

**Electric Load Forecast for
Ketchikan, Metlakatla, Petersburg,
and Wrangell, Alaska: 1990-2010**

FINAL REPORT

Prepared for

Alaska Energy Authority
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1 EXECUTIVE SUMMARY

Utility electric energy requirements in the study area¹ are projected to grow at an average annual rate of between -.3 and +4.0 percent per year between 1990 and 2010, from a 1988 level of 198,000 Megawatt hours (MWh). The sum of noncoincident utility peak loads is projected to grow at an annual rate of between +.2 and +4.0 percent.²

These growth rates take account of the economic effects of the Quartz Hill mine and the Bradfield intertie, but do not include the mine loads themselves. The text presents these loads along with projected utility sales.

Regional Total Sales

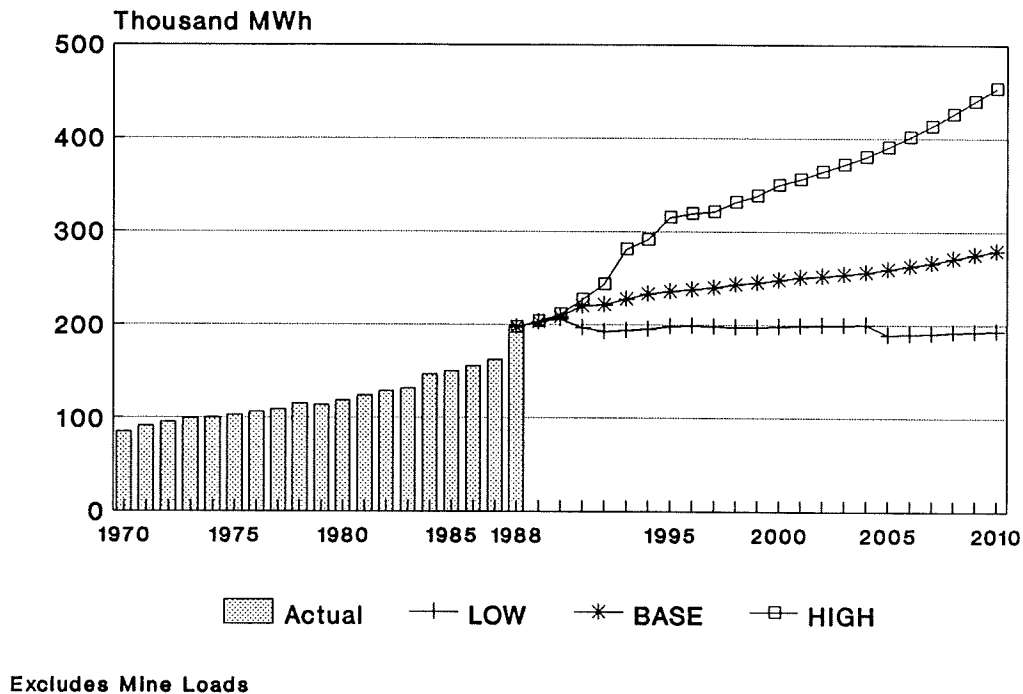


Figure 1: Regional Total Electric Sales by Case

¹The study area consists of the service territories of Ketchikan Public Utilities, Metlakatla Power and Light, Petersburg Power and Light, and Wrangell Power and Light.

²Peak loads are projected under the assumption of constant load factors for each utility. Ketchikan has a lower load factor and higher load growth than Wrangell or Petersburg. Its low load factor becomes relatively more important in contributing to the regional sum of peak loads. Hence the regional sum of peak loads grows faster than regional energy requirements.

In the Base case, the major causes of changes in load are:

- Stable employment in fishing, fish processing, sawmills and pulp.
- Continuing growth of tourist visits at 3% annually.
- Addition of several large loads in Ketchikan including the naval test facility, Cape Fox Lodge phase one, Coast Guard upper campus, and the Spruce Mill complex.
- Declining employment in logging as Native timber supply is exhausted.
- Continued growth of commercial consumption per employee at 1.6% per year.

The major differences between cases, in approximate order of importance, are:

Commercial/Industrial Class Sales:

- **Low Case:** Ketchikan Public Utilities' sales to the Ketchikan Pulp Company (KPC) pulp mill decline to 5,000 MWh/yr and drop to near zero in 2005 when the mill closes. The historical trend of growth in commercial consumption per employee falls from Base Case level of 1.6% per year to 0% per year. Several Ketchikan fish processors stay off the grid.
- **High Case:** Significant sales to Alaska Pulp Co./ Wrangell (Wrangell Forest Products) resume in 1992. Annual growth in consumption per employee continues at historical rate of 3.2%, higher than base case. Ketchikan adds Coast Guard LORAN station and the Cape Fox Lodge and Spruce Mill sites are developed to full planned capacity. All communities except Wrangell add fish processing capacity and Wrangell experiences continued growth as a mining staging area.

Residential Sales:

- **Low Case:** Residential sales per customer fall by .2% per year except in Wrangell³. The KPC mill closes in 2005.
- **High Case:** Residential sales per customer rise by .4% per year except in Wrangell. The Quartz Hill mining project begins operation in 1995, adding over 900 households to Ketchikan.

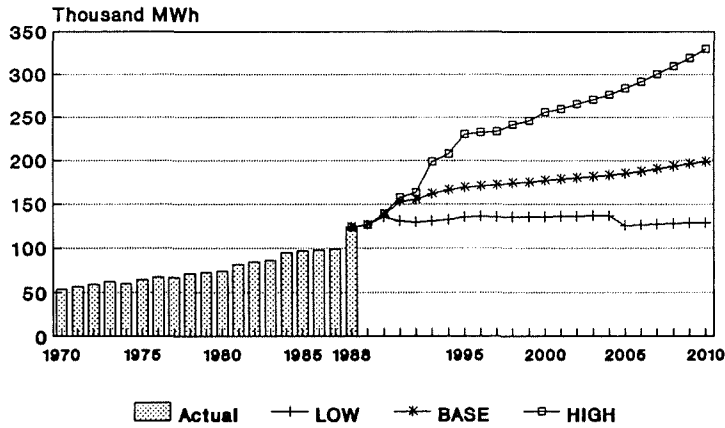
Basic Industry:

- **Low Case:** Logging employment declines 25% from Base case levels due to 25% decrease in timber produced from the Tongass forest. Government employment declines at .5% per year as oil revenues decline.
- **High Case:** Logging increases 10% from Base case levels due to strong foreign demand for cants (minimally processed logs) as Native exports of round logs decline. Tourist visits increase 5% per year, vs 3% in the Base case.

³In Wrangell an econometric equation based on price and income is used to project residential sales. See text.

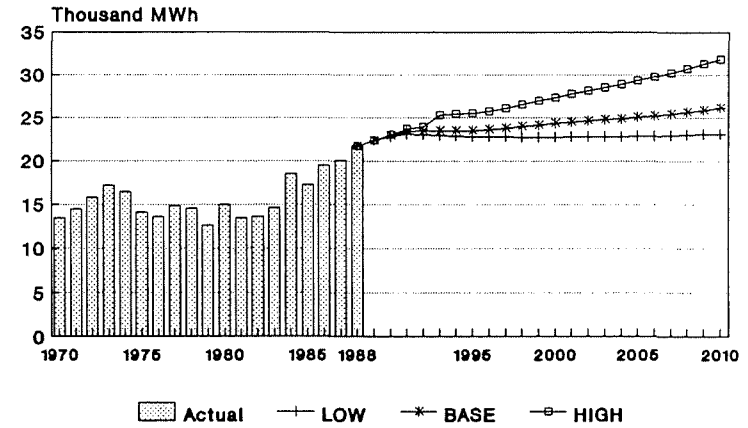
Figure 2: Energy Sales by Region and Case

Ketchikan Public Utilities Forecast Total Sales

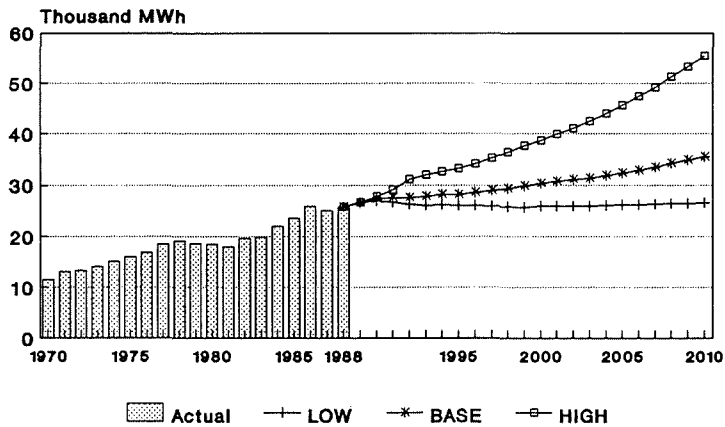


Excludes Quartz Hill

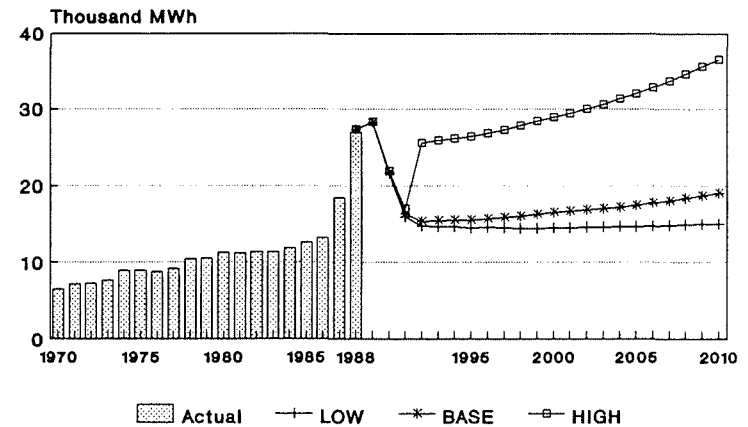
Metlakatla Power & Light Forecast Total Sales



Petersburg Power & Light Forecast Total Sales

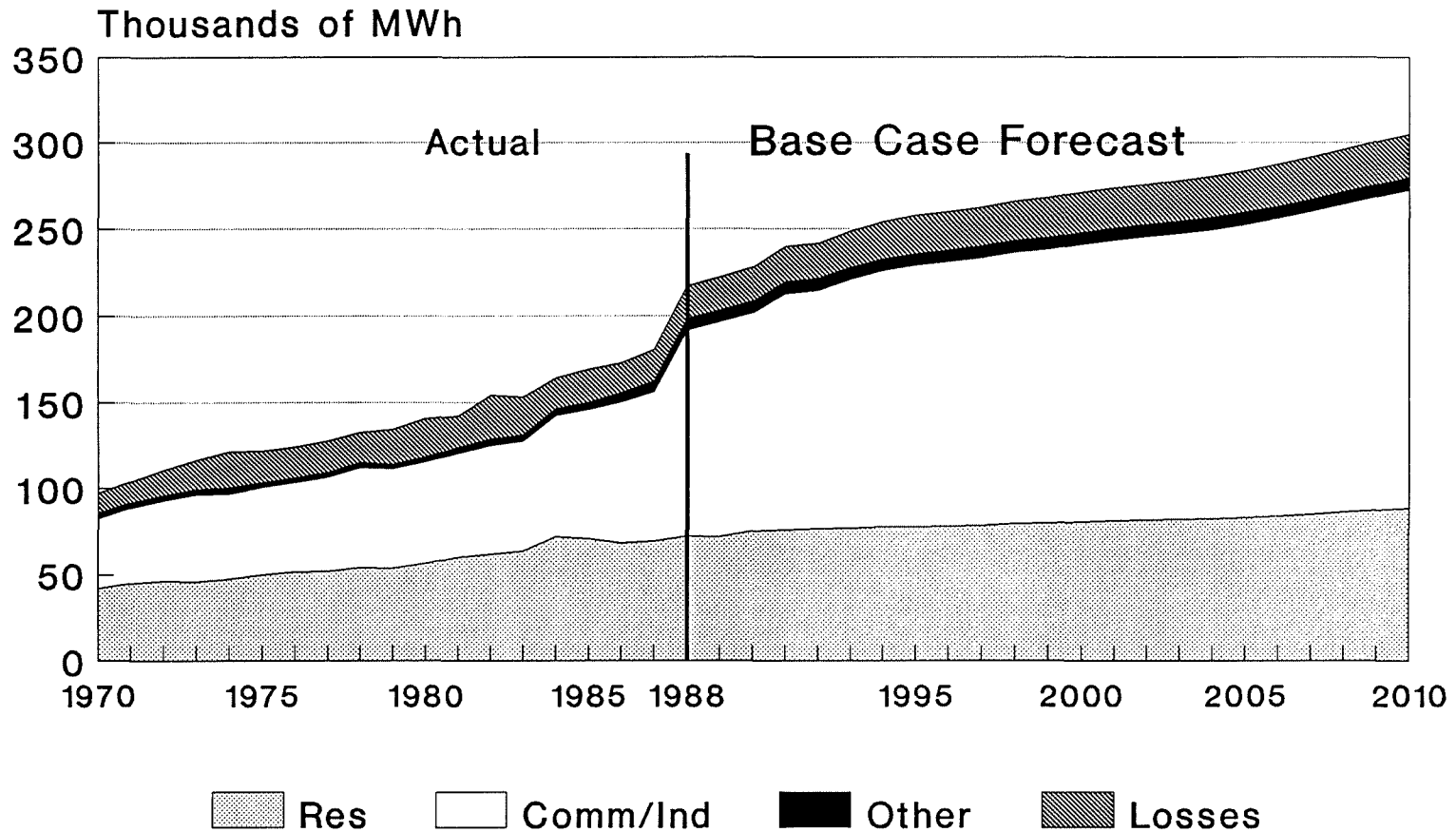


Wrangell Power & Light Forecast Total Sales



Regional Energy Requirements Base Case Projection

Figure 3: Base Case Regional Energy Requirements by Class



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2 ECONOMY OF THE STUDY AREA

2.1 Historical Background

The study area is composed of the Alaskan communities of Ketchikan, Metlakatla, Petersburg, and Wrangell. In this report we call the area Lower Southeast Alaska (LSE). Economic data for these communities are generally available for the census areas which encompass them: the Ketchikan Borough Census Area (Ketchikan), Prince of Wales-Outer Ketchikan Census Area (Metlakatla), and Wrangell-Petersburg Census Area (Wrangell and Petersburg), respectively.

Like that of Southeast Alaska as a whole, the LSE economy is built on timber (logging, lumber, and pulp), fishing, and tourism. Hard rock mining is an emerging but still relatively unimportant basic sector. Rogers (1989) emphasizes the importance of the forest products industry in stabilizing the regional economy during the past 40 years. He notes that while in 1950 the highly seasonal fishing industry generated nine times the product value of the timber industry, by 1983 the two sectors produced roughly the same amount.

Since 1980, total employment in the Lower Southeast Alaska economy has grown at an average annual rate of 2.5%, as shown in table 1. Figure 4 shows that this overall growth has been driven by a continuing expansion in the trade and services sector and in state and local government, tempered by a cyclical downturn in the timber industry during the mid 1980s. Although the region has felt the positive effects of the statewide oil boom through increased construction of public buildings and government employment at all levels, it is far less reliant on the petroleum industry than is the rest of the state. Instead, the people of Southeast Alaska are heavily exposed to swings in the world market prices of wood and fish products. The tourism industry has been growing steadily. Rogers (1985) estimates that tourism employment has grown at an annual rate of 4.2% since 1973 to the point where it now provides two thirds as many jobs as either the timber or fishing industry. Because of the way in which the trade and services sector serves both tourist and local demand, however, there are no direct data by which to measure the output of this increasingly important basic industry.

Further descriptions of community economies are provided later in the text with each community's load forecast assumptions and results.

Lower Southeast Alaska Historical Employment (1)

EMPLOYMENT by SECTOR	1980	1981	1982	1983	1984	1985	1986	1987	1988	Avg annual growth 1980-88
Manufacturing/Mining (2)	3,163	2,621	2,430	2,047	1,714	1,960	2,496	2,735	3,158	-0.0%
Infrastructure	1,451	1,383	1,261	1,556	1,400	1,427	1,227	1,320	1,486	0.3%
Trade/Service/Finance	2,738	2,939	3,118	3,408	3,383	3,409	3,433	3,507	3,803	4.2%
Fed Govt	855	830	864	804	760	737	775	837	758	-1.5%
State/Local Govt	2,025	2,210	2,317	2,488	2,644	2,794	2,662	2,592	2,646	3.4%
Proprietors (3)	1,858	1,878	2,321	2,454	2,580	2,724	2,964	2,905	2,976	6.1%
Misc/Stat Discrepancy (4)	81	115	102	74	86	88	92	72	56	-4.5%
TOTAL EMPLOYMENT	12,170	11,975	12,413	12,831	12,566	13,138	13,648	13,966	14,882	2.5%

Notes:

- (1) Lower Southeast Alaska is defined as the sum of Ketchikan Borough Census Area, Prince of Wales-Outer Ketchikan Census Area, and Wrangell-Petersburg Census Area.
- (2) Manufacturing sector includes logging, lumber, and pulp industries.
- (3) Proprietors' sector includes fish harvesting employment
- (4) Misc/Stat Discrepancy is used to reconcile the sum of sectoral employment figures with the separately published total. Reconciliation is needed because some individual sector data is undisclosed.

Sources: Employment by Industry from Ak. Dept. of Labor, Statistical Quarterly.

Number of military from Ak. Dept. of Labor, Population Overview; Economic Trends, Nov. 1987; and faxed sheet from Neal Fried dated 3/5/1990.

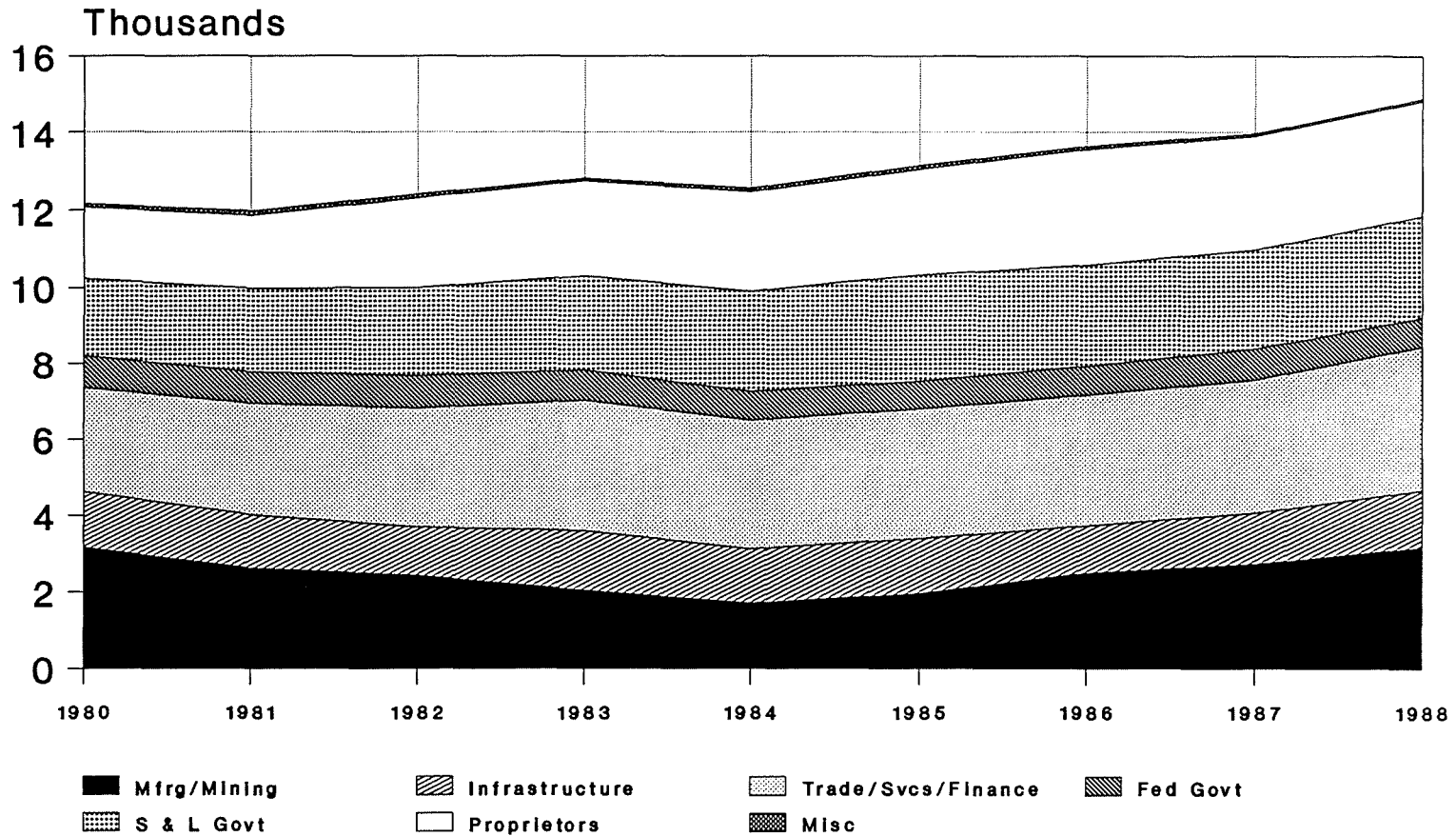
Number of proprietors from U.S. Dept. of Commerce, Bureau of Economic Analysis, fiche dated April 1988, and printout dated April 1990.

Personal Income from U.S. Dept. of Commerce, Bureau of Economic Analysis, Printouts of Table CA5, dated Nov. 1, 1989 (ISER) and April 1990 (BEA).

Table 1: Lower Southeast Alaska Historical Employment

Historical Employment Growth Lower Southeast Alaska (*)

Figure 4: Lower Southeast Alaska Historical Employment



(*) Ketchikan, POW-Outer Ketchikan,
Wrangell-Petersburg Census Areas

2.2 Outlook for Basic Industries

2.2.1 Fish Harvesting

Commercial fish harvesting employment in the LSE area is expected to remain constant throughout the study period at a level of about 1200 average annual jobs. The underlying resource base is essentially fully utilized.

2.2.2 Fish Processing

Table 2 summarizes our assumed levels of projected employment in fish processing. Activity is expected to increase slightly throughout the area as existing processors attempt to exploit emerging specialty markets.⁴ This increase is generally expected to be expressed as greater capacity utilization of existing facilities, rather than construction of new facilities. Since the underlying resource base is essentially fully utilized, Alaskan processors must find new ways to add value to the product before it leaves the region. For example, until recently one company⁵ was "backhauling" fish originally caught in Alaska from a Seattle freezer plant to Ketchikan in order to smoke them. This company has now expanded its freezer operations to eliminate the need for backhauls.

Some local officials feel that major expansion of fish processing capacity is probable in Petersburg and Metlakatla. The Petersburg project depends, first of all, on the successful sale of the Chatham Straits cannery by Sealaska Corporation⁶, while the plans for a shellfish cannery in Metlakatla are not well-developed. Regional observers caution that shore-based processors will be coming under increasing competitive pressure from floating operations, some of which can deliver fresh Alaska product to the Seattle market without using air transportation.

There is some chance that a finfish farming industry could be launched in the protected coves of Prince of Wales Island. If finfish farming were to begin in the LSE area, it is likely that a fish food industry would also arise to provide food for the farms. According to some observers,⁷ a fish feed plant could be supported by as few as two farms each operating on 2 acres of water and producing 1 million pounds of farmed fish per year. This possibility is incorporated into our High case scenario.

⁴Interviews: Brian Rae, ADOL Regional Economist, 2/13/90; C.L. Cheshire, Assistant Professor of Economic Development, U of AK Southeast, 2/14/90.

⁵Silver Lining Seafoods. John Sund, owner, 6/15/90.

⁶In early July, Sealaska announced the sale of its subsidiary Ocean Beauty Seafoods, which operates the Chatham Plant. No expansion plans for the plant were mentioned.

⁷Rick Harris, VP Resource Planning, Sealaska Corp., 2/19/90.

Fish Processing Employment Scenarios
(Average Annual Jobs)

	Ketchikan Census Area			Outer Ketchikan Census Sub-Area (Includes Metlakatla)			Wrangell-Petersburg Census Area		
	Low	Base	High	Low	Base	High	Low	Base	High
1988	300	300	300	70	70	70	154	154	154
1989	300	312	312	70	70	70	154	154	154
1990	300	325 (1)	325	70	70	70	154	154	154
1991	300	338	338	70	70	70	154	154	154
1992	300	338	338	70	70	70	154	154	178 (4)
1993	300	338	388 (2)	70	70	120 (3)	154	154	178
1994	300	338	388	70	70	120	154	154	178
1995	300	338	388	70	70	120	154	154	178
1996	300	338	388	70	70	120	154	154	178
1997	300	338	388	70	70	120	154	154	178
1998	300	338	388	70	70	120	154	154	178
1999	300	338	388	70	70	120	154	154	178
2000	300	338	388	70	70	120	154	154	178
2001	300	338	388	70	70	120	154	154	178
2002	300	338	388	70	70	120	154	154	178
2003	300	338	388	70	70	120	154	154	178
2004	300	338	388	70	70	120	154	154	178
2005	300	338	388	70	70	120	154	154	178
2006	300	338	388	70	70	120	154	154	178
2007	300	338	388	70	70	120	154	154	178
2008	300	338	388	70	70	120	154	154	178
2009	300	338	388	70	70	120	154	154	178
2010	300	338	388	70	70	120	154	154	178

- Notes:
- (1) Silver Lining Seafoods blast freezer expansion
 - (2) Ketchikan General expansion, perhaps including fish-feed plant
 - (3) New shellfish processing plant in Metlakatla
 - (4) Chatham Straits Cannery doubles in size

Table 2: Fish Processing Employment Scenarios

2.2.3 Logging, Lumber and Pulp⁸

The health of the LSE forest products industry depends fundamentally on world market demand for its final outputs (logs, lumber, and dissolving pulp) and on the supply and quality of its basic input, raw timber. While the industry is quite complex, it is useful to keep the following in mind:

- The industry produces three distinct products: raw and semi-processed logs, dimensional lumber, and dissolving pulp. The world prices for these products are substantially independent of one another.
- Almost all of the output of the Alaska timber industry is exported to Japan and other Pacific Rim countries.
- It never pays a timber operator to log for pulpwood alone. Only the higher values obtained from sawtimber sold as logs or lumber can justify the expense of the logging operation. If the world price of pulp is low enough, as it was during the mid 1980s, substantial amounts of pulp-grade timber will be left unharvested.
- Timber cut on the federally owned Tongass National Forest must be processed in some way before it can be exported. However, timber cut on Native lands is not subject to this requirement and is generally exported directly in the form of round logs.

Final Demand. Factors affecting the demand for final products cause changes in the world price of exported products over which Alaska producers have little control. These exogenous influences include exchange rates, foreign income levels and tastes, and fluctuations in world pulp manufacturing capacity. Almost all of Alaska's timber-based products are exported to Pacific Rim countries, and we will always be a relatively high cost producer. This puts Alaska in a "last in, first out" position in the product markets, with the notable exception of old growth Sitka Spruce logs and lumber, for which Southeast producers enjoy a quality advantage over British Columbia and dwindling supplies in the Pacific Northwest.

World prices for pulp are in a long-term slow decline as synthetic substitutes crowd out rayon (the chief end product requiring SE Alaska's dissolving pulp) and new mills continue to show productivity gains over old ones. However, during the past few years there has been a leveling in these trends (Dubak, 1989) and current markets for Alaskan pulp are strong. Furthermore, our analysis suggests that the Ketchikan Pulp Company has been successful in positioning itself to weather the next worldwide downturn in markets. It has significantly improved productivity, diversified its markets away from reliance on Japan, added a modern sawmill at the mill site to take full advantage of the lumber value of incoming wood supply, and diversified its wood supply sources to include Canadian suppliers.

⁸This section is based on interviews with: R Michael Martin, USFS Regional Economist, Juneau, 2/5/90; Joseph Mehrkens, Forest Economist, Southeast Alaska Resource Center, Juneau, 2/5/90; C.L. Cheshire, Economic Development Specialist, Ketchikan, 2/14/90; Steven Hagan, Pulp Mill Manager, Ketchikan Pulp Co., 2/16/90; Martin Pihl, KPC General Manager, 2/16/90. General use is also made of Dubak 1989, Haynes and Brooks 1990, Knapp 1989, Merhkens 1989, and Stevens and Adams 1988.

Native lands timber supply. The amount of timber harvested from Native lands grew rapidly in the 1980s and reached 400 million board feet (MMbf) in 1988, compared with 396 MMbf taken from the Tongass National Forest (USFS 1988). The Native harvest levels will soon decline:

"There is a general consensus among industry observers that Native timber harvests will decline sharply in the 1990s, due to declining inventory. Nine of the twelve village corporations are likely to have cut nearly all of their economically operable timber by 1991 [and] only one village corporation is likely to be able to sustain harvests at current levels for more than eight years into the future...In contrast, Sealaska Corporation still has substantial volumes of timber and has stated that harvests can continue at current levels for 10-12 years if current market conditions continue.

"A 'best guess' projection [under current market conditions] is that Native harvests will decline sharply over the next three years to between 150 and 250 million board feet per year. Harvests will then gradually decline further to between 100 and 150 million board feet per year until the late 1990s." (Knapp 1989, p.49)

No one with whom we talked disagreed with this general assessment, and it has been incorporated into our Base case assumptions. Since logs from Native lands are exported directly, the reductions in harvests from Native lands will be felt in the *logging* industry rather than the lumber or pulp industries. Both pulp mills have purchased some pulp logs from Native (and Canadian) sources during the past few years at favorable prices; however, the mills can operate solely on their Tongass contract resources if necessary. The details of the resulting decline in logging employment are shown in table 3.

Tongass National Forest supply. Although the congressional debate over management of the Tongass National Forest is not yet resolved, it is unlikely that any significant changes in harvest volume will occur during the next five years as a result of the legislation. Legislation passed by the House and Senate removes 1.8 million and 700,000 acres of land, respectively, from the timber base. These withdrawals reduce the sustainable annual yield from the forest from 450 MMbf to between 390 MMbf (House version) and 420 MMbf (Senate version)⁹. However, in recent years, the Forest Service has been unable to sell more than about 400 MMbf of timber. Lack of demand has therefore put a ceiling on Tongass timber output roughly equal to that resulting from proposed legislation.

It is also important to remember that the sustainable yield from the forest depends on the amount of money invested in road construction, precommercial thinning, and advanced logging techniques. Both versions of pending legislation repeal the automatic appropriation of \$40 million per year for the Tongass Timber Supply Fund. However, during the past several years, the Forest Service has sought and received funding for preparation of timber sales through the normal appropriations process. While it is impossible to predict future budgets, most observers agree that funding for roads and other subsidies seems secure at

⁹U.S. Forest Service, Steve Ambrose, 6/18/90, and USFS mimeo titled "HR 987, Tongass Timber Reform Act", dated 13 June 1990.

current levels of approximately \$40 million per year, regardless of whether the appropriations are required by law.

Both Forest Service¹⁰ and KPC¹¹ personnel also feel strongly that the existing 50 year timber contracts will not be cancelled: even if Congress directed this step, an effective legal delay could be mounted at low cost until scheduled contract expiration in 2004. In addition, Frank Seymour of the Alaska Department of Commerce points out¹² that the *scheduled* expiration of the Ketchikan Pulp Corporation's long term contract is now little more than ten years away. Seymour feels that the onset of this event has been forgotten in the heat of the Tongass debate; its nearness may soon exert considerable drag on further investment by the company.

While Tongass legislation itself is therefore unlikely to affect harvest levels in the next five years, there is a concern expressed by some observers that the Tongass is currently being "high-graded," such that the marginal cost of stumpage will rise rapidly in the future. Mehrkens (1989) is the most articulate exponent of this view. He argues two points. First, the high volume stands have been disproportionately harvested, leaving lower volume stands remaining to be harvested. This legacy shows up as a greatly increased road cost per board foot harvested during the second entry into a management area. Second, historical harvests on the forest have averaged 50% Sitka spruce, a much higher-valued tree, while the average volume of spruce throughout Southeast is less than 33% of commercial volume. This legacy shows up as reduced value per average board foot harvested.

We have incorporated the Mehrkens concepts into the Low projection case by assuming that economically operable harvest volume falls from 400 to 300 MMbf between 1995 and 2000, with a corresponding decrease in logging and sawmill employment. See table 3. This Low case is also broadly consistent¹³ with a continuing public appropriation of 40 million *nominal* dollars, which equates to a reduction in real spending of 5% per year.

Based on the above considerations, we feel it is extremely unlikely that the Ketchikan Pulp Company will reduce or curtail its operations before its 50 year contract with the Forest Service expires in 2004. Several observers, however, felt that a shutdown was possible at the end of the contract period, and we have incorporated this event into the Low case scenario. Even in this Low case, however, we assume that the sawmills at Ketchikan, Metlakatla, and Wrangell will continue to operate through the study period, using Tongass timber obtained through the normal timber sale process if necessary.

¹⁰Mike Martin, USFS Regional Economist, 2/5/90.

¹¹Martin Pihl, General Manager, 2/16/90.

¹²Personal communication, 11 June 1990.

¹³based on the only published source of estimates of the "supply curve" relating public funding to sustainable harvest levels. This source is USFS 1979, the final environmental impact statement prepared with the original Tongass Land Management Plan.

Timber Harvesting and Sawmill Employment Scenarios
(Average Annual Jobs: Excludes Pulp Mill Employment)

	Ketchikan Census Area			Prince of Wales- Outer Ketchikan Census Area			Wrangell-Petersburg Census Area		
	Low	Base	High	Low	Base	High	Low	Base	High
1988	445	445	445	600	600	600	800	800	800
1989	445	445	445	600	600	600	800	800	800
1990	445	445	445	600	600	600	800	800	800
1991	445	445	445	540	540	540	740	740	740
1992	445	445	445	480	480	480	680	680	680
1993	445	445	445	420	420	420	620	620	620
1994	445	445	445	360	360	360	560	560	560
1995	445	445	445	300	300	300	500	500	500
1996	423	445	454	285	300	306	475	500	510
1997	401	445	463	270	300	312	450	500	520
1998	378	445	472	255	300	318	425	500	530
1999	356	445	481	240	300	324	400	500	540
2000	334	445	490	225	300	330	375	500	550
2001	334	445	490	225	300	330	375	500	550
2002	334	445	490	225	300	330	375	500	550
2003	334	445	490	225	300	330	375	500	550
2004	334	445	490	225	300	330	375	500	550
2005	334	445	490	225	300	330	375	500	550
2006	334	445	490	225	300	330	375	500	550
2007	334	445	490	225	300	330	375	500	550
2008	334	445	490	225	300	330	375	500	550
2009	334	445	490	225	300	330	375	500	550
2010	334	445	490	225	300	330	375	500	550

Notes: BASE Case reflects decline in timber harvest from Native lands.
 LOW Case reflects decline in Tongass National Forest timber harvest from 1990 level of 400 MMBF to 300 MMBF, due to some combination of low public funding for road building, reduced availability of high-value spruce, or low world prices in end use markets.
 HIGH Case reflects increased Pacific Rim demand for semi-processed logs (cants) which are close substitutes for the reduced round-log exports from Native lands.

Table 3: Logging and Sawmill Employment Scenarios (excludes pulp mills)

Finally, there is some chance that Tongass-based timber employment will *increase* from the levels associated with the Base case harvest of 400 MMbf. Under this scenario, adopted for the High case, the demand for minimally processed logs ("cants") increases as the supply of Native round log exports dwindles. This surge in demand for cants is controversial and depends on the substitutability of cants for raw logs in foreign manufacturing processes, as well as a lack of round log supplies from other parts of the world which might replace the supplies from Alaskan Native lands. In the High scenario, the high price for cants increases the economic harvest by 10% above the Base case level.

2.2.4 Tourism

The summer of 1990 promises to be a banner year for cruise ship visits to Southeast Alaska¹⁴, with 287 sailings to Juneau planned, up from 227 in 1989. Although berthing capacity is significantly higher on several of the major vessels that visit Southeast, the cruise industry appears to be suffering from an excess of berths,¹⁵ resulting in the need for aggressive marketing and price cuts. Regional economist Brian Rae feels that while Alaska can expect to hold its share of the *U.S.-bound* U.S. tourist market, the size of that market may be declining with the opening of Eastern Europe, rising incomes, and decreased concern over terrorism.

We have chosen two scenarios for tourism industry growth. In the Low and Base cases, tourist volume increases at 3% annually, while in the High case tourist volume increases at 5%. These increases are consistent with historical trends in visitor arrivals since 1964 (avg annual increase of 10.2%) and since 1980 (avg annual increase of 4.2%).¹⁶

2.2.5 Mining

Southeast Alaska as a whole is enjoying a resurgence of the mining industry, but most of the activity is concentrated north of the study area. Newly opened deposits at the Canadian Johnny Mountain and Snip mines near Wrangell have stimulated new activity in Wrangell in the air transport business. Some local observers believe that this area could become a major minerals center during the next decade, if transport costs are reduced by building a road to the site. In 1990, the Alaska legislature approved State revenue bonding for a supply road to be built from the head of the Bradfield canal to the Canadian border.

The world class Molybdenum mine planned for Quartz Hill near Ketchikan is still on indefinite hold pending improvement in the world price of Molybdenum. Quartz Hill development with operation beginning in 1995 is incorporated into the High case scenario.

¹⁴"Tourism Rides Currents of Change," *AK Bus. Monthly*, April 1990, pp.30-35.

¹⁵*Wall Street Journal*, 4/3/90, p.B1

¹⁶ISER *Tourism and Travel Sector Report, 1989*, p. 15. Reported arrival trends are statewide, through 1988.

Sealaska Corporation has stepped up mineral exploration activity on its lands on Prince of Wales Island. Although no major prospects have been publicly identified, the corporation is particularly interested in the possibilities for limestone mining, given the increased demand for limestone products caused by the pollution control (scrubber) industry.

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3 COMMUNITY LOAD FORECASTS

3.1 Forecast Methodology

The load forecasts which follow were produced using a combination of econometric and scenario-building approaches involving the following steps:

3.1.1 Estimate Historical Relationships

We gathered annual data on electricity consumption and explanatory economic and weather variables from the utilities and various published and internal agency sources. We then attempted to estimate simple econometric relationships for the residential and commercial/industrial customer classes. First, we used the pooled sample of data from all four study communities. This procedure yielded a good statistical model of commercial/industrial use based on employment and an underlying time trend. This model is presented in Appendix B.

With the residential data the pooled sample did not yield a defensible model. We discovered potential problems with the data, such as the shifting of harbor customers into and out of the residential class and inconsistent reporting of some measures of customer counts. We therefore estimated time trends in use per customer and for Wrangell and Metlakatla were able to estimate acceptable equations based on either price and income (Wrangell) or heating degree days (Metlakatla)(see Appendix B).

