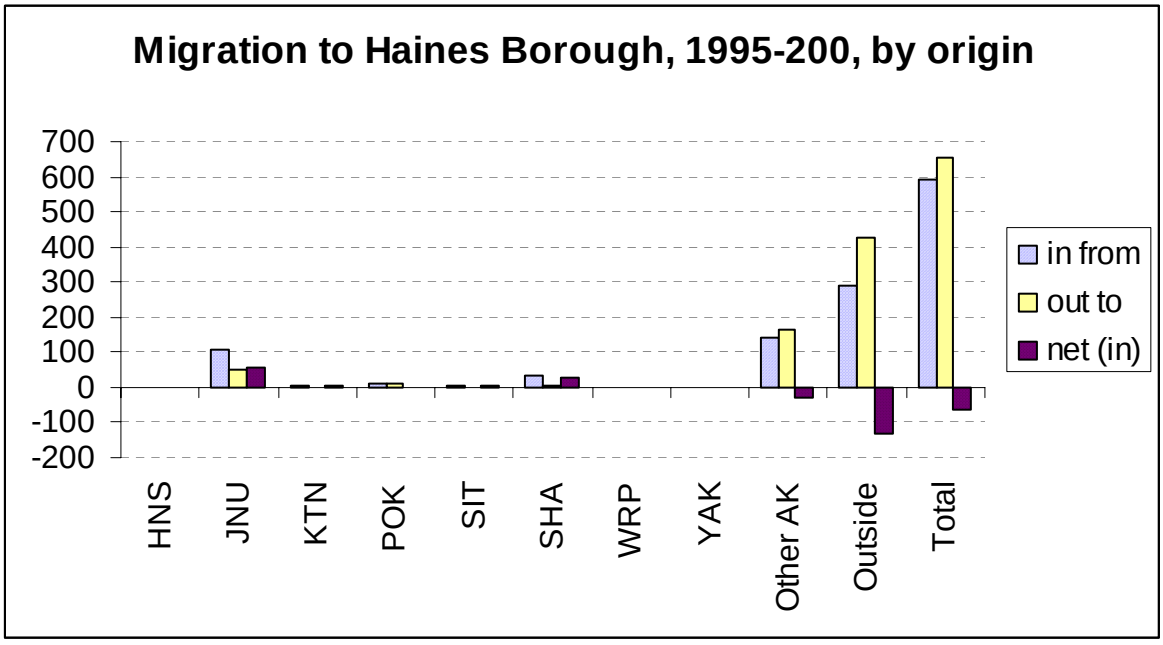
Examples of how to read this table:

Haines gained 57 people (net) from Juneau, 5 from Ketchikan Borough, etc. But Haines had a net outmigration of 134 people to counties outside Alaska. Overall, there was net (in)migration to Haines of –65 people, meaning that 65 more people migrated out than migrated in.

Overall net migration to SE Alaska from all sources was –5,411, meaning that the number of out-migrants exceeded the number of in-migrants by 5,411.

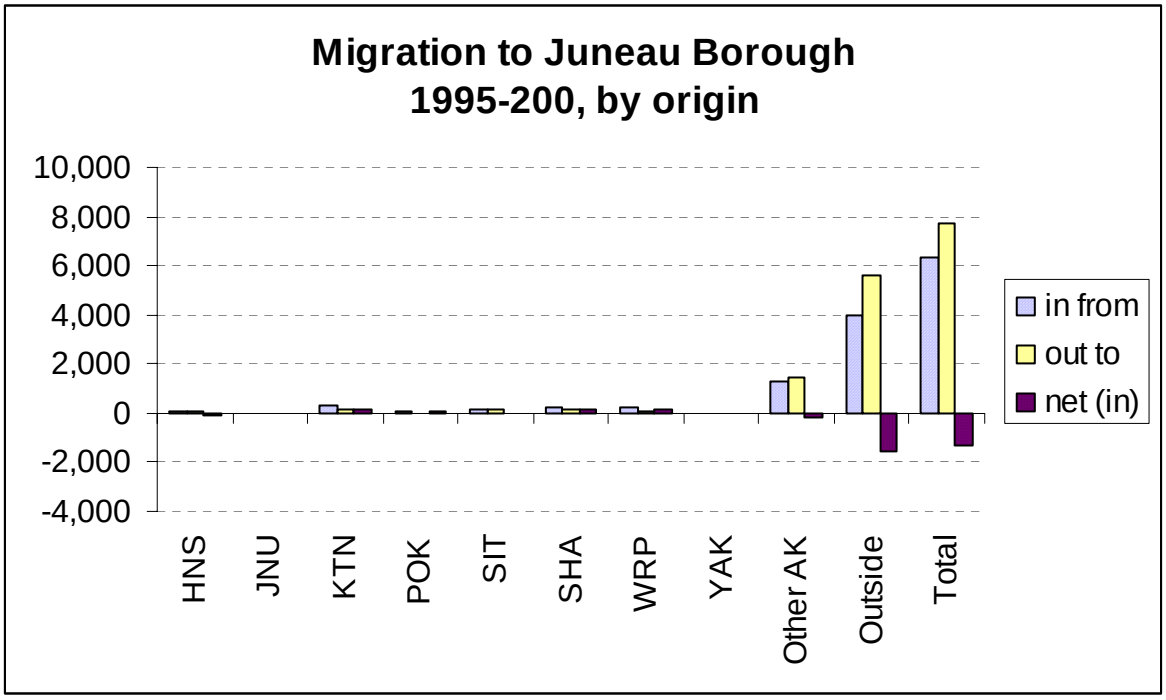
Migration to Haines Borough, 1995-2000

Origin or Destination	in to HNS from:	out from HNS to:	net migration
Haines Borough	0	0	0
Juneau Borough	109	52	57
Ketchikan Borough	5	0	5
POW-Outer Ketchikan CA	10	12	-2
Sitka Borough	6	0	6
Skagway-Hoonah-Angoon CA	31	3	28
Wrangell-Petersburg CA	2	0	2
Yakutat Borough	0	0	0
Other Alaska	139	166	-27
Other states (=Outside)	290	424	-134
All Areas	592	657	-65



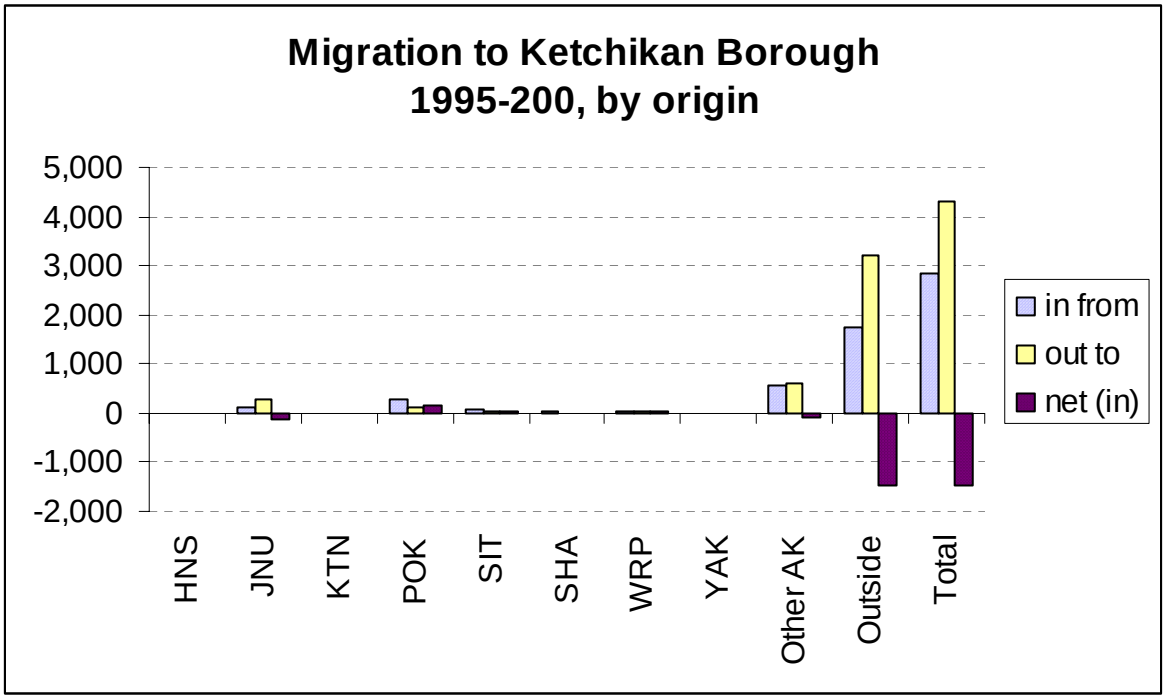
Migration to Juneau Borough, 1995-2000

Origin or Destination	in to JNU from:	out from JNU to:	net migration
Haines Borough	52	109	-57
Juneau Borough	0	0	0
Ketchikan Borough	274	130	144
POW-Outer Ketchikan CA	94	17	77
Sitka Borough	176	153	23
Skagway-Hoonah-Angoon CA	240	124	116
Wrangell-Petersburg CA	229	84	145
Yakutat Borough	0	26	-26
Other Alaska	1,303	1,446	-143
Other states (=Outside)	4,005	5,601	-1,596
All Areas	6,373	7,690	-1,317



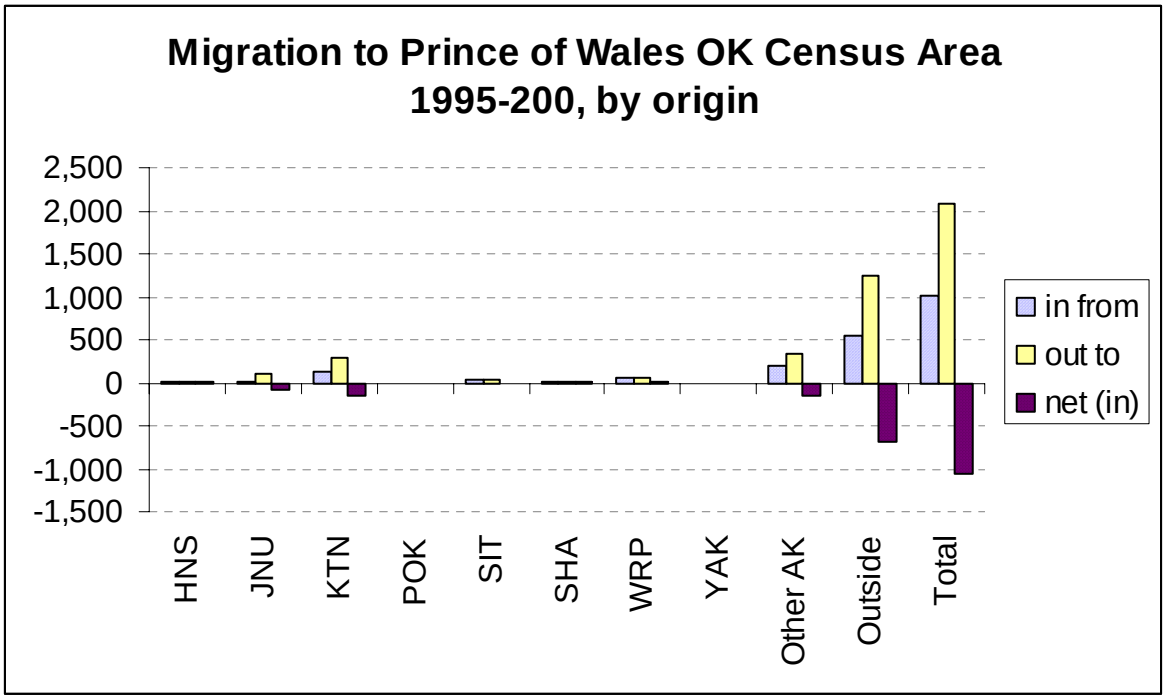
Migration to Ketchikan Borough, 1995-2000

Origin or Destination	in to KTN from:	out from KTN to:	net migration
Haines Borough	0	5	-5
Juneau Borough	130	274	-144
Ketchikan Borough	0	0	0
POW-Outer Ketchikan CA	285	129	156
Sitka Borough	77	36	41
Skagway-Hoonah-Angoon CA	20	10	10
Wrangell-Petersburg CA	47	31	16
Yakutat Borough	0	0	0
Other Alaska	549	620	-71
Other states (=Outside)	1,730	3,215	-1,485
All Areas	2,838	4,320	-1,482



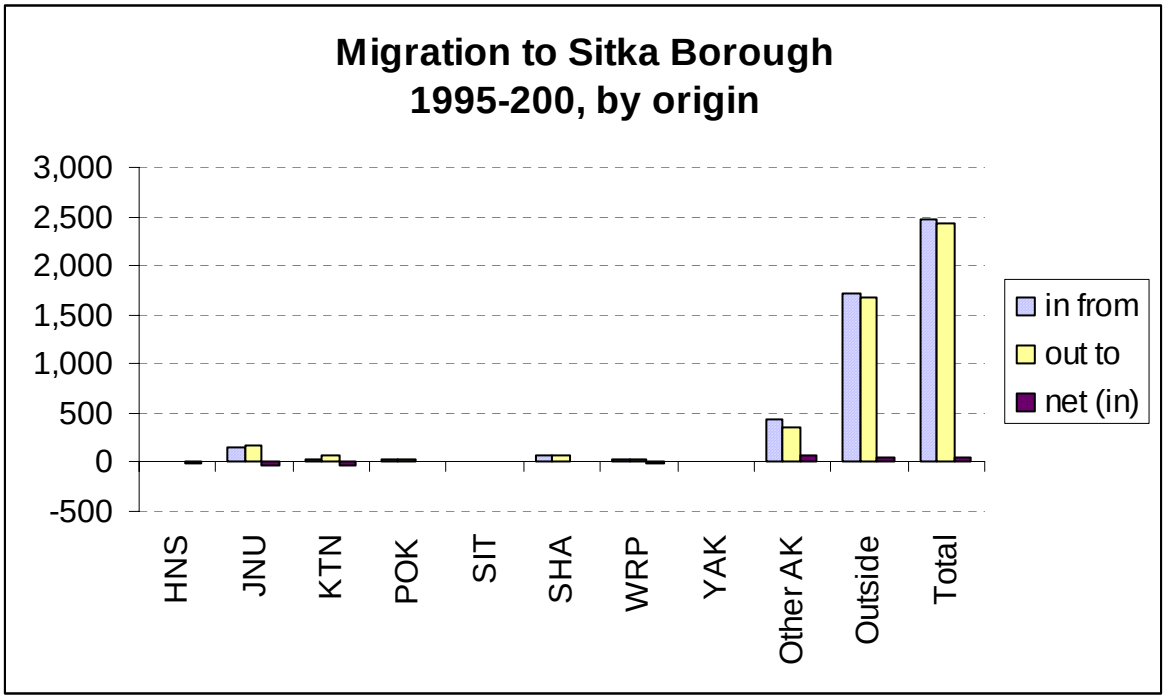
Migration to Prince of Wales – Outer Ketchikan Census Area, 1995-2000

Origin or Destination	in to POK from:	out from POK to:	net migration
Haines Borough	12	10	2
Juneau Borough	17	94	-77
Ketchikan Borough	129	285	-156
POW-Outer Ketchikan CA	0	0	0
Sitka Borough	31	34	-3
Skagway-Hoonah-Angoon CA	17	13	4
Wrangell-Petersburg CA	62	55	7
Yakutat Borough	0	0	0
Other Alaska	196	344	-148
Other states (=Outside)	558	1,254	-696
All Areas	1,022	2,089	-1,067



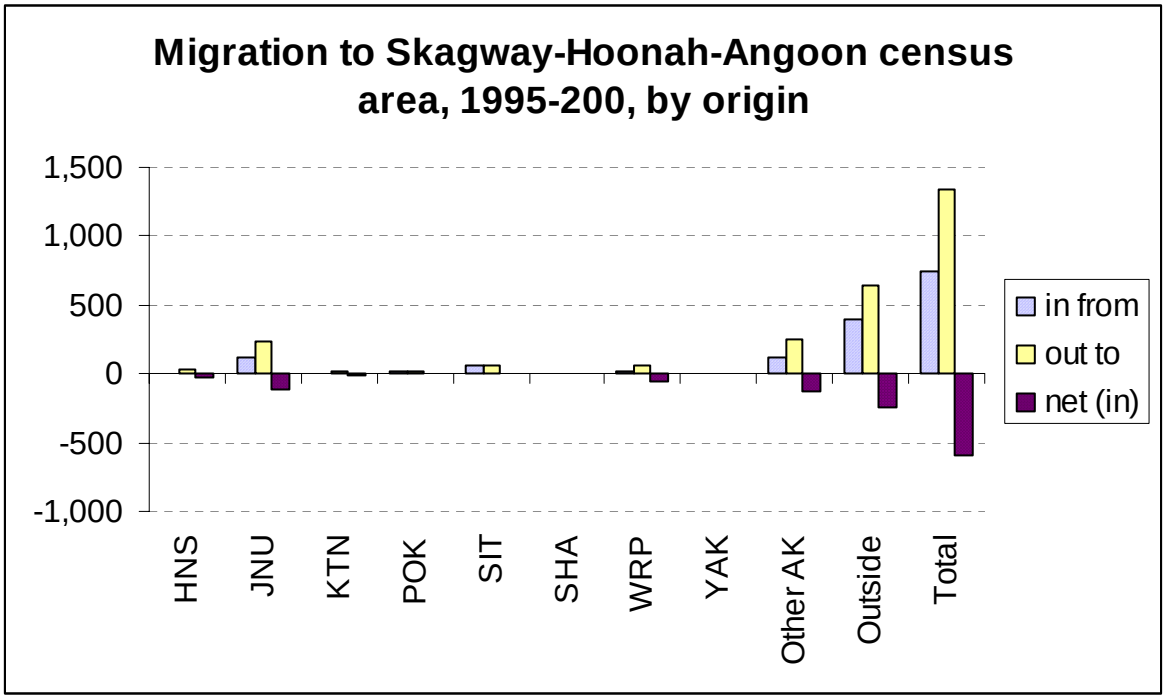
Migration to Sitka Borough, 1995-2000

Origin or Destination	in to SIT from:	out from SIT to:	net migration
Haines Borough	0	6	-6
Juneau Borough	153	176	-23
Ketchikan Borough	36	77	-41
POW-Outer Ketchikan CA	34	31	3
Sitka Borough	0	0	0
Skagway-Hoonah-Angoon CA	68	67	1
Wrangell-Petersburg CA	25	35	-10
Yakutat Borough	5	2	3
Other Alaska	426	359	67
Other states (=Outside)	1,723	1,673	50
All Areas	2,470	2,426	44



