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The total value of sport fishing to Alaska's economy was estimated in studies conducted in 1973 and again in 1985. In 1973, the total estimated expenditures by sport anglers in Alaska was $52 million. BY 1985, total expenditures related to sport fishing in Alaska had risen to approximately **$204.7 million**. These studies also revealed that sport fishing was a significant source of jobs for Alaskans. In 1985, an estimated 3,033 jobs were generated due to sport fishing activities, with a total of $60.4 million in wages and salaries.

More detailed evaluations of the economic impact of sport fishing have been conducted in several specific areas of Alaska. Some of the findings of interest were that in 1986 anglers spent more than $127 million on sport fishing in southcentral Alaska and supported over 2,000 jobs. In 1988, anglers spent $83.1 million on sport fishing in southeast Alaska and supported the equivalent of 1,113 full-time jobs. Southeast anglers spent an average of $923 for each king salmon harvested, $255 for each coho salmon, and $245 for each halibut harvested in 1988. Angler spending associated with sport fishing in southeast Alaska also resulted in over $3 million in license fees and tax revenues to local and state governments.

SPORT FISH PROGRAM SUMMARY

Since the 1960s, the activities of the Division of Sport Fish have evolved from the basic task of finding out what species of fish inhabit our lakes and streams to the complex task of understanding the total impact of man's activities on fish populations and managing complex multi-user group fisheries. The overall program of the Division of Sport Fish is now organized under four major categories: Research, Management, Public Access, and Hatcheries.

Research

In FY94, approximately 40 percent of the operating budget request is dedicated to performing research and data collecting projects. These projects are designed to answer specific questions about how to better manage the resource. Through our research program, we are striving to determine the carrying capacity of specific lakes and streams, the timing and movement patterns of fish as they migrate through heavily fished waters, the optimum number of spawners needed to perpetuate fish populations, sport fishing effort and harvest, the effects of hooking and releasing fish, and the minimum amount of water needed to support fish populations. This information is vital in the day to day management of sport fisheries in Alaska.

Management

Management biologists apply the results of research to conserve stocks of fish and to meet the diverse needs of the angling public. Increasing numbers of fishermen, conflicts between user groups, subsistence issues, federal management, and more detailed resource allocations and management plans have made fisheries management more complex than ever before. One of the primary tasks of the sport fish management staff will be to develop detailed plans for major recreational fisheries. These plans will guide fishery managers in their efforts to meet the division's three major goals: sustained yield, diverse fishing opportunities, and optimum social and economic value from sport fisheries. As management complexity increases, sport fishing regulations become more difficult to understand. Through a strong information and aquatic education program, the division works closely with the angling public to identify their desires and promote the understanding, appreciation, and educated use of Alaskan aquatic resources and the ecosystems that support them.

Public Access

Although Alaska has thousands of lakes and thousands of miles of rivers and marine coastline, access to fishery resources is severely restricted by a limited road system and private landholdings. With over 252,000 resident and about 173,000 nonresident sport anglers participating in the fisheries each year, available access sites quickly become overcrowded, and the quality of the fishing experience is degraded. For this reason, the Division of Sport Fish has established an aggressive public access program. The goal of this program is to increase recreational boating and sport fishing opportunities within the state.

In FY94, the division is requesting two million dollars to build sport fishing access facilities. Included are projects in all regions of the state involving boat launch improvements, trail development, parking areas for fishermen, and access site acquisitions. Rules governing the use of federal monies require that at least 12.5 percent of the W-B funds received must be used for boating access projects. Since the start of the access program in FY86, the Division of Sport Fish has committed an average of 17 percent of its W-B funds to access projects. The facilities provided by the access program currently accommodate over 500,000 user-days of recreational boating and sport fishing activities annually.

Sport Fish Hatcheries

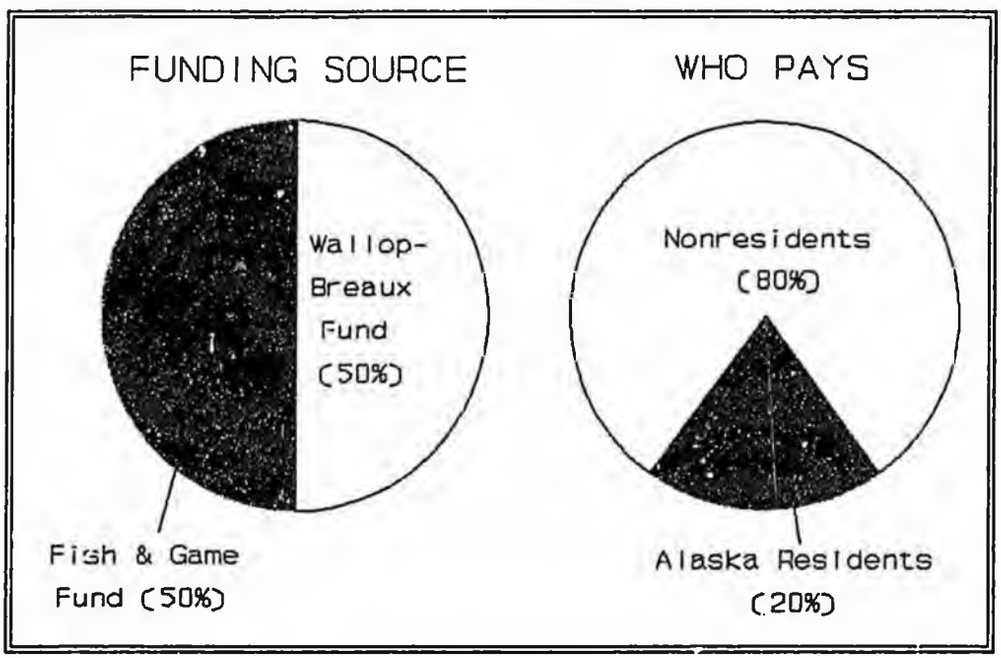
Since 1986, W-B and Fish and Game Funds have been used by FRED Division to raise and stock fish to benefit sport fisheries. As a part of the department's restructuring of FRED Division, three hatchery facilities (Elmendorf, Ft. Richardson, and the Broodstock Development Center) will be transferred to the Division of Sport Fish. These facilities have received the majority of their funding from sport fishermen and have mainly produced fish to enhance sport fisheries. The goals of the sport fish hatchery program will be to increase and diversify sport fishing opportunities and to shift fishing pressure away from overutilized wild stocks.

SPORT FISH DIVISION BUDGET SUMMARY

Who Pays?

The entire operational budget of the Division of Sport Fish is paid by the sport fishing public. About fifty percent comes from W-B funds which result from a national tax on sport fishing equipment and marine fuels. This revenue is distributed to states (based on the size of the state and the number of sport fishing licenses sold) to be used for sport fish research and management. The remaining fifty percent of the budget comes from the sale of fishing licenses in Alaska. In total, 80 percent of the division's operating budget is provided by nonresident sport fishermen.

In 1992, the legislature increased the cost of a resident sport fishing license by five dollars, and required that all anglers who fish for king salmon buy a tag which costs ten dollars for residents and twenty dollars for nonresidents. It is expected that these fee increases will generate an additional $2.7 million to fund sport fish related programs in FY94.

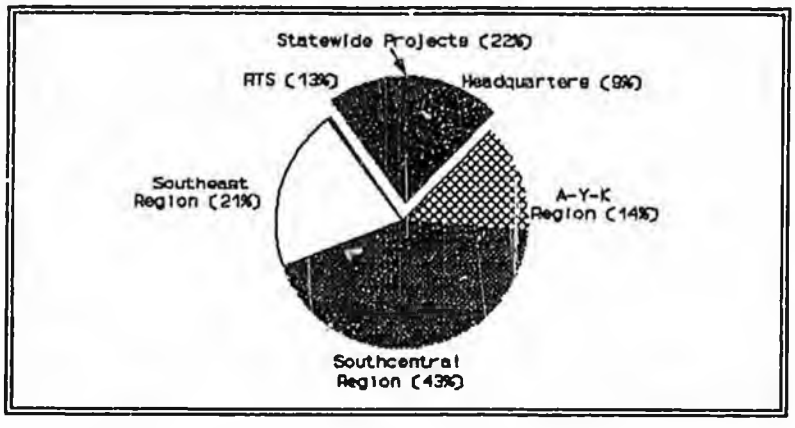


FY94 Budget

Between FY84 and FY94 the operating budget of the Division of Sport Fish increased from $5 million to $15.3 million. During this time period the level of federal funding increased five fold due to passage of the Wallop-Breaux Amendment to the Federal Aid in Sport Fish Restoration Act. State funding declined for several years after FY84 due to the transfer of general funds and Fish and Game Funds from the Division of Sport Fish. However, in recent years Fish and Game Funds have increased due mainly to steadily increasing numbers of sport fishermen purchasing licenses, the new king salmon tag requirement, and increases in the cost of nonresident and resident sport fishing licenses that went into effect in 1991 and 1993.

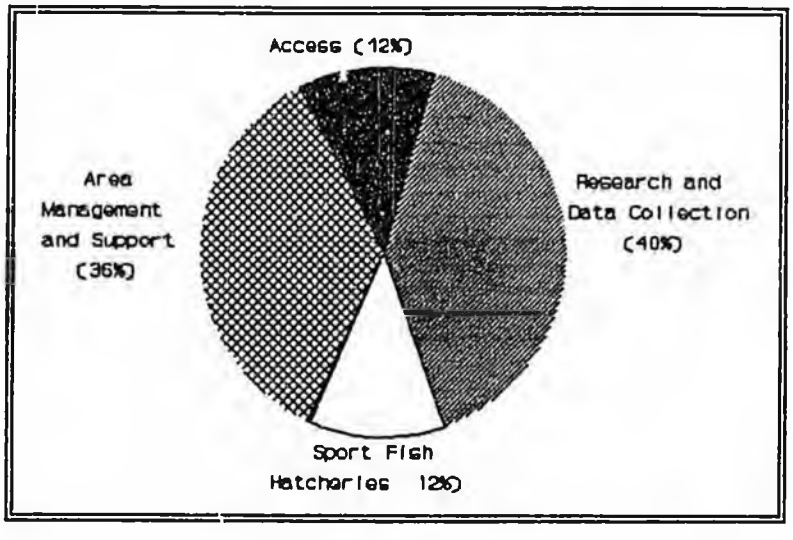
In FY94 it is estimated that the king salmon tag will generate $1.8 million in additional revenue. These funds will be dedicated to new projects to enhance and manage recreational king salmon fisheries. In total, $2.4 million will be spent by the department on new king salmon management and enhancement projects in FY94.

The Sport Fish operating budget request ($15.3 million) will be used to fund programs in three regions, the Research and Technical Services section, and Headquarters. The approximate breakdown of expenditures by region is:



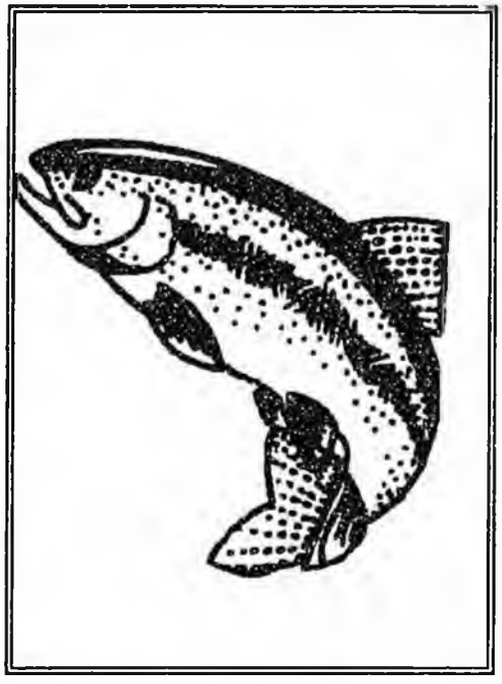
In addition to the $15.3 million in the operating budget, the Sport Fish Division has requested a Capital Improvements Project (CIP) budget for the sport fishing access program in the amount of $2.0 million. This program will be funded with 75 percent W-B funds and the required 25% match will be from the state General Fund.

The total FY94 funding request for the Division of Sport Fish will be split between its major program components as follows:



In addition to hatchery funds in the Sport Fish base, Fish and Game Funds and W-B monies totalling $1.6 million are carried in the FRED Division base to carry out sport fishery enhancement projects. Also in FY94, a $1.0 million CIP project request for a water recirculation system (50% Fish and Game Fund and 50% General Fund) will approximately double the production capacity of Crystal Lake hatchery.

THE FUTURE



Alaska has the best cold water sport fishing opportunities in the world. Our challenge will be to manage this unique resource to ensure that the qualities that make Alaska unique are perpetuated and, at the same time, maximize the opportunities for people to enjoy and benefit from their use. The state must be willing to compare the social and economic benefits of management options along with the resource costs of each; then be prepared to adopt policies, programs, and allocations that are in the best interests of the people. We must not allow potential short-term gains to endanger the long-term well being of the resources. Protection of habitat, maintenance of the diversity of wild stocks of fish, and careful limits on harvest are essential.

Hard work and dedication will be required by the Department of Fish and Game along with everyone interested in sport fishing to meet the challenges of the future. We must continue our management, research, hatchery, and public access programs. More emphasis will be placed on fisheries management plans developed by all interest groups and with public input to solve complex management and allocative issues. The division will become more involved in the education of the public at all age levels, and we will also accomplish new projects in partnership with the citizens and sportsmen of Alaska.

Sportsman's groups, conservation organizations and the public must become more involved in decisions related to sport fishing. Individuals and groups must emphasize to their legislators that sport fishing is important to most Alaskans, and that adequate funding for sport fish management is necessary and expected.

The department and sport fishing interests, along with elected officials and other decision makers, must work together to ensure that the world class sport fishing in Alaska can be enjoyed now and by future generations. Benefits are guaranteed to far exceed the costs.

POINTS TO REMEMBER

- Between 1977 and 1991, the number of sport fishermen in Alaska increased by 111 percent. Over 425,000 anglers now fish in Alaska each year.

- In 1985, over $200 million was spent on sport fishing in Alaska. In southeast Alaska during 1988, anglers spent $923 to harvest each king salmon, $255 for each coho salmon, and $245 for each halibut.

- Sport anglers harvest less than one percent of the total number of salmon harvested in Alaska.

- Operational costs of the Division of Sport Fish are paid with sport fishermen's money; a 100 percent user funded program. Nonresidents provide 80 percent of these funds.

- Hatchery programs intended to benefit sport fisheries are funded with W-B and Fish and Game Funds. A total of $3.7 million for sport fish hatcheries is requested in the Sport Fish and FRED Division operating budgets.

- Sport fishermen, the general public, and decision makers must work together to assure the long-term well being of Alaska's fishery resources and that maximum social and economic benefits are provided on a sustained yield basis.

FY 94 BUDGET AND PROGRAM OVERVIEW

DIVISION OF COMMERCIAL FISHERIES

Bob Clasby, Acting Director

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January 20, 1993

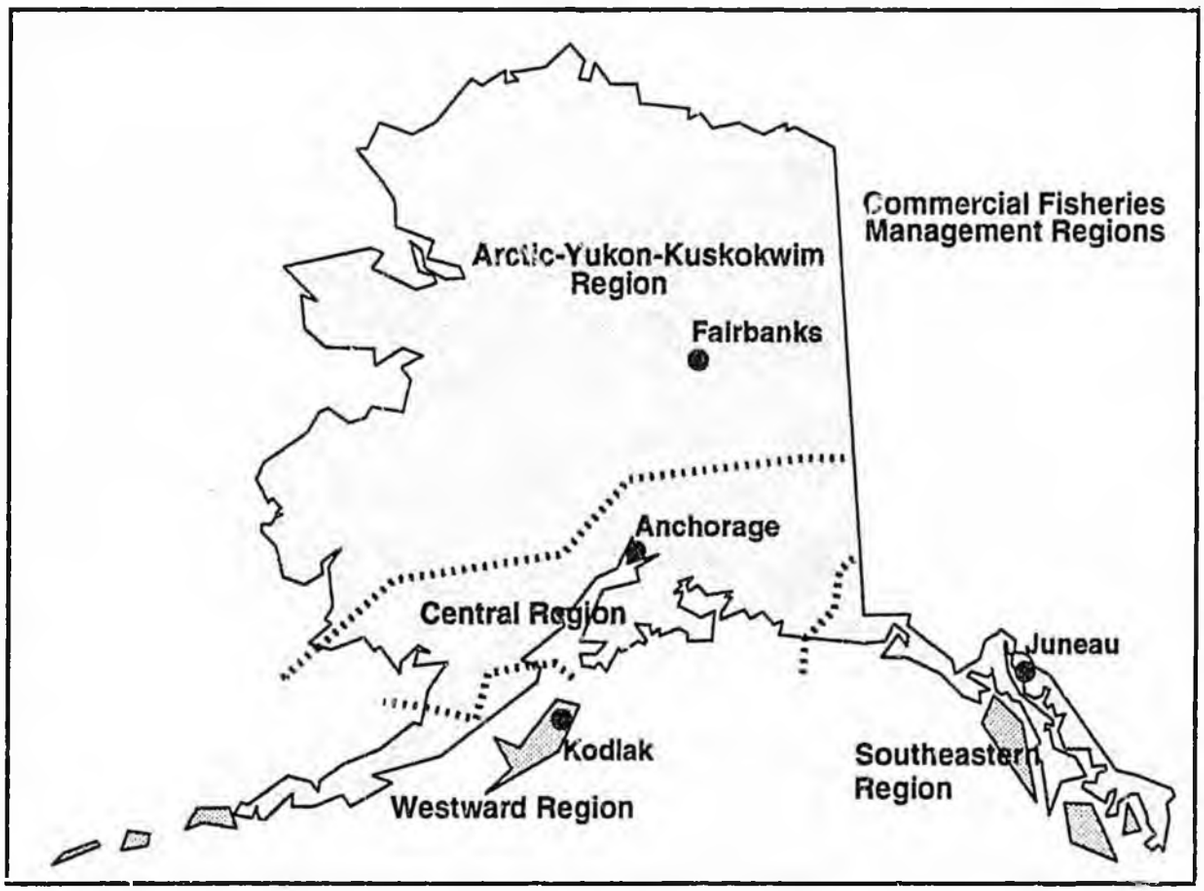
FY 94 BUDGET OVERVIEW

DIVISION OF COMMERCIAL FISHERIES
DEPARTMENT OF FISH AND GAME

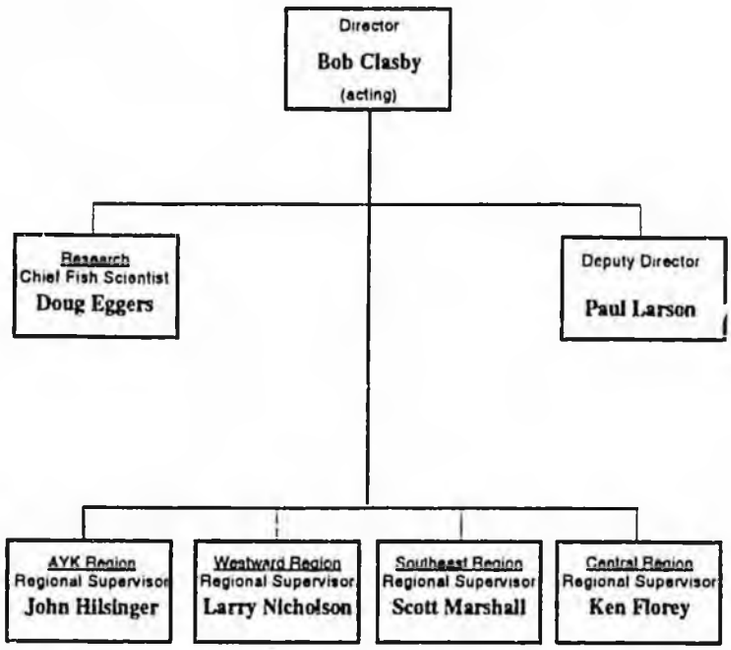
DIVISION FUNCTIONS and ORGANIZATION:

The Division of Commercial Fisheries is responsible for the management of the state's commercial, subsistence, and personal use fisheries. It also plays a major role in management of fisheries in the 200 mile Exclusive Economic Zone off Alaska and in international fisheries negotiations. The division carries out its mission by maintaining brood stock levels capable of producing optimum resource yield, preventing the overharvest of specific depressed stocks, identifying appropriate harvest methods, and minimizing incidental harvests of non-targeted species or stocks. The division also implements decisions of the Board of Fisheries that allocate fishery resources among various users. Data needed to make resource decisions are obtained by monitoring fishing effort and landing records, and by research studies of the distribution, species composition, availability, and reproductive requirements of fish populations.

The division is organized into a Headquarters Office located in Juneau and four regions: Southeastern, Central, Westward, and Arctic-Yukon-Kuskokwim.



COMMERCIAL FISHERIES ORGANIZATION



Southeastern Region and Headquarters

Location	PFT	PPT
Juneau Hq	31	3
Douglas Reg	37	27
Douglas Area	4	14
Craig	0	1
Haines	1	12
Hoonah	0	1
Hyder	0	1
Ketchikan	6	27
Klawock	0	2
Pelican	0	1
Petersburg	8	21
Port Alexander	0	1
Sitka	7	21
Snettisham	0	1
Wrangell	1	2
Yakutat	1	9
	—	—
	96	144

Central Region

Location	PFT	PPT
Anchorage Reg	17	7
Cordova	10	16
Dillingham	5	25
Homer	7	9
King Salmon	2	35
Soldotna	6	34
	—	—
	47	126

Arctic-Yukon Kuskokwim Region

Location	PFT	PPT
Anchorage	18	9
Anvik	0	2
Bethel	5	26
Emmonak	0	10
Fairbanks	4	12
Kotzebue	1	5
Nome	3	12
Saint Mary's	0	23
	—	—
	31	99

Division Totals

Comm Fish	178	337
Special Proj	34	129
	—	—
	212	466

Westward Region

Location	PFT	PPT
Kodiak	31	57
Belkofsky	0	1
Chignik	1	9
Cold Bay	1	0
Dutch Harbor	4	9
King Cove	0	3
Bear River	0	2
Sand Point	1	12
Port Moller	0	4
	—	—
	38	97

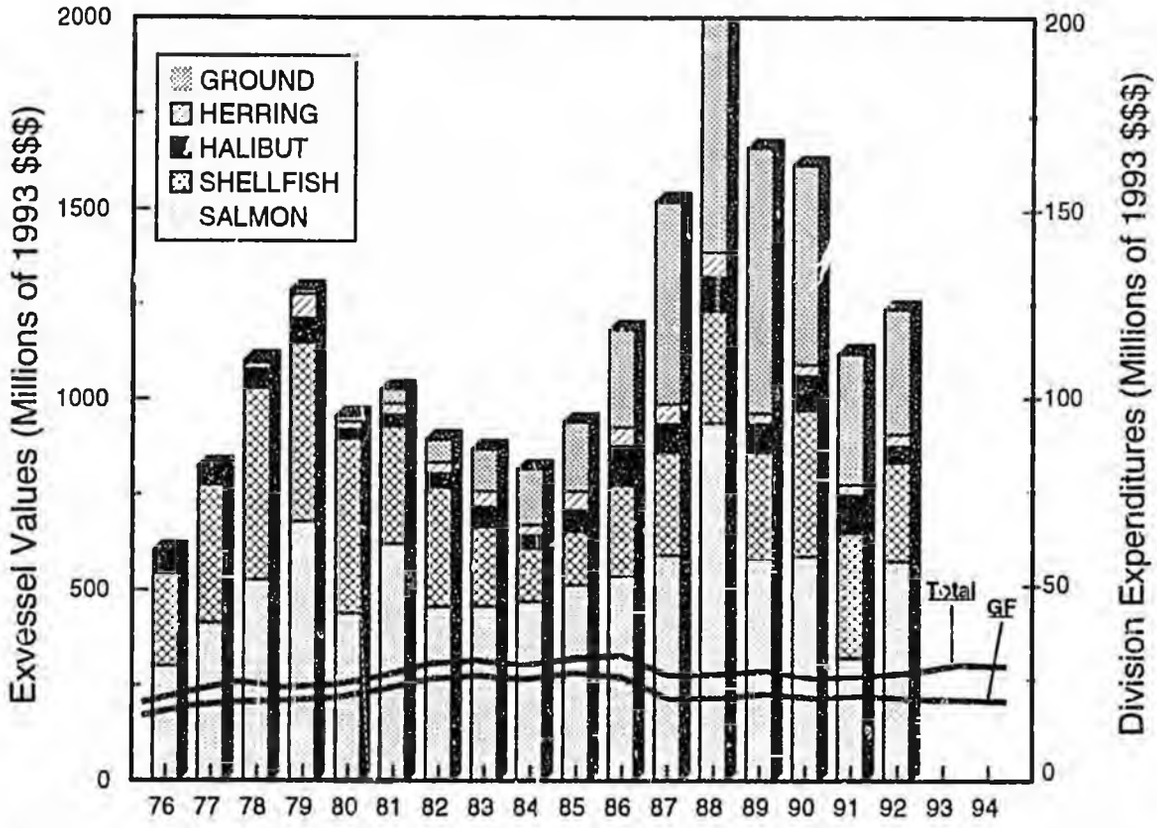
The above organizational chart shows key headquarters and region staff for FY 94, as well as office staffing levels. Note that temporary positions are included with permanent part time (PPT) positions in the above table.