3.1.2 Develop Statewide and Regional Economic Forecasts

Although the LSE economy is somewhat insulated from the rest of the Alaska economy, it is still intimately connected with Alaska's fortunes as an oil producer through the flow of state dollars for local aid and state government employment. We therefore based our estimates of future economic growth in the study area on three complete forecasts of Alaska economic activity produced with the MAP econometric model. The MAP forecasts have the advantage of depending explicitly on a detailed set of assumptions about future economic activity in local basic industry and the fiscal effects of future oil production and state revenues. These assumptions are presented in detail in Appendix A.

For this study, the useful output of the MAP model is a set of forecasts of households, employment, and personal income for each of the census areas containing the study communities. These forecasts are presented in Appendix C.

3.1.3 Specify Discrete Changes in Large Loads

Several of the customers in the study area are large enough to have a significant effect on total load should their plans for expansion or self-generation change. We considered these loads, both current and future, with the help of utility staff and other knowledgeable individuals. A set of prospects for these large loads was developed consistent with the Low, Base, and High case economic scenarios.

There is a potential for double counting the load associated with a discrete project. This problem arises because the employment associated with a single large load "produces" load through the commercial class econometric equation. We avoided this problem by subtracting the employment associated with a discrete large load from the amount of employment driving the econometric load forecasting equation. By subtracting only the direct employment, we correctly account for the additional support sector jobs and residential consumption which are induced by the direct jobs associated with the project. These support jobs do create loads in addition to the direct load from the project.

3.1.4 Forecast

We developed Low, Base, and High case load forecasts for each community using a spreadsheet model and making use of the available econometric relationships to forecast residential and baseline commercial/industrial sales. To these we added discrete large loads appropriate to the scenario. We projected miscellaneous sales (public authorities, street lights, harbor sales) rising with population based on an "elasticity" which was generally less than one, indicating that a one percent increase in population would cause less than a one percent increase in miscellaneous sales. These low elasticities reflect our judgment that the fishing fleet is stable (harbor consumption is unlikely to rise proportionately with population) and that the public building boom is over (sales to public authorities are unlikely to rise proportionately with population).

Losses and utility use were projected by examining historical data on losses. The assumed loss/use percentage is presented below for each community. The resulting energy requirements figure corresponds with the historical data for net generation. Station service is not included in the forecast.

We estimated peak load based on historical load factors which are assumed to remain constant and are presented below. In the case of Metlakatla, which has a significant heating load, we used a conservatively low estimated load factor because of the need to account for the "certain uncertainty" of the weather. Just as an engineer designs a heating system for a minimum winter design temperature substantially lower than the average expected temperature, we feel it is only prudent to base a weather-sensitive peak load forecast on a load factor at the lower end of the historical range.

Finally, we present the expected loads for major mining projects in the High case forecast for completeness. These loads are not reflected in any other aggregate figures for sales, requirements, or peak load, although the *economic* effects of the projects have been considered in projecting utility electricity demand in the affected communities.

3.2 Ketchikan Load Forecast

3.2.1 Economy

Ketchikan is Alaska's fourth largest city, with a 1988 estimated population of 12,630 people in the Ketchikan Gateway Borough. As shown in table 4 and figure 5, the economy is supported by the timber, fishing, and tourist industries. In addition, the U.S. Coast Guard is a major basic industry, providing a consistent 200 jobs during the period 1980 through 1988. Since its construction in 1954, the mainstay of the economy has always been the pulp mill at Ward Cove owned and operated by the Ketchikan Pulp Company (KPC), a division of Louisiana Pacific, Inc. In 1988 KPC opened a new sawmill to handle larger logs arriving at Ward Cove. The sawmill employs about 150 people in addition to the 465 employees at the pulp mill. The city also serves as a support and trade center for logging activity on Prince of Wales island.

Figure 5 presents historical employment by industry while figure 6 shows the distribution of 1988 employment for both a winter and a summer quarter. Total summer employment of 7847 was 1.5 times the measured winter level of 5286.¹⁷

Fish processing activity continues slowly to increase. Newer companies such as Silver Lining Seafoods are exploring specialty markets and the ever more important trade in fresh fish. Several small expansions are planned in the waterfront district.

For years Ketchikan has been awaiting the development of the world class molybdenum deposit at Quartz Hill. This project is currently on indefinite hold due to low molybdenum prices. If Quartz Hill is developed, it would bring over 1000 new jobs to Ketchikan and cause a major economic boom.

¹⁷In presenting these figures we include our estimates of fish harvesting employment based on a number of secondary data sources, no one of which is totally accurate or comprehensive. Fish harvesters are generally self-employed proprietors; hence their employment is not reported through the Alaska Department of Labor ES-202 reports. Statewide total figures are difficult to estimate, and regional allocation is even more problematic. Our regional allocations are based on an analysis of fishing permit files maintained by the Alaska Commercial Fisheries Entry Commission. In light of these difficulties, we have presented the fish harvesting employment data as if the employment were constant year round.

Historical Economic Data for KETCHIKAN BOROUGH Census Area

KETCHIKAN BOROUGH EMPLOYMENT (thousands)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 (1)	Avg Annual Growth
											1980-88
Mining (2)	29	49	24	41	33	31	44	38	31	NA	NA
Construction	392	258	270	424	435	336	268	366	375	295	-0.6%
Manufacturing (3)	1,239	959	973	822	560	937	1,197	1,282	1,378	1,381	1.3%
Transp/Commun/Util	627	630	499	488	430	441	509	584	675	517	0.9%
Wholesale Trade	114	81	96	192	150	138	142	154	177	183	5.7%
Retail Trade	856	899	965	997	941	975	963	979	1,048	1,042	2.6%
Fin/Insur/R Estate	229	234	212	202	210	216	231	230	209	229	-1.1%
Services	872	947	1,036	1,094	1,146	1,129	1,108	1,121	1,265	1,255	4.8%
Federal Civilian	359	321	342	309	313	282	269	262	251	263	-4.4%
State Government	431	445	531	561	587	542	556	510	523	524	2.5%
Local Government	695	776	768	896	919	945	872	910	921	1,004	3.6%
Subtotal: Wage & Salary	5,841	5,598	5,714	6,024	5,723	5,971	6,158	6,434	6,852		2.0%
Military	203	204	215	182	163	152	211	276	205		0.1%
Proprietors (4)	847	900	1,033	1,002	1,051	1,049	1,096	1,110	1,139		3.8%
TOTAL EMPLOYMENT	6,891	6,702	6,962	7,208	6,937	7,172	7,465	7,820	8,196		2.2%
EMPLOYMENT by SECTOR											
Manufacturing/Mining (3)	1,268	1,008	997	862	593	968	1,241	1,320	1,409		1.3%
Infrastructure	1,019	888	768	912	865	777	777	950	1,049		0.4%
Trade/Service/Finance	2,070	2,161	2,309	2,485	2,447	2,458	2,444	2,484	2,700		3.4%
Fed Govt (incl. Military)	562	525	557	491	476	434	480	538	456		-2.6%
State/Local Govt	1,125	1,221	1,299	1,457	1,506	1,487	1,428	1,419	1,444		3.2%
Proprietors (4)	847	900	1,033	1,002	1,051	1,049	1,096	1,110	1,139		3.8%
TOTAL EMPLOYMENT	6,891	6,702	6,962	7,208	6,937	7,172	7,465	7,820	8,196		2.2%
REAL PERSONAL INCOME and POPULATION											
	1980	1981	1982	1983	1984	1985	1986	1987	1988		Avg Annual Growth 1980-88
Real Pers. Inc., million 1988\$	222.88	213.03	228.94	251.65	233.70	242.53	249.18	263.35	281.84		3.0%
Population (BEA est.)	11,369	11,555	12,011	12,712	12,886	12,238	12,027	11,957	12,796		1.5%
Real Per Capita Income, 1988\$	19,604	18,435	19,061	19,796	18,135	19,817	20,718	22,025	22,025		1.5%

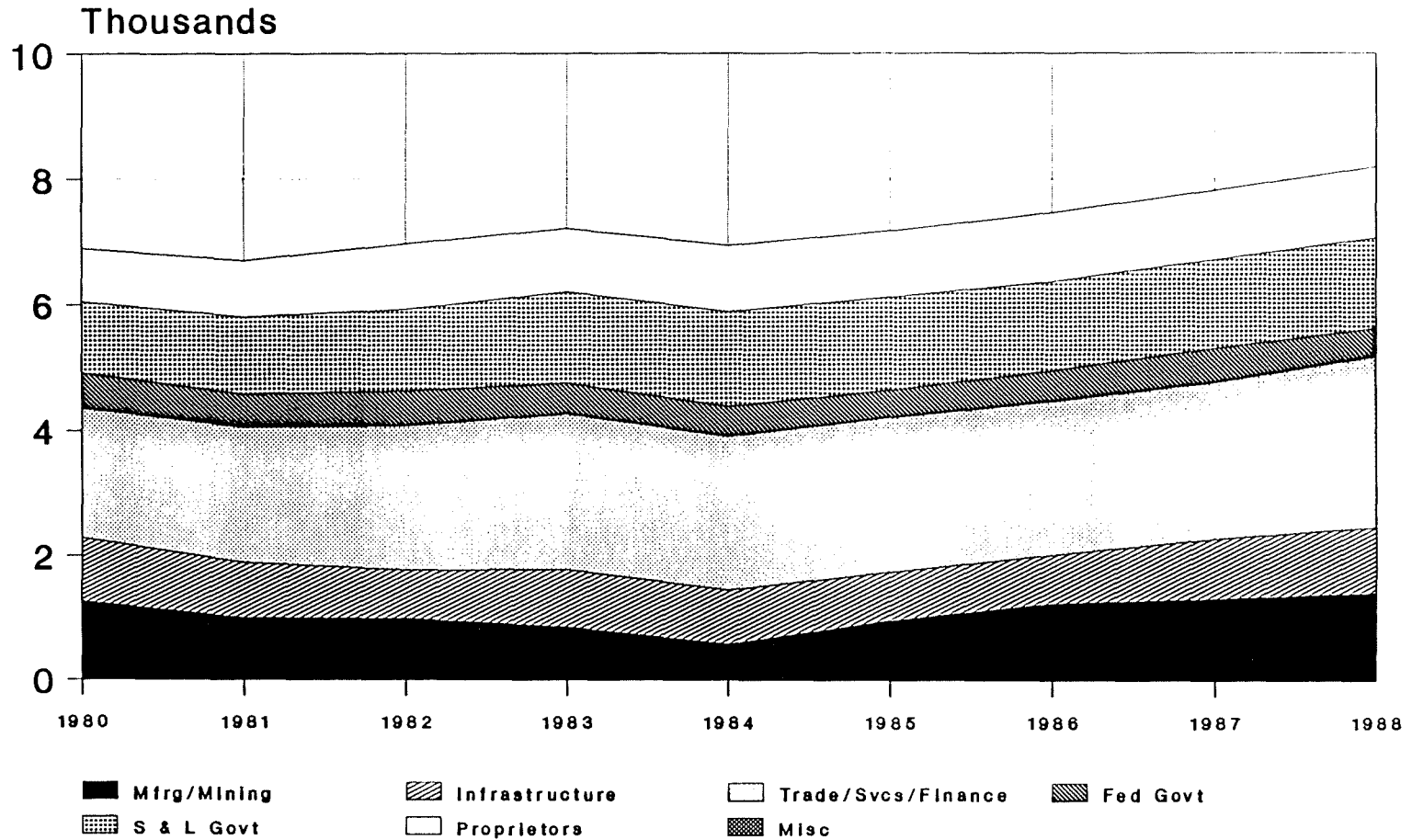
Notes:

- (1) 1989 Data is average of first two quarters only
- (2) Data not available; estimated as residual from other categories and total
- (3) Manufacturing Sector includes Logging, Sawmills, Pulp Mills, and Fish Processing
- (4) Proprietors employment includes fish harvesting

Sources: Employment by Industry from Ak. Dept. of Labor, Statistical Quarterly.
 Number of military from Ak. Dept. of Labor, Population Overview; Economic Trends, Nov. 1987;
 and faxed sheet from Neal Fried dated 3/5/1990.
 Number of proprietors from U.S. Dept. of Commerce, Bureau of Econ. Analysis, fiche 4/88 and printout 4/90
 Personal Income from U.S. Dept. of Commerce, BEA, Table CA5 Printouts of 11/89 and 4/90

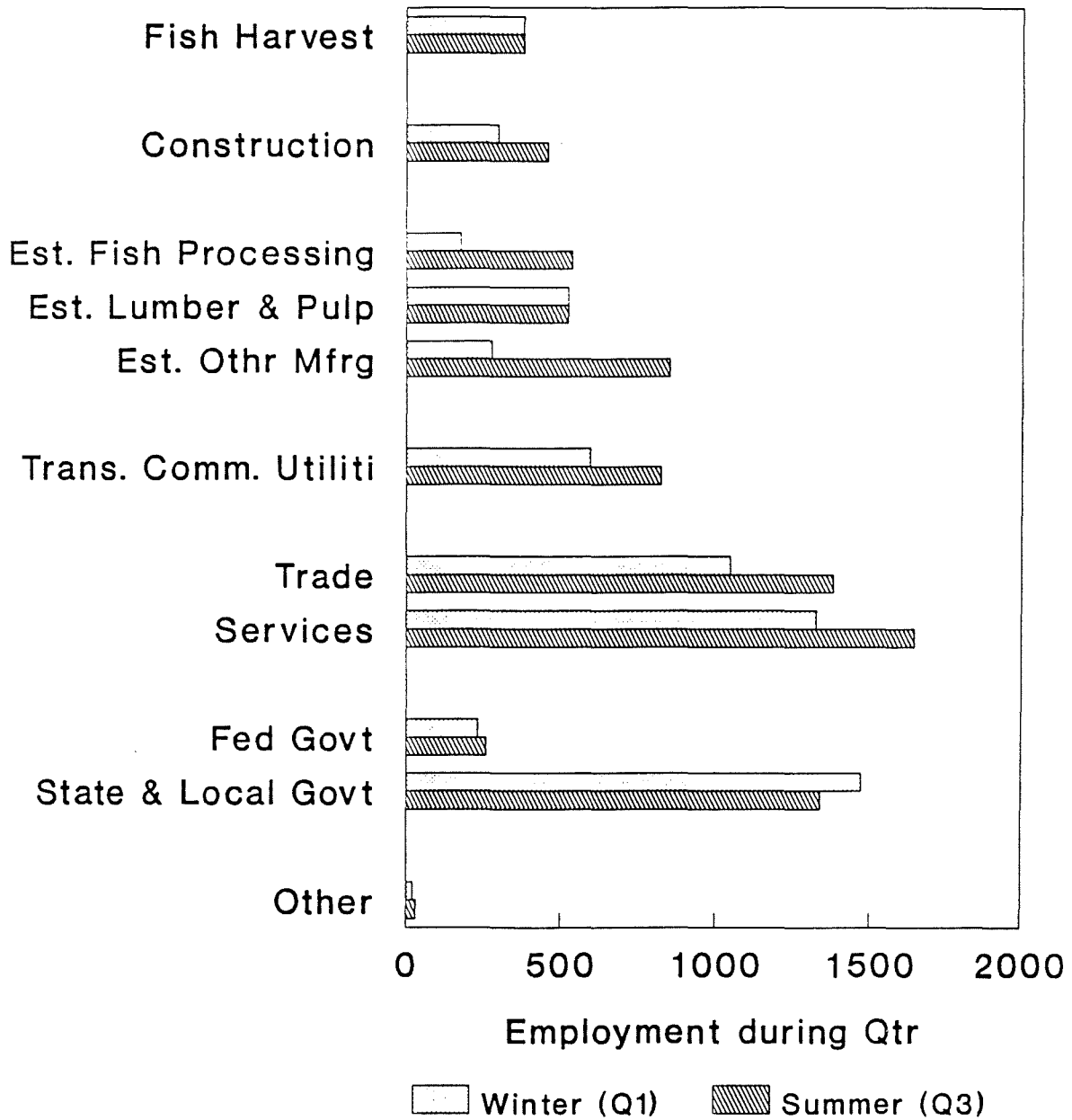
Historical Employment Growth Ketchikan Borough

Figure 5: Historical Employment: Ketchikan Borough



1988 Ketchikan Employment

First and Third Quarters



ISER:WS88-K.WK1

Figure 6: 1988 Ketchikan Employment by Industry and Season

3.2.2 Residential and Commercial Consumption

Table 5 presents historical statistics for Ketchikan Public Utilities (KPU). Figure 7 shows the historical trend in residential use per customer for the four utilities in the study area. Residential use per KPU customer has been increasing at an average annual rate of .4% per year from 1969 through 1987. This nearly constant use per customer may reflect a reduction in the use of electric space heating coupled with increasing numbers of appliances due to a growth in real per capita income. Unfortunately there are no data to support or rebut this hypothesis. KPU staff believes that the current levels of electric heat are now quite low, less than 10 percent of customers. If this is true, then future use per customer may grow with income. However, trends in appliance efficiency and saturation derived from our Railbelt end use studies suggest a decrease in residential use per customer is possible even with increasing income.

Commercial use has grown faster than residential, reflecting a "broadening and deepening" of the local economy. For example, the community's first large enclosed shopping mall was constructed on Tongass Avenue in the mid 1980s. An excellent fish processing season is believed by KPU staff to be largely responsible for a surge in commercial consumption in 1989.

Ketchikan Public Utilities Historical Load Data

YEAR	Residential		Commercial		Street		Total Sales MWh	Loss/Use MWh	Total Reqts MWh	YEAR	Peak Demand MW	Load Factor
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh	KPC Sales MWh	Misc Sales MWh						
1970	3,067	8,845	27,128	25,381	0	1,384	53,893	7,228	61,121	1970	10.0	0.70
1971	3,193	9,159	29,246	26,067	0	1,521	56,834	6,418	63,252	1971	12.4	0.58
1972	3,281	9,387	30,797	26,975	0	1,572	59,344	7,833	67,177	1972	12.5	0.61
1973	3,569	8,674	30,958	29,250	0	1,549	61,757	10,221	71,978	1973	13.9	0.59
1974	3,754	8,292	31,128	27,460	0	1,385	59,973	12,512	72,485	1974	13.4	0.62
1975	3,837	8,558	32,838	29,847	0	1,431	64,116	11,941	76,057	1975	13.7	0.63
1976	4,019	8,723	35,059	30,654	0	1,259	66,972	12,360	79,332	1976	14.0	0.65
1977	4,173	8,407	35,082	30,501	0	1,109	66,692	13,829	80,521	1977	16.3	0.56
1978	4,312	8,524	36,754	33,235	0	1,136	71,125	13,586	84,711	1978	15.1	0.64
1979	4,393	8,528	37,462	33,702	0	1,050	72,214	12,868	85,082	1979	16.1	0.60
1980	4,459	8,777	39,135	33,285	0	1,328	73,748	16,350	90,098	1980	17.7	0.58
1981	4,561	9,391	42,834	36,763	0	1,866	81,463	12,035	93,498	1981	16.9	0.63
1982	4,769	9,051	43,164	39,213	0	1,998	84,375	19,834	104,209	1982	19.1	0.62
1983	5,053	8,898	44,961	39,060	0	1,676	85,697	16,197	101,894	1983	20.8	0.56
1984	5,149	9,962	51,292	41,117	0	1,970	94,379	15,478	109,857	1984	21.6	0.58
1985	5,036	9,777	49,236	45,618	0	1,938	96,792	NA	NA	1985	25.1	NA
1986	5,010	9,340	46,795	48,640	0	1,907	97,342	9,818	107,160	1986	20.4	0.60
1987	5,047	9,293	46,904	49,958	3,449	1,857	98,686	12,917	111,603	1987	22.0	0.58
1988	5,062	9,733	49,269	57,174	15,565	2,061	124,069	11,355	135,424	1988	23.8	0.65
Avg Annual Growth Rates												
1970-1988	2.8%	0.5%	3.4%	4.6%	NA	2.2%	4.7%	2.5%	4.5%		4.9%	-0.4%
1970-1980	3.8%	-0.1%	3.7%	2.7%	NA	-0.4%	3.2%	8.5%	4.0%		5.9%	-1.8%
1980-1988	1.6%	1.3%	2.9%	7.0%	NA	5.6%	6.7%	-4.5%	5.2%		3.8%	1.4%

Table 5: Ketchikan Historical Utility Data

Res. Use per Customer

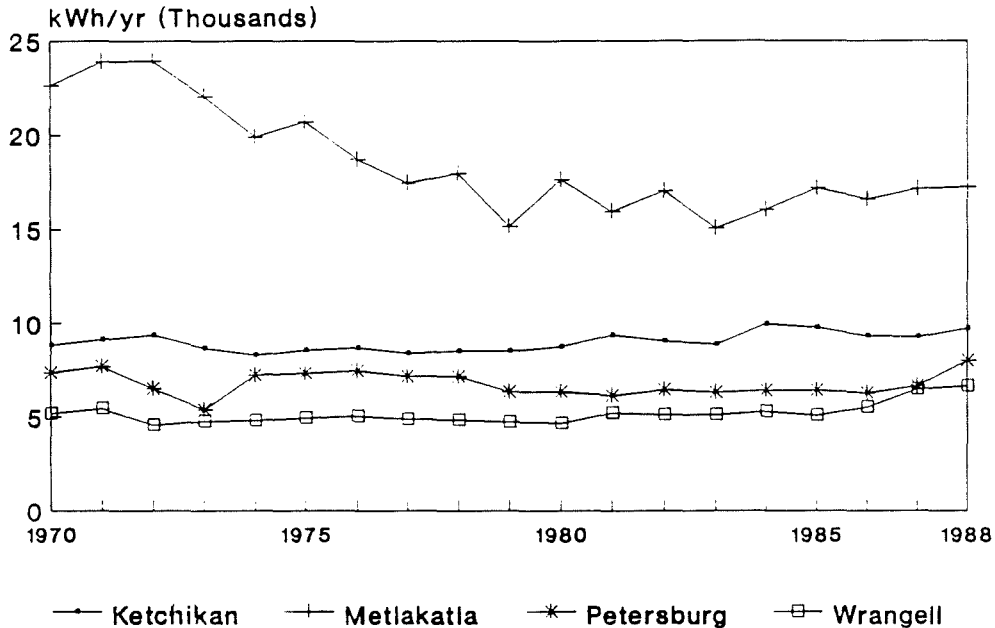


Figure 7: Historical Residential Use per Customer

3.2.3 Major Single Electric Loads

Ketchikan Pulp Corporation (KPC) self-generates most of its power; otherwise it would be the major firm industrial load on the Ketchikan Public Utilities system. The company is expected to continue to self-generate for two reasons. First, it can produce power for 2.5 cents/kWh average cost using waste wood from its chipping operations mixed with some diesel. Second, it has no alternative means of disposing of the wood waste. KPC began buying power from KPU on a surplus basis in October 1987: 1988 sales were 15,565 MWh. These sales allow KPC to shut down its turbines for occasional maintenance. As of February 1990, KPC and KPU had not reached agreement on a renegotiated power sales agreement to replace the current agreement which is now formally expired but has been informally extended through June 1990.

Other major connected loads include several fish processors and the Ferry maintenance facility. Sales to the latter totaled 3403 MWh in 1988 and are forecast to continue at that level.

3.2.4 Prospects for New Large Loads

Table 6 shows the individual additions to the KPU load which we incorporated into the various forecast scenarios. The table shows three rows of ones and zeros which indicate whether a particular load was (1) or was not (0) incorporated into the Low, Base, or High forecasts. Specific comments on these loads follow.

Table 6: Individual Large Loads in KPU Forecast

	Navy Test	Spruce Mill	Cape Fox I	Cape Fox II	USCG Campus	USCG Loran	Silver Lin. Frz	Fish Rejoin	Fish Expand
Peak MW	2.5	1.5	0.5	2.0	0.5	2.5	0.5	2.0	2.5
Load Fact	NA	0.6	0.6	0.4	0.5	0.8	0.5	0.4	0.4
Include? (1=Y, 0=N)									
LOW	1	1	1	0	1	0	1	0	0
BASE	1	1	1	1	1	0	1	1	0
HIGH	1	1	1	1	1	1	1	1	1
YEAR	Navy Test	Spruce Mill	Cape Fox I	Cape Fox II	USCG Campus	USCG Loran	Silver Lin. Frz	Fish Rejoin	Fish Expand
1988									
1989									
1990			2,628		2,190		2,190		
1991			2,628	7,008	2,190		2,190	7,008	
1992	932		2,628	7,008	2,190		2,190	7,008	
1993	988	3,942	2,628	7,008	2,190	17,520	2,190	7,008	8,760
1994	1,048	5,913	2,628	7,008	2,190	17,520	2,190	7,008	8,760
1995	1,111	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
1996	1,177	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
1997	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
1998	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
1999	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2000	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2001	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2002	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2003	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2004	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2005	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2006	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2007	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2008	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2009	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760
2010	1,248	7,884	2,628	7,008	2,190	17,520	2,190	7,008	8,760

Navy Test Facility. The US Navy is currently completing the permitting process for a submarine testing facility in the Tongass Narrows which would draw between 2.5 and 4.5 MW of power when running a test and use about 1,248 MWh annually. The testing cycles are short (< 20 minutes) and presumably would be timed to avoid contributing to the KPU system peak load.

Spruce Mill. The Spruce Mill site is a prime piece of downtown property which is awaiting development as a public lands information center and historical museum with associated retail space. According to the U.S. Forest Service project manager for the information

center¹⁸, the lands center is on a national list of interagency projects awaiting a priority ranking for federal funding and should be under construction by 1992 at the latest. Once construction starts on this building, private funds should be forthcoming from the cruise ship industry, among others, for the museum project. Finally, City officials¹⁹ report that the City of Ketchikan will be offering the retail portion of the property for lease on about July 1 1990.

Cape Fox Lodge Projects. A major lodge ("Cape Fox I") is now under construction by Cape Fox Native Corporation and will be opening for business in september 1990²⁰. This site may eventually house a convention and civic center ("Cape Fox II") funded by the city and the federal government. The City of Ketchikan has received \$350,000 in design funds as well as a commitment by the Economic Development Administration to provide \$600,000 in construction funds.

USCG Upper Campus. This is a certain load which will commence later this year when expansion of the Coast Guard upper campus is completed.

USCG Loran. KPU is planning to sell significant amounts of power to the Coast Guard Loran station at Shoal Cove once a road is built to the site, which currently uses diesel. There appear to be no firm plans to build such a road at this time, so this substantial load is only included in the High case.

Silver Lining Freezer Plant. Silver Lining Seafoods will be consolidating its company-wide freezer operations into additional capacity in Ketchikan.²¹ This capacity is currently under construction and is expected to support 12 full time equivalent jobs.

Fish Rejoin. This load represents several processing loads which left the KPU system for a period of time between 1987 and 1989 due to a high demand charge. Now that the demand charge has been reduced they are expected to rejoin the grid or have already done so. KPU staff indicate that most of these processors maintained some diesel capacity before they left the grid in 1987. At least one major firm, Phillips, added additional diesel capacity when it began self-generating.

Fish Expand. Expansion by several fish processors is envisioned by KPU personnel. This expansion activity is consistent with the employment increases in fish processing assumed for the High case economic scenario. Because fish processing is a highly energy intensive industry, the additional load is included explicitly.

¹⁸Michael Terzich, personal communication, 13 June

¹⁹Assistant City Manager Bill Jones, personal communication, 22 June 1990

²⁰Karen Wolfred, Historic Ketchikan, Inc., personal communication 12 June 1990

²¹John Sund, owner, personal communication, 12 June 1990.

3.2.5 Projection Scenario Assumptions:

All Cases

- Load Factor: .56
- Loss/Use Factor: 8.0% of sales
- KPC sales: 15,565 MWh/yr (1988 level)

Base Case

- Employment growth: .6%
- Residential kWh/cust growth: 0.0%
- Commercial MWh/employee: 1.6% per year increase (half historical trend)
- KPC sales: 15,565 MWh (1988 level)

The KPC mill runs at capacity through the study period. Logging, Fishing and Fish processing employment remains essentially flat. Tourism expands. See table 6 for a list of large individual loads.

Low Case

- Employment growth: -.3%
- Residential kWh/cust growth: -.2%
- Commercial MWh/employee: 0% per year increase
- KPC sales: drops to 5,000 MWh by 1994

The KPC pulp mill closes in 2005, but the sawmill at Ward Cove remains open. Logging declines 25% from Base case due to lower output from Tongass National Forest. Several fish processors stay off the grid. See table 6 for individual large loads.

High Case

- Employment growth: 2.6%
- Residential kWh/cust growth: .4% (trend value 1970-87)
- Commercial MWh/employee: 3.2% per year increase (1970-87 trend value)
- KPC Sales: 15,565 MWh (1988 level)

In the High case logging expands 10% over Base case levels due to a strong market for cants (minimally processed logs) which are substitutes for declining round log exports from Native lands. The Quartz Hill mine comes on line in 1995. Fish processing expands with the addition of a fish-food plant to serve a new fish farming industry which develops on Outer Prince of Wales Island, or some other combination of processor expansion yielding 50 jobs and 2.5 MW of load. Large loads include 2.5 MW Coast Guard Loran station (see table 6).

Ketchikan Public Utilities Load Forecast: LOW Case

YEAR	Residential		Commercial		KPC Sales MWh	Street, Misc Sales MWh	Total Sales MWh	Loss/ Use MWh	Total Energy Reqts MWh	YEAR	Firm	Load Factor	Forecast
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh							Energy Reqts MWh		Peak Demand MW
1988	5,055	9,513	48,085	57,174	15,565	2,061	122,885	9,831	132,716	1988	117,151	0.56	23.9
1989	5,105	9,494	48,472	59,665	15,565	2,082	125,784	10,063	135,846	1989	120,281	0.56	24.5
1990	5,301	9,475	50,232	67,036	15,565	2,093	134,927	10,794	145,721	1990	130,156	0.56	26.5
1991	5,311	9,456	50,224	66,594	12,000	2,080	130,899	10,472	141,370	1991	129,370	0.56	26.4
1992	5,297	9,437	49,991	66,847	10,000	2,060	128,898	10,312	139,210	1992	128,278	0.56	26.1
1993	5,321	9,419	50,115	70,939	7,500	2,063	130,617	10,449	141,067	1993	132,579	0.56	27.0
1994	5,412	9,400	50,870	73,831	5,000	2,088	131,790	10,543	142,333	1994	136,285	0.56	27.8
1995	5,492	9,381	51,520	76,244	5,000	2,099	134,863	10,789	145,652	1995	139,541	0.56	28.4
1996	5,554	9,362	51,995	76,522	5,000	2,105	135,622	10,850	146,472	1996	140,295	0.56	28.6
1997	5,556	9,343	51,911	76,137	5,000	2,092	135,141	10,811	145,952	1997	139,704	0.56	28.5
1998	5,554	9,325	51,787	75,929	5,000	2,086	134,803	10,784	145,587	1998	139,339	0.56	28.4
1999	5,564	9,306	51,775	75,867	5,000	2,084	134,726	10,778	145,504	1999	139,256	0.56	28.4
2000	5,609	9,287	52,093	76,096	5,000	2,091	135,280	10,822	146,103	2000	139,855	0.56	28.5
2001	5,651	9,269	52,381	76,215	5,000	2,094	135,690	10,855	146,545	2001	140,297	0.56	28.6
2002	5,688	9,250	52,617	76,303	5,000	2,097	136,017	10,881	146,898	2002	140,650	0.56	28.7
2003	5,719	9,232	52,801	76,376	5,000	2,099	136,276	10,902	147,178	2003	140,930	0.56	28.7
2004	5,755	9,213	53,025	76,490	5,000	2,102	136,617	10,929	147,546	2004	141,298	0.56	28.8
2005	5,255	9,195	48,318	75,178	100	2,065	125,661	10,053	135,714	2005	134,366	0.56	27.4
2006	5,277	9,177	48,420	75,439	100	2,072	126,032	10,083	136,115	2006	134,767	0.56	27.5
2007	5,338	9,158	48,889	75,758	100	2,082	126,828	10,146	136,974	2007	135,626	0.56	27.6
2008	5,400	9,140	49,355	76,044	100	2,090	127,589	10,207	137,796	2008	136,448	0.56	27.8
2009	5,449	9,122	49,701	76,194	100	2,094	128,090	10,247	138,337	2009	136,989	0.56	27.9
2010	5,499	9,103	50,055	76,391	100	2,100	128,646	10,292	138,938	2010	137,590	0.56	28.0
Avg Annual Growth Rates													
1990-2010	0.2%	-0.2%	-0.0%	0.7%	-22.3%	0.0%	-0.2%	-0.2%	-0.2%		0.3%		0.3%
1990-2000	0.6%	-0.2%	0.4%	1.3%	-10.7%	-0.0%	0.0%	0.0%	0.0%		0.7%		0.7%
2000-2010	-0.2%	-0.2%	-0.4%	0.0%	-32.4%	0.0%	-0.5%	-0.5%	-0.5%		-0.2%		-0.2%

Table 7: Ketchikan Low Case Forecast

Ketchikan Public Utilities Load Forecast: BASE Case

YEAR	Residential		Commercial		Street,		Loss/ Use MWh	Total Energy Reqts MWh	Firm Energy Reqts MWh	Load Factor	Forecast Peak Demand MW		
	# Cust	Use/Cust kwh	Sales MWh	Indust. Sales MWh	KPC Sales MWh	Misc Sales MWh						Total Sales MWh	
1988	5,055	9,513	48,085	57,174	15,565	2,061	122,885	9,831	132,716	1988	117,151	0.56	23.9
1989	5,116	9,513	48,672	59,763	15,565	2,085	126,086	10,087	136,172	1989	120,607	0.56	24.6
1990	5,329	9,513	50,692	68,184	15,565	2,099	136,540	10,923	147,463	1990	131,898	0.56	26.9
1991	5,405	9,513	51,423	83,466	15,565	2,108	152,562	12,205	164,767	1991	149,202	0.56	30.4
1992	5,465	9,513	51,990	85,445	15,565	2,111	155,111	12,409	167,520	1992	151,023	0.56	30.8
1993	5,535	9,513	52,659	90,887	15,565	2,123	161,235	12,899	174,134	1993	157,581	0.56	32.1
1994	5,624	9,513	53,504	94,475	15,565	2,138	165,682	13,255	178,937	1994	162,324	0.56	33.1
1995	5,660	9,513	53,844	97,141	15,565	2,128	168,678	13,494	182,172	1995	165,496	0.56	33.7
1996	5,689	9,513	54,123	98,289	15,565	2,129	170,106	13,608	183,714	1996	166,972	0.56	34.0
1997	5,722	9,513	54,432	99,450	15,565	2,130	171,576	13,726	185,302	1997	168,489	0.56	34.3
1998	5,808	9,513	55,256	101,089	15,565	2,144	174,054	13,924	187,978	1998	171,165	0.56	34.9
1999	5,814	9,513	55,307	102,050	15,565	2,141	175,063	14,005	189,068	1999	172,255	0.56	35.1
2000	5,869	9,513	55,833	103,487	15,565	2,148	177,033	14,163	191,196	2000	174,383	0.56	35.5
2001	5,917	9,513	56,286	104,749	15,565	2,151	178,751	14,300	193,051	2001	176,238	0.56	35.9
2002	5,940	9,513	56,513	105,788	15,565	2,149	180,014	14,401	194,415	2002	177,602	0.56	36.2
2003	5,956	9,513	56,657	106,829	15,565	2,146	181,196	14,496	195,692	2003	178,879	0.56	36.5
2004	5,982	9,513	56,904	108,099	15,565	2,147	182,715	14,617	197,333	2004	180,520	0.56	36.8
2005	6,030	9,513	57,368	109,674	15,565	2,155	184,762	14,781	199,543	2005	182,730	0.56	37.2
2006	6,099	9,513	58,017	111,426	15,565	2,167	187,174	14,974	202,148	2006	185,335	0.56	37.8
2007	6,181	9,513	58,800	113,341	15,565	2,180	189,886	15,191	205,077	2007	188,264	0.56	38.4
2008	6,276	9,513	59,707	115,383	15,565	2,196	192,851	15,428	208,279	2008	191,466	0.56	39.0
2009	6,373	9,513	60,624	117,412	15,565	2,211	195,811	15,665	211,476	2009	194,663	0.56	39.7
2010	6,460	9,513	61,458	119,349	15,565	2,222	198,594	15,888	214,482	2010	197,669	0.56	40.3

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Table 8: Ketchikan Base Case Forecast

Avg Annual Growth Rates

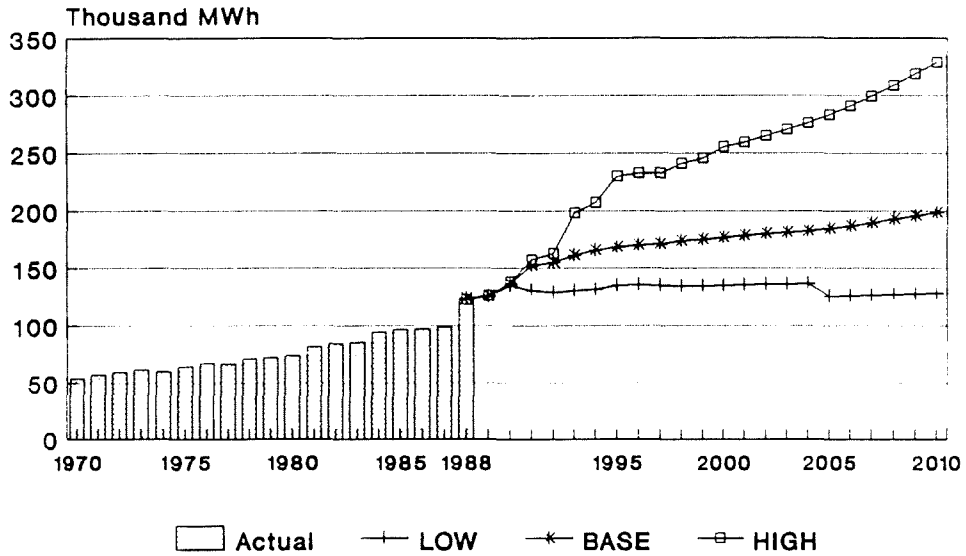
1990-2010	1.0%	0.0%	1.0%	2.8%	0.0%	0.3%	1.9%	1.9%	1.9%	2.0%	2.0%
1990-2000	1.0%	0.0%	1.0%	4.3%	0.0%	0.2%	2.6%	2.6%	2.6%	2.8%	2.8%
2000-2010	1.0%	0.0%	1.0%	1.4%	0.0%	0.3%	1.2%	1.2%	1.2%	1.3%	1.3%