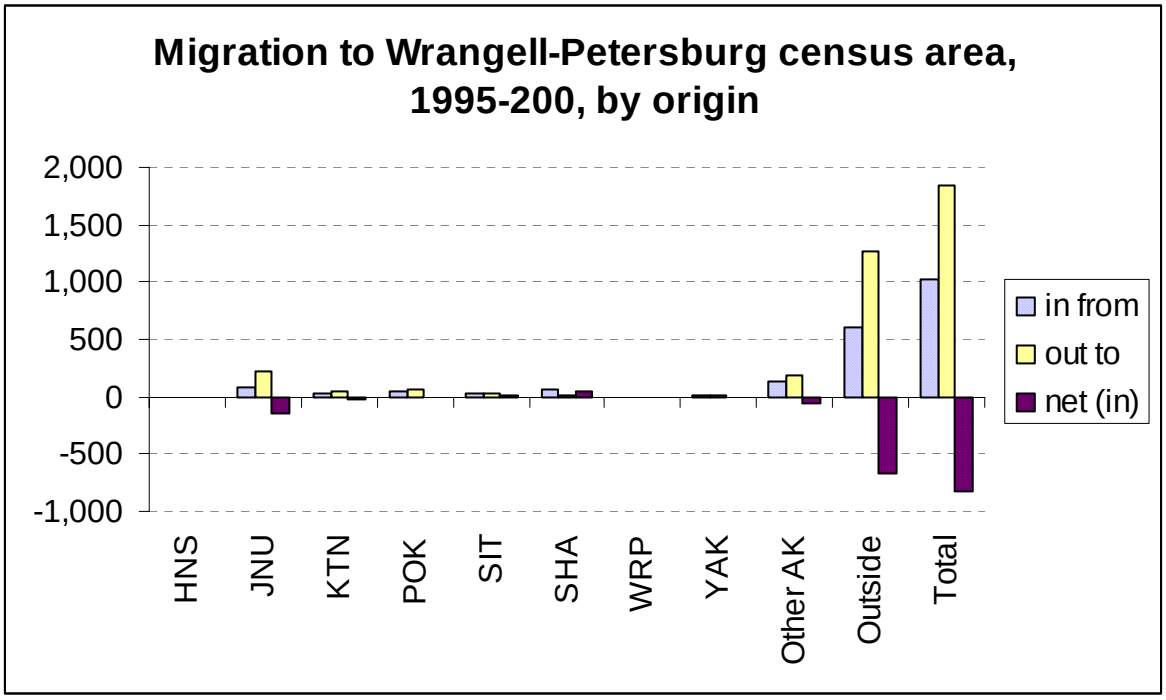
Migration to Skagway-Hoonah-Angoon Census Area, 1995-2000

Origin or Destination	in to SHA from:	out from SHA to:	net migration
Haines Borough	3	31	-28
Juneau Borough	124	240	-116
Ketchikan Borough	10	20	-10
POW-Outer Ketchikan CA	13	17	-4
Sitka Borough	67	68	-1
Skagway-Hoonah-Angoon CA	0	0	0
Wrangell-Petersburg CA	12	67	-55
Yakutat Borough	0	1	-1
Other Alaska	121	256	-135
Other states (=Outside)	392	637	-245
All Areas	742	1,337	-595



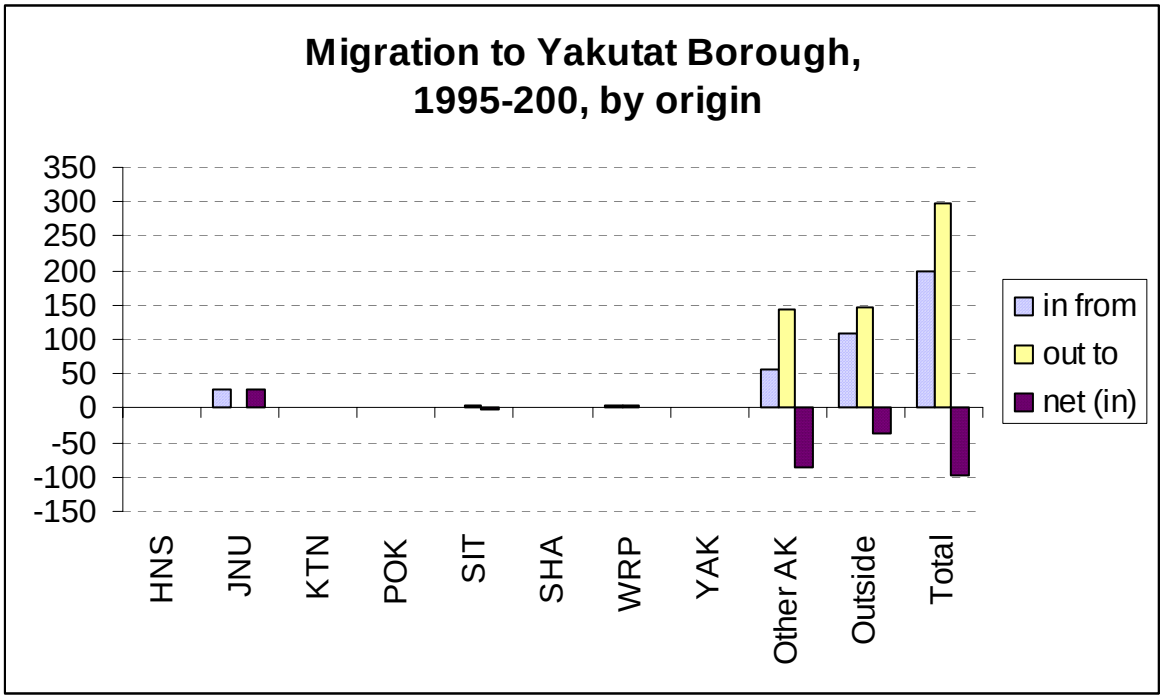
Migration to Wrangell-Petersburg Census Area, 1995-2000

Origin or Destination	in to WRP from:	out from WRP to:	net migration
Haines Borough	0	2	-2
Juneau Borough	84	229	-145
Ketchikan Borough	31	47	-16
POW-Outer Ketchikan CA	55	62	-7
Sitka Borough	35	25	10
Skagway-Hoonah-Angoon CA	67	12	55
Wrangell-Petersburg CA	0	0	0
Yakutat Borough	4	4	0
Other Alaska	129	194	-65
Other states (=Outside)	612	1,272	-660
All Areas	1,017	1,847	-830



Migration to Yakutat Borough, 1995-2000

Origin or Destination	in to YAK from:	out from YAK to:	net migration
Haines Borough	0	0	0
Juneau Borough	26	0	26
Ketchikan Borough	0	0	0
POW-Outer Ketchikan CA	0	0	0
Sitka Borough	2	5	-3
Skagway-Hoonah-Angoon CA	1	0	1
Wrangell-Petersburg CA	4	4	0
Yakutat Borough	0	0	0
Other Alaska	57	143	-86
Other states (=Outside)	110	147	-37
All Areas	200	299	-99



Appendix C Population, employment, and personal income

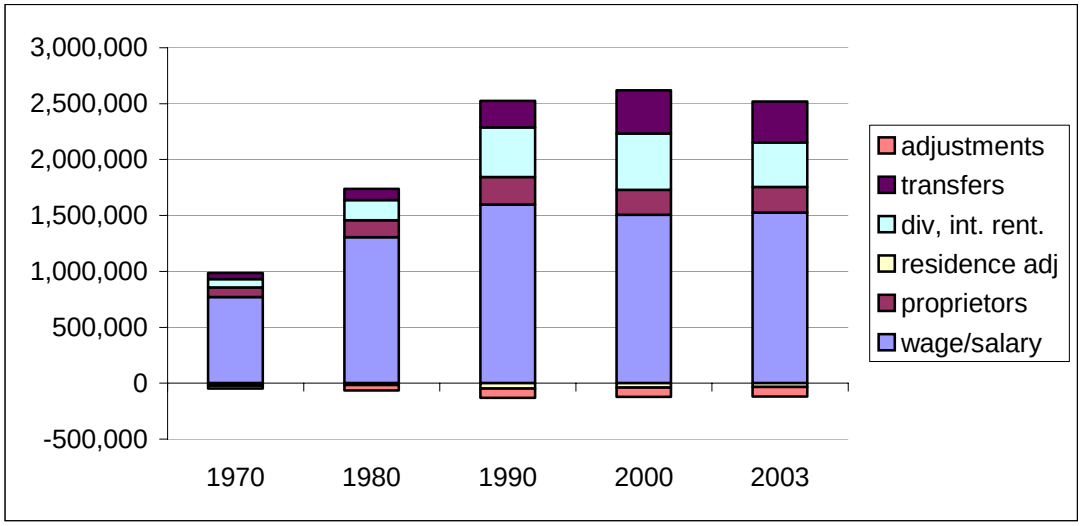
This appendix shows the changing make-up of personal income for each borough and census area. It also shows the relationship between wage and salary employment and proprietor's employment. Together these two types of employment add to total employment as measured by the Bureau of Economic Analysis.

Southeast Alaska:
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	42,565	53,794	68,989	73,082	71,767
average annual growth		*2.4%*	*2.5%*	*0.6%*	*-0.6%*
Total employment	21,599	34,113	46,715	50,855	49,422
average annual growth		*4.7%*	*3.2%*	*0.9%*	*-0.9%*
wage and salary	19,079	28,764	35,929	37,922	37,703
proprietors	2,520	5,349	10,786	12,933	11,719
proprietors' share	*12%*	*16%*	*23%*	*25%*	*24%*
Real per capita income	5,525	16,193	25,143	31,780	33,592
average annual growth		*11.4%*	*4.5%*	*2.4%*	*1.9%*

Components of total personal income (thousands of real 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	770,815	1,306,414	1,596,499	1,506,852	1,526,001
Proprietors' income	84,524	150,500	246,300	223,550	228,925
Residence adjustment	(23,224)	(16,028)	(48,882)	(38,074)	(33,698)
Dividends, interest, rent	74,699	180,082	443,962	502,377	398,684
Personal transfers	55,460	101,086	239,131	387,804	366,161
Adjustments and other, net	(23,707)	(48,313)	(82,505)	(85,592)	(84,410)
Personal income	938,566	1,673,742	2,394,506	2,496,917	2,401,663



Shares of personal income

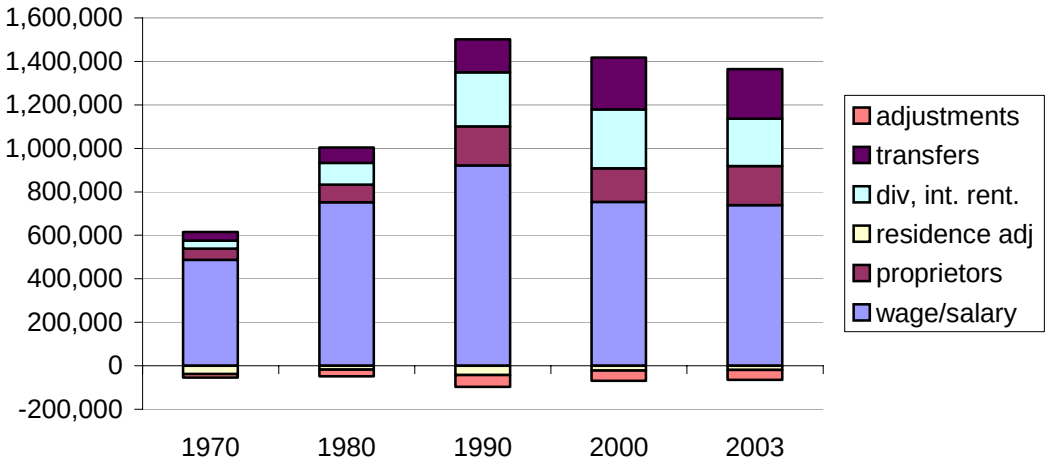
	1970	1980	1990	2000	2003
Wages & Salaries	82%	78%	67%	60%	64%
Proprietors' income	9%	9%	10%	9%	10%
Residence adjustment	-2%	-1%	-2%	-2%	-1%
Dividends, interest, rent	8%	11%	19%	20%	17%
Personal transfers	6%	6%	10%	16%	15%
Adjustments and other, net	-3%	-3%	-3%	-3%	-4%
Personal income	100%	100%	100%	100%	100%

Rural Southeast (all areas other than Juneau): Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	29,009	34,266	42,238	42,371	40,521
average annual growth		*1.7%*	*2.1%*	*0.0%*	*-1.5%*
Total employment	14,102	20,103	28,702	29,278	29,411
average annual growth		*3.6%*	*3.6%*	*0.2%*	*0.2%*
wage and salary	12,489	17,037	21,279	20,064	19,723
proprietors	1,613	3,066	7,423	9,214	9,688
proprietors' share	*11%*	*15%*	*26%*	*31%*	*33%*
Real per capita income	(1,432)	(2,961)	(1,560)	(2,982)	(1,886)
average annual growth		*7.5%*	*-6.2%*	*6.7%*	*-14.2%*

Components of total personal income (thousands of real 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	487,457	752,957	921,559	753,894	739,320
Proprietors' income	51,870	79,961	179,820	153,684	179,005
Residence adjustment	(37,399)	(17,311)	(42,392)	(22,011)	(18,411)
Dividends, interest, rent	36,280	100,058	249,099	271,281	218,145
Personal transfers	39,415	70,955	151,019	239,075	228,683
Adjustments and other, net	(16,171)	(31,031)	(54,137)	(47,503)	(46,541)
Personal income	561,451	955,589	1,404,967	1,348,420	1,300,201



Shares of personal income

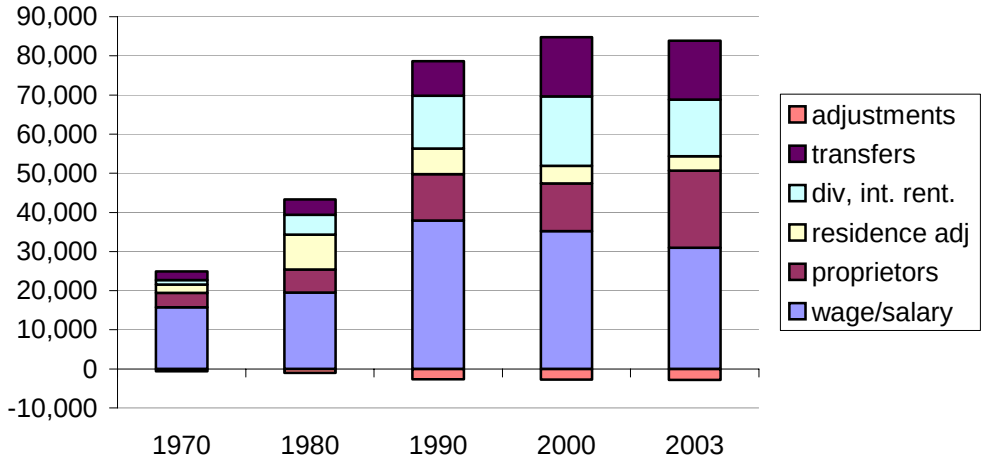
	1970	1980	1990	2000	2003
Wages & Salaries	87%	79%	66%	56%	57%
Proprietors' income	9%	8%	13%	11%	14%
Residence adjustment	-7%	-2%	-3%	-2%	-1%
Dividends, interest, rent	6%	10%	18%	20%	17%
Personal transfers	7%	7%	11%	18%	18%
Adjustments and other, net	-3%	-3%	-4%	-4%	-4%
Personal income	100%	100%	100%	100%	100%

Haines Borough:
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	1,401	1,680	2,117	2,392	2,319
average annual growth		*1.8%*	*2.3%*	*1.2%*	*-1.0%*
Total employment	600	807	1,654	2,488	2,097
average annual growth		*3.0%*	*7.4%*	*4.2%*	*-5.5%*
wage and salary	493	595	942	1,063	1,023
proprietors	107	212	712	1,425	1,074
proprietors' share	*18%*	*26%*	*43%*	*57%*	*51%*
Real per capita income	3,996	13,103	26,217	31,750	35,237
average annual growth		*12.6%*	*7.2%*	*1.9%*	*3.5%*

Components of personal income
(thousands of real year 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	15,744	19,536	37,898	35,192	30,998
Proprietors' income	3,685	5,890	11,875	12,179	19,665
Residence adjustment	2,095	8,893	6,522	4,555	3,726
Dividends, interest, rent	1,182	5,059	13,521	17,709	14,425
Personal transfers	2,222	3,972	8,843	15,097	15,045
Adjustments and other, net	(581)	(988)	(2,614)	(2,708)	(2,778)
Personal income	24,347	42,362	76,045	82,024	81,081



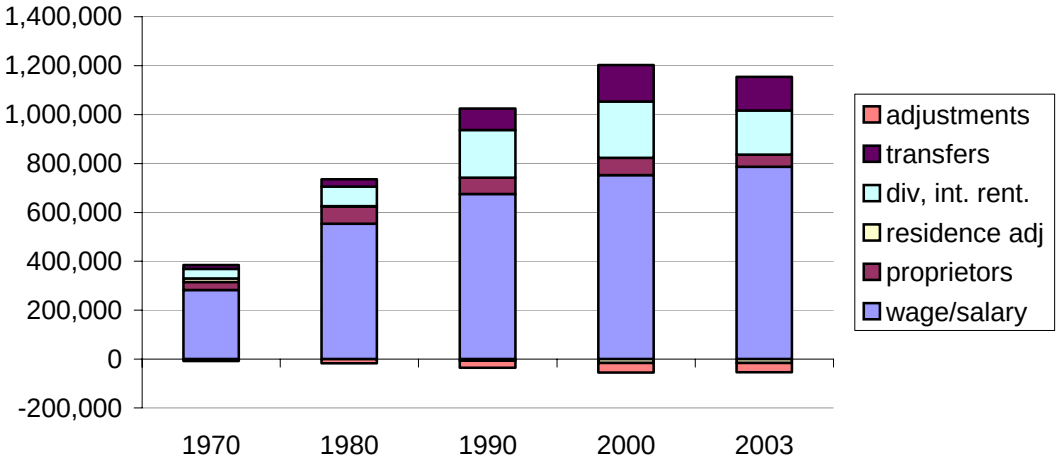
Shares of personal income	1970	1980	1990	2000	2003
Wages & Salaries	65%	46%	50%	43%	38%
Proprietors' income	15%	14%	16%	15%	24%
Residence adjustment	9%	21%	9%	6%	5%
Dividends, interest, rent	5%	12%	18%	22%	18%
Personal transfers	9%	9%	12%	18%	19%
Adjustments and other, net	-2%	-2%	-3%	-3%	-3%
Personal income	100%	100%	100%	100%	100%

Juneau Borough:
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	13,556	19,528	26,751	30,711	31,246
average annual growth		*3.7%*	*3.2%*	*1.4%*	*0.6%*
Total employment	7,497	14,010	18,013	21,577	20,011
average annual growth		*6.5%*	*2.5%*	*1.8%*	*-2.5%*
wage and salary	6,590	11,727	14,650	17,858	17,980
proprietors	907	2,283	3,363	3,719	2,031
proprietors' share	*12%*	*16%*	*19%*	*17%*	*10%*
Real per capita income	6,957	19,154	26,703	34,762	35,478
average annual growth		*10.7%*	*3.4%*	*2.7%*	*0.7%*

Components of personal income
(thousands of real year 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	283,359	553,458	674,941	752,958	786,681
Proprietors' income	32,654	70,538	66,480	69,866	49,920
Residence adjustment	14,174	1,283	(6,489)	(16,063)	(15,287)
Dividends, interest, rent	38,419	80,024	194,863	231,096	180,539
Personal transfers	16,044	30,132	88,112	148,729	137,478
Adjustments and other, net	(7,536)	(17,282)	(28,368)	(38,089)	(37,869)
Personal income	377,115	718,153	989,539	1,148,497	1,101,462