FUNDING HISTORY AND FISHERY VALUES:

The preliminary exvessel value of Alaska's commercial fisheries for 1992 is estimated to be about $1.2 billion, a $150 million increase from the 1991 value. The 1992 exvessel value of the salmon fishery was $ 564 million, while the values for groundfish, herring, halibut and shellfish were, $322, $30, $42 and $252 million respectively.

Exvessel Values of Alaska's Commercial Fisheries and Expenditures by the Division of Commercial Fisheries.

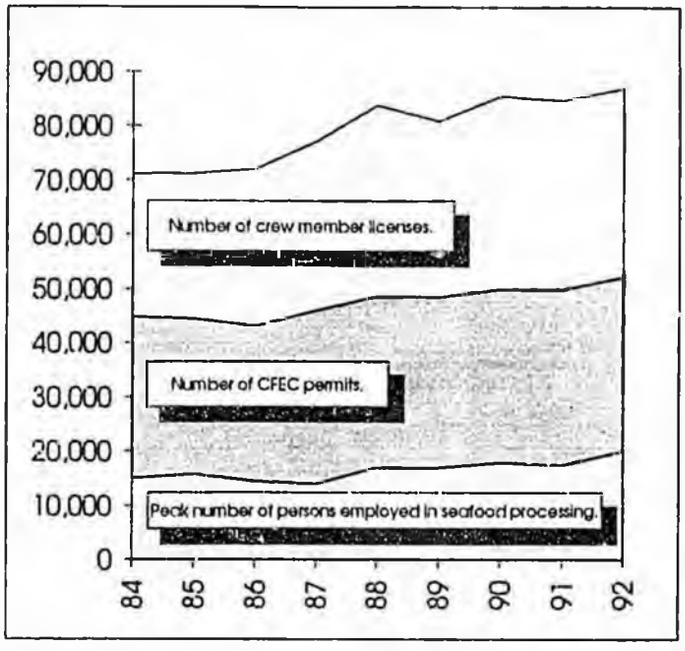
(All amounts shown as real dollar amounts, inflation adjusted to the 1993 U.S. Urban Consumer's Price Index.)



The division's budget has remained fairly stable during recent years, although there have been losses to the programs due to budget cuts in FY 90, FY 92, and FY 93, as well as the effects of inflation. In dollar amounts, the division's FY 94 GF Budget Request is close to the actual budgets of the last three fiscal years. However, when adjusted for inflation, the FY 94 request has only 73% of the purchasing power of the FY 85 spending level, and is actually just about equal to the FY 78 budget, (see graph on page 14).

Based on the number of fishing licenses issued and an estimate of jobs in the processing industry, more than 25 percent of the working age population of the state is directly involved in the fish processing and harvesting sectors of the industry. An even higher percentage are involved if one counts businesses indirectly associated with the fishing industry.

The number of people actively engaged in the commercial fishing industry has been gradually increasing. The graph on the right gives an indication of that growth expressed as number of Commercial Fisheries Entry Commission fishing permits issued, the number of people licensed to crew on fishing vessels and tenders, and the number of people employed in the fish processing sector.



The fishing industry is important to Alaskan communities. For many small coastal communities, commercial fishing is the major source of cash, whether it be direct or indirect. The boroughs and cities of the state receive a share, about one-half, of the state's fish tax. Their share of the FY 92 tax was $14.5 million. For many small communities, their share likely represents a significant portion of their tax base.

CHANGES TO FY 93 BUDGET:

The division has not made any substantive changes between the way the FY 93 budget was authorized and the way it is being spent. The division was required to reduce its General Fund service level by about $835 thousand below that provided in FY 92. The division did receive a $368.5 unallocated General Fund reduction in the FY 93 budget. That reduction resulted in reduced herring assessment projects statewide, as well as public service related functions in headquarters.

FY 94 BUDGET REQUEST:

The FY 94 Governor's budget request will allow the division to continue the level of services it provided in FY 93. Those programs and projects that are being operated during FY 93 will be operated again in FY 94. The Governor's FY 94 budget request contains funding for one new project, which will be supported by Program Receipts.

Bering Sea Crab	$185.3

During its spring 1992 meeting, the Board of Fisheries established a limit on the number of crab pots that could be used in the Bering Sea king and Tanner crab fisheries. For enforcement purposes, state laws require a buoy identification system be initiated whenever a pot limit is in effect and allows the department to charge for the cost of the system. The Governor's budget requests $185.3 in program receipt authority for the system. This

authority was requested and approved for FY 93 by the Legislative Budget and Audit Committee.

REORGANIZATION PLANS:

In FY 94, the division will be combined with the FRED division. This possibility was discussed with the legislature during the FY 93 budget process. The department identified $300.0 in savings which could result from the potential merger. In anticipation of the department's plans, the legislature reduced the Commercial Fisheries Division's budget by $210.0 in FY 93. Another $90.0 was cut from the FRED budget.

The first step in the merger was the issuance of Executive Order 86, transferring the statutory duties of the FRED Division to the department. A management team within the department will work out the details of the combination.

The following "flow chart" details the development of the FY 94 General Fund budget request starting with the FY 93 Governor's request:

FY 93 Governor's Request	Legislative Additions	Legislative Reductions	FY 93 Authorized	Adjustments	FY 94 Governor's Request
20,412.6	337.0	(943.9)	19,805.7	1.5	19,807.2

Legislative Additions	
Atka Salmon	67.0
GSI	270.0
Total	337.0

Legislative Reductions	
COLA	196.8
R/V Steller Crew	88.0
FRED Div. Merger	210.0
Travel	78.5
Media Center	2.1
Unallocated	368.5
Total	(943.9)

Adjustments	
Yetna Sonar Cabin (DOA Transfer)	1.5
Total	1.5

Component Request	
General Fund	19,370.0
General Fund Match	437.2
Federal Fund	669.5
Test Fish Fund	2,120.5
Total Request	22,597.2

MAJOR ISSUES:

The following are several major issues that confront the state's commercial, subsistence, and personal use fishery management programs for FY 94 and beyond.

Groundfish Management

Federal and cooperative management of groundfish in the Exclusive Economic Zone (EEZ) off Alaska (3-200 miles) is quickly becoming so complicated that the state is loosing the ability to protect its legitimate interests. Allocation of allowable harvests and limitation of impacts on state-managed resources are issues of great import to Alaska residents, yet which are not adequately addressed with current fiscal resources. There is also a growth of the groundfish fisheries that take place in state waters, particularly those for rockfish, lingcod, and sablefish. The division's ability to assess the size of these resources is severely limited.

Maximizing Sustained Yield

As oil revenues decrease, the economy of Alaska will become more dependent on renewable natural resources. To ensure that the greatest benefit is derived, management must be capable of maximizing yield over the long term. For fisheries, this will require a knowledge of the amount of spawning fish that is needed to achieve that goal and the ability to manage the harvests to ensure that the individual goals are met.

Shellfish Stock Assessment

Almost all of the king, Tanner, and Dungeness crab, as well as other shellfish, stocks in Alaska are managed on very rudimentary information about stock status, reproductive potential, and optimum exploitation rate. This has resulted in very conservative management in many areas and has allowed for some boom and bust cycles in the past. Given lower prices for salmon in recent years, shellfish fisheries hold substantial potential for increased income and revenue, but such expansion will require significant increases in assessment information and management precision. In addition, there is a likelihood that the National Marine Fisheries Service may discontinue its Bering Sea king and Tanner crab stock assessment program. If that occurs, the state will no longer have information upon which to base its harvest determinations for the richest shellfish fishery in the state (an exvessel value in excess of $300 million annually).

Vessel Maintenance

The division has five large research and support vessels, with a total replacement value in excess of $10 million, that require regular maintenance and periodic overhaul. These vessels are integral to a variety of finfish, shellfish, and groundfish stock assessment programs as well as provide platforms for inseason management of several specific fisheries. Maintenance must be provided to protect this capital investment and to assure safety and efficiency of the vessel support program.

Prince William Sound Pink Salmon Stock Identification

With the loss of oil spill related funding, the division no longer has a way of discriminating between hatchery and wild stocks of pink salmon in Prince William Sound. It is essential for management of the commercial fishery to be able to identify these stocks inseason in the fishery areas. Presently the wild stocks of pink salmon are very low, while hatchery production is high. Given the differences in magnitude between wild and hatchery returns, the history of under escapements for wild stocks in recent years, and the lack of an inseason stock identification tool, the division is faced with the task of severely restricting or closing the commercial fishery.

Developing Fisheries

In recent years there has been a growth in exploitation of previously underutilized species such as sea cucumbers, sea urchins, and clams. These growing industries, however, are exploiting stocks not normally assessed or managed by the division. In order to best take advantage of these development opportunities, more assessment and management planning will be required.

CAPITAL REQUESTS:

The Governor's FY 94 CIP request contains the following division project.

Vessels Major Maintenance and R/V Medeia Outfitting. $315.0

This CIP project will fund major maintenance needed on the division's five large vessels. These vessels support fishery monitoring efforts and are extensively involved in salmon, herring, and shellfish stock assessment programs. They are also used by the other divisions in the department, as well as the Division of Fish and Wildlife Protection, to carry out their operational responsibilities. The R/V Medeia was purchased this winter as a replacement for the R/V Steller, which had to be removed from service because of stability problems. The R/V Medeia was built in 1992 and used by the oil industry to conduct surveys in the Gulf of Mexico. The vessel is 110 feet in length and was purchased for $401 thousand. This CIP will fund retrofitting the vessel's heating system, insulation, refrigerated seawater tankage, and a bait freezer.

LEGISLATION:

The division did not request the introduction of any legislation this year.

DIVISION FUNDING
(Thousands of dollars)

Funding	FY94 Gov.	FY93 Auth.	FY92 Auth.	FY91 Auth.	FY90 Auth.	FY89 Auth.
Gen. Fund	$19807.2	$19805.7	$19435.2	$19804.9	$18473.2	$18569.6
GF/Prog. Rec.	2277.5	2092.2	2141.8	1504.0	1607.4	1487.4
Fed. Rec.	6288.9	6288.9	5076.5	4573.6	4302.7	4278.0
F&G Fund	431.4	431.4	381.4	181.4	0.0	0.0
I/A Rec	270.3	270.3	271.5	267.4	264.7	231.0
TOTAL	29075.3	28888.5	27306.4	26331.3	24648.0	24566.0
Personnel						
PFT	212	212	216	204	198	195
PPT	449	450	465	479	488	491
Temp.	16	16	16	16	16	16
Staff Months	4099	4090	3948	4102	4049	4049

COMMERCIAL HARVEST EX-VESSEL VALUES
(millions of dollars)

Fishery	1992	1991	1990	1989	1988	1987
Salmon	$564.4*	$309.3	$540.0	$505.0	$780.0	$473.0
Herring	30.5*	26.0	26.9	24.2	55.9	42.7
Halibut	42.0*	98.1	85.0	76.1	74.5	60.9
Groundfish	321.5*	330.1	479.4	606.8	673.9	423.5
DAP	321.5*	330.1	450.0	402.0	254.9	118.6
JVP	0.0*	0.0	29.4	204.8	419.0	304.9
Shellfish	252.2*	313.0	352.0	274.0	244.1	213.5
TOTAL	1,210.6	1,076.5	1,483.3	1,486.1	1,828.4	1,213.6

TAX REVENUES GENERATED BY THE FISHING INDUSTRY
(Thousands of dollars)

	FY 92	FY 91	FY 90	FY 89	FY 88	FY 87
Fish Proc. Taxes	$30,168.0	$41,365.2	$38,242.9	$41,338.0	$29,237.5	$26,605.1
Salmon Enhancement Tax	4,092.0	6,149.0	6,520.3	9,544.0	5,768.8	4,444.1
Seafood Marketing Tax	2,743.0	3,275.0	3,264.6	3,349.3	2,669.9	1,460.2
Marine Fuel Tax	9,360.0	10,073.5	9,235.1	7,208.0	5,294.4	5,372.9
CFEC License Fees	6,178.5	5,902.8	4,928.8	4,789.4	4,433.7	3,251.4
TOTAL	52,541.5	66,765.5	62,191.7	66,228.7	47,404.3	41,133.7

INDUSTRY & FISHERIES EMPLOYMENT

	1992	1991	1990	1989	1988	1987
CFEC Permits	32,417	32,594	32,215	32,416	32,669	32,540
Vessel Licenses	17,194	17,580	17,417	16,963	16,574	16,262
Crew Member Licenses	34,849	34,906	35,588	32,433	35,207	31,159
Processors & Buyers	629	559	541	517	526	502
Processing Employment	20,000	17,400	17,850	17,000	16,900	14,000

* Note: All 1992 value and industry figures are preliminary.

Distribution of the state's fish tax collected in FY 92 by borough and by city. A total of $30.1 million was collected, of which $14.5 was distributed to Alaska's boroughs and cities.

Distribution to Boroughs	
Aleutians East	$1,780,831.67
Anchorage	86,426.06
Bristol Bay	1,403,630.88
Haines	178,612.64
Juneau	32,139.76
Kenai	499,981.74
Ketchikan	242,817.76
Kodiak	1,005,663.88
Lake & Peninsula	391,237.54
NW Arctic	2.32
North Star	5.09
Sitka	440,237.54

Distribution to Cities	
Akutan	$588,202.55
Atka	851.25
Bethel	64,549.23
Chignik	145,636.73
Clark's Point	120,817.58
Cordova	334,651.50
Craig	29,279.50
Dillingham	186,761.89
Emmonak	35,051.16
False Pass	12,788.81
Homer	93,158.41
Hoonah	53,377.10
Kenai	132,875.73
Ketchikan	215,780.04
King Cove	341,478.44
Kodiak	616,602.39
Larson Bay	55,399.82
Old Harbor	1,121.21
Pelican	163,111.01
Petersburg	599,514.12
Saint George	116,408.96
Saint Mary's	1,274.58
Saint Paul	1,140,370.45
Sand Point	110,624.56
Seward	153,392.71
Togiak	99,567.78
Unalaska	2,475,196.65
Valdez	249,495.51
Whittier	38,066.16
Wrangell	53,102.42
Yakutat	170,979.38
All other cities	6,108,476.56

Division of Commercial Fisheries Budget by Management Region and Species, (Commercial Fisheries Component only, Special Projects are not included).

	FY 93 Authorized	FY 94 Incs/Decs	FY 94 Request
Southeastern Region			
Groundfish	465.6	0.6	466.2
Herring	534.4	-2.6	531.8
Salmon	3,381.6	-20.2	3,361.4
Shellfish	538.1	-0.7	537.4
Total	$4,919.7	$-22.9	$4,896.8
Central Region			
Groundfish	29.7	0.0	29.7
Herring	692.1	23.8	715.9
Salmon	3993.4	-17.0	3,976.4
Shellfish	600.2	-5.3	594.9
Total	$5,315.4	$1.5	$5,316.9
AYK Region			
Groundfish	0.0	0.0	0.0
Herring	537.6	12.0	549.6
Salmon	2,931.6	-18.5	2,913.1
Shellfish	63.1	6.5	69.6
Total	$3,532.3	$0.0	$3,532.3
Westward Region			
Groundfish	0.0	0.0	0.0
Herring	342.6	-2.6	340.0
Salmon	2,929.2	-2.2	2,927.0
Shellfish	2,441.1	190.1	2,631.2
Total	$5,712.9	$185.3	$5,898.2
Headquarters Office			
Groundfish	275.8	3.9	279.7
Herring	436.9	3.0	439.9
Salmon	1,762.7	10.4	1,773.1
Shellfish	454.7	5.6	460.3
Total	$2,930.1	$22.9	$2,953.0
Totals by Species			
Groundfish	771.1	4.5	775.6
Herring	2,543.6	33.6	2,577.2
Salmon	14,998.5	-47.5	14,951.0
Shellfish	4,097.2	196.2	4,293.4
Component Total	**$22,410.4**	**$186.8**	**$22,597.2**

Note: Halibut are included in "Groundfish" in these figures.

Exvessel Values of Alaska's Commercial Fisheries, and Expenditures by the Division of Commercial Fisheries, (in Millions of dollars).

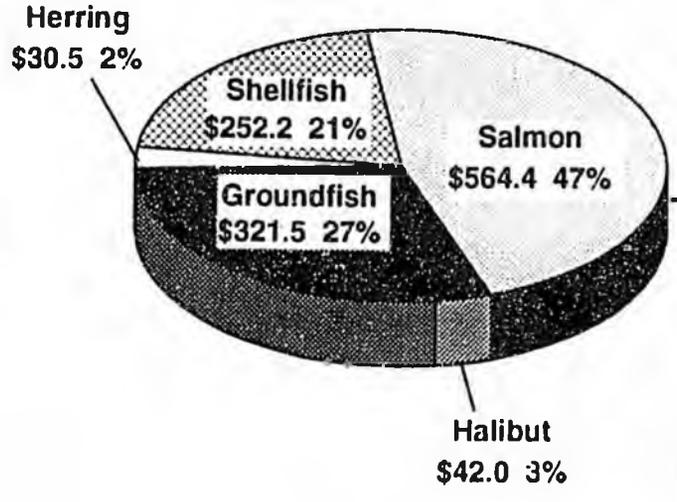
	Exvessel Values						Division Expenditures	
Year	Salmon	Shell Fish	Halibut	Herring	Ground Fish	Total Value	GF	Total
76	119.7	97.3	20.5	2.5	1.1	241.1	6.2	7.6
77	176.4	153.2	17.6	2.7	1.6	351.5	7.7	9.3
78	241.2	230.6	23.4	7.2	3.3	505.7	8.9	11.3
79	346.8	239.0	32.9	32.7	6.3	657.7	10.0	11.8
80	254.1	265.3	13.5	12.2	8.9	554.0	11.7	13.7
81	397.3	196.9	19.3	18.6	24.0	656.1	14.3	16.6
82	309.7	211.7	24.9	20.2	40.9	607.4	17.1	19.9
83	320.2	146.6	35.3	28.9	78.0	609.0	18.4	21.1
84	343.1	102.1	24.9	19.8	107.2	597.1	18.5	21.1
85	389.0	106.3	40.3	38.0	137.5	711.1	20.2	23.2
86	414.0	182.0	79.4	38.5	197.9	911.8	19.9	24.3
87	473.0	213.5	60.9	42.7	423.5	1,213.6	16.1	21.0
88	780.0	244.1	74.5	55.9	673.9	1,828.4	16.9	21.9
89	505.0	274.0	76.8	24.2	606.8	1,486.1	18.5	23.7
90	540.0	352.0	85.0	26.9	479.4	1,483.3	18.6	23.4
91	309.3	313.0	94.3	26.0	330.0	1,072.6	19.8	25.0
92	564.4	252.2	42.0	30.5	321.5	1,210.6	19.5	26.2
93	-----	-----	-----	-----	-----	-----	19.8	28.9
94	-----	-----	-----	-----	-----	-----	19.8	29.1

NOTES:

1) Nominal amounts displayed in the above table. Real (inflation adjusted nominal amounts) are shown on the graph on page 3.
2) Exvessel values do not include Washington landings or fish caught by foreign fleets.
3) Exvessel values are reported by calendar year, Division expenditures are by fiscal year. The Division authorized amount is shown for FY 93 and the Governor's request is shown for FY 94.
4) 1991 and 1992 exvessel values are considered preliminary, and may be subject to revision.

1992 Exvessel Values of Alaska's Commercial Fisheries

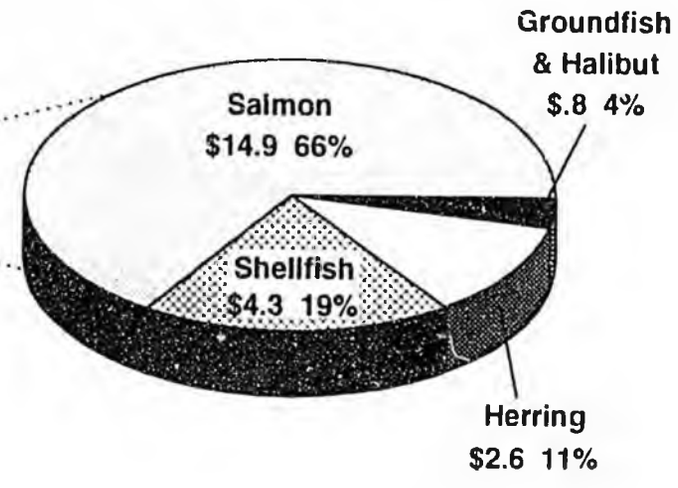
(Millions of dollars paid to fishers for catches in Alaskan waters.)



TOTAL
$1,210.6

FY 94 Commercial Fisheries Component Budget

(Millions of dollars spent to manage various Alaskan fisheries.)

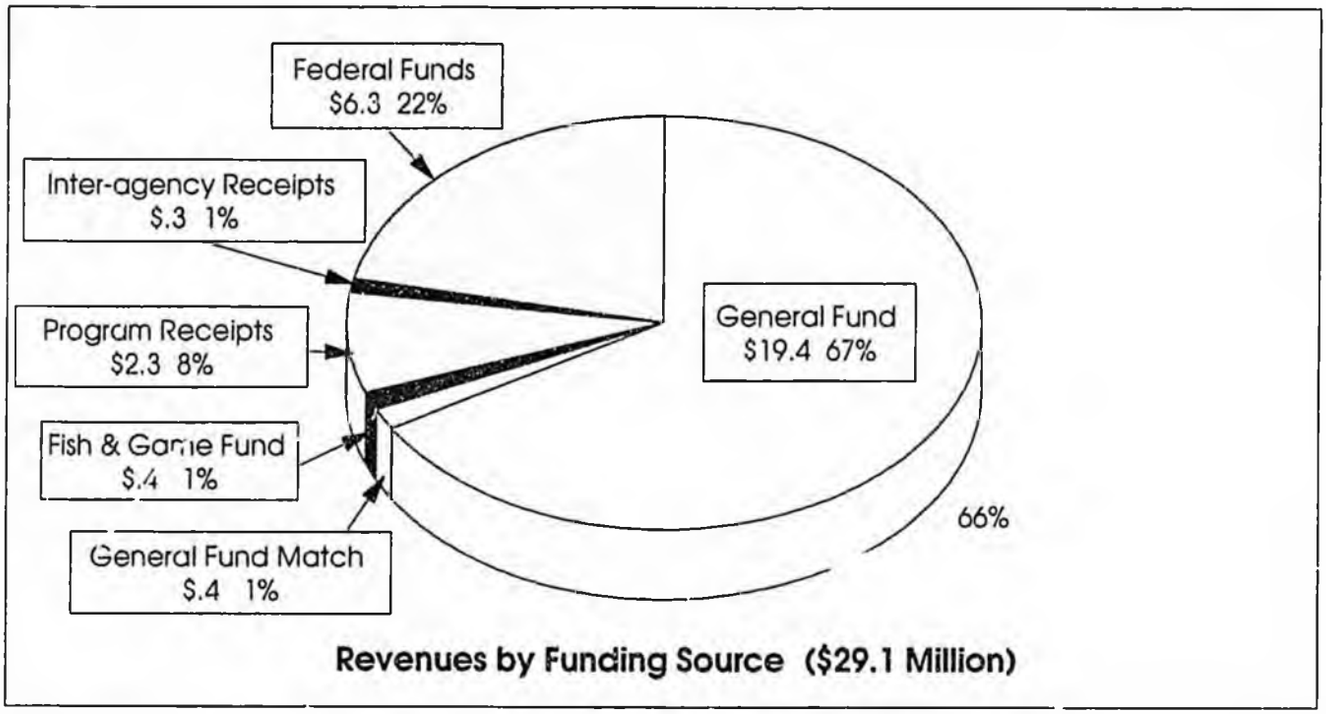


TOTAL
$22.6

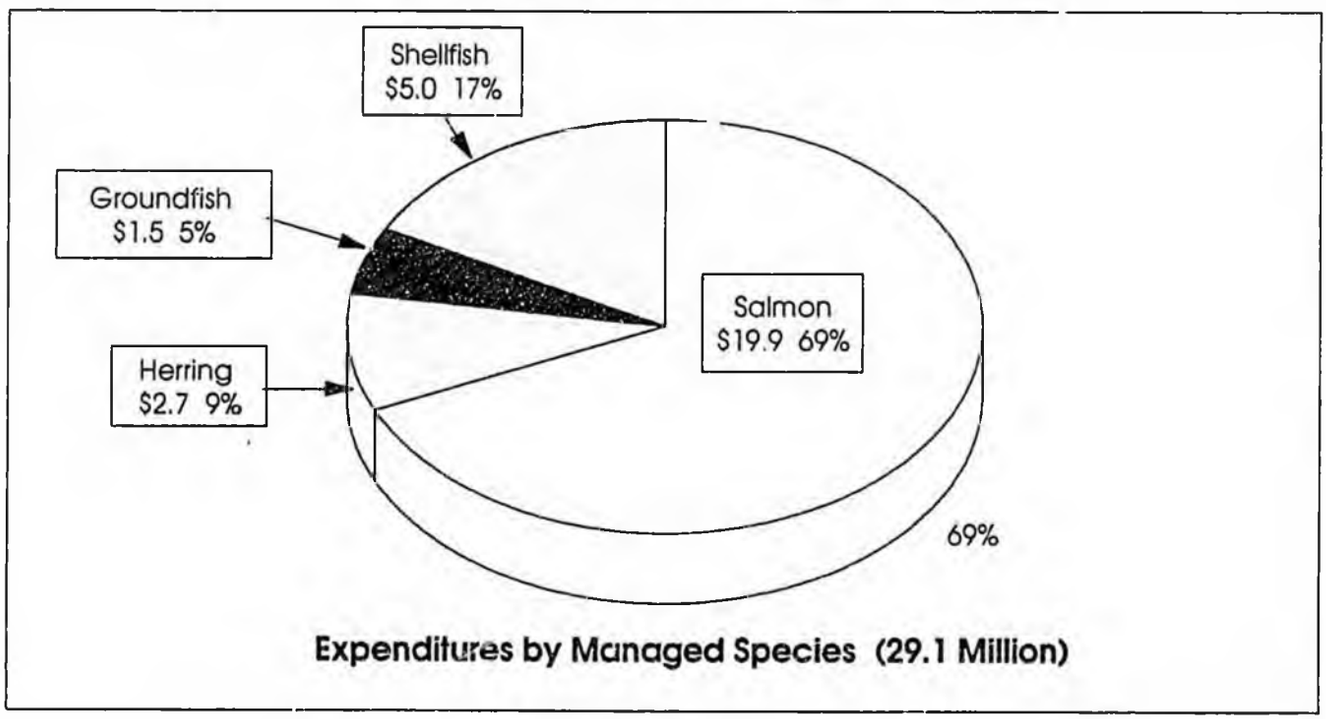
Commercial Fisheries budget if displayed to scale with the exvessel value.