Ketchikan Public Utilities Load Forecast: HIGH Case

YEAR	Residential		Commercial		Street,		Total	Loss/ Use	KPU Total	Quartz Hill	KPU Firm Energy	Forecast KPU Peak	Quartz Hill		
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh	KPC Sales MWh	Misc Sales MWh								Reqts MWh	Reqts MWh
1988	5,055	9,513	48,085	57,174	15,565	2,061	122,885	9,831	132,716	0	1988	117,151	0.56	23.9	
1989	5,122	9,551	48,919	59,826	15,565	2,087	126,396	10,112	136,508	0	1989	120,943	0.56	24.7	
1990	5,365	9,590	51,451	69,317	15,565	2,105	138,437	11,075	149,512	0	1990	133,947	0.56	27.3	
1991	5,520	9,628	53,148	86,553	15,565	2,140	157,405	12,592	169,998	0	1991	154,433	0.56	31.5	
1992	5,670	9,666	54,805	90,397	15,565	2,163	162,930	13,034	175,964	0	1992	159,467	0.56	32.5	
1993	5,816	9,705	56,443	123,808	15,565	2,188	198,004	15,840	213,845	0	1993	197,292	0.56	40.2	
1994	6,095	9,744	59,392	130,103	15,565	2,237	207,297	16,584	223,881	14,400	1994	207,268	0.56	42.3	
1995	7,046	9,783	68,932	142,913	15,565	2,440	229,850	18,388	248,238	199,800	1995	231,562	0.56	47.2	47.5
1996	7,054	9,822	69,282	145,118	15,565	2,427	232,392	18,591	250,983	250,300	1996	234,241	0.56	47.7	47.5
1997	6,956	9,861	68,598	146,291	15,565	2,391	232,844	18,628	251,472	250,300	1997	234,659	0.56	47.8	47.5
1998	7,235	9,901	71,628	151,417	15,565	2,439	241,049	19,284	260,333	453,200	1998	243,520	0.56	49.6	47.5
1999	7,303	9,940	72,593	154,608	15,565	2,443	245,209	19,617	264,825	475,600	1999	248,012	0.56	50.6	88.0
2000	7,646	9,980	76,310	160,973	15,565	2,507	255,355	20,428	275,783	476,100	2000	258,970	0.56	52.8	88.0
2001	7,683	10,020	76,984	164,183	15,565	2,505	259,237	20,739	279,976	476,100	2001	263,163	0.56	53.6	88.0
2002	7,805	10,060	78,523	168,550	15,565	2,522	265,160	21,213	286,373	476,300	2002	269,560	0.56	54.9	88.0
2003	7,899	10,100	79,778	172,609	15,565	2,531	270,482	21,639	292,121	476,300	2003	275,308	0.56	56.1	88.0
2004	7,991	10,141	81,031	177,095	15,565	2,544	276,234	22,099	298,333	476,300	2004	281,520	0.56	57.4	88.0
2005	8,130	10,181	82,777	182,429	15,565	2,568	283,340	22,667	306,007	478,200	2005	289,194	0.56	59.0	88.0
2006	8,303	10,222	84,868	188,224	15,565	2,597	291,254	23,300	314,554	478,200	2006	297,741	0.56	60.7	88.0
2007	8,486	10,263	87,086	194,403	15,565	2,627	299,681	23,974	323,655	478,200	2007	306,842	0.56	62.5	88.0
2008	8,703	10,304	89,678	201,236	15,565	2,663	309,142	24,731	333,873	478,200	2008	317,060	0.56	64.6	88.0
2009	8,940	10,345	92,490	208,457	15,565	2,700	319,212	25,537	344,749	478,200	2009	327,936	0.56	66.8	88.0
2010	9,173	10,387	95,279	215,677	15,565	2,732	329,253	26,340	355,594	478,200	2010	338,781	0.56	69.1	88.0
Avg Annual Growth Rates															
1990-2010	2.7%	0.4%	3.1%	5.8%	0.0%	1.3%	4.4%	4.4%	4.4%		4.7%		4.7%		
1990-2000	3.6%	0.4%	4.0%	8.8%	0.0%	1.8%	6.3%	6.3%	6.3%		6.8%		6.8%		
2000-2010	1.8%	0.4%	2.2%	3.0%	0.0%	0.9%	2.6%	2.6%	2.6%		2.7%		2.7%		

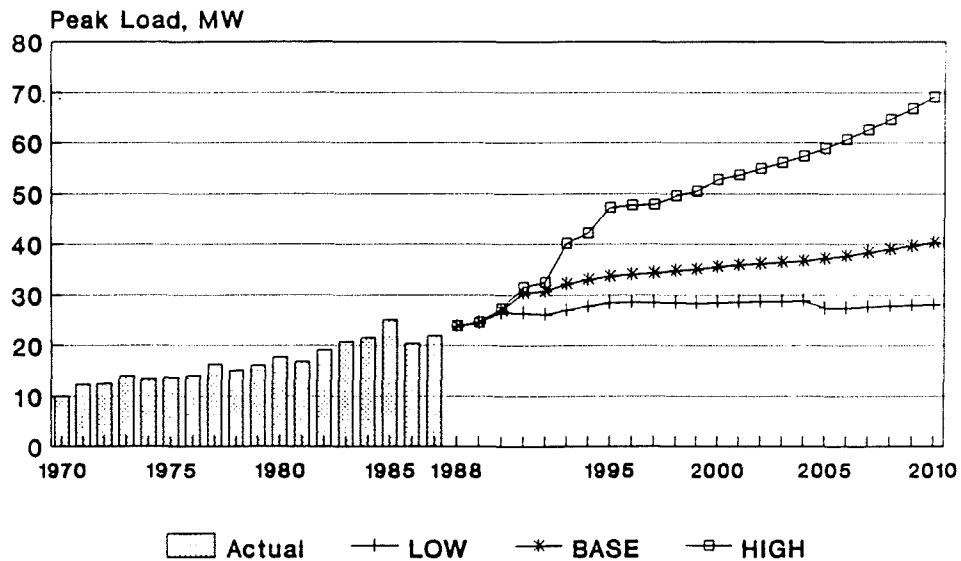
Table 9: Ketchikan High Case Forecast

Ketchikan Public Utilities Forecast Total Sales



Excludes Quartz Hill

Ketchikan Public Utilities Forecast Peak Load

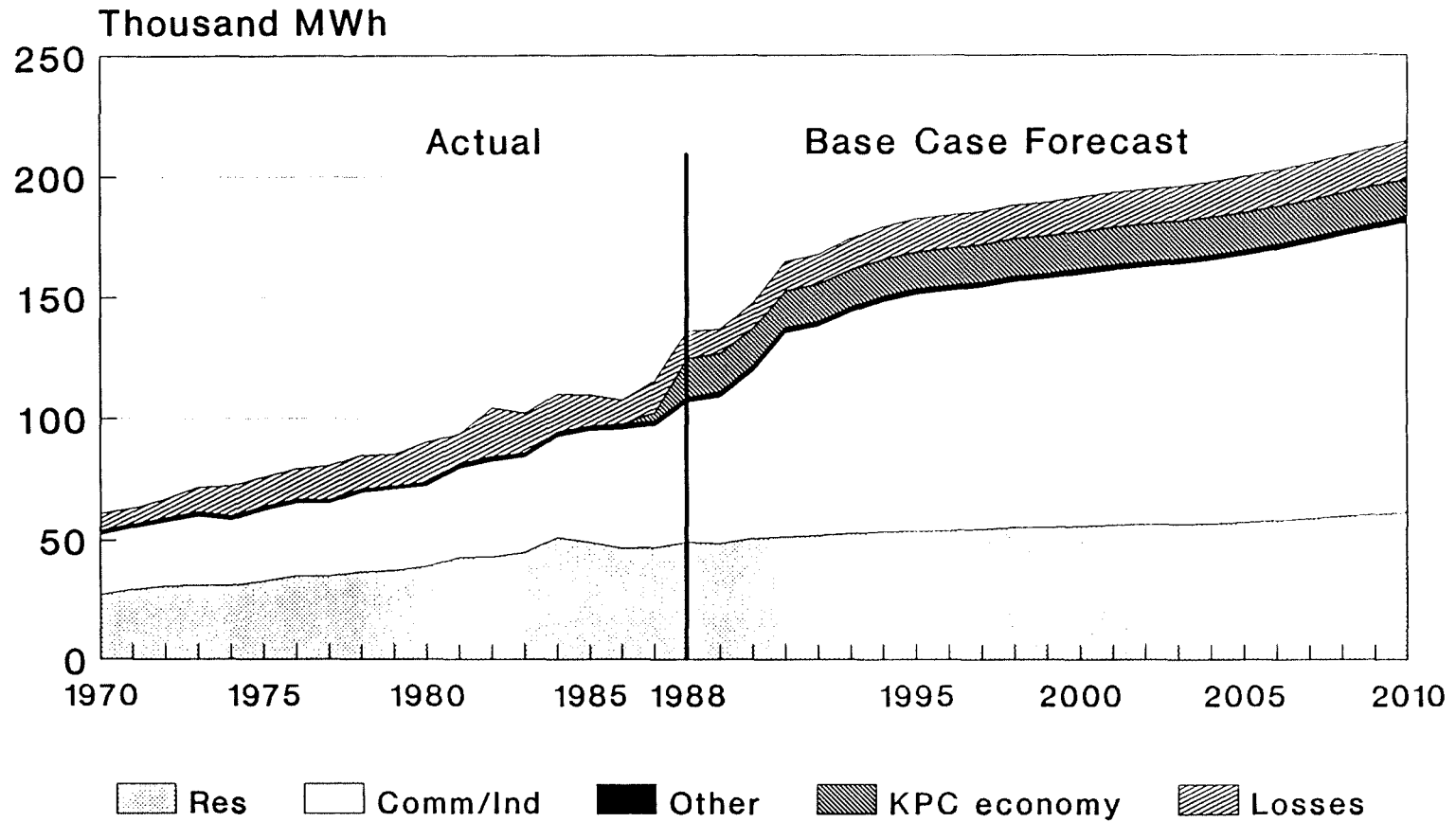


Excludes Quartz Hill

Figure 8: Ketchikan Sales and Peak Load Forecast

Ketchikan Public Utilities Requirements: Base Case

Figure 9: Ketchikan Base Case Forecast by Class



3.3 Metlakatla Load Forecast

3.3.1 Economy

Metlakatla is located on Annette Island, about 15 miles southwest of Ketchikan. The community of approximately 1,500 people is within the Annette Islands Indian Reservation. Table 10 and figure 10 display historical data for the entire Prince of Wales-Outer Ketchikan Census Area. These data cover the smallest possible unit for which economic statistics are compiled. However, the data include the volatile logging sector which makes up a large part of the Prince of Wales Island economy; Metlakatla's economy is more stable.

The Metlakatla economy is primarily supported by the timber and fishing industries. Although little local employment is derived from the direct harvesting of timber, royalty payments to the community from harvesting firms totalled \$5 million from 1967 through 1987. The remaining timber resource is expected to net the community an additional \$3 million of revenue, if the entire resource is harvested. In addition to the harvesting revenue, a community-owned sawmill operated by the Ketchikan Pulp Company under a long term lease is a major employer. 110 year-round full-time jobs are provided by the mill, and an additional 30 jobs are associated with longshoring activities.

Major expansion of lumber operations is not expected in light of KPC's recent opening of a second company sawmill at their Ward Cove pulp mill. On the other hand, decreases in operating time are not likely to be induced by a lower timber harvest from Native lands: the sawmill can operate on the supply of timber provided through KPC's long term contract for Tongass timber. The KPC-Annette Island sawmill lease ends in 2004. Even if the KPC pulp mill shuts down at the expiration of its 50 year contract period in 2004, we assume that the sawmill will remain operational through the study period using timber obtained through the normal Forest Service timber sale process, perhaps with a new operator.

Fisheries activities support the economy through harvesting jobs, fish processing jobs, and hatchery jobs. Salmon and herring are the primary species harvested. Harvesting provides approximately 13 jobs on an annual average basis. Fish processing at the community-owned Annette Island Packing Company provides 70 jobs (annual average) and contributes approximately \$300,000 per year to the community government. The Tamgas Creek Hatchery provides about 10 jobs.

Salmon and herring fishery activity is expected to remain stable in the future. Growth depends on future strength of the salmon runs. There is the future prospect of a shellfish cannery on Annette Island.

Historical Economic Data for PRINCE of WALES-OUTER KETCHIKAN Census Area

PRINCE OF WALES-OUTER KETCHIKAN EMPLOYMENT (thousands)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 (1)	Avg Ann. Growth 1980-88
Mining	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Construction	18	17	NA	50	35	49	45	28	71	76	19.0%
Manufacturing (2)	534	572	589	554	634	527	647	515	750	585	4.3%
Transp/Commun/Util	87	101	80	NA	52	93	84	96	100	161	1.8%
Wholesale Trade	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Retail Trade	67	103	102	118	150	158	166	190	207	227	15.2%
Fin/Insur/R Estate	17	31	37	67	45	50	45	39	40	47	11.2%
Services	53	76	67	96	105	110	120	132	138	155	12.9%
Federal Government	51	62	71	85	86	111	114	110	110	110	10.2%
State Government	15	21	24	25	26	31	30	29	31	31	9.4%
Local Government	412	477	452	455	515	654	574	545	541	529	3.5%

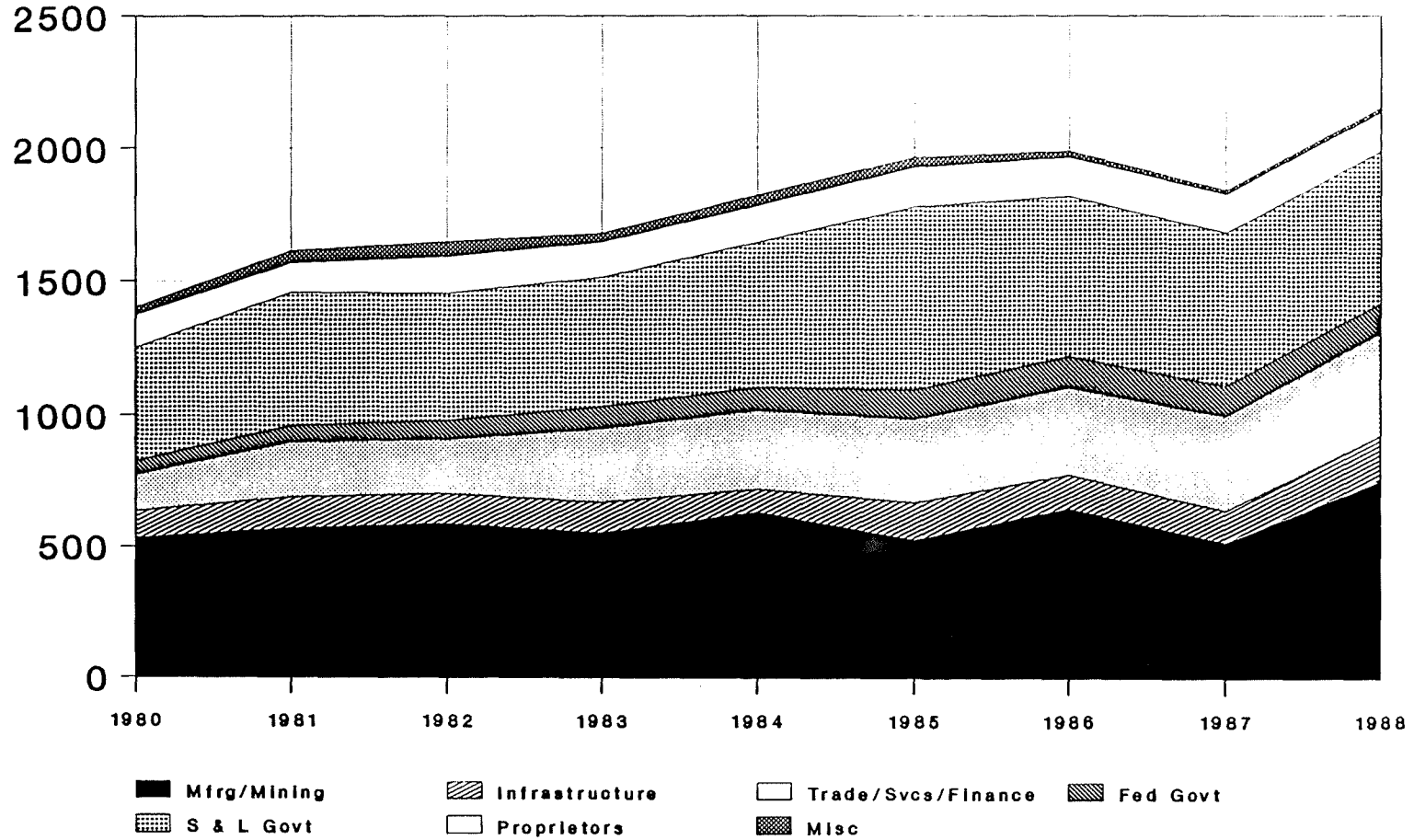
Subtotal: Wage & Salary	1,278	1,502	1,510	1,544	1,684	1,818	1,844	1,697	2,005		5.8%
Military	0	0	0	0	0	0	0	0	0		ERR
Proprietors (3)	123	112	139	136	142	148	145	146	149		2.4%
=====											
TOTAL EMPLOYMENT	1,401	1,614	1,649	1,680	1,826	1,966	1,989	1,843	2,154		5.5%
EMPLOYMENT by SECTOR											
Manufacturing/[Mining] (2,4)	534	572	589	554	634	527	647	515	750		4.3%
Infrastructure	104	117	113	116	87	142	129	124	171		6.3%
Trade/Service/Finance (4)	137	210	206	281	300	318	330	361	386		13.8%
Fed Govt	51	62	71	85	86	111	114	110	110		10.2%
State/Local Govt	427	497	476	479	541	685	604	574	572		3.7%
Proprietors (3)	123	112	139	136	142	148	145	146	149		2.4%
TOTAL EMPLOYMENT	1,401	1,614	1,649	1,680	1,826	1,966	1,989	1,843	2,154		5.5%
REAL PERSONAL INCOME (Million 1988 \$) and POPULATION											
	1980	1981	1982	1983	1984	1985	1986	1987	1988		
Real Pers. Inc., million 1988\$	55.14	57.99	61.92	68.44	67.37	71.51	77.14	76.25	83.26		5.3%
Population (BEA est.)	3,838	3,894	4,032	4,301	4,560	4,817	5,289	5,190	5,385		4.3%
Real Per Capita Income, 1988\$	14,366	14,892	15,356	15,913	14,775	14,845	14,584	14,691	15,462		0.9%

Notes: (1) 1989 Data is average of first two quarters only
 (2) Manufacturing Sector includes Logging, Sawmills, Pulp Mills, and Fish Processing
 (3) Proprietors employment includes fish harvesting
 (4) Manufacturing/Mining excludes Mining; Trade excludes Wholesale Trade (data not available)

Sources: Employment by Industry from Ak. Dept. of Labor, Statistical Quarterly.
 Number of military from Ak. Dept. of Labor, Population Overview; Economic Trends, Nov. 1987;
 and faxed sheet from Neal Fried dated 3/5/1990.
 Number of proprietors from U.S. Dept. of Commerce, Bureau of Econ. Analysis, fiche 4/88 and printout 4/90
 Personal Income from U.S. Dept. of Commerce, BEA, Table CA5 Printouts of 11/89 and 4/90

Historical Employment Growth POW-Outer Ketchikan Census Area

Figure 10: Historical Employment: Prince of Wales-Outer Ketchikan



3.3.2 Residential and Commercial Use

Table 11 presents historical data on Metlakatla electricity use. Residential use per customer in Metlakatla is very high, averaging 17,250 kWh in 1988 (see figure 7). This high usage is primarily due to use of electricity for space heating and water heating in conjunction with poorly insulated homes. Wood, propane, and fuel oil are available as substitute space heating fuels. Use per customer declined substantially between 1970 and 1979, providing evidence that some fuel switching occurred during this period. Further declines since 1980 are not statistically significant, however, when fluctuations in the weather are taken into account.

The Metlakatla data on residential use per customer can be described by a regression on time and weather which takes special account of the apparent fuel switching activity during the 1970-79 period. See Appendix B for details. The equation implies that for forecasting purposes, constant use per customer (after normalizing the 1987 data for weather factors) makes the most sense for the Base case. For consistency with the other areas of the study region, a growth rate of .4% per year is used in the High case. To allow for the fact that substantial declines are still possible should fuel switching accelerate again, the low case assumes a .4% annual decline in use per customer.

3.3.3 Major Single Electrical Loads

The KPC sawmill consumes about 6000 MWh/year (1989 data), or about 40% of Metlakatla Power & Light's (MPL) annual sales. The mill operates year round, 16-20 hours per day for typically 5 days per week, although 7 day per week operation sometimes occurs.

The sawmill's load fluctuates substantially on a second-by-second basis. The MPL hydroelectric plants cannot respond quickly enough to this variation in load. Thus, MPL is forced to run a 3,500 kW diesel generator loaded to 1,000 kW in order to respond to the sawmill load and maintain system stability.

Although large amounts of wood waste are generated at the mill, it is required by contract to buy electricity from MPL instead of generating its own power. Wood waste is currently disposed of in the community land fill. According to Metlakatla utility staff,²² the power sales agreement is an integral part of the operating lease agreement. The contract rates are designed to recover the average variable cost of producing power, including capital payments for the diesel generators. Staff also indicated that they have looked into installing generating equipment in the mill, but found it unpromising, partly because of the large surges in load which can accompany start-up or a particularly bad knot in a log. To allow for these surges, diesels would presumably have to be sized substantially larger than necessary to cover the "average" peak demand.

²²Gordon Thompson, personal communication, 19 June 1990.

Metlakatla Power and Light Historical Load Data

YEAR	Residential		Small Comm. Sales MWh	Ind. & Special Sales MWh	Street Pub Auth Sales MWh	Total Sales MWh	Loss/ Use MWh	Total Energy Reqs MWh	YEAR	Peak Demand MWh	Load Factor	
	# Cust	Use/Cust kWh										Sales MWh
1970	282	22,626	6,380	443	6,231	403	13,458	1,664	15,122	1970	3.8	0.45
1971	294	23,897	7,026	522	6,387	488	14,423	1,758	16,181	1971	5.3	0.35
1972	297	23,919	7,104	719	7,535	412	15,770	2,440	18,210	1972	5.5	0.38
1973	315	22,038	6,942	1,080	8,292	863	17,177	2,540	19,717	1973	4.4	0.51
1974	345	19,946	6,881	1,172	7,704	665	16,422	3,604	20,026	1974	5.4	0.42
1975	329	20,711	6,814	1,350	5,565	368	14,097	2,748	16,845	1975	5.3	0.36
1976	339	18,735	6,351	1,408	5,089	748	13,596	1,544	15,140	1976	NA	NA
1977	363	17,463	6,339	1,330	6,280	886	14,835	421	15,256	1977	NA	NA
1978	355	17,980	6,383	1,316	6,018	847	14,564	380	14,944	1978	NA	NA
1979	359	15,198	5,456	1,149	5,213	790	12,608	2,200	14,808	1979	NA	NA
1980	369	17,626	6,504	1,465	6,095	883	14,947	2,229	17,176	1980	4.0	0.49
1981	388	15,969	6,196	1,610	4,691	959	13,456	2,322	15,778	1981	4.2	0.43
1982	397	17,071	6,777	1,973	3,822	1,038	13,610	1,873	15,483	1982	3.6	0.49
1983	430	15,074	6,482	1,865	4,639	1,602	14,588	2,001	16,589	1983	3.9	0.49
1984	467	16,054	7,497	1,879	7,647	1,474	18,497	1,169	19,666	1984	5.7	0.39
1985	440	17,186	7,562	1,934	6,214	1,536	17,246	2,316	19,562	1985	5.0	0.45
1986	460	16,609	7,640	1,992	7,794	2,067	19,493	1,252	20,745	1986	6.2	0.38
1987	450	17,151	7,718	2,275	7,730	2,339	20,062	1,832	21,894	1987	6.6	0.38
1988	460	17,250	7,935	3,229	8,071	2,503	21,738	2,224	23,962	1988	4.8	0.57
Avg Annual Growth Rates												
1970-1988	2.8%	-1.5%	1.2%	11.7%	1.4%	10.7%	2.7%	1.6%	2.6%		1.3%	1.3%
1970-1980	2.7%	-2.5%	0.2%	12.7%	-0.2%	8.2%	1.1%	3.0%	1.3%		0.5%	0.8%
1980-1988	2.8%	-0.3%	2.5%	10.4%	3.6%	13.9%	4.8%	-0.0%	4.2%		2.3%	1.9%

Table 11: Metlakatla Historical Utility Data

The Annette Island Packing Company, consumes approximately 1200 MWh/year. The refrigeration equipment associated with this fish processing operation consumes substantial electricity from April through September.

The Metlakatla school system is also a large electricity consumer. The school currently heats a swimming pool with electricity. MPL has waived the demand charge for the school to make the heating method more attractive to the school.

All of these individual large loads are treated separately from the commercial forecast using the econometric equation.

3.3.4 Scenario Assumptions

All Cases

- Load Factor: .40
- Loss/Use Factor: 10.8% of sales
- Sawmill/ Industrial sales: 8071 MWh/yr (1988 level)

Base Case

- Employment growth: .6%
- Residential kWh/cust growth: 0.0% (1979-88 Trend)
- Commercial MWh/employee: 1.6% per year increase (half historical trend)

The KPC mill runs at capacity through the study period. Logging on Prince of Wales Island declines as Native Timber Inventories are exhausted. Fishing and Fish processing employment remains essentially flat.

Low Case

- Employment growth: -.4%
- Residential kWh/cust growth: -.4%
- Commercial MWh/employee: 0% per year increase

Logging employment declines by 25% relative to Base case as sustainable yield from the Tongass National Forest is reduced from 400 MMbf to 300 MMbf.

High Case

- Employment growth: 1.8%
- Residential kWh/cust growth: .4% (trend value 1970-87)
- Commercial MWh/employee: 3.2% per year increase (1970-87 trend value)

A shellfish cannery is built on the island by 1993 which consumes 1,200 MWh annually, the level of the existing packing plant. The plant adds 50 jobs to the economy. Logging employment is 10% higher than Base case, reflecting strong markets for minimally processed logs as Native round log exports decline.

Metlakatla Power and Light Load Forecast: LOW Case

YEAR	Residential		Small	Ind. &	Street,	Total	Loss/ Use	Total Energy Reqts	YEAR	Firm	Load Factor	Forecast	
	# Cust	Use/Cust kWh	Sales MWh	Comm. Sales MWh	Special Sales MWh					Pub Auth Sales MWh		Energy Reqs MWh	Energy Reqs MWh
1988	460	17,178	7,902	3,229	8,146	2,427	21,704	2,344	24,048	1988	24,048	0.40	6.9
1989	484	17,204	8,323	3,349	8,146	2,477	22,295	2,408	24,703	1989	24,703	0.40	7.1
1990	509	17,135	8,716	3,352	8,146	2,528	22,742	2,456	25,198	1990	25,198	0.40	7.2
1991	516	17,067	8,800	3,334	8,416	2,542	23,092	2,494	25,586	1991	25,586	0.40	7.3
1992	515	16,999	8,747	3,298	8,416	2,540	23,001	2,484	25,485	1992	25,485	0.40	7.3
1993	511	16,931	8,648	3,331	8,416	2,532	22,928	2,476	25,404	1993	25,404	0.40	7.3
1994	506	16,863	8,533	3,390	8,416	2,523	22,862	2,469	25,331	1994	25,331	0.40	7.2
1995	502	16,796	8,427	3,381	8,416	2,514	22,739	2,456	25,194	1995	25,194	0.40	7.2
1996	506	16,729	8,469	3,361	8,416	2,524	22,769	2,459	25,229	1996	25,229	0.40	7.2
1997	511	16,662	8,520	3,292	8,416	2,534	22,762	2,458	25,220	1997	25,220	0.40	7.2
1998	515	16,595	8,544	3,234	8,416	2,541	22,735	2,455	25,190	1998	25,190	0.40	7.2
1999	517	16,529	8,549	3,185	8,416	2,545	22,696	2,451	25,147	1999	25,147	0.40	7.2
2000	520	16,463	8,559	3,191	8,416	2,551	22,717	2,453	25,171	2000	25,171	0.40	7.2
2001	523	16,398	8,573	3,191	8,416	2,556	22,737	2,456	25,193	2001	25,193	0.40	7.2
2002	525	16,332	8,579	3,185	8,416	2,561	22,741	2,456	25,197	2002	25,197	0.40	7.2
2003	528	16,267	8,583	3,185	8,416	2,566	22,750	2,457	25,208	2003	25,208	0.40	7.2
2004	531	16,202	8,597	3,185	8,416	2,571	22,770	2,459	25,229	2004	25,229	0.40	7.2
2005	535	16,137	8,627	3,188	8,416	2,579	22,811	2,464	25,274	2005	25,274	0.40	7.2
2006	539	16,073	8,657	3,195	8,416	2,587	22,855	2,468	25,323	2006	25,323	0.40	7.2
2007	543	16,009	8,696	3,204	8,416	2,596	22,911	2,474	25,385	2007	25,385	0.40	7.2
2008	549	15,945	8,746	3,210	8,416	2,606	22,978	2,482	25,460	2008	25,460	0.40	7.3
2009	554	15,881	8,792	3,210	8,416	2,616	23,033	2,488	25,521	2009	25,521	0.40	7.3
2010	558	15,818	8,833	3,210	8,416	2,625	23,084	2,493	25,577	2010	25,577	0.40	7.3

Avg Annual Growth Rates												
1990-2010	0.5%	-0.4%	0.1%	-0.2%	0.2%	0.2%	0.1%	0.1%	0.1%		0.1%	0.1%
1990-2000	0.2%	-0.4%	-0.2%	-0.5%	0.3%	0.1%	-0.0%	-0.0%	-0.0%		-0.0%	-0.0%
2000-2010	0.7%	-0.4%	0.3%	0.1%	0.0%	0.3%	0.2%	0.2%	0.2%		0.2%	0.2%

Table 12: Metlakatla Low Case Forecast

Metlakatla Power and Light Load Forecast: BASE Case

YEAR	Residential			Small	Ind. &	Street,	Total	Loss/ Use	Total Energy Reqts	YEAR	Firm	Load Factor	Forecast
	# Cust	Use/Cust kWh	Sales MWh	Comm. Sales MWh	Special Sales MWh	Pub Auth Sales MWh					Energy MWh		Energy Reqs MWh
1988	460	17,178	7,902	3,229	8,146	2,427	21,704	2,344	24,048	1988	24,048	0.40	6.9
1989	484	17,273	8,357	3,352	8,146	2,477	22,332	2,412	24,743	1989	24,743	0.40	7.1
1990	509	17,273	8,786	3,402	8,146	2,528	22,862	2,469	25,331	1990	25,331	0.40	7.2
1991	516	17,273	8,920	3,467	8,416	2,544	23,347	2,521	25,869	1991	25,869	0.40	7.4
1992	517	17,273	8,929	3,513	8,416	2,545	23,403	2,528	25,931	1992	25,931	0.40	7.4
1993	514	17,273	8,874	3,591	8,416	2,538	23,419	2,529	25,948	1993	25,948	0.40	7.4
1994	511	17,273	8,819	3,679	8,416	2,532	23,446	2,532	25,978	1994	25,978	0.40	7.4
1995	508	17,273	8,777	3,725	8,416	2,527	23,445	2,532	25,978	1995	25,978	0.40	7.4
1996	512	17,273	8,837	3,785	8,416	2,534	23,572	2,546	26,118	1996	26,118	0.40	7.5
1997	518	17,273	8,943	3,845	8,416	2,546	23,751	2,565	26,316	1997	26,316	0.40	7.5
1998	524	17,273	9,045	3,904	8,416	2,558	23,923	2,584	26,506	1998	26,506	0.40	7.6
1999	530	17,273	9,151	3,967	8,416	2,570	24,104	2,603	26,707	1999	26,707	0.40	7.6
2000	536	17,273	9,257	4,034	8,416	2,582	24,289	2,623	26,913	2000	26,913	0.40	7.7
2001	542	17,273	9,354	4,085	8,416	2,593	24,448	2,640	27,089	2001	27,089	0.40	7.7
2002	547	17,273	9,447	4,130	8,416	2,603	24,596	2,656	27,252	2002	27,252	0.40	7.8
2003	551	17,273	9,525	4,176	8,416	2,612	24,729	2,671	27,399	2003	27,399	0.40	7.8
2004	556	17,273	9,599	4,236	8,416	2,620	24,871	2,686	27,557	2004	27,557	0.40	7.9
2005	560	17,273	9,673	4,309	8,416	2,628	25,026	2,703	27,729	2005	27,729	0.40	7.9
2006	566	17,273	9,770	4,392	8,416	2,638	25,216	2,723	27,939	2006	27,939	0.40	8.0
2007	572	17,273	9,881	4,479	8,416	2,650	25,426	2,746	28,172	2007	28,172	0.40	8.0
2008	579	17,273	10,006	4,572	8,416	2,664	25,658	2,771	28,429	2008	28,429	0.40	8.1
2009	587	17,273	10,144	4,659	8,416	2,678	25,898	2,797	28,695	2009	28,695	0.40	8.2
2010	595	17,273	10,278	4,736	8,416	2,693	26,123	2,821	28,944	2010	28,944	0.40	8.3
Avg Annual Growth Rates													
1990-2010	0.8%	0.0%	0.8%	1.7%	0.2%	0.3%	0.7%	0.7%	0.7%		0.7%		0.7%
1990-2000	0.5%	0.0%	0.5%	1.7%	0.3%	0.2%	0.6%	0.6%	0.6%		0.6%		0.6%
2000-2010	1.1%	0.0%	1.1%	1.6%	0.0%	0.4%	0.7%	0.7%	0.7%		0.7%		0.7%

Table 13: Metlakatla Base Case Forecast

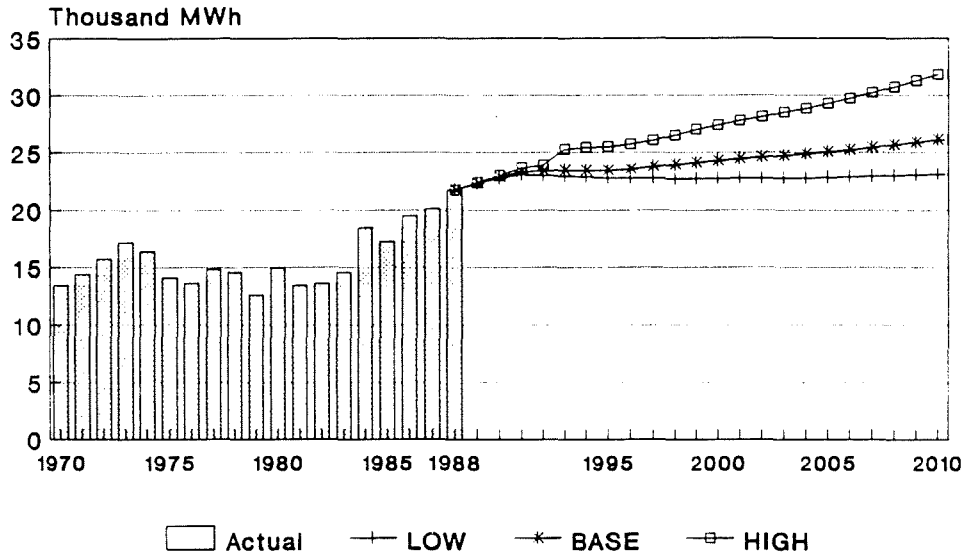
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Metlakatla Power and Light Load Forecast: HIGH Case

YEAR	Residential			Small Comm.	Ind. & Special	Street, Pub Auth	Total Sales	Loss/Use	Total Energy Reqts	YEAR	Firm Energy Reqts	Load Factor	Forecast Peak Demand
	# Cust	Use/Cust kWh	Sales MWh	Sales MWh	Sales MWh	Sales MWh	Sales MWh	MWh	MWh		MWh	MWh	MWh
1988	460	17,178	7,902	3,229	8,146	2,427	21,704	2,344	24,048	1988	24,048	0.40	6.9
1989	484	17,342	8,385	3,352	8,146	2,477	22,360	2,415	24,775	1989	24,775	0.40	7.1
1990	509	17,411	8,866	3,474	8,146	2,529	23,015	2,486	25,500	1990	25,500	0.40	7.3
1991	518	17,481	9,051	3,662	8,416	2,546	23,676	2,557	26,233	1991	26,233	0.40	7.5
1992	520	17,551	9,125	3,805	8,416	2,550	23,897	2,581	26,477	1992	26,477	0.40	7.6
1993	520	17,622	9,171	3,963	9,616	2,552	25,302	2,733	28,034	1993	28,034	0.40	8.0
1994	520	17,692	9,198	4,091	9,616	2,550	25,456	2,749	28,206	1994	28,206	0.40	8.0
1995	513	17,763	9,107	4,214	9,616	2,536	25,473	2,751	28,224	1995	28,224	0.40	8.1
1996	515	17,834	9,191	4,348	9,616	2,542	25,697	2,775	28,472	1996	28,472	0.40	8.1
1997	526	17,906	9,415	4,483	9,616	2,562	26,076	2,816	28,893	1997	28,893	0.40	8.2
1998	538	17,978	9,674	4,642	9,616	2,586	26,518	2,864	29,382	1998	29,382	0.40	8.4
1999	551	18,050	9,954	4,819	9,616	2,612	27,001	2,916	29,917	1999	29,917	0.40	8.5
2000	560	18,122	10,154	4,967	9,616	2,629	27,365	2,955	30,321	2000	30,321	0.40	8.7
2001	570	18,195	10,370	5,145	9,616	2,647	27,777	3,000	30,777	2001	30,777	0.40	8.8
2002	578	18,268	10,563	5,300	9,616	2,662	28,141	3,039	31,180	2002	31,180	0.40	8.9
2003	585	18,341	10,737	5,452	9,616	2,675	28,481	3,076	31,557	2003	31,557	0.40	9.0
2004	593	18,414	10,913	5,645	9,616	2,689	28,863	3,117	31,980	2004	31,980	0.40	9.1
2005	601	18,488	11,105	5,868	9,616	2,703	29,293	3,164	32,456	2005	32,456	0.40	9.3
2006	610	18,562	11,314	6,095	9,616	2,719	29,744	3,212	32,957	2006	32,957	0.40	9.4
2007	619	18,637	11,533	6,341	9,616	2,736	30,227	3,264	33,491	2007	33,491	0.40	9.6
2008	629	18,711	11,775	6,612	9,616	2,754	30,757	3,322	34,079	2008	34,079	0.40	9.7
2009	641	18,786	12,033	6,884	9,616	2,774	31,306	3,381	34,688	2009	34,688	0.40	9.9
2010	652	18,862	12,303	7,145	9,616	2,794	31,858	3,441	35,299	2010	35,299	0.40	10.1
Avg Annual Growth Rates													
1990-2010	1.2%	0.4%	1.7%	3.7%	0.8%	0.5%	1.6%	1.6%	1.6%		1.6%		1.6%
1990-2000	1.0%	0.4%	1.4%	3.6%	1.7%	0.4%	1.7%	1.7%	1.7%		1.7%		1.7%
2000-2010	1.5%	0.4%	1.9%	3.7%	0.0%	0.6%	1.5%	1.5%	1.5%		1.5%		1.5%