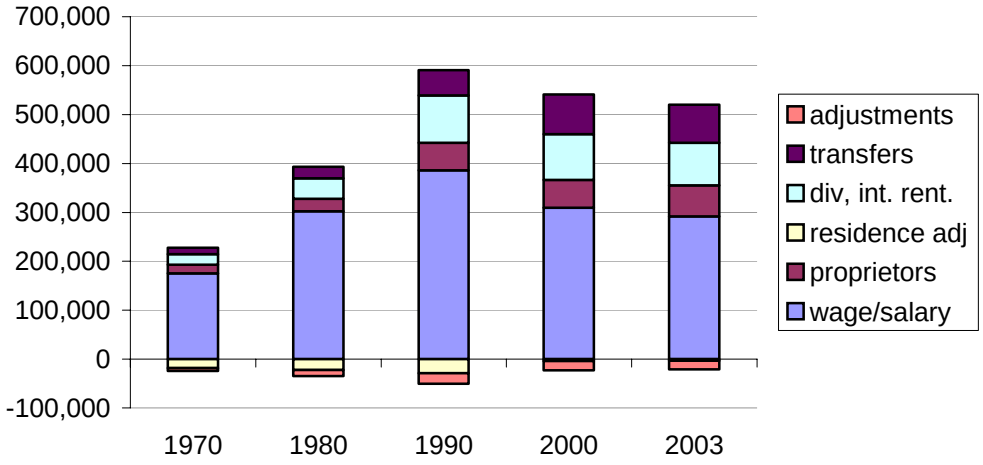
Shares of personal income	1970	1980	1990	2000	2003
Wages & Salaries	75%	77%	68%	66%	71%
Proprietors' income	9%	10%	7%	6%	5%
Residence adjustment	4%	0%	-1%	-1%	-1%
Dividends, interest, rent	10%	11%	20%	20%	16%
Personal transfers	4%	4%	9%	13%	12%
Adjustments and other, net	-2%	-2%	-3%	-3%	-3%
Personal income	100%	100%	100%	100%	100%

Ketchikan Borough:
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	10,041	11,316	13,828	14,059	13,533
average annual growth		*1.2%*	*2.0%*	*0.2%*	*-1.3%*
Total employment	5,154	7,353	10,761	10,188	10,103
average annual growth		*3.6%*	*3.9%*	*-0.5%*	*-0.3%*
wage and salary	4,622	6,371	8,543	7,701	7,407
proprietors	532	982	2,218	2,487	2,696
proprietors' share	*10%*	*13%*	*21%*	*24%*	*27%*
Real per capita income	5,100	16,447	28,258	34,389	37,393
average annual growth		*12.4%*	*5.6%*	*2.0%*	*2.8%*

Components of personal income
(thousands of real year 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	175,583	302,315	386,181	309,811	291,570
Proprietors' income	17,586	25,302	56,027	56,455	63,505
Residence adjustment	(18,081)	(22,205)	(28,684)	(4,099)	(3,141)
Dividends, interest, rent	21,255	42,079	96,840	93,750	87,149
Personal transfers	13,154	23,735	51,666	80,944	78,060
Adjustments and other, net	(5,808)	(12,304)	(21,684)	(19,037)	(17,840)
Personal income	203,690	358,922	540,345	517,825	499,303



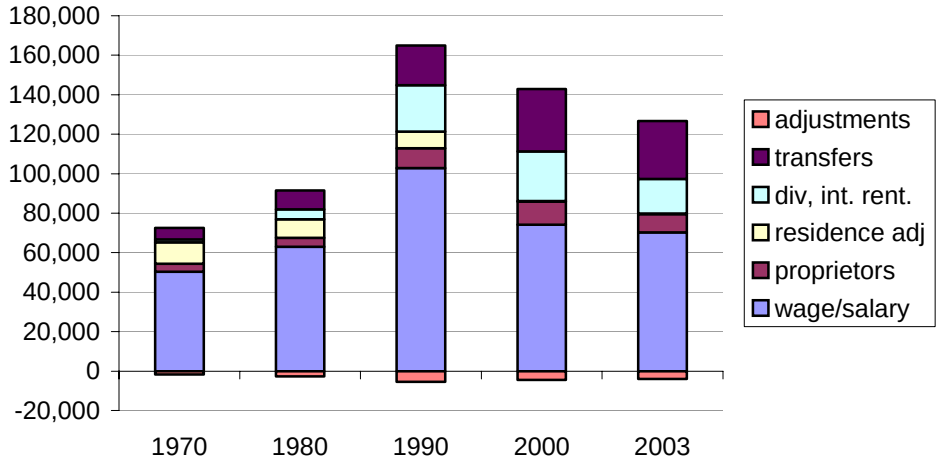
Shares of personal income	1970	1980	1990	2000	2003
Wages & Salaries	86%	84%	71%	60%	58%
Proprietors' income	9%	7%	10%	11%	13%
Residence adjustment	-9%	-6%	-5%	-1%	-1%
Dividends, interest, rent	10%	12%	18%	18%	17%
Personal transfers	6%	7%	10%	16%	16%
Adjustments and other, net	-3%	-3%	-4%	-4%	-4%
Personal income	100%	100%	100%	100%	100%

Prince of Wales-Outer Ketchikan CA:
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	3,782	3,822	6,278	6,157	5,594
average annual growth		*0.1%*	*5.1%*	*-0.2%*	*-3.1%*
Total employment	1,290	1,517	2,800	2,855	2,824
average annual growth		*1.6%*	*6.3%*	*0.2%*	*-0.4%*
wage and salary	1,179	1,391	2,284	2,092	2,024
proprietors	111	126	516	763	800
proprietors' share	*9%*	*8%*	*18%*	*27%*	*28%*
Real per capita income	4,750	11,929	18,523	20,945	21,283
average annual growth		*9.6%*	*4.5%*	*1.2%*	*0.5%*

Components of personal income
(thousands of real year 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	50,375	63,010	102,859	74,152	70,244
Proprietors' income	4,092	4,563	10,098	11,610	9,329
Residence adjustment	10,821	9,345	8,299	405	224
Dividends, interest, rent	1,372	5,000	23,557	25,073	17,470
Personal transfers	5,950	9,533	20,034	31,657	29,349
Adjustments and other, ne	(1,605)	(2,691)	(5,468)	(4,384)	(3,897)
Personal income	71,006	88,761	159,379	138,513	122,719



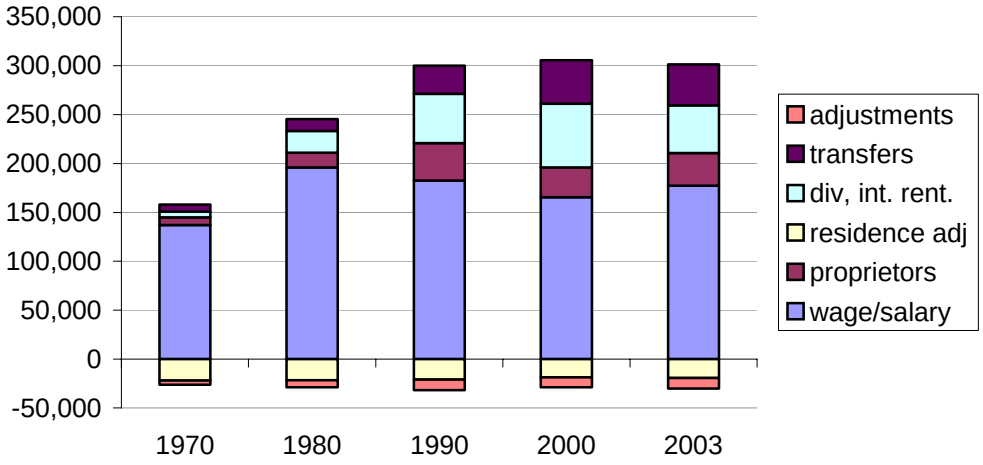
Shares of personal incor	1970	1980	1990	2000	2003
Wages & Salaries	71%	71%	65%	54%	57%
Proprietors' income	6%	5%	6%	8%	8%
Residence adjustment	15%	11%	5%	0%	0%
Dividends, interest, rent	2%	6%	15%	18%	14%
Personal transfers	8%	11%	13%	23%	24%
Adjustments and other, ne	-2%	-3%	-3%	-3%	-3%
Personal income	100%	100%	100%	100%	100%

Sitka borough:
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	6,073	7,803	8,588	8,835	8,897
average annual growth		*2.5%*	*1.0%*	*0.3%*	*0.2%*
Total employment	3,449	4,739	6,205	6,151	6,556
average annual growth		*3.2%*	*2.7%*	*-0.1%*	*2.1%*
wage and salary	3,226	4,193	4,540	4,455	4,565
proprietors	223	546	1,665	1,696	1,991
proprietors' share	*6%*	*12%*	*27%*	*28%*	*30%*
Real per capita income	5,443	14,529	22,640	29,078	30,591
average annual growth		*10.3%*	*4.5%*	*2.5%*	*1.7%*

Components of personal income
(thousands of real year 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	137,097	195,791	182,530	165,525	177,389
Proprietors' income	7,935	15,340	38,351	30,363	33,407
Residence adjustment	(21,773)	(21,420)	(20,876)	(18,684)	(19,285)
Dividends, interest, rent	5,879	22,052	50,267	65,218	48,736
Personal transfers	7,263	12,166	28,875	44,418	41,716
Adjustments and other, net	(4,266)	(7,443)	(10,730)	(10,157)	(10,713)
Personal income	132,135	216,486	268,417	276,683	271,250



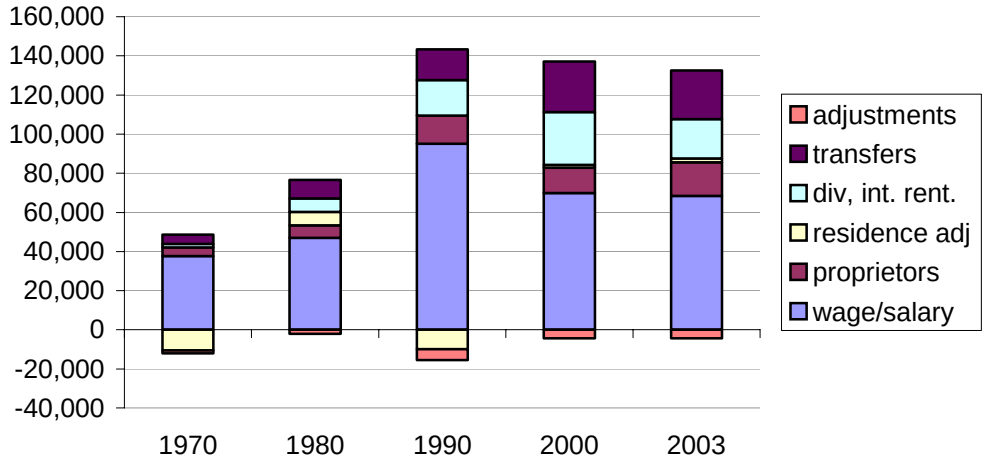
Shares of personal income	1970	1980	1990	2000	2003
Wages & Salaries	104%	90%	68%	60%	65%
Proprietors' income	6%	7%	14%	11%	12%
Residence adjustment	-16%	-10%	-8%	-7%	-7%
Dividends, interest, rent	4%	10%	19%	24%	18%
Personal transfers	5%	6%	11%	16%	15%
Adjustments and other, net	-3%	-3%	-4%	-4%	-4%
Personal income	100%	100%	100%	100%	100%

Skagway-Yakutat-Angoon Census Area:
(equals sum of Skagway-Hoonah-Angoon and Yakutat Borough for 2000, 2003)
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	2,792	3,478	4,385	4,244	3,857
average annual growth		*2.2%*	*2.3%*	*-0.3%*	*-3.1%*
Total employment	1,186	1,533	2,952	3,081	3,354
average annual growth		*2.6%*	*6.8%*	*0.4%*	*2.9%*
wage and salary	1,004	1,264	2,175	1,979	1,972
proprietors	182	269	777	1,102	1,382
proprietors' share	*15%*	*18%*	*26%*	*36%*	*41%*
Real per capita income	3,477	11,307	21,120	29,129	33,121
average annual growth		*12.5%*	*6.4%*	*3.3%*	*4.4%*

Components of personal income
(thousands of real year 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	37,679	46,946	95,134	69,928	68,350
Proprietors' income	4,452	6,511	14,347	12,917	17,262
Residence adjustment	(10,644)	6,774	(9,986)	1,515	1,968
Dividends, interest, rent	1,759	6,933	18,108	26,871	20,014
Personal transfers	4,752	9,444	15,679	25,885	24,992
Adjustments and other, net	(1,364)	(2,079)	(5,433)	(4,396)	(4,406)
Personal income	36,636	74,530	127,849	132,720	128,180



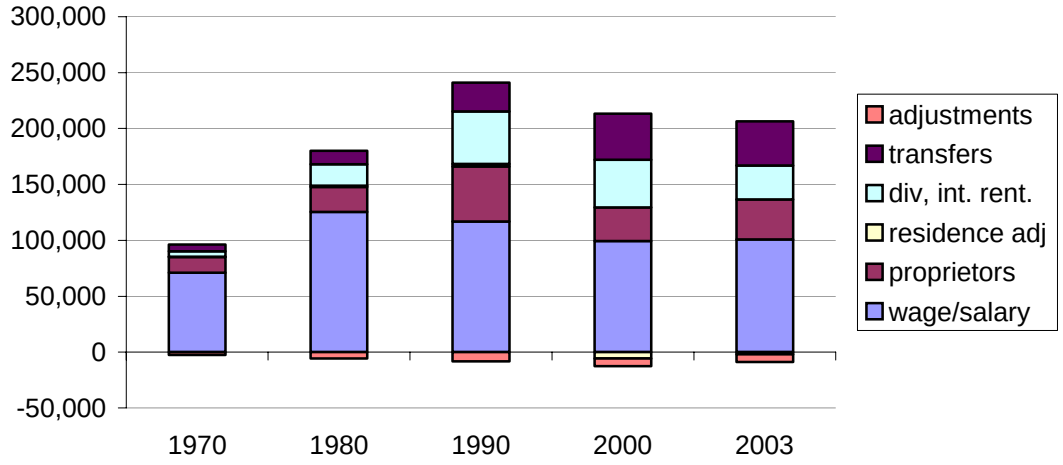
Shares of personal income	1970	1980	1990	2000	2003
Wages & Salaries	103%	63%	74%	53%	53%
Proprietors' income	12%	9%	11%	10%	13%
Residence adjustment	-29%	9%	-8%	1%	2%
Dividends, interest, rent	5%	9%	14%	20%	16%
Personal transfers	13%	13%	12%	20%	19%
Adjustments and other, net	-4%	-3%	-4%	-3%	-3%
Personal income	100%	100%	100%	100%	100%

Wrangell-Petersburg Census Area:
Population, employment, and components of real personal income

	1970	1980	1990	2000	2003
Population (census)	4,920	6,167	7,042	6,684	6,321
average annual growth		*2.3%*	*1.3%*	*-0.5%*	*-1.8%*
Total employment	2,423	4,154	4,330	4,515	4,477
average annual growth		*5.5%*	*0.4%*	*0.4%*	*-0.3%*
wage and salary	1,965	3,223	2,795	2,774	2,732
proprietors	458	931	1,535	1,741	1,745
proprietors' share	*19%*	*22%*	*35%*	*39%*	*39%*
Real per capita income	4,713	14,688	24,162	27,852	31,416
average annual growth		*12.0%*	*5.1%*	*1.4%*	*4.1%*

Components of personal income
(thousands of real year 2003 dollars)

	1970	1980	1990	2000	2003
Wages & Salaries	70,978	125,359	116,956	99,287	100,769
Proprietors' income	14,119	22,355	49,123	30,159	35,837
Residence adjustment	182	1,302	2,332	(5,704)	(1,903)
Dividends, interest, rent	4,832	18,934	46,807	42,660	30,351
Personal transfers	6,073	12,105	25,923	41,075	39,521
Adjustments and other, net	(2,546)	(5,525)	(8,209)	(6,821)	(6,907)
Personal income	93,637	174,529	232,933	200,656	197,668



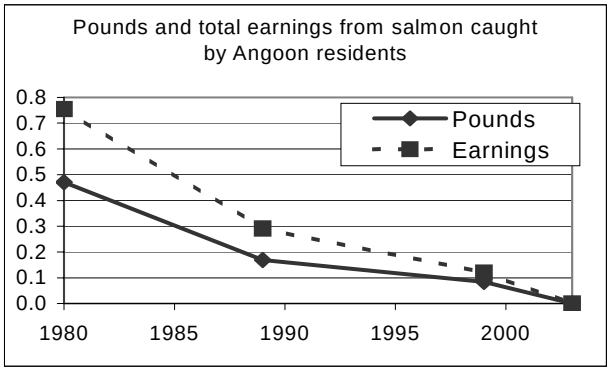
Shares of personal income	1970	1980	1990	2000	2003
Wages & Salaries	76%	72%	50%	49%	51%
Proprietors' income	15%	13%	21%	15%	18%
Residence adjustment	0%	1%	1%	-3%	-1%
Dividends, interest, rent	5%	11%	20%	21%	15%
Personal transfers	6%	7%	11%	20%	20%
Adjustments and other, net	-3%	-3%	-4%	-3%	-3%
Personal income	100%	100%	100%	100%	100%

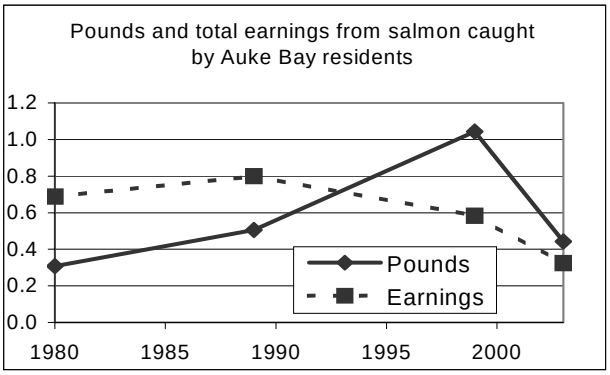
Appendix D Pounds caught and real earnings from fish caught by Southeast residents

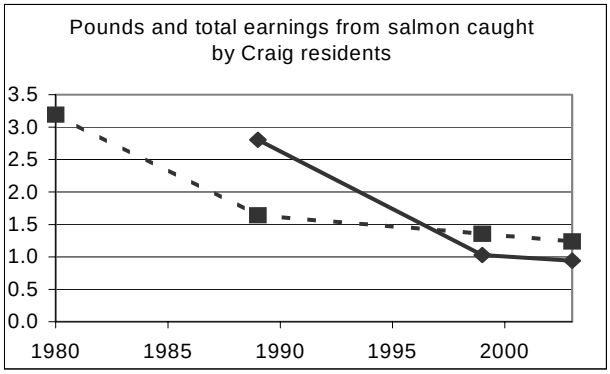
This appendix presents data compiled from Commercial Fisheries Entry Commission fish tickets. The data show pounds and earnings by place of residence of the permit holder. The data are presented at the community level.