FY 94 Budget by Revenue Source and by Species for the Division of Commercial Fisheries

(in millions of dollars)



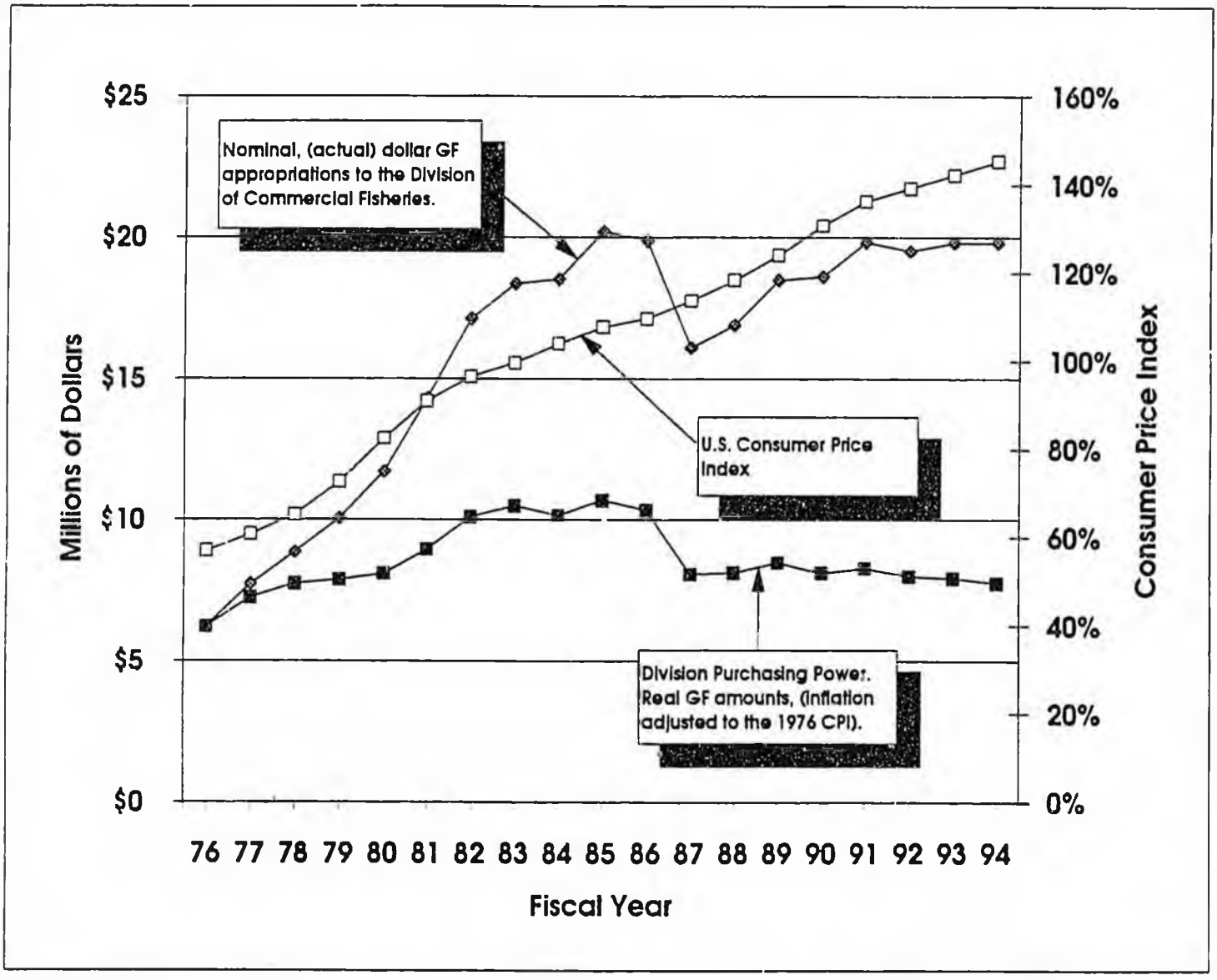
Revenues by Funding Source ($29.1 Million)



Expenditures by Managed Species (29.1 Million)

Division of Commercial Fisheries GF Budget

1976 - 1994 nominal amounts and inflation adjusted amounts shown



Executive Summary
Alaska Seafood Industry
Sector Report

by
Terrence Smith

Institute of Social and Economic Research
University of Alaska Anchorage

June 1992

This executive summary of the Alaska seafood industry sector report was funded by the Alaska Department of Commerce and Economic Development and by the Natural Resources Fund of the University of Alaska. The Alaska Department of Fish and Game provided data and financial support for maintenance of the Alaska Fisheries Economics Database (AKFED), on which this report is based. The Division of Commercial Fisheries and the Alaska Seafood marketing Institute paid for the printing of the document. The seafood industry sector report is one in a series of industry sector reports commissioned by the Alaska Industrial Development and Export Authority and Department of Commerce and Economic Development. Copies of the full report are available from DCED and ISER.

Table of Contents

Introduction

The 1980s saw rapid and remarkable change in the Alaska seafood industry. Salmon landings and revenues reached all-time highs. The crab and halibut fisheries rebounded. And in the biggest change of the decade, American fishermen and processors took over Alaska's offshore fisheries and the billions of pounds of groundfish harvests that had previously gone to foreign vessels.

As Figure 1 shows, the domestic catch of groundfish off Alaska increased from virtually nothing in 1980 to more than 4.5 billion pounds by the late 1980s. That huge increase in domestic groundfish harvests meant Alaska's overall domestic seafood harvest quadrupled between 1980 and 1990.

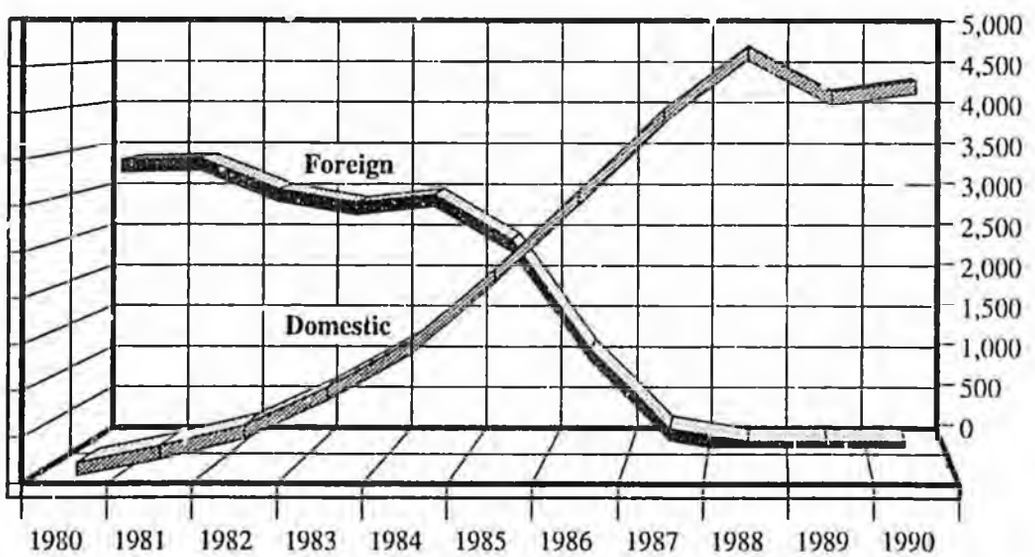
Alaska ranked among the top ten seafood producers in the world in the 1980s. Figure 2 shows Alaska harvests over the decade as compared with those of the entire U.S. and some other major fishing nations. Nearly 3 percent of world harvests, and half of U.S. harvests, came from Alaska waters in recent years.

The seafood industry has always been important to the state's economy, and in the 1980s it provided more jobs and a bigger payroll than any other resource industry. Close to one in ten Alaska adults spent at least some time commercial fishing in 1989, and throughout the 1980s Alaska residents bought about 80 percent of commercial fishing permits and around 65 percent of crew licenses for Alaska fisheries. (For brevity, thoughout this publication we use "fishermen" to refer to both men and women who fish.)

Table 1 shows that the seafood industry (including both harvesting and processing) contributed 7 percent of total personal income in Alaska in 1984, and much more than that in coastal regions with the richest fisheries. And if we consider just income from Alaska's private basic industries—those that drive the economy by producing goods or services for export—the seafood industry contributed more than one-quarter of Alaska's private basic income in 1984, and much bigger shares in the Southwest, Gulf Coast, and Southeast regions.

Alaska's commercial fisheries stretch from the southeast panhandle along the Gulf of Alaska and the Aleutian chain and up the southwest and northern coasts. Figure 3 shows locations of major Alaska fisheries.

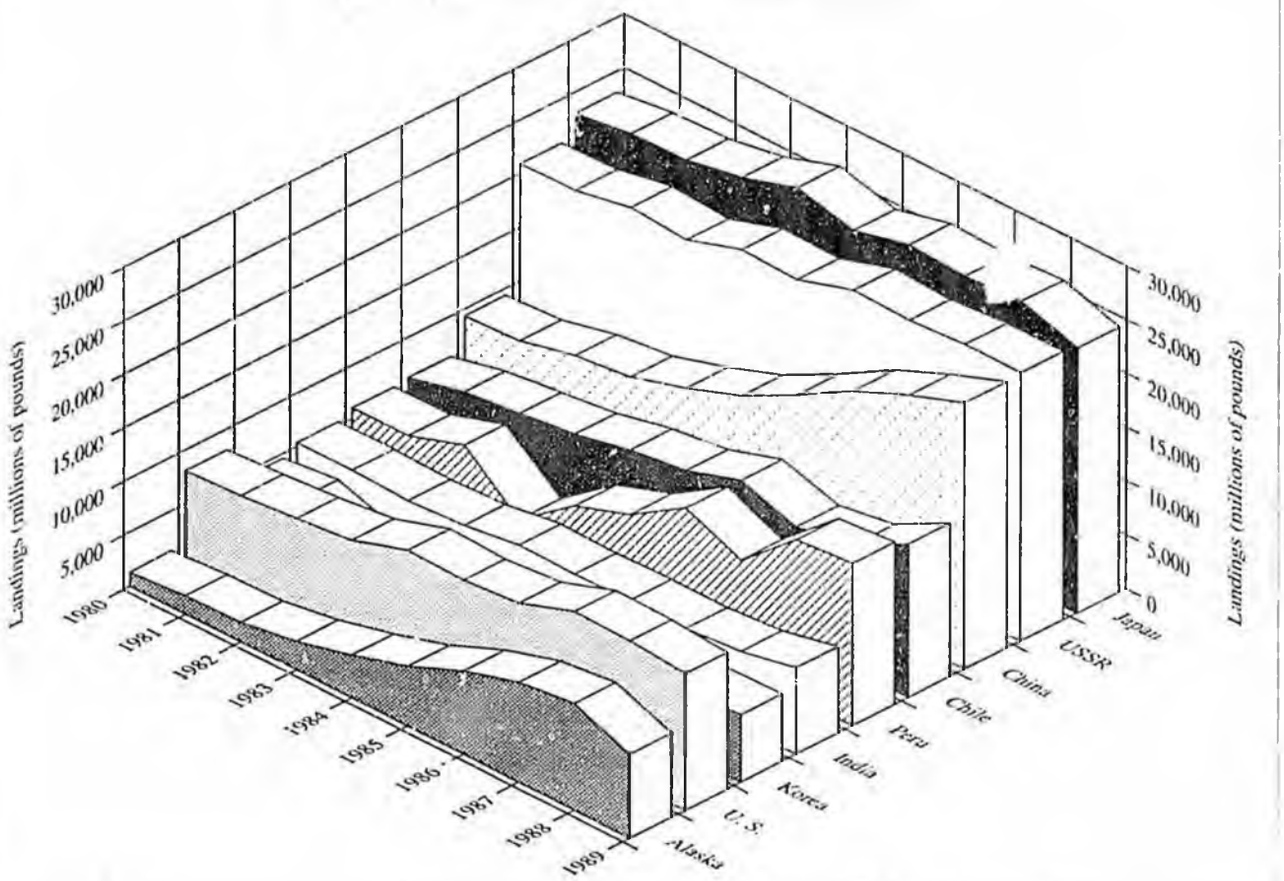
Figure 1. Domestic* and Foreign Groundfish Harvests Off Alaska, 1980-1990
(In Millions of Pounds)



**Domestic harvests here include joint venture harvests—harvests made by American fishermen but processed by foreign trawlers. Such joint ventures ended in 1990.*

Source: Alaska Fisheries Economic Database (ISER)

Figure 2. Seafood Harvests of Selected Major Fishing Nations and Alaska, 1980-1989



Source: World Fisheries and Agricultural Organization, yearbooks; National Marine Fisheries Service, Fisheries of the United States, *1985-1989.*

What we refer to broadly as the Alaska seafood "industry" is in fact a diverse collection of individuals and businesses that handle seafood products. It includes the fishermen who harvest the catch; processors and shippers who deliver a variety of processed products to the next market level; other shippers, producers, or exporters who resell the products; and ultimately, seafood markets, grocery stores, and restaurants that bring a myriad of seafood products to the consumer.

This publication examines the industry's performance over the past decade. It both updates and summarizes "The Alaska Seafood Industry: Seafood Sector Report," published in May 1991 by the Alaska Industrial Development and Export Authority (AIDEA) and the Alaska Department of Commerce and Economic Development (DCED). Both the full report and this summary are based largely on data from ISER's Alaska Fisheries Economic Database (AKFED).

Table 1. Importance of Seafood Industry* to Alaska Personal Income, 1984

Seafood Income	Anchorage/ Mat-Su	Southwest	Gulf Coast	Interior	Northern	Southeast	Alaska
As Percentage of Regional and Statewide Personal Income	2	47	19	-	2	10	7
As Percentage of Private Basic Income	9	98	44	1	5	40	27

**Includes harvesting and processing income. Regions are Alaska Department of Labor regions.*

Source: Berman and Hull, 1987

Figure 3. Major Alaska Fisheries Locations

Performance of the Seafood Industry, 1980-1990

Figures 4 through 7 show how harvests, ex-vessel values, production, and wholesale values of Alaska seafood changed during the 1980s. *Harvests* are simply the total weight of seafood fishermen haul in. *Ex-vessel* value is the total money processors and others pay fishermen for unprocessed seafood. *Production* is the weight of processed seafood and *wholesale value* is money paid to seafood processors.

Harvests and Ex-Vessel Value

Commercial fishermen use a variety of vessels and gear types to harvest Alaska seafood, and are regulated by several agencies under different management systems. The Alaska Department of Fish and Game manages the salmon, crab, and herring fisheries. The International Pacific Halibut Commission (a joint treaty organization of the U.S. and Canada) manages halibut, and the North Pacific Fishery Management Council manages groundfish off Alaska.

Five types of salmon (chinook, coho, sockeye, pink, and chum) are harvested commercially in Alaska waters. Tanner, king, and dungeness crab make up most of the shellfish harvest, but shrimp and other shellfish also contribute. Herring are harvested for roe (eggs), food, and bait. Pacific halibut from Alaska waters make up most of the world's halibut supply.

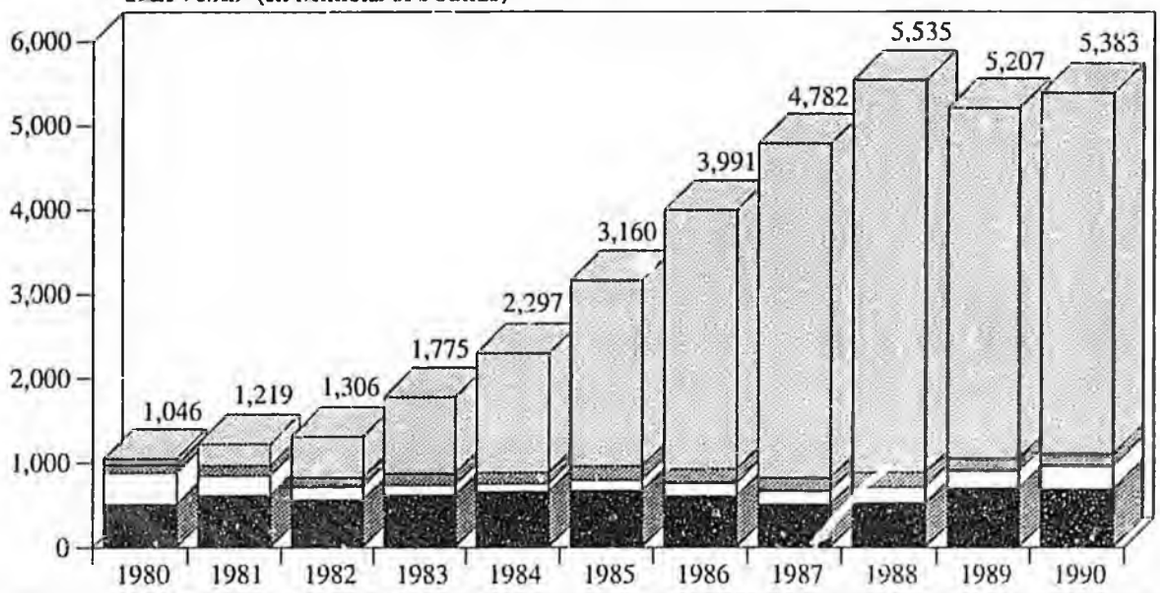
Many kinds of groundfish are harvested in the waters off Alaska, but the most common species groups are Alaska pollock, Pacific cod, flatfish, rockfish, and sablefish. At the beginning of the decade foreign trawlers took 98 percent of the groundfish catch in Alaska's offshore fisheries. But because of the preference to domestic processors written into the federal Magnuson Fishery Conservation and Management Act of 1976, the foreign fishery was phased out. At first domestic vessels began replacing foreign trawlers and delivering to foreign processors ("joint ventures"). Finally domestic processing capacity increased to the point where U.S. processors were able to handle the entire catch. Foreign harvests off Alaska ended in 1987 and joint ventures in 1990.

Changes in the offshore fisheries and in other fisheries meant big changes in harvest and ex-vessel values in the 1980s:

- ***Domestic harvests soared 500 percent between 1980 and 1990***—increasing from 1.05 billion pounds to 5.4 billion pounds. The 1990 harvest was made up of 4.3 billion pounds of groundfish, 692 million pounds of salmon, 267 million pounds of shellfish, 91 million pounds of herring, and 53 million pounds of halibut. (Figure 4.)
- ***Tremendous growth in the domestic groundfish catch*** accounted for most of the increase in Alaska seafood harvests. Domestic groundfish harvests increased from 69 million pounds to 4.3 billion pounds as American fishermen and processors took over the offshore fisheries. (Figure 1.)
- ***Harvests of other seafood were more volatile but also trended up.*** The combined catch of non-groundfish species was about 13 percent larger in 1990 than in 1980. (Figures 4 and 6.)
- ***Salmon harvests generally increased,*** with record landings of nearly 700 million pounds in 1989.
- ***The shellfish catch peaked in 1980 at 367 million pounds,*** crashed to 92 million pounds in 1984 (mostly because of a sharp drop in harvests of king crab and shrimp), and steadily recovered to 267 million pounds in 1990, largely because of growth in Tanner crab harvests.
- ***Herring catches moved up and down with no apparent trend*** over the decade and stood at about 91 million pounds in 1990.
- ***Halibut harvests increased through 1988,*** peaking at 61 million pounds. Since then halibut harvests have declined due to lower catch quotas established by the International Pacific Halibut Commission.
- ***Groundfish made up nearly 80 percent of the weight of seafood harvested*** in Alaska in the second half of the 1980s, with salmon making up about 15 percent, shellfish 4 percent, herring 2 percent and halibut 1 percent. (Figure 7.)
- ***American fishermen were paid 230 percent more for their catches*** in 1990 than in 1981—$1.5 billion as compared with $665 million. Ex-vessel values in 1990 were higher than in 1980 for all species groups. Values for shellfish, halibut, and groundfish reached record highs in 1990 while salmon and herring values peaked in 1988. (Figure 4.)
- ***Salmon fishermen saw ex-vessel values rise 175 percent between 1980 and 1988,*** then fall 32 percent between 1988 and 1989 as salmon prices plummeted. Prices continued to drop through 1991 (Knapp, 1992). The ex-vessel value recovered somewhat in 1990—not because prices went up, but because harvests of sockeye salmon increased. (Figure 4.)
- ***Ups and downs marked shellfish, herring, and halibut ex-vessel values.*** (Figures 4 and 6.) Halibut values went from about $13 million in 1980 to nearly $96 million in 1990. Herring values ranged from $15 million in 1980 to $61 million in 1988 with large variations from year to year. Shellfish values fell to a low of $103 million when stocks crashed in 1984, but by 1990 had rebounded to a peak of $365 million.
- ***Salmon brought fishermen more money*** than any other seafood sector in the 1980s. But as the size of the groundfish harvest grew ever larger and salmon prices dropped in the late 1980s, the ex-vessel value of groundfish moved closer to that of salmon. (Figure 4.) On average during the last half of the decade salmon made up 45 percent of value paid domestic fishermen, followed by groundfish at 27 percent, shellfish at 19 percent, halibut at 6 percent, and herring at 3 percent. (Figure 7.)