Table 14: Metlakatla High Case Forecast

Metlakatla Power & Light Forecast Total Sales



Metlakatla Power & Light Forecast Peak Load

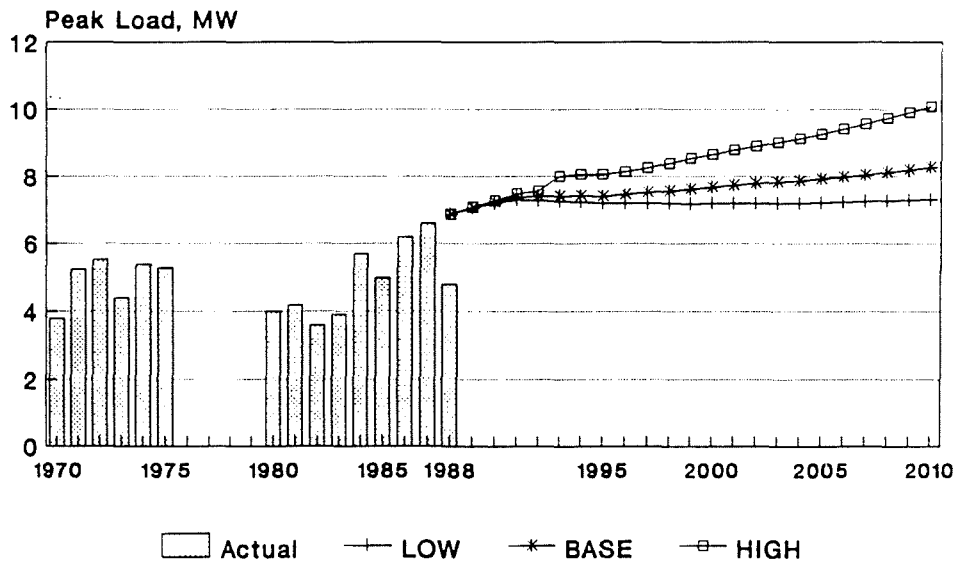
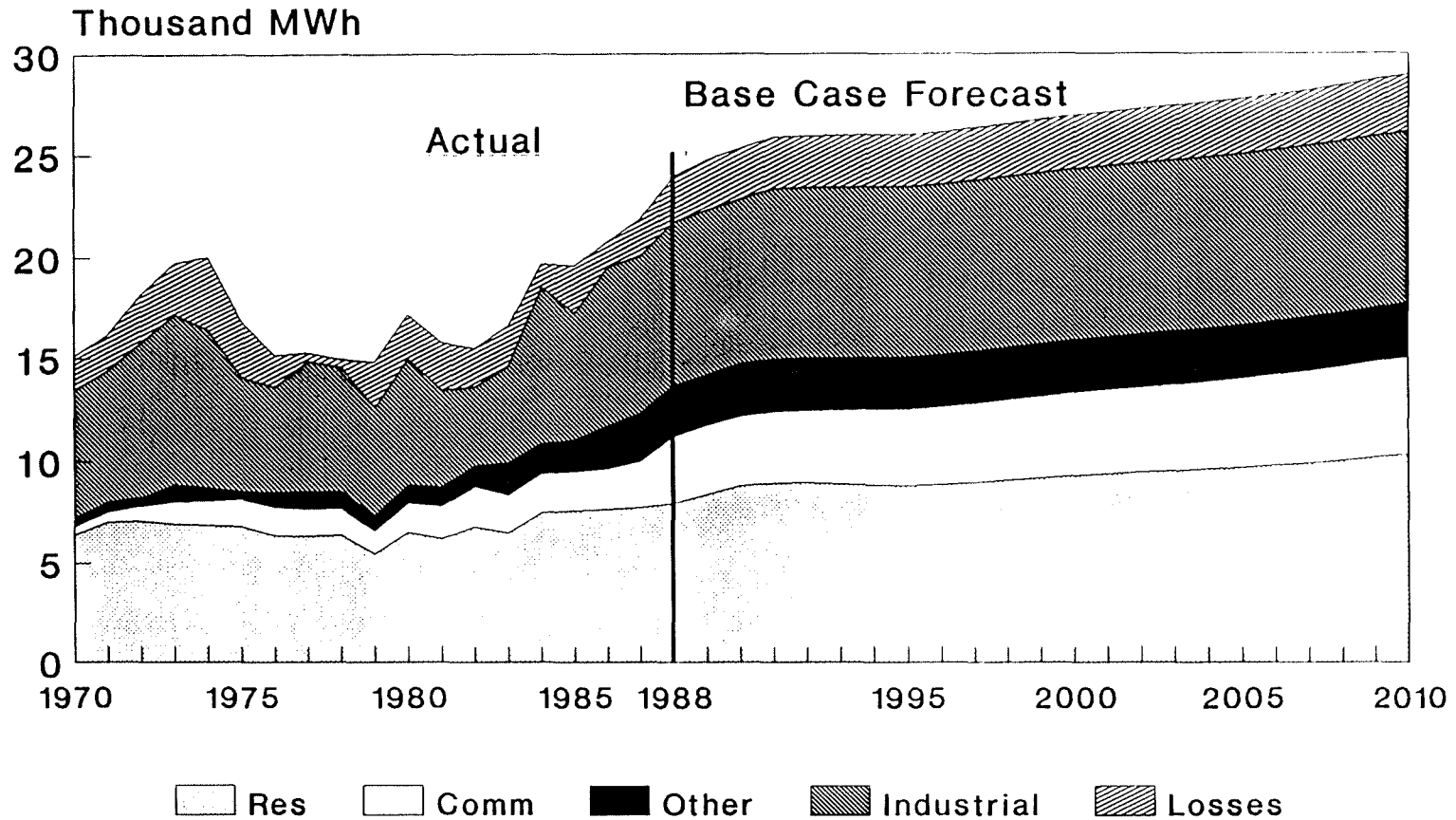


Figure 11: Metlakatla Sales and Peak Load Forecast

Metlakatla Power & Light Requirements: Base Case

Figure 12: Metlakatla Base Case Forecast by Class



3.4 Petersburg Load Forecast

3.4.1 Economy

With a fishing fleet of perhaps 400 boats and several of Alaska's largest fish processing plants, Petersburg (1988 population: 3178) has historically relied on the ocean to support itself. Table 15 and figure 13 show historical employment and population data for the Wrangell-Petersburg Census Area. Figure 14 shows 1988 employment by industry and season for the City of Petersburg, and illustrates the seasonal nature of the fish processing industry. (Fish processing employment is classified under manufacturing). Petersburg Power and Light peaks in the summer from the fish plants' demand for motor power, refrigeration, and freezing.

3.4.2 Residential Use

Historical data for Petersburg Municipal Power and Light (PMPL) is shown in table 16. Petersburg residential use per customer has been declining at an average annual rate of 1.0 percent from 1970 through 1986 (see figure 7). This average reflects a relatively significant decline between 1970 and 1979, followed by an average decline of only .2 percent from 1979 through 1986.

Analysis of Petersburg residential use is complicated by the changing status of sales to individual boat harbor customers. Prior to 1987²³, these customers were treated as part of the residential class. They were removed and placed in a separate class beginning in 1987. It appears that calendar year 1987 statistics are inaccurate due to this movement. We therefore obtained fiscal year and monthly data for 1987 and 1988. These data show that the effect of removing harbor customers from the residential class is to increase use per customer by 21 percent, from 6553 (FY87) to 7919 (FY88). The calendar year 1988 figure, 8036, suggests that this higher number is stable.

Because of the complications introduced by the harbor statistics, it is inappropriate to base a forecast on a simple time trend fitted to historical data. Instead, we assume per customer growth consistent with Ketchikan: .4, 0 and -.2 percent annual increases in use per customer for the High, Base, and Low cases, respectively.

Petersburg's load factor has been relatively constant at an average of .584 between 1980 and 1988. This is due largely to the fact that the Petersburg system peaks in the summer when fish processing is in full swing. At this time the random factor of weather is minimized. We have projected peak load for Petersburg using a load factor of .58.

²³According to Don Schmidt of PMPL, harbor customers were always included in the residential class prior to 1987. However, sales data compiled by the Federal Alaska Power Administration and now maintained by the AEA show some separate "Harbor" sales statistics for some of the early 1970s. This exclusion of harbor sales from the residential totals at this time might provide an explanation for the drop in use per customer seen at the end of the 1970s.

Historical Economic Data for WRANGELL-PETERSBURG Census Area

WRANGELL-PETERSBURG EMPLOYMENT (000)	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 (1)	Avg Annual Growth
											1980-88
Mining	0	NA	0	0	0	0	0	0	0	0	ERR
Construction	164	243	221	352	265	323	172	104	92	66	-7.0%
Manufacturing (2)	1,361	1,042	844	631	488	466	608	900	999	641	-3.8%
Transp/Commun/Util	164	135	158	178	183	185	150	142	174	162	0.7%
Wholesale Trade	NA	NA	4	10	9	8	7	5	4	4	NA
Retail Trade	312	343	357	375	359	359	365	375	389	382	2.8%
Fin/Insur/R Estate	33	44	45	45	58	55	64	61	56	67	7.0%
Services	187	181	198	213	210	211	224	222	269	275	4.6%
Federal Government	222	223	215	207	186	172	162	166	164	164	-3.7%
State Government	74	82	96	106	106	111	107	96	94	85	3.0%
Local Government	399	410	446	446	491	511	524	503	537	562	3.8%
Subtotal: Wage & Salary	2,970	2,772	2,631	2,605	2,403	2,452	2,451	2,631	2,816		-0.7%
Military	20	21	22	22	13	21	20	23	28		4.3%
Proprietors (3)	888	866	1,149	1,316	1,387	1,527	1,723	1,649	1,688		8.4%
TOTAL EMPLOYMENT	3,878	3,659	3,802	3,943	3,803	4,000	4,194	4,303	4,532		2.0%
EMPLOYMENT by SECTOR											
Manufacturing/Mining (2)	1,361	1,042	844	631	488	466	608	900	999		-3.8%
Infrastructure	328	378	379	529	448	508	322	247	266		-2.6%
Trade/Service/Finance (4)	531	568	604	642	636	633	659	663	717		3.8%
Fed Govt	242	244	237	229	199	193	182	189	192		-2.9%
State/Local Govt	473	492	542	552	597	622	631	599	631		3.7%
Proprietors (3)	888	866	1,149	1,316	1,387	1,527	1,723	1,649	1,688		8.4%
TOTAL EMPLOYMENT	3,878	3,659	3,802	3,943	3,803	4,000	4,194	4,303	4,532		2.0%
REAL PERSONAL INCOME (Million 1988 \$) and POPULATION											
	1980	1981	1982	1983	1984	1985	1986	1987	1988		Avg Annual Growth 1980-88
Real Pers. Inc., million 1988\$	113.13	108.25	106.66	123.09	101.95	125.91	134.36	146.87	158.09		4.3%
Population (BEA est.)	6,198	6,305	6,395	6,651	6,544	6,265	6,484	6,737	6,874		1.3%
Real Per Capita Income, 1988\$	18,252	17,168	16,678	18,507	15,579	20,097	20,721	21,801	22,998		2.9%

Notes:

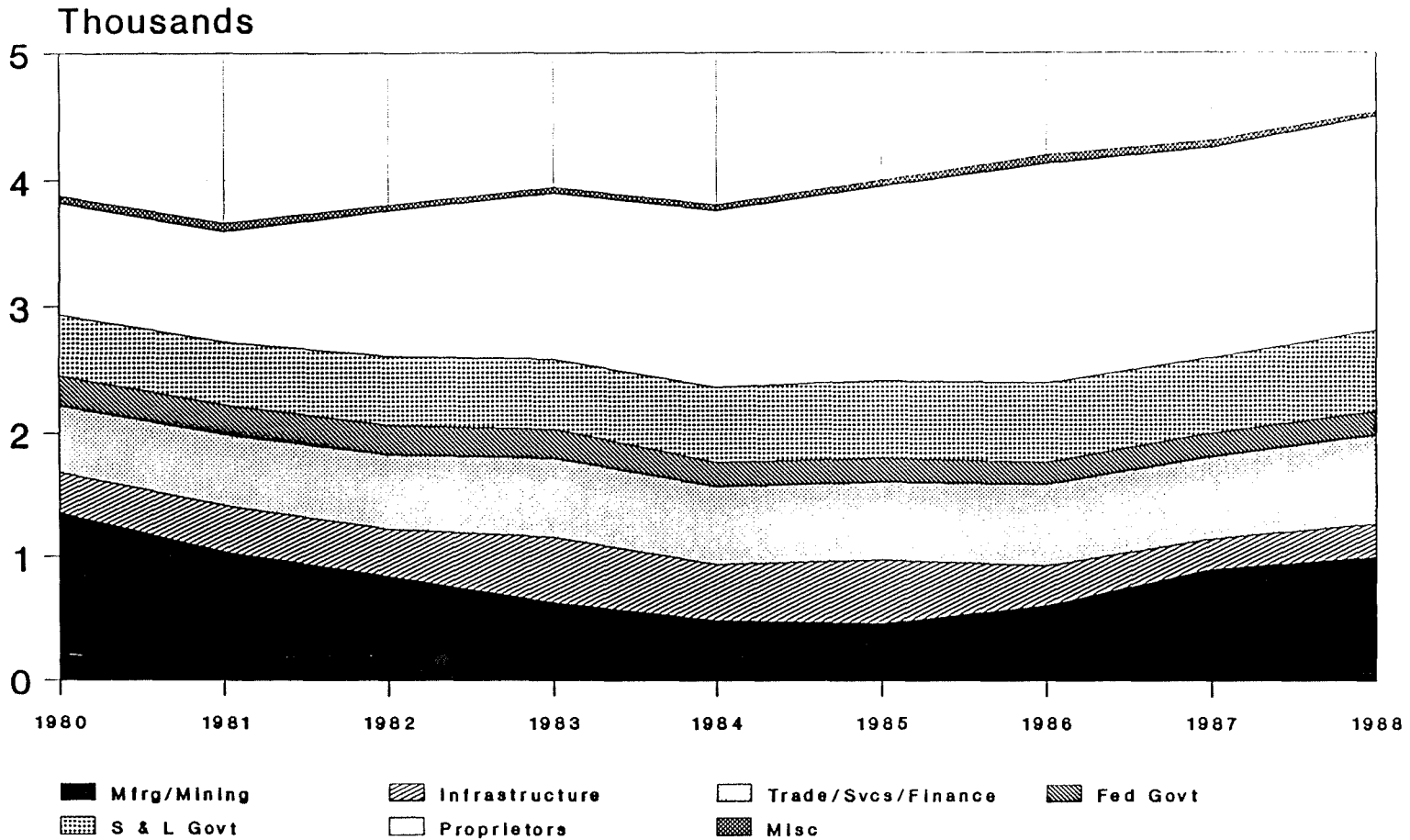
- (1) 1989 Data is average of first two quarters only
- (2) Manufacturing Sector includes Logging, Sawmills, Pulp Mills, and Fish Processing
- (3) Proprietors employment includes fish harvesting
- (4) Excludes wholesale trade (data not available)

Sources:

Employment by Industry from Ak. Dept. of Labor, Statistical Quarterly.
 Number of military from Ak. Dept. of Labor, Population Overview; Economic Trends, Nov. 1987;
 and faxed sheet from Neal Fried dated 3/5/1990.
 Number of proprietors from U.S. Dept. of Commerce, Bureau of Econ. Analysis, fiche 4/88 and printout 4/90
 Personal Income from U.S. Dept. of Commerce, BEA, Table CA5 Printouts of 11/89 and 4/90

Historical Employment Growth Wrangell-Petersburg Census Area

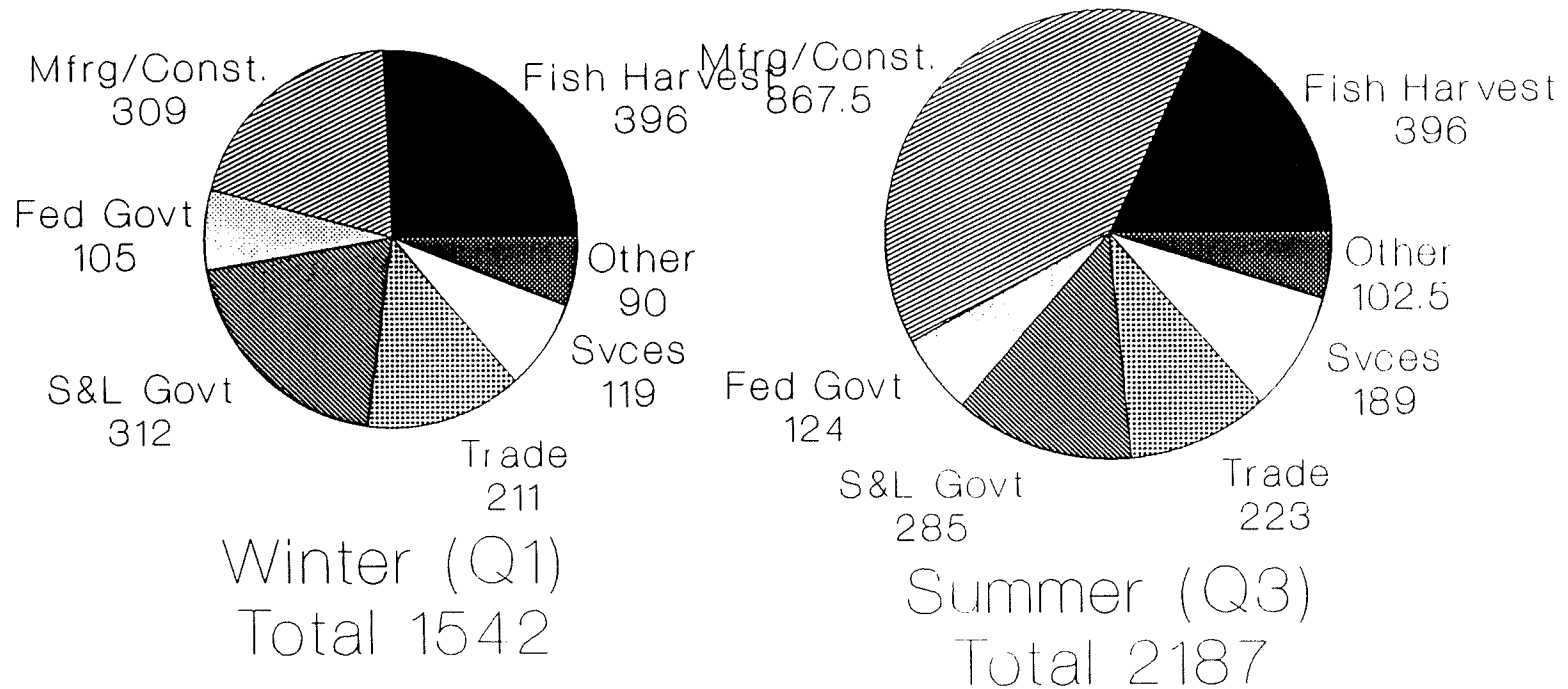
Figure 13: Historical Employment: Wrangell-Petersburg Census Area



1988 Employment: Petersburg Full Time Equivalent

Figure 14: 1988 Petersburg Employment

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ISER estimates from ADOL Data

Petersburg Power and Light Historical Load Data

YEAR	Residential		Commercial		Misc. & Harbor		Loss/Use MWh	Total Reqts MWh	YEAR	Peak Demand MW	Load Factor
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh	Sales MWh	Total Sales MWh					
1970	767	7,366	5,649	5,206	685	11,540	2,133	13,673	1970	NA	NA
1971	744	7,718	5,742	6,756	599	13,097	3,217	16,314	1971	2.9	0.65
1972	801	6,531	5,231	7,316	701	13,338	3,014	16,352	1972	3.0	0.62
1973	836	5,408	4,521	7,570	694	13,999	2,315	16,314	1973	3.2	0.58
1974	812	7,248	5,886	7,816	1,300	15,002	3,733	18,735	1974	3.5	0.61
1975	846	7,359	6,226	9,101	625	15,952	2,248	18,200	1975	3.3	0.64
1976	858	7,489	6,426	9,825	572	16,823	1,279	18,102	1976	3.7	0.56
1977	922	7,172	6,613	11,392	418	18,423	920	19,343	1977	3.8	0.59
1978	985	7,179	7,071	11,645	431	19,147	(80)	19,067	1978	4.0	0.54
1979	1,096	6,361	6,972	11,532	153	18,657	1,831	20,488	1979	4.2	0.56
1980	1,147	6,355	7,289	11,232	0	18,522	1,949	20,471	1980	4.2	0.56
1981	1,155	6,148	7,101	10,913	0	18,014	2,068	20,082	1981	4.2	0.55
1982	1,160	6,450	7,482	12,139	0	19,621	1,693	21,314	1982	4.3	0.57
1983	1,206	6,302	7,600	12,228	1	19,829	2,129	21,958	1983	4.7	0.53
1984	1,268	6,420	8,140	13,857	(0)	21,997	283	22,280	1984	4.8	0.53
1985	1,378	6,414	8,839	14,723	(0)	23,562	3,013	26,575	1985	5.6	0.54
1986	1,394	6,270	8,740	17,175	(0)	25,915	4,754	30,669	1986	5.7	0.61
1987	1,399	6,673	9,336	15,710	216	25,048	1,880	26,928	1987	5.8	0.53
1988	1,145	8,036	9,201	16,105	521	25,825	3,873	29,698	1988	5.8	0.59
Avg Annual Growth Rates											
1970-1988	2.3%	0.5%	2.7%	6.5%	-1.5%	4.6%	3.4%	4.4%	1971-1988	4.2%	-0.6%
1970-1980	4.1%	-1.5%	2.6%	8.0%	-52.5%	4.8%	-0.9%	4.1%	1971-1980	4.4%	-1.8%
1980-1988	-0.0%	3.0%	3.0%	4.6%	145.1%	4.2%	9.0%	4.8%	1980-1988	4.0%	0.7%

Table 16: Petersburg Historical Utility Data

3.4.3 Major Single Electric Loads

The Pacific Fisheries International cold storage plant is the largest single user, consuming 3504 MWh in 1988, equal to about 20% of total commercial/industrial consumption. Other large users include PFI's cannery, several other smaller fish processors, the Blind Slough fish hatchery, and the larger public buildings. None of these facilities is likely to generate their own power in the foreseeable future.

3.4.4 Scenario Assumptions

All Cases

- Load Factor: .58
- Loss/Use Factor: 14.2% of sales

Base Case

- Employment growth: -.2%
- Residential kWh/cust growth: 0.0% (1979-88 Trend)
- Commercial MWh/employee: 1.6% per year increase (half historical trend)

Total employment is driven down by a decline in logging jobs on Native lands.

Low Case

- Employment growth: -.8%
- Residential kWh/cust growth: -.2%
- Commercial MWh/employee: 0% per year increase

Total employment drops due to a decline in logging jobs on both Native and Tongass National Forest lands.

High Case

- Employment growth: .8%
- Residential kWh/cust growth: .4%
- Commercial MWh/employee: 3.2% per year increase (1970-87 trend value)

The Chatham Cannery (owned by Ocean Beauty Seafoods/ Sealaska) is successfully sold and the buyer expands operations by a factor of two, adding 1050 MWh to annual energy sales beginning in 1992, and adding 24 jobs to the economy. Tourist visits increase 5% annually, vs 3% in the Base case. Logging employment is 10% higher than Base case due to strong demand for minimally processed logs from the Tongass forest to replace Native round log exports.

Petersburg Municipal Power and Light Load Forecast: LOW Case

YEAR	Residential		Commercial		Harbor Sales MWh	Total Sales MWh	Loss/Use MWh	Total Reqts MWh	YEAR	Firm Energy Reqts MWh	Load Factor	Forecast Peak Demand MW
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh								
1988	1,145	8,036	9,201	16,106	446	25,753	3,657	29,410	1988	29,410	0.58	5.8
1989	1,151	8,020	9,233	16,888	446	26,568	3,773	30,341	1989	30,341	0.58	6.0
1990	1,188	8,004	9,508	16,961	449	26,918	3,822	30,741	1990	30,741	0.58	6.1
1991	1,190	7,988	9,504	16,720	449	26,673	3,788	30,461	1991	30,461	0.58	6.0
1992	1,179	7,972	9,396	16,402	449	26,246	3,727	29,973	1992	29,973	0.58	5.9
1993	1,162	7,956	9,241	16,412	447	26,101	3,706	29,807	1993	29,807	0.58	5.9
1994	1,143	7,940	9,076	16,635	446	26,157	3,714	29,871	1994	29,871	0.58	5.9
1995	1,126	7,924	8,926	16,614	445	25,985	3,690	29,675	1995	29,675	0.58	5.8
1996	1,126	7,908	8,901	16,730	445	26,076	3,703	29,778	1996	29,778	0.58	5.9
1997	1,125	7,892	8,879	16,588	444	25,911	3,679	29,591	1997	29,591	0.58	5.8
1998	1,121	7,877	8,830	16,508	444	25,783	3,661	29,444	1998	29,444	0.58	5.8
1999	1,115	7,861	8,767	16,482	444	25,692	3,648	29,340	1999	29,340	0.58	5.8
2000	1,117	7,845	8,765	16,651	444	25,860	3,672	29,532	2000	29,532	0.58	5.8
2001	1,123	7,829	8,789	16,672	444	25,906	3,679	29,584	2001	29,584	0.58	5.8
2002	1,128	7,814	8,817	16,672	445	25,934	3,683	29,617	2002	29,617	0.58	5.8
2003	1,134	7,798	8,845	16,683	445	25,973	3,688	29,662	2003	29,662	0.58	5.8
2004	1,141	7,782	8,881	16,709	446	26,036	3,697	29,733	2004	29,733	0.58	5.9
2005	1,149	7,767	8,923	16,751	446	26,121	3,709	29,830	2005	29,830	0.58	5.9
2006	1,156	7,751	8,958	16,804	447	26,209	3,722	29,931	2006	29,931	0.58	5.9
2007	1,164	7,736	9,001	16,878	448	26,326	3,738	30,064	2007	30,064	0.58	5.9
2008	1,172	7,720	9,051	16,930	448	26,429	3,753	30,182	2008	30,182	0.58	5.9
2009	1,180	7,705	9,089	16,940	449	26,478	3,760	30,238	2009	30,238	0.58	6.0
2010	1,187	7,690	9,127	16,961	449	26,538	3,768	30,306	2010	30,306	0.58	6.0
Avg Annual Growth Rates												
1990-2010	-0.0%	-0.2%	-0.2%	0.0%	-0.0%	-0.1%	-0.1%	-0.1%		-0.1%		-0.1%
1990-2000	-0.6%	-0.2%	-0.8%	-0.2%	-0.1%	-0.4%	-0.4%	-0.4%		-0.4%		-0.4%
2000-2010	0.6%	-0.2%	0.4%	0.2%	0.1%	0.3%	0.3%	0.3%		0.3%		0.3%

Table 17: Petersburg Low Case Forecast

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Petersburg Municipal Power and Light Load Forecast: BASE Case

YEAR	Residential		Commercial		Harbor Sales MWh	Total Sales MWh	Loss/Use MWh	Total Reqts MWh	YEAR	Firm Energy	Load Factor	Forecast
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh						Reqts MWh		Peak Demand MW
1988	1,145	8,036	9,201	16,106	446	25,753	3,657	29,410	1988	29,410	0.58	5.8
1989	1,151	8,036	9,252	16,893	446	26,592	3,776	30,368	1989	30,368	0.58	6.0
1990	1,188	8,036	9,546	17,256	449	27,251	3,870	31,121	1990	31,121	0.58	6.1
1991	1,193	8,036	9,585	17,513	450	27,548	3,912	31,460	1991	31,460	0.58	6.2
1992	1,187	8,036	9,538	17,576	449	27,563	3,914	31,477	1992	31,477	0.58	6.2
1993	1,174	8,036	9,432	17,927	448	27,807	3,949	31,756	1993	31,756	0.58	6.3
1994	1,162	8,036	9,334	18,342	447	28,123	3,994	32,117	1994	32,117	0.58	6.3
1995	1,153	8,036	9,268	18,482	447	28,196	4,004	32,200	1995	32,200	0.58	6.3
1996	1,154	8,036	9,275	18,822	447	28,544	4,053	32,597	1996	32,597	0.58	6.4
1997	1,160	8,036	9,322	19,174	447	28,943	4,110	33,053	1997	33,053	0.58	6.5
1998	1,166	8,036	9,373	19,526	448	29,347	4,167	33,514	1998	33,514	0.58	6.6
1999	1,174	8,036	9,432	19,927	448	29,808	4,233	34,041	1999	34,041	0.58	6.7
2000	1,182	8,036	9,499	20,331	449	30,278	4,300	34,578	2000	34,578	0.58	6.8
2001	1,191	8,036	9,569	20,678	450	30,697	4,359	35,056	2001	35,056	0.58	6.9
2002	1,199	8,036	9,632	20,955	450	31,037	4,407	35,444	2002	35,444	0.58	7.0
2003	1,205	8,036	9,687	21,254	451	31,392	4,458	35,849	2003	35,849	0.58	7.1
2004	1,211	8,036	9,734	21,618	451	31,803	4,516	36,319	2004	36,319	0.58	7.1
2005	1,217	8,036	9,781	22,075	452	32,308	4,588	36,895	2005	36,895	0.58	7.3
2006	1,226	8,036	9,851	22,590	452	32,893	4,671	37,564	2006	37,564	0.58	7.4
2007	1,237	8,036	9,937	23,142	453	33,532	4,762	38,294	2007	38,294	0.58	7.5
2008	1,249	8,036	10,039	23,719	454	34,212	4,858	39,071	2008	39,071	0.58	7.7
2009	1,262	8,036	10,145	24,280	455	34,880	4,953	39,833	2009	39,833	0.58	7.8
2010	1,276	8,036	10,255	24,795	456	35,505	5,042	40,547	2010	40,547	0.58	8.0

Avg Annual Growth Rates												
1990-2010	0.4%	0.0%	0.4%	1.8%	0.1%	1.3%	1.3%	1.3%		1.3%		1.3%
1990-2000	-0.0%	0.0%	-0.0%	1.7%	-0.0%	1.1%	1.1%	1.1%		1.1%		1.1%
2000-2010	0.8%	0.0%	0.8%	2.0%	0.2%	1.6%	1.6%	1.6%		1.6%		1.6%

Table 18: Petersburg Base Case Forecast

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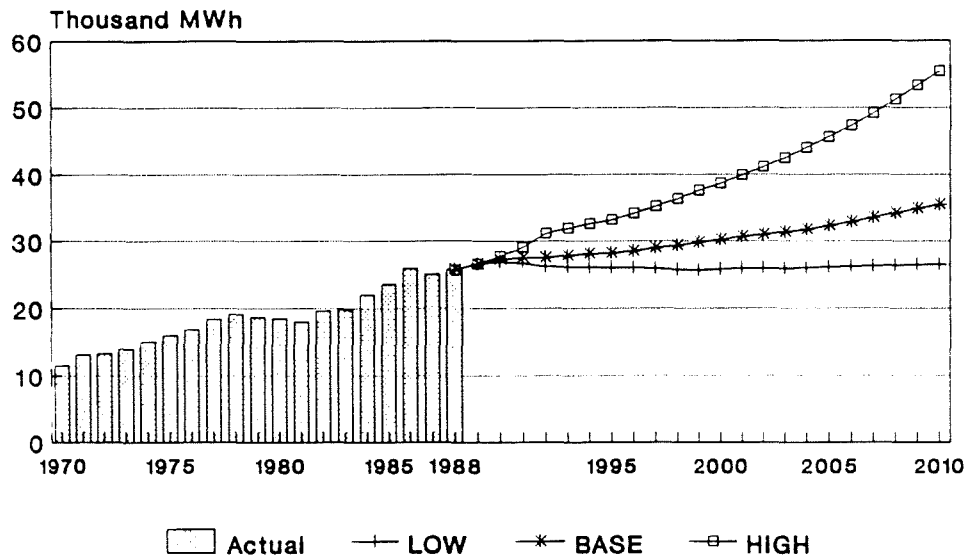
Petersburg Municipal Power and Light Load Forecast: HIGH Case

YEAR	Residential		Commercial		Harbor Sales MWh	Total Sales MWh	Loss/Use MWh	Total Reqts MWh	YEAR	Firm Energy Reqts MWh	Load Factor	Forecast Peak Demand MW
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh								
1988	1,145	8,036	9,201	16,106	446	25,753	3,657	29,410	1988	29,410	0.58	5.8
1989	1,151	8,068	9,289	16,909	446	26,644	3,784	30,428	1989	30,428	0.58	6.0
1990	1,190	8,100	9,638	17,680	449	27,768	3,943	31,711	1990	31,711	0.58	6.2
1991	1,207	8,133	9,819	18,774	451	29,044	4,124	33,168	1991	33,168	0.58	6.5
1992	1,224	8,165	9,998	20,700	452	31,150	4,423	35,574	1992	35,574	0.58	7.0
1993	1,225	8,198	10,046	21,456	452	31,954	4,537	36,491	1993	36,491	0.58	7.2
1994	1,221	8,231	10,046	22,127	452	32,625	4,633	37,257	1994	37,257	0.58	7.3
1995	1,203	8,264	9,941	22,845	450	33,236	4,720	37,956	1995	37,956	0.58	7.5
1996	1,207	8,297	10,013	23,695	451	34,159	4,851	39,009	1996	39,009	0.58	7.7
1997	1,228	8,330	10,228	24,531	452	35,211	5,000	40,211	1997	40,211	0.58	7.9
1998	1,250	8,363	10,456	25,485	454	36,395	5,168	41,563	1998	41,563	0.58	8.2
1999	1,272	8,397	10,678	26,468	456	37,602	5,339	42,942	1999	42,942	0.58	8.5
2000	1,283	8,430	10,820	27,355	456	38,631	5,486	44,116	2000	44,116	0.58	8.7
2001	1,299	8,464	10,995	28,455	458	39,907	5,667	45,574	2001	45,574	0.58	9.0
2002	1,313	8,498	11,159	29,492	459	41,110	5,838	46,947	2002	46,947	0.58	9.2
2003	1,332	8,532	11,362	30,669	460	42,490	6,034	48,524	2003	48,524	0.58	9.6
2004	1,350	8,566	11,566	31,978	461	44,005	6,249	50,254	2004	50,254	0.58	9.9
2005	1,368	8,600	11,763	33,421	462	45,646	6,482	52,128	2005	52,128	0.58	10.3
2006	1,387	8,634	11,974	34,913	464	47,351	6,724	54,075	2006	54,075	0.58	10.6
2007	1,407	8,669	12,199	36,534	465	49,198	6,986	56,185	2007	56,185	0.58	11.1
2008	1,431	8,704	12,452	38,308	466	51,226	7,274	58,500	2008	58,500	0.58	11.5
2009	1,456	8,739	12,727	40,145	468	53,341	7,574	60,915	2009	60,915	0.58	12.0
2010	1,484	8,773	13,018	41,929	470	55,417	7,869	63,286	2010	63,286	0.58	12.5
Avg Annual Growth Rates												
1990-2010	1.1%	0.4%	1.5%	4.4%	0.2%	3.5%	3.5%	3.5%		3.5%		3.5%
1990-2000	0.8%	0.4%	1.2%	4.5%	0.2%	3.4%	3.4%	3.4%		3.4%		3.4%
2000-2010	1.5%	0.4%	1.9%	4.4%	0.3%	3.7%	3.7%	3.7%		3.7%		3.7%

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Table 19: Petersburg High Case Forecast

Petersburg Power & Light Forecast Total Sales



Petersburg Power & Light Forecast Peak Load

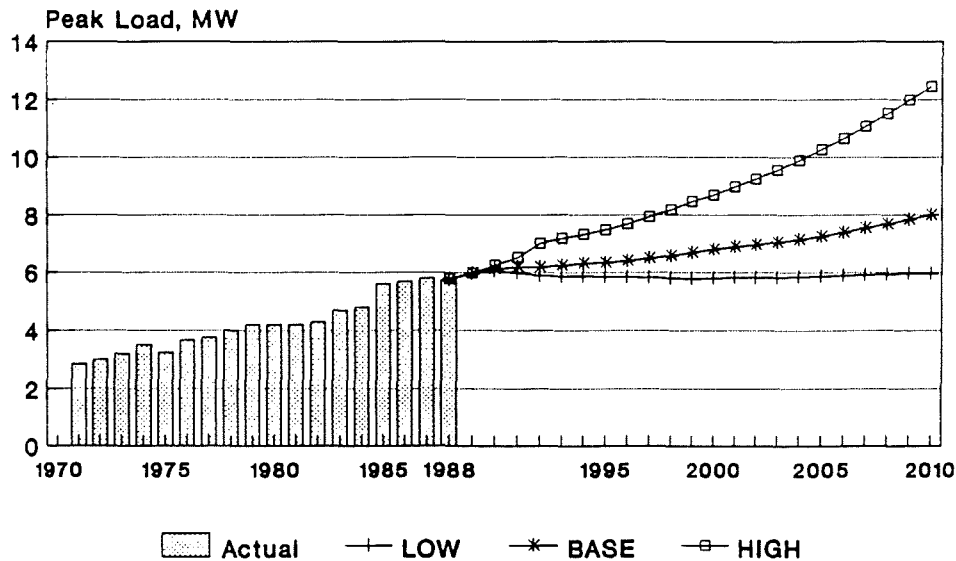
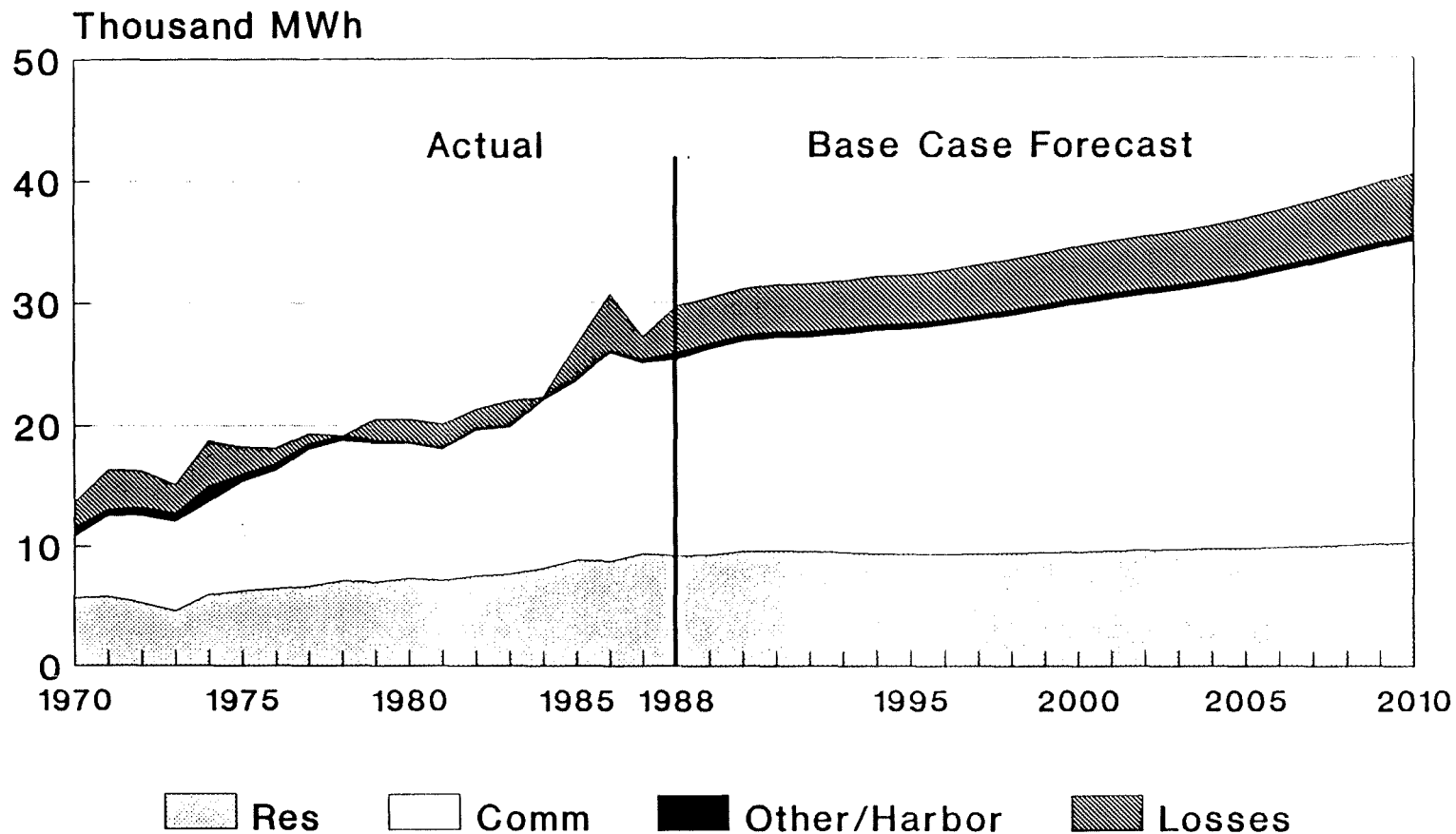


Figure 15: Petersburg Sales and Peak Load Forecast

Petersburg Power & Light Requirements: Base Case

Figure 16: Petersburg Base Case Forecast by Class



ISER FCST_P.WK1

3.5 Wrangell Load Forecast

3.5.1 *Economy*

Figure 17 shows estimated 1988 employment by industry and season for Wrangell. (Refer also to historical data for the Wrangell-Petersburg Census Area presented with the Petersburg forecast). Like Petersburg, Wrangell is dependent on fishing and tourism for the much of its economic base. Unlike its northern neighbor, however, Wrangell also benefits from a sawmill and is enjoying a new life as a staging area for mining activity just across the Canadian border, at the Johnny Mountain and Snip deposits. This activity has been felt in Wrangell largely as a demand for airport and logistical services. City economic development director Jim Gove estimates that support activity related to mining generated 24 direct new jobs during the last two years as international flight operations have soared from 3,600 (1987) to 7,372 (1989). Gove does not expect an actual influx of miners as a result of this new development; they commute from Canadian cities such as Vancouver.