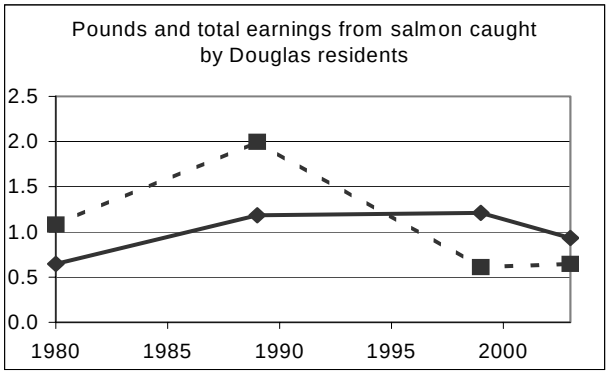
Part 1: Salmon

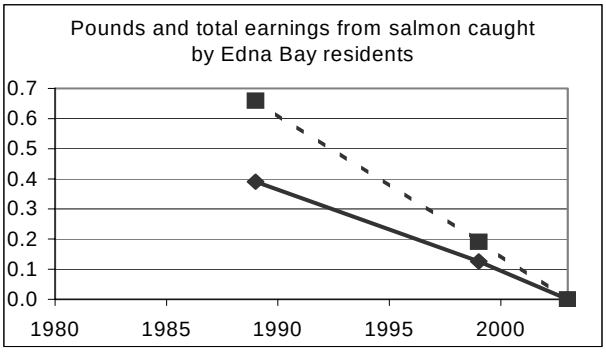
Salmon data are shown as millions of pounds and millions of real year 2004 dollars.

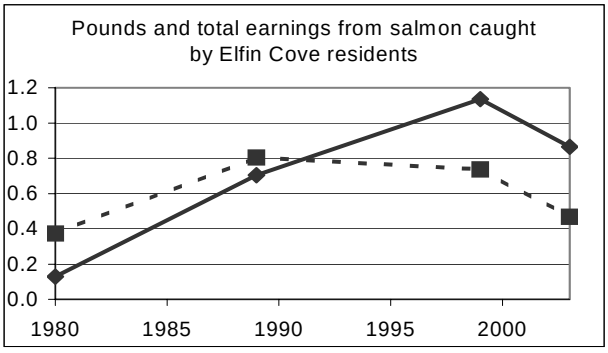

Pounds and total earnings from salmon caught by Angoon residents
Pounds
Earnings
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1980
1985
1990
1995
2000

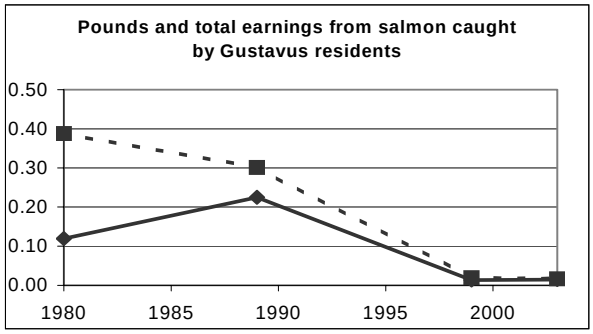

Pounds and total earnings from salmon caught by Auke Bay residents
Pounds
Earnings
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1980
1985
1990
1995
2000

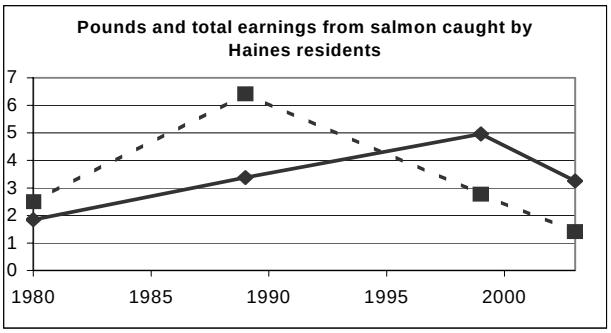

Pounds and total earnings from salmon caught by Craig residents
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000

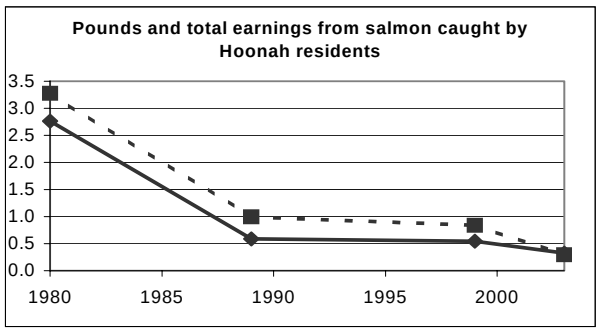

Pounds and total earnings from salmon caught by Douglas residents
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000

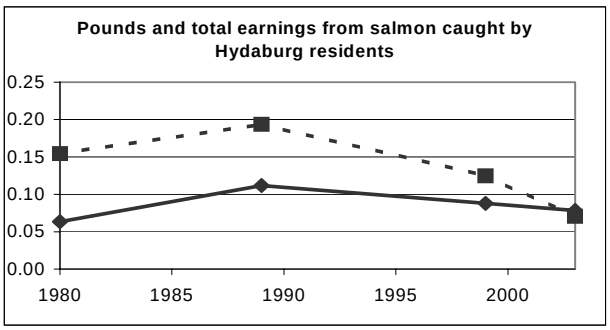

Pounds and total earnings from salmon caught by Edna Bay residents
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1980
1985
1990
1995
2000

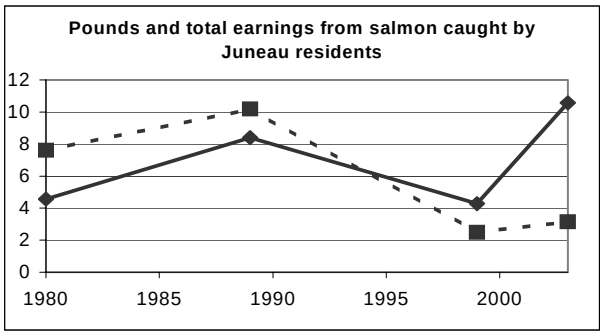

Pounds and total earnings from salmon caught by Elfin Cove residents
1.2
1.0
0.8
0.6
0.4
0.2
0.0
1980
1985
1990
1995
2000

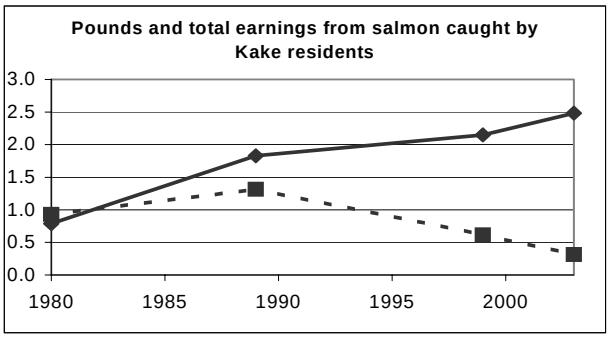

Pounds and total earnings from salmon caught by Gustavus residents
0.50
0.40
0.30
0.20
0.10
0.00
1980
1985
1990
1995
2000

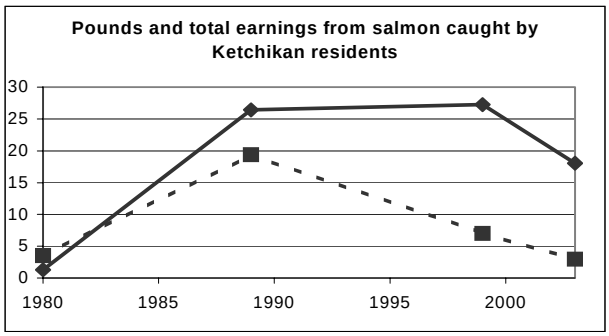

Pounds and total earnings from salmon caught by Haines residents
7
6
5
4
3
2
1
0
1980
1985
1990
1995
2000

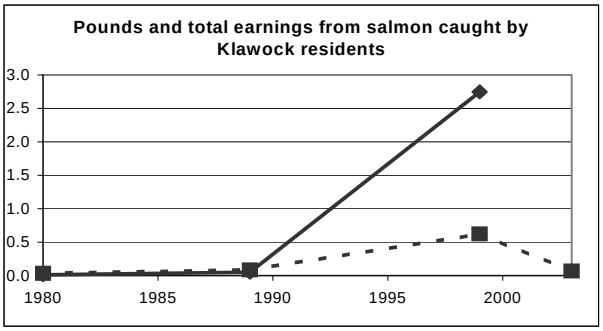

Pounds and total earnings from salmon caught by Hoonah residents
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000

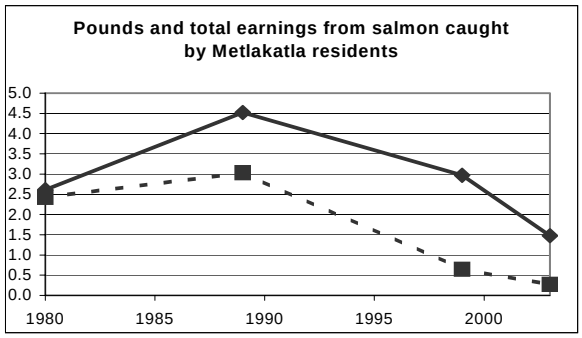

Pounds and total earnings from salmon caught by Hydaburg residents
0.25
0.20
0.15
0.10
0.05
0.00
1980
1985
1990
1995
2000

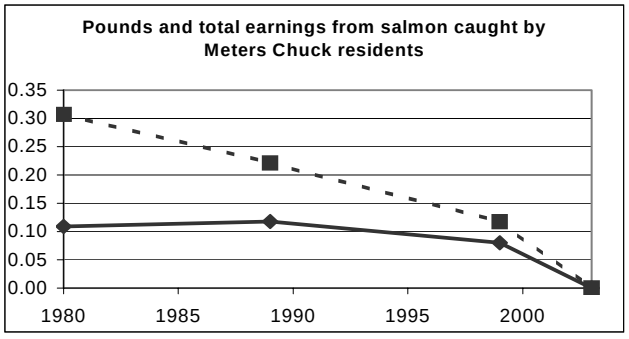

Pounds and total earnings from salmon caught by Juneau residents
12
10
8
6
4
2
0
1980
1985
1990
1995
2000

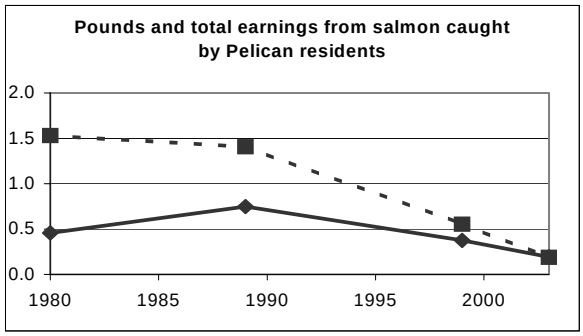

Pounds and total earnings from salmon caught by Kake residents
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000

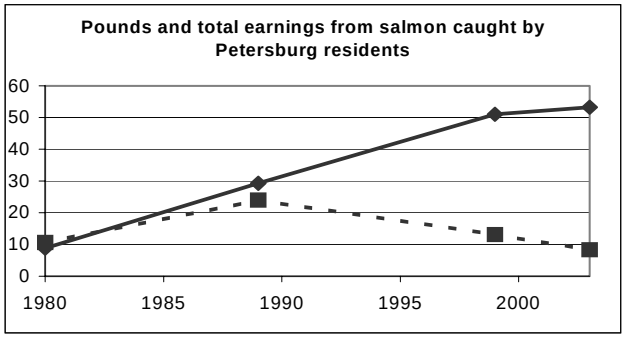

Pounds and total earnings from salmon caught by Ketchikan residents
30
25
20
15
10
5
0
1980
1985
1990
1995
2000

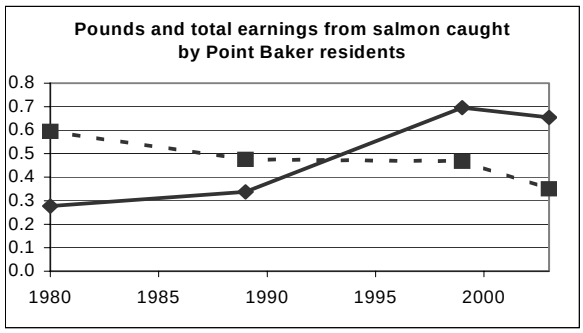

Pounds and total earnings from salmon caught by Klawock residents
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000

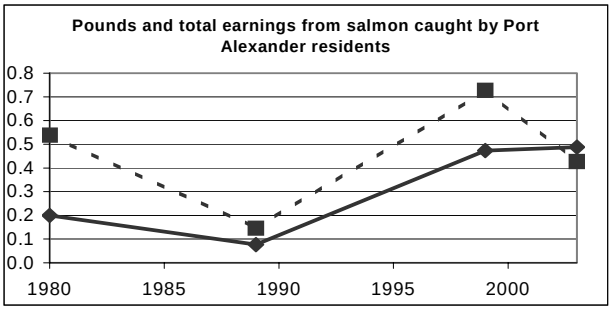

Pounds and total earnings from salmon caught by Metlakatla residents
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000

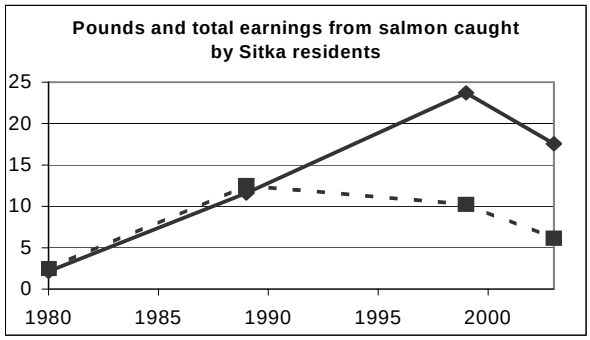

Pounds and total earnings from salmon caught by Meters Chuck residents
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1980
1985
1990
1995
2000

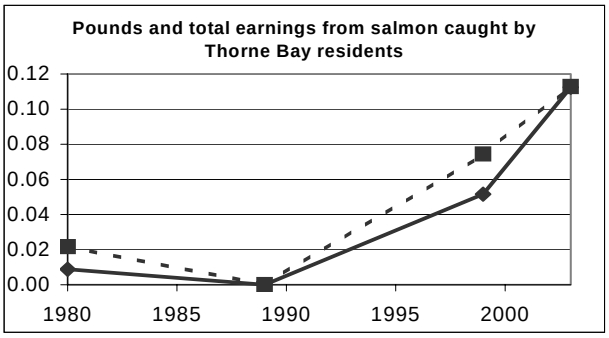

Pounds and total earnings from salmon caught by Pelican residents
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000

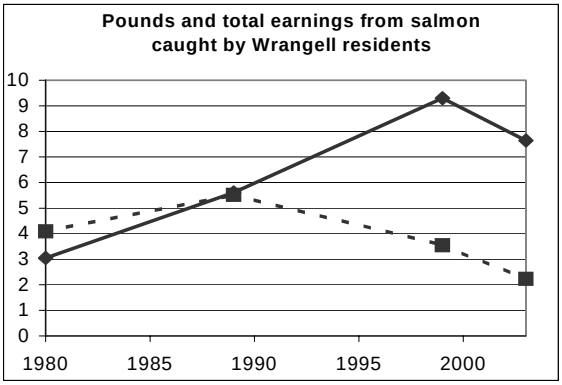

Pounds and total earnings from salmon caught by Petersburg residents
60
50
40
30
20
10
0
1980
1985
1990
1995
2000

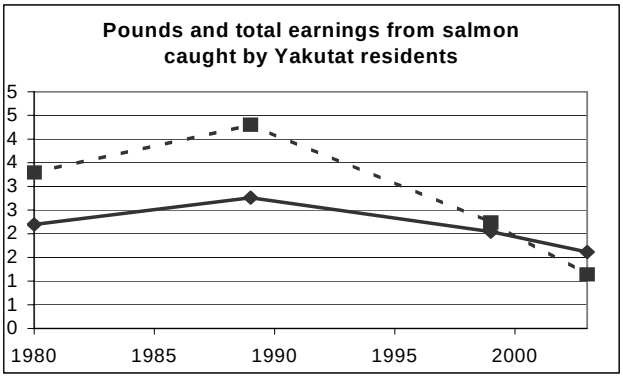

Pounds and total earnings from salmon caught by Point Baker residents
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1980
1985
1990
1995
2000

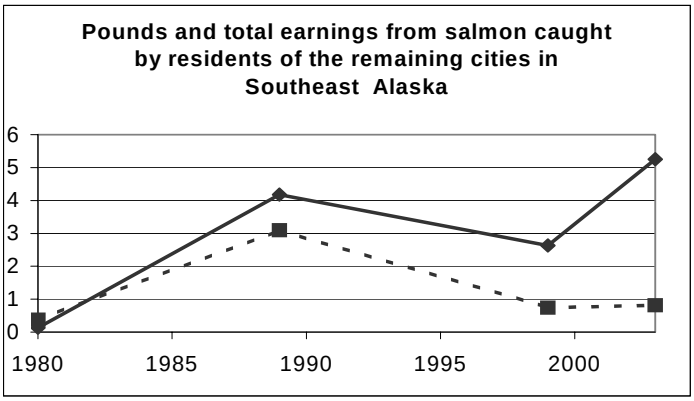

Pounds and total earnings from salmon caught by Port Alexander residents
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
1980
1985
1990
1995
2000


Pounds and total earnings from salmon caught by Sitka residents
25
20
15
10
5
0
1980
1985
1990
1995
2000


Pounds and total earnings from salmon caught by Thorne Bay residents
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1980
1985
1990
1995
2000


Pounds and total earnings from salmon caught by Wrangell residents
10
9
8
7
6
5
4
3
2
1
0
1980
1985
1990
1995
2000

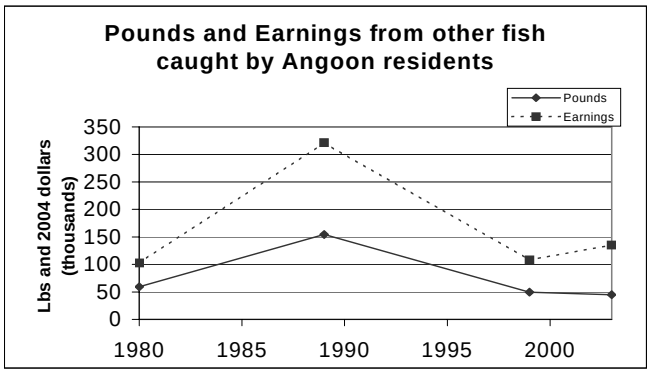

Pounds and total earnings from salmon caught by Yakutat residents
5
5
4
4
3
3
2
2
1
1
0
1980
1985
1990
1995
2000

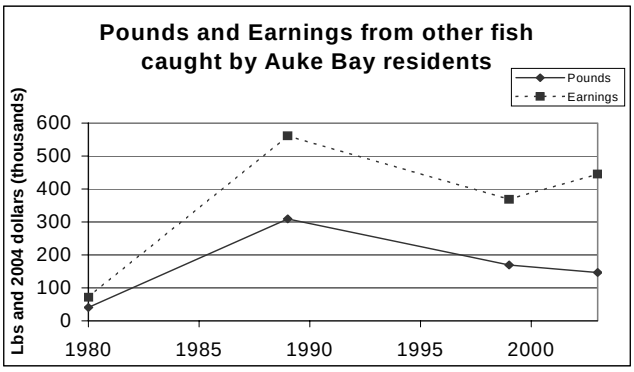

Pounds and total earnings from salmon caught by residents of the remaining cities in Southeast Alaska
6
5
4
3
2
1
0
1980
1985
1990
1995
2000

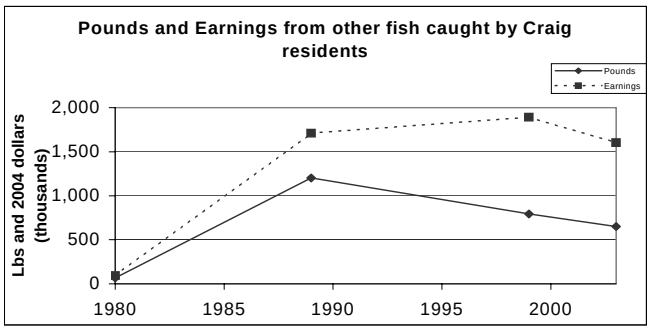
Part 2: Other fish

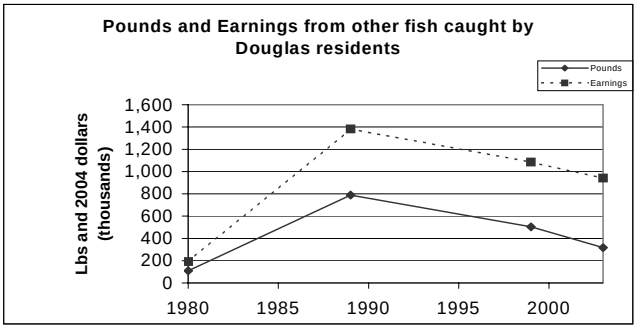
Other fish include crab, halibut, herring, sablefish, and other species.