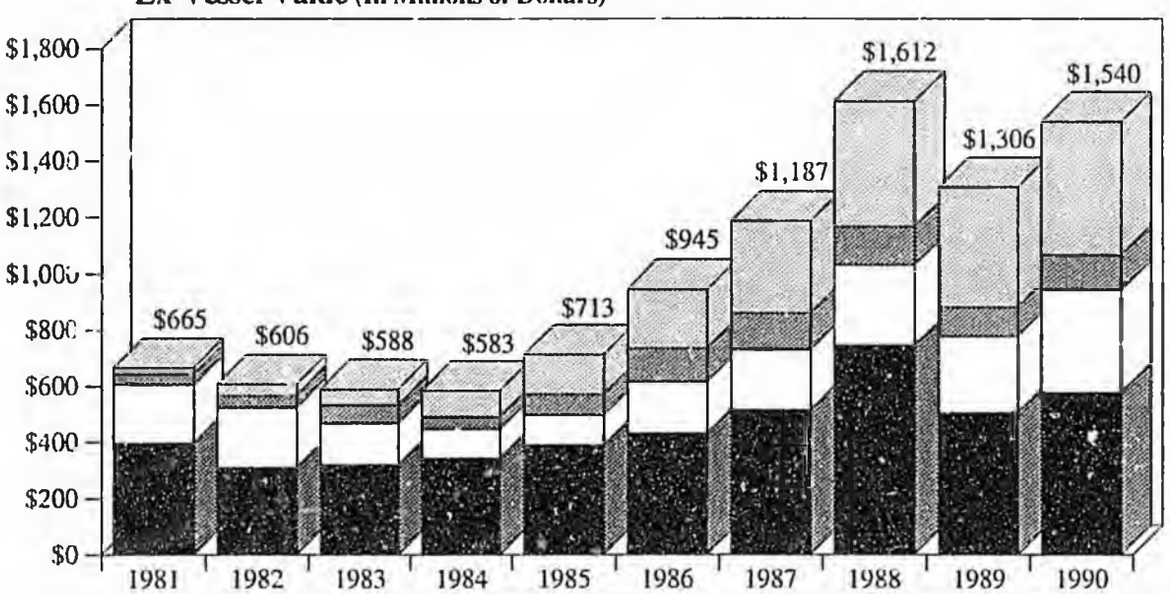
Figure 4. Alaska Domestic Seafood Harvests and Ex-Vessel Value, 1980-1990

Harvests (In Millions of Pounds)



	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Groundfish	69	252	476	901	1,412	2,201	3,063	3,958	**4,648***	4,153	4,280
Halibut	14	20	23	33	35	45	58	57	**61***	56	53
Herring	84	100	95	108	98	**121***	113	102	115	97	91
Shellfish	**367***	235	148	112	92	120	150	157	185	203	267
Salmon	512	612	563	622	660	674	608	508	526	**699***	692

Ex-Vessel Value (In Millions of Dollars)



	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Groundfish	22	39	55	92	142	209	326	445	425	**474***
Halibut	19	25	35	25	38	83	89	75	86	**96***
Herring	20	19	30	20	37	38	42	**61***	18	29
Shellfish	206	213	147	103	106	182	214	287	272	**365***
Salmon	398	311	321	343	390	433	516	**745***	505	576

**Peak harvest and ex-vessel value for decade.*
Note: Excludes foreign groundfish harvests.

Source: Alaska Fisheries Economic Database, ISER

Production and Wholesale Value

Alaska's seafood harvests are processed into a myriad of wholesale products in a variety of ways—from simple operations such as bleeding the fish to high-technology operations that create products like surimi, a paste made from whitefish flesh. Multiple products, such as pollock fillets and fish meal, may also be produced from a single fish.

The percentage of total weight remaining after processing is known as the yield. Yields vary in different processing operations. For example, a heading and gutting operation may have a 75 to 80 percent yield, while surimi operations typically have yields in the 15 percent range.

In the groundfish and crab fisheries some processing is done offshore on vessels which also harvest (catcher/processors) or which take delivery from catcher vessels (mothership/processors). Otherwise, processing occurs at shoreside plants in Alaska, and to a certain extent, in the Pacific Northwest.

How the groundfish catch is split between offshore processors (which employ mostly non-residents) and onshore plants in Alaska (which create more local jobs) has become controversial in Alaska in recent years. The North Pacific Fishery Management Council in 1992 for the first time specifically allocated portions of future groundfish catches to onshore and offshore processors.

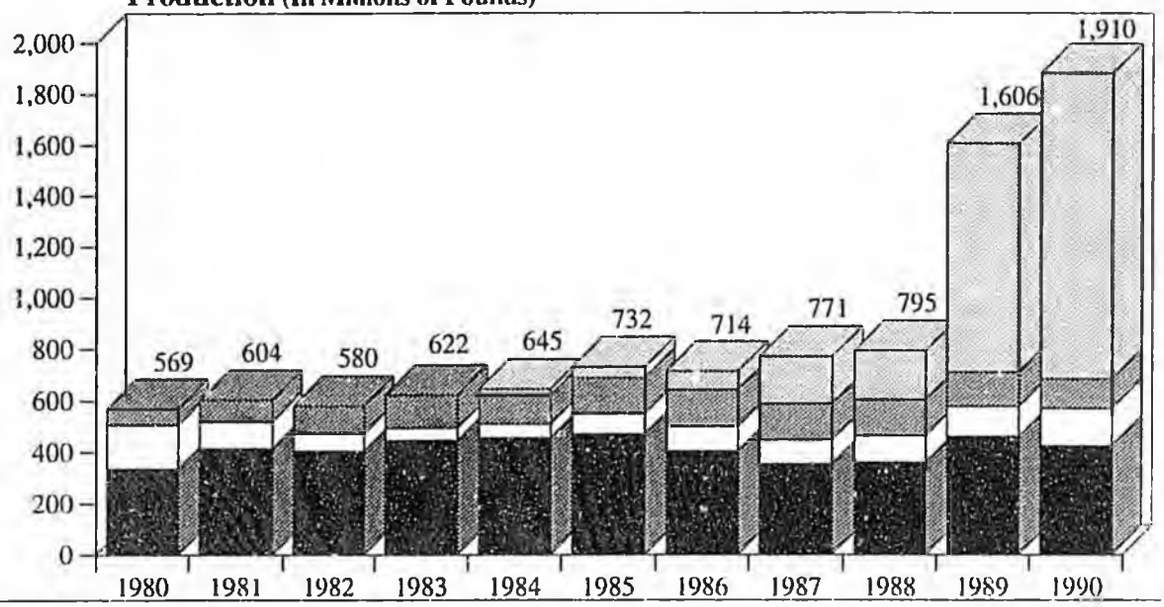
This summary and the full technical report represent the most comprehensive accounting to date of the Alaska seafood industry's wholesale sector. They use previously unpublished production data provided by the Alaska Commercial Fisheries Entry Commission and the National Marine Fisheries Service. Some of the reported production may have occurred at sea or at shoreside processing plants outside Alaska. However, the harvests came from Alaska waters.

Production and wholesale value of Alaska seafood changed dramatically in the 1980s:

- ***Domestic production skyrocketed,*** growing from about 569 million pounds in 1980 to nearly 2 billion pounds in 1990. (Figure 5.) That 1990 production was made up of 1.2 billion pounds of groundfish, 426 million pounds of salmon, 144 million pounds of shellfish, 75 million pounds of herring, and 41 million pounds of halibut.
- ***Groundfish led growth in production,*** increasing from about 22 million pounds in 1984 to 1.2 billion pounds in 1990—a nearly six-fold increase in six years.
- ***Production from other kinds of seafood was more volatile.*** (Figures 5 and 6.) Salmon production peaked in 1985 at 472 million pounds, shellfish in 1980 at 172 million pounds, herring in 1985 at 106 million pounds, and halibut in 1987 at 52 million pounds.
- ***Salmon contributed the most to seafood production*** in the last half of the 1980s, even though groundfish harvests were much larger. That's because a large portion of the salmon catch is exported with just minor processing, while much of the groundfish catch is used to produce relatively lower yield products (surimi, for instance). Between 1984 and 1990 salmon accounted for 42 percent of total seafood production, groundfish 37 percent, shellfish 10 percent, herring 7 percent and halibut 4 percent. (Figure 7.)
- ***By 1990 groundfish overtook salmon*** as the largest contributor to production. (Figure 5.) By that time groundfish harvests had grown so large that even with much lower processing yields, the resulting production outweighed salmon production. In 1990 groundfish accounted for 64 percent of total production, salmon 22 percent, shellfish 8 percent herring 4 percent, and halibut 2 percent.
- ***The wholesale value of Alaska production doubled*** over the decade, growing from just over $1 billion in 1980 to more than $2.5 billion in 1990. (Figure 5.) Leading that wholesale value in 1990 were groundfish products worth more than $1 billion, followed by salmon products at $893 million, shellfish products at $468 million, herring products at $65 million, and halibut products at $61 million.
- ***Wholesale value grew even more dramatically in the last half of the decade.*** Because data on the value of groundfish production aren't available for the early 1980s, and shellfish production and value were falling at the same time, the reported total wholesale value of Alaska products bottomed out at about $745 million in 1984. This means that in the six years from 1984 to 1990, the total wholesale value from production of Alaska seafood increased nearly 350 percent.

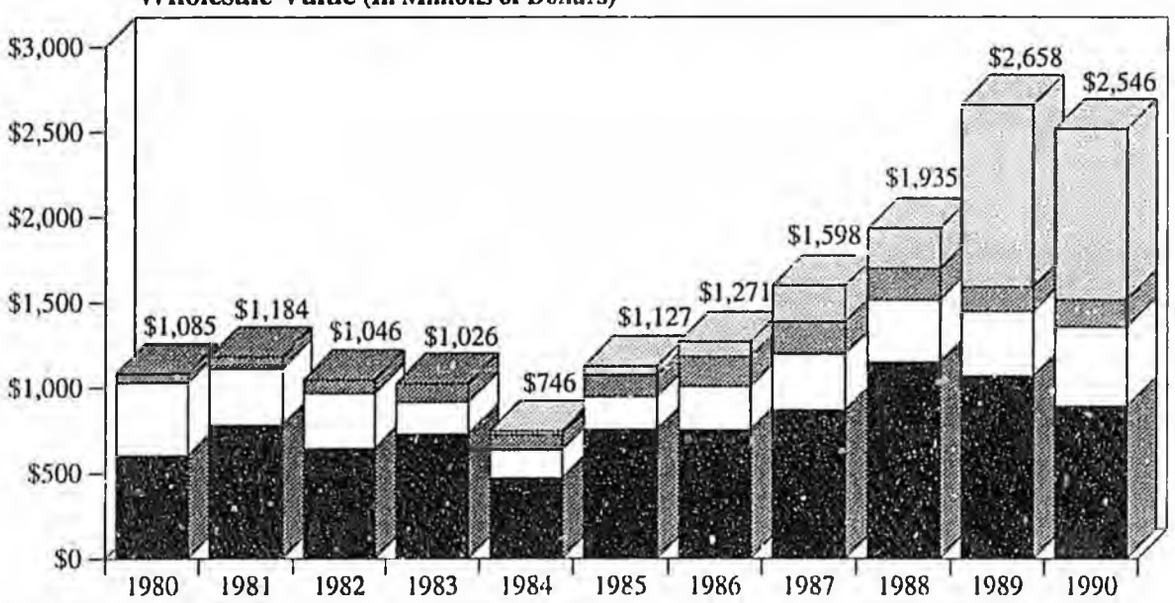
Figure 5. Alaska Domestic Seafood Production and Wholesale Value, 1980-1990

Production (In Millions of Pounds)



	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Groundfish	N/A	N/A	N/A	N/A	22	43	71	181	190	893	**1,224***
Halibut	11	16	17	28	30	34	49	**52***	50	48	41
Herring	52	70	92	101	83	**106***	94	90	91	87	75
Shellfish	**172***	106	68	48	54	77	96	93	104	116	144
Salmon	335	413	403	446	456	**472***	404	355	359	461	426

Wholesale Value (In Millions of Dollars)



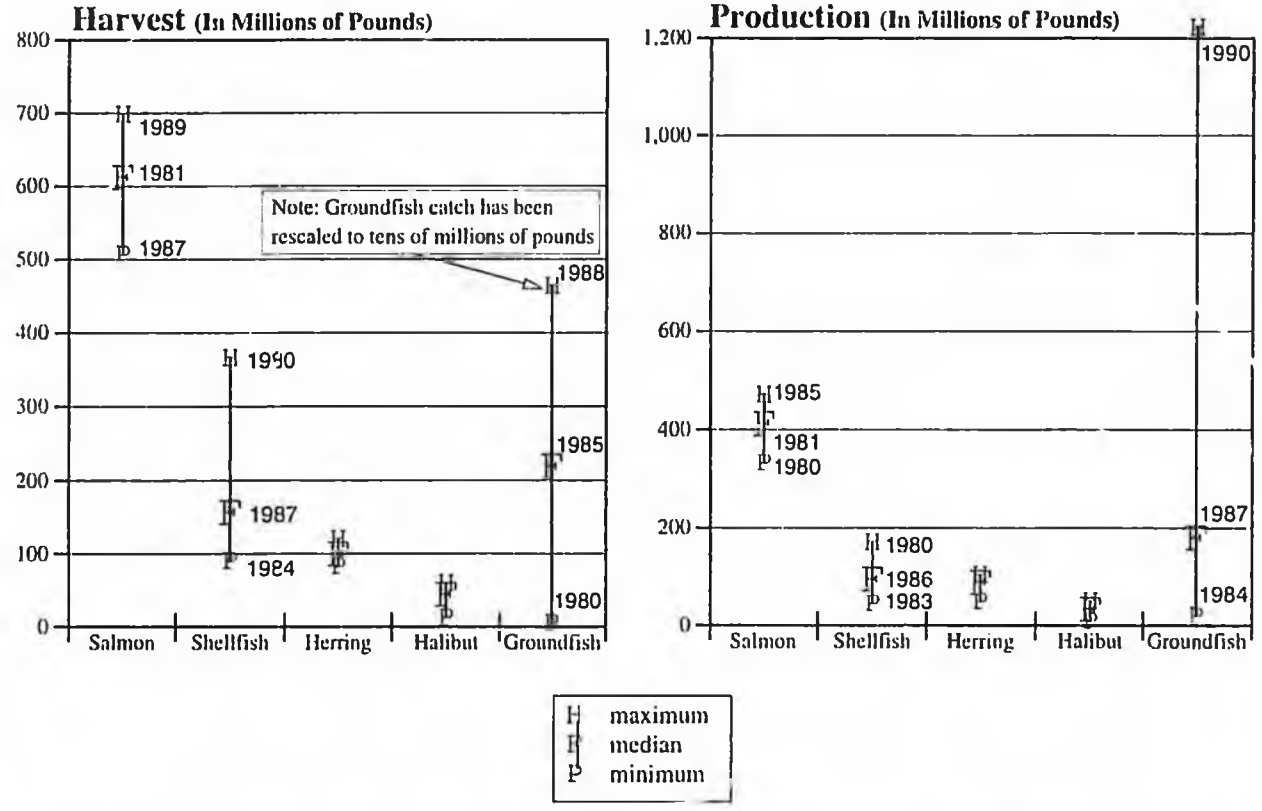
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Groundfish	N/A	N/A	N/A	N/A	20	50	87	211	235	**1,065***	1,026
Halibut	16	22	28	44	37	48	95	**103***	90	93	100
Herring	38	52	52	67	55	83	82	86	**93***	51	59
Shellfish	428	331	323	188	164	193	258	330	365	378	**468***
Salmon	602	780	644	726	470	753	750	869	**1,152***	1,071	893

**Peak for decade.*

Note: Excludes foreign groundfish production. 1989 groundfish production and wholesale value estimated using 1990 yield and price.

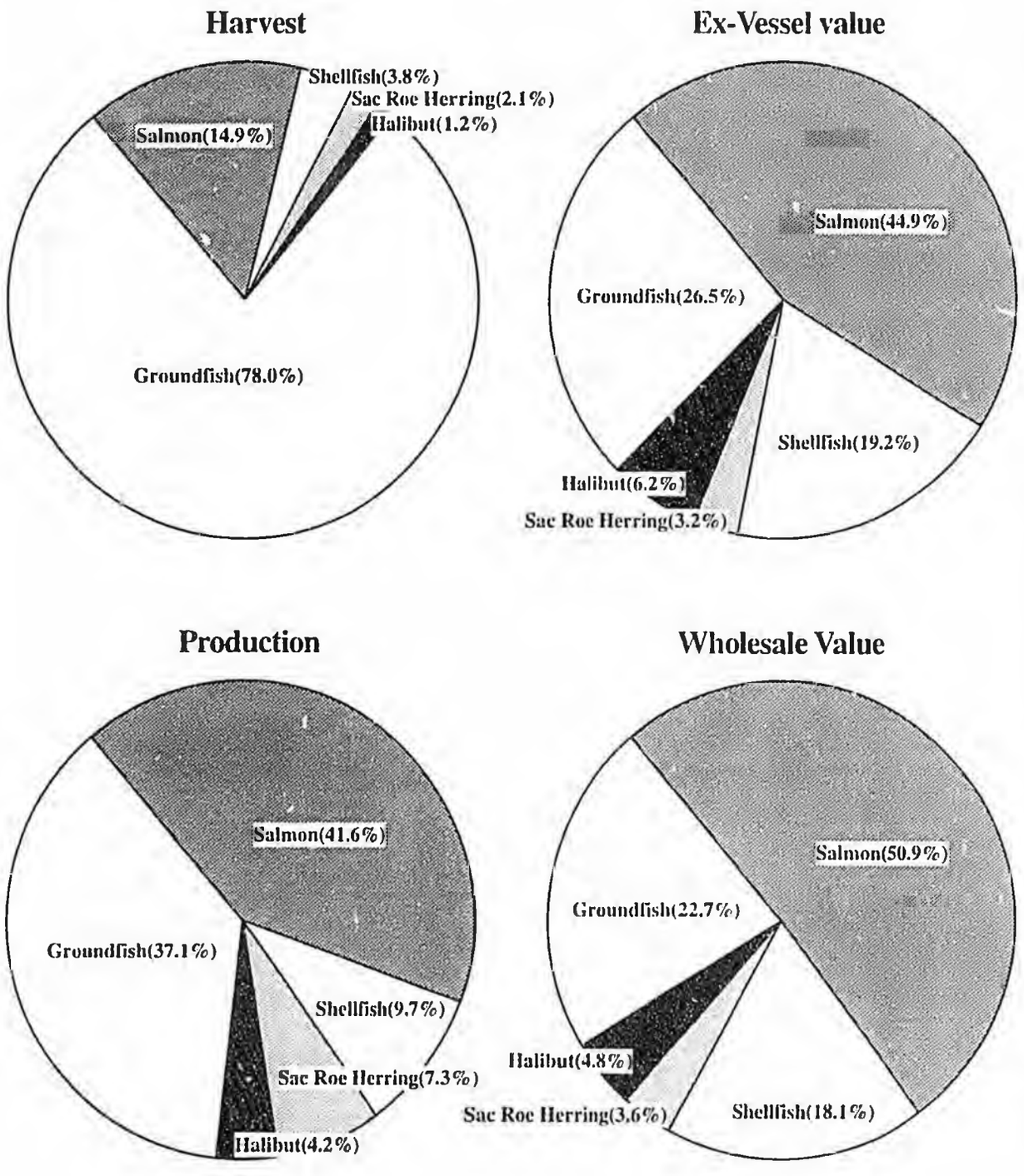
Sources: Alaska Department of Fish and Game, 1980-83, 1989-90; Commercial Fisheries Entry Commission, 1984-88; National Marine Fisheries Service, 1990.

Figure 6. Range of Performance by Species Groups, 1980-1990 (Maximum, Median, Minimum)



Sources: See Figures 4 and 5.

Figure 7. Relative Contributions of Species Groups to Alaska Seafood Industry
(1984-1990 Average)



Sources: See Figures 4 and 5.

Alaska's Role in U.S. and World Seafood Markets

Alaska's seafood harvests are far and away the largest and most valuable of any state, and they are also significant worldwide. Here are some comparisons for recent years.

- ***Alaska contributed about 50 percent of total U.S. harvests*** and 40 percent of total ex-vessel value throughout the 1980s.
- ***The 1990 Alaska harvest was an all-time record for any state.*** The 5.4 billions pounds of seafood harvested off Alaska was more than five times the 1990 harvest off Louisiana, which had the second largest harvest.
- ***The 1990 ex-vessel value of Alaska seafood was five times greater*** than the ex-vessel value of harvests off Massachusetts, the state ranked second in 1990 ex-vessel value.
- ***Alaska's Dutch Harbor was first in U.S. landings*** in 1990, and Kodiak was third. Several other Alaska communities also ranked in the top 20 for landings in 1990—Naknek (13), Cordova (14), Petersburg (16), Ketchikan (17), Egegik (19), and Seward (20).
- ***Dutch Harbor was second in U.S. ex-vessel value in 1990,*** after New Bedford, Massachusetts—home port to many of the George's Bank scallopers. Kodiak ranked third in ex-vessel value. Naknek fourth, Egegik sixth, and Kenai eighth.
- ***Alaska pollock alone accounted for 33 percent*** of the total domestic catch in 1990. Sockeye salmon and Alaska pollock were the second and third most valuable species harvested in the U.S in 1990, just behind shrimp from the Gulf of Mexico.
- ***Alaska waters provide most of the world's*** harvests of sockeye salmon, Tanner crab, Pacific halibut, and sablefish. In 1987, the most recent year for which international harvest data are available, Alaska accounted for 80 percent of the world sockeye harvest, 84 percent of Tanner crab, 87 percent of Pacific halibut, and 67 percent of sablefish. Alaska harvests made up smaller but still substantial shares of the world harvests of Pacific cod (43 percent), pink salmon (34 percent), coho salmon (33 percent), dungeness crab (28 percent), and king crab (26 percent).

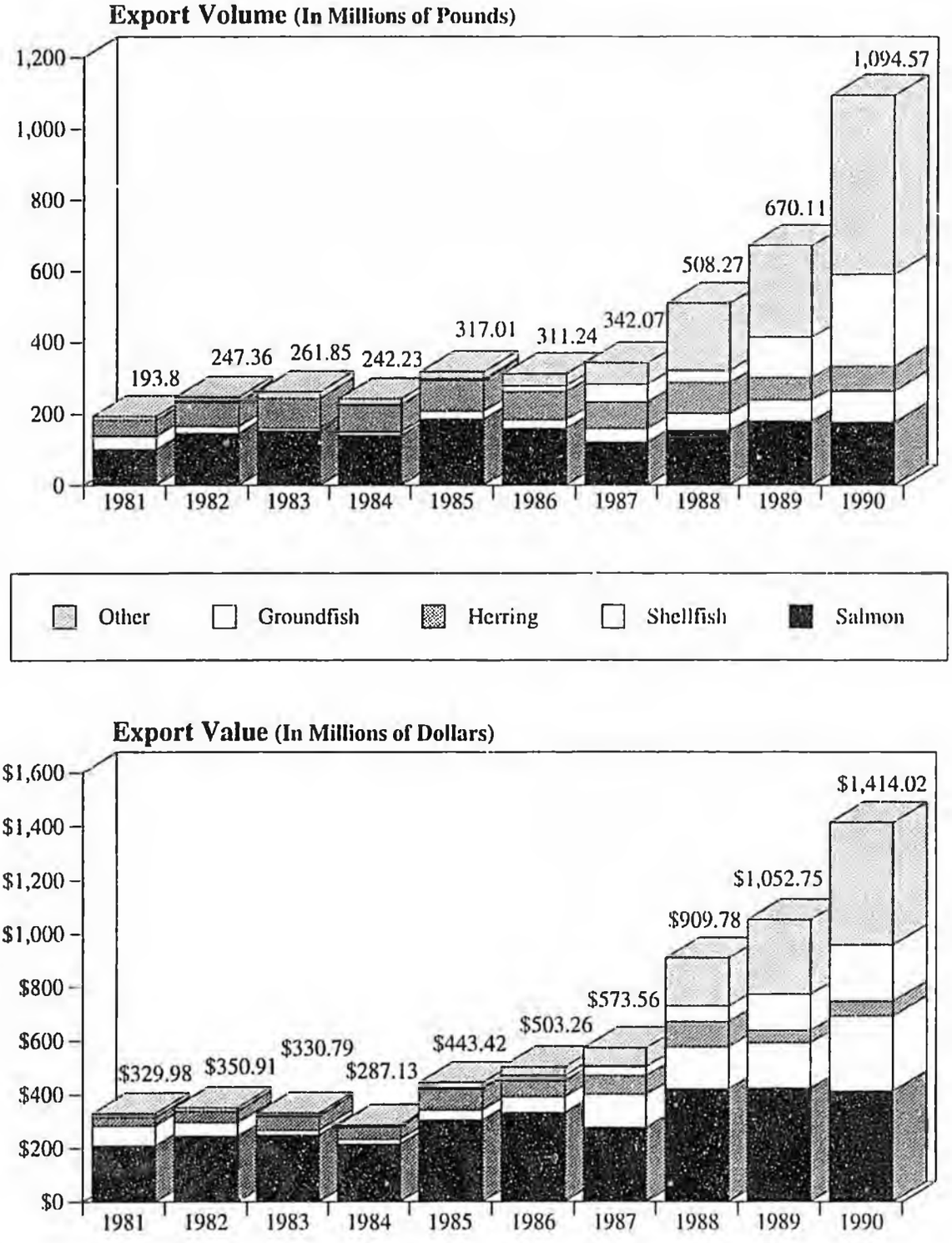
Exports of Alaska Seafood

Some of Alaska's seafood is exported directly from Alaska to other countries, some is exported indirectly (shipped first from Alaska to other states and then exported), and some is eaten in Alaska and other states.

For this study we estimated indirect exports.[1] As far as we know, no other recent studies have estimated indirect exports of Alaska fisheries production. What did Alaska exports look like in the 1980s?