The Wrangell Forest Products lumber mill has recently been purchased by the Alaska Pulp Company, owners of the Sitka pulp mill. WFP currently operates a sawmill and a planer on one concurrent shift, according to plant manager Rick Klinke. WFP may split shifts when they begin self-generating this spring, but overall output is expected to remain constant for the foreseeable future. The WFP mill employs about 150 people, and is not expected to reduce operations significantly due to the decline in timber harvests from Native lands. Its timber supply is primarily derived from APC's long term contract for Tongass timber, which does not expire until 2011.

3.5.2 *Residential Use*

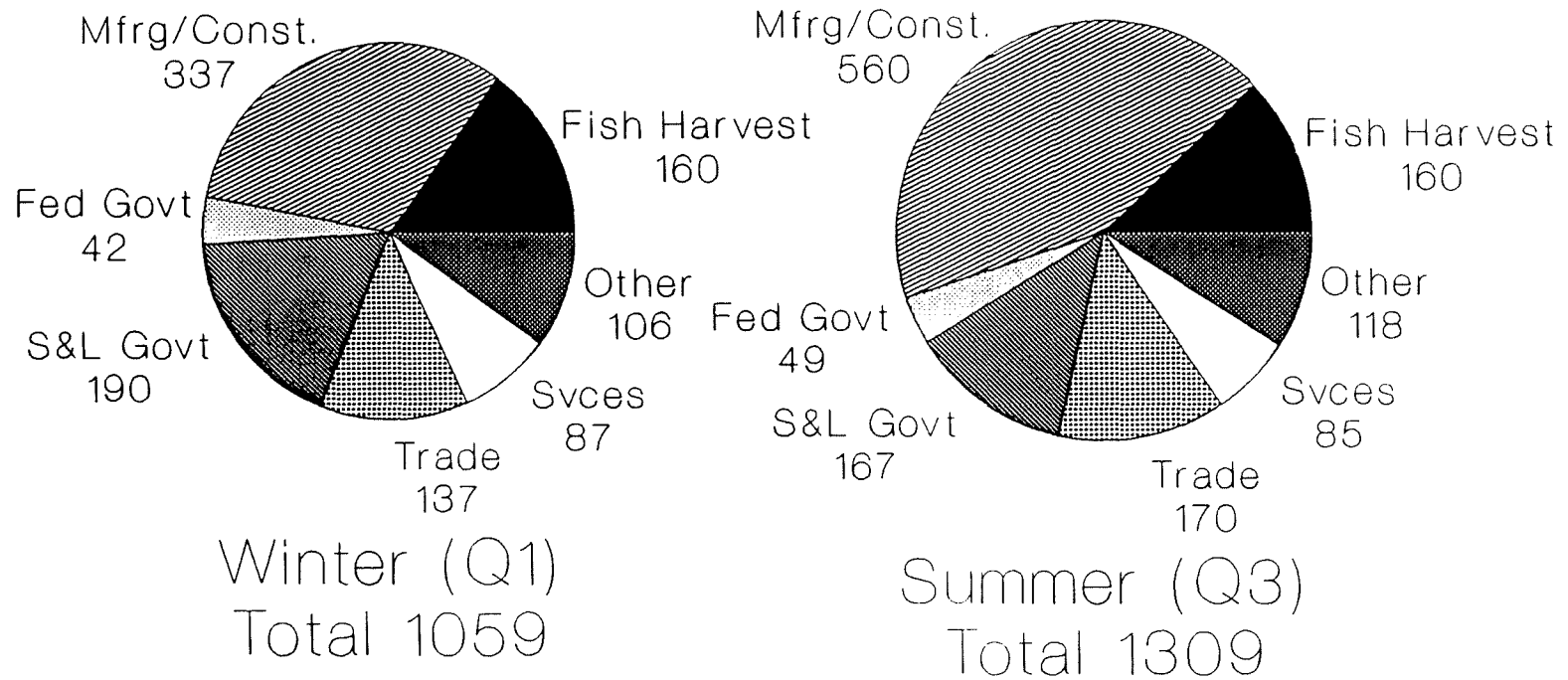
Table 20 shows historical data for Wrangell Power and Light. Wrangell residential use per customer was constant between 1971 and 1985, but has increased 31% between 1985 and 1988. These data are consistent with a decrease in the real price of residential electricity caused by a drop in diesel prices and the substitution of Tyee hydropower for diesel.

The Wrangell residential use per customer data are consistent with a regression equation using the average real price of electricity and real per capita personal income as explanatory variables. The equation is presented in Appendix B.

1988 Employment: Wrangell Full Time Equivalent

Figure 17: 1988 Wrangell Employment by Industry

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ISER estimates from ADOL Data

Wrangell Power and Light Historical Load Data

YEAR	Residential				Commercial			Industrial			Firm (1)		
	# Cust	Use/Cust kwh	Sales MWh	Avg Price 1988\$/kwh	Sales MWh	WFP Sales MWh	City Sales MWh	Total Sales MWh	Loss/ Use MWh	Total Reqts MWh	YEAR	Peak Demand MWh	Firm Load Factor
1970	536	5,192	2,783	0.126	3,231	56	467	6,537	662	7,199	1970	1.7	0.48
1971	543	5,468	2,969	0.127	3,595	42	546	7,152	1,123	8,275	1971	2.1	0.45
1972	706	4,559	3,219	0.127	3,844	24	158	7,245	1,753	8,998	1972	2.3	0.45
1973	715	4,792	3,426	0.123	3,978	24	291	7,719	2,005	9,724	1973	2.3	0.48
1974	750	4,796	3,597	0.135	4,392	583	333	8,906	1,399	10,305	1974	2.2	0.50
1975	775	4,937	3,826	0.147	4,085	584	455	8,957	1,796	10,753	1975	2.6	0.45
1976	769	5,035	3,872	0.146	3,980	500	460	8,813	2,860	11,673	1976	2.7	0.47
1977	804	4,871	3,916	0.144	4,143	660	446	9,165	3,569	12,734	1977	3.0	0.46
1978	785	4,855	3,811	0.145	5,173	676	797	10,457	3,628	14,085	1978	3.0	0.51
1979	780	4,728	3,688	0.146	5,363	744	731	10,527	3,714	14,241	1979	3.1	0.50
1980	794	4,691	3,725	0.196	6,054	757	733	11,266	2,037	13,303	1980	3.0	0.48
1981	729	5,218	3,804	0.183	5,440	1,223	742	11,208	1,984	13,192	1981	2.8	0.49
1982	839	5,125	4,300	0.173	4,471	1,785	814	11,370	2,131	13,501	1982	3.0	0.45
1983	893	5,105	4,559	0.172	4,645	1,392	822	11,418	1,478	12,896	1983	2.6	0.51
1984	890	5,294	4,712	0.165	5,245	981	910	11,855	689	12,544	1984	3.0	0.44
1985	984	5,098	5,016	0.158	5,874	793	992	12,679	NA	NA	1985	3.6	NA
1986	936	5,529	5,175	0.141	NA	NA	1,992	13,238	NA	NA	1986	2.5	NA
1987	846	6,473	5,476	0.103	6,378	4,638	1,926	18,417	1,588	20,005	1987	2.6	0.67
1988	846	6,669	5,642	0.106	6,558	12,902	1,859	26,961	1,087	28,048	1988	2.8	0.62

Avg Annual Growth Rates												
1970-1988	2.6%	1.4%	4.0%	-0.9%	4.0%	35.3%	8.0%	8.2%	2.8%	7.8%	2.8%	1.4%
1970-1980	4.0%	-1.0%	3.0%	4.5%	6.5%	29.7%	4.6%	5.6%	11.9%	6.3%	5.8%	-0.0%
1980-1988	0.8%	4.5%	5.3%	-7.4%	1.0%	42.5%	12.3%	11.5%	-7.6%	9.8%	-0.9%	3.3%

Note: (1) Peak demands presented here do not reflect non-firm sales made to Wrangell Forest Products at time of system peak.

Table 20: Wrangell Historical Utility Data

3.5.3 Major Electric Loads and Prospects for Load Growth

Wrangell Forest Products, which purchased almost 13,000 MWh of interruptible energy in 1988, will begin generating its own power beginning in October 1990, according to plant manager Rick Klinke and Wrangell Utilities Manager Frank Fields. The WFP mill used to generate its own power prior to 1987, but had to stop due to environmental problems associated with burning wood waste. Self-generation by WFP will reduce industrial and special interruptible rate sales to an assumed "emergency" level of 500 MWh for the foreseeable future. Like Ketchikan Pulp Co. in Ketchikan, WFP will be generating power partly as a means of disposing of its sawmill wood waste. The company has installed extensive de-watering equipment to ensure that its wood waste will be burnable with a minimal amount of added fossil fuel and is now awaiting a permit from the Alaska Department of Environmental Conservation. Once the permit is granted, generation will begin. For the High case we assume that because of mechanical problems or favorable rates, the sawmill begins purchasing 9,000 MWh of economy energy again beginning in 1992.

In interpreting the historical data and load forecast, it is important to keep in mind that WFP's contribution to system peak load is not measured by Wrangell Power and Light. The peak loads forecast here and the data for 1987 and 1988 reflect only the peak demand associated with firm power sales. Utility staff suggest that the probable level of WFP load at the time the system peaks is between 4 and 5 MW.

Wrangell Utility staff foresee no major facility growth in the near future.

A private company, Bradfield Electric, has been planning for several years to construct a power line to connect the Tyee Lake hydro project to the mining sites at Johnny Mountain and Snip. According to company spokesman Gary Floyd,²⁴ the company is awaiting the opening of a third deposit which would have a load comparable to the Johnny Mountain and Snip sites (11,500 MWh/yr each). Until this additional load materializes, the line remains only marginally economic. Bradfield line sales of 33,000 MWh are presented with the High case results for the Wrangell area.

²⁴Personal Communication 3/7/90

3.5.4 Scenario Assumptions:

All Cases

- Load Factor: .55
- Loss/Use Factor: 10.0% of sales

Base Case

- Employment growth: -.2%
- Residential kWh/cust growth: -.1% (determined econometrically)
- Commercial MWh/employee: 1.6% per year increase (half historical trend)
- WFP sales: 500 MWh/year after 1991

Total employment is driven down by a decline in logging jobs on Native lands.

Low Case

- Employment growth: -.8%
- Residential kWh/cust growth: -.1% (determined econometrically)
- Commercial MWh/employee: 0% per year increase
- WFP sales: 500 MWh/year after 1991

Total employment drops due to a decline in logging jobs on both Native and Tongass National Forest lands.

High Case

- Employment growth: .8%
- Residential kWh/cust growth: 0.0% (determined econometrically)
- Commercial MWh/employee: 3.2% per year increase (1970-87 trend value)
- WFP sales: 9,500 MWh/year after 1991

In the high case we assume that a third feasible mineral deposit is opened for mining in the Johnny Mountain area. The Bradfield power line is constructed and delivers 33,000 MWh per year to the mines. Construction of the Bradfield road and dock at the head of Bradfield Canal reduces the logistical support operations conducted through the Wrangell airport, but these losses of economic activity are more than offset by general support sector activity in support of the new mines. The additional mining activity generates a net increase of the equivalent of 50 full time jobs held by Wrangell residents. Logging employment increases 10% from Base case levels due to a strong market for minimally processed logs from Tongass Forest lands to replace declining round log exports from Native lands.

Wrangell Municipal Power and Light Load Forecast: LOW Case

YEAR	Residential		Commercial			City	Total	Loss/	Total	YEAR	Firm	Load	Firm
	Use/Cust	Sales	Indust.	WFP	Energy						Peak		
# Cust	kWh	MWh	Sales	Sales	Sales	Sales	Sales	Use	Reqts	MWh	Factor	MW	
1988	846	6,571	5,559	6,558	13,353	1,857	27,327	2,733	30,060	1988	16,707	0.55	3.5
1989	851	6,611	5,624	6,907	13,853	1,862	28,247	2,825	31,071	1989	17,218	0.55	3.6
1990	878	6,607	5,799	6,940	6,951	1,892	21,581	2,158	23,740	1990	16,789	0.55	3.5
1991	879	6,536	5,746	6,832	1,500	1,893	15,972	1,597	17,569	1991	16,069	0.55	3.3
1992	871	6,507	5,667	6,690	500	1,884	14,741	1,474	16,215	1992	15,715	0.55	3.3
1993	858	6,498	5,577	6,695	500	1,871	14,642	1,464	16,107	1993	15,607	0.55	3.2
1994	845	6,510	5,498	6,794	500	1,856	14,648	1,465	16,113	1994	15,613	0.55	3.2
1995	832	6,462	5,378	6,785	500	1,842	14,506	1,451	15,956	1995	15,456	0.55	3.2
1996	832	6,466	5,377	6,837	500	1,842	14,556	1,456	16,012	1996	15,512	0.55	3.2
1997	831	6,455	5,366	6,773	500	1,841	14,480	1,448	15,928	1997	15,428	0.55	3.2
1998	828	6,454	5,346	6,738	500	1,838	14,421	1,442	15,864	1998	15,364	0.55	3.2
1999	824	6,454	5,318	6,726	500	1,833	14,377	1,438	15,815	1999	15,315	0.55	3.2
2000	825	6,467	5,338	6,802	500	1,835	14,474	1,447	15,922	2000	15,422	0.55	3.2
2001	829	6,465	5,362	6,811	500	1,839	14,513	1,451	15,964	2001	15,464	0.55	3.2
2002	834	6,471	5,395	6,811	500	1,844	14,550	1,455	16,005	2002	15,505	0.55	3.2
2003	838	6,467	5,420	6,816	500	1,849	14,584	1,458	16,043	2003	15,543	0.55	3.2
2004	843	6,468	5,453	6,827	500	1,854	14,635	1,463	16,098	2004	15,598	0.55	3.2
2005	849	6,471	5,493	6,846	500	1,861	14,700	1,470	16,170	2005	15,670	0.55	3.3
2006	854	6,477	5,531	6,870	500	1,866	14,767	1,477	16,244	2006	15,744	0.55	3.3
2007	860	6,480	5,570	6,903	500	1,872	14,846	1,485	16,330	2007	15,830	0.55	3.3
2008	866	6,481	5,614	6,926	500	1,880	14,919	1,492	16,411	2008	15,911	0.55	3.3
2009	872	6,481	5,649	6,931	500	1,885	14,965	1,496	16,461	2009	15,961	0.55	3.3
2010	877	6,482	5,685	6,940	500	1,891	15,016	1,502	16,517	2010	16,017	0.55	3.3
Avg Annual Growth Rates													
1990-2010	-0.0%	-0.1%	-0.1%	0.0%	-12.3%	-0.0%	-1.8%	-1.8%	-1.8%		-0.2%		-0.2%
1990-2000	-0.6%	-0.2%	-0.8%	-0.2%	-23.1%	-0.3%	-3.9%	-3.9%	-3.9%		-0.8%		-0.8%
2000-2010	0.6%	0.0%	0.6%	0.2%	0.0%	0.3%	0.4%	0.4%	0.4%		0.4%		0.4%

Table 21: Wrangell Low Case Forecast

Wrangell Municipal Power and Light Load Forecast: BASE Case

YEAR	Residential		Commercial		WFP	City	Total	Loss/ Use	Total Reqts	YEAR	Firm Energy Reqts	Load Factor	Firm Peak Demand MW
	Use/Cust kWh	----- Sales MWh	----- Sales MWh	----- Sales MWh									
1988	846	6,571	5,559	6,558	13,353	1,857	27,327	2,733	30,060	1988	16,707	0.55	3.5
1989	851	6,611	5,624	6,910	13,853	1,862	28,249	2,825	31,074	1989	17,221	0.55	3.6
1990	878	6,607	5,799	7,072	6,951	1,892	21,714	2,171	23,885	1990	16,934	0.55	3.5
1991	881	6,549	5,772	7,187	1,500	1,896	16,354	1,635	17,989	1991	16,489	0.55	3.4
1992	877	6,521	5,719	7,215	500	1,891	15,324	1,532	16,857	1992	16,357	0.55	3.4
1993	867	6,520	5,654	7,371	500	1,880	15,406	1,541	16,947	1993	16,447	0.55	3.4
1994	858	6,522	5,597	7,557	500	1,871	15,525	1,552	17,077	1994	16,577	0.55	3.4
1995	852	6,507	5,545	7,619	500	1,864	15,528	1,553	17,081	1995	16,581	0.55	3.4
1996	853	6,516	5,557	7,771	500	1,865	15,693	1,569	17,263	1996	16,763	0.55	3.5
1997	857	6,479	5,553	7,928	500	1,870	15,851	1,585	17,436	1997	16,936	0.55	3.5
1998	862	6,482	5,586	8,086	500	1,875	16,047	1,605	17,651	1998	17,151	0.55	3.6
1999	867	6,491	5,629	8,265	500	1,881	16,275	1,627	17,902	1999	17,402	0.55	3.6
2000	873	6,494	5,672	8,445	500	1,887	16,504	1,650	18,154	2000	17,654	0.55	3.7
2001	880	6,494	5,714	8,600	500	1,894	16,709	1,671	18,379	2001	17,879	0.55	3.7
2002	886	6,487	5,745	8,724	500	1,900	16,870	1,687	18,557	2002	18,057	0.55	3.7
2003	891	6,486	5,777	8,858	500	1,906	17,040	1,704	18,744	2003	18,244	0.55	3.8
2004	895	6,487	5,805	9,020	500	1,910	17,236	1,724	18,959	2004	18,459	0.55	3.8
2005	899	6,495	5,841	9,225	500	1,915	17,480	1,748	19,228	2005	18,728	0.55	3.9
2006	906	6,499	5,886	9,454	500	1,922	17,763	1,776	19,539	2006	19,039	0.55	4.0
2007	914	6,502	5,941	9,701	500	1,930	18,072	1,807	19,880	2007	19,380	0.55	4.0
2008	923	6,506	6,005	9,959	500	1,940	18,404	1,840	20,245	2008	19,745	0.55	4.1
2009	933	6,508	6,070	10,209	500	1,950	18,730	1,873	20,603	2009	20,103	0.55	4.2
2010	943	6,509	6,137	10,439	500	1,961	19,037	1,904	20,941	2010	20,441	0.55	4.2
Avg Annual Growth Rates													
1990-2010	0.4%	-0.1%	0.3%	2.0%	-12.3%	0.2%	-0.7%	-0.7%	-0.7%		0.9%		0.9%
1990-2000	-0.0%	-0.2%	-0.2%	1.8%	-23.1%	-0.0%	-2.7%	-2.7%	-2.7%		0.4%		0.4%
2000-2010	0.8%	0.0%	0.8%	2.1%	0.0%	0.4%	1.4%	1.4%	1.4%		1.5%		1.5%

Table 22: Wrangell Base Case Forecast

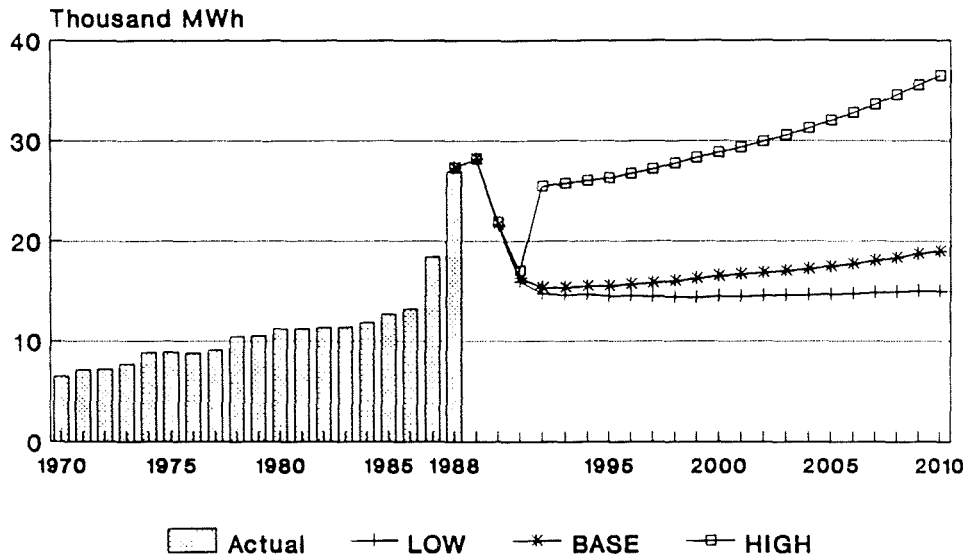
Wrangell Municipal Power and Light Load Forecast: HIGH Case

YEAR	Residential		Commercial			City	Total	Loss/ Use	WMPL		YEAR	Firm		Firm		
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh	WFP Sales MWh				Total Reqt's MWh	Bradfield Sales MWh		Energy Reqt's MWh	Load Factor	Peak Demand MW	Bradfld Load Factor	Bradfield Peak MW
1988	846	6,571	5,559	6,558	13,353	1,857	27,327	2,186	29,513	0	1988	16160	0.55	3.4	0.57	0.0
1989	851	6,612	5,624	6,917	13,853	1,862	28,256	2,260	30,517	0	1989	16664	0.55	3.5	0.57	0.0
1990	879	6,612	5,813	7,261	6,951	1,893	21,918	1,753	23,672	0	1990	16721	0.55	3.5	0.57	0.0
1991	892	6,574	5,864	7,750	1,500	1,907	17,021	1,362	18,383	0	1991	16883	0.55	3.5	0.57	0.0
1992	905	6,568	5,942	8,141	9,500	1,921	25,503	2,040	27,543	0	1992	18043	0.55	3.7	0.57	0.0
1993	905	6,561	5,940	8,478	9,500	1,921	25,840	2,067	27,907	25,000	1993	18407	0.55	3.8	0.57	5.0
1994	902	6,562	5,918	8,778	9,500	1,918	26,114	2,089	28,203	33,000	1994	18703	0.55	3.9	0.57	6.6
1995	889	6,556	5,828	9,099	9,500	1,904	26,330	2,106	28,437	33,000	1995	18937	0.55	3.9	0.57	6.6
1996	892	6,577	5,865	9,478	9,500	1,907	26,750	2,140	28,890	33,000	1996	19390	0.55	4.0	0.57	6.6
1997	907	6,582	5,971	9,852	9,500	1,924	27,247	2,180	29,427	33,000	1997	19927	0.55	4.1	0.57	6.6
1998	924	6,615	6,111	10,278	9,500	1,941	27,830	2,226	30,056	33,000	1998	20556	0.55	4.3	0.57	6.6
1999	940	6,613	6,214	10,717	9,500	1,958	28,388	2,271	30,660	33,000	1999	21160	0.55	4.4	0.57	6.6
2000	948	6,614	6,272	11,113	9,500	1,967	28,852	2,308	31,160	33,000	2000	21660	0.55	4.5	0.57	6.6
2001	960	6,584	6,320	11,605	9,500	1,979	29,403	2,352	31,755	33,000	2001	22255	0.55	4.6	0.57	6.6
2002	970	6,590	6,394	12,068	9,500	1,989	29,951	2,396	32,348	33,000	2002	22848	0.55	4.7	0.57	6.6
2003	984	6,597	6,491	12,594	9,500	2,003	30,588	2,447	33,035	33,000	2003	23535	0.55	4.9	0.57	6.6
2004	998	6,604	6,588	13,179	9,500	2,017	31,284	2,503	33,787	33,000	2004	24287	0.55	5.0	0.57	6.6
2005	1,011	6,612	6,682	13,823	9,500	2,031	32,036	2,563	34,599	33,000	2005	25099	0.55	5.2	0.57	6.6
2006	1,025	6,621	6,784	14,490	9,500	2,045	32,819	2,625	35,444	33,000	2006	25944	0.55	5.4	0.57	6.6
2007	1,040	6,631	6,895	15,214	9,500	2,060	33,668	2,693	36,362	33,000	2007	26862	0.55	5.6	0.57	6.6
2008	1,057	6,642	7,021	16,006	9,500	2,077	34,604	2,768	37,372	33,000	2008	27872	0.55	5.8	0.57	6.6
2009	1,076	6,653	7,160	16,827	9,500	2,096	35,582	2,847	38,428	33,000	2009	28928	0.55	6.0	0.57	6.6
2010	1,096	6,652	7,292	17,624	9,500	2,115	36,531	2,923	39,454	33,000	2010	29954	0.55	6.2	0.57	6.6

Avg Annual Growth Rates												
1990-2010	1.1%	0.0%	1.1%	4.5%	1.6%	0.6%	2.6%	2.6%	2.6%		0.1%	3.0%
1990-2000	0.8%	0.0%	0.8%	4.3%	3.2%	0.4%	2.8%	2.8%	2.8%		0.1%	2.6%
2000-2010	1.5%	0.1%	1.5%	4.7%	0.0%	0.7%	2.4%	2.4%	2.4%		0.0%	3.3%

Table 23: Wrangell High Case Forecast

Wrangell Power & Light Forecast Total Sales



Wrangell Power & Light Forecast Peak Load

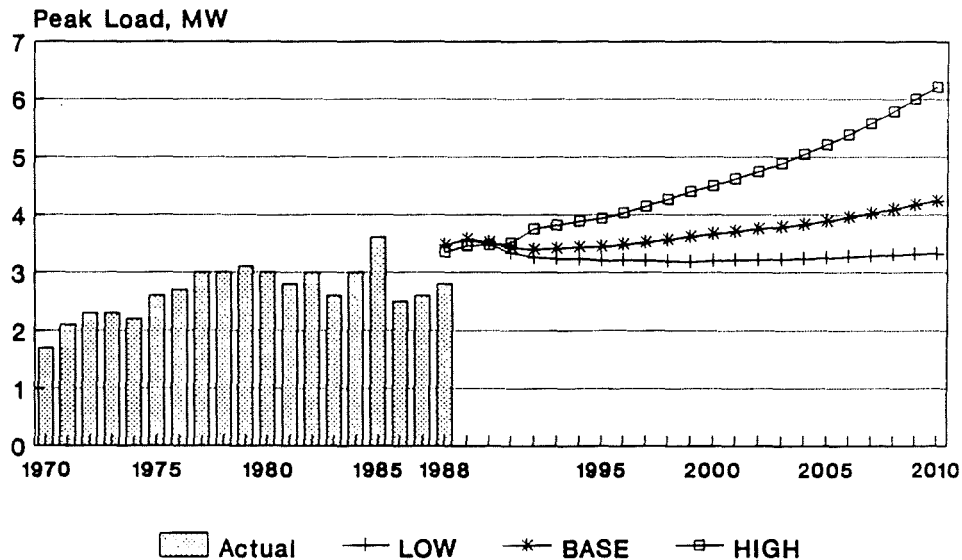
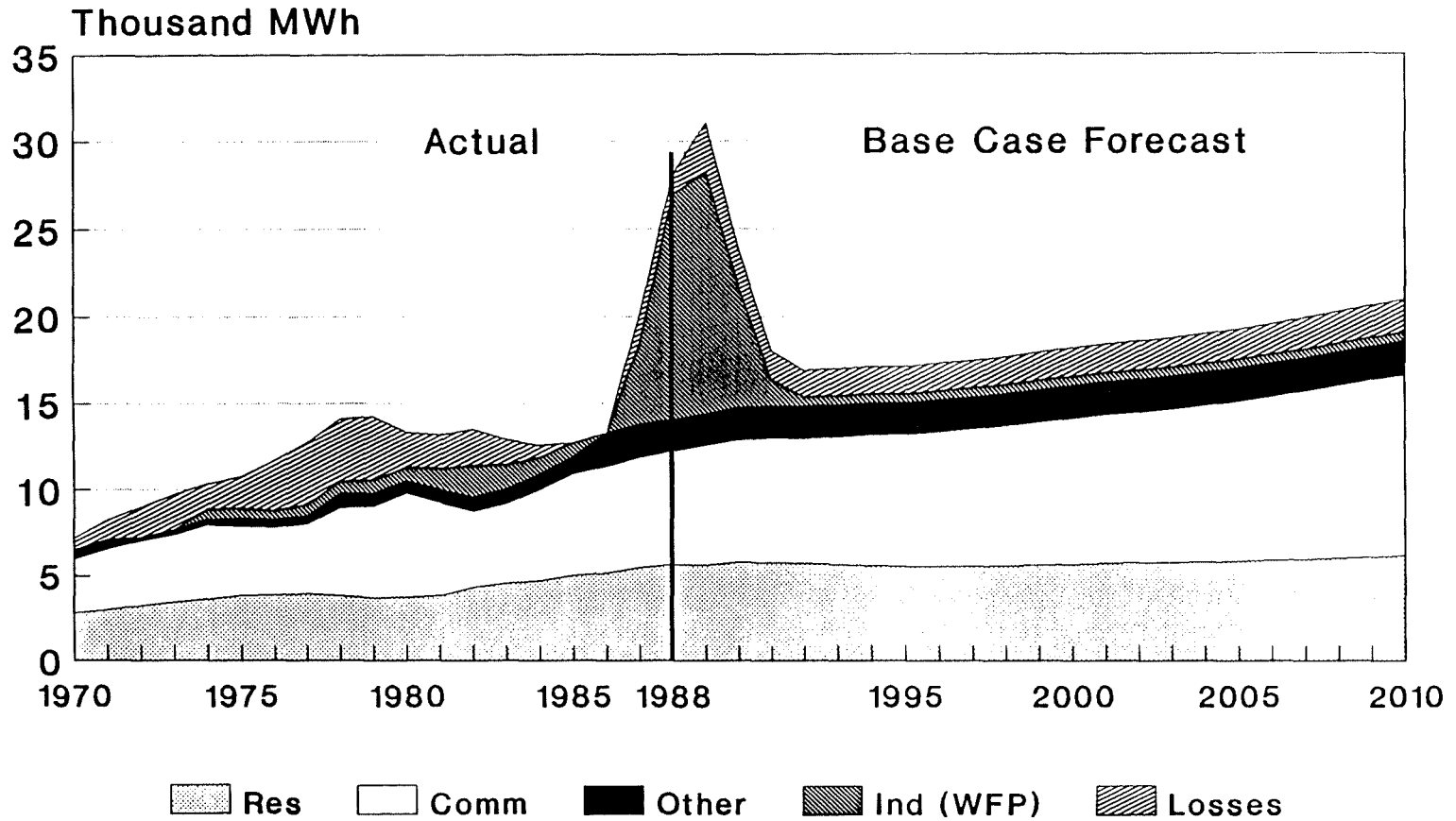


Figure 18: Wrangell Sales and Peak Load Forecast

Wrangell Power & Light Requirements: Base Case

Figure 19: Wrangell Base Case Forecast by Class



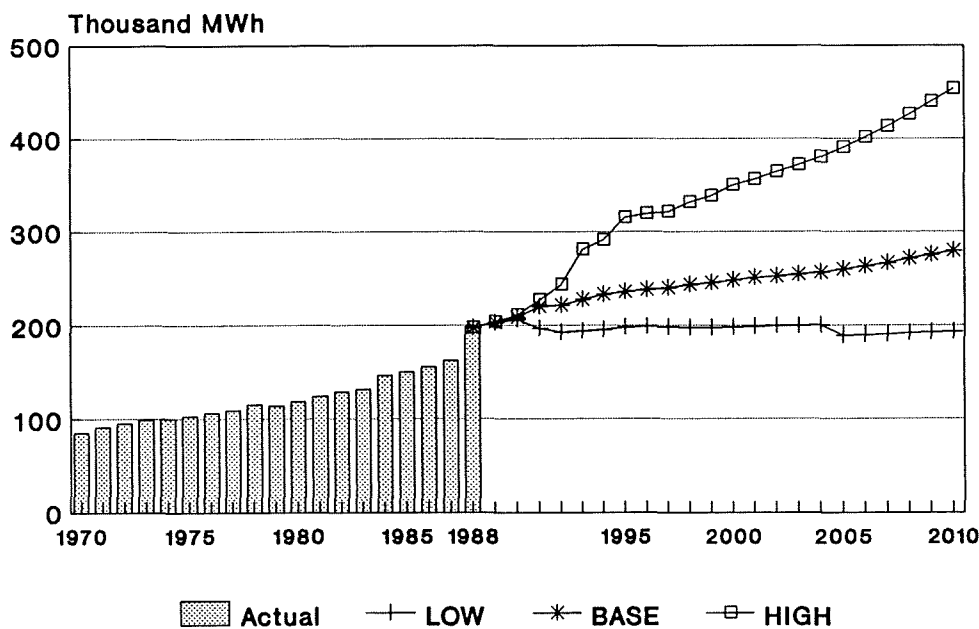
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4 REGIONAL LOAD FORECAST

The following tables and figures present a forecast for the combined study area load center. It is important to keep in mind that community peak load estimates are simply added together in the presentation that follows without making any allowance for coincidence. The sum of noncoincident peaks may not be too far from the coincident regional peak, however, since all communities with the exception of Petersburg peak in the winter during a cold spell. Petersburg tends to peak in the summer, but monthly peak data show that its winter peak is quite close to its summer peak.

Mining loads for Quartz Hill and the Johnny Mountain area are presented as separate items in the High case results. They have been incorporated into the determination of community economic growth for this case, but do not form a part of any aggregate sales or peak load figure.