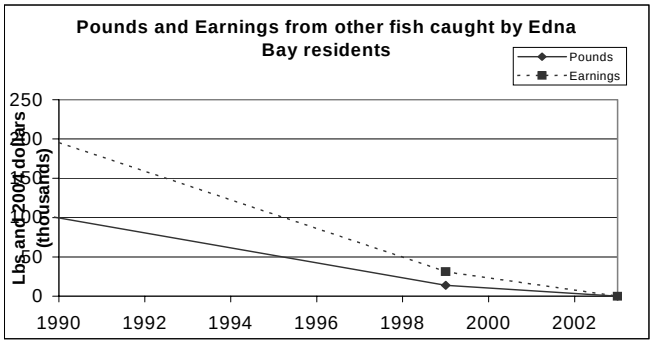
Data for other fish are presented in thousands of pounds and thousands of year 2004 dollars.

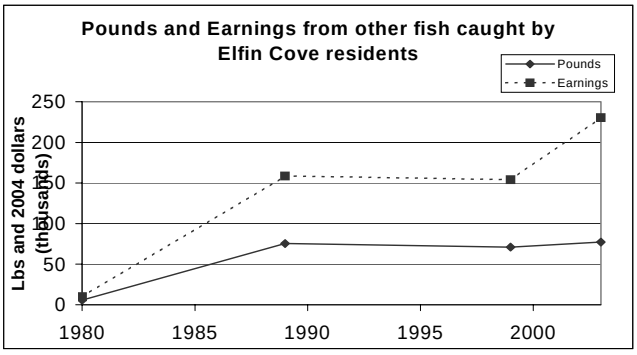


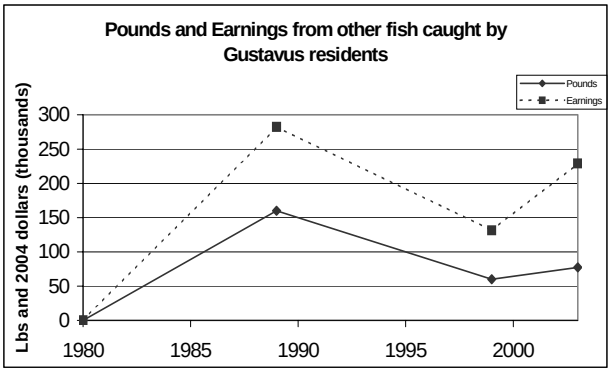


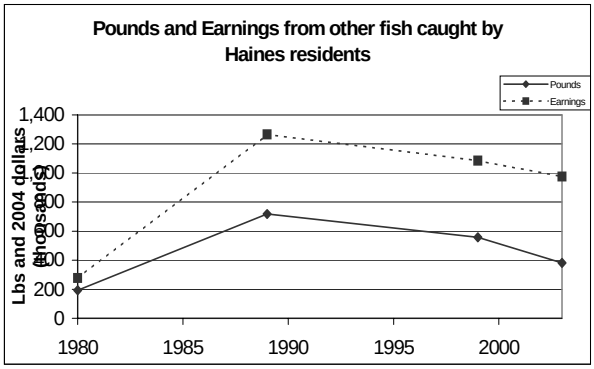


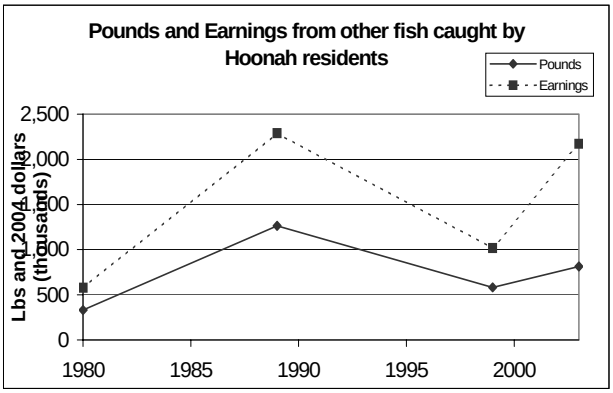


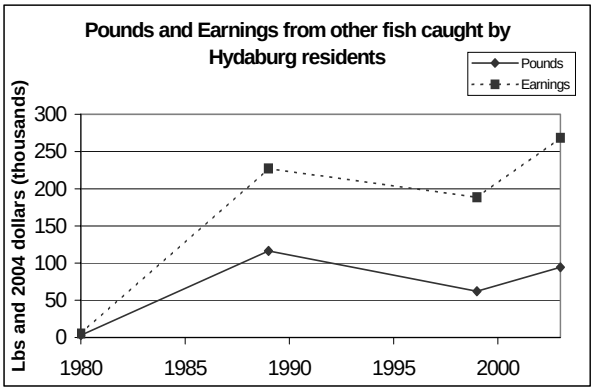


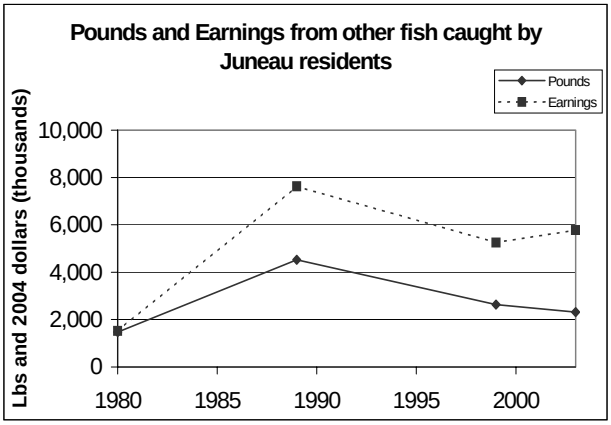


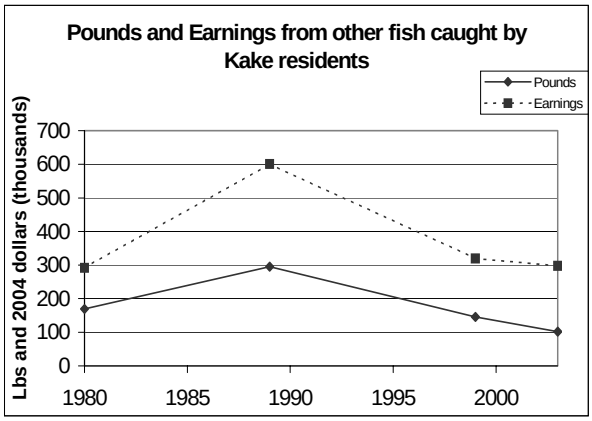

Pounds and Earnings from other fish caught by Gustavus residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
300
250
200
150
100
50
0
1980
1985
1990
1995
2000

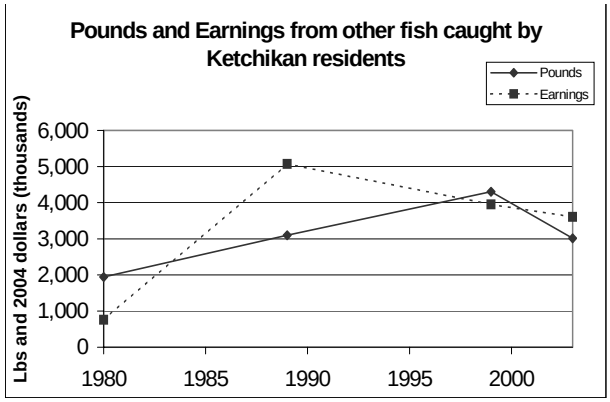

Pounds and Earnings from other fish caught by Haines residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
1,400
1,200
1,000
800
600
400
200
0
1980
1985
1990
1995
2000

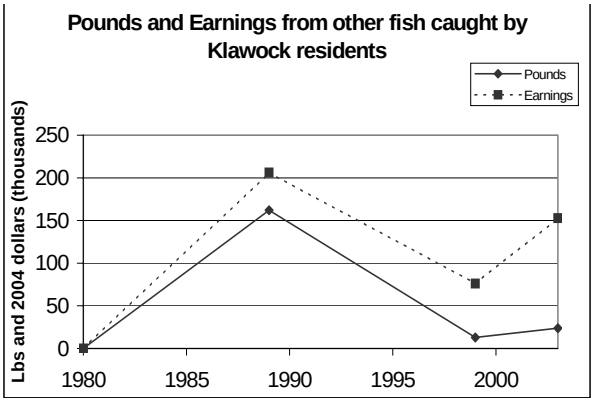

Pounds and Earnings from other fish caught by Hoonah residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
2,500
2,000
1,500
1,000
500
0
1980
1985
1990
1995
2000

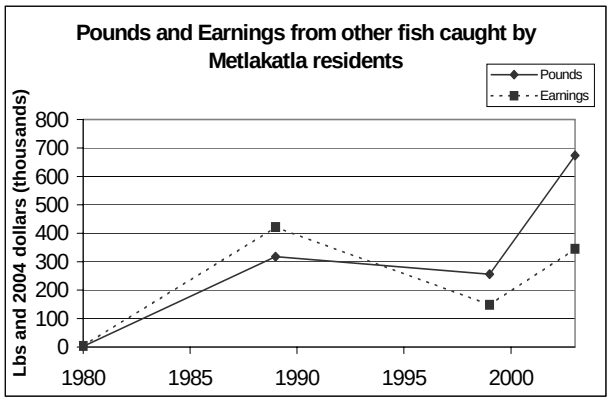

Pounds and Earnings from other fish caught by Hydaburg residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
300
250
200
150
100
50
0
1980
1985
1990
1995
2000

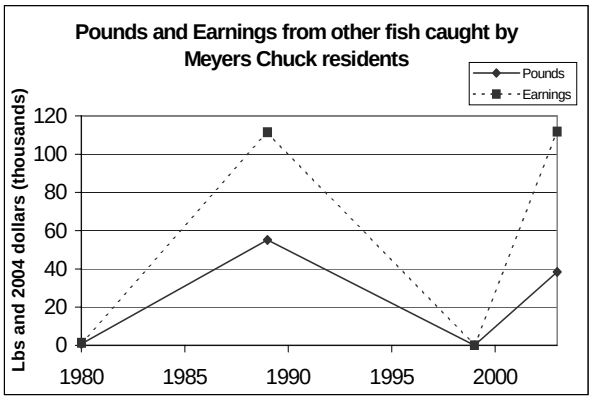

Pounds and Earnings from other fish caught by Juneau residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
10,000
8,000
6,000
4,000
2,000
0
1980
1985
1990
1995
2000

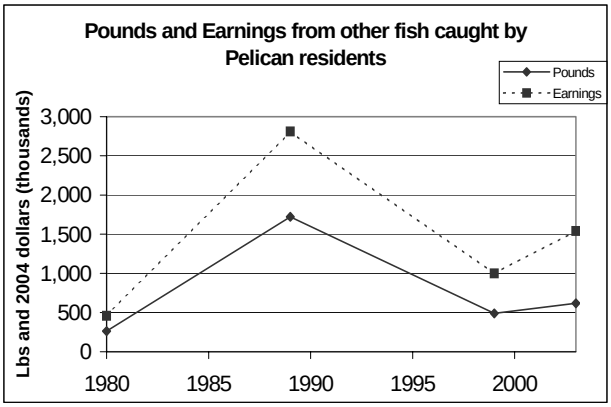

Pounds and Earnings from other fish caught by Kake residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
700
600
500
400
300
200
100
0
1980
1985
1990
1995
2000

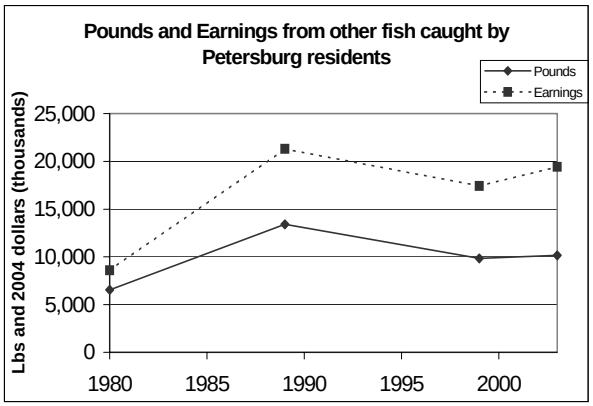

Pounds and Earnings from other fish caught by Ketchikan residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
6,000
5,000
4,000
3,000
2,000
1,000
0
1980
1985
1990
1995
2000

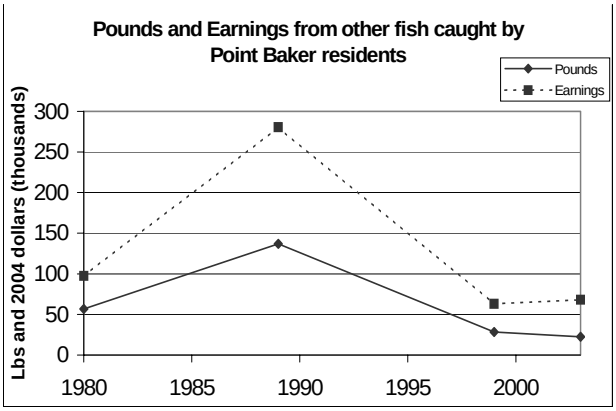

Pounds and Earnings from other fish caught by Klawock residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
250
200
150
100
50
0
1980
1985
1990
1995
2000

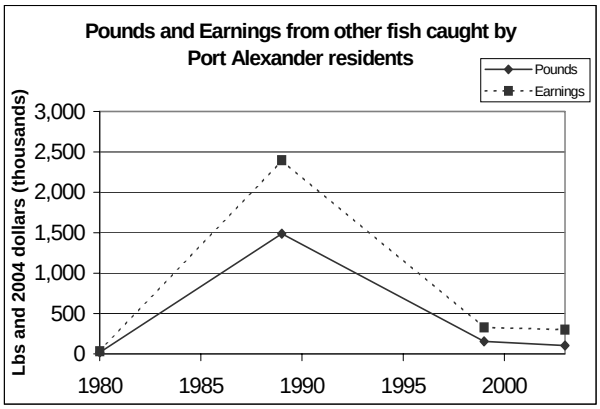

Pounds and Earnings from other fish caught by Metlakatla residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
800
700
600
500
400
300
200
100
0
1980
1985
1990
1995
2000

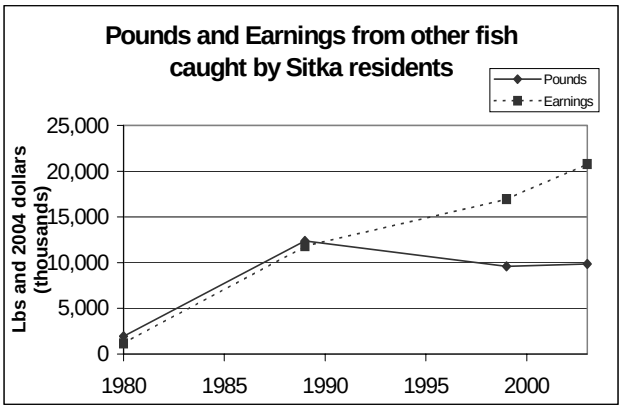

Pounds and Earnings from other fish caught by Meyers Chuck residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
120
100
80
60
40
20
0
1980
1985
1990
1995
2000

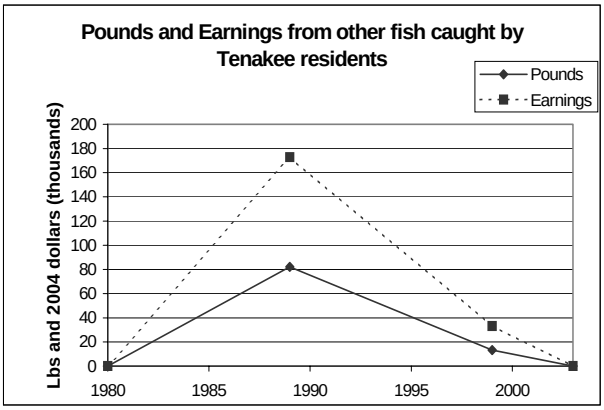

Pounds and Earnings from other fish caught by Pelican residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
3,000
2,500
2,000
1,500
1,000
500
0
1980
1985
1990
1995
2000

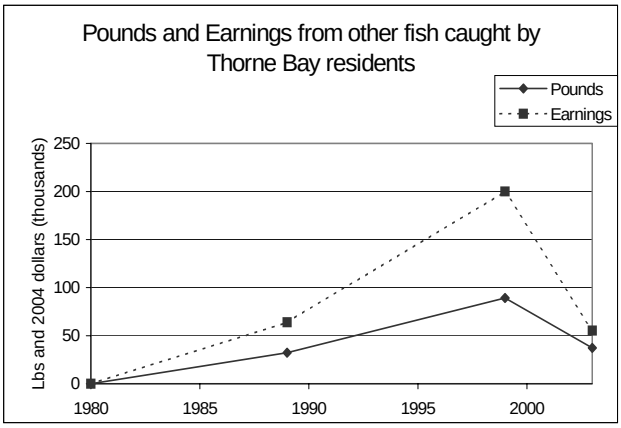

Pounds and Earnings from other fish caught by Petersburg residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
25,000
20,000
15,000
10,000
5,000
0
1980
1985
1990
1995
2000