- ***Direct exports of Alaska seafood grew five-fold*** in volume and four-fold in value over the 1980s. (Figure 8.) In 1980 direct exports totalled just under 2 million pounds worth about $330 million. By 1990 direct exports from Alaska exceeded 1 billion pounds worth more than $1.4 billion.
- ***Salmon dominated the export statistics*** both in weight and value for most of the decade, peaking at about 180 million pounds valued at $423 million in 1989. Herring have traditionally been the second most important Alaska seafood export, but as of 1989 groundfish exports exceeded herring exports both by weight and value.
- ***Salmon remained the most valuable export in 1990, followed by shellfish.*** But groundfish led in weight exported. That year about 176 million pounds of salmon products valued at $412 million were exported directly from Alaska, and 86 million pounds of shellfish valued at $280 million. By comparison, about 255 million pounds of groundfish valued at $210 million dollars were exported.[2]
- ***Japan was still the largest market*** for Alaska seafood exports at the end of the decade, but other countries were increasing their share. Tables 2 and 3 show that from 1988 through 1990, Japan bought more and more Alaska seafood but its overall share dropped from 95 to 87 percent. During the same period Korea and several European countries sharply increased their purchases of Alaska seafoods.

Figure 8. Direct Alaska Seafood Exports, 1981-1990



Sources: 1981-87: U.S. Department of Commerce, Bureau of the Census, Export Tapes; 1988-90: National Marine Fisheries Service, Alaska Fishery Science Center.

Table 2. Direct Seafood Exports from Alaska By Country of Destination, 1988-1990
(In Thousands of Pounds and Dollars)

	1988		1989		1990	
	Pounds	Value	Pounds	Value	Pounds	Value
Japan	473,873	$865,372	591,910	$975,742	870,186	$1,227,253
Korea	18,464	$24,014	40,473	$44,893	103,618	$80,906
Germany	148	$231	249	$274	51,922	$44,764
Norway	-	-	2,525	$1,386	40,373	$28,907
Portugal	6,822	$8,929	12,522	$13,224	16,288	$18,629
Canada	5,47?	$6,273	20,368	$18,816	4,568	$7,461
United Kingdom	-	-	-	-	2,063	$1,709
Taiwan	2,065	$2,838	1,928	$1,193	1,835	$1,146
Spain	-	-	-	-	967	$854
France	-	$423	6	$71	943	$940
Thailand	1,169	$1,542	-	-	453	$672
All Other Countries	69	$157	125	$154	551	$779
Total	508,265	$909,799	670,105	$1,055,752	1,093,769	$1,414,020

Source: National Marine Fisheries Service, Fisheries of the United States.

- ***Most Alaska herring was exported directly*** from Alaska in the 1980s. (Table 4.)
- ***Roughly a third of processed salmon was exported directly*** and another third indirectly over the decade.
- ***Almost no processed halibut and little king crab was exported directly*** from Alaska in the 1980s, but about one-quarter of halibut and one-sixth of king crab were exported indirectly.
- ***About 18 percent of processed groundfish was exported directly*** and another 55 percent exported indirectly from Alaska in the last half of the 1980s.
- ***Total direct and indirect exports in the 1980s*** included about 60 percent of salmon products, 80 percent of herring, 25 percent of king crab and halibut, and 73 percent of groundfish.
- ***Markets for Alaska seafood include Asia, Europe, and Australia.*** Japan buys most exports of fresh and frozen salmon, herring, and crab. The United Kingdom, Canada, and Australia provide the biggest markets for canned salmon. Historically, most groundfish from Alaska waters and other areas of the North Pacific was processed as surimi and exported to Japan. But recently U.S. and European markets for Alaska groundfish blocks and fillets have developed.

Table 3. Top Importers of Alaska Seafood
(In Percentage of Direct Export Value)

	1988	1989	1990
Japan	95%	92%	87%
Korea	3	4	6
Portugal	1	1	1
Germany	-	-	3
Norway	-	-	2
Canada	<1	2	<1

Source: See Table 2.

Table 4. Estimated Alaska Seafood Exports in the 1980s*
(In Percentage of Alaska Production)

	Direct	Indirect	Total Exports
Salmon	31%	30%	61%
King Crab	14%	14%	28%
Herring	77%	2%	79%
Halibut	0%	25%	25%
Groundfish	18%	55%	73%

**Salmon and herring, 1980-88 average; king crab and halibut, 1984-87 average; groundfish, 1984-90 average.*

Source: ISER calculations, based on fisheries statistics sources.

Public Revenues and Expenditures

Alaska's fish are public resources. Fish within 3 miles offshore are managed by the State of Alaska. Fish within the federal Exclusive Economic Zone, from 3 to 200 miles offshore, are managed by the federal government under the Magnuson Fishery Conservation and Management Act.

In return for their use of the resource, fishermen and processors pay various taxes and fees at the local, state, and federal levels. They also benefit from government expenditures for services such as research, management, and enforcement.

Taxes and Fees

- ***The fishing industry paid*** about $52 million in major taxes and fees in fiscal year 1989, the most recent year for which figures are available. In 1980 taxes and fees totalled about $21.5 million.
- ***The biggest source of revenue*** is the Fisheries Business Tax (also called the raw fish tax), which brought the state government $27 million in fiscal 1989.[3] The state refunds 50 percent of that tax to the communities and boroughs where it is collected. Other state taxes include the Salmon Enhancement Tax, used to help pay costs of hatchery operations; and the Seafood Marketing Assessment, which funds the Alaska Seafood Marketing Institute. The state government also collected about $5.1 million from licenses and permits in fiscal 1989.
- ***The federal Marine Fuel Tax*** netted the government $7.2 million in 1989, but that figure includes not only taxes paid by commercial fishing vessels but also marine transportation and recreational vessels. The fishing industry also paid $6.8 million in fiscal 1991 for the observers the federal government requires on vessels in the groundfish fisheries.
- ***Cities received $8.1 million and boroughs $7.6 million*** in shared state fisheries business taxes in fiscal 1989. Shared revenues to cities were up from $4.7 million in fiscal 1987, and to boroughs up from $3.9 million.

Expenditures

- ***The federal government spent $4.2 million*** in managing fisheries in the Alaska region in fiscal 1989.
- ***The Alaska Department of Fish and Game spent about $49.5 million*** managing the commercial fisheries in fiscal 1989. (We reached that estimate by applying the same percentage of commercial management expenses to total ADFG expenses calculated by Kruse [1988] for fiscal 1987.)
- ***Together the federal and state governments spent about $54 million*** managing Alaska's fisheries in fiscal 1989 and collected about $42 million, if we net out revenues that went to salmon aquaculture associations. To give us some perspective on those revenues and expenditures, the total ex-vessel value of the fisheries off Alaska for 1989 was $1.3 billion and the wholesale value of seafood products was $2.7 billion.

Table 5. Fisheries Taxes and Fees, FY85-FY89
(In Thousands of Dollars)

	1985	1986	1987	1988	1989
Marine Fuel Tax	$4,298	$5,290	$5,373	$5,294	$7,208
Licenses and Permits	4,847	5,073	4,939	5,821	5,162
Seafood Marketing Tax	964	1,122	1,460	2,670	3,349
Salmon Enhancement Tax	2,625	4,263	4,444	5,769	9,544
Fisheries Business Tax	18,663	21,105	26,605	22,523	26,690
TOTAL MAJOR SOURCES	**$31,397**	**$36,853**	**$42,821**	**$42,077**	**$51,953**

Notes: Marine fuel tax includes taxes paid by vessels other than commercial fishing vessels, such as marine transportation and sport fishing vessels.

Sources: Original data from Kruse, 1987. Updated using data provided by Bob Elliot, Alaska Department of Revenue, May 1990.

The Seafood Industry in Alaska's Economy

The seafood industry has historically been an important part of Alaska's economy. In several regions of the state it provides most of the private economic base. It generates jobs and income in a number of ways—through fishing itself; through seafood processing; through other sectors that supply goods and services to fishermen and processors; and through fishermen, processors, and others spending their money in the local economy. Adding all those sources of jobs and income together shows the overall economic contributions of the seafood industry.

Table 6 gives us an idea of participation in commercial fishing itself in the 1980s, by showing the number of fishing permits and crew licenses purchased annually. (Bear in mind that a single person may hold several fisheries permits.) The number of permits sold fluctuated around 18,000, and the number of crew licenses sold varied from 24,000 to 35,000. Alaska residents bought most of those permits and licenses, but non-residents bought about 20 percent of permits and 35 percent of crew licenses.The largest numbers of fishermen were in the salmon fisheries and in the Southeast, Southcentral, and Bristol Bay regions.

Fisheries jobs are mainly seasonal, and economists commonly assess the economic effects of fishing jobs by calculating how the large number of seasonal jobs would translate into the equivalent of year-round jobs. The most recent available estimates of average annual employment in fishing were done by McDowell (1989) for 1986, and are shown in Figure 9. McDowell's estimates are generally higher than those from previous studies, in part because they include not only time fishermen actually spent fishing but also time they spent before and after the fishing season in preparation, maintenance, and other work related to fishing. The figure shows there were the equivalent of about 10,600 year-round jobs in fishing in 1986, and that most of them were in the salmon fisheries.

Jobs and wages in seafood processing are also important parts of seafood's overall contribution to Alaska's economy. Table 7 shows how average annual employment and annual wages in processing looked in the 1980s. Average annual employment (excluding the groundfish fisheries) varied from about 5,600 to 8,400, and annual wages from $104 million to $163 million. Data on employment and wages in the rapidly expanding offshore

Table 6. Estimated Harvesting Participation

Permit Holders and Crew Members (Range, 1980-1989)

	Numbers	Percentage Alaska Resident
Permits Purchased	17,340-19,598	78% - 82%
Crew Licenses Purchased	24,228-35,207	63% - 67%
TOTAL	43,826-53,508	69% - 72%

Numbers of Permits and Crew Licenses By Region and By Fishery, 1986

	Salmon	Shellfish	Herring	Halibut	Percentage Participation by Region†
Southeast	6,069	617	651	2,601	22%
Southcentral	4,730	460	1,261	3,366	21
Kodiak	1,564	306	392	3,468	12
Aleutians	1,916	2,411	258	765	12
Bristol Bay	7,193	-	2,200	-	20
Northwest	3,777	-	2,082	-	13
TOTAL PARTICIPATION	**25,249**	**3,794**	**6,844**	**10,200**	
Percentage Participation† by Fishery	55%	8	15	22	

† *Totals and percentage participation apply to total permits and licenses, not numbers of fishermen, since one person may hold multiple permits.*

Sources: Kruse, 1988; Helgath and Rainery, 1987; McDowell, 1989.

groundfish fisheries are limited. Available estimates of processing and harvesting workers combined put total employment in the groundfish fisheries at anywhere from 3,000 to 5,400 in the late 1980s. (McDowell 1989; Coopers and Lybrand 1990; Northern Economics 1990.)

Table 7. Processing Employment and Wages
Range 1980-1988

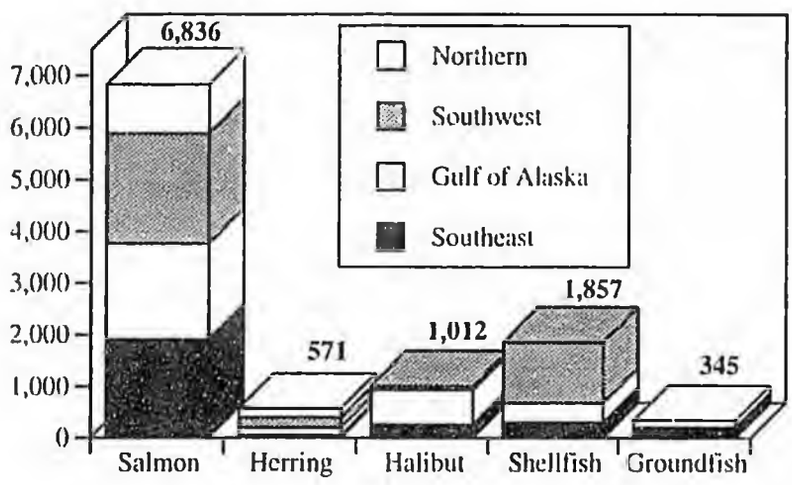
Average Annual Employment	5,650-8,388
Annual Wages	$104 million-$163 million

Source: Alaska Department of Labor

If we add together the jobs and income from fishing itself, from processing, and from all the other activities generated by fishing and processing, we get a total picture of seafood's contribution to the Alaska economy. Two estimates of the seafood industry's economic contributions were done in the 1980s. Berman and Hull (1987) estimated total income generated by the industry in 1984. McDowell (1989) estimated jobs and payroll the industry contributed in 1987. In the 1980s the seafood industry made valuable contributions to Alaska's economy:

- ***Total income attributable to the seafood industry in 1984 was $583 million.*** (Figure 10.) Alaskans earned $431 million, or nearly 75 percent, of that total. The Southwest region accounted for about 42 percent of all seafood income, followed by the Gulf of Alaska region (25 percent), the Southeast (17 percent) and the Anchorage/Matanuska-Susitna region (13 percent). The Northern and Interior regions accounted for the remaining 3 percent.
- ***Roughly 33,000 to 38,000 Alaska jobs were attributable to the seafood industry*** in 1987 (McDowell 1989). Looked at another way, harvesting and processing jobs accounted for roughly 50 to 60 percent of total jobs generated by the seafood industry, while the industry generated the other 40 percent or so of jobs in less direct ways.
- ***About 7 percent of all personal income in Alaska*** in 1984 was contributed by the seafood industry. (Table 1.)
- ***About 27 percent of private basic income*** in Alaska in 1984 was generated by the seafood industry. Basic industries are those that drive the economy by producing goods or services for export. Alaska's private basic industries include the seafood, petroleum, mining, forest products, and tourism industries. The federal government is also considered a basic industry, but it is not a *private* basic industry.
- ***The economies of several regions depend heavily*** on the seafood industry. In 1984 the southwest region's seafood industry generated 47 percent of total personal income and 98 percent of private basic income. The industry provided 19 percent of total income and 44 percent of private basic income in the Gulf of Alaska region, and 10 percent of total and 40 percent of private basic income in the southeast region.

Figure 9. Estimated Annual Average Harvesting Jobs,* By Species Group and Region, 1986

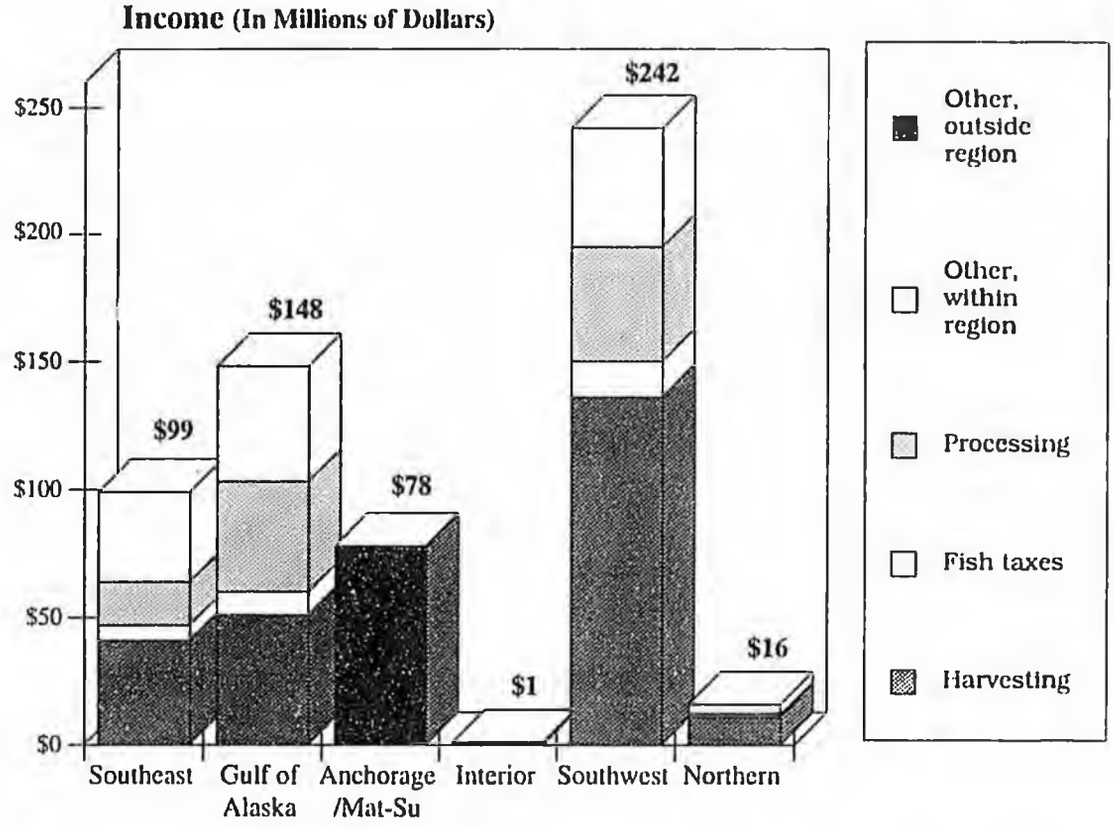


**Based on time spent in fishing-related activities before and after the fishing season as well as actual fishing time.*

Source: McDowell et al., 1989.

- ***The seafood industry had more workers and a bigger payroll*** than any other private basic industry in 1987. Including both the fishing and processing sectors, it accounted for 23 percent of total basic industry employment and 24 percent of basic industry payroll. (Figure 11.) Only the federal government employed more people and had a bigger payroll, and among private basic industries only oil and gas came close to matching seafood's payroll. However, the oil and gas industry didn't employ nearly as many people.
- ***Most private employment in Kodiak, the Aleutians, and Bristol Bay*** in 1987 was in the seafood industry, and that industry was the largest private employer in the southeast and northwest.

Figure 10. Total Income in the Alaska Seafood Industry By Region, 1984



Source: Berman and Hull, 1987.

The Alaska Seafood Industry in the 1990s

Profound and lasting changes in the harvesting, processing, and marketing sectors will likely transform the Alaska seafood industry in the 1990s.

Already at the end of the 1980s growing supplies of farmed salmon and other factors depressed prices for Alaska's wild salmon. Although 1992 prices may rebound slightly (Knapp 1992), long-term prospects are for increased substitution of foreign produced farmed salmon for wild salmon in Alaska's export markets. Fishermen will therefore be squeezed between higher costs and weakening prices.

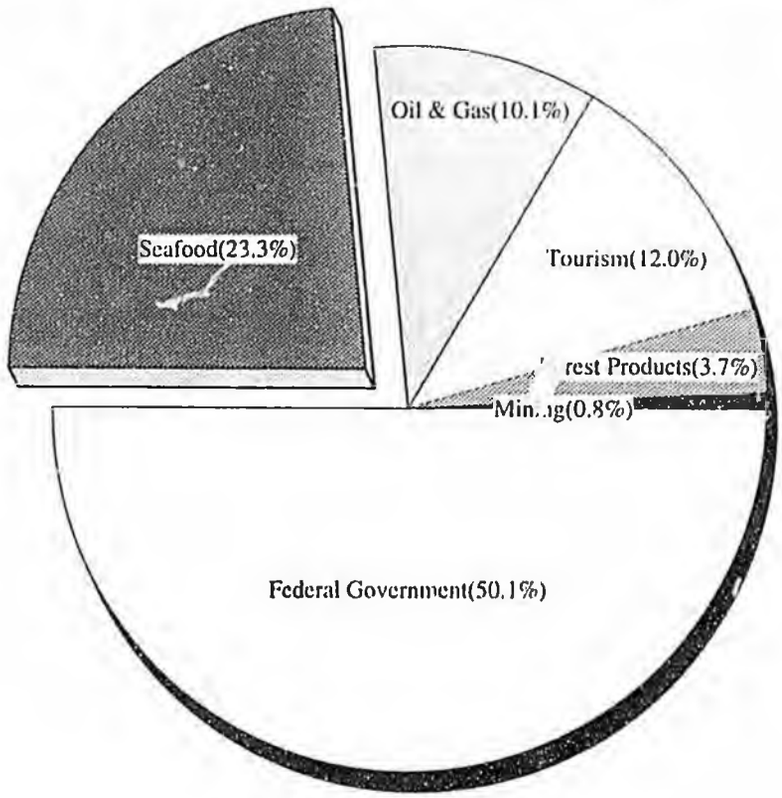
The groundfish fishery is also undergoing significant restructuring. First, the North Pacific Fishery Management Council recently approved, for the first time, a formal allocation of groundfish harvests between inshore and offshore processors. In the short run, this proposed allocation implies displacement of the large offshore fleet and expansion of shoreside processing capacity. In the longer run, overcapitalization of both types of processing and local preemption issues will force further division of the catch quotas by season and area.

Second, the council has approved a share quota limited access system for sablefish and halibut, and is considering a moratorium on further entry into the groundfish and crab fisheries and limited access systems for these fisheries. Privatizing the fisheries will result in a fleet structure considerably different from the current structure, and limited access systems will change the timing and type of production.

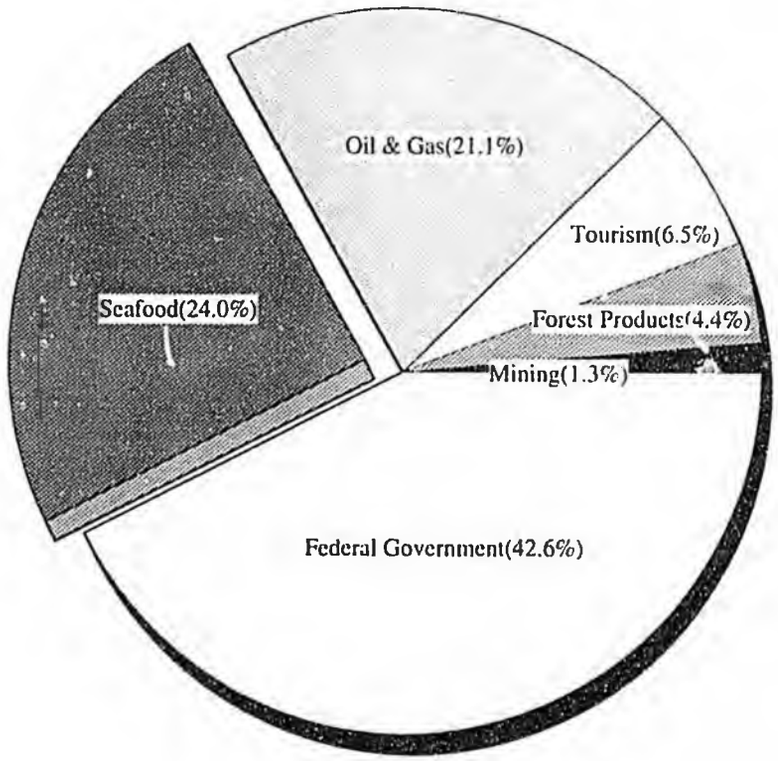
Included under both inshore versus offshore allocation and individual quota systems are programs that will allocate a share of the groundfish resource to Alaska coastal communities. Since these quotas may be fished, leased, or sold, substantial changes in who benefits from groundfish harvesting and processing can be expected.

In sum, Alaska seems likely to retain a prominent role in U.S. and world fisheries, but the complexion of the industry will be very different in the year 2000 from what it is today.

Figure 11. The Role of the Seafood Sector in Alaska's Basic Industries, 1987



Total Employment



Total Payroll

Includes industries that produce goods or services for export. Excludes state and local government, and portions of support, service, and infrastructure industries.

Source: McDowell et al., 1989.

Endnotes

1. Information on direct exports is available from the U.S. Department of Commerce, Bureau of the Census. We estimate indirect exports by assuming that for each species the share of the total Alaska exports (direct and indirect) in Alaska production is the same as the share of total U.S. exports in total U.S. production. We then estimate indirect exports as the difference between total Alaska exports and direct exports. Domestic consumption is estimated as the difference between total Alaska production and estimated total exports.

2. The precise distribution of 1990 exports is uncertain, because the data sources allocate 45 percent of exports to the category of "other fish." If the "other fish" category were more accurately allocated, substantial shares would shift to other specific categories.

3. Liability under the Fisheries Business Tax can be reduced by the Fisheries Business Education Credit which allows a fisheries business to credit up to 50 percent of cash contributions for direct instruction, research, and educational support purposes made to two- or four-year colleges and universities in Alaska. Until the end of 1991 liability could also be reduced through the Fisheries Business Tax Credit which allowed processors a credit of up to 50 percent of their annual Fisheries Business Tax liability for approved capital expenditures that (1) increased product diversity, production efficiency or capacity, or product quality at a shore-based fisheries business facility in Alaska; or (2) contributed to the development of a cooperative seafood industrial park in Alaska.

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From Governor Walter J. Hickel's

WHO OWNS AMERICA?