Regional Total Sales



Excludes Mine Loads

Figure 20: Regional Total Electric Sale by Case

Lower Southeast Alaska Regional Utility Load Forecast: LOW Case

YEAR	Residential		Commercial			Total Sales MWh	Loss/Use MWh	Total Energy Reqts MWh	Noncoincident Utility Peak Demand MW	Mine Energy Reqts MWh	Mine Peak Demand MW
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh	Other Sales MWh						
1988	7,506	9,426	70,747	120,131	6,791	197,669	18,564	216,233	40.0	0	0
1989	7,591	9,439	71,653	124,373	6,868	202,893	19,068	221,961	41.1	0	0
1990	7,876	9,428	74,255	124,952	6,962	206,168	19,231	225,399	43.3	0	0
1991	7,896	9,407	74,275	115,396	6,965	196,636	18,351	214,986	43.0	0	0
1992	7,861	9,388	73,800	112,153	6,933	192,886	17,997	210,883	42.6	0	0
1993	7,852	9,372	73,582	113,793	6,914	194,289	18,096	212,385	43.4	0	0
1994	7,906	9,358	73,977	114,567	6,913	195,457	18,191	213,648	44.1	0	0
1995	7,953	9,337	74,251	116,941	6,901	198,093	18,385	216,478	44.7	0	0
1996	8,017	9,323	74,742	117,366	6,915	199,023	18,467	217,491	44.9	0	0
1997	8,024	9,307	74,676	116,706	6,911	198,294	18,397	216,691	44.7	0	0
1998	8,018	9,292	74,507	116,326	6,909	197,742	18,343	216,085	44.6	0	0
1999	8,020	9,278	74,409	116,176	6,907	197,491	18,315	215,807	44.5	0	0
2000	8,072	9,262	74,756	116,656	6,920	198,332	18,395	216,727	44.7	0	0
2001	8,126	9,243	75,106	116,806	6,934	198,846	18,441	217,287	44.8	0	0
2002	8,176	9,224	75,407	116,888	6,947	199,242	18,475	217,717	44.9	0	0
2003	8,219	9,204	75,650	116,976	6,959	199,584	18,506	218,090	45.0	0	0
2004	8,270	9,184	75,955	117,128	6,974	200,057	18,549	218,606	45.1	0	0
2005	7,787	9,164	71,362	110,980	6,951	189,292	17,696	206,988	43.7	0	0
2006	7,825	9,146	71,567	111,324	6,972	189,863	17,749	207,613	43.9	0	0
2007	7,905	9,128	72,156	111,758	6,997	190,911	17,843	208,754	44.1	0	0
2008	7,987	9,111	72,766	112,126	7,024	191,915	17,934	209,848	44.3	0	0
2009	8,054	9,093	73,231	112,291	7,044	192,566	17,991	210,557	44.5	0	0
2010	8,121	9,075	73,700	112,519	7,065	193,283	18,055	211,338	44.6	0	0
Avg Annual Growth Rates											
1990-2010	0.2%	-0.2%	-0.0%	-0.5%	0.1%	-0.3%	-0.3%	-0.3%	0.2%		
1990-2000	0.2%	-0.2%	0.1%	-0.7%	-0.1%	-0.4%	-0.4%	-0.4%	0.3%		
2000-2010	0.1%	-0.2%	-0.1%	-0.4%	0.2%	-0.3%	-0.2%	-0.3%	-0.0%		

Table 24: Regional Low Case Forecast

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Lower Southeast Alaska Regional Utility Load Forecast: BASE Case

YEAR	Residential		Commercial			Total Sales MWh	Loss/Use MWh	Total Energy Reqts MWh	Noncoincident Utility Peak Demand MW	Mine Energy Reqts MWh	Mine Peak Demand MW
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh	Other Sales MWh						
1988	7,506	9,426	70,747	120,131	6,791	197,669	18,564	216,233	40.0	0	0
1989	7,602	9,459	71,905	124,482	6,871	203,258	19,100	222,358	41.2	0	0
1990	7,903	9,468	74,822	126,576	6,968	208,367	19,433	227,800	43.8	0	0
1991	7,996	9,467	75,700	137,115	6,997	219,812	20,274	240,085	47.4	0	0
1992	8,046	9,468	76,176	138,230	6,996	221,401	20,383	241,784	47.8	0	0
1993	8,090	9,471	76,620	144,258	6,990	227,868	20,917	248,785	49.2	0	0
1994	8,155	9,474	77,254	148,534	6,988	232,776	21,333	254,109	50.3	0	0
1995	8,173	9,474	77,434	151,448	6,966	235,848	21,583	257,431	50.9	0	0
1996	8,208	9,478	77,792	153,148	6,975	237,915	21,777	259,692	51.4	0	0
1997	8,257	9,477	78,251	154,878	6,993	240,122	21,986	262,108	51.9	0	0
1998	8,360	9,481	79,261	157,085	7,024	243,370	22,280	265,650	52.6	0	0
1999	8,385	9,484	79,520	158,690	7,039	245,250	22,468	267,718	53.0	0	0
2000	8,460	9,487	80,260	160,778	7,066	248,105	22,736	270,841	53.7	0	0
2001	8,529	9,488	80,924	162,594	7,088	250,605	22,970	273,575	54.3	0	0
2002	8,572	9,489	81,337	164,077	7,102	252,516	23,152	275,668	54.7	0	0
2003	8,603	9,490	81,646	165,597	7,114	254,356	23,328	277,684	55.1	0	0
2004	8,644	9,492	82,043	167,454	7,128	256,625	23,543	280,168	55.6	0	0
2005	8,707	9,494	82,663	169,764	7,150	259,576	23,820	283,396	56.3	0	0
2006	8,796	9,496	83,525	172,342	7,179	263,046	24,144	287,190	57.1	0	0
2007	8,903	9,498	84,560	175,144	7,214	266,917	24,506	291,423	58.0	0	0
2008	9,028	9,499	85,757	178,115	7,397	271,268	24,909	296,178	59.0	0	0
2009	9,155	9,501	86,984	181,042	7,438	275,463	25,299	300,763	59.9	0	0
2010	9,274	9,502	88,128	183,801	7,476	279,405	25,666	305,071	60.8	0	0

Avg Annual Growth Rates

1990-2010	0.8%	0.0%	0.8%	1.9%	0.4%	1.5%	1.4%	1.5%	1.7%
1990-2000	0.7%	0.0%	0.7%	2.4%	0.1%	1.8%	1.6%	1.7%	2.1%
2000-2010	0.9%	0.0%	0.9%	1.3%	0.6%	1.2%	1.2%	1.2%	1.3%

Table 25: Regional Base Case Forecast

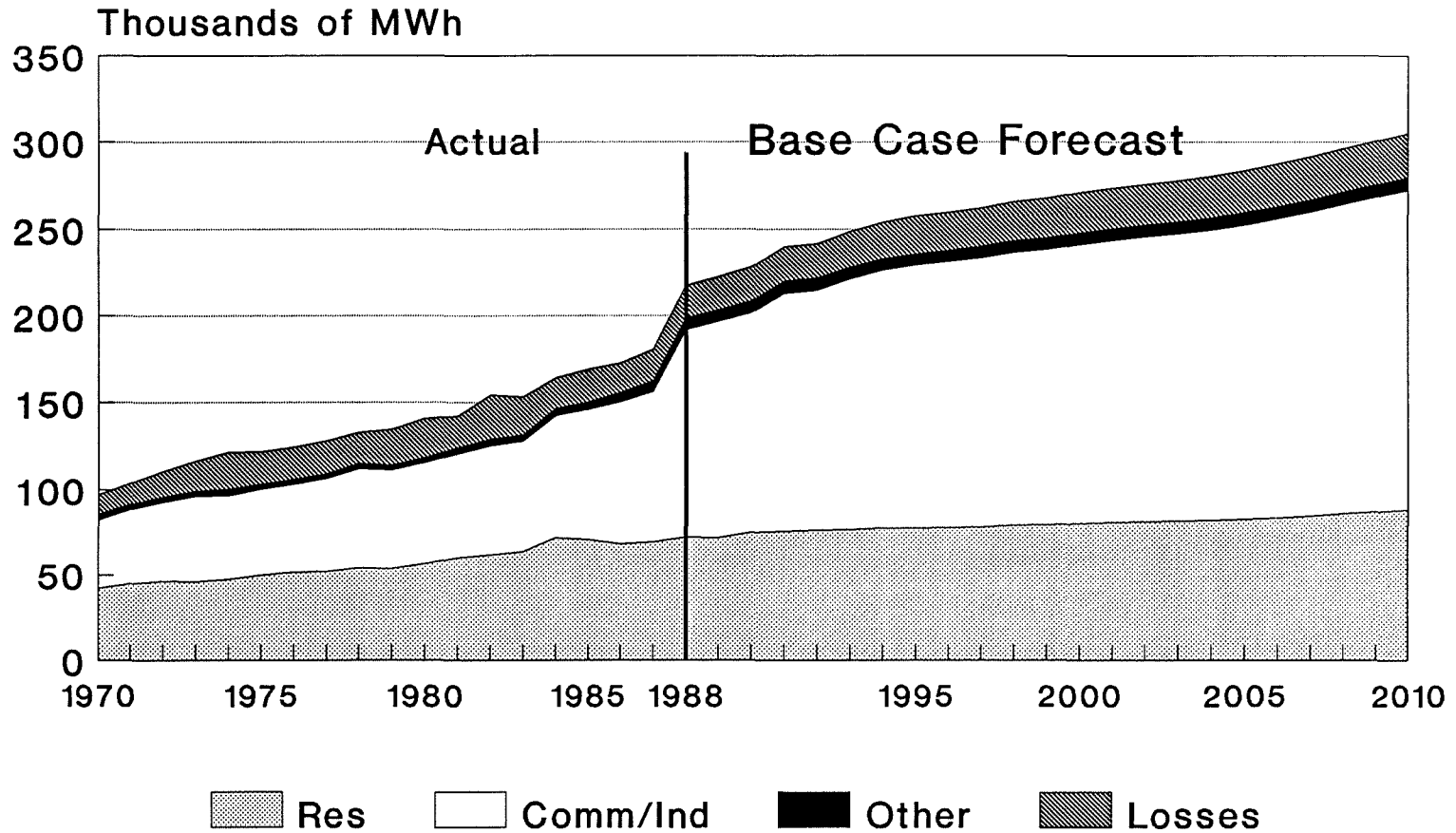
Lower Southeast Alaska Regional Utility Load Forecast: HIGH Case

YEAR	Residential		Commercial			Total Sales MWh	Loss/Use MWh	Total Energy Reqts MWh	Noncoincident Utility Peak Demand MW	Mine Energy Reqts MWh	Mine Peak Demand MW
	# Cust	Use/Cust kWh	Sales MWh	Indust. Sales MWh	Other Sales MWh						
1988	7,506	9,426	70,747	120,131	6,791	197,669	18,018	215,687	39.9	0	0.0
1989	7,607	9,493	72,217	124,567	6,872	203,657	18,571	222,227	41.2	0	0.0
1990	7,944	9,538	75,768	128,394	6,977	211,138	19,257	230,395	44.3	0	0.0
1991	8,137	9,571	77,883	142,219	7,044	227,146	20,635	247,781	49.0	0	0.0
1992	8,319	9,601	79,870	156,524	7,086	243,480	22,079	265,559	50.8	0	0.0
1993	8,467	9,637	81,601	192,387	7,113	281,100	25,178	306,278	59.2	25,000	5.0
1994	8,738	9,677	84,554	199,780	7,157	291,491	26,055	317,546	61.5	47,400	6.6
1995	9,651	9,720	93,808	213,751	7,331	314,890	27,965	342,855	66.7	232,800	54.1
1996	9,668	9,759	94,351	217,320	7,326	318,997	28,357	347,355	67.6	283,300	54.1
1997	9,617	9,796	94,212	219,838	7,329	321,379	28,624	350,002	68.1	283,300	54.1
1998	9,947	9,839	97,869	226,503	7,420	331,792	29,542	361,335	70.5	486,200	54.1
1999	10,066	9,879	99,438	231,294	7,468	338,200	30,143	368,343	71.9	508,600	94.6
2000	10,438	9,921	103,555	239,089	7,558	350,203	31,178	381,380	74.6	509,100	94.6
2001	10,512	9,957	104,668	244,068	7,588	356,324	31,758	388,082	76.0	509,100	94.6
2002	10,667	9,997	106,638	250,092	7,632	364,362	32,486	396,847	77.8	509,300	94.6
2003	10,800	10,034	108,367	256,004	7,669	372,041	33,195	405,236	79.6	509,300	94.6
2004	10,931	10,072	110,097	262,577	7,711	380,386	33,967	414,353	81.4	509,300	94.6
2005	11,109	10,111	112,328	270,222	7,764	390,314	34,875	425,189	83.7	511,200	94.6
2006	11,323	10,151	114,941	278,403	7,824	401,167	35,862	437,029	86.1	511,200	94.6
2007	11,551	10,190	117,714	287,173	7,887	412,774	36,919	449,693	88.7	511,200	94.6
2008	11,820	10,230	120,926	296,843	7,960	425,729	38,096	463,825	91.7	511,200	94.6
2009	12,114	10,270	124,410	306,994	8,037	439,441	39,339	478,780	94.7	511,200	94.6
2010	12,406	10,309	127,892	317,056	8,112	453,060	40,573	493,633	97.8	511,200	94.6
Avg Annual Growth Rates											
1990-2010	2.3%	0.4%	2.7%	4.6%	0.8%	3.9%	3.8%	3.9%	4.0%		
1990-2000	2.8%	0.4%	3.2%	6.4%	0.8%	5.2%	4.9%	5.2%	5.4%		
2000-2010	1.7%	0.4%	2.1%	2.9%	0.7%	2.6%	2.7%	2.6%	2.7%		

Table 26: Regional High Case Forecast

Regional Energy Requirements Base Case Projection

Figure 21: Base Case Regional Energy Requirements by Class



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Appendix A:
Assumptions Used for MAP Econometric Model Runs

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1990 ALASKA ENERGY AUTHORITY SOUTHEAST ALASKA ELECTRICITY DEMAND STUDY
ASSUMPTIONS USED IN ECONOMIC PROJECTIONS

BASE CASE

LOW CASE

HIGH CASE

A. PETROLEUM PRICE ASSUMPTIONS

1. Average Expected
OPEC Price

Three alternatives are considered for the world oil price (Saudi Light delivered to the U.S. Gulf). In real 1989 dollars, they are as follows:

	<u>1990</u>	<u>2000</u>	<u>2010</u>
Low	\$18	\$14	\$14
Mid	18	19	21
High	18	26	35

\$18 Saudi Lite delivered to the U.S. Gulf corresponds to \$17 ANS crude delivered to the U.S. Gulf. (\$17 in 1989\$ is \$18.75 in 1991\$.)

B. INDUSTRY ASSUMPTIONS

1. Trans-Alaska Pipeline Operating employment remains constant at 885 through 2010 with 390 at headquarters in Anchorage and the remainder along the pipeline corridor. [Source: personal communication with Alyeska Pipeline Company] (TAP.S90).
2. Pipeline Corrosion Corrosion-related repairs and maintenance results in construction employment peaking at 1200 in 1991 and 1992, falling to a constant level of 150 in 1994 (COR.S90N).
3. Oilspill The Exxon Valdez oilspill generated employment of 2,650 in 1989 and \$700 million in additional personal income to Alaskans (SPL.S90).

NOTE: Codes in parentheses indicate ISER names for MAP Model SCEN_ case files, and codes in brackets indicate MAP variable names.

	BASE CASE	LOW CASE	HIGH CASE
4. North Slope Petroleum Development and Production	This case (NSO.S90H) is based upon an expansion of production to include West Sak or a comparable major new field in the 1990s.	This case (NSO.S90L) is based upon an expansion of production to include West Sak or a comparable new major field after 2000.	Same as Base.
5. ANWR	Exploration but no development in ANWR (ANWR.S90L).	Same as Base.	Development of a major field in ANWR with production commencing after 2000 (ANWR.S90H).
6. Upper Cook Inlet-- Petroleum Production	Employment in exploration and development of oil and gas in the Upper Cook Inlet area declines gradually (1 percent annually) as the major oil fields are depleted (UPC.S90).		
7. Oil Industry Headquarters	This case (OBQ.S90) is associated with additional development of North Slope fields.	Same as Base.	This case (OHQ.S90H) is associated with development of fields in new regions.
8. TAGS Pipeline	-		The "TAGS" pipeline to transport North Slope natural gas to market in Japan is constructed over a 5-year period. Construction begins in 1993. Operations begin in 1998. The line extends from Prudhoe Bay to Valdez and includes compressor stations, conditioning facilities, and a liquefaction plant and marine terminal. Construction employment peaks at 7,202. Operations employment is 1,130. Construction and operations employment occurs all along the pipeline corridor. The pipeline produces 200 million (nominal \$) in state revenue in its first year of operation (TAG.S90-2).

BASE CASE

LOW CASE

HIGH CASE

9. Beluga Coal Production Development of a 3.5 million ton/year mine for export beginning in 1993 results in employment of 375 in 1995 and beyond (BCL.S90-3).

10. U.S. Borax

The U.S. Borax molybdenum mine near Ketchikan is brought into production in 1995. Operating employment is initially 685 and grows to 1,020 over the next 15 years. [Source: USDA Forest Service, Draft EIS, personal communication with U.S. Forest Service & U.S. Borax personnel] (BXM.S90).

11. Greens Creek Mine

Production from the Greens Creek Mine on Admiralty Island begins at the end of 1988. Employment in the mine is constant at 250 through 2010. [Source: personal communication, Greens Creek Mining Company] (GCM.S90).

12. Red Dog Mine

The Red Dog Mine in the Western Brooks Range begins operation in 1990 with production employment of 350 (RED.S90).

13. Wishbone Hill

This coal mine in the Matanuska-Susitna Valley begins operation in mid-1991, employing 250 in the extraction and export of coal to Japan (WIS.S90).

14. AJ MINE

Echo Bay Mining Company begins production from this gold mine in Juneau in mid-1993. Operations employment is 450 (AJM.S90).

	BASE CASE	LOW CASE	HIGH CASE
15. Kensington Mine	Echo Bay Mining Company begins production from this mine north of Juneau in mid-1993. Operations employment is 340 (KEN.S90).		
16. Other Mining Activity	Mining employment net of specifically identified projects increases from 650 in 1989 by 3 percent annually (OMN.S90).	Same as Base.	Opening of additional deposits in Canada near Johnny Mtn results in 50 new jobs in Wrangell beginning in 1992. Increased exploration activity on Prince of Wales Island adds 20 jobs in Ketchikan beginning in 1992 (WMB.S90--add on to base).
17. Agriculture	Employment in agriculture is constant at 1989 level of 525 (AGR.S90).		
18. Logging and Sawmills	Logging employment in the Southeast declines in the 1990s by 800 as the Native Corp. harvest falls to a sustainable level. Employment growth in Southcentral reflects new Native Corp. activities (FML.S90).	Logging employment drops 25 percent relative to base case between 1995 and 2000 as timber harvest from public land drops from 400 MMbf to 300 MMbf (FML.S90L--add on to base).	Logging employment is 10 percent higher than base case due to strong demand for cants as Native round log exports decline (FML.S90H--add on to base).
19. Pulp Mills	After 1991 employment declines at a rate of 1 percent per year because of productivity gains (FMP.S90).	Ketchikan mill closes in 2005 when current USFS contract expires (FMP.S90L--add on to base).	Same as Base.
20. Commercial Fish Harvesting-- Nonbottomfish	Employment levels in traditional fisheries harvest remain constant at 8,200 through 2010 (SFH.S88).		
21. Commercial Fish Processing-- Nonbottomfish	Employment in processing of traditional fisheries harvest increases to 7,500 and then remains constant (SFP.S90).	Employment in Lower Southeast Alaska remains constant (SFP.L90).	A new Ketchikan fish-feed plant and miscellaneous industry expansion add 50 jobs in Ketchikan, 24 in Petersburg, and 50 in Metlakatla beginning in 1992 or 1993 (FFR.S90X--add on to base).

	BASE CASE	LOW CASE	HIGH CASE
22. Commercial Fishing-- Bottomfish	The total U.S. bottomfish catch expands to allowable catch. Onshore processing is centered in the Aleutians and Kodiak with additional activity in Anchorage, Kenai Peninsula, and Bristol Bay (SBO.S90).		
23. Federal Military Employment	Strength level not associated with special projects remains constant at current level (MIL.S90).	Same as Base.	Strength level not associated with special projects grows 1 percent annually (MIL.S90H).
24. Light Infantry Army Division Deployment	A new Army division is deployed to Fairbanks and Anchorage beginning in 1986, augmenting active-duty personnel by approximately 3,000 in 1989 and 3,400 by 1992. [Source: personal communication, Fort Richardson Office of Public Affairs] (LID.S90)		
25. Navy Cruiser Homeporting			A Navy cruiser is "home-ported" in Anchorage starting in mid-1992 (HPT.S88-1).
26. Federal Civilian Employment	Employment rises at 0.5 percent annual rate consistent with the long-term trend since 1960 (CIV.S90).	Employment is constant, consistent with trend since early 1970s (CIV.S90L).	Same as Base.
27. Tourism	Index of tourist visitors to Alaska increases by 3 percent per year (TRS.S90).	Same as Base.	Index of tourist visitors to Alaska increases by 5 percent per year (TRS.S90H).
28. State Electric Projects	Construction employment from Alaska Power Authority projects includes Bradley Lake (SHP.S90).		

BASE CASE

LOW CASE

HIGH CASE

C. FISCAL ASSUMPTIONS

C.1. Revenues

	BASE CASE	LOW CASE	HIGH CASE
1. Severance Taxes [RPTS]	No changes from current tax structure (REVN.90).	Calculated using low price (REVN.90L).	Calculated using high price (REVN.90H).
2. Royalties [RPRY]	Current royalty structure continues. These revenues are distributed between the General Fund and Permanent Fund (REVN.90).	Calculated using low price.	Calculated using high price.
3. Bonuses [RPBS]	Based on projections published by Alaska Department of Revenue (REVN.90). No change in regulations.	Calculated using low price.	Calculated using high price.
4. Property Taxes [RPPS]	Based on projections published by Alaska Department of Revenue (REVN.90) augmented by taxes on onshore facilities related to OCS development. (See OCS case.)	Calculated using low price.	Calculated using high price.
5. Petroleum Corporate Income Tax [RTCSPX]	Based on projections published by Alaska Department of Revenue (REVN.90). No change in tax regulations.	Calculated using low price.	Calculated using high price.
6. Rents [RPEN]	Constant in real terms at current level of \$8 million.		
7. Miscellaneous Petroleum Settlement Revenues [RP9X] [EXPF2]	Alaska receives \$2 billion (1990\$) over the period FY 1991 to 2000 in settlement of disputed offshore leases in the Beaufort Sea and in settlement of lawsuits and tax disputes regarding the valuation of North Slope oil. These revenues are evenly distributed between the General Fund and the Permanent Fund (WIN.S90).		

BASE CASE

LOW CASE

HIGH CASE

- | | BASE CASE | LOW CASE | HIGH CASE |
|---|---|----------|-----------|
| 8. Federal-State
Petroleum-Related
Shared Revenues
[RSFDNFX] | Increasing \$1 million
annually from current level
of \$25 million. | | |
| 9. Personal Income Tax
[EXPIT] | Reimposed at previous level
when state appropriations
fall below the FY 1988 level
in real terms. Income tax is
reimposed prior to elimina-
tion of the dividend but
only after Permanent Fund
earnings have been appro-
priated to the general fund. | | |
| 10. Large Project Corporate
Income Taxes [RTCSX] | Zero. | | |
| 11. Miscellaneous Local
Revenue Sources
[RLTX]
[RLPTX]
[RLTFPX] | Miscellaneous state-local
transfers, large project
property taxes, petroleum-
related federal transfers
all set to zero. | | |
| 12. New Federal-State
Shared Revenues
[RSFDNX] | Zero. | | |

C.2. State Appropriations

- | | | | |
|---|--|--|--|
| 13. Aggregate
Appropriations
[EXWIND] | Annual appropriation equals
current revenues plus
50 percent of general fund
balance available for
appropriations. | | |
| 14. Capital/Operations
Split [XSPLITX] | 90 percent operations;
10 percent capital. | | |
| 15. General Obligation
Bonds | Bond sales for capital
expenditures occur at a rate
which maintains annual debt
service payments at a level
no more than 5 percent of
current state revenues. | | |

BASE CASE

LOW CASE

HIGH CASE

- | | BASE CASE | LOW CASE | HIGH CASE |
|--|--|----------|-----------|
| 16. Federal Grants-in-Aid for Capital Expenditures [RSFDNCAX] | Constant at \$75 million. | | |
| 17. State Loan Programs [EXKTR1X] [EXLOAN2] [EXCPSR1] | Appropriations from the general fund for program capitalization terminated after FY 1987. Programs continue functioning on existing capitalization including AHFC and APA revenue bond expenditures. | | |
| 18. Municipal Capital Grants [RLTMCAP] | Funding terminated after FY 1987. | | |
| 19. State-Local Revenue Sharing [RLTRS] | Continuation proportional to total state expenditures. | | |
| 20. State-Local Municipal Assistance [RLTMA] | Continuation proportional to total state expenditures. | | |
| 21. Permanent Fund/Other Appropriations in Excess of Spending Limit [EXGFOPSK] [EXSPCAP] | Special appropriation to Perm. Fund of \$150 million in 1991. Special capital appropriation from Railbelt Energy Fund in 1991. | | |

C.3. Permanent Fund

- | | | | |
|--|--|--|--|
| 22. Permanent Fund Principal [EXKPF1] | Deposits from petroleum revenues continue at current rates; inflation-proofing eliminated when complete withdrawal of nominal earnings commences. | | |
| 23. Permanent Fund Dividend [EXPFDIST] | Continued at the rate of 50 percent of earnings averaged over the previous 5 years until revenues from all other sources are insufficient to maintain state appropriations at real 1988 level. When that milestone is reached, the dividend is phased out. | | |

BASE CASE

LOW CASE

HIGH CASE

24. Permanent Fund Earnings
[EXPFTOGF] After payment of the dividend, the remaining Fund earnings are added to the corpus of the Permanent Fund--inflation proofing and undistributed income. When state appropriations begin to fall below the real 1988 level, earnings are diverted to the general fund to maintain the 1988 level.

25. Real Rate of Return
[RORPF] 3 percent

C.4. Miscellaneous

26. State-Local Wage Rates
[EKWR] Wages held constant in nominal \$ for a 2-year period in early 1990s. Wages held four years. No cap on wages.

D. NATIONAL VARIABLE ASSUMPTIONS

1. U.S. Inflation Rate
[GRUSPCI] Consumer prices rise at an annual rate of 5 percent (REV.S90).

2. Real Average Weekly Earnings [GRRWEUS] Growth in real average weekly earnings averages .05 percent annually. Same as base. Growth in real average weekly earnings averages 1 percent annually.

3. Real Per Capita Income
[GRDIRPU] Growth in real per capita income averages .5 percent annually in excess of average weekly earnings.

4. Unemployment Rate [UUS] Long-run rate of 6.5 percent.

BASE CASE

LOW CASE

HIGH CASE

E. REGIONAL ASSUMPTIONS

- | | |
|---------------|---|
| 1. Population | Regional population growth allocated on the basis of existing population and employment growth. |
| 2. Employment | No significant shifts in the location of support industries. |

F. DEMOGRAPHICS

- | | |
|---|---------------------------|
| 1. Labor Force Participation Rate [LAFERT1] | Stabilizes at 69 percent. |
|---|---------------------------|

Appendix B: Statistical Equations

Residential Forecasting Equations

We were able to develop reasonable econometric equations for Metlakatla and Wrangell only. The Metlakatla data can be described by the following regression equation:

$$\log(\text{USE}) = 5.655 + .007 \cdot \text{TIME} + .448 \cdot \log(\text{HDD}) - .043 \cdot (\text{D7079} \cdot \text{TIME}) + .480 \cdot \text{D7079}$$

(1.09)
(3.55)
(3.64)
(3.51)

(coefficient t-statistics in parentheses)

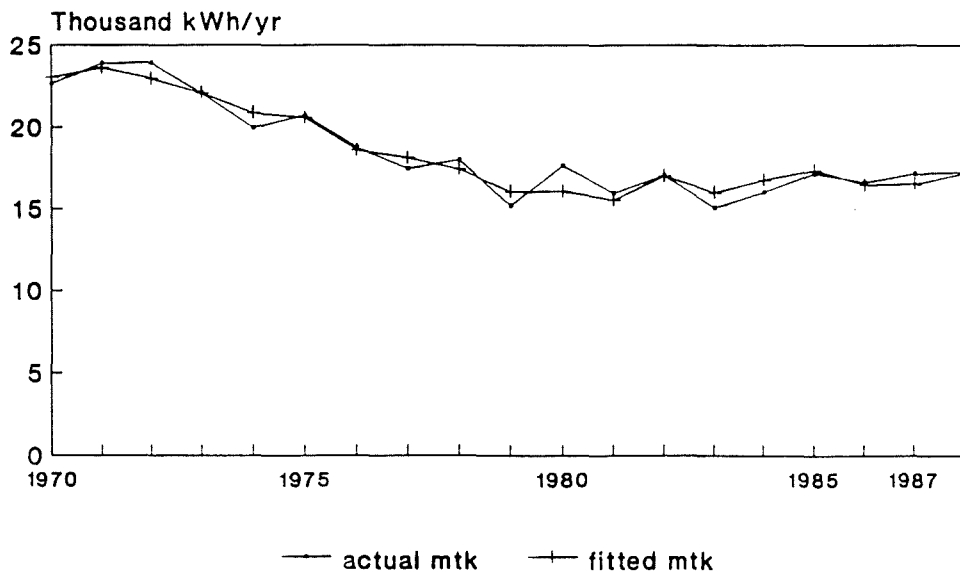
where

USE = residential kWh per customer
 TIME = Time trend (1970=1, 1971=2, etc.)
 HDD = Area Heating degree days (Anette Island Station)
 D7079 = Dummy variable for the period 1970-79

Nobs = 18 (1970-87)
 R2 = .947

The graph below shows the fit obtained. The formulation suggests that use is increasing at an underlying rate of .7% per year, while during the period 1970-79 use *decreased* at a rate of $(.043 - .007) = 3.6\%$ per year. The underlying time trend is insignificant, however.

Metlakatla Equation Fit Res. Use per Cust.



Wrangell. The Wrangell data are reasonably described by the following regression equation:

$$\log(\text{USE}) = 9.105 - .225 \cdot \log(\text{PRICE}) + .183 \cdot \log(\text{INCOME})$$

(1.99) (1.70)

(coefficient t-statistics in parentheses)

where

USE = residential kWh per customer

PRICE = average residential revenue per kWh

INCOME = real percapita personal income (Wrangell/Petersburg Census Area)

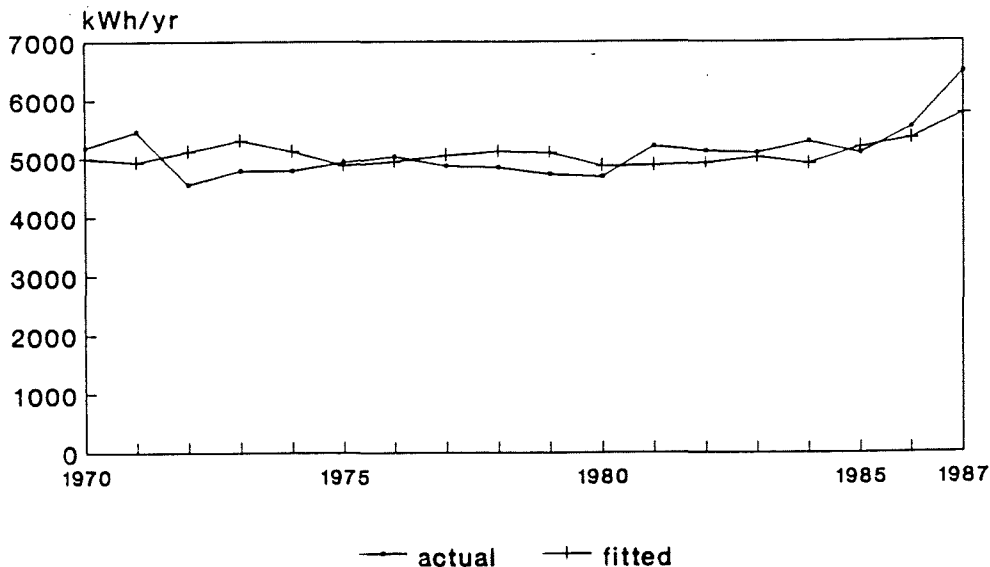
Nobs = 18 (1970-87)

R2 = .274

This model is particularly satisfying because it is structural and does not rely on an ad hoc time trend. The elasticity coefficients are consistent with the range obtained in the econometric literature and with income elasticity estimates obtained from a large cross sectional sample of Alaskan Villages (XiWei Yang, 1989).

The graph below shows actual and fitted values obtained with this regression equation:

Wrangell Res use/cust actual vs fitted



Commercial Sector Forecasting Equation

This section describes the forecasting equation which was derived from pooled data and hence is the same for all four communities.

The so-called commercial customer class is more accurately described as the noresidential buildings class. This distinction is especially important in smaller communities throughout Alaska, where government and school buildings make up a proportionately larger part of the building stock than in a larger trade and service center such as Anchorage. We have no direct data on the distribution of floorstock to support this contention, but we are convinced by casual observation and a limited analysis of utility billing records for Metlakatla and Petersburg.

Because of the amount of institutional building space served as commercial class customers, a model based on wage and salary employment makes more sense than one built on personal income. Employment figures capture the disproportionate size of the government sector in Alaska in general and in small communities in particular. We use wage and salary employment data as reported to the Alaska Department of Labor without adding in estimates of proprietors' employment. While the omission of proprietors' employment may neglect some small businesses, it properly excludes fishermen and women, who do not work in buildings.

We tried several models of commercial class consumption using the pooled data from all four communities. We selected the following regression equation as the best representation of the data for forecasting purposes:

$$\begin{aligned} \text{Log(CMWH)} = & 6.467336 + .032274 * \text{TIME} + .638381 * \text{Log(EMPLOYMENT)} \\ & (4.49) \qquad \qquad \qquad (8.22) \\ & + 2.258938 * \text{D}_K + 1.613665 * \text{D}_P + .807797 * \text{D}_W \\ & (13.46) \qquad \qquad \qquad (9.70) \qquad \qquad \qquad (8.78) \end{aligned}$$

Where:

CMWH	= Commercial Class consumption
TIME	= Time Trend (1960 = 1, 1961 = 2, etc.)
EMPLOYMENT	= Wage and Salary Employment
D_K	= Dummy variable for Ketchikan
D_P	= Dummy variable for Petersburg
D_W	= Dummy variable for Wrangell

R² = .9905

N = 68

The equation can be interpreted as follows:

First, commercial use has been growing at a trend rate of 3.2 percent per year independent

of employment growth. This trend may reflect any of the following changes to the economy:

- Addition of relatively energy intensive industries (fish freezing).
- Addition of large buildings (gyms, swimming pools, enclosed malls).
- Increased lighting and refrigeration per worker in retail and supermarket space.

Second, a 1 percent change in employment, all other things being equal, causes a .78 percent increase in consumption. The fact that this elasticity measure is less than one may reflect the fact that lower employment levels do not imply one for one reductions in electric use since the building stock cannot be adjusted in the short run. Also, to the extent that the more volatile components of the wage and salary economy are outside the traditional trade and service sectors, employment swings in these industries would not be reflected in short term changes in consumption. We are thinking here especially of the mineral exploration and timber employees who work outdoors.

Third, the dummy variables capture regional differences in both the structure of the economy and the way the available data is measured:

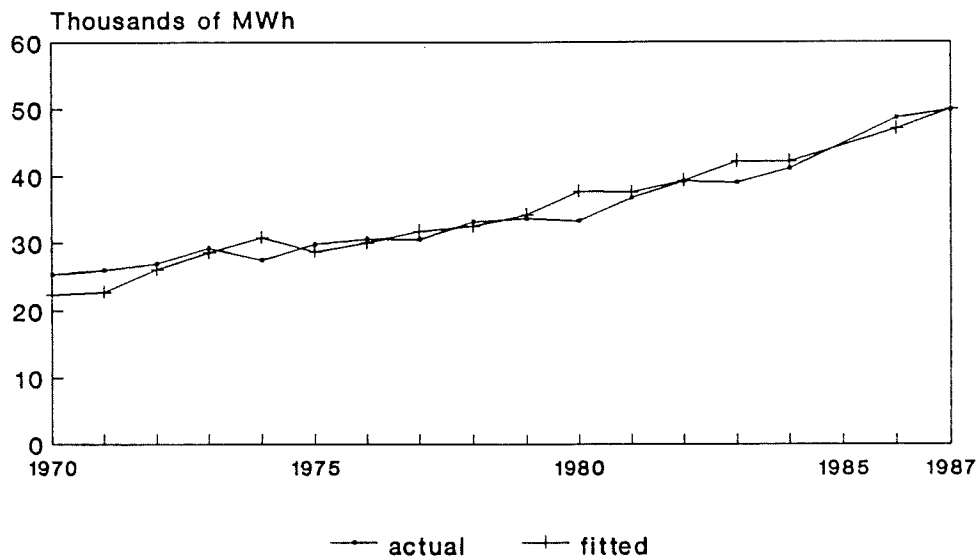
- Ketchikan consumption data includes large commercial customers such as fish processors.
- Metlakatla employment is measured for the entire Prince of Wales - Outer Ketchikan census area, so a given amount of consumption is related to a much larger employment base (in the data) than in the other areas. Similarly, employment data used for Wrangell and Petersburg is the combined total for the Wrangell-Petersburg census area.

While the chosen equation exhibits good statistical properties, we believe it is imprudent to base all forecasts on the continuation of the relatively strong time trend variable. This trend probably reflects structural factors in the economy and the stock of institutional buildings which are likely to change in the future for several reasons. With state revenues declining, we are not likely to see a continuation of the building boom of the 1980s. In addition, new laws and new technology may cause a decline in use per employee during the next two decades. These include the recently enacted federal ballast standards for fluorescent lighting and the availability of more efficient lighting and refrigeration devices. Detailed end use modelling for the Railbelt (Colt, 1989) suggests that use per square foot in new commercial buildings is declining in Alaska, and that federal ballast standards alone will eventually reduce lighting consumption per square foot by about 9 percent. In addition, Mitchell (1989) concluded that the end use forecasts for the rural Railbelt implied average decreases of between .56 and 1 percent per year in commercial consumption per capita.

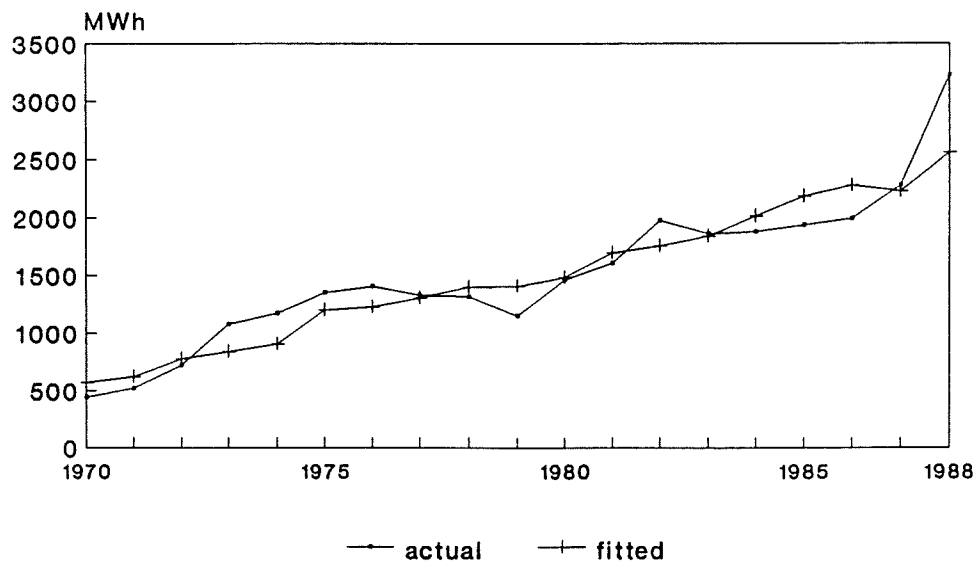
Because of this evidence that commercial use per capita may decline over the next two decades, we have set the trend rate of growth to zero for the Low case, and cut the trend in half in the MID case. The computed trend is employed in the High case.

The following figures show actual and fitted values obtained with the commercial sector equation.