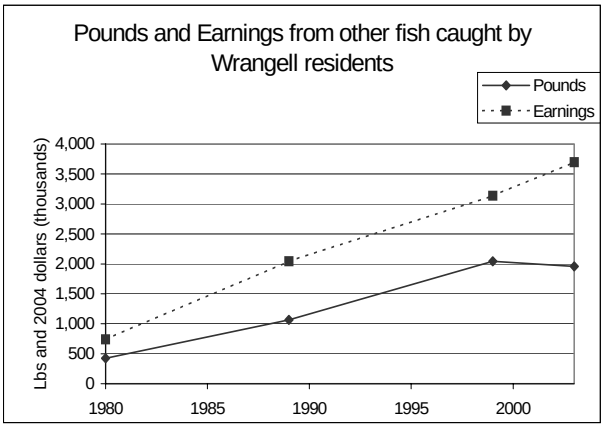

Pounds and Earnings from other fish caught by Point Baker residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
300
250
200
150
100
50
0
1980
1985
1990
1995
2000

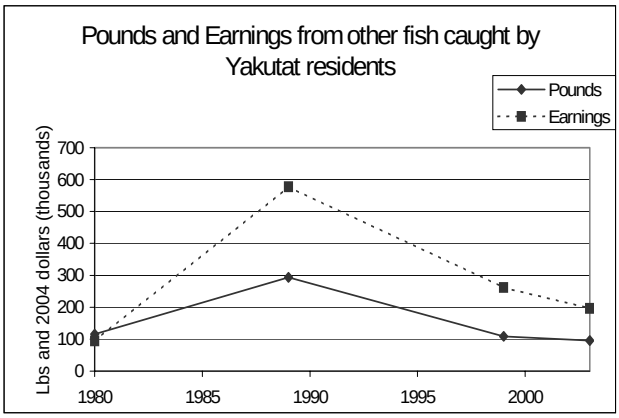

Pounds and Earnings from other fish caught by Port Alexander residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
3,000
2,500
2,000
1,500
1,000
500
0
1980
1985
1990
1995
2000

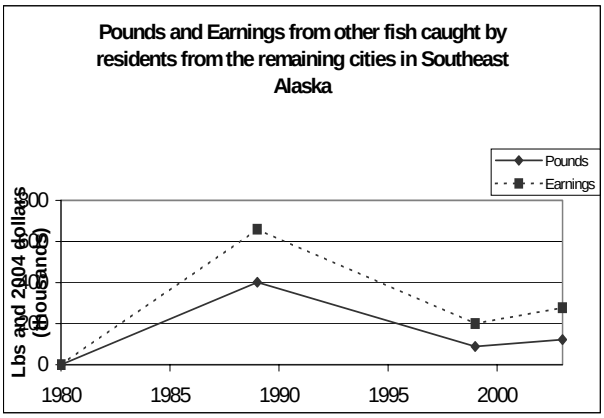

Pounds and Earnings from other fish caught by Sitka residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
25,000
20,000
15,000
10,000
5,000
0
1980
1985
1990
1995
2000


Pounds and Earnings from other fish caught by Tenakee residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
200
180
160
140
120
100
80
60
40
20
0
1980
1985
1990
1995
2000


Pounds and Earnings from other fish caught by Thorne Bay residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
250
200
150
100
50
0
1980
1985
1990
1995
2000


Pounds and Earnings from other fish caught by Wrangell residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1980
1985
1990
1995
2000


Pounds and Earnings from other fish caught by Yakutat residents
Pounds
Earnings
Lbs and 2004 dollars (thousands)
700
600
500
400
300
200
100
0
1980
1985
1990
1995
2000


Pounds and Earnings from other fish caught by residents from the remaining cities in Southeast Alaska
Pounds
Earnings
Lbs and 2004 dollars (thousands)
1980
1985
1990
1995
2000

Appendix E Comprehensive References -- Forest Products

Alaska Department of Labor, Research and Analysis. 2000. Alaska population overview, 1999 estimates. Juneau, AK. 152 p.

Alaska Department of Labor, Research and Analysis. 2002. Employment and income databases. Juneau, AK. http://almis.labor.state.ak.us/ (17 February 2004).

Alaska Manufacturers' Association. 2002. The strength of Alaska's lumber. Alaska manuFACTS. 1(3): 1, 4-5.

Alaska National Interest Lands Conservation Act of 1981. Public Law 96-487, 94 Stat. 2371-2251.

Alaska Native Claims Settlement Act of December 18, 1971. PL 93-203. 85 Stat. 689; 43 USCA 1601 et seq.

Alaska Science & Technology Foundation, *A Long-Term Economic Development Strategy for Alaska*, April 2000 edition.

Allen, S.D.; Robertson, G.; Schaefers, J. 1998. Economies in transition: an assessment of trends relevant to management of the Tongass National Forest. Gen. Tech. Rep. PNW-GTR-417. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 101 p.

Baker, R. 2001. Statewide forecast: employment growth for years 2001 and 2002. *Economic Trends*. 21(5): 3-5.

Behnke, S. 1999. Tongass tourism themes: socioeconomic research needs and opportunities in Southeast Alaska. Juneau, AK: Office of Tourism. http://juneau.org/tourism2/documents90-99/Tongass_Themes.pdf.(17 February 2004).

Beyers, W.B.; Lindahl, D.B. 1996. Lone eagles and high fliers in rural producer services. Rural Development Perspectives. 11(3): 2-10.

Bosselman, F.P.; Peterson, C.A.; McCarthy, C. 1999. Managing tourism growth: issues and applications. Washington, DC: Island Press. 304 p.

Bowen, H.R.; Leamer, E.; Sveikauskas, L. 1987. Multicountry, multifactor tests of the factor abundance theory. The American Economic Review. 77: 791–809.

Brackley, Allen M.; Rojas, Thomas D.; Haynes, Richard W. 2006. Timber products output and timber harvests in Alaska: projections for 2005-25. Gen. Tech. Rep. PNW-GTR-XXX. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. XX p. [forthcoming]

Brackley, A.M.; Davis, E.F. 2004. A model to evaluate the technical and economic feasibility of constructing a board plant (OSB or MDF) in southeast Alaska. In: Proceedings of the 38th international wood composites symposium. Pullman, WA: Washington State University. 43-71.

Brackley, A.M.; Parrent, D.J.; Rojas, T.D. [In press]. Estimating sawmill processing capacity for Tongass timber: 2003 and 2004 update. Res. Note. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Braden, R.; Cunningham, K.; Lippke, B.; Eastin, I. 2000. An assessment of market opportunities for Alaskan forest products exports. In: Laufenberg, T.L.; Brady, B.K., eds. Proceedings: linking healthy forests and communities through Alaska value-added forest products. Gen. Tech. Rep. PNW-GTR-500. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 247–316.

Brooks, D.J.; Haynes, R.W. 1994. Timber products output and timber harvests in Alaska: projections for 1992-2010. Gen. Tech. Rep. PNW-GTR-334. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 48 p.

Brooks, D.J.; Haynes, R.W. 1997. Timber products output and timber harvests in Alaska: projections for 1997-2010. Gen. Tech. Rep. PNW-GTR-409. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 17 p.

Brooks, D.J.; Haynes, R.W. 1990. Timber products output and timber harvests in Alaska: projections for 1989-2010. Gen. Tech. Rep. PNW-GTR-261. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 48 p.

Brown, G. 1999. Alaska community quality of life study (detailed responses), and How does your community compare to others? http://polar.alaska.pacific.edu/gregb/research.htm. (27 January 2003).

Buongiorno, J.; Uusivuori, J. 1992. The law of one price in the trade of forest products: co-integration tests for the U.S. exports of pulp and paper. Forest Science. 38(3): 539-553.

Butterworth, J.; Lei, Z. 2005. China, Peoples Republic of--Solid wood products annual 2005. GAIN Rpt. CH5052. Beijing, China: U.S. Foreign Agriculture Service, Global Agriculture Information Network. 27 p.

Byers, A.M. 1960. The timber industry and industrial forestry in Alaska. Journal of Forestry. 58(6): 474–477.

Cerveny, Lee K. 2005. Tourism and its effects on Southeast Alaska communities and resources: case studies from Haines, Craig, and Hoonah, Alaska. Res. Pap. PNW-RP-566. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 147 p.

Cerveny, Lee K. 2004. Preliminary research findings from a study of the sociocultural effects of tourism in Haines, Alaska. Gen. Tech. Rep. PNW-GTR-612. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 144 p.

Christensen, N.A.; Nickerson, N.P. 1995. *Jobs and wages: the tourism industry dilemma*. Res. Note 21. Missoula, MT: The Institute for Tourism and Recreation Research, University of Montana. 12 p.

Collier, P.; Willem, J.G., eds. 1999. Trade shocks in developing countries. New York: Oxford University Press. 491 p.

Colt, Steve, 2001. The economic importance of healthy Alaska ecosystems. University of Alaska Anchorage, Institute of Social and Economic Research. www.iser.uaa.alaska.edu

Conway, F.D.; Wells, G.E. 1994. *Timber in Oregon: history and projected trends*. EM 8544. Corvallis, OR: Oregon State University Extension Service. 16 p.

Cook, P.; Mizer K. 1994. The revised ERS county typology. Rural Development Research Report 89. Washington, DC: U.S. Department of Agriculture, Economic Research Service, Rural Economy Division. 47 p.

Cordova, L.; Landry, G.; Tomlinson, N. 2002. The 2010 employment outlook. *Economic Trends*. 22(5): 3-10.

Cordova, Lorraine, Gerald Landry, and Nels Tomlinson, The 2010 Employment Outlook, *Alaska Economic Trends*, May 2002.

Coughlin, C.C.; Terza, J.V.; Arromdee, V. 1991. State characteristics and the location of foreign direct investment within the United States. The Review of Economics and Statistics. 11: 29–35.

Crone, L.K. 2005. Southeast Alaska economics–a resource-abundant region competing in a global marketplace. Landscape and Urban Planning. 72(1-3): 215-249.

.Crone, L. 2004. Rural manufacturing and the U.S. wood products industry: trends and influences on rural areas. In: Mazza, R., tech. ed. Economic growth and change in Southeast Alaska. Gen. Tech. Rep. PNW-GTR-611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 33–71.

Crone, L.K.; Haynes, R.W. 1999. Revised estimates for direct-effect recreation jobs in the interior Columbia River basin. Gen. Tech. Rep. PNW-GTR-483. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 29 p. (Quigley, Thomas M., ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

Crone, L.K.; Haynes, R.W. 2001. "Socioeconomic evaluation of broad-scale land management strategies." *Forest Ecology and Management*. 153(1-3): 147-160.

Crone, L.K.; Reed, P.; Schaefers, J. 2002. Social and economic assessment of the Chugach National Forest area. Gen. Tech. Rep. PNW-GTR-561. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 108 p.

Crone, Lisa K. 2004. Rural manufacturing and the U.S. wood products industry: trends and influences on rural areas. In: Mazza, R., tech. ed. Economic growth and change in Southeast Alaska. Gen. Tech. Rep. PNW-GTR-611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 33-71.

Dickey, D.A.; Fuller, W.A. 1981. Likelihood ratio statistics for autoregressive time series with a unit root. Econometrica. 49: 1057-1072.

Doak, S.; Kusel, J. 1996. Well-being in forest-dependent communities. Part 2: A social assessment. In: Sierra Nevada Ecosystem Project: final report to Congress—assessments and scientific basis for management options. Davis, CA: University of California, Centers for Water and Wildland Resources: 375-402. Vol 2.

Donoghue, E.M.; Haynes, R.W. 2002. Assessing the viability and adaptability of Oregon communities. Gen. Tech. Rep. PNW-GTR-549. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 11 p.

Drabenstott, M.; Smith, T.R. 1996. “The changing economy of the rural heartland.” In: *Proceedings, Economic forces shaping the rural heartland*. Kansas City, MO: Federal Reserve Bank of Kansas City, Center for the Study of Rural America: 1-11.

Drucker, P.F. 1986. “The changed world economy.” *Foreign Affairs*. 64(4): 768-791.

Durbin, K. 1999. Tongass: pulp politics and the fight for the Alaska rain forest. Corvallis, OR: Oregon State University Press. 328 p.

Emmingham,W. 1998. Uneven-aged management in the Pacific Northwest. Journal of Forestry. 96(7): 37-39.

Engle, R.; Granger, C.W.J. 1987. Co-integration and error-correction: representation, estimation and testing. Econometrica. 55: 251-276.

Erickson, G. 2000. *Playing the sympathy card*. 16 p. Report prepared for Southeast Alaska Conservation Council. On file with: Southeast Alaska Conservation Council, 419 Sixth Street, Suite 200, Juneau, AK 99801.

Fay, Ginny, *Alaska Timber Harvests and Export Volumes*, prepared for the Alaska Conservation Alliance, May 2003.

Flora, D.F.; Anderson, A.L.; McGinnis, W. 1991. *Pacific Rim softwood log trade: determinants and trends*. Res. Pap. PNW-RP-432. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 72 p.

Food and Agriculture Organization (FAO). 1997. FAO provisional outlook for global forest products consumption, production and trade to 2010. Rome: Forestry Department, Forest Policy and Planning Division. 390 p.

Food and Agriculture Organization (FAO). 1998. Asia-Pacific forestry towards 2010. Rome: Forestry Department, Forest Policy and Planning Division. 242 p.

Food and Agriculture Organization (FAO). 2006. FAOSTAT [Database]. www.fao.org/forestry/site/29420/en. (January).

Force, E.F.; Machlis, G.E.; Zhang, L.; Kearney, A. 1993. “The relationship between timber production, local historical events, and community social change: a quantitative case study.” *Forest Science*. 39(4): 722-742.

Forest Ecosystem Management Assessment Team [FEMAT]. 1993. Forest ecosystem management: an ecological, economic, and social assessment. Portland, OR: U.S. Department of Agriculture; U.S. Department of the Interior [and others]. [Irregular pagination].

Friedman, J.; Gerlowski, D.A.; Silberman, J. 1993. What attracts foreign multinational corporations? Evidence from branch plant location in the United States. Journal of Regional Science. 32(4): 403–418.

Gale, F.; McGranahan, D. 2001. Nonmetro areas fall behind in the “new economy.” *Rural America*. 16(1): 2001.

Galston, W.A.; Baehler, K.J. 1995. *Rural development in the United States: connecting theory, practice, and possibilities*. Washington, DC: Island Press. 353 p.

Garrett, L.D.; Dykstra, D. 1988. *Demand for stumpage and wood products from the Tongass National Forest, Alaska: 1988-2000*. Juneau, AK: U.S. Department of Agriculture, Forest Service, Alaska Region; final report. 190 p.

General Accounting Office. 1990. *Forest Service timber harvesting, planting, assistance programs and tax programs*. Washington, DC: [Pages unknown].

Gilbertsen, N. 2002. "Manufacturing." *Alaska Economic Trends*. 22 (1): 3-8.

Gilbertson, Neal and Dan Robinson, "Natural Resources: Mining and Timber," *Alaska Economic Trends*, December 2003.

Greber, B. 1993. "Impacts of technological change on employment in the timber industries of the Pacific Northwest." *Western Journal of Applied Forestry*. 8(1): 34-37.

Greenough, J.A.; Robinson, D.C.E.; Kurz,W.A. [and others]. 1999. Use of the Prognosis EI Model in balancing timber and environmental values at the watershed- level. Vancouver, BC: ESSA Technologies Ltd. 30 p.

Gregory, R.G. 1972. Marginal analysis and multiple products. In: Forest Resources Economics. New York: John Wiley and Sons: 254-269. Chapter 13.

GTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 1873-2009. Vol 4. (Quigley, Thomas M., ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

Haight, R. 2000. Assessment of mathematical modeling approaches for solving forest management problems: the complexity imposed by environmental and spatial constraints. Precision Forestry Cooperative Decision Support Working Paper 01. Seattle, WA: University of Washington, College of Forest Resources. [Pages unknown].

Hall, C.M. 2001. "Trends in ocean and coastal tourism: The end of the last frontier?" *Ocean and Coastal Management*. 44(9-10): 601-618.

Halpern, C.B.; Raphael, M.G., eds. 1999. Retention harvests in Northwestern forest ecosystems: the Demonstration of Ecosystem Management Options (DEMO) study. Northwest Science. 73(Special Issue). 125 p.

Hamilton, J.D. 1994. Time series analysis. Princeton, NJ: Princeton University Press. 799 p.

Hamrick, K. 1997. "Rural labor markets often lead urban markets in recessions and expansions." *Rural Development Perspectives*. 12(3): 11-17.

Hanninen, R. 1998. The law of one price in United Kingdom soft sawn wood imports: a cointegration approach. Forest Science. 44(1): 17-23.

Hanninen, R.; Toppinen, A.; Ruuska, P. 1997. Testing arbitrage in newsprint imports to United Kingdom and Germany. Canadian Journal of Forest Research. 27: 1946-1952.

Harris, C.C.; McLaughlin, W.; Brown, G.; Decker, D. 2000. Rural communities in the inland Northwest: an assessment of small communities in the interior and upper Columbia River basins. Gen. Tech. Rep. PNW-GTR-477. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 120 p. (Quigley, Thomas M., ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

Haycox, S. 1990. "Economic development and Indian land rights in modern Alaska: the 1947 Tongass Timber Act." *Western Historical Quarterly*. 21(Feb.): 20-46.

Haycox, S. 1997. "*The times, they are a changin' ": a short history of the Tongass National Forest 1897-1990*. Paper presented at university conference on the forest products industry. Fairbanks, AK: University of Alaska Cooperative Extension Service. 15 p.

Haynes, R.W. 1993. Forestry sector analysis for developing countries: issues and methods. Gen. Tech. Rep. PNW-GTR-314. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 47 p.

Haynes, R.W.; Brooks, D.J. 1990. *An analysis of the timber situation in Alaska: 1970-2010*. Gen. Tech. Rep. PNW-GTR-264. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 33 p.

Haynes, R.W.; McCool, S.; Horne, A.; Birchfield [Burchfield], J. 1996. Natural resource management and community well-being. Wildlife Society Bulletin. 24(2): 222-226.

Haynes, Richard W. 2003. Assessing the viability and adaptability of forest-dependent communities in the United States Gen. Tech. Rep. PNW-GTR-567. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 33 p.

Haynes, Richard W.; Monserud, Robert A. 2002. A basis for understanding compatibility among wood production and other forest values Gen. Tech. Rep. PNW-GTR-529. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 46 p.

Haynes, R.W.; Adams, D.M.; Alig, R.J.; Ince, P.J.; Mills, J.R.; Zhou, X. [In press]. The 2005 RPA timber assessment update. Gen. Tech. Rep. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Haynes, R.W.; Connaughton, K.P.; Adams, D.M. 1981. Projections of the demand for national forest stumpage by region; 1980-2030. Res. Pap. PNW-282. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 13 p.