(Beyond Partisan Politics)

Book 1. How to become an endangered species

p. ix Son of a tenant farmer . . . I've written this book for the young of all ages, the young of thought who refuse to be locked into the past, who do not fear the challenge of change and who anticipate the hope of the future.

We are at a time in our national history when mistrust of the responsiveness of government to the popular will has reached a critical point - a point at which increasing numbers of Americans feel denied and even robbed of the power to influence public policy; a point at which the cry is "return it to us." This mood is not the property of any age or class, and it can be a good and healthy thing if those in government will listen. But if no one will listen, the lack of communication causes frustration and fear. Fear leads to hate, and hate leads to violence.

What Americans want "returned to us" is a sense of care, a sense of ownership. We want renewed assurance that we have some control over our physical assets and our spiritual destiny. We want to know that the important decisions affecting our life styles, and our very existence, will not be made by an anonymous "them" who may have no suitable consideration for our wishes. The public is asking for a larger role in the direction of its fate.

. . . Sometime in the 1960's a political and economic era came to an end in this country. The rough-and-tumble of economic survival and growth failed to provide the satisfaction that was supposed to come with the accumulation of glitter. We discovered that economic prosperity without due consideration for the needs of the mind and spirit left us with a society where the "good life" was measured in tangibles rather than those intangibles, such as friendship and service, that can make life a joy to live.

We need a truly national approach to government, and we must have men in government who will have the courage to accept responsibility for planning and implementing the policies that will lift us as a nation into the next century. This government must be visionary in nature and be prepared to "return to us" both the physical things that only national government can give back - clean rivers and unpolluted air and land - and those human things of hope and heart.

p. 38 . . . I never was much of a joiner, and I am not even sure how I got into the Republican Party. Nor do I really know how I came be a member of President Nixon's Cabinet for twenty-two months. I am a free-thinking and impatient man, and I do not always go by the book.

p. 40 . . . We heated the Grizell house and cooked our meals with wood and coal; for light, we hand two-mantled Coleman lamps, which burned ordinary low-octane white gasoline, plus those old-fashioned kerosene lamps. The house was not wired for electricity until 1938. I do not recall when we first got a telephone, but naturally it was a hand-crank wall instrument on a party line, which was great for those days.

p. 41 . . . It finally dawned on me that we would never own the home we were living in. Somehow it could never be for sale — to us. This was a crushing realization.

p. 42 . . . I was milking cows when I was five years old. I was in the field behind four head of horses and a gang plow when I was eight.

p. 43 . . . The greatest thing I got out of my childhood was not formal schooling but religious training and a sense of confidence in whatever I had to do. Mother used to say, "Walter knows no fear."

p. 45 . . . I remember going down to a little creek to sit on the bank and dream.

p. 45 . . . I loved every bit of the natural state. There were still opossums and badgers to trap, along with a few muskrats. When the dew was on the fields, there was a sort of mist on the ground. Then I would go to plow in the fields, and as I watched the soil turn over it all seemed so great - so human. The gulls would follow me and squawk, and every once in a while their droppings would fall on my head and I would swear at them in a boy's cussword language.

p. 57 . . . I knew that Alaska was going to be "my country" before I stepped off the S.S. YUKON in Seward.

p. 58 . . . For most of the Western world, 1940 was a year of fear and pessimism.

This was not the case in Alaska, which then had a population of 72,000. The only atmosphere I can recall from 1940 was one of optimism. And in my case the feeling was a little more than optimism. It was pure happiness, a feeling that every new day was going to be the greatest day of my life. At no time was there ever a fleeting thought in my mind that I had made the wrong choice in picking a new home.

p. 83 . . . In fact, I had no big business or industrial support at all. I had put together a people's campaign and won the election as a free man.

I had an attitude in mind: the people who would serve in the State government had to be people who wanted to do a job, not merely get a job. Furthermore, whether you were a Native fisherman in a remote bush village or the president of an oil company, my door in Juneau was open. Everyone had an audience, but no one had a claim.

Book 2: <u>Return it to us . . .</u>

p. 115 . . . The American people, so proud of their private ownership, are largely unaware of their public obligation for the care and use of those things they will always own in common - millions of acres of public land, including national parks, wilderness and recreation areas as well as the Continental Shelf, not to mention the water and the air. Think it out clear on down the line: Who owns the Mississippi River, or any of our great rivers? The water runs out of a mountain down to the sea. It belongs to no individual. Each has the right to use it, but it really belongs to the public.

p. 127 . . . I cherish the beauty of my north country, Alaska's "resource of the heart and soul." And I never would have given the Alaska pipeline my support if I were not absolutely certain, on the basis of facts rather than emotion, that it could be designed and constructed without endangering this resource of beauty. Americans realize that we cannot "stop the world and get off." Nor can we simply turn off the ignition of America. To do so would be to plunge our nation into economic, political and industrial darkness. The key is to do the job right.

p. 129 . . . Resources must be developed and used; homes and office buildings must be built. But it is inexcusable to do these things without considering the impact they have on the heart and soul and spirit of the American people. Industry and architects have proved that all these things can be done with proper respect for the environment. The question is: Do we care enough about our land to see that they are done in that way?

p. 136 . . . The sea covers more than 70 percent of our earth, but less than 5 percent of this vast expanse has been charted for man's use, much less properly catalogued to show the wealth of resources. The most important part of this watery kingdom is the Continental Shelf, which comprises about 9 percent of the total area of our seas. This shelf is the relatively shallow submarine plain extending from the coasts of the continents to the steeper slopes plunging off into the deep water of the oceanic abyss. The Continental Shelf is the womb of our ocean resources.

p. 141-2 . . . Is the cry of the whale trying to tell man something? Is the cry of the whale really the cry of life? And if that cry falls on deaf ears, will the cry of our fellow man fall on deaf ears as well?

The person who has no heart for the value of a living creature such as the whale has no heart for his fellow human. He does not hear the depth of the cry of man, pleading for help - whether in Biblical times when it took a Moses to free the people, or in the present with the violence of some and the frustration of others who reject violence. They are crying out. The cry of the smallest child in the ghetto forgotten in the crowd, or the cry of the greatest animal forgotten in the vast open sea - these are both part of the same fabric of life.

p. 146-7 . . . As we begin to understand the fragile web of life, of which we are but a precious part, we become aware that man is the only species that willfully damages that web for reasons of greed, hatred or ignorance. Our scientists have warned us that, unless we stop now, one too many species of wildlife soon may be wiped out; one two many lakes or rivers fouled beyond redemption.

p. 157 . . . But most important, as man evolves to the realization that other creatures and other values may be as important as he is, we suddenly feel the need for our companions on this planet. The inescapable challenge we face at this moment is whether we will hear the cry of the whale and the other animals in time for future generations to be able to enjoy and appreciate all the creatures of our animal world - and whether heeding that cry will teach us to listen also to the cry of man in all corners of the earth.

p. 158 . . .Love of land and nature is more deeply embedded in the heart and soul of the American Indian than in any other people in our country. While some say the Indian has a lot to learn, I think he has much to teach.

p. 159 . . . The word "Native" is used in Alaska to identify any descendant of the first Alaskans, which include not only Indians but also the Eskimos and the Aleuts, a distinct ethnic group descended from the original habitats of the Aleutian Island Chain.

p. 161 . . . One of my first acts was to create the Rural Affairs Commission, an agency designated to deal directly with Native needs. I approached the Alaska Federation of Natives (A.F.N.) and asked its leaders for a list of individuals they felt should be appointed to this commission, which consisted of more than thirty members. In almost every instance we accepted those nominated by the A.F.N.

p. 163 . . . The key to our success was that we did not pay lip service to the theory that the Native peoples can become involved, contribute positive thoughts and resolve their own problems. We accepted the theory as fact and provided the means and encouragement for the Natives to seize opportunities and prove themselves.

p. 170 . . . On July, 1970, President Nixon delivered a message on Indian affairs to Congress.

p. 171 . . . The story of the Indian in America is something more than the record of the white man's frequent aggression, broken agreements, intermittent remorse and prolonged failure. It is a record also of endurance, of survival, adaptation and creativity in the face of overwhelming obstacles. It is a record of enormous contributions to the country - to its art and culture, to its strength and spirit, to its sense of history and its sense of purpose.

p. 172 . . . When I testified before the Senate subcommittee on an Indian Trust Council Authority, I stated that the white man, on issues relating to Indian rights, had indeed spoken "with a forked tongue." The Authority would bring this to an end.

p. 178 . . . In early July 1970 I accepted the invitation of the leaders of the Crow Indian Nation to visit their rugged and beautiful ancestral land near Billings, Montana. Nine months after I had been heralded as Custer reincarnate, the Indian people demonstrated to me their gratitude for the direction we were beginning to take on federal Indian policy.

After welcoming me to the reservation, the Crow leaders took me to a secluded spot isolated from human habitation. Unfolding blankets, we sat together on the ground in reverence and solitude as Crow Indian prayers were recited. They offered the pipe of peace, first to "the One Above, the First Person, and First Maker"; then to "Mother Earth so that our moccasins may follow the trail of beauty forever"; followed by "the East from whence Grandfather Sun brings us daylight; the South, where eternal summer lives; the West where the Sun wraps his scarlet robes around him"; and finally to "the North, where eternal winter lives."

Barney Old Coyote spoke: "This ground is sacred ground. It is here that we return our blessings to nature. We did not attempt to control it. We lived in harmony with our surroundings.
I was adopted into the tribe and given the name of Pipe Carrier.

p. 181 . . . Above all, and I concluded my remarks to the Indians with these words, "Let's provide the vision for our young people, of all races of America, so that they can look forward to the future with eager expectancy and can demonstrate a promise for the rest of the world of how men are meant to live.

p. 183 . . . What we are dealing with in the world, as I see it, is the environment of the mind, tied into the environment of the soul. The problem is not just money. It is not just education; it is not just security; it is not even the problem of a job. It is the combination of these problems that causes a man to become depressed.

p. 183-4 . . . How do we free Americans from their enslavement to road transport? What kind of transport is in the best interests of this country for moving people? The answer lies in high-speed mass rapid transit, elevated and electrified over long and short distances. The technology is there. It has been there for at least 20 years, but it has been almost totally ignored by this country.

p. 185-6 . . . We ought to be merging the various modes of transport - air, necessary short-haul trucking, long-distance elevated rail - in a balanced and coherent system regulated at the federal level. Such mergers should not only be permitted but encouraged.

p. 188 . . . I had in mind the coordination of all overland transport inside "corridors" that could make manageable the delivery of goods and people to their destination. It would also provide a practical system for millions of Americans to see and enjoy the scenic grandeur of this vast area - the finest kind of development and conservation.

p. 188-9 . . . Washington showed its usual lack of interest in Alaska, and oil companies who could have used the railroad to carry their produce in

and out showed no interest at all. Had the railroad been extended, an enormous area of northern Alaska would have been opened up wisely for its highest and best use, and many of the environmental dangers mentioned in the argument about the building of an Alaska pipeline from Prudhoe Bay to Valdez would have been avoided.

p. 191 . . . I put my staff to work developing similar types of conveyances to operate in great parks such as Yellowstone. I visited Yellowstone personally and toured it by horseback. It seemed to me that visitors ought to be able to leave more freely the tiny ribbon of asphalt to which they are now restricted and move out into the wild and wilderness to enjoy the refreshing character of nature in its raw state.
This was unfinished business when President Nixon fired me as Secretary of the Interior. I still believe that public conveyances can be built and operated in parks such as Yellowstone. People who are limited in time could then get in and out of remote areas of beauty in a single day.

p. 193 . . . The urban problem has as its central core the fact that people need to live with reasonable access to their work but still crave the open spaces of country living. The inner-city problem is created when we force a man to come into a metropolitan area for his economic survival - and live there unhappily.

p. 193 . . . The same American technology that made it possible to land men on the moon can make it possible to take other men to and from their work efficiently. The answer to part of our urban crisis lies in a transit system that will move the worker from his home, fifty or even seventy-five miles away, ...

p. 200 . . . To turn your mind off from your heart when you make a decision affecting human lives is to isolate yourself from reality and morality.

p. 200 . . . A strong Cabinet system is essential for American government, because people have more faith in decisions they know have been debated and thoroughly thrashed out at that level.

p. 201 . . . It is not my nature to fit old solutions to new problems, so in the Cabinet I was always looking ahead, not back. I won some of my battles and lost some. As an adversary, I thought of myself as one of the President's truest and most loyal friends. The adversary nearly always is a friend, because within the house he usually has a greater love for the structure than anyone else. He cares enough to communicate, and he wants to preserve the house that others merely want to use as long as it stands.

p. 213-4 . . . We were about to propose an ongoing program that would eliminate the guesswork. When a city - any city - needed a secondary

sewage treatment plant, it would automatically go ahead and design it, knowing full well that when the community went to sell its bonds, the federal government would be responsible for capital repayment. And this repayment, scheduled over a period of twenty years, would be guaranteed right on the face of the bonds. All the local taxpayers had to do was pay interest to the bondholders during the same span of time. For example, a million-dollar city sewage treatment plant would cost the federal government only $50,000 a year for twenty years. I called this the FHA of pollution financing. There was virtually a fifty-fifty proposition - finest kind of "revenue sharing." We could start cleaning up the nation's dirt rivers immediately, avoid escalating construction costs and have the use of the facility while we were paying for it.

p. 222 I was aware of these springtime rumblings in Washington, and I was conscious that some of them concerned the complicated problem of Vietnam. That sorry conflict had lasted a decade. The cost in American lives was approaching that of World War I. This is not the place to go into the rights and wrongs of the Vietnam argument. But there must have been a time when we could have adopted Senator George Aiken's suggestion that we announce we had "won" and then go home. Instead, the war went on, and half a million American combat troops were committed to a conflict that had large elements of a purely civil war. The physical destruction of a small country by the armed might of the world's greatest power became repugnant to more and more Americans. This was particularly true among American youth, as the 1968 Democratic Party convention in Chicago and subsequent events during the presidential campaign should have made clear.
I thought this was as clear to President Nixon as it was to me.

p. 223 . . . I really had no worries about Vietnam on the afternoon of April 30. The Nixon Administration had taken office pledged to wind down the Vietnam war, and I thought the President was doing an excellent job - in an admittedly difficult situation - to fulfill this pledge. I genuinely thought we had turned the corner in Vietnam.

p. 223 . . . Almost everyone can remember precisely where he was, whom he was with, and what he was doing on certain dates.
Such a date, for me, was April 30, 1970.

p. 224 . . . We did not have long to wait. The President walked in. Then he announced the decision to use American troops in South Vietnam to invade Cambodia.

I listened with horror. I had knots inside my stomach. Over and over - but only in my mind - I kept saying: No, Mr. President. No, No, No! I thought we had turned that corner. Don't say it. Please don't say it!

He said it. When I walked out of that room, I was screaming inside.

p. 230 . . . In December 1969 the first Earth Day was being organized for the following April. I called John Whitaker at the White House and suggested that Earth Day be declared a national holiday by the President. John thought it might be a good idea, so I said, "Does it merit writing a letter to the President?" He did not have a comment one way or the other, so on December 16 I wrote:

. . . Dear Mr. President:

To demonstrate your commitment to the fight to preserve and protect our Nation's environment, and to acknowledge youth's role in that fight, I strongly recommend that you declare April 22 - the date of the Environmental Teach-In - a National Holiday. This need not be a Holiday in the sense of releasing employees, closing banks, etc., but rather one that clearly demonstrates your understanding of the problems of the environment and your appreciation for the commitment and concern shown by young people. In addition, an executive order might direct all pertinent government agencies to aid the Teach-In, something most offices are already doing as part of their information function.

This action would be beneficial not only to our fight for environment, but also to our continued efforts to involve people in national concerns.

Respectfully yours,

Walter J. Hickel
Secretary of Interior

p. 233 . . . My interest in direct youth involvement has been a continuing pattern in life both in business and government. I have always believed that if you want to discover the truth you should ask the young or the very old. The very young are completely uninhibited in saying what they think. They are the most punishing of people because they will say it exactly like it is. Old people have nothing to lose. They no longer have to worry about who cares. So the truth of the world comes from the very young; the wisdom of the world comes from the very old.

p. 233 . . . Surrounding yourself with young-thinking people is essential in government if you are to make the right decisions in a world changing at the pace it is today. Your mind has to be open to all alternatives. If you or your staff are locked in to the ways of the past, you are likely to suppress the vitality of the new and the original, which have been the lifeblood of the American experiment. Both in Juneau and Wash-

ington I hired young talent. But I made sure they were competent as well as creative. My theory is always to hire "up" to find those staff members who in their areas are more able than I.

p. 247 . . . Dear Mr. President:

I believe this Administration finds itself, today, embracing a philosophy which appears to lack appropriate concern for the attitude of a great mass of Americans - our young people.

Addressed either politically or philosophically, I believe we are in error if we set out consciously to alienate those who could be our friends.

Today, our young people, or at least a vast segment of them, believe they have no opportunity to communicate with Government, regardless of Administration, other than through violent confrontation. But I am convinced we - and they - have the capacity, if we will but have the willingness, to learn from history.

p. 265 . . . One of my greatest hopes, as a private citizen, as Governor of Alaska and as Secretary of the Interior, has been to alert the United States to the potential of its Arctic areas. The Soviet Union, the Scandinavian countries and the Canadians have far greater knowledge of their Arctic areas than we do. They could teach us much.

p. 287 . . . I believe people are looking for something new in leadership. They are fed up with being represented by those who only play the partisan political game, using their position for personal benefit. Politics as we have known it is becoming more and more out of touch with the people. It is less and less able to respond to the opportunities of the times we live in.

The frustration felt by Americans - whether airline pilots, plumbers or housewives - stems from the fact that they are busy coping with their own problems. They can only hope, as far as government is concerned, that someone will care enough to see that the country is run properly.

Our world changes at the speed of global electronic communication. This demands a new breed of national leader, a "searcher" who ferrets out and explores the new and the never-tried-before. He never puts a ceiling on his expectations, and he refuses to let his thought become inflexible and locked into the past. A searcher is a man who want to improve upon the solutions for problems he finds while searching.

p. 280 . . . My schedule was very busy for Wednesday, November 25, the day before Thanksgiving. I had an early-morning staff meeting lasting until ten o'clock, followed by a long and tough session with Mitch Melich, Bill Pecora and a group of Justice Department lawyers regarding an oil pollution case. At noon I met with Ambassador Glenn Olds, United States Representative to the United Nations Economic and Social Commission. At one o'clock Hilton drove me to the Luxembourg Embassy at Massachusetts Avenue for a reception honoring the Apostolic Delegate, Archbishop Raimondi.

p. 281 . . . Finally I agreed to be at the White House at four o'clock.

p. 281 . . . I walked in. Nixon was there with John Ehrlichman. I shook hands with the President. He sat down. I drew my chair up close to the President's desk.

p. 282 . . . He said he wanted a quiet transition. I did not know what he meant by that; how can you quietly fire a man?

p. 282 . . . I got up to leave. I did not shake hands with the President, but not out of bitterness. I didn't think of it. I felt so clean and totally free.

p. 284 . . . The President terminated me about two hours ago - and there's really nothing I can say to help the situation - and nothing I would say to hurt it. Given the hostility toward me when I first arrived - and some of those incredible decisions I had to make immediately thereafter - and trying to do a job for the President and all Americans and still survive as an individual - I had to do it my way.

p. 288 . . . "There is only one thing we need - people to come to Alaska who care. My definition of a searcher is a man who, no matter what he accomplishes or what he might do, isn't satisfied. He is a combination of the dreamer and the doer, the contented man and the ambitious man, all molded into one."

p. 290-1 . . . It may be time for the people's party to emerge every four years to offer an alternative candidate for President, to break the hammerlock that the leaders of the two major parties now have on presidential candidate selection. It could breathe new life into the entire system. In effect it would be a third party within the two-party system. The Senate and the House would still be organized in the customary manner, but the President would be the nonpartisan representative of all the people. I believe that instead of receiving the hate or opposition of

alternatives, not between compromises. But this kind of compromise can be achieved with justification, only at the last stage of the administrative decision or the legislative process.

p. 297 . . . People respect a noncompromising leader - if he keeps an open mind. The distinction is very fine, but it is a great and important one. At the highest level of government, a President should always remember the difference between stubbornness and strength. The mark of a man who lacks an open mind is the lack of confidence, and a man without confidence does not want criticism. A person who has great confidence, and who is guided by his conscience, finds it invigorating to hear criticism. He is eager to learn from it. Only those who really fear themselves get isolated.

p. 298 . . . The protest that marked the end of the 1960's and the beginning of the 1970's would have occurred with or without the war in Vietnam. The basic protest we have witnessed was not so much against an event as against ar. attitude. It was a protest against the exclusion of the public from decision-making. This was the same reason for our stimulated concern for the environment, or almost any other area of public interest that we might mention. It just happens that the war was the obvious issue.

p. 299 . . . I will always consider government's major job to be the setting and administering of regulations. But this should come only after the public has had a full opportunity to comment. If the public understands that it is locked in, not locked out, then people will have confidence. But if they have not chance to make an input, they will be totally frustrated.

p. 301 . . . If you are going to do a job for America and do it right, do it with a sense of style. Perhaps it sound corny when we are surrounded today by so much "cool" and cynicism, but I believe most Americans not only want good government - they want exciting government.

p. 302 . . . Laughter has its place in government, and we provided our share, sometimes accidentally.

p. 304 . . . The kind of leader who is a searcher does not need to play old-fashioned party politics. The searchers are the young of all ages. They are not afraid of changing attitudes. They want to find solutions for problems regardless of whose idea the solutions might be. They want

the opposition to become just as involved as the Administration itself. They put the burden of proof upon those who want to solve problems for humanity with goals that are attainable. And a leader who really wants to face the challenge of doing what is right will find the majority of Congress with him, regardless of political party, because the momentum of the public will be devastating to those who oppose solutions for the living of life.

Our leaders, both in government and in the private sector, must be willing to say: "We cannot make decisions just for partisan or monetary reasons, or for short-term gain. These decisions must be great beyond our lifetimes and not just for the moment." These men must be bold enough to face the challenge of change.

p. 306 . . . Hope is what people really count on from the time they are small children until they die. The searchers see life as an opportunity to care for people. Their job is people! If you treat humans as humans, instead of as votes, the great heart of America will respond. American will awaken; she will shake off her frustration and fear. And we will demonstrate to the world that it is possible to care for all the needs of all the people.

. . . The searchers will not get lost in a backwater of history by trying to change society without using the tools of government. The system can work. It is a great system, and those elements in it, like bureaucracy, can be made to work for the good of the public if they are directed by men of vision at the top. The searchers - the challengers and dreamers of all ages - openly question the values that have been the guidelines for generations before us. They want to make human values the guiding force in their lives of public service.

p. 309 . . . I want America to be the conscience of the world again. I want Americans to lead the world in showing that the human being is the most important thing in existence, and perhaps we are just the people to do it. We are a Mongrel people.

p. 310 . . . The belief that we have too much government has been accepted without question by what must be a majority of Americans of all political persuasions. I totally disagree. There may be too many people in government, or government may be misdirected, but I will argue until I die that there is not enough government in those areas where life is being choked from living: transportation, the cities and the general environment.

What we must now realize for the first time in America is that it is really a collective world, but one in which we live so privately. Without concern for the other person, for his desires and wants, activities for strictly private gain become destructive not only to others but eventually to oneself. No matter how great, how vast or how simple individual ownership might be, it must be looked upon as a passing thing. What good would it be if one owned it all and left an emptiness in passing? In reality, one has but a lease on ownership during one's lifetime. The success or failure of how something is used depends on how it is left.

p. 314 . . .We cannot turn off the ignition of the world. Our concern is how we can better utilize the energy we have. The whole direction of utilizing energy has to be viewed on a national basis. This means the government is going to have to get involved in how this energy is used for the advancement of 200 million Americans.

p. 315 . . . We must have government that cares for the total, that sees the nation as a whole in order to solve the problems on the broadest level.

p. 316 . . . There are very few purely private decisions anymore. Increasingly every private decision related to our society must also be considered a public decision, which cannot be undertaken without regard for its effect upon others. Continued indifference to the public today can only burden more severely the public of tomorrow.

p. 317 . . . Our nation fosters the concept that all men are created equal and should be so treated by their government. But too often government, on one level or another, has ignored the long-term good of one segment of its people to enhance the political advantage of another, thereby creating inequality of the worst sort.

p. 318 . . . The question is: Can heart power deal with the dirt and grime of pollution, the power and greed of certain vested interests, the lawlessness and crime in our cities? Personally, I believe no force can stand up to that power of the heart in people when it is wedded to tough, practical men of commitment in government.
When people care, there is hope and anticipation. Since the beginning of man, every person who ever lived on earth has lived his whole life "today." He goes through hardships knowing what happened yesterday. But anticipating a better tomorrow is what motivates him to solve the problems of today.

p. 320 . . . We must not cool the spirit, cool the anticipation of hope, cool the desire to care, cool the ambition to make society better. Men must be free, free to work and free to try something new. **Only the small and fearful want a controlled society.** They prostitute patriotism and morality in a futile attempt to keep the lid on what they do not understand - the new, the original, the unique. Change does not frighten a people or a nation that is youthful, growing and learning. Great leadership does not suppress change but welcomes it, guides it and directs it.

p. 321 . . . This awakening brings an awareness that the individual cannot live without his neighbor. Life styles of consumption and extravagance must change, and the individual can no longer remain isolated. His personal decisions affect his neighbor. His neighbor's decisions affect him. Even when the community you live in is absolutely free of air and water pollution, if your neighbor is prejudiced the "atmosphere" in your neighborhood is in a very real sense polluted.

p. 322-3 . . . We confused free enterprise with free society. But free enterprise is only part of the wheel. Enterprise means some kind of business, and that is right and good. But business is not the total man - 75 percent of most people's time is not devoted to earning a living.