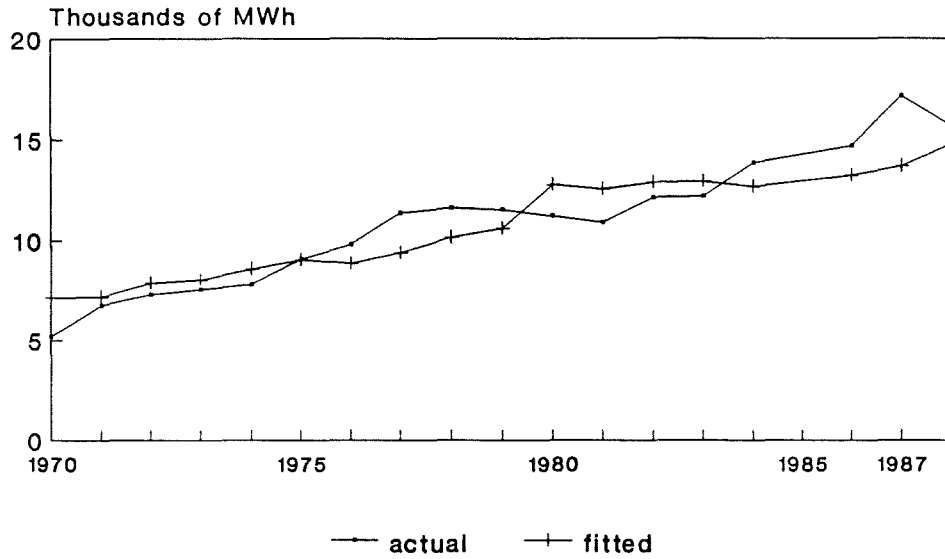
Commercial Equation Fit Ketchikan



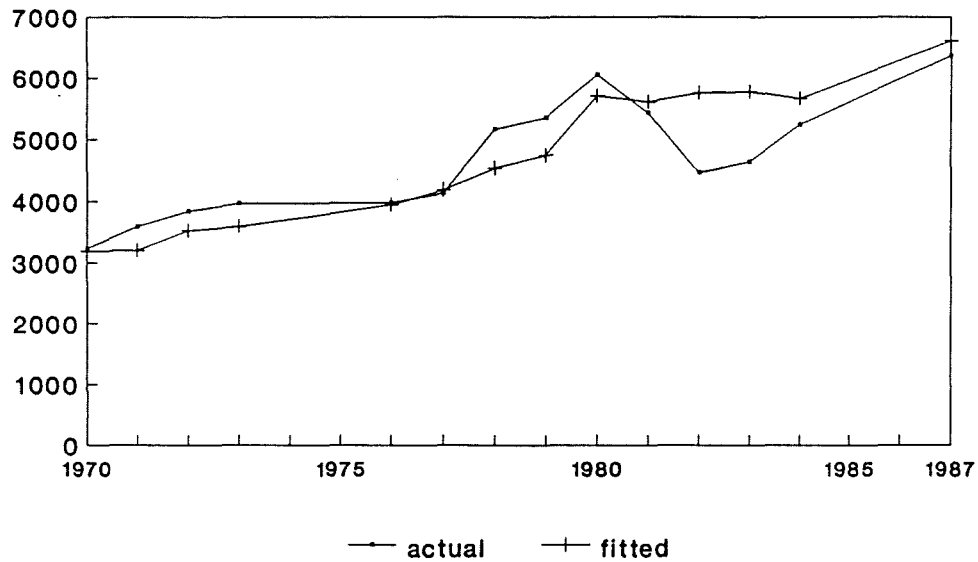
Commercial Equation Fit Metlakatla (Industrial Excluded)



Commercial Equation Fit Petersburg (includes Lg Comm)



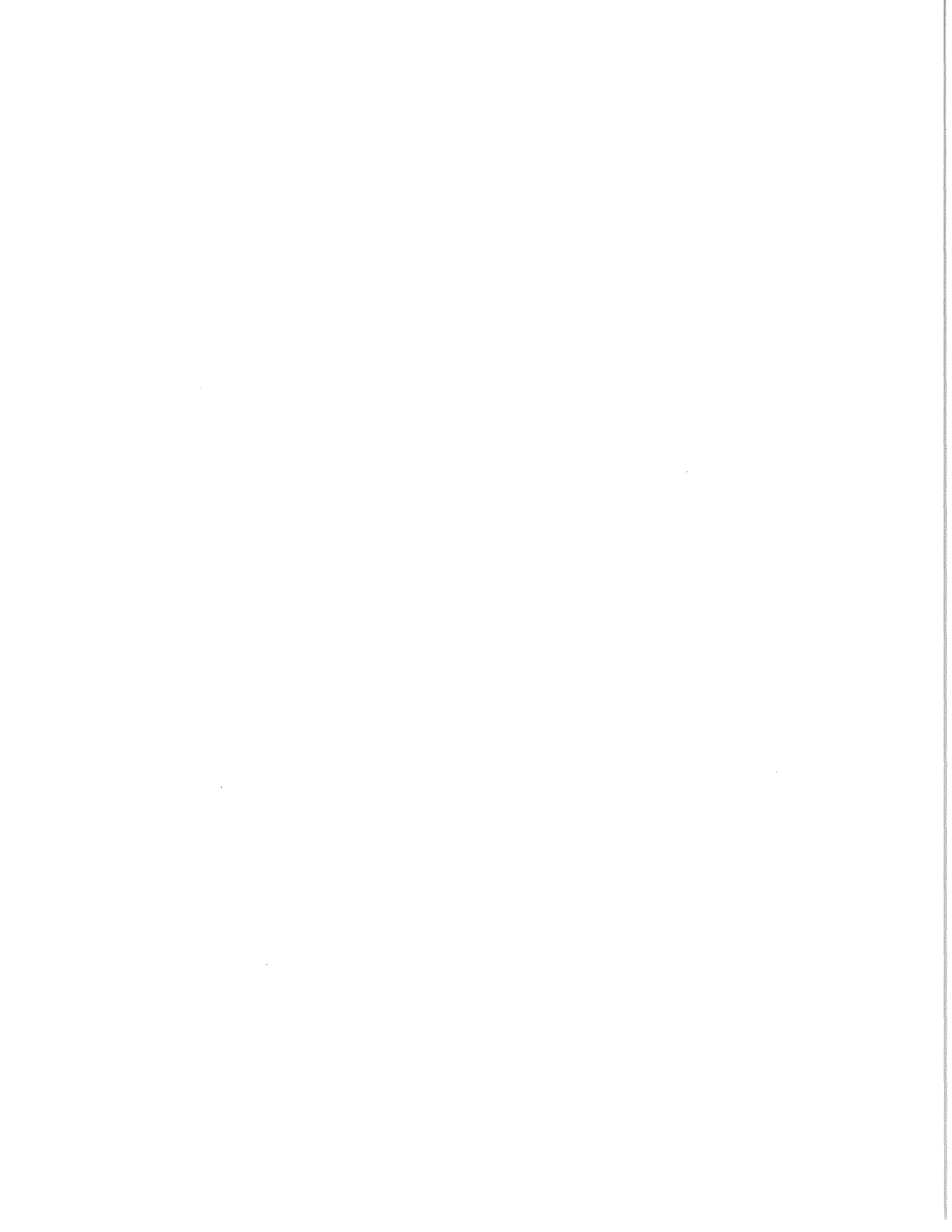
Commercial Equation Fit Wrangell (excludes WFP)



Appendix C: MAP Model Results

These results from MAP econometric model runs are organized by region and within each region by case, from LOW to HIGH.

Employment projections are presented separately for each of the Outer Ketchikan and Prince of Wales Census sub-areas. Projections of number households and personal income are presented for the Prince of Wales-Outer Ketchikan census area, consistent with available data on these quantities.



MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL LOW
 KETCHIKAN
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	3.034	2.714	1.929	7.677	6.771	12.752
1989	3.020	2.817	2.002	7.839	6.910	12.842
1990	3.059	2.877	1.983	7.919	6.992	13.276
1991	3.085	2.811	1.945	7.841	6.907	13.247
1992	3.096	2.745	1.869	7.710	6.777	13.154
1993	3.112	2.676	1.948	7.736	6.795	13.160
1994	3.156	2.700	2.055	7.911	6.960	13.346
1995	3.141	2.695	2.146	7.982	7.033	13.504
1996	3.096	2.706	2.221	8.024	7.074	13.618
1997	3.053	2.692	2.192	7.936	6.986	13.583
1998	3.038	2.684	2.176	7.898	6.946	13.540
1999	3.032	2.682	2.175	7.890	6.934	13.527
2000	3.050	2.709	2.179	7.938	6.978	13.608
2001	3.072	2.729	2.162	7.963	7.001	13.679
2002	3.094	2.754	2.132	7.980	7.018	13.740
2003	3.108	2.773	2.114	7.994	7.032	13.792
2004	3.117	2.795	2.105	8.018	7.054	13.853
2005	2.600	2.568	2.102	7.270	6.302	12.657
2006	2.628	2.598	2.101	7.327	6.352	12.694
2007	2.660	2.632	2.104	7.396	6.413	12.827
2008	2.698	2.664	2.097	7.459	6.468	12.964
2009	2.732	2.687	2.077	7.497	6.497	13.066
2010	2.769	2.714	2.059	7.541	6.535	13.171

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: B.13, S.13, G.13, M.13, M97.13 P.13

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL LOW
 KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	12.752	12.752	12.752	4.667	2.661
1989	12.842	12.842	12.842	4.714	2.654
1990	13.276	13.276	13.276	4.895	2.644
1991	13.247	13.247	13.247	4.904	2.633
1992	13.154	13.154	13.154	4.891	2.622
1993	13.160	13.160	13.160	4.913	2.611
1994	13.346	13.346	13.346	4.997	2.604
1995	13.504	13.504	13.504	5.071	2.597
1996	13.618	13.618	13.618	5.128	2.591
1997	13.583	13.583	13.583	5.130	2.583
1998	13.540	13.540	13.540	5.128	2.575
1999	13.527	13.527	13.527	5.137	2.569
2000	13.608	13.608	13.608	5.179	2.563
2001	13.679	13.679	13.679	5.218	2.558
2002	13.740	13.740	13.740	5.252	2.553
2003	13.792	13.792	13.792	5.281	2.549
2004	13.853	13.853	13.853	5.314	2.545
2005	12.657	12.657	12.657	4.852	2.540
2006	12.694	12.694	12.694	4.872	2.537
2007	12.827	12.827	12.827	4.929	2.535
2008	12.964	12.964	12.964	4.986	2.533
2009	13.066	13.066	13.066	5.031	2.531
2010	13.171	13.171	13.171	5.077	2.529

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: PCEN.23, PBEA.23, PBOR.23, HHCEN.23, HSIZE.23

MAP REGIONAL MODEL PROJECTIONS: PART III
 SEA FINAL LOW
 KETCHIKAN
 PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 281	\$ 240	\$22057	\$18820	\$ 247	\$22668	\$19342
1989	\$ 306	\$ 260	\$23823	\$20278	\$ 256	\$23418	\$19933
1990	\$ 328	\$ 279	\$24671	\$21025	\$ 262	\$23198	\$19770
1991	\$ 333	\$ 283	\$25101	\$21369	\$ 253	\$22478	\$19136
1992	\$ 344	\$ 292	\$26124	\$22199	\$ 249	\$22280	\$18933
1993	\$ 361	\$ 301	\$27420	\$22836	\$ 244	\$22272	\$18549
1994	\$ 388	\$ 323	\$29060	\$24175	\$ 250	\$22480	\$18701
1995	\$ 396	\$ 329	\$29311	\$24342	\$ 243	\$21691	\$18013
1996	\$ 416	\$ 346	\$30569	\$25380	\$ 245	\$21640	\$17967
1997	\$ 432	\$ 358	\$31789	\$26388	\$ 243	\$21528	\$17870
1998	\$ 451	\$ 375	\$33317	\$27680	\$ 243	\$21584	\$17932
1999	\$ 472	\$ 393	\$34913	\$29016	\$ 243	\$21638	\$17984
2000	\$ 500	\$ 415	\$36715	\$30492	\$ 246	\$21770	\$18080
2001	\$ 524	\$ 435	\$38292	\$31819	\$ 247	\$21723	\$18050
2002	\$ 552	\$ 459	\$40209	\$33384	\$ 249	\$21823	\$18119
2003	\$ 578	\$ 480	\$41919	\$34824	\$ 249	\$21767	\$18083
2004	\$ 607	\$ 505	\$43853	\$36427	\$ 251	\$21788	\$18098
2005	\$ 572	\$ 475	\$45182	\$37523	\$ 226	\$21478	\$17837
2006	\$ 606	\$ 503	\$47747	\$39630	\$ 229	\$21717	\$18025
2007	\$ 642	\$ 532	\$50037	\$41500	\$ 232	\$21777	\$18061
2008	\$ 679	\$ 563	\$52414	\$43467	\$ 235	\$21828	\$18102
2009	\$ 717	\$ 595	\$54896	\$45549	\$ 237	\$21876	\$18151
2010	\$ 757	\$ 628	\$57497	\$47705	\$ 240	\$21925	\$18191

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: PI.23, DPI.23, P.PI.23, P.DI.23, DF.DI.23, DP.PI.23, DP.DI.23

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL BASE
 KETCHIKAN
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	3.034	2.714	1.929	7.677	6.771	12.752
1989	3.032	2.822	2.003	7.858	6.929	12.869
1990	3.084	2.889	1.989	7.963	7.035	13.342
1991	3.129	2.879	2.021	8.029	7.096	13.483
1992	3.169	2.874	2.002	8.045	7.112	13.579
1993	3.204	2.891	2.044	8.138	7.197	13.710
1994	3.213	2.918	2.116	8.247	7.297	13.889
1995	3.176	2.874	2.125	8.175	7.227	13.928
1996	3.161	2.885	2.139	8.184	7.235	13.951
1997	3.163	2.872	2.155	8.191	7.241	13.986
1998	3.228	2.907	2.154	8.289	7.337	14.152
1999	3.203	2.912	2.155	8.270	7.314	14.132
2000	3.231	2.941	2.154	8.327	7.367	14.235
2001	3.256	2.963	2.131	8.350	7.387	14.316
2002	3.264	2.972	2.094	8.330	7.368	14.342
2003	3.261	2.978	2.071	8.309	7.347	14.348
2004	3.269	2.992	2.062	8.323	7.359	14.381
2005	3.290	3.023	2.070	8.383	7.414	14.475
2006	3.314	3.063	2.089	8.466	7.491	14.620
2007	3.346	3.113	2.111	8.569	7.587	14.805
2008	3.386	3.171	2.130	8.687	7.696	15.024
2009	3.429	3.231	2.136	8.797	7.797	15.245
2010	3.472	3.288	2.126	8.885	7.879	15.445

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: B.13, S.13, G.13, M.13, M97.13 P.13

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL BASE
 KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	12.752	12.752	12.752	4.667	2.661
1989	12.869	12.869	12.869	4.724	2.654
1990	13.342	13.342	13.342	4.920	2.645
1991	13.483	13.483	13.483	4.991	2.635
1992	13.579	13.579	13.579	5.046	2.625
1993	13.710	13.710	13.710	5.111	2.617
1994	13.889	13.889	13.889	5.193	2.610
1995	13.928	13.928	13.928	5.226	2.601
1996	13.951	13.951	13.951	5.253	2.593
1997	13.986	13.986	13.986	5.283	2.584
1998	14.152	14.152	14.152	5.363	2.577
1999	14.132	14.132	14.132	5.368	2.571
2000	14.235	14.235	14.235	5.419	2.565
2001	14.316	14.316	14.316	5.463	2.560
2002	14.342	14.342	14.342	5.485	2.554
2003	14.348	14.348	14.348	5.499	2.549
2004	14.381	14.381	14.381	5.523	2.544
2005	14.475	14.475	14.475	5.568	2.540
2006	14.620	14.620	14.620	5.631	2.538
2007	14.805	14.805	14.805	5.707	2.536
2008	15.024	15.024	15.024	5.795	2.535
2009	15.245	15.245	15.245	5.884	2.534
2010	15.445	15.445	15.445	5.965	2.533

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: PCEN.23, PBEA.23, PBOR.23, HHCEN.23, HSIZE.23

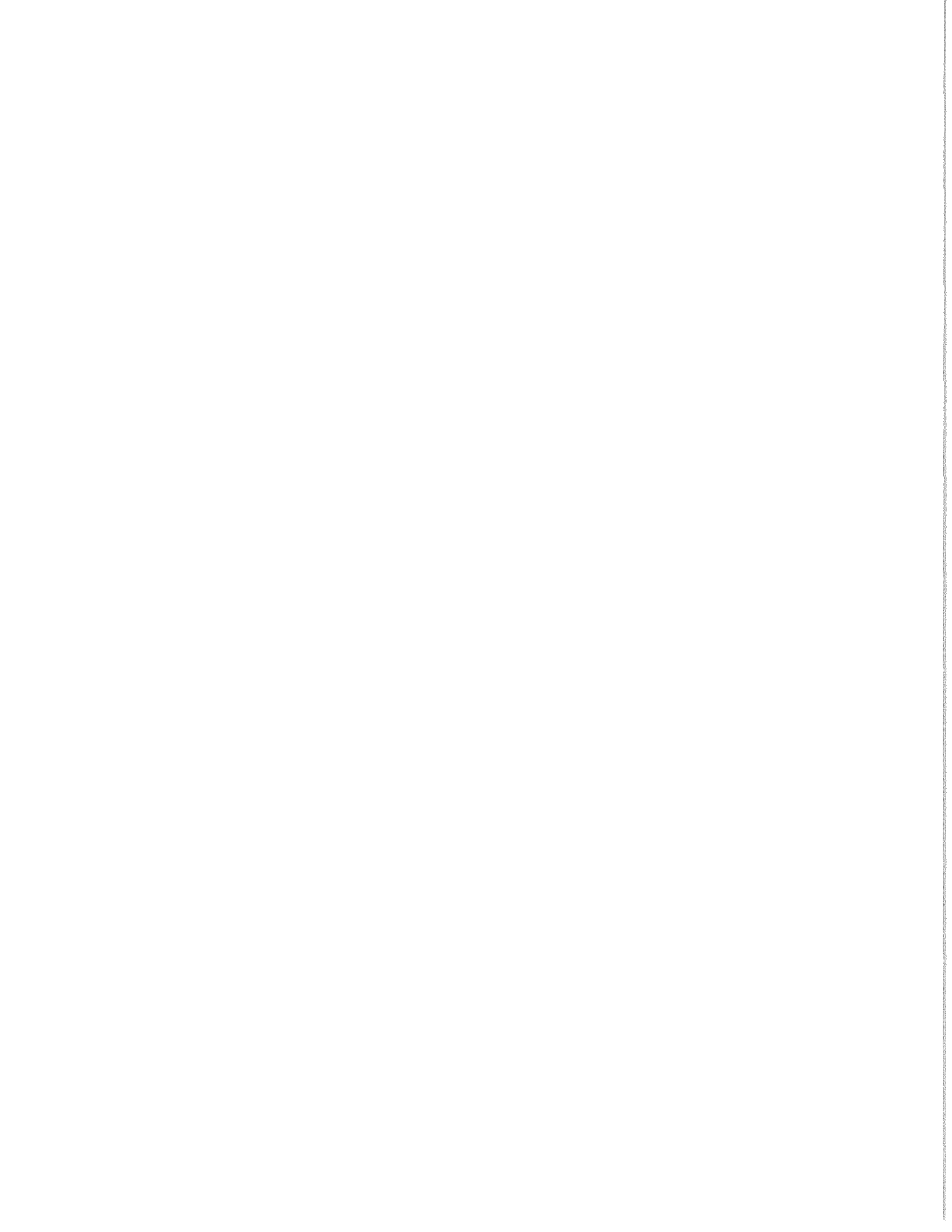
MAP REGIONAL MODEL PROJECTIONS: PART III
SEA FINAL BASE
KETCHIKAN
PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 281	\$ 240	\$22057	\$18820	\$ 247	\$22668	\$19342
1989	\$ 307	\$ 261	\$23833	\$20286	\$ 257	\$23428	\$19941
1990	\$ 329	\$ 281	\$24688	\$21041	\$ 264	\$23214	\$19784
1991	\$ 341	\$ 290	\$25278	\$21499	\$ 260	\$22637	\$19253
1992	\$ 355	\$ 302	\$26135	\$22232	\$ 259	\$22388	\$19045
1993	\$ 376	\$ 320	\$27432	\$23318	\$ 262	\$22480	\$19109
1994	\$ 400	\$ 340	\$28778	\$24455	\$ 266	\$22561	\$19172
1995	\$ 417	\$ 347	\$29954	\$24891	\$ 260	\$22465	\$18667
1996	\$ 440	\$ 366	\$31527	\$26225	\$ 261	\$22519	\$18732
1997	\$ 446	\$ 370	\$31873	\$26475	\$ 253	\$21779	\$18091
1998	\$ 476	\$ 395	\$33599	\$27912	\$ 257	\$21865	\$18164
1999	\$ 499	\$ 414	\$35291	\$29292	\$ 258	\$21972	\$18237
2000	\$ 526	\$ 437	\$36984	\$30694	\$ 260	\$22030	\$18283
2001	\$ 554	\$ 460	\$38712	\$32121	\$ 262	\$22061	\$18305
2002	\$ 578	\$ 480	\$40333	\$33469	\$ 262	\$21991	\$18248
2003	\$ 605	\$ 502	\$42173	\$34989	\$ 262	\$22000	\$18253
2004	\$ 635	\$ 527	\$44141	\$36636	\$ 263	\$22032	\$18286
2005	\$ 672	\$ 557	\$46409	\$38502	\$ 266	\$22164	\$18388
2006	\$ 711	\$ 589	\$48607	\$40295	\$ 269	\$22212	\$18414
2007	\$ 754	\$ 625	\$50915	\$42203	\$ 273	\$22264	\$18454
2008	\$ 801	\$ 664	\$53340	\$44207	\$ 278	\$22319	\$18497
2009	\$ 852	\$ 706	\$55870	\$46297	\$ 283	\$22371	\$18538
2010	\$ 904	\$ 749	\$58507	\$48476	\$ 287	\$22418	\$18574

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: PI.23, DPI.23, P.PI.23, P.DI.23, DF.DI.23, DP.PI.23, DP.DI.23



MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL HIGH
 KETCHIKAN
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	3.034	2.714	1.929	7.677	6.771	12.752
1989	3.041	2.825	2.003	7.870	6.941	12.882
1990	3.103	2.914	2.031	8.048	7.121	13.438
1991	3.193	2.989	2.110	8.292	7.356	13.782
1992	3.291	3.067	2.091	8.449	7.512	14.120
1993	3.405	3.164	2.064	8.633	7.686	14.450
1994	3.614	3.318	2.058	8.990	8.032	15.096
1995	4.507	3.877	2.050	10.434	9.475	17.376
1996	4.354	3.939	2.044	10.336	9.374	17.373
1997	4.116	3.914	2.030	10.060	9.095	17.105
1998	4.282	4.088	2.059	10.429	9.460	17.725
1999	4.271	4.071	2.123	10.464	9.489	17.841
2000	4.581	4.274	2.109	10.965	9.984	18.627
2001	4.552	4.282	2.121	10.954	9.968	18.678
2002	4.620	4.373	2.099	11.092	10.104	18.936
2003	4.642	4.445	2.077	11.164	10.173	19.123
2004	4.650	4.525	2.099	11.274	10.280	19.313
2005	4.696	4.640	2.142	11.478	10.477	19.623
2006	4.760	4.783	2.174	11.717	10.706	20.021
2007	4.826	4.937	2.212	11.975	10.954	20.448
2008	4.910	5.123	2.251	12.284	11.252	20.966
2009	5.003	5.327	2.275	12.605	11.563	21.535
2010	5.088	5.517	2.285	12.890	11.839	22.087

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: B.13, S.13, G.13, M.13, M97.13 P.13

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL HIGH
 KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	12.752	12.752	12.752	4.667	2.661
1989	12.882	12.882	12.882	4.729	2.654
1990	13.438	13.438	13.438	4.954	2.646
1991	13.782	13.782	13.782	5.097	2.639
1992	14.120	14.120	14.120	5.235	2.634
1993	14.450	14.450	14.450	5.370	2.629
1994	15.096	15.096	15.096	5.628	2.623
1995	17.376	17.376	17.376	6.506	2.620
1996	17.373	17.373	17.373	6.513	2.616
1997	17.105	17.105	17.105	6.423	2.612
1998	17.725	17.725	17.725	6.680	2.604
1999	17.841	17.841	17.841	6.743	2.597
2000	18.627	18.627	18.627	7.060	2.591
2001	18.678	18.678	18.678	7.094	2.586
2002	18.936	18.936	18.936	7.207	2.581
2003	19.123	19.123	19.123	7.293	2.577
2004	19.313	19.313	19.313	7.378	2.572
2005	19.623	19.623	19.623	7.507	2.570
2006	20.021	20.021	20.021	7.666	2.568
2007	20.448	20.448	20.448	7.835	2.567
2008	20.966	20.966	20.966	8.036	2.568
2009	21.535	21.535	21.535	8.255	2.568
2010	22.087	22.087	22.087	8.470	2.568

SOURCE: DSET SEA2HR
 DATE OF CREATION: 6/90
 VARIABLES: PCEN.23, PBEA.23, PBOR.23, HHCEN.23, HSIZE.23

MAP REGIONAL MODEL PROJECTIONS: PART III
SEA FINAL HIGH
KETCHIKAN
PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 281	\$ 240	\$22057	\$18820	\$ 247	\$22668	\$19342
1989	\$ 307	\$ 261	\$23835	\$20288	\$ 257	\$23430	\$19943
1990	\$ 333	\$ 284	\$24744	\$21100	\$ 267	\$23267	\$19841
1991	\$ 350	\$ 298	\$25369	\$21597	\$ 268	\$22821	\$19427
1992	\$ 374	\$ 318	\$26493	\$22530	\$ 274	\$22799	\$19389
1993	\$ 402	\$ 342	\$27820	\$23652	\$ 281	\$22904	\$19473
1994	\$ 444	\$ 377	\$29417	\$24997	\$ 297	\$23170	\$19689
1995	\$ 541	\$ 460	\$31150	\$26484	\$ 347	\$23475	\$19958
1996	\$ 563	\$ 478	\$32389	\$27507	\$ 345	\$23353	\$19833
1997	\$ 577	\$ 489	\$33740	\$28604	\$ 338	\$23276	\$19732
1998	\$ 647	\$ 549	\$36521	\$30958	\$ 362	\$24104	\$20432
1999	\$ 681	\$ 564	\$38145	\$31636	\$ 356	\$24088	\$19977
2000	\$ 775	\$ 642	\$41586	\$34465	\$ 375	\$24300	\$20139
2001	\$ 789	\$ 653	\$42220	\$34939	\$ 365	\$23602	\$19532
2002	\$ 841	\$ 696	\$44405	\$36738	\$ 372	\$23749	\$19648
2003	\$ 891	\$ 737	\$46596	\$38541	\$ 377	\$23842	\$19720
2004	\$ 945	\$ 782	\$48943	\$40479	\$ 383	\$23959	\$19816
2005	\$ 1010	\$ 836	\$51491	\$42582	\$ 391	\$24117	\$19945
2006	\$ 1084	\$ 897	\$54161	\$44780	\$ 402	\$24272	\$20068
2007	\$ 1165	\$ 964	\$56979	\$47156	\$ 413	\$24433	\$20220
2008	\$ 1257	\$ 1040	\$59973	\$49627	\$ 427	\$24607	\$20362
2009	\$ 1360	\$ 1125	\$63143	\$52236	\$ 442	\$24790	\$20508
2010	\$ 1457	\$ 1207	\$65988	\$54626	\$ 453	\$24791	\$20522

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: PI.23, DPI.23, P.PI.23, P.DI.23, DF.DI.23, DP.PI.23, DP.DI.23

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL LOW
 OUTER KETCHIKAN
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	0.226	0.107	0.313	0.646	0.564	1.833
1989	0.225	0.111	0.323	0.660	0.576	1.896
1990	0.228	0.113	0.321	0.661	0.577	1.992
1991	0.230	0.110	0.315	0.655	0.571	2.076
1992	0.231	0.107	0.305	0.643	0.559	2.154
1993	0.233	0.106	0.316	0.654	0.570	2.221
1994	0.236	0.109	0.330	0.675	0.590	2.273
1995	0.222	0.107	0.343	0.672	0.587	2.319
1996	0.206	0.106	0.353	0.665	0.580	2.358
1997	0.190	0.103	0.349	0.642	0.557	2.390
1998	0.176	0.100	0.347	0.623	0.538	2.406
1999	0.162	0.098	0.347	0.607	0.522	2.408
2000	0.164	0.099	0.347	0.610	0.524	2.412
2001	0.166	0.099	0.345	0.610	0.524	2.420
2002	0.168	0.099	0.341	0.608	0.522	2.431
2003	0.169	0.100	0.338	0.608	0.522	2.444
2004	0.170	0.100	0.337	0.608	0.522	2.458
2005	0.172	0.101	0.337	0.610	0.523	2.476
2006	0.174	0.102	0.337	0.612	0.525	2.494
2007	0.176	0.103	0.337	0.616	0.528	2.515
2008	0.179	0.103	0.336	0.618	0.530	2.539
2009	0.181	0.104	0.333	0.618	0.530	2.565
2010	0.183	0.104	0.331	0.619	0.530	2.592

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: B.19, S.19, G.19, H.19, H97.19 P.19

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL LOW
 PRINCE OF WALES/OUTER KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	5.567	5.567	5.567	1.720	3.134
1989	5.829	5.829	5.829	1.809	3.125
1990	6.099	6.099	6.099	1.902	3.114
1991	6.155	6.155	6.155	1.928	3.101
1992	6.114	6.114	6.114	1.924	3.087
1993	6.050	6.050	6.050	1.910	3.075
1994	5.978	5.978	5.978	1.892	3.067
1995	5.915	5.915	5.915	1.876	3.059
1996	5.950	5.950	5.950	1.893	3.051
1997	5.992	5.992	5.992	1.912	3.042
1998	6.013	6.013	6.013	1.925	3.033
1999	6.024	6.024	6.024	1.934	3.025
2000	6.043	6.043	6.043	1.944	3.018
2001	6.064	6.064	6.064	1.955	3.012
2002	6.081	6.081	6.081	1.964	3.006
2003	6.098	6.098	6.098	1.973	3.001
2004	6.121	6.121	6.121	1.984	2.996
2005	6.156	6.156	6.156	1.999	2.991
2006	6.192	6.192	6.192	2.014	2.988
2007	6.240	6.240	6.240	2.031	2.985
2008	6.294	6.294	6.294	2.051	2.983
2009	6.345	6.345	6.345	2.070	2.980
2010	6.395	6.395	6.395	2.088	2.978

SOURCE: DSET SEA2LR
 DATE OF CREATION: 6/90
 VARIABLES: PCEN.22, PBEA.22, PBOR.22, HHCEN.22, HSIZE.22

MAP REGIONAL MODEL PROJECTIONS: PART III
 SEA FINAL LOW
 PRINCE OF WALES/OUTER KETCHIKAN
 PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 80	\$ 68	\$14330	\$12227	\$ 70	\$14727	\$12566
1989	\$ 87	\$ 74	\$14948	\$12723	\$ 73	\$14694	\$12507
1990	\$ 93	\$ 80	\$15304	\$13043	\$ 75	\$14391	\$12264
1991	\$ 91	\$ 78	\$14804	\$12603	\$ 69	\$13257	\$11286
1992	\$ 91	\$ 77	\$14851	\$12620	\$ 66	\$12666	\$10763
1993	\$ 92	\$ 77	\$15186	\$12647	\$ 62	\$12335	\$10273
1994	\$ 95	\$ 79	\$15842	\$13179	\$ 61	\$12255	\$10195
1995	\$ 92	\$ 76	\$15526	\$12893	\$ 56	\$11489	\$ 9541
1996	\$ 96	\$ 80	\$16135	\$13396	\$ 56	\$11422	\$ 9483
1997	\$ 99	\$ 82	\$16512	\$13707	\$ 56	\$11182	\$ 9282
1998	\$ 103	\$ 85	\$17073	\$14184	\$ 55	\$11061	\$ 9189
1999	\$ 107	\$ 89	\$17719	\$14726	\$ 55	\$10982	\$ 9127
2000	\$ 113	\$ 94	\$18686	\$15519	\$ 56	\$11080	\$ 9202
2001	\$ 118	\$ 98	\$19492	\$16197	\$ 56	\$11058	\$ 9188
2002	\$ 125	\$ 103	\$20477	\$17001	\$ 56	\$11114	\$ 9227
2003	\$ 130	\$ 108	\$21325	\$17715	\$ 56	\$11073	\$ 9199
2004	\$ 137	\$ 113	\$22302	\$18525	\$ 56	\$11080	\$ 9204
2005	\$ 144	\$ 120	\$23386	\$19422	\$ 57	\$11117	\$ 9232
2006	\$ 152	\$ 126	\$24609	\$20425	\$ 58	\$11193	\$ 9290
2007	\$ 161	\$ 134	\$25804	\$21402	\$ 58	\$11230	\$ 9314
2008	\$ 170	\$ 141	\$27032	\$22417	\$ 59	\$11257	\$ 9336
2009	\$ 179	\$ 149	\$28272	\$23458	\$ 59	\$11266	\$ 9348
2010	\$ 189	\$ 157	\$29564	\$24529	\$ 60	\$11273	\$ 9353

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: PI.22, DPI.22, P.PI.22, P.DI.22, DF.DI.22, DP.PI.22, DP.DI.22

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL BASE
 OUTER KETCHIKAN
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	0.226	0.107	0.313	0.646	0.564	1.833
1989	0.225	0.111	0.324	0.660	0.577	1.896
1990	0.228	0.113	0.322	0.663	0.579	1.993
1991	0.230	0.113	0.327	0.670	0.586	2.076
1992	0.233	0.113	0.325	0.670	0.586	2.154
1993	0.236	0.114	0.331	0.681	0.596	2.220
1994	0.237	0.116	0.341	0.694	0.609	2.283
1995	0.235	0.115	0.343	0.693	0.608	2.357
1996	0.235	0.116	0.345	0.696	0.611	2.420
1997	0.235	0.116	0.348	0.699	0.614	2.478
1998	0.237	0.117	0.348	0.701	0.616	2.527
1999	0.239	0.118	0.348	0.705	0.619	2.570
2000	0.241	0.118	0.349	0.708	0.623	2.610
2001	0.243	0.119	0.346	0.708	0.622	2.649
2002	0.244	0.119	0.341	0.705	0.619	2.689
2003	0.245	0.119	0.338	0.702	0.616	2.727
2004	0.246	0.120	0.338	0.703	0.617	2.760
2005	0.247	0.121	0.339	0.707	0.621	2.790
2006	0.249	0.122	0.342	0.714	0.627	2.820
2007	0.252	0.124	0.346	0.722	0.634	2.852
2008	0.255	0.126	0.349	0.730	0.642	2.888
2009	0.258	0.128	0.350	0.736	0.648	2.928
2010	0.262	0.130	0.349	0.740	0.651	2.972

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: B.19, S.19, G.19, M.19, M97.19 P.19

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL BASE
 PRINCE OF WALES/OUTER KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	5.567	5.567	5.567	1.720	3.134
1989	5.828	5.828	5.828	1.809	3.125
1990	6.100	6.100	6.100	1.902	3.114
1991	6.170	6.170	6.170	1.931	3.103
1992	6.152	6.152	6.152	1.933	3.091
1993	6.097	6.097	6.097	1.921	3.082
1994	6.045	6.045	6.045	1.909	3.074
1995	5.997	5.997	5.997	1.900	3.063
1996	6.016	6.016	6.016	1.913	3.053
1997	6.067	6.067	6.067	1.936	3.043
1998	6.118	6.118	6.118	1.958	3.035
1999	6.172	6.172	6.172	1.981	3.027
2000	6.228	6.228	6.228	2.004	3.021
2001	6.282	6.282	6.282	2.025	3.015
2002	6.326	6.326	6.326	2.045	3.008
2003	6.365	6.365	6.365	2.062	3.001
2004	6.400	6.400	6.400	2.078	2.995
2005	6.440	6.440	6.440	2.094	2.991
2006	6.496	6.496	6.496	2.115	2.988
2007	6.563	6.563	6.563	2.139	2.986
2008	6.643	6.643	6.643	2.166	2.985
2009	6.728	6.728	6.728	2.196	2.984
2010	6.814	6.814	6.814	2.225	2.983

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: PCEN.22, PBEA.22, PBOR.22, HHCEN.22, HSIZE.22

MAP REGIONAL MODEL PROJECTIONS: PART III
 SEA FINAL BASE
 PRINCE OF WALES/OUTER KETCHIKAN
 PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 80	\$ 68	\$14330	\$12227	\$ 70	\$14727	\$12566
1989	\$ 87	\$ 74	\$14951	\$12726	\$ 73	\$14696	\$12509
1990	\$ 93	\$ 80	\$15310	\$13048	\$ 75	\$14396	\$12269
1991	\$ 92	\$ 79	\$14962	\$12725	\$ 70	\$13399	\$11395
1992	\$ 92	\$ 78	\$14968	\$12733	\$ 67	\$12822	\$10907
1993	\$ 94	\$ 80	\$15381	\$13075	\$ 65	\$12605	\$10715
1994	\$ 96	\$ 81	\$15850	\$13469	\$ 64	\$12426	\$10559
1995	\$ 96	\$ 80	\$16011	\$13304	\$ 60	\$12008	\$ 9978
1996	\$ 101	\$ 84	\$16831	\$14001	\$ 60	\$12022	\$10000
1997	\$ 103	\$ 85	\$16930	\$14063	\$ 58	\$11568	\$ 9609
1998	\$ 108	\$ 90	\$17728	\$14727	\$ 59	\$11537	\$ 9584
1999	\$ 115	\$ 95	\$18605	\$15442	\$ 59	\$11583	\$ 9614
2000	\$ 121	\$ 100	\$19441	\$16134	\$ 60	\$11580	\$ 9610
2001	\$ 127	\$ 106	\$20270	\$16819	\$ 60	\$11552	\$ 9585
2002	\$ 133	\$ 110	\$20983	\$17412	\$ 60	\$11440	\$ 9493
2003	\$ 139	\$ 115	\$21810	\$18095	\$ 60	\$11377	\$ 9439
2004	\$ 146	\$ 121	\$22738	\$18872	\$ 60	\$11349	\$ 9419
2005	\$ 154	\$ 128	\$23898	\$19827	\$ 61	\$11413	\$ 9469
2006	\$ 163	\$ 135	\$25042	\$20759	\$ 62	\$11443	\$ 9486
2007	\$ 172	\$ 143	\$26251	\$21759	\$ 62	\$11479	\$ 9515
2008	\$ 183	\$ 152	\$27525	\$22812	\$ 63	\$11517	\$ 9545
2009	\$ 194	\$ 161	\$28828	\$23889	\$ 64	\$11543	\$ 9565
2010	\$ 205	\$ 170	\$30142	\$24974	\$ 65	\$11549	\$ 9569

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: PI.22, DPI.22, P.PI.22, P.DI.22, DF.DI.22, DP.PI.22, DP.DI.22

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL HIGH
 OUTER KETCHIKAN
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	0.226	0.107	0.313	0.646	0.564	1.833
1989	0.226	0.111	0.324	0.661	0.577	1.896
1990	0.229	0.114	0.328	0.671	0.588	1.992
1991	0.245	0.119	0.339	0.703	0.619	2.081
1992	0.258	0.123	0.336	0.716	0.633	2.172
1993	0.317	0.136	0.333	0.785	0.700	2.298
1994	0.321	0.139	0.332	0.792	0.706	2.412
1995	0.321	0.142	0.331	0.794	0.709	2.497
1996	0.322	0.147	0.330	0.799	0.714	2.574
1997	0.324	0.150	0.328	0.803	0.718	2.666
1998	0.326	0.153	0.332	0.812	0.727	2.752
1999	0.329	0.154	0.341	0.825	0.739	2.836
2000	0.333	0.156	0.340	0.828	0.742	2.901
2001	0.338	0.158	0.341	0.837	0.751	2.965
2002	0.341	0.160	0.338	0.839	0.753	3.024
2003	0.343	0.161	0.335	0.839	0.753	3.081
2004	0.344	0.164	0.339	0.847	0.761	3.134
2005	0.348	0.168	0.344	0.860	0.774	3.181
2006	0.352	0.172	0.349	0.873	0.786	3.228
2007	0.356	0.177	0.354	0.888	0.800	3.276
2008	0.362	0.183	0.360	0.905	0.817	3.326
2009	0.369	0.189	0.363	0.921	0.832	3.382
2010	0.374	0.194	0.365	0.932	0.843	3.445

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: B.19, S.19, G.19, M.19, M97.19 P.19