Haynes, R.W.; Fight, R.D. 2004. Reconsidering price projections for selected grades of Douglas-fir, coast hem-fir, inland hem-fir, and ponderosa pine lumber. Res. Pap. PNW-RP-561. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 31 p.

Heffner, R.A.; Kirkpatrick, G.; Duckett, S. 1989. *Decision by default: the southwest Montana mill crisis.* Helena, MT: Small Business Development Center, Montana Department of Commerce. [Pages unknown].

Hirschman, A.O. 1958. The strategy of economic development. New Haven, CT: Yale University Press. 217 p. Institute of Social and Economic Research [ISER]. 1997. Alaska's gross state product, 1963–1996. Summary No. 58. Anchorage, AK: University of Alaska. 4 p.

Hodge, T. 1997. Toward a conceptual framework for assessing progress toward sustainability. Social Indicators Research. 40: 5-98.

Horne, A.L.; Haynes, R.W. 1999. Developing measures of socioeconomic resiliency in the interior Columbia basin. Gen. Tech. Rep. PNW-GTR-453. Portland, OR: U.S.

Department of Agriculture, Forest Service, Pacific Northwest Research Station. 41 p. (Quigley, Thomas M., ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

Humphrey, C.R. 1995. "Introduction: natural resource-dependent communities and persistent rural poverty in the U.S.—Part 4." *Society and Natural Resources*. 8: 93-96.

Irland Group. 1991. *Demand outlook for Alaska timber and wood products. Review draft*. Working Paper No. 2. Tongass Timber Studies. 52 p. On file with: U.S. Department of Agriculture, Pacific Northwest Research Station, Human and Natural Resources Interactions Program, 3200 SW Jefferson Way, Corvallis, OR 97331.

Irland Group. 1992. *Timber demand scenarios for Tongass National Forest 1991-2010*. 74 p. [plus appendices]. Report prepared for U.S. Department of Agriculture, Forest Service, Alaska Region. On file with: U.S. Department of Agriculture, Pacific Northwest Research Station, Human and Natural Resources Interactions Program, 3200 SW Jefferson Way, Corvallis, OR 97331.

Isserman, A.M. 2000. "Creating new economic opportunities: the competitive advantages of rural America in the next century." In: *Proceedings, Beyond agriculture: new policies for rural America*. Kansas City, MO: Federal Reserve Bank of Kansas City, Center for the Study of Rural America: 123-141.

Japan Lumber Journal [JLJ]. 1971-99. Annual. Tokyo, Japan.

Japan Lumber Reports [JLR]. 1986-99. Semi-monthly market price guides. Tokyo, Japan.

Japan Lumber Journal. 2005. Total production of laminated lumber in 2004 marked as new record with an increase of 5.9% to 1,490,000 cubic meters. JLJ Inc. 36(8): 17-15.

Japan Wood-Products Information and Research Center (JAWIC). 2006. Japan Wood Market Statistics. Tokyo: January.

Jay Gruenfeld Associates. 1991. Demand for Alaskan logs and lumber in the 1990s. Unpublished report. On file with: USDA Forest Service, Pacific Northwest Research Station, Social and Economic Values Research Program, Forestry Sciences Laboratory, 3200 SW Jefferson Way, Corvallis, OR 97331.

Johansen, S. 1995. Likelihood based inference in co integrated vector auto regression models. Oxford, United Kingdom: Oxford University Press. 267 p.

Johansen, S. 1997. Mathematical and statistical modeling of cointegration. EUI Working paper ECO No. 97/14. Florence, Italy: European University Institute. [Pages unknown].

Johnson, D. 2002. "Environmentally sustainable cruise tourism: a reality check." *Marine Policy*. 26(4): 261-270.

Johnson, J.; Rasker, R. 1993. "Local government: local business climate and quality of life." *Montana Policy Review*. Fall: 11-19.

Johnson, K.M.; Beale, C.L. 1995. Nonmetropolitan recreational counties: identification and fiscal concerns. Working Pap. 6. Chicago, IL: Loyola University. 14 p. [plus appendixes].

Johnson, T.G. 2000. "The rural economy in a new century." In: *Proceedings, Beyond agriculture: new policies for rural America*. Kansas City, MO: Federal Reserve Bank of Kansas City, Center for the Study of Rural America: 7-20.

Jung, C.; Doroodian, K. 1994. The law of one price for U.S. softwood lumber: a multivariate cointegration test. Forest Science. 40(4): 595-600.

Katz, Dave, *Modeling a Small-Scale Secondary Manufacturing Timber Industry in Southeast Alaska*, August 1997.

Ketchikan Daily News. 2002. Center works to improve wood values. June 5. http://www.ketchikandailynews.com/cgi-shl/news/search.pl?category=1&keyword=wood+values. (13 December 2003).

Kilborn, K. 2000. Sawmilling technology application in commodity products. In: Laufenberg, T.L.; Brady, B.K., eds. Proceedings: linking healthy forests and communities through Alaska value-added forest products. Gen. Tech. Rep. PNW-GTR 500. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 56–94.

Kilborn, K.A.; Parrent, D.J.; Housley, R.D. 2004. Estimating sawmill processing capacity for Tongass timber. Res. Note PNW-RN-545, Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 12 p.

Kromm, D.E. 1972. Limitations on the role of forestry in regional economic development. Journal of Forestry. 70: 630–633.

Krugman, P. 1991a. History versus expectations. Quarterly Journal of Economics. 106: 651–667.

Krugman, P. 1991b. Increasing returns and economic geography. Journal of Political Economy. 99(3): 483–499.Krugman, P. 1992. Geography and trade. Cambridge, MA: MIT Press. 156 p.

Kusel, J. 1996. Well-being in forest-dependent communities. Part I: A new approach. In: Sierra Nevada Ecosystem Project: final report to Congress—assessments and scientific basis for management options. Davis, CA: University of California, Centers for Water and Wildland Resources: 361-374. Vol. 2.

Kusel, J.; Fortmann, L. 1991. Well-being in forest-dependent communities. Sacramento, CA: California Department of Forestry and Fire Protection, Forest and Rangeland Resources Assessment Program; report; contract 8CA85064. 2 vol.

Landry, G. 2001. "The Ketchikan pulp mill closure: a study of laid-off workers." *Alaska Economic Trends*. 21(1): 3-10. Louisiana-Pacific Corporation. 1998. Form 10-K annual report pursuant to section 13 or 15(d) of the Securities Exchange Act of 1934. Washington, DC. 127 p.

Leamer, E. 1987. Paths of development in the three-factor, n-good general equilibrium model. Journal of Political Economy. 95(5): 961–999.

Lee, R.G. 1990. Sustained yield and social order. In: Lee, R.G.; Field, D.R.; Burch, W.J., eds. Community and forestry: continuities in the sociology of natural resources. Boulder, CO: Westview Press: 83-94.

Leonard Guss Associates, Inc. 2005. Technical and economic feasibility of constructing a medium density fiberboard plant in southeast Alaska. 107 p. Unpublished report. On file with: University of Alaska Fairbanks, Sitka Forest Products Program, PO Box 6410, Sitka, AK 99835.

Lippke, B.; Marshall, S.; Ludwig, M. [and others]. 2000. Lewis County economic assessment: prepared for Lewis County Natural Resources Advisory Committee. CINTRAFOR special paper 35. Seattle, WA: University of Washington, College of Forest Resources. 157 p.

Lippke, B.; Oliver, C.D. 1993a. An economic tradeoff system for ecosystem management. In: Jensen, M.E.; Bourgeron, P.S., eds. Ecosystem management: principles and applications. Gen. Tech. Rep. PNW-GTR-318. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 337-345. Vol. 2.

Lippke, B.; Oliver, C.D. 1993b. Managing for multiple values. Journal of Forestry. 91(12): 14-18.

Lippke, B.; Xu,W. 1999. Are CV results always irrational, and what about CE results? Proceedings of the Western Forest Economists annual meeting. On file with: College of Forest Resources, University of Washington, Seattle, WA 98195.

Lippke, B.R.; Sessions, J.; Carey, A.B. 1996. Economic analysis of forest landscape management alternatives; final report of the working group on the economic analysis of forest landscape management alternatives for the Washington Forest Landscape Management Project. CINTRAFOR special paper 21. Seattle, WA: University of Washington, College of Forest Resources. 157 p.

MacKinnon, J.G. 1991. Critical values for cointegration tests. In: Engle, R.F.; Granger, C.W.J., eds. Long-run economic relationships: readings in cointegration. Oxford, United Kingdom: Oxford University Press. 312 p.

Markel, J. 2003. "Silver Bay Logging files for bankruptcy protection." *Juneau Empire*. February 3. http://www.juneauempire.com/stories/020303/sta_silverbay.shtml. (13 December).

Marple's. 1999–2000. Marple's business newsletter. Seattle, WA. Biweekly.

McCool, S.F.; Burchfield, J.A.; Allen, S.D. 1997. Social assessment. In: Quigley, T.M.; Arbelbide, S.J., tech. eds. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins. Gen. Tech. Rep. PNW-

McDowell Group. 2004. Timber markets update and analysis of potential for an integrated southeast Alaska timber industry. Juneau, AK. 66 p.

McDowell Group. 2000. The global market for timber from the Tongass National Forest: Juneau, AK. Final report prepared for the Ketchikan Gateway Borough. 133 p.

McDowell, C.; Gemmell, T.; McAllister, S.; Haight, G. 2001. *State of Alaska comments on U.S.-Chile free trade agreement: potential economy wide and selected sectoral effects, investigation* 332-434. Report to the Office of the Secretary, U.S. International Trade Commission. 19 p. http://www.dced.state.ak.us/dca/seafood/pub/soacomments.pdf. (17 February 2004).

McGranahan, D.A. 2000. “Natural amenities drive rural population change.” *Agricultural Economic Report* No. 781. Washington, DC: U.S. Department of Agriculture, Economic Research Service, Food and Rural Economics Division. 24 p.

McLaughlin, D.K. 2002. “Income inequality in America.” *Rural America*. 17(2): 14-20.

Mehrkens, Joseph. 1985. Timber supply and demand. ANILCA section 706(a) report number 4. Juneau: USFS Alaska Region. (March 20, draft)

Miller-Freeman Publications, Inc. 2001. *Pulp and paper 2001 North American Factbook*. San Francisco, CA. 364 p.

Montréal Process Working Group. 1998. The Montréal Process. http://www.mpci.org. (January 9, 2002).

Morse, K. 2000. *Responding to the market demand for Tongass timber*. R10-MB-372. Juneau, AK: U.S. Department of Agriculture, Forest Service, Alaska Region. 43 p.

Murphy, K.M.; Shleifer, A.; Vishny, R.W. 1989. Industrialization and the big push. Journal of Political Economy. 97(5): 1003–1025.

Murray, B.C.; Wear, D.N. 1998. Federal timber restrictions and interregional arbitrage in U.S. lumber. Land Economics. 74(1): 76-91.

Myrdal, G. 1957. Economic theory and underdeveloped regions. London: Duckworth. 168 p.

Nagahama, M. 2004a. Japan’s fiberboard production steady–MDF up 2004. GAIN Rpt. JA4035. Tokyo, Japan: U.S. Foreign Agriculture Service, Global Agriculture Information Network. 2 p.

Nagahama, M. 2004b. Japan--solid wood products–domestic glulam production explodes to meet demand 2004. GAIN Rpt. JA4031. Tokyo, Japan: U.S. Foreign Agriculture Service, Global Agriculture Information Network. 2 p.

Nagahama, M. 2005a. Japan solid wood products annual report 2005. GAIN Rpt. JA5046. Tokyo, Japan: U.S. Foreign Agricultural Service, Global Agriculture Information Network. 18 p.

Nagahama, M. 2005b. Japanese glued laminated product imports growing rapidly in 2004–An update. GAIN Rpt. JA5006. Tokyo, Japan: U.S. Foreign Agriculture Service, Global Agriculture Information Network. 2 p.

Nicholls, D.L.; Brackley, A.M.; Rojas, T.D. [N.d.]. Alaska’s lumber drying industry—trends in employment, dry kiln capacity, lumber volumes, and capital spending. Manuscript in preparation. On file with: D. Nicholls, Pacific Northwest Research Station, 204 Siginaka Way, Sitka, AK 99835.

Naisbitt, J. 1994. *Global paradox*. New York: William Morrow and Company. 304 p. National Bureau of Economic Research, Inc. 2003. Business cycle expansion and contractions. http://www.nber.org/cycles/. (2 January).

National Research Council. 2000. Ecological indicators for the Nation. Washington, DC: National Academy Press. 180 p.

Neary, P.J.; Van Wijnbergen, S., eds. 1986. Natural resources and the macroeconomy. Cambridge, MA: MIT Press. 352 p.

Nelson, P. 1999. “Quality of life, nontraditional income, and economic growth: new development opportunities for the rural West.” *Rural Development Perspectives*. 14(2): 32-37.

Niemi, E.G.; Whitelaw, E.W. 1995. “The economic consequences of protecting salmon habitat in Idaho.” Preliminary report. Eugene, OR: *ECONorthwest*. [Pages unknown].

Niemi, E.G.; Whitelaw, E.W. 1997. *Assessing economic tradeoffs in forest management*. Gen. Tech. Rep. PNW-GTR-403. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 78 p.

PaperAge. 2003. *International Paper to shut Natchez, MS pulp mill*. O’Brien Publications, Inc. http://www.paperage.com. (25 January).

Pattulo, P. 1996. *Last resorts: the cost of tourism in the Caribbean*. London: Cassell. 220 p.

Pezzini, M.; Wojan T.R. 2001. “Leveraging amenities for rural development: direction, dialogue, and negotiation.” In: *Proceedings: Exploring policy options for a new rural America*. Kansas City, MO: Federal Reserve Bank of Kansas City, Center for the Study of Rural America: 121-147.

Power, T.M. 1996. *Lost landscapes and failed economies: the search for a value of place*. Washington, DC: Island Press. 304 p.

Quigley, T.M.; Haynes, R.W.; Graham, R.T., tech. eds. 1996. Integrated scientific assessment for ecosystem management in the interior Columbia basin and portions of the Klamath and Great Basins. Gen. Tech. Rep. PNW-GTR-382. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 197 p. [plus appendices]. (Quigley, T.M., ed.; Interior Columbia Basin Ecosystem Management Project: scientific assessment).

Radelet, S.C.; Sachs, J.D. 1998. Shipping costs, manufactured exports, and economic growth. Harvard Institute for International Development. 21 p. Unpublished document. On file at: USDA Forest Service, Pacific Northwest Research Station, Forestry Sciences Laboratory, P.O. Box 3890, Portland, OR 97208.

Rakestraw, L. 1981. *A history of the United States Forest Service in Alaska*. Anchorage, AK: Alaska Historical Commission; U.S. Department of Agriculture, Forest Service, Alaska Region. 221 p.

Rasker, R. 1995. *A new home on the range: economic realities in the interior Columbia basin*. Washington, DC: The Wilderness Society. 59 p.

Reyna, N.E. 1998. Economic and social characteristics of communities in the interior Columbia basin. In: Economic and social conditions: economic and social characteristics of interior Columbia basin communities and an estimation of effects on communities from the alternatives of the eastside and Upper Columbia River basin draft environmental impact statements. Part 1. A report prepared by the Interior Columbia Basin Ecosystem Management Project. [Place of publication unknown]: U.S. Department of Agriculture, Forest Service; U.S. Department of the Interior, Bureau of Land Management: 4-81.

Richardson, C.W. 1996. Stability and change in forest-based communities: a selected bibliography. Gen. Tech. Rep. PNW-GTR-366. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 36 p.

Richardson, C.W.; Christensen, H. 1997. From rhetoric to reality: research on the well being of forest-based communities. In: Integrating social science and ecosystem management: a national challenge, proceedings. Gen. Tech. Rep. SRS-17. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station: 195-200.

Riis, J. 1996. Forecasting Danish timber prices with an error correction model. Journal of Forest Economics. 2(3): 257-271.

Robertson Guy C. and David J. Brooks, "*Assessment of the competitive position of the forest products sector in Southeast Alaska*" Gen. Tech. Rep. PNW-GTR-504. http://www.fs.fed.us/pnw/pubs/gtr504.pdf.

Robertson, G. 1999. Employment impact multipliers and the economic role of timber in the small forest economies of Southeast Alaska. In:Yoshimoto, A.;Yukutake, K., eds. 1999. Global concerns for forest resource utilization: sustainable use and management. London: Kluwer Academic Publishers: 123-135.

Robertson, G.C.; Brooks, D.J. 2001. Assessment of the competitive position of the forest products sector in Southeast Alaska, 1985–94. Gen. Tech. Rep. PNW-GTR-504. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 29 p.

Robertson, Guy. 2004. *Economic growth and change in Southeast Alaska*. In: Mazza, R., tech. ed. *Economic growth and change in Southeast Alaska*. Gen. Tech. Rep. PNW-GTR- 611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 1-32.

Rogers, G. 1960. *Alaska in transition: the Southeast region*. Baltimore, MD: Johns Hopkins Press. 384 p.

Romer, P.M. 1996. Why, indeed, in America? Theory, history, and the origins of modern economic growth. In: Papers and proceedings of the 108th annual meeting of the American Economic Association. The American Economic Review: 86(2): 202–206.

Rosenstein-Rodan, P. 1943. Problems of industrialization of Eastern and Southeastern Europe. Economic Journal. 53: 202–211.Rosenstein-Rodan, P. 1961. Notes on the theory of the big push. In: Ellis, H.S.; Wallich, H.C., eds. Economic development for Latin America. New York: St. Martin's Press: 202–211.

Roth, D. 2000. "Thinking about rural manufacturing: a brief history." *Rural America*.15(1): 12-49.

Rudzitis, G. 1999. "Amenities increasingly draw people to the rural West." *Rural Development Perspectives*. 14(2): 9-13.

Sachs, J.D.; Warner, A.M. 1998. Natural resource abundance and economic growth. Work. Pap. 5398. [Cambridge, MA]: National Bureau of Economic Research. 47 p.

Sachs, J.D.; Warner, A.M. 1999. The big push, natural resource booms and growth. Journal of Development Economics. 59: 43–76.

Sasatani, D.; Roos, J.A.; Brackley, A.M.; Eastin, I.L. 2005. Niche market opportunities for Alaska forest products in Japan (2005 Update). Working Paper 100. Seattle, WA: Center for International Trade in Forest Products, College of Forest Resources, University of Washington. 52 p.

Savage, J.A. 1990. "Timber companies can't see the forest for the trees." *Business and Society Review*. 4 (Summer): 44-47.

Schallau, C.H. 1989. Sustained yield versus community stability: An unfortunate wedding? Journal of Forestry. 87(9): 16-23.

Schroeder, R.; Cerveny, L.; Robertson, G. [N.d.]. *Tourism growth in Southeast Alaska: trends, projections and issues*. Chapter 3 in: Mazza, Rhonda; Kruger, Linda E., tech. eds. 2005. Social conditions and trends in Southeast Alaska. Gen. Tech. Rep. PNW-GTR-653. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 91 p.