Free enterprise left alone without government regulation can destroy itself. It can dominate the rest of the wheel of life. In a completely unregulated competitive system, the most economical approach is to put everyone into slavery, feed them a little less each day, and when they die throw them to one side. Total freedom to exploit can lead to total slavery. This is why the free enterprise system needs tough government guidelines from the top.

p. 323 . . . The day of being able to solve the world's problems in the board rooms of the money establishment is over.

p. 324 . . . Something is very wrong about a free enterprise system in which we bail out a huge corporation with enormous sums of government money, but a poor fisherman often cannot go to the bank and get $500 to repair his boat.

The people who make a practice of belittling the bureaucracy and inefficiency of government, the people who criticize government most, are the same people who always come back to government with their hand out for financial help. Meanwhile they say: "The poor should help themselves, but our companies should be helped by the govern-

ment because it's in the national interest." Bullshit! In the long run the laziness of a million-dollar "bailout" might open up less opportunity then the liveliness of a one-buck loan.

p. 326 . . . The credibility of a nation is at stake when it tries to justify at the same time both war and peace, setting a priority on neither and losing both.

p. 328 . . . The challenge of freedom still ahead of us is to break out into the freedom of the heart, the mind and the soul. This is a great nation. But a great nation, standing still, decays and falls under its own weight. If we pause now to bathe in the glory of our rhetoric, then we are on the road to failure. That need not happen.

. . . With big dreams we can achieve big things and little things, but with little dreams we can only achieve little things.

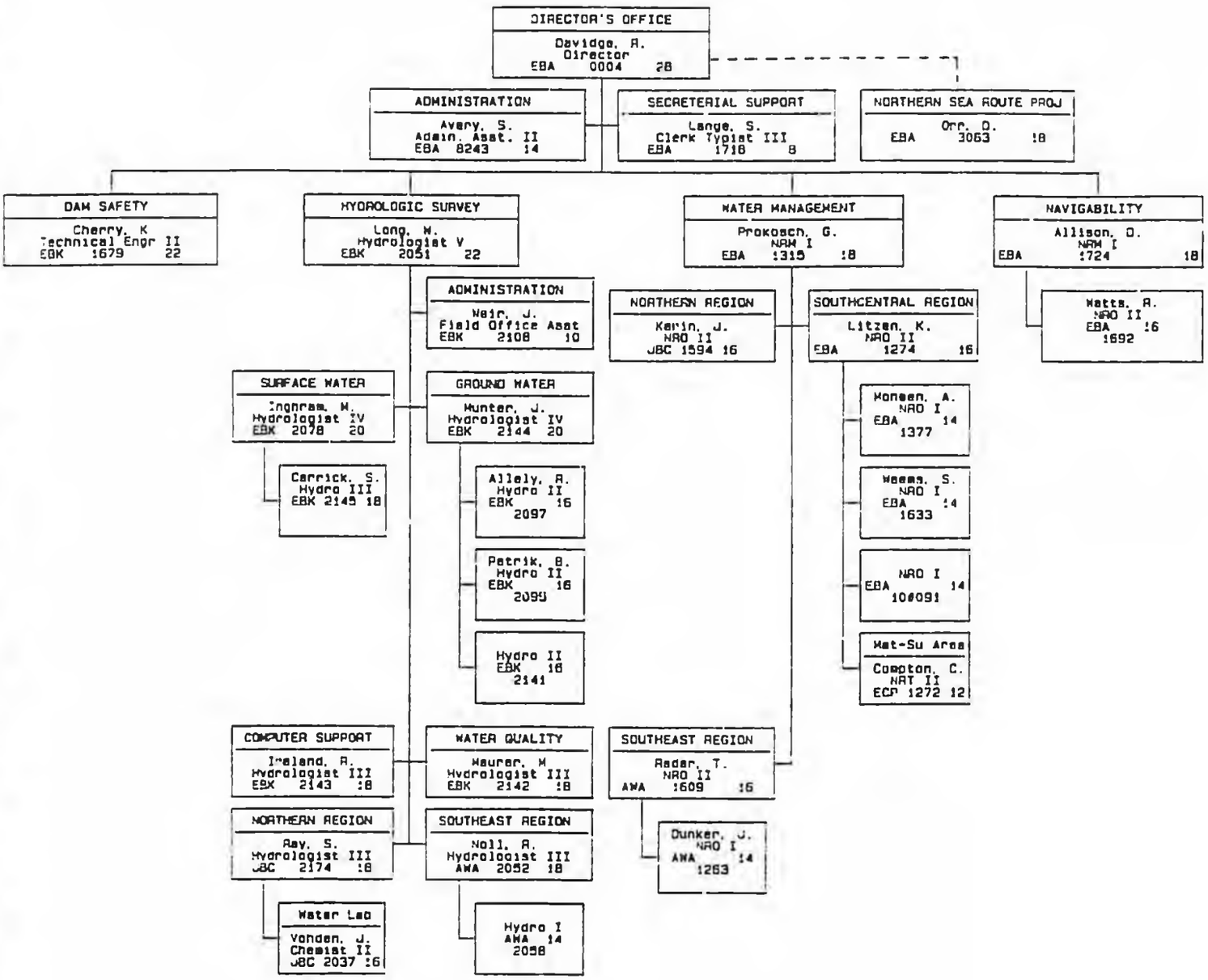
THE DIVISION OF WATER

The Alaska Division of Water manages an estimated 40% of our Nation's free (not frozen) fresh water resources including over 3 million lakes larger than 50 acres and an estimated 11,000 streams. These responsibilities include the State Water Policy and Water Management Strategy; issuing water rights; administering the dam safety program; rendering and reviewing administrative navigability determinations, asserting ownership and management of submerged lands; surveying, collecting and distributing water resource data related to the quantity and quality of surface, ground and coastal waters of Alaska; coordinating water related data collection and management activities with other agencies; providing support to the State Water Board; advocating responsible water development including water exports. The Director of the Division represents the Governor at the Western States Water Council consisting of 17 western states.

In addition to the Office of the Director, the Division of Water is comprised of four sections; The Alaska Hydrologic Survey which includes the State Water Lab, Water Management, Navigability, and Dam Safety and Construction. The Division has offices in Anchorage, Fairbanks, Juneau and Wasilla.

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER



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September 18, 1992

D R A F T

A L A S K A

WATER EXPORTS & SALES

A discussion paper of key issues involved in moving bulk quantities of water from Alaska to the southwestern states and Mexico using marine transport.

Developed by

Ric Davidge

Director of Water
Department of Natural Resources
State of Alaska

November 9, 1992

D R A F T

Under review by a number of experts in specific areas

ALASKA

WATER EXPORTS & SALES

(One Acre Foot = 325,851 gallons or 1,360 short tons)

With legislative approval in 1992, the Division of Water is moving forward, with a sense of urgency, to finalize regulations that facilitate Alaska's first bulk water sale. Although Alaska is already exporting water and ice to American and foreign markets, the notion of bulk water sales by the state is the next logical step in responding to market demand. To assist those with interest in the development of this resource, we provide this general discussion of the key issues affecting Alaska bulk water exports and sales. This is not a feasibility report, however the Division is aware of a number of private and public efforts to study the economic feasibility of these concepts. This report has been successful is assisting interested parties understand the basic concepts, some of the history, and some of the socio-political, economic and environmental issues involved. For specific information, copies of applicable source materials, or contacts with experts relied upon in the development of this paper, you may contact the Director of Water, Department of Natural Resources, State of Alaska (907) 762-2294.

Based on proven marine transport technologies such as large tankers and evolving technologies such as coated nylon fabric bags, discussed in this paper, the Division of Water believes the bulk transport of water from Alaska to markets in the southwestern states and northern Mexico to be economically viable. The development of this resource will not only generate significant new annual revenue to the state treasury it will stimulate new economic activity creating new jobs in southeastern Alaska. With the use of bag technology for storage and/or transport, many small communities can directly participate in this industry creating new revenue sources with little or no capital risk.

The storage, transport technologies and other concepts discussed in this paper could also be applied to address some of Alaska's rural drinking water problems.

If you desire more information on this new and exciting resource development opportunity please contact John Dunker or Rick Noll at the Division of Water in Juneau at 465-3400 or Ric Davidge, the Director of Water, in Anchorage, at 762-2294.

DEMAND/MARKET

Based on our continuing research the most attractive water export markets are southern California, southern Nevada, and the northern regions of Mexico including Baja California. These areas are most vulnerable to drought (now in its 6th year) and rapidly growing population pressures.

Highest probability for delivery points are California coastal communities not directly connected to a subsidized surface water delivery system (California Water Project) plus northern Mexico including Baja California. The Division of Water continues to research and maintain communication with all apparent markets.

Manufacturing interests in this market area that are very dependent on large quantities of high quality water are:

- Breweries - The Anheuser Busch Plant in the San Fernando Valley is the largest single commercial water user in the Metropolitan Water District of Southern California.
- Computer manufacturing
- All water-based products such as beverages

"Made in Alaska", "Clear Glacier Water", "Alaska Ice Water", and the image or mystique of Alaska are very attractive marketing tools.

Inland States and Water Transfers

Many land-locked western states, particularly Nevada, are interested in augmenting their existing water supplies. Discussions with officials of the Colorado River Commission, and others involved in such sources as the Colorado, Columbia and Sacramento Rivers, have developed interest in water imports through exchanges or "wheeling" agreements as a possible solution. This would work in the following way: If Nevada interests wished to purchase new water they could contract for a volume of water from Alaska. The actual delivery, which Nevada interests would arrange, would be to a coastal community in California, allowing that community to "transfer" its downstream appropriation from the Colorado River to southern Nevada in exchange for the imported Alaskan water. Nevada users pay the cost of the import, receive more water from an existing source, and the California community would receive the benefit of fresh Alaska water. These types of water transfers or "wheeling" agreements are very common in the western United States.

These concepts have opened an entire new area in the market. In discussions at the Western States Water Council (17 western states), a number of states have expressed an interest in exploring this concept as they prepare their Drought Contingency Plans required under new federal law.

Foreign Interest

Although the Division of Water has been contacted by groups from South Korea and Norway, other than in northern Mexico the interest has been limited to bottled water. Japan was purchasing water from WETCO (an Anchorage based company) for use in manufacturing perfume, but this would not qualify as a bulk sale for the purposes of this discussion.

The South Korean interest is focused on value-added bottled wate water for beverages. This recent interest is a result of a decision in January 92 by South Korea to lift restrictions on water imports.

Bottled Water

Alaska has several bottled water and beverage industries with plants located in Anchorage and Juneau. WETCO bottles water under the name Beluga Water with a large share of the shelf space in Anchorage retail outlets. WETCO products are also delivered to other areas of the state. Alaska's Best Water of Anchorage supplies drinking water to many office buildings in Anchorage in five-gallon bottles. Alaska Pure Water Products and Alaska Pure Mountain Spring Water of Juneau, also supply drinking water in various size bottles to local markets with limited exports.

The Municipality of Anchorage has a limited contract to supply water to Alaska Glacier from the Eklutna Water Project, that is truck tankered on barges to Washington state for bottling in a test market. This is a back-haul using milk tank trucks from the Seattle area. If this market proves out, the owners will consider opening a bottling company near the Eklutna Water Treatment Plant.

Alaska Aquaculture, Inc. (Burnett Inlet Hatchery), in southeast Alaska, has a permit to export one million gallons of water a week from the Burnett River system to RainMaker, a firm in California. A small tanker will be used for transport, and they anticipate 52 shipments a year for a total export of 52 million gallons or 159.6 acre feet. The hatchery will charge as much as 1 cent a gallon at the point of transfer. This income will pay off the debt (state loan) on the hatchery.

A group of businesses involved in the tourism market in SE Alaska have advanced the concept of bottling local water as a souvenir. This may prove to be a successful enterprise focused initially at a very limited market, however, with development and experienced marketing this approach may open new markets outside of Alaska.

Test-markets by private companies using Alaska bottled water have been very successful. The cost of shelf space and an economically viable delivery system are the greatest challenges to developing markets outside of Alaska. These are the same challenges faced by most in the bottled water industry.

Glacier Ice

The harvesting and export of glacier ice continues to increase. Currently there are 26 permitted harvesters and a number of pending applications. The market demand for glacier ice continues to be predominately Japan and Hawaii. We have seen a recent increase in the level of interest in glacier ice exporting and in use for domestic tourism markets. The last reported wholesale price for "clean" glacier ice is $500 per ton.

SUPPLY/SOURCES

Two dozen high quality developable sources of water in southeast Alaska that are potentially viable for export development have been identified. General criteria developed in selecting these sources include water quality, large drainage areas, adequate precipitation, storage volume, VLCC class tanker access, and existing delivery systems. Consistent with new state law, the Division of Water plans to select some of these sources and file applications for water appropriations to the state for the purpose of sale and export. Approval of these applications will require a reservation of water for fish habitat as required under statute. The drainages of these sources receive from 150 to 400+ inches of precipitation a year. Although monthly/seasonal fluctuations in discharge are of management concern, during those periods of low flow (winter) export demand is also low. The level of precipitation of these sources is very significant and to many in our market area unbelievable. It does make water from this area a vast and renewable resource. As some in southeastern Alaska say, "It's like living under water without really being there."

Six sources are already developed with hydroelectric facilities, a couple have old pipelines, or in-use delivery systems at tidewater. These existing developments greatly reduce initial capital risk, minimizing further environmental impacts, and decreasing delivery delays associated with undeveloped sites.

The water quality of many sources is expected to be very high. Many were surveyed for fish hatchery development due to very low levels of organic and mineral constituents making the water attractive for high-tech manufacturing and beverages.

Desalination (desal)

Most analysts agree that the most direct competition for water imports to this market is desalination. Meetings with government officials in Mexico revealed they had received seven desal proposals and only one import proposal (Sun Belt Water, Inc.). One of the difficulties with desal is the representation of delivery price versus real cost. As discussed below under Price, the only real example we have is the new $30 million desal plant in Santa Barbara, that after three months was shut down due to rain. This plant is the only one of its size operating in the United States and many experts claim it is underpriced to encourage further desal development in the market. The contract price for desal water from the Ionics plant in Santa Barbara plant is $1965 per acre foot with annual delivery of only 3200 acre feet to Santa Barbara and a total capacity of 7500 acre feet a year. One VLCC class tanker can deliver 8,000 acre feet a year at 225 acre feet per trip with 35 trips.

One other interesting fact: With the Santa Barbara plant now on long-term standby, under the contract with Ionics, the city must continue to pay $1231 per acre foot against 3200 acre feet a year with **no water being produced**.

In addition to the technological and cost limitations of desal, four specific variables favor water imports. First, all existing technologies for desal are greatly dependent on low energy cost. Desal consumes energy to a point that many argue against it due to environmental costs. Consumption of energy also creates fuel storage and delivery and air quality concerns. A delivery price for desal water based on low energy cost is misleading. After the capital plant is developed, a buyer is vulnerable to raising energy costs and constrained by energy inefficient technology. With any significant increase in the cost of energy or associated environmental regulations, the price of desal water will escalate directly. The use of VLCC tankers to transport water from Alaska to southern California use less than half of the energy desal does with little or no impact on local air quality. Ocean going tugs, pulling bags would use less than a third of the energy of desal.

Second, the processes used to desalinate water generate a couple of waste streams. In addition to the concentrated brine, depending on the technology used, one must dispose of large volumes of arsenic and other chemicals. No one anticipates the cost of waste stream management to go down, and most expect it to increase. Recent studies on the ecological impacts of large-scale concentrated brine discharges offshore have raised serious questions about impacts on aquatic life. The Santa Barbara plant was permitted under a declared water emergency, allowing it to come on-line without the normal stipulations and permitting review requirements. It is, therefore, difficult to make an informed analysis of the environmental questions and permitting costs that will surround other desal proposals.

COMPETITORS

Other Sources

More than three years ago those interested in importing water by marine transport to southern California looked first at sources in northern California, Oregon, Washington, British Columbia, and Panama before coming to Alaska.

Legal limitations, political concerns, and environmental permitting problems, as well as some technical engineering difficulties attended to some sources in northern California, Oregon, and Washington, quickly convinced private industry to look further north. Although about a dozen contracts were negotiated with sources in British Columbia, a sudden change in attitude with a subsequent change in political leadership in the B.C. government imposed a moratorium on all bulk water transfers. This moratorium was to be for one year, however, it has been extended for a total of three years. This action and the economic uncertainty it established caused a number of ventures to lose significant investment, time, and delivery contracts - and for many the courage to proceed with the concept. Recent discussions with some of the parties impacted by the B.C. moratorium report litigation and investigations underway or being developed further raising question with the certainty and stability of this competing source even if the moratorium is eventually lifted.

The next source investigated was Panama. Even an Alaskan firm explored the notion of exporting water from Panama to southern California and northern Mexico. Difficulties included greater distance, running against coastal currents and prevailing winds while under load, and political uncertainty. One by one the firms left Panama although Sun Belt Water, Inc. reports they still retain contracts for a number of Panamanian sources.

Although Alaska was often discussed, its vast water resource export potential was not actively explored until 1990. Other than the additional cost in transport time, the concern that Alaska would not politically be open to such a venture changed with the election of Walter Hickel as Governor. Efforts by members of the City Council of Los Angeles to import water from Alaska by pipeline encouraged industry to explore the notion. Sun Belt Water, Inc., which was involved for over three years in efforts in British Columbia and Panama, commissioned a private study of sources in southeast Alaska and entered into direct contact with the new Division of Water within days of its creation by the Governor. These discussions resulted in two applications for water from two sources in Southeast for a total of 350,000 AFY using marine transport technologies.

Third, how much salt do you want in your water? A single stage reverse osmosis seawater desal plant does not remove all salt from the water. Desal is allowed up to 800 PPM total dissolved solids (TDS) in its delivered water. This standard has more to do with taste than health concerns. Informed sources claim that over 90% of the TDS from desal is salt. What are the long-term human health concerns of this large unnatural consumption of salt? We have not been able, at this point, to satisfactorily resolve this question. There are reports of medical problems in the middle east where desal has operated for long periods of time, but we have yet to receive independent confirmation of those reports. However, in discussions of the choices between desal and fresh Alaska water, the question is often asked, "Do you know of any health professionals that recommend putting more salt in your water?" Most health experts recommend serious reduction of salt intake.

Four, is the demand for very expensive coastal property. Small to intermediate sized desal plants for sea water use high value coastal zone land, which in general, is already over-utilized. Few sites are available for such applications that would not be competing with existing users. Siting of large scale facilities may be less controversial when associated with electrical power generation plants. Nevertheless, marine transportation, by contrast, can be implemented in a way that will have little onshore land use and cost impact.

FEASIBILITY

Delivery Systems

Tankers/Bags

The most promising, immediately available, water transfer technology is the use of single-hull VLCC (Very Large Crude Carrier) or ULCC (Ultra Large Crude Carrier) class tankers with near shore temporary storage. With the change in petroleum tanker regulations requiring double hulls following the Exxon Valdez spill, dozens of single-hull tankers are on the wholesale market at prices from $6 - $10 million for used tankers to $80 - $85 million for new, never used single-hull tankers.

The VLCC class tanker is most attractive because its size allows it to access many sources in southeast Alaska and provides sufficient volume to make it economical. A VLCC class tanker has the capability of carrying 225 acre feet per trip, with a turn around time of 10-11 days depending on source and delivery point. This class of tanker has two large pumps that allow it to be filled within 20 hours, considered the maximum load time. These tankers currently have significant tonnage that can be eliminated as the extra equipment is for the transfer and control of hydrocarbons and associated emergencies and not necessary for hauling fresh water. The day-cost of a new VLCC, fitted for water transfer, is about $30,000 per day. This includes an

assumption of 20 year debt service and capitalization, crew cost of about $5,000 per day and fuel cost of about $5,000 per day.

One concern with tankers is ballast water discharge in Alaska, especially if the ballast is collected in polluted coastal waters off California. Ballast tanks are not the same tanks used for cargo transport. Tanker engineers advise that almost all ballast is discharged prior to docking and, if there is a "contamination" issue, standard operating procedure is to exchange ballast in the open ocean after leaving the harbor. Regardless, any discharge is subject to appropriate federal and/or state permitting.

Bags/Tugs

Bag technology was originally developed by Dunlap Rubber in Great Britain, for the oil transport industry in the '60s to allow the capture of oil spills from tankers. The technology, at this point in development, was not acceptable due to cost, material used and technological limitations. Research and development continued and adaptation for water transfers was explored by UNITOR, in Norway; Avon Rubber, United Kingdom; Yokahoma Rubber, Japan, and Medusa Corporation, Inc., in Alberta, Canada. Extensive tank testing of a patented design has been conducted by Medusa Corp. at the University of British Columbia, Vancouver (tow testing for drag and stability) and at The National Research Council in Ottawa, which has the largest wave basin in Canada to study wave interactions. Simply stated, the bag is streamlined, relatively shallow with large flat areas on the top and bottom. It is constructed of a commercially available industrial coated (both sides) nylon fabric with reinforced stress diffusing straps. The bags have an expected life of 10 years when used for storage and 7 to 8 years when towed.

The bags can be used for offshore storage or transport. The offshore storage application (at pick-up or point of delivery) is now available. A 225 acre foot bag (sufficient to fill a VLCC tanker) would be 500 feet in diameter and 50 feet deep in a lozenge shape. For storage purposes bags can be constructed in sizes up to one million tons (812.3 acre feet) according to James Cran, President of Medusa Corporation in Canada. Extensive testing has provided solutions for tug operator concerns with "fish-tailing". Solutions include speed reduction, rudders, and other design modifications.

The use of a tug and bag configuration for storage and transport greatly reduces the day-cost of transporting water. Transport time is lengthened to about 14 days when traveling south under load with return (north) in 4 to 5 days depending on distance and weather. This means that one bag/tug configuration could make 20 trips a year at a cost of about $75,000 per trip. Assuming a sale price of $800 per acre foot, using a 225 acre foot bag the profit would be in excess of $100,000 per trip.

For ocean going tugs at 5-6,000 horsepower, the day cost is estimated to be about $5,000 with a 225 acre foot bag. These vessels are generally 180 feet with a crew of 6. In the event larger bags are used, tugs with 10-15,000 horsepower capabilities, 250-300 feet and larger crews are necessary. However, even the most expensive configuration using tugs and bags can provide water at very competitive prices with significant profit margins. The use of bags is far less environmentally intrusive due to the limited upland impacts required than the use of VLCC class tankers with traditional onshore pipelines and pumping stations.

Other than the interest of southwestern states for the transport of fresh water, there is also interest in using bags for transporting treated sewage for deep ocean disposal. This is now being explored by some communities in southern California. Other applications are under negotiation in the middle east hauling water from Turkey to Israel according to the Wall Street Journal.

The application of bag technology for offshore storage offers Alaska a number of very attractive solutions to storage, flow rate and transfer problems, and environmental concerns. One challenge in using tankers is the need for sufficient on-site storage that allows the tanker to fill/load within 20 hours. This requires a flow rate (approximately 150 cfs) that exceeds the natural year-round flow of many accessible sources. With the use of storage bags, 225 acre feet can be accumulated over a few days using natural flow rates and a collection point, at discharge, that should not require onshore pumping, pipelines, or large service camps, thus significantly reducing permitting complexity, environmental impact, and cost. Design parameters are dependent on scale and location. For example, if VLCC class tankers are used for transferring water from Alaska to the market, the size of the bag would need to be a little greater than 225 acre feet. Depending on the area used for storage and tidal fluctuations, the bag can have the shape of a flat hot dog, or a hockey puck.

Bags float just below the surface, allowing them to absorb wave and wind action. They can be filled by a low technology collection mechanism and tankers can load using their own pumps and existing single mooring applications.