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL HIGH
 PRINCE OF WALES/OUTER KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	5.567	5.567	5.567	1.720	3.134
1989	5.827	5.827	5.827	1.808	3.125
1990	6.106	6.106	6.106	1.904	3.115
1991	6.191	6.191	6.191	1.936	3.107
1992	6.204	6.204	6.204	1.944	3.101
1993	6.201	6.201	6.201	1.946	3.096
1994	6.180	6.180	6.180	1.944	3.089
1995	6.089	6.089	6.089	1.917	3.085
1996	6.113	6.113	6.113	1.927	3.081
1997	6.222	6.222	6.222	1.966	3.075
1998	6.345	6.345	6.345	2.012	3.066
1999	6.481	6.481	6.481	2.062	3.058
2000	6.570	6.570	6.570	2.095	3.051
2001	6.667	6.667	6.667	2.131	3.045
2002	6.747	6.747	6.747	2.162	3.040
2003	6.817	6.817	6.817	2.189	3.034
2004	6.890	6.890	6.890	2.216	3.029
2005	6.973	6.973	6.973	2.246	3.026
2006	7.067	7.067	7.067	2.279	3.024
2007	7.171	7.171	7.171	2.314	3.023
2008	7.289	7.289	7.289	2.353	3.023
2009	7.419	7.419	7.419	2.395	3.024
2010	7.553	7.553	7.553	2.439	3.024

SOURCE: DSET SEA2HR
 DATE OF CREATION: 6/90
 VARIABLES: PCEN.22, PBEA.22, PBOR.22, HHCEN.22, HSIZE.22

MAP REGIONAL MODEL PROJECTIONS: PART III
 SEA FINAL HIGH
 PRINCE OF WALES/OUTER KETCHIKAN
 PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 80	\$ 68	\$14330	\$12227	\$ 70	\$14727	\$12566
1989	\$ 87	\$ 74	\$14952	\$12727	\$ 73	\$14698	\$12510
1990	\$ 94	\$ 80	\$15359	\$13097	\$ 75	\$14442	\$12315
1991	\$ 94	\$ 80	\$15180	\$12922	\$ 72	\$13655	\$11624
1992	\$ 96	\$ 82	\$15481	\$13165	\$ 70	\$13322	\$11329
1993	\$ 101	\$ 86	\$16331	\$13884	\$ 71	\$13445	\$11431
1994	\$ 104	\$ 88	\$16808	\$14283	\$ 70	\$13239	\$11250
1995	\$ 104	\$ 89	\$17134	\$14567	\$ 67	\$12912	\$10978
1996	\$ 111	\$ 94	\$18156	\$15419	\$ 68	\$13091	\$11117
1997	\$ 118	\$ 100	\$18962	\$16075	\$ 69	\$13081	\$11090
1998	\$ 128	\$ 109	\$20208	\$17130	\$ 72	\$13338	\$11306
1999	\$ 136	\$ 113	\$20939	\$17366	\$ 71	\$13222	\$10966
2000	\$ 148	\$ 123	\$22550	\$18689	\$ 72	\$13177	\$10921
2001	\$ 153	\$ 126	\$22894	\$18946	\$ 71	\$12798	\$10591
2002	\$ 162	\$ 134	\$23941	\$19807	\$ 71	\$12804	\$10593
2003	\$ 170	\$ 141	\$24970	\$20654	\$ 72	\$12776	\$10568
2004	\$ 180	\$ 149	\$26147	\$21626	\$ 73	\$12800	\$10587
2005	\$ 192	\$ 159	\$27514	\$22754	\$ 74	\$12887	\$10657
2006	\$ 205	\$ 169	\$28976	\$23958	\$ 76	\$12986	\$10736
2007	\$ 219	\$ 181	\$30556	\$25288	\$ 78	\$13102	\$10843
2008	\$ 235	\$ 195	\$32281	\$26712	\$ 80	\$13245	\$10960
2009	\$ 253	\$ 209	\$34102	\$28212	\$ 82	\$13389	\$11076
2010	\$ 269	\$ 223	\$35619	\$29486	\$ 84	\$13381	\$11077

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: PI.22, DPI.22, P.PI.22, P.DI.22, DF.DI.22, DP.PI.22, DP.DI.22

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL LOW
 PRINCE OF WALES
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	1.029	0.278	0.378	1.685	1.371	3.734
1989	1.036	0.291	0.396	1.723	1.397	3.933
1990	1.040	0.294	0.392	1.725	1.399	4.107
1991	0.985	0.276	0.382	1.643	1.313	4.079
1992	0.926	0.258	0.362	1.546	1.217	3.960
1993	0.871	0.243	0.383	1.497	1.163	3.830
1994	0.821	0.236	0.410	1.466	1.127	3.705
1995	0.760	0.227	0.433	1.421	1.083	3.596
1996	0.758	0.230	0.453	1.441	1.102	3.592
1997	0.755	0.230	0.445	1.430	1.091	3.602
1998	0.757	0.230	0.441	1.428	1.088	3.607
1999	0.760	0.230	0.441	1.431	1.089	3.616
2000	0.764	0.232	0.442	1.438	1.093	3.630
2001	0.767	0.233	0.437	1.438	1.092	3.643
2002	0.770	0.234	0.430	1.434	1.088	3.650
2003	0.771	0.235	0.425	1.431	1.085	3.655
2004	0.772	0.236	0.423	1.431	1.085	3.663
2005	0.775	0.238	0.422	1.435	1.086	3.680
2006	0.780	0.240	0.422	1.442	1.089	3.699
2007	0.786	0.242	0.423	1.451	1.094	3.725
2008	0.793	0.244	0.421	1.458	1.097	3.755
2009	0.800	0.245	0.416	1.461	1.094	3.781
2010	0.806	0.247	0.411	1.464	1.093	3.803

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: B.20, S.20, G.20, M.20, M97.20 P.20

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL LOW
 PRINCE OF WALES/OUTER KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	5.567	5.567	5.567	1.720	3.134
1989	5.829	5.829	5.829	1.809	3.125
1990	6.099	6.099	6.099	1.902	3.114
1991	6.155	6.155	6.155	1.928	3.101
1992	6.114	6.114	6.114	1.924	3.087
1993	6.050	6.050	6.050	1.910	3.075
1994	5.978	5.978	5.978	1.892	3.067
1995	5.915	5.915	5.915	1.876	3.059
1996	5.950	5.950	5.950	1.893	3.051
1997	5.992	5.992	5.992	1.912	3.042
1998	6.013	6.013	6.013	1.925	3.033
1999	6.024	6.024	6.024	1.934	3.025
2000	6.043	6.043	6.043	1.944	3.018
2001	6.064	6.064	6.064	1.955	3.012
2002	6.081	6.081	6.081	1.964	3.006
2003	6.098	6.098	6.098	1.973	3.001
2004	6.121	6.121	6.121	1.984	2.996
2005	6.156	6.156	6.156	1.999	2.991
2006	6.192	6.192	6.192	2.014	2.988
2007	6.240	6.240	6.240	2.031	2.985
2008	6.294	6.294	6.294	2.051	2.983
2009	6.345	6.345	6.345	2.070	2.980
2010	6.395	6.395	6.395	2.088	2.978

SOURCE: DSET SEAZLR

DATE OF CREATION: 6/90

VARIABLES: PCEN.22, PBEA.22, PBOR.22, HHCEN.22, HSIZE.22

MAP REGIONAL MODEL PROJECTIONS: PART III
 SEA FINAL LOW
 PRINCE OF WALES/OUTER KETCHIKAN
 PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 80	\$ 68	\$14330	\$12227	\$ 70	\$14727	\$12566
1989	\$ 87	\$ 74	\$14948	\$12723	\$ 73	\$14694	\$12507
1990	\$ 93	\$ 80	\$15304	\$13043	\$ 75	\$14391	\$12264
1991	\$ 91	\$ 78	\$14804	\$12603	\$ 69	\$13257	\$11286
1992	\$ 91	\$ 77	\$14851	\$12620	\$ 66	\$12666	\$10763
1993	\$ 92	\$ 77	\$15186	\$12647	\$ 62	\$12335	\$10273
1994	\$ 95	\$ 79	\$15842	\$13179	\$ 61	\$12255	\$10195
1995	\$ 92	\$ 76	\$15526	\$12893	\$ 56	\$11489	\$ 9541
1996	\$ 96	\$ 80	\$16135	\$13396	\$ 56	\$11422	\$ 9483
1997	\$ 99	\$ 82	\$16512	\$13707	\$ 56	\$11182	\$ 9282
1998	\$ 103	\$ 85	\$17073	\$14184	\$ 55	\$11061	\$ 9189
1999	\$ 107	\$ 89	\$17719	\$14726	\$ 55	\$10982	\$ 9127
2000	\$ 113	\$ 94	\$18686	\$15519	\$ 56	\$11080	\$ 9202
2001	\$ 118	\$ 98	\$19492	\$16197	\$ 56	\$11058	\$ 9188
2002	\$ 125	\$ 103	\$20477	\$17001	\$ 56	\$11114	\$ 9227
2003	\$ 130	\$ 108	\$21325	\$17715	\$ 56	\$11073	\$ 9199
2004	\$ 137	\$ 113	\$22302	\$18525	\$ 56	\$11080	\$ 9204
2005	\$ 144	\$ 120	\$23386	\$19422	\$ 57	\$11117	\$ 9232
2006	\$ 152	\$ 126	\$24609	\$20425	\$ 58	\$11193	\$ 9290
2007	\$ 161	\$ 134	\$25804	\$21402	\$ 58	\$11230	\$ 9314
2008	\$ 170	\$ 141	\$27032	\$22417	\$ 59	\$11257	\$ 9336
2009	\$ 179	\$ 149	\$28272	\$23458	\$ 59	\$11266	\$ 9348
2010	\$ 189	\$ 157	\$29564	\$24529	\$ 60	\$11273	\$ 9353

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: PI.22, DPI.22, P.PI.22, P.DI.22, DF.DI.22, DP.PI.22, DP.DI.22

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL BASE
 PRINCE OF WALES
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	1.029	0.278	0.378	1.685	1.371	3.734
1989	1.036	0.291	0.396	1.723	1.396	3.932
1990	1.040	0.294	0.392	1.726	1.400	4.107
1991	0.986	0.281	0.400	1.667	1.337	4.093
1992	0.930	0.267	0.395	1.593	1.263	3.998
1993	0.878	0.258	0.405	1.541	1.207	3.877
1994	0.823	0.250	0.424	1.497	1.158	3.762
1995	0.757	0.236	0.426	1.419	1.081	3.640
1996	0.756	0.237	0.429	1.422	1.083	3.596
1997	0.756	0.237	0.433	1.425	1.087	3.589
1998	0.758	0.237	0.432	1.428	1.088	3.591
1999	0.763	0.239	0.432	1.434	1.092	3.602
2000	0.768	0.241	0.432	1.440	1.096	3.619
2001	0.771	0.242	0.425	1.438	1.093	3.632
2002	0.772	0.241	0.415	1.429	1.083	3.637
2003	0.771	0.241	0.409	1.422	1.076	3.638
2004	0.772	0.242	0.407	1.421	1.074	3.640
2005	0.776	0.244	0.408	1.428	1.079	3.650
2006	0.782	0.247	0.413	1.441	1.088	3.675
2007	0.788	0.250	0.418	1.457	1.100	3.711
2008	0.796	0.255	0.423	1.473	1.112	3.755
2009	0.805	0.258	0.424	1.487	1.120	3.801
2010	0.812	0.262	0.421	1.494	1.124	3.842

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: B.20, S.20, G.20, M.20, M97.20 P.20

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL BASE
 PRINCE OF WALES/OUTER KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	5.567	5.567	5.567	1.720	3.134
1989	5.828	5.828	5.828	1.809	3.125
1990	6.100	6.100	6.100	1.902	3.114
1991	6.170	6.170	6.170	1.931	3.103
1992	6.152	6.152	6.152	1.933	3.091
1993	6.097	6.097	6.097	1.921	3.082
1994	6.045	6.045	6.045	1.909	3.074
1995	5.997	5.997	5.997	1.900	3.063
1996	6.016	6.016	6.016	1.913	3.053
1997	6.067	6.067	6.067	1.936	3.043
1998	6.118	6.118	6.118	1.958	3.035
1999	6.172	6.172	6.172	1.981	3.027
2000	6.228	6.228	6.228	2.004	3.021
2001	6.282	6.282	6.282	2.025	3.015
2002	6.326	6.326	6.326	2.045	3.008
2003	6.365	6.365	6.365	2.062	3.001
2004	6.400	6.400	6.400	2.078	2.995
2005	6.440	6.440	6.440	2.094	2.991
2006	6.496	6.496	6.496	2.115	2.988
2007	6.563	6.563	6.563	2.139	2.986
2008	6.643	6.643	6.643	2.166	2.985
2009	6.728	6.728	6.728	2.196	2.984
2010	6.814	6.814	6.814	2.225	2.983

SOURCE: DSET SEA2BR
 DATE OF CREATION: 6/90
 VARIABLES: PCEN.22, PBEA.22, PBOR.22, HHCEN.22, HSIZE.22

MAP REGIONAL MODEL PROJECTIONS: PART III
SEA FINAL BASE
PRINCE OF WALES/OUTER KETCHIKAN
PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 80	\$ 68	\$14330	\$12227	\$ 70	\$14727	\$12566
1989	\$ 87	\$ 74	\$14951	\$12726	\$ 73	\$14696	\$12509
1990	\$ 93	\$ 80	\$15310	\$13048	\$ 75	\$14396	\$12269
1991	\$ 92	\$ 79	\$14962	\$12725	\$ 70	\$13399	\$11395
1992	\$ 92	\$ 78	\$14968	\$12733	\$ 67	\$12822	\$10907
1993	\$ 94	\$ 80	\$15381	\$13075	\$ 65	\$12605	\$10715
1994	\$ 96	\$ 81	\$15850	\$13469	\$ 64	\$12426	\$10559
1995	\$ 96	\$ 80	\$16011	\$13304	\$ 60	\$12008	\$ 9978
1996	\$ 101	\$ 84	\$16831	\$14001	\$ 60	\$12022	\$10000
1997	\$ 103	\$ 85	\$16930	\$14063	\$ 58	\$11568	\$ 9609
1998	\$ 108	\$ 90	\$17728	\$14727	\$ 59	\$11537	\$ 9584
1999	\$ 115	\$ 95	\$18605	\$15442	\$ 59	\$11583	\$ 9614
2000	\$ 121	\$ 100	\$19441	\$16134	\$ 60	\$11580	\$ 9610
2001	\$ 127	\$ 106	\$20270	\$16819	\$ 60	\$11552	\$ 9585
2002	\$ 133	\$ 110	\$20983	\$17412	\$ 60	\$11440	\$ 9493
2003	\$ 139	\$ 115	\$21810	\$18095	\$ 60	\$11377	\$ 9439
2004	\$ 146	\$ 121	\$22738	\$18872	\$ 60	\$11349	\$ 9419
2005	\$ 154	\$ 128	\$23898	\$19827	\$ 61	\$11413	\$ 9469
2006	\$ 163	\$ 135	\$25042	\$20759	\$ 62	\$11443	\$ 9486
2007	\$ 172	\$ 143	\$26251	\$21759	\$ 62	\$11479	\$ 9515
2008	\$ 183	\$ 152	\$27525	\$22812	\$ 63	\$11517	\$ 9545
2009	\$ 194	\$ 161	\$28828	\$23889	\$ 64	\$11543	\$ 9565
2010	\$ 205	\$ 170	\$30142	\$24974	\$ 65	\$11549	\$ 9569

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: PI.22, DPI.22, P.PI.22, P.DI.22, DF.DI.22, DP.PI.22, DP.DI.22

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL HIGH
 PRINCE OF WALES
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	1.029	0.278	0.378	1.685	1.371	3.734
1989	1.037	0.291	0.396	1.724	1.397	3.932
1990	1.041	0.296	0.403	1.740	1.414	4.114
1991	0.991	0.289	0.423	1.702	1.372	4.110
1992	0.938	0.280	0.417	1.635	1.305	4.032
1993	0.885	0.271	0.409	1.565	1.231	3.904
1994	0.828	0.262	0.407	1.497	1.158	3.768
1995	0.764	0.255	0.404	1.422	1.084	3.592
1996	0.765	0.262	0.401	1.428	1.090	3.538
1997	0.767	0.267	0.397	1.431	1.092	3.557
1998	0.770	0.272	0.403	1.445	1.105	3.593
1999	0.774	0.274	0.419	1.467	1.125	3.646
2000	0.781	0.277	0.415	1.472	1.128	3.669
2001	0.788	0.280	0.416	1.484	1.139	3.702
2002	0.793	0.283	0.410	1.485	1.140	3.723
2003	0.793	0.285	0.403	1.480	1.135	3.736
2004	0.794	0.289	0.408	1.491	1.144	3.756
2005	0.799	0.296	0.418	1.513	1.164	3.792
2006	0.807	0.303	0.425	1.535	1.183	3.839
2007	0.816	0.312	0.434	1.562	1.205	3.895
2008	0.828	0.322	0.443	1.593	1.231	3.963
2009	0.841	0.332	0.448	1.621	1.255	4.037
2010	0.850	0.341	0.450	1.641	1.271	4.108

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: B.20, S.20, G.20, M.20, M97.20 P.20

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL HIGH
 PRINCE OF WALES/OUTER KETCHIKAN
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	5.567	5.567	5.567	1.720	3.134
1989	5.827	5.827	5.827	1.808	3.125
1990	6.106	6.106	6.106	1.904	3.115
1991	6.191	6.191	6.191	1.936	3.107
1992	6.204	6.204	6.204	1.944	3.101
1993	6.201	6.201	6.201	1.946	3.096
1994	6.180	6.180	6.180	1.944	3.089
1995	6.089	6.089	6.089	1.917	3.085
1996	6.113	6.113	6.113	1.927	3.081
1997	6.222	6.222	6.222	1.966	3.075
1998	6.345	6.345	6.345	2.012	3.066
1999	6.481	6.481	6.481	2.062	3.058
2000	6.570	6.570	6.570	2.095	3.051
2001	6.667	6.667	6.667	2.131	3.045
2002	6.747	6.747	6.747	2.162	3.040
2003	6.817	6.817	6.817	2.189	3.034
2004	6.890	6.890	6.890	2.216	3.029
2005	6.973	6.973	6.973	2.246	3.026
2006	7.067	7.067	7.067	2.279	3.024
2007	7.171	7.171	7.171	2.314	3.023
2008	7.289	7.289	7.289	2.353	3.023
2009	7.419	7.419	7.419	2.395	3.024
2010	7.553	7.553	7.553	2.439	3.024

SOURCE: DSET SEA2HR
 DATE OF CREATION: 6/90
 VARIABLES: PCEN.22, PBEA.22, PBOR.22, HHCEN.22, HSIZE.22

MAP REGIONAL MODEL PROJECTIONS: PART III
 SEA FINAL HIGH
 PRINCE OF WALES/OUTER KETCHIKAN
 PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 80	\$ 68	\$14330	\$12227	\$ 70	\$14727	\$12566
1989	\$ 87	\$ 74	\$14952	\$12727	\$ 73	\$14698	\$12510
1990	\$ 94	\$ 80	\$15359	\$13097	\$ 75	\$14442	\$12315
1991	\$ 94	\$ 80	\$15180	\$12922	\$ 72	\$13655	\$11624
1992	\$ 96	\$ 82	\$15481	\$13165	\$ 70	\$13322	\$11329
1993	\$ 101	\$ 86	\$16331	\$13884	\$ 71	\$13445	\$11431
1994	\$ 104	\$ 88	\$16808	\$14283	\$ 70	\$13239	\$11250
1995	\$ 104	\$ 89	\$17134	\$14567	\$ 67	\$12912	\$10978
1996	\$ 111	\$ 94	\$18156	\$15419	\$ 68	\$13091	\$11117
1997	\$ 118	\$ 100	\$18962	\$16075	\$ 69	\$13081	\$11090
1998	\$ 128	\$ 109	\$20208	\$17130	\$ 72	\$13338	\$11306
1999	\$ 136	\$ 113	\$20939	\$17366	\$ 71	\$13222	\$10966
2000	\$ 148	\$ 123	\$22550	\$18689	\$ 72	\$13177	\$10921
2001	\$ 153	\$ 126	\$22894	\$18946	\$ 71	\$12798	\$10591
2002	\$ 162	\$ 134	\$23941	\$19807	\$ 71	\$12804	\$10593
2003	\$ 170	\$ 141	\$24970	\$20654	\$ 72	\$12776	\$10568
2004	\$ 180	\$ 149	\$26147	\$21626	\$ 73	\$12800	\$10587
2005	\$ 192	\$ 159	\$27514	\$22754	\$ 74	\$12887	\$10657
2006	\$ 205	\$ 169	\$28976	\$23958	\$ 76	\$12986	\$10736
2007	\$ 219	\$ 181	\$30556	\$25288	\$ 78	\$13102	\$10843
2008	\$ 235	\$ 195	\$32281	\$26712	\$ 80	\$13245	\$10960
2009	\$ 253	\$ 209	\$34102	\$28212	\$ 82	\$13389	\$11076
2010	\$ 269	\$ 223	\$35619	\$29486	\$ 84	\$13381	\$11077

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: PI.22, DPI.22, P.PI.22, P.DI.22, DF.DI.22, DP.PI.22, DP.DI.22

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL LOW
 WRANGELL-PETERSBURG
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	1.829	0.811	0.792	3.432	2.795	6.718
1989	1.821	0.839	0.821	3.481	2.844	6.737
1990	1.831	0.851	0.814	3.495	2.858	6.920
1991	1.776	0.815	0.798	3.389	2.752	6.903
1992	1.720	0.781	0.767	3.269	2.632	6.812
1993	1.664	0.747	0.799	3.211	2.574	6.687
1994	1.615	0.735	0.843	3.193	2.556	6.568
1995	1.533	0.716	0.880	3.129	2.492	6.459
1996	1.505	0.716	0.910	3.131	2.494	6.436
1997	1.477	0.709	0.899	3.084	2.447	6.416
1998	1.455	0.703	0.892	3.049	2.412	6.375
1999	1.435	0.697	0.892	3.024	2.387	6.328
2000	1.440	0.703	0.893	3.036	2.399	6.325
2001	1.447	0.706	0.886	3.040	2.403	6.341
2002	1.454	0.712	0.874	3.040	2.403	6.362
2003	1.459	0.716	0.867	3.042	2.405	6.384
2004	1.463	0.721	0.863	3.047	2.410	6.409
2005	1.467	0.725	0.862	3.055	2.418	6.443
2006	1.473	0.730	0.862	3.065	2.428	6.472
2007	1.480	0.736	0.863	3.079	2.442	6.511
2008	1.487	0.741	0.860	3.089	2.452	6.552
2009	1.495	0.744	0.852	3.091	2.454	6.588
2010	1.502	0.748	0.845	3.095	2.458	6.621

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: B.28, S.28, G.28, H.28, M97.28 P.28

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL LOW
 WRANGELL-PETERSBURG
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	6.718	6.718	6.718	2.349	2.786
1989	6.737	6.737	6.737	2.362	2.779
1990	6.920	6.920	6.920	2.437	2.769
1991	6.903	6.903	6.903	2.441	2.758
1992	6.812	6.812	6.812	2.418	2.745
1993	6.687	6.687	6.687	2.383	2.734
1994	6.568	6.568	6.568	2.345	2.727
1995	6.459	6.459	6.459	2.311	2.720
1996	6.436	6.436	6.436	2.309	2.713
1997	6.416	6.416	6.416	2.308	2.705
1998	6.375	6.375	6.375	2.300	2.697
1999	6.328	6.328	6.328	2.288	2.690
2000	6.325	6.325	6.325	2.292	2.684
2001	6.341	6.341	6.341	2.303	2.678
2002	6.362	6.362	6.362	2.315	2.673
2003	6.384	6.384	6.384	2.327	2.669
2004	6.409	6.409	6.409	2.341	2.664
2005	6.443	6.443	6.443	2.357	2.660
2006	6.472	6.472	6.472	2.371	2.657
2007	6.511	6.511	6.511	2.387	2.655
2008	6.552	6.552	6.552	2.405	2.653
2009	6.588	6.588	6.588	2.420	2.650
2010	6.621	6.621	6.621	2.435	2.648

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: PCEN.21, PBEA.21, PBOR.21, HHCEN.21, HSIZE.21

MAP REGIONAL MODEL PROJECTIONS: PART III
SEA FINAL LOW
WRANGELL-PETERSBURG
PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 159	\$ 136	\$23649	\$20179	\$ 139	\$24304	\$20738
1989	\$ 172	\$ 147	\$25565	\$21760	\$ 144	\$25130	\$21390
1990	\$ 184	\$ 157	\$26624	\$22689	\$ 148	\$25035	\$21335
1991	\$ 182	\$ 155	\$26365	\$22445	\$ 139	\$23610	\$20100
1992	\$ 184	\$ 156	\$27012	\$22953	\$ 133	\$23038	\$19576
1993	\$ 188	\$ 157	\$28150	\$23444	\$ 127	\$22865	\$19043
1994	\$ 196	\$ 163	\$29861	\$24841	\$ 126	\$23100	\$19217
1995	\$ 194	\$ 161	\$29967	\$24886	\$ 119	\$22176	\$18416
1996	\$ 202	\$ 168	\$31452	\$26113	\$ 119	\$22265	\$18486
1997	\$ 209	\$ 173	\$32563	\$27031	\$ 117	\$22052	\$18305
1998	\$ 217	\$ 180	\$33993	\$28241	\$ 117	\$22022	\$18296
1999	\$ 225	\$ 187	\$35549	\$29545	\$ 116	\$22033	\$18312
2000	\$ 238	\$ 197	\$37562	\$31196	\$ 117	\$22272	\$18497
2001	\$ 249	\$ 207	\$39206	\$32579	\$ 117	\$22241	\$18481
2002	\$ 262	\$ 217	\$41178	\$34188	\$ 118	\$22349	\$18555
2003	\$ 274	\$ 228	\$42896	\$35635	\$ 118	\$22275	\$18504
2004	\$ 288	\$ 239	\$44862	\$37265	\$ 119	\$22289	\$18514
2005	\$ 303	\$ 251	\$47001	\$39034	\$ 120	\$22343	\$18555
2006	\$ 320	\$ 265	\$49392	\$40995	\$ 121	\$22465	\$18646
2007	\$ 337	\$ 279	\$51730	\$42904	\$ 122	\$22514	\$18672
2008	\$ 355	\$ 294	\$54123	\$44884	\$ 122	\$22539	\$18692
2009	\$ 373	\$ 309	\$56572	\$46939	\$ 123	\$22544	\$18705
2010	\$ 392	\$ 325	\$59159	\$49084	\$ 124	\$22559	\$18717

SOURCE: DSET SEA2LR

DATE OF CREATION: 6/90

VARIABLES: PI.21, DPI.21, P.PI.21, P.DI.21, DF.DI.21, DP.PI.21, DP.DI.21

MAP REGIONAL MODEL PROJECTIONS: PART I
SEA FINAL BASE
WRANGELL-PETERSBURG
EMPLOYMENT
(THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	1.829	0.811	0.792	3.432	2.795	6.718
1989	1.821	0.839	0.822	3.482	2.845	6.737
1990	1.831	0.851	0.817	3.499	2.862	6.922
1991	1.778	0.828	0.830	3.435	2.798	6.924
1992	1.729	0.808	0.823	3.359	2.722	6.866
1993	1.678	0.794	0.840	3.311	2.674	6.773
1994	1.620	0.783	0.870	3.273	2.636	6.688
1995	1.553	0.759	0.874	3.186	2.549	6.617
1996	1.551	0.763	0.879	3.193	2.556	6.601
1997	1.553	0.761	0.887	3.201	2.564	6.614
1998	1.558	0.763	0.886	3.208	2.571	6.631
1999	1.566	0.769	0.887	3.222	2.585	6.655
2000	1.573	0.775	0.887	3.235	2.598	6.687
2001	1.581	0.779	0.878	3.238	2.601	6.722
2002	1.584	0.781	0.863	3.229	2.592	6.750
2003	1.586	0.783	0.854	3.223	2.586	6.773
2004	1.589	0.786	0.851	3.226	2.589	6.791
2005	1.595	0.793	0.855	3.242	2.605	6.816
2006	1.601	0.801	0.862	3.265	2.628	6.856
2007	1.609	0.811	0.872	3.292	2.655	6.910
2008	1.619	0.822	0.880	3.321	2.684	6.975
2009	1.629	0.834	0.883	3.346	2.709	7.047
2010	1.640	0.844	0.879	3.363	2.726	7.118

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: B.28, S.28, G.28, M.28, H97.28 P.28

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL BASE
 WRANGELL-PETERSBURG
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	6.718	6.718	6.718	2.349	2.786
1989	6.737	6.737	6.737	2.362	2.779
1990	6.922	6.922	6.922	2.437	2.769
1991	6.924	6.924	6.924	2.447	2.759
1992	6.866	6.866	6.866	2.435	2.749
1993	6.773	6.773	6.773	2.408	2.740
1994	6.688	6.688	6.688	2.383	2.733
1995	6.617	6.617	6.617	2.366	2.724
1996	6.601	6.601	6.601	2.368	2.715
1997	6.614	6.614	6.614	2.380	2.706
1998	6.631	6.631	6.631	2.393	2.698
1999	6.655	6.655	6.655	2.408	2.692
2000	6.687	6.687	6.687	2.425	2.686
2001	6.722	6.722	6.722	2.443	2.681
2002	6.750	6.750	6.750	2.459	2.675
2003	6.773	6.773	6.773	2.473	2.669
2004	6.791	6.791	6.791	2.485	2.664
2005	6.816	6.816	6.816	2.497	2.660
2006	6.856	6.856	6.856	2.515	2.657
2007	6.910	6.910	6.910	2.537	2.655
2008	6.975	6.975	6.975	2.563	2.654
2009	7.047	7.047	7.047	2.590	2.654
2010	7.118	7.118	7.118	2.618	2.653

SOURCE: DSET SEA2BR
 DATE OF CREATION: 6/90
 VARIABLES: PCEN.21, PBEA.21, PBOR.21, HHCEN.21, HSIZE.21

MAP REGIONAL MODEL PROJECTIONS: PART III
SEA FINAL BASE
WRANGELL-PETERSBURG
PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 159	\$ 136	\$23649	\$20179	\$ 139	\$24304	\$20738
1989	\$ 172	\$ 147	\$25570	\$21764	\$ 144	\$25135	\$21394
1990	\$ 184	\$ 157	\$26634	\$22699	\$ 148	\$25044	\$21344
1991	\$ 185	\$ 157	\$26651	\$22666	\$ 141	\$23866	\$20298
1992	\$ 187	\$ 159	\$27210	\$23147	\$ 136	\$23309	\$19829
1993	\$ 192	\$ 164	\$28412	\$24151	\$ 134	\$23284	\$19792
1994	\$ 199	\$ 169	\$29751	\$25283	\$ 133	\$23324	\$19821
1995	\$ 203	\$ 169	\$30723	\$25529	\$ 127	\$23042	\$19146
1996	\$ 215	\$ 179	\$32512	\$27045	\$ 128	\$23222	\$19317
1997	\$ 218	\$ 181	\$32923	\$27348	\$ 124	\$22497	\$18687
1998	\$ 230	\$ 191	\$34664	\$28797	\$ 124	\$22558	\$18740
1999	\$ 243	\$ 202	\$36507	\$30301	\$ 126	\$22729	\$18865
2000	\$ 256	\$ 212	\$38253	\$31747	\$ 126	\$22786	\$18910
2001	\$ 269	\$ 223	\$39998	\$33188	\$ 127	\$22794	\$18913
2002	\$ 281	\$ 233	\$41567	\$34493	\$ 127	\$22663	\$18807
2003	\$ 294	\$ 244	\$43383	\$35993	\$ 127	\$22631	\$18776
2004	\$ 308	\$ 256	\$45372	\$37657	\$ 128	\$22646	\$18796
2005	\$ 325	\$ 270	\$47751	\$39615	\$ 129	\$22805	\$18919
2006	\$ 343	\$ 285	\$50063	\$41502	\$ 130	\$22877	\$18965
2007	\$ 363	\$ 301	\$52480	\$43500	\$ 131	\$22948	\$19021
2008	\$ 384	\$ 318	\$54998	\$45581	\$ 133	\$23013	\$19072
2009	\$ 406	\$ 336	\$57578	\$47713	\$ 135	\$23055	\$19104
2010	\$ 429	\$ 355	\$60211	\$49888	\$ 136	\$23071	\$19115

SOURCE: DSET SEA2BR

DATE OF CREATION: 6/90

VARIABLES: PI.21, DPI.21, P.PI.21, P.DI.21, DF.DI.21, DP.PI.21, DP.DI.21

MAP REGIONAL MODEL PROJECTIONS: PART I
 SEA FINAL HIGH
 WRANGELL-PETERSBURG
 EMPLOYMENT
 (THOUSANDS)

	BASIC	SUPPORT	GOVERNMENT	TOTAL	WAGE AND SALARY	POPULATION
1988	1.829	0.811	0.792	3.432	2.795	6.718
1989	1.823	0.839	0.822	3.485	2.848	6.737
1990	1.836	0.856	0.834	3.526	2.889	6.934
1991	1.832	0.863	0.866	3.560	2.923	7.017
1992	1.840	0.874	0.858	3.571	2.934	7.100
1993	1.811	0.874	0.846	3.532	2.894	7.095
1994	1.759	0.870	0.844	3.473	2.835	7.051
1995	1.703	0.876	0.840	3.418	2.780	6.943
1996	1.708	0.906	0.837	3.451	2.812	6.955
1997	1.716	0.929	0.832	3.476	2.837	7.062
1998	1.724	0.947	0.843	3.514	2.875	7.166
1999	1.733	0.950	0.869	3.552	2.912	7.266
2000	1.747	0.960	0.863	3.570	2.930	7.317
2001	1.764	0.971	0.867	3.603	2.963	7.389
2002	1.779	0.986	0.858	3.623	2.982	7.456
2003	1.801	1.004	0.849	3.654	3.014	7.544
2004	1.816	1.025	0.858	3.699	3.057	7.635
2005	1.829	1.047	0.875	3.751	3.110	7.724
2006	1.843	1.073	0.888	3.804	3.162	7.824
2007	1.860	1.102	0.903	3.864	3.222	7.934
2008	1.881	1.135	0.918	3.935	3.292	8.063
2009	1.905	1.172	0.928	4.004	3.361	8.210
2010	1.924	1.204	0.931	4.060	3.416	8.360

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: B.28, S.28, G.28, M.28, M97.28 P.28

MAP REGIONAL MODEL PROJECTIONS: PART II
 SEA FINAL HIGH
 WRANGELL-PETERSBURG
 POPULATION
 (THOUSANDS)

	POPULATION			HOUSEHOLDS	
	STATE	U.S.BEA	BOROUGH	NUMBER	SIZE
1988	6.718	6.718	6.718	2.349	2.786
1989	6.737	6.737	6.737	2.362	2.779
1990	6.934	6.934	6.934	2.441	2.770
1991	7.017	7.017	7.017	2.477	2.763
1992	7.100	7.100	7.100	2.512	2.758
1993	7.095	7.095	7.095	2.514	2.753
1994	7.051	7.051	7.051	2.504	2.747
1995	6.943	6.943	6.943	2.468	2.743
1996	6.955	6.955	6.955	2.476	2.740
1997	7.062	7.062	7.062	2.519	2.735
1998	7.166	7.166	7.166	2.565	2.726
1999	7.266	7.266	7.266	2.609	2.719
2000	7.317	7.317	7.317	2.633	2.713
2001	7.389	7.389	7.389	2.665	2.708
2002	7.456	7.456	7.456	2.694	2.703
2003	7.544	7.544	7.544	2.732	2.698
2004	7.635	7.635	7.635	2.770	2.694
2005	7.724	7.724	7.724	2.806	2.691
2006	7.824	7.824	7.824	2.845	2.689
2007	7.934	7.934	7.934	2.887	2.688
2008	8.063	8.063	8.063	2.935	2.689
2009	8.210	8.210	8.210	2.988	2.689
2010	8.360	8.360	8.360	3.044	2.689

SOURCE: DSET SEA2HR
 DATE OF CREATION: 6/90
 VARIABLES: PCEN.21, PBEA.21, PBOR.21, HHCEN.21, HSIZE.21

MAP REGIONAL MODEL PROJECTIONS: PART III
 SEA FINAL HIGH
 WRANGELL-PETERSBURG
 PERSONAL INCOME

	NOMINAL \$				1989 \$		
	PERSONAL INCOME (MILLION \$)	DISPOSABLE PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)	PERSONAL INCOME (MILLION \$)	PER CAPITA INCOME (\$)	PER CAPITA DISPOSABLE INCOME (\$)
1988	\$ 159	\$ 136	\$23649	\$20179	\$ 139	\$24304	\$20738
1989	\$ 172	\$ 147	\$25572	\$21767	\$ 144	\$25138	\$21397
1990	\$ 185	\$ 158	\$26735	\$22798	\$ 149	\$25139	\$21437
1991	\$ 190	\$ 162	\$27079	\$23052	\$ 146	\$24358	\$20736
1992	\$ 200	\$ 170	\$28162	\$23950	\$ 146	\$24235	\$20610
1993	\$ 208	\$ 177	\$29277	\$24892	\$ 145	\$24104	\$20493
1994	\$ 216	\$ 184	\$30634	\$26032	\$ 145	\$24129	\$20504
1995	\$ 221	\$ 188	\$31862	\$27089	\$ 142	\$24011	\$20414
1996	\$ 236	\$ 200	\$33872	\$28766	\$ 144	\$24423	\$20741
1997	\$ 251	\$ 213	\$35560	\$30146	\$ 147	\$24531	\$20797
1998	\$ 274	\$ 232	\$38190	\$32373	\$ 153	\$25206	\$21366
1999	\$ 290	\$ 240	\$39844	\$33045	\$ 152	\$25160	\$20867
2000	\$ 315	\$ 261	\$43117	\$35733	\$ 153	\$25195	\$20881
2001	\$ 325	\$ 269	\$43960	\$36379	\$ 150	\$24575	\$20337
2002	\$ 344	\$ 285	\$46165	\$38194	\$ 152	\$24690	\$20427
2003	\$ 366	\$ 303	\$48528	\$40140	\$ 155	\$24830	\$20538
2004	\$ 389	\$ 322	\$51011	\$42190	\$ 158	\$24972	\$20654
2005	\$ 415	\$ 343	\$53698	\$44408	\$ 161	\$25151	\$20800
2006	\$ 442	\$ 366	\$56543	\$46749	\$ 164	\$25339	\$20951
2007	\$ 473	\$ 391	\$59582	\$49309	\$ 168	\$25549	\$21144
2008	\$ 507	\$ 419	\$62839	\$51999	\$ 172	\$25783	\$21335
2009	\$ 544	\$ 450	\$66252	\$54809	\$ 177	\$26011	\$21519
2010	\$ 578	\$ 479	\$69169	\$57259	\$ 180	\$25986	\$21512

SOURCE: DSET SEA2HR

DATE OF CREATION: 6/90

VARIABLES: PI.21, DPI.21, P.PI.21, P.DI.21, DF.DI.21, DP.PI.21, DP.DI.21