Sedjo, R.A.; Goetzl, A.; Moffat, S.O. 1998. Sustainability of temperate forests. [Washington, DC]: Resources for the Future Press. 102 p.

Shepard, S. 1997. "The new economy: what it really means." *Business Week*. Nov. 17: 38.

Smith, D. 1975. Pulp, paper, and Alaska. Pacific Northwest Quarterly. 66: 61-70.

Smith, D.C. 1975. Pulp, paper, and Alaska. Pacific Northwest Quarterly. 66: 61-70.

Smith, M. 1989. Behind the glitter—the impact of tourism on rural women in the Southeast. [Pages unknown]. Unpublished report. On file with: Southeast Women's Employment Coalition, 140 East Third Street, Lexington, KY 40508.

Society of American Foresters [SAF]. 1989. Report of the Society of American Foresters national task force on community stability. Bethesda, MD. 42 p.

Southeast Alaska Conservation Council, *Taxpayer Losses and Missed Opportunities: How Logging and Road Building in the Tongass National Forest Costs Taxpayers Millions*, 2003.

Southeast Regional Timber Industry Task Force. 1997. Planning for a viable timber industry in Southeast Alaska. 68 p. Draft report prepared for Alaska Governor Tony Knowles. On file with: U.S. Department of Agriculture, Pacific Northwest Research Station, Human and Natural Resources Interactions Program, P.O. Box 3890, Portland, OR 97208.

Southwick Associates. 2000. Historical economic performance of Oregon and Western counties associated with roadless and wilderness areas. 26 p. Unpublished report prepared for Oregon Natural Resources Council and World Wildlife Fund. On file with: Oregon Natural Resources Council, 5825 N Greeley, Portland, OR 97217-4145.

Stevens, James A. and David J. Brooks, 2003. Alaska softwood market price arbitrage. Res. Pap. PNW-RP 556. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Summers, L.H. 2000. The new wealth of nations. Remarks by Treasury Secretary at Hambrect and Quist Technology Conference, San Francisco, CA. May 10. http://www.treas.gov/press/releases/ls617.htm. (7 January 2003).

Swainbank, R.C.; Szumigala, D.J.; Henning, M.W.; Pillifant, F.M. 2002. Alaska's mineral industry 2001. Special report 56. Fairbanks, AK: Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, Division of Community and Business Development and Division of Mining, Land and Water. 36 p. [plus appendices].

Thorsen, B.J. 1998. Spatial integration in the Nordic timber market: long-run equilibria and short run dynamics. Scandinavian Journal of Forest Research. 13: 488-498.

Thorsen, B.J.; Riis, J; Helles, F.; Holten-Andersen, P. 1999. Internationalization of roundwood markets: the case of Denmark. In: Abildtrup, J.; Helles, F.; Holten-Andersen, P. [et al.], eds. Modern time series analysis in forest products markets. Dordrecht, The Netherlands: Kluwer Academic Publishers: 69-81.

Toivonen, R.; Toppinen, A.; Tilli, T. 2000. Roundwood price co-movement in Austria, Finland, and Sweden. Working Papers No. 30. Helsinki, Finland: Pellervo Economic Research Institute. 21 p.

Tongass Timber Reform Act of 1990. Public Law 101-626, 104 Stat. 4426.

Tongass Timber Reform Act of 1990; 16 U.S.C. 539d (note).

Toppinen, A. 1998. Incorporating cointegration relations in a short-run model of the Finnish sawlog market. Canadian Journal of Forest Research. 28: 291-298.

Tromble, K. 1998. Case study of a layoff—work life after Sitka's pulp mill closure. Alaska Economic Trends. 18(1): 7-15.

Tsournos, Pete; Haynes, Richard W. 2004. An assessment of growth and development paths for Southeast Alaska. Gen. Tech. Rep. PNW-GTR-620. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 27 p.

Tussing, A.R; Comitini, S.; Gellert, H. [et al.]. 1968. Alaska-Japan economic relations: a study of the potential contribution of trade with Japan to Alaska's economic development. Fairbanks, AK: Institute of Social Economic and Government Research. [Pages unknown].

United States International Trade Commission (USITC). 2005. USITC Interactive Tarriff and Trade Dataweb [Database]. Version 2.7.4. http://dataweb.usitc.gov/scripts/user_set .asp. (November).

U.S. Bureau of Economic Analysis. 2002. Regional economic information system, 1969-2000. [CD-ROM]. Washington, DC.

U.S. Department of Agriculture, Forest Service. 1994. Timber supply and demand 1993 report to Congress, ANILCA section 706(a.) Juneau, AK: Alaska Region. [Pages unknown].

U.S. Department of Agriculture, Forest Service. 1997. Timber supply and demand 1993 report to Congress, ANILCA section 706(a.) Juneau, AK: Alaska Region. [Pages unknown].

U.S. Department of Agriculture, Forest Service. 1997. *Tongass Land Management Plan revision, final environmental impact statement, Part 2*. R10-MB-338b. Juneau, AK: Alaska Region. [Pages unknown].

U.S. Department of Agriculture, Forest Service. 2002a. Timber program in Alaska. Briefing Paper. Juneau, AK: Alaska Region. http://fsweb.r10.fs.fed.us/staffs/pao/briefing_papers. (10 October 2002).

U.S. Department of Agriculture, Forest Service. 2002b. Timber supply and demand, 2000; report to Congress, ANILCA section 706(a.) Juneau, AK: Alaska Region. 14 p. [plus appendix].

U.S. Department of Commerce, Bureau of Economic Analysis. 2001. Gross state product: new estimates for 1999 and revised estimates for 1993–98. BEA 01-16. BEA News Release, June 4, 2001. http://www.bea.doc.gov. (August 19, 2003).

U.S. Department of Commerce, Bureau of Economic Analysis. 2002. [CD-ROM. 1969–2000]. RCN-0295. Regional Economic Information System (REIS).

U.S. Department of Commerce, Bureau of the Census. 2002. Census 2000 gateway. http://www.census.gov/main/www/cen2000.html. (27 January 2004).

U.S. Department of Labor, Bureau of Labor Statistics. 2003. National employment, hours and earnings. http://data.bls.gov/labjava/outside.jsp?survey=ee. (27 January 2004).

U.S. Department of Labor, Occupational Health and Safety Administration. 2003. SIC Division Structure. http://www.osha.gov/cgi-bin/sic/sicser5. (27 January 2004).

U.S. Federal Court of Claims, No, 95-153C, *Alaska Pulp Corporation v. United States of America*, January 28, 2004.

U.S. Forest Service *2002 Road Deferred Maintenance* report, in response to SEACC FOIA request of October 10, 2002.

U.S. Forest Service *Final Supplemental Environmental Impact Statement Roadless Area Evaluation for Wilderness Recommendations* (February 2003).

U.S. Forest Service, *Assessment of Fish Passage through Culverts on the Tongass National Forest*. March, 2002.

United Nations, FAO. 2003. FAOSTAT database collection: forestry data. http://apps.fao.org/page/collections?subset=forestry. (10 January).

University of Alaska Land Management Office, Timber Harvest Information, June 2003.

University of Alaska Land Management Office, Timber Harvest Information, June 2003.

Uri, N.D.; Boyd, R. 1990. Considerations on modeling the market for softwood lumber in the United States. Forest Science. 36(3): 680-692.

USDA Forest Service, Alaska Region. Data on file with: Guy Robertson, Ecosystems Planning, USDA Forest Service, PO Box 21628, Juneau, AK 99802-1628.

USDA, Forest Service, *National Strategy for Special Forest Products*, March 27, 2001.

Wahl, A. 2004. China's non-structural panel markets. In: Proceedings of the 38th international wood composites symposium. Pullman, WA: Washington State University. 21-27.

Warren, D. 2005. Production, prices, employment, and trade in Northwest forest industries, all quarters of 2003. Resource. Bull. PNW-RB-247. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 171 p.

Warren, D.D. 2000. Production, prices, employment, and trade in Northwest forest industries, all quarters 1998. Resource. Bull. PNW-RB-231. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 171 p.

Wheeler, B. 2001. Interview with John Sturgeon. Under the Canopy. Fairbanks, AK: Cooperative Extension Service. (February): 8-9. http://www.uaf.edu/coop=ext/forestry/canopy/canopyfeb01.pdf. (12 January 2004).

Whitelaw, E.; Gall, M., MacMullan, E.; Johnston, A. 1998. The changing role of the Tongass timber industry in the economy of Southeast Alaska. 33 p. Unpublished report. On file with: The Southeast Alaska Conservation Council by ECONorthwest, 419 Sixth Street, Suite 200, Juneau, AK 99801.

Wilkerson, C. 2001. Trends in rural manufacturing. The Main Street Economist. Commentary on the rural economy. Kansas City, MO: Federal Reserve Bank of Kansas City, Center for the Study of Rural America. 4 p.

Wood, D. 2000. Caribbean cruise tourism: globalization at sea. Annals of Tourism Research. 27(2): 345-370.

Xu,W. 1997. Experimental choice analysis of non-market values for ecosystem management with preference heterogeneity. Seattle, WA: University of Washington, College of Forest Resources. [Pages unknown]. Ph.D. dissertation.

Xu,W.; Lippke, B.R.; Bare, B.B. [N.d]. Total utility optimization of forest ecosystem management. Unpublished document. On file with:Weihuan Xu, College of Forest Resources, University of Washington, Seattle, WA 98195.

Zhou, X.; Haynes, R.W.; Barbour, J.R. 2005. Projections of timber harvest in western Oregon and Washington by county, owner, forest type, and age class. Gen. Tech. Rep. PNW-GTR-633. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 30 p.

Appendix F General References

Alaska Department of Community & Economic Development, *Alaska Economic Performance Report*, Alaska Economic Information System, *2002*.

Alaska Department of Community and Economic Development, Alaska Visitor Statistics Program data, 2001.

Alaska Department of Labor and Work Force Development, 2004 Census Area Population Estimates.

Alaska Department of Natural Resources, Division of Forestry, Timber Harvest Information, May 2003.

Alaska Department of Revenue, Tax Division, Fall 2003 Revenue Sources Book, December 2003.

Alaska Department of Revenue, Tax Division, Spring 2003 Revenue Sources Book, 2003.

Alaska Science & Technology Foundation, *A Long-Term Economic Development Strategy for Alaska*, April 2000 edition.

Berger, M.C. and G. C. Blomquist, 1992, "Mobility and Destination in Migration Decisions: The Roles of Earnings, Quality of Life, and Housing Prices," *Journal of Housing Economics* 2: 37-59.

Beyers, W.B.; Lindahl, D.B. 1996. Lone eagles and high fliers in rural producer services. Rural Development Perspectives. 11(3): 2-10.

Brooks, David and Richard Haynes, *Conservation and Resource Assessments for the Tongass Land Management Plan Revision, Timber Products Output and Timber Harvests in Alaska: Projections for 1997-2010*, USDA Forest Service, Pacific Northwest Research Station, Gen. Tech. Report PNW-GTR-409, September 1997.

Colt, Steve, *The Economic Importance of Healthy Alaska Ecosystems*, University of Alaska Anchorage, Institute of Social and Economic Research, January 2, 2001.

Colt, Steve. 2002. Salmon fish traps in Alaska: an economic history perspective. Institute of Social and Economic Research, University of Alaska Anchorage.

Cordova, Lorraine, Gerald Landry, and Nels Tomlinson, The 2010 Employment Outlook, *Alaska Economic Trends*, May 2002.

Costanza, Robert and Carl Folke, "Valuing Ecosystem Services with Efficiency, Fairness and Sustainability as Goals," in Gretchen C. Daly, ed., *Nature's Services: Societal Dependence on Natural Ecosystems*, pp. 68-74. Island Press: Washington, D.C., 1997.

Costanza, Robert, Ralph d'Arge, Rudolf de Groot, Stephen Farber, Monica Grasso, Bruce Hannon, Karin Limburg, Shahid Naeem, Robert O'Neill, Jose Paruelo, Robert G. Raskin, Paul Sutton, and Marjan Van den Belt, "The Value of the World's Ecosystem Services

and Natural Capital." in *Nature*, Vol. 387, No. 15 May 1997, p. 254 and reprinted in *Ecological Economics*, Number 25, 1998.

Crone, Lisa K. 2004. Rural manufacturing and the U.S. wood products industry: trends and influences on rural areas. In: Mazza, R., tech. ed. Economic growth and change in Southeast Alaska. Gen. Tech. Rep. PNW-GTR-611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 33-71.

Dixon, J.A. and P.B. Sherman, "Economics of Protected Areas," 3-15. *Ambio*, Vol. 20, no. 2, 1991.

Fay, Ginny, *Alaska Timber Harvests and Export Volumes*, prepared for the Alaska Conservation Alliance, May 2003.

Force, E.F.; Machlis, G.E.; Zhang, L.; Kearney, A. 1993. "The relationship between timber production, local historical events, and community social change: a quantitative case study." *Forest Science*. 39(4): 722-742.

Freudenburg, W.R. 1992. "Addictive economies: extractive industries and vulnerable localities in a changing world economy." *Rural Sociology*. 57(3): 305-332.

Fried, Neal and Brigitta Windisch-Cole, "Leisure & Hospitality", *Alaska Economic Trends*, January 2004.

Galston, W.A.; Baehler, K.J. 1995. *Rural development in the United States: connecting theory, practice and possibilities*. Washington, DC: Island Press. 353 p.

Gilbertsen, Neal. 2004. Southeast Alaska: a tale of two economies. *Alaska Economic Trends* 24(3)(March): 3-11. http://labor.state.ak.us/trends/trends2004.htm

Gilbertsen, Neal, and Dan Robinson. 2003. Natural resources: mining and timber. *Alaska Economic Trends* 23(12) (December): 3-13.

Gilstrap, Nichols, *Strategic Marketing Analysis and Planning for Alaska Tourism*, prepared for the Alaska Department of Commerce and Economic Development, Division of Tourism, November 2000.

Global Insight. 2004. The Alaska tourism satellite account. Prepared for State of Alaska, Department of Commerce and Economic Development. Available (22 August 2005) at http://www.dced.state.ak.us/oed/toubus/pub/TSA_Final.pdf

Goldsmith, Scott and Patrick Burden, "Alaska's Economy: Where Is It Going?" Alaska Humanities Forum, Alaska 20/20 Project, no date, pp. 2-4.

Goldsmith, Scott, Linda Leask and Mary Killorin, *Alaska's State Budget: Where the Money Came From and Where the Money Went, 1990 to 2002*, University of Alaska Anchorage, Institute of Social and Economic Research, Fiscal Policy Paper Number 13, May 2003.

Harris, C.C.; McLaughlin, W.J.; Brown, G. 1998. "Rural communities in the interior Columbia basin: How resilient are they?" *Journal of Forestry*. 96(3): 11-15.

Hoover, E.M.; Giarratani, F. 1984. *An introduction to regional economics*. New York: Alfred A. Knopf. 444 p.

Humphrey, C.R. 1995. "Introduction: natural resource-dependent communities and persistent rural poverty in the U.S.—Part 4." *Society and Natural Resources*. 8: 93-96.

Katz, Dave, *Modeling a Small-Scale Secondary Manufacturing Timber Industry in Southeast Alaska*, August 1997.

McCollum, Daniel and SuzAnne Miller, 1997, *Alaska Non-resident Visitors: Their Attitudes towards Wildlife*.

McDowell Group, *The Economics of the Cruise Ship Industry in Alaska, 2003*, prepared for the North West Cruise Ship Association, September 2004.

McDowell Group. 1989. *Alaska seafood industry study—a technical report: an economic profile of the seafood industry in Alaska*. On file with: McDowell Group, 416 Harris Street, Juneau, AK 99801.

McDowell Group. 1991. *Alaska's visitor industry: an economic profile*. 132 p. Unpublished report. On file with: Division of Tourism, Alaska Department of Commerce and Economic Development, P.O. Box 110804, Juneau, AK 99811-0804.

McDowell Group. 1999. *Alaska visitor industry economic impact study 1999 update*. 44 p. Unpublished report. On file with: Division of Tourism, Alaska Department of Commerce and Economic Development, P.O. Box 110804, Juneau, AK 99811-0804.

Miller, SuzAnne and Dan McCollum, *Less May Mean More: Maximizing the Economic, Environmental, and Social Benefits from Alaska's Visitors Industry,* A paper presented at a Conference on Alaska's Economy: "Can the Last Frontier Have a Sustainable Future" sponsored by the Alaska Conservation Alliance, July 22, 1999.

North, D.C. 1955. "Location theory and regional economic growth." *Journal of Political Economy*. 63(3): 243-258.

Power, Thomas M., *Economic Well-Being and Environmental Protection in the Pacific Northwest: A Consensus Report*, by Pacific Northwest Economists, Department of Economics, University of Montana, Missoula, MT, December 1995.

Robertson Guy C. and David J. Brooks, "*Assessment of the competitive position of the forest products sector in Southeast Alaska*" Gen. Tech. Rep. PNW-GTR-504. http://www.fs.fed.us/pnw/pubs/gtr504.pdf.

Robertson, Guy. 2004. *Economic growth and change in Southeast Alaska*. In: Mazza, R., tech. ed. *Economic growth and change in Southeast Alaska*. Gen. Tech. Rep. PNW-GTR- 611. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 1-32.

Rogers, George. 1985. Southeast Alaska regional economy and communities: evolution and structure. Institute of Social and Economic Research, University of Alaska Anchorage. www.iser.uaa.alaska.edu.

Southeast Alaska Conservation Council, *Taxpayer Losses and Missed Opportunities: How Logging and Road Building in the Tongass National Forest Costs Taxpayers Millions*, 2003.

U.S. Department of Agriculture, Forest Service. 1997. *Tongass Land Management Plan revision, final environmental impact statement, Part 2*. R10-MB-338b. Juneau, AK: Alaska Region. [Pages unknown].

U.S. Forest Service *2002 Road Deferred Maintenance* report, in response to SEACC FOIA request of October 10, 2002.

U.S. Forest Service *Final Supplemental Environmental Impact Statement Roadless Area Evaluation for Wilderness Recommendations* (February 2003).

U.S. Forest Service, *Assessment of Fish Passage through Culverts on the Tongass National Forest*. March, 2002.

University of Alaska Land Management Office, Timber Harvest Information, June 2003.

USDA Forest Service, Alaska Region. Data on file with: Guy Robertson, Ecosystems Planning, USDA Forest Service, PO Box 21628, Juneau, AK 99802-1628.

USDA, Forest Service, *National Strategy for Special Forest Products*, March 27, 2001.

Vias, A.C. 1999. Jobs follow people in the rural Rocky Mountain West. Rural Development Perspectives. 14(2): 14-23.

Villa, Ferdinando, Matthew A. Wilson, Rudolf de Groot, Steven Farber, Robert Costanza' and Roelof M. J. Boumans, *Designing an integrated knowledge base to support ecosystem services valuation***,** in SPECIAL ISSUE: The Dynamics and Value of Ecosystem Services: Integrating Economic and Ecological Perspectives**,** Ecological Economics, Volume 41, Issue 3, June 2002, Pages 445-456**.**

Weber, S. 1997. End of the business cycle? Foreign Affairs. 76(4): 65-82.