The application of this technology makes it attractive to small communities and villages with existing tidewater delivery systems that have a surplus of potable water. With little or no investment risk and few permitting concerns a community could either acquire a storage bag and contract with a transport firm for a scheduled stop once 225 acre feet are available, enter into a joint venture with a purchaser of water whereby the purchaser provides the bag, or enter into a cooperative venture with the state and a private venture. There are a number of variable approaches to small community participation in the development of this resource.

The use of bag technology for offshore storage greatly reduces cost and risk, environmental concerns including ballast, tidal and upland impacts, permitting costs and delays, and opens new opportunities to small communities in southeast Alaska to participate in a new revenue source. The application of bag technology for storage and transport may also serve as a solution to rural Alaska domestic drinking water needs as well as emergency needs in the event of a natural disaster.

Price

The price of water in the market area is highly variable due to location, quantity, quality, government subsidies, source, precipitation, time of delivery, and type of water. It is recognized that there are areas in the southwest where Alaska water imports may not be competitive, however even in some of these locations a mixing of Alaska water with local supplies ensures a greater confidence of supply in times of drought.

Since 1989 the price of water in many countries, for example Australia, Italy and Britain, has increased substantially faster than each country's rate of inflation. This is a function of governments reducing subsidies as they face revenue difficulties. In many cases this phased reduction of subsidization has resulted in prices raising as much as 20% in a year. As the southwestern states and northern Mexico look at the real cost of water, passing it on to customers, the competitive edge of Alaska water imports to this region is sharpened.

The target price for delivered water to this market must be <u>less</u> than the current price of desalination (about $2,000 per acre foot) if we are to compete with desal. To compete with other new sources of water we need to deliver water for less than $1500 per acre foot. Alaska, in cooperation with transport industries, can provide higher quality water with greater delivery volume and little or <u>no capital risk</u> to the customer, with <u>significant flexibility</u> in volume and delivery points and schedules.

The contract price for desalinated water (desal) from the newest plant in the market area (Santa Barbara) is $1965 per acre foot for delivered water and $1312 per acre foot when on short-term stand-by, and $1231 per acre foot on long-term stand-by against a 3200 acre foot total delivery contract (with no water being produced). The capital cost of the plant was about $30 million and the plant has shut down after operating for less than 3 months due to an oversupply of natural water (rain) in the area. With real-time depreciation, start-up, and all other costs included, some report that the actual cost of delivered desal from this plant for the first three months was in excess of $5000 per acre foot. This has not been independently confirmed. Other cost factors that impact desal such as energy dependence, waste stream management and land use are addressed in the section on competition in this paper.

Formal proposals to Santa Barbara by such firms as Sun Belt Water, Inc. offered delivered water at under $2000 per acre foot for ten years. Proposals to northern Mexico, now under development, are attempting to deliver water for less than $2000 per acre foot using a ULCC class tanker under a 20 year contract.

The application of bag technology, depending on the scale of bags used for towing and pickup or delivery locations, may bring delivery cost down to $800 per acre foot.

Existing prices for water in the southwestern states are difficult to compare due to significant, long-standing subsidies by the Federal government (Bureau of Reclamation and the Army Corps of Engineers) and state governments. Capitalization, amortization, and depreciation of extensive and expensive surface delivery and storage systems are rarely totally passed on to the consumer in the delivered price of water making it difficult to establish a market based value.

Other than desal, known prices/costs for water in the market area are:

Average cost of delivered water to coastal communities tied into the State Water Project is about $500 per acre foot. It is not clear if this cost includes the value of all subsidies (capital and operating).

Average cost of reclaimed water (treated sewage) with delivery is $700 to $1,400 per acre foot. As a source of drinking water, California has not had good success, however, there is a willingness to use reclaimed water for agricultural use. This will require significant capital investment as most reclaimed water is in coastal communities and most agriculture is inland.

The California Water Bank purchased water from agricultural water right holders for $125 per acre foot in 1991 and $75 per acre foot in 1992, and in most cases reallocated that water to urban users connected to existing delivery systems.

A new water pipeline for Santa Barbara connecting it to the state water system delivering 70,000 AFY, is reported (by Ionics) to cost $5400 per acre foot, however the State claims the cost to be closer to $1200 per acre foot.

The Marginal Cost of Water

By blending high cost Alaska water with existing sources in the market area the economic impact on end users is significantly reduced. For example, if Alaska water is delivered at $2000 per acre foot and mixed with a source in the market area at a cost of $100 per acre foot the end "marginal" cost is $1100 per acre foot. When you consider the absolute and unimpeachable reliability of water from Alaska you can argue that this cost is the price of "insurance".

Costs/Economics

When the notion of using existing tanker technology to transport water from Alaska to southern California and northern Mexico was first proposed to the Division of Water, we were skeptical of its economic feasibility. A commodities economist familiar with Alaska and shipping costs was brought in to review the numbers. His conclusion was that the concept is not only economically feasible but should be very attractive to investors based on profit margin. Application of bag technology for storage and especially for transport bring the economics of this application in competition with reclaimed water as well as desal and even some conventional land-based delivery systems. The application of bag technology not only makes Alaska water more competitive it raises potential profit margins with far less environmental impact than traditional tanker technologies.

The important cost variables considered in marine transport systems are:

Length of contract (depreciation, amortization)
Volume of water (annual)
Distance of delivery
Capital cost (purchase of tankers or tugs/bags)
Onshore facilities at source and delivery point
Permitting and compliance at source and delivery point
Operation day-cost of transfer technology (tankers or tugs/bags)
Quality of water

Of these variables one of the most significant is the length of contract. Capital amortization and depreciation of initial capital investment over a ten-year contract versus a twenty-year or longer contract is a significant factor in cost per acre foot. Operation and maintenance is generally static depending on the use of tankers or bags/tugs. The quality of the water is a variable depending on its end use/market. If it is of very high quality with few organics and few minerals, it is very attractive to manufacturing uses such as computers and bottled products.

LIMITATIONS

The Jones Act

Delivery of water from Alaska, other that from the Yukon River, to California is subject to the Jones Act. This federal Act requires that cargo transported from one American port to another must use vessels constructed in the United States and operated by American crews increasing the cost of capital investment and labor. The use of dozens of existing single-hull tankers built by other nations allows a far less risky capital investment. Some of those investigating large water transfers from one

American port to another advocate a specific exemption in the Jones Act for the transport of fresh water. With the use of towable bags, it is our understanding that only the tugs are affected by the Jones Act. Water deliveries from Alaska to Mexico do not fall under the Jones Act.

Public Perception

"Water from Alaska?" "You got to be kidding!" "Get real!" The general public, both in Alaska and in the southwestern states, thinks of the viability of water imports from Alaska as an *exotic* notion. Limited public appearances by the Director of Water in southwestern communities while attending Western State's Water Council meetings, before the Association of California Water Agencies (ACWA), and the Metropolitan Water District of Southern California have had some impact on this disbelief, but this effort is greatly limited by the budget of the Division. We have found that, once the technologies and economics are explained and technical questions addressed directly and understandably, the audience is receptive to the notion of water imports by tanker or bag and willing to investigate this concept further.

The Political Water Infrastructure of Southern California

For decades the politics of water in southern California have dominated state and local power struggles. Massive bureaucracies and political systems have developed to support various distribution schemes. Despite all the environmental and technological problems of desal and with major communities spending millions researching the use of desal - getting these groups to open their minds to consider an external solution is difficult. When you also understand that desal cannot produce the volume or quality of water that marine transport can with little or no municipal capital exposure or long-term debt, and far less environmental damage, it is even more frustrating. Thousands of engineers are now employed by governments at all levels to "design" solutions; but they are all looking inward when, at least a part of the solution, may be outside of their experience or perspective.

The Price of Water and Conservation

One of the issues raised in discussions of the transport of water from Alaska to southern California and Mexico, is water conservation and the question of local responsibility. Some would argue that it is philosophically wrong to encourage greater growth in the southwest by providing new water. That the availability of water is a "natural" limitation on population and economic growth in the area and to import water into this region delays local public policy decisions that should have been addressed years ago. When these questions are considered only in the context of southern California, which is often the case, this is a fair point. However, when considered in a broader context the reality of shortages of water, food, shelter, and space are evident in many corners of the world. Is it humane to simply tell starving

people in regions of Africa, for example, that it is more responsible to not send them food or means of creating food because their environment can not support them? Is it humane to tell developing nations and struggling communities that they can not reach for economic independence because "we" believe their dreams should be limited by "their" local environments?

For centuries humankind has moved commodities found in large natural supply in one region to areas of the world with high demand and short supply. This is true for energy, food, construction materials, ice, and water. History has found that people will live where they want to live based on many factors including economic vitality and employment opportunities, weather, and life style and will adjust their expectations based on these same considerations. The projections of population increases in the southwest are built on the trends of significant immigration from outside of the United States. Persons immigrating to southwestern states find economic opportunity and life styles offered there are far more attractive than those they left. This perception may not be shared by some in the middle or upper economic classes, but they are real and vary attractive to families climbing out of poverty or socio-political oppression.

The economics of water are greatly effected by price. Some reports claim that Los Angeles County reduced its water consumption by 25% as a result of drought ordinances alone. According to the Metropolitan Water District of Southern California this increased the cost per acre foot further encouraging conservation. Studies on price and consumption clearly establish a relationship between greater conservation as a result of higher price. The study conducted by the Bay Area Economic Forum (October 1991) Using Water Better: A Market-Based Approach to California's Water Crisis is one of the most far thinking studies done of the relationship of price to consumption and is critical of continued government subsidies for infrastructure as well as operation and maintenance that do not encourage conservation.

Due to the cost of transportation, Alaska water is generally more expensive than southwestern supplies. But local supplies are simply not sufficient to meet demand, even if every effort by state and local governments is successful. According to the Secretary of Natural Resources of the State of California, if every water option is successful - and it rains, southern California alone is facing a 4 - 6 million acre foot a year water deficit. They still need **new** water. In considering the development of new water we must look at all economic and environmental costs to make informed, rational and sustainable public policy decisions. In our opinion, based on significant research, importing Alaska water to the southwestern states is economically and environmentally more attractive than many of the other alternatives especially desalination.

Alaska believes it is very appropriate to offer this vast resource to the world. Alaska is blessed with natural resources at a scale unknown in many regions of the planet. As a sister state and a member of nation states, Alaska believes it responsible to offer our excess water to people in need. Alaska is also in need of new revenue sources as it faces a serious decline in oil and gas production. The sale and export of water from Alaska is a sound economic and environmental decision endorsed by the State Legislature and the Governor.

Technology/Scale

Only so many vessels can move so much water from feasible sources through transport routes annually. We believe a target of 2 million acre feet a year may be realistic given these limitations. Bag technology may allow this target to be increased depending on the scale of bags used, however, that is only speculation. The driving cost limitation is capital risk, amortization and the day-cost of transport - with the operation of tankers using bags for offshore storage or a bag/tug storage and transport system. Eventually serious discussion of other transport mechanisms such as a pipeline will take place. It just depends on how thirsty people and their economies get and how much they are willing to pay for water. With the market or population base in the southern California area - for the price of a soft drink a day per person, a water pipeline could be built.

STRATEGY

With the signature of the first contract and delivery of the first shipment transferring water from Alaska to southern California or northern Mexico, the world will change. Those who have objectively examined marine transport (tanker or bag) as a mechanism to bring new water to this market agree that once it is real, once a contract is signed and delivery begins, it will become a dominant force in the market.

The Division of Water understands that the export of water from Alaska by itself will not solve the major water deficit problems of southern California, the southwestern states or northern Mexico. Alaska water can be a part of a broader array of solutions to these problems. Price and security of source are, and will continue to be, the cornerstones of buyer and seller decisions.

Our focus right now is Baja California. (Rosa Rito Beach, Tijuana and Ensenada) They have an immediate need that can be satisfied within months with a single tanker. Once this relationship is established additional tankers or bags can be added to meet demand. Discharges in Baja are not subject to the Jones Act limitations, allowing lower capital and operating cost. The Baja government has stated that they will build whatever is necessary for delivery systems on their shores, on their own peso, thus reducing risk to investors and quickening the pace. Delivery to Baja also

means that we do not have the political or permitting problems faced in southern California.

We have raised important questions in the minds of Baja officials on the long-term economic and environmental viability of the desal proposals they have received. Continuing discussions indicate that the Baja government is willing to work with Sun Belt Water, Inc. and find a contract approach beneficial to both and to Alaska.

Another approach is a direct contract between Alaska and the buyer of the water, other than through a transport company. The buyer, the Baja government, then arranges its own transport. Discussions on this approach have usually been short once the customer realizes the value of what private companies such as Sun Belt Water, Inc. and its subsidiary Sun Belt Marine, Ltd. have already contributed in knowledge and investment. The Division of Water is willing to enter into negotiations with any qualified party interested in securing a purchase contract for water.

PENDING APPLICATIONS

Alaska Aquaculture, Inc. (Burnett Inlet Hatchery)

In an effort to pay off outstanding state loans for the development of the fish hatchery at Burnett Inlet and provide some operating capital, Alaska Aquaculture, Inc. applied for and the Division issued a Temporary Water Use Permit to export up to one million gallons a week from the Burnett River system. Using a small tanker this water is to be sold as potable water for no more than one cent a gallon to RainMaker Resources in Corte Madera, California. This temporary permit has been issued.

Sun Belt Water, Inc. & Sun Belt Marine, Ltd.

These California-based firms are pioneering the marine transport of water to southern California and Mexico. Originally formed by a group of former oil company executives and experts in marine transport to bid on the Santa Barbara RFP/contract in 1990, they have continued to develop water transport opportunities. Their senior executives, Board of Directors, and legal counsel represent very high profile, experienced, and creditable talent. Sun Belt has local representation in Juneau and Anchorage and has sent senior executives to Alaska to meet with the Division of Water as well as all other state and federal permitting agencies. The same executives met with representatives of major environmental groups in 1991 in Anchorage to discuss any concerns they may have. At the request of the Division of Water, Sun Belt withdrew one application when it was discovered the source was located in a federal wilderness area.

Although the Division of Water often receives calls and visits from individuals, firms, and groups, other than the Burnett Inlet Hatchery application approved in 1991, Sun Belt Water, Inc. is the only firm to have actually filed applications with the state for water for the purpose of export. In the absence of competing applications, the Division of Water is working with Sun Belt on their two applications for the export of 350,000 acre feet a year. The division is working closely with the Division of Governmental Coordination and the Attorney General's Office to ensure these applications are processed according to existing statutes and regulations.

THE FUTURE

Given the expectations of growth in the southwestern United States, and a variety of developments impacting existing and potential local sources of water such as new listings of instream dependent species under the Endangered Species Act and new directions in Congress for the Bureau of Reclamation that require more local water to be dedicated to fish and game, market demand will continue to grow - even if it rains. State officials in California predict a water deficit of 4 to 6 million acre feet a year in just their area, not including northern Mexico or inland states such as Nevada. Although political leaders and professional water managers in the market area are making every effort to solve their water deficits with local sources, conservation, reclamation, and even desal, many have already come to the realization that it cannot be done. New sources of water must be found and the importation of water from Alaska can be a part of the solution to this challenge.

A number of communities in northern Mexico (Rosa Rita Beach and Ensenada) currently do not have enough water to meet their needs, let alone future demands. Efforts by the State of Alaska, in cooperation with the private sector, can cost-effectively meet these immediate needs. The first and still most difficult hurdle to overcome is believability. In this area we are making slow but noticeable progress.

ALASKA

40% OF OUR NATION'S FRESH WATER RESOURCES

Superior quality fresh water can be provided by the private sector, on a turn-key basis, with zero capital funding by California water buyers. By using marine transport the buyers of quality Alaskan water allow themselves total flexibility in the rate of delivery at minimum cost.

THE MARINE TRANSPORT OF SUPERIOR QUALITY WATER FROM SOUTHEAST ALASKA TO SOUTHERN CALIFORNIA IS ECONOMICALLY MORE VIABLE AND ENVIRONMENTALLY MORE RESPONSIBLE THAN MANY OTHER ALTERNATIVES

Major Advantages of Marine Transport Compared to Desalination

Uses approximately 33% less energy, most of which is used outside of California. Reduces future energy dependence and impacts on California air quality.

* Significantly less expensive, both in real dollars and environmental costs.

* Requires no significant on-shore land use thus minimizing the impact on sensitive coastal areas.

* Involves no toxic chemicals or expensive waste-stream management.

* Has no waste discharge thereby minimizing impacts on marine environments.

Secure So ces

Over 25 la ge lakes in Southeast, Alaska with watersheds that average annual precipitation between 150 to 400+ inches, many without fish, and are easily accessed by marine transport. Applications now being processed by the State of Alaska for annual deliveries in excess of 350,000 AFY.

Cost Estimates

Assuming a minimum of 15,000 AFY for 10 years with delivery to the Central Coast of California, $1,500 to $1,900 per acre foot. With bag technology the delivery cost is less than $1,000 per acre foot. Using single hull VLCC tankers, delivery is in multiples of 15,000 AFY. Direct tie-in with existing water delivery and storage systems allows mixing with lower cost sources, reducing economic impact.

Mitigation of other Environmental Concerns

Allows exchange with inland states, such as Nevada, for existing water appropriations from Colorado or Sacramento Rivers as well as inland California agriculture with coastal communities.

Allows more inland water to meet growing endangered species demands.

CALIFORNIA

If we are able to achieve every success, every advantage, in conservation, water reclamation (sewage/water recovery), redistribution, groundwater management, water marketing, new sources, expanded storage, and population control we will still be short 4 to 6 million acre feet a year by 2010 - if it rains. So said Douglas Wheeler, Secretary of Natural Resources for California at the Global Cities Project Water conference in San Francisco (3/20/92).

Population Increase

The experts agree that by the year 2010 the population of Southern California will increase by one third. That is if no-growth ordinances continue in place.

The Colorado River

As a result of court decisions the State of Arizona has begun claiming their priority right to water from the Colorado River; efforts by federal agencies to protect threatened or endangered species that depend on this river system; international demands will cause more, clean, water to be passed to Mexico - each of these facts will significantly reduce the amount of water available to Southern California.

The Sacramento River

California will become very familiar with the Endangered Species Act over the next decade. Some California groups openly claim to have dozens of species, which are instream dependent, ready for "listing". This coupled with seismic, water quality and wetland concerns and the delays and exponential costs of new storage and diversions make more water from this source very problematic.

Economic Impacts

California newspapers are full of stories of businesses leaving. Some businesses are already spending significant dollars to cleanup the water they receive for manufacturing. Sources are less and less dependable. Importing water from Alaska; it is a simple economic decision if you need dependable, low cost, high quality water.

Desalination

Although the contract price for desal in Santa Barbara was $1965 per AF, the current cost is reported to be much greater. After 3 months of operation the $30 million plant was shut down, but the city is still paying $1200 per acre foot against 3200 acre feet a year and no water is being produced. Desalination costs will escalate because they are dependent on very large quantities of energy. As the cost of energy increases so will the cost of desal water. Desalination also produces a huge waste stream. Existing discharge and waste stream management costs will increase with more restrictive environmental laws and regulations. Due to low volume production, dozens of large plants will need to be located on the California coast.

December 1990

Policies and Procedures on OWNERSHIP AND MANAGEMENT OF NAVIGABLE AND PUBLIC WATERS

State ownership of the beds of navigable waters is an inherent attribute of state sovereignty protected by the United States Constitution. *Utah v. United States,* 482 U.S. 193 (1987). Under the doctrine that all states enter the Union on an equal footing with respect to sovereign rights and powers, title to the beds of navigable waters in Alaska vested in the newly formed State of Alaska in 1959. In addition, under the Alaska Constitution and the public trust doctrine, **all waters** in the state are held and managed by the state in trust for the use of the people, regardless of navigability and ownership of the submerged lands under the Equal Footing Doctrine.

The purpose of this paper is to describe the State of Alaska's policies and procedures for identifying and protecting the state's title to the beds of navigable waters. In addition, this paper outlines the legal and policy considerations which guide the ownership and management of submerged lands and public waters.

Identifying and Protecting State Title to the Beds of Navigable Waters

Identification and management of the beds of navigable waters is an important policy of the State of Alaska. In 1980, the state established a comprehensive navigability program to respond to federal land conveyances and land management activities under the Alaska Statehood Act, the Alaska Native Claims Settlement Act (ANCSA) and the Alaska National Interest Lands Conservation Act (ANILCA). Pursuant to the provisions of those acts, the federal government has issued navigability determinations for thousands of lakes, rivers and streams throughout the state in an effort to determine whether the state or federal government owns the submerged lands. Navigability determinations are also made prior to many state land disposals to insure that adequate public use easements are reserved.

The basic purpose of the state's program is to protect the public rights associated with navigable waters, including in particular the state's title to the submerged lands. Because state and Native land selections and federal conservation units blanket the state, navigability questions have arisen for rivers, lakes and streams throughout Alaska. The navigability of many of those waterbodies has already been established. There are hundreds of others, however, where navigability is not yet determined.

To help resolve these navigability disputes, a major goal of the state's navigability program is to identify the proper criteria for determining title navigability in Alaska and to gather sufficient information about the uses and physical characteristics of individual waterbodies so that accurate navigability determinations can be made as disputes arise. Other important aspects of the program include monitoring federal land conveyance and management programs to identify particular navigability disputes, seeking cooperative resolution of navigability problems through negotiations and legislation, and preparing for statewide navigability litigation.

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Alaska Department of NATURAL RESOURCES

Riparian Rights and Statute of Limitations

Disputes over ownership of submerged lands in Alaska have arisen under a variety of circumstances. The principal source of the disputes in Alaska is the survey and acreage accounting system used by the federal government for conveying land to the state and Native corporations.

The standard procedures for surveying and conveying federal land are found in the *Manual of Instructions for the Survey of the Public Lands of the United States*, generally known as the *BLM Manual of Surveying Instructions*. Under those procedures, consistently used in every public land state except Alaska, only uplands are surveyed and conveyed in fulfillment of acreage entitlements, not submerged lands. The survey rules require that all lakes 50 acres or larger and rivers and streams three chains (198) feet in width or wider, regardless of navigability, be meandered and segregated (excluded) from the surveyed public lands. Only the surveyed uplands are conveyed. The acreage of meandered rivers, lakes and streams is not included in computing the amount of land involved in the conveyance.

In Alaska, however, the federal government has not consistently followed these survey rules. Until 1983, the federal government treated submerged lands the same as uplands. All bodies of water that were considered non-navigable by the federal government, regardless of size, were surveyed as though they were uplands and the acreage of submerged lands was charged against the total acreage entitlement.

Because of these conveyance procedures, the navigability of waterbodies in Alaska has been an issue of contention since the enactment of the Alaska Statehood Act and ANCSA. In addition to the problems caused by a lack of information about many waterbodies, the situation was exacerbated by the narrow definition of navigability used by the federal government. Hundreds of rivers, lakes and streams considered navigable by the state were determined non-navigable by the federal government.

In 1983, following years of negotiations, lawsuits and legislative attempts to solve the navigability problems created by the unusual survey and conveyance procedures in Alaska, the State of Alaska, the United States Department of the Interior and the Alaska Federation of Natives (AFN) agreed that the standard rules of survey should be followed for land conveyances in Alaska. The effect of that decision was to treat Alaska surveys and land conveyances like federal land surveys and conveyances in other states. The recipients of conveyances from the federal government are charged only for the amount of public land that is calculated by the survey, which does not include the areas of meandered rivers, lakes and streams.

The use of these survey procedures has eliminated many of the problems associated with the federal land conveyance programs in Alaska. Submerged lands are no longer being conveyed to fulfill acreage entitlements. With the exception of lakes smaller than 50 acres and streams narrower than 198 feet, navigability determinations are no longer being made prior to federal land conveyances. Determinations of ownership of submerged lands can be put off until a natural resource use or conflict requires resolution, such as issuance of an oil and gas lease, mining claim or a gravel sale.

Through the joint efforts of the State of Alaska, AFN and the Department of the Interior, the 1983 decision to use the standard survey procedures for land conveyances in Alaska was legislatively approved in August of 1988 when the United States Congress passed legislation (94 Stat. 2430) amending section 901 of the Alaska National Interest Lands Conservation Act, codified at 43 U.S.C. 1631. The 1988 amendment, sometimes referred to as the Alaska Submerged Lands Act, requires that the standard rules of survey in the *BLM Manual of Surveying Instructions* be used for all federal surveys under the Alaska Statehood Act and ANCSA. The 1988 amendment also repealed the Section 901 statute of limitations that would have required the state to file a lawsuit within a very short period of time in order to preserve its title to the beds of navigable waters conveyed to Native corporations by the federal government as a result of erroneous navigability determinations, poor maps, surveys or whatever.

Even with this legislation, a major problem concerning navigability decisions made by the federal government under the old system remains unresolved. At issue are the hundreds of erroneous non-navigability decisions and the resulting submerged land conveyances made to ANCSA cor